Bay Area Drought Relief Program (Bay DRP)

Attachment 1

Authorization and Eligibility Requirements

Association of Bay Area Governments

Proposition 84

Integrated Regional Water Management

2014 Drought Grant Application

Authorizing Documentation

The Association of Bay Area Governments (ABAG) is pleased to serve as the applicant for the San Francisco Bay Integrated Regional Water Management (IRWM) Region's Bay Area Drought Relief Program (Bay DRP). The Bay DRP is comprised of 11 projects involving 19 agencies and organizations representing the nine-county San Francisco Bay Area. The Proposal Objective, as determined by the Bay Area IRWM Coordinating Committee, is to implement 11 high priority projects selected from the Bay Area IRWM Plan to provide immediate drought relief and meet the San Francisco Regional IRWM Plan Objectives as well as the Department of Water Resources' evaluation criteria for this funding round.

The Bay DRP projects will implement multi-objective improvements in all parts of the region. They incorporate a range of water management elements and address drought-related regional and subregional needs. Alameda, Contra Costa, Santa Clara, San Mateo, and San Francisco counties are experiencing "exceptional drought" conditions, while Marin, Sonoma, Napa and Solano counties in the North Bay are under "extreme drought" conditions (National Drought Mitigation Center 2014). Emergency water shortage proclamations have been issued by the cities of St. Helena, Calistoga, and American Canyon in Napa County, the County of Sonoma, the Sonoma County Water Agency, the Alameda County Water District, the Zone 7 Water Agency, and the City of Mountain View. The Bay DRP, if funded, will go a long way to meeting the region's current drought related needs and objectives.

ABAG is a joint powers authority (JPA) formed under California Government Code Section 6500. ABAG is the comprehensive regional planning agency and Council of Governments for the San Francisco Bay Area. All nine counties and 101 cities and towns within the Bay Area are voluntary members, representing all of the region's population – more than 7 million people. The ABAG Executive Board adopted Resolution 09-14 on June 13, 2014, authorizing ABAG to submit this application and execute an agreement with the State of California for an IRWM Implementation Grant. A copy of the resolution is included on the next page.

ASSOCIATION OF BAY AREA GOVERNMENTS
ADMINISTRATIVE COMMITTEE

RESOLUTION NO. 09-14

AUTHORIZING THE EXECUTIVE DIRECTOR OR DESIGNEE, TO SUBMIT AN APPLICATION AND EXECUTE AN AGREEMENT WITH THE CALIFORNIA DEPARTMENT OF WATER RESOURCES ON BEHALF OF THE SAN FRANCISCO BAY REGION IRWMP DROUGHT RELIEF PROJECTS

NOW, THEREFORE, BE IT RESOLVED, that the Administrative Committee of the Association of Bay Area Governments hereby approves that application be made to the California Department of Water Resources to obtain an Integrated Regional Water Management Implementation Grant pursuant to the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Public Resource Code Section 75001 et/seq.), and to enter into an agreement to receive a grant for the Bay Area Drought Relief Program (BAYDRP). The Executive Director, or designee, of the Association of Bay Area Governments is hereby authorized and directed to prepare the necessary data, conduct investigations, file such application, and execute a grant agreement with the California Department of Water Resources.

The foregoing was adopted by the Administrative Committee this 13th day of June, 2014.

Julie Pierce
Chair

Certification of Executive Board Approval

I, the undersigned, the appointed and qualified Secretary-Treasurer of the Association of Bay Area Governments (Association), do hereby certify that the foregoing resolution was adopted by the Administrative Committee of the Association at a duly called meeting held on the 13th day of June, 2014.

Ezra Rapport
Secretary-Treasurer

Approved as To Legal Form

Kenneth K. Moy
Legal Counsel

Eligible Applicant Documentation

Local Agencies

Is the applicant a local agency as defined in Appendix B of the 2014 IRWM Drought Guidelines? Please explain.

Yes. The Association of Bay Area Governments (ABAG), a local agency as defined in Appendix B of the 2014 Guidelines, is the applicant for the Bay Area Drought Relief Program (Bay DRP), Proposition 84 (Prop 84), 2014 Integrated Regional Water Management (IRWM) Drought Grant Application (Proposal) submittal.

What is the statutory or other legal authority under which the applicant was formed and is authorized to operate?

ABAG, a joint powers authority (JPA) formed under California Government Code Section 6500, is the comprehensive regional planning agency and Council of Governments for the San Francisco Bay Area. All nine counties and 101 cities and towns within the Bay Area are voluntary members, representing all of the region's population – more than 7 million people. ABAG is governed by a 38-member Executive Board of local elected officials, and an elected official from each member city, town, and county serves as a delegate to ABAG's General Assembly. ABAG was the first Council of Governments formed in California (1961) and serves as a leader in the areas of land use, environmental stewardship, energy efficiency, hazard mitigation, and water resource protection. ABAG has launched and/or housed a variety of distinct innovative environmental programs, including the San Francisco Bay Trail, the Bay Area Water Trail, the Bay Area Green Business Program, and the San Francisco Estuary Partnership.

ABAG has legal authority to enter into agreements with the State of California. ABAG will enter into agreements with each of the local project sponsors participating in this Proposal following execution of the Grant Agreement with the California Department of Water Resources (DWR) to ensure performance and tracking of funds.

Does the applicant have legal authority to enter into a grant agreement with the State of California?

Yes. On March 20, 2014, ABAG's Executive Board adopted Resolution 04-14, which gives the agency authority to submit this application and enter into a Grant Agreement with DWR.

Describe any legal agreements among partner agencies and/or organizations that ensure performance of the Proposal and tracking of funds.

The local project sponsors and ABAG will form an Oversight and Coordination Committee that will review project progress and quarterly reports, oversee grant reimbursement and invoicing, and resolve outstanding matters.

A Local Project Sponsor (LPS) Agreement between ABAG and each local project sponsor will be established to ensure that matching funds are committed and grant requirements are satisfied. These agreements will include DWR-required provisions and will be consistent with the DWR Grant Agreement. Each of the agreements will have similar general conditions, but each agreement will also be tailored to the specific funding and grant requirements applicable to that project. Generally, the LPS Agreements will be controlling with respect to issues affecting a specific project, whereas the LPS Oversight and Coordination Committee will review issues affecting implementation of the entire suite of nine proposed projects.

ABAG will appoint a Grant Manager from the San Francisco Estuary Partnership (SFEP). SFEP, a program of ABAG, is part of the National Estuary Program, developed under Section 320 of the federal Clean Water Act with the specific mission of preserving, restoring, and enhancing the ecological health of the estuary through implementation of the Comprehensive Conservation and Management Plan (CCMP). The current CCMP (2007) serves as the overarching watershed plan for the estuary. SFEP collaborates with resource agencies, non-profit organizations, citizens, and scientists working to protect, restore, and enhance water quality and fish and wildlife habitat in and around the San Francisco Bay/Delta Estuary. SFEP has more than 15 years of experience managing similar projects to improve the Estuary and brings its strong record of project and contract management to this effort. SFEP has successfully completed many multi-million-dollar grants and projects funded by government agencies. SFEP has worked with many of the project proponents in past and ongoing efforts. The Grant Manager will oversee the Bay DRP by coordinating with all local project sponsors to ensure completeness and timeliness in reporting and invoicing. The

Grant Manager will also ensure that project progress occurs according to schedule and concomitant with progress reports and field visits.

Non-profit Organizations

Is the applicant a non-profit organization as defined in Appendix B of the 2014 IRWM Drought Guidelines? Please explain.

No. ABAG is not a non-profit organization.

Does the applicant have legal authority to enter into a grant agreement with the State of California?

N/A

Describe any legal agreements among partner agencies and/or organizations that ensure performance of the Proposal and tracking of funds.

N/A

Include a copy of the certificate of incorporation for the organization.

N/A

Acknowledgement Form

A copy of the 2014 IRWM Drought Grant Acknowledgement Form signed by ABAG is included on the next page.

The original copy with wet signature was mailed to DWR directly.

Coordinating Committee
San Francisco Bay Area
Integrated Regional Water Management Plan
c/o San Francisco Public Utilities Commission
525 Golden Gate Avenue
San Francisco, CA 94102

2014 IRWM Drought Grant Acknowledgement

Applicant Name: Association of Bay Area Governments/ San Francisco Estuary Partnership

IRWM Region: San Francisco Bay Area

RWMG: San Francisco Bay Area Coordinating Committee

As the authorized representative of the above-referenced RWMG, I acknowledge and affirm that the RWMG understands that it must provide additional information to DWR in the event that the RWMG is conditionally selected to receive 2014 IRWM Drought grant funding.

I further acknowledge that the RWMG understands that its request for 2014 IRWM Drought grant funding is part of an expedited solicitation effort and agrees to the following items:

- If conditionally awarded funding, the applicant, on the behalf of RWMG, will submit to DWR, within thirty (30) calendar days of written notification, which may include email or electronic notification, all of the following items:
  - A detailed Work Plan for each project contained in the Proposal
  - Documentation to support the Project Justification claims contained in the Proposal
  - Audited Financial Statements for the Grantee and the individual project proponents whose project(s) is/are about to begin construction/implementation
  - CEQA/NEPA documentation for those projects that are about to begin construction/implementation
  - Other materials that DWR deems necessary, which will be detailed in the award notification

I further acknowledge that the RWMG also understands that failure to submit the necessary information, within thirty (30) calendar days, may result in delayed execution of the grant agreement or revocation of the conditional award of funds.

Authorized Original Signature: _____
Printed Name: Steve Ritchie, Chair, Bay Area Coordinating Committee
Date: 5/30/14

Adopted IRWM Plan and Proof of Formal Adoption

The 2013 San Francisco Bay Area Integrated Regional Water Management Plan Update (Bay Area IRWM Plan) has been adopted by the agencies and entities listed in **Table 1-1**, below. Resolutions adopted by supervising Boards for each of these agencies are included in the following pages.

Table 1-1. Proof of Formal Adoption of the 2013 Bay Area IRWM Plan Update

Bay Area IRWM Plan Adopting Entity	Date of Adoption	Resolution Number
ABAG Executive Board	March 20, 2014	04-14
Alameda County StopWaste.org (StopWaste)*	March 26, 2014	WMA 2014-2
Alameda County Water District (ACWD)*	April 8, 2014	14-015
Bay Area Water Supply and Conservation Agency (BAWSCA)*	March 20, 2014	2014-02
City of Calistoga	June 17, 2014	2014-052
City of Napa*	May 1, 2014	R2014-67
City of Sunnyvale	The City of Sunnyvale will adopt the IRWM plan and submit to DWR in August 2014.	
Contra Costa Water District (CCWD)*	April 16, 2014	14-08
Dublin San Ramon Services District – East Bay Municipal Utility District Recycled Water Authority (DERWA)	June 23, 2014	14-2
Dublin San Ramon Services District (DSRSD)	April 22, 2014	20-14
East Bay Municipal Utility District (EBMUD)*	April 8, 2014	33973-14
Marin Municipal Water District (MMWD)*	April 1, 2014	8258
Napa Sanitation District	April 2, 2014	14-003
San Francisco Public Utilities Commission and City and County of San Francisco (SFPUC)*	April 22, 2014	14-0059
San Mateo County Resource Conservation District (San Mateo County RCD)	June 26, 2014	2014-5
Santa Clara Valley Water District (SCVWD)*	April 22, 2014	14-48
Solano County Water Agency*	April 10, 2014	2014-1
Sonoma County Water Agency*	April 22, 2014	14-0155
Stinson Beach County Water District	June 21, 2014	GB-2014-06
Zone 7 Water Agency (Zone 7)*	April 16, 2014	14-4359

**Indicates Participating Agency of the Bay Area Regional Drought Relief Conservation Program (Project 10)*

Association of Bay Area Governments

ASSOCIATION OF BAY AREA GOVERNMENTS
EXECUTIVE BOARD

RESOLUTION NO. 04-14

RESOLUTION TO ADOPT THE BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN UPDATE

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area jointly submitted an IRWM grant application for state consideration where a condition for funding required the Bay Area IRWM Plan to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds did adopt the Bay Area IRWM Plan before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the Bay Area IRWM Plan be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a grant was received to update the Bay Area IRWM Plan, that Plan having been completed in the fall of 2013 and submitted to the Department of Water Resources in January 2014; and

WHEREAS, a series of workshops were held on the initial Bay Area IRWM Plan and, recently, the Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the Draft Bay Area IRWM Plan Update was posted on the internet and made available for public comment; and

WHEREAS, the Bay Area IRWM Plan Update before the Board for consideration incorporates changes based on comments received during the public review period in

the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the Bay Area IRWM Plan Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the Bay Area IRWM Plan as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, adoption of the Bay Area IRWM Plan Update does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the Bay Area IRWM Plan Update participants to implement any or all of the projects; and

WHEREAS, the Executive Director of the Association of Bay Area Governments has reviewed the Bay Area IRWM Plan Update and determined that it is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the IRWM Plan Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the IRWM Plan Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWM does not prohibit or effect in any way a participating agencies' planning efforts separate from the IRWM Plan.

ASSOCIATION OF BAY AREA GOVERNMENTS
RESOLUTION NO. 04-14

NOW, THEREFORE, BE IT RESOLVED that the Executive Board of the Association of Bay Area Governments does hereby adopts the Bay Area Integrated Regional Water Management Plan Update.

The foregoing was adopted by the Executive Board this 20th day of March, 2014.

Julie Pierce
President

Certification of Executive Board Approval

I, the undersigned, the appointed and qualified Secretary-Treasurer of the Association of Bay Area Governments (Association), do hereby certify that the foregoing resolution was adopted by the Executive Board of the Association at a duly called meeting held on the 20th day of March, 2014.

Ezra Rapport
Secretary-Treasurer

Approved as To Legal Form

Kenneth K. Moy
Legal Counsel

Alameda County StopWaste.org (StopWaste)

ALAMEDA COUNTY WASTE MANAGEMENT AUTHORITY

RESOLUTION #WMA 2014 – 2
MOVED: Tam
SECONDED: Wozniak
AT THE MEETING HELD MARCH 26, 2014

ADOPTING THE SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN UPDATE

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area, including the Alameda County Waste Management Authority ("Authority") jointly submitted an IRWM grant application for state consideration where a condition for funding required the Bay Area IRWM Plan to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds did adopt the Bay Area IRWM Plan before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the Bay Area IRWM Plan be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a grant was received to update the Bay Area IRWM Plan, that Plan having been completed in the fall of 2013 and submitted to the Department of Water Resources in January 2014; and

WHEREAS, a series of workshops were held on the initial Bay Area IRWM Plan and recently the Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the Draft Bay Area IRWM Plan Update was posted on the internet and made available for public comment; and

WHEREAS, the Bay Area IRWM Plan Update before the Authority Board for consideration incorporates changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the Bay Area IRWM Plan Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the Bay Area IRWM Plan as conditions warrant, provided that funding and resources are available to carry out these activities; and

WHEREAS, adoption of the Bay Area IRWM Plan Update does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the Bay Area IRWM Plan Update participants, including the Authority, to implement any or all of the projects; and

WHEREAS, the Bay Area IRWM Plan Update is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the IRWM Plan Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the IRWM Plan Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWM does not prohibit or affect in any way the Alameda County Waste Management Authority's planning efforts separate from the IRWM Plan; and

NOW THEREFORE, BE IT RESOLVED THAT:

The Bay Area IRWM Plan Update, a comprehensive nonbinding plan that analyzes and prioritizes water supply, wastewater and recycled water, stormwater and flood protection, watershed management, habitat protection and restoration needs and projects in the nine county Bay Area region, is hereby adopted.

ADOPTED BY THE FOLLOWING VOTE:

AYES:	Akagi, Biddle, Carson, Cutter, Ellis, Halliday, Kalb, Maass, Natarajan, Pentin, Tam, Turner, West, Wozniak
NOES:	None
ABSENT:	Freitas, Landis
ABSTAIN:	Rood

I certify that under the penalty of perjury that the foregoing is a full, true and correct copy of Resolution No. 2014-2.

GARY WOLFF, PE, PhD
EXECUTIVE DIRECTOR

Alameda County Water District

RESOLUTION NO. 14-015

OF BOARD OF DIRECTORS OF THE ALAMEDA COUNTY WATER DISTRICT ADOPTING THE SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN UPDATE

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area jointly submitted an IRWM grant application for state consideration where a condition for funding required the Bay Area IRWM Plan to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds did adopt the Bay Area IRWM Plan before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the Bay Area IRWM Plan be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a series of workshops were held on the initial Bay Area IRWM Plan and recently the Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the Draft Bay Area IRWM Plan Update was posted on the internet and made available for public comment; and

WHEREAS, the Bay Area IRWM Plan Update before the Board for consideration incorporates changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the Bay Area IRWM Plan Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the Bay Area IRWM Plan as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, adoption of the Bay Area IRWM Plan Update does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the Bay Area IRWM Plan Update participants to implement any or all of the projects; and

WHEREAS, the Bay Area IRWM Plan Update is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the IRWM Plan Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the IRWM Plan Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWM does not prohibit or effect in any way a participating agencies' planning efforts separate from the IRWM Plan.

NOW THEREFORE, BE IT RESOLVED that the Alameda County Board of Directors does hereby adopt the Bay Area IRWM Plan Update.

PASSED AND ADOPTED THIS 8th day of April, 2014, by the following vote:

AYES: Directors Koller, Gunther, Huang, Weed, and Sethy

NOES: None

ABSENT: None

/s/ PAUL S. SETHY
Paul S. Sethy, President
Board of Directors
Alameda County Water District

ATTEST:

/s/ GINA MARKOU
Gina Markou, District Secretary
Alameda County Water District
(Seal)

APPROVED AS TO FORM:

/s/ PATRICK T. MIYAKI
Patrick T. Miyaki, Attorney
Alameda County Water District

CERTIFICATE

I, the undersigned District Secretary of ALAMEDA COUNTY WATER DISTRICT, do hereby certify that the foregoing is a full, true and correct copy of a Resolution of the Board of Directors of ALAMEDA COUNTY WATER DISTRICT, a political subdivision, which said Resolution was duly adopted at a meeting of said Board regularly held on April 8, 2014, that a copy of said Resolution was forthwith duly entered in the minutes of said meeting of said Board, and that the same is in full force and effect.

Dated: April 9, 2014

Gina Markou

Gina Markou, District Secretary
Alameda County Water District

Bay Area Water Supply and Conservation Agency (BAWSCA)

RESOLUTION NO. 2014-02
BY THE BOARD OF DIRECTORS OF THE
BAY AREA WATER SUPPLY AND CONSERVATION AGENCY

ADOPTING THE UPDATED SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN

WHEREAS, the Bay Area Water Supply and Conservation Agency (BAWSCA) is organized and established pursuant to the Bay Area Water Supply and Conservation Agency Act, Water Code section 81300, et seq. (Act); and

WHEREAS, Bay Area Clean Water Agencies (BACWA) is a joint powers authority made up of numerous water agencies in the San Francisco Bay Area region: and

WHEREAS, BACWA is the recipient of a grant from the State of California, Department of Water Resources (DWR Grant) to help fund integrated planning efforts for water resources management, including the implementation and operation of various regional water conservation, water recycling, ecosystem restoration, green infrastructure, and flood management-watershed projects to be carried out by a number of participating agencies, including BAWSCA; and

WHEREAS, the DWR Grant provided BAWSCA with $862,988 for its water conservation programs; and

WHEREAS, the DWR Grant also provided funds to update the Bay Area Integrated Regional Water Management Plan (IRWMP), a nine-county effort to coordinate and improve water supply reliability, protect water quality, manage flood protection, maintain public health standards, protect habitat and watershed resources, and enhance the overall health of the bay; and

WHEREAS, the IRWMP was posted on the internet for public comment and updated in September, 2013 to incorporate changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the IRWMP; and

WHEREAS, BAWSCA does not have any responsibility either to implement any projects under the updated IRWMP or commit any resources, and the updated IRWMP does not effect in any way BAWSCA's planning efforts separate from the updated IRWMP; and

WHEREAS, a requirement of the DWR Grant is that participating agencies, including BAWSCA, adopt the IRWMP, as updated.

NOW THEREFORE, BE IT RESOLVED, that the Board of Directors hereby adopts the IRWMP as updated.

ADOPTED this 20th day of March, 2014, by the following votes:

AYES: Abrica, Anderson, Breault, Chambers, Gomez, Guingona, Guzzetta, Klein, Laporte, Larsson, Mendall, Mickelsen, O'Connell, O'Mahony, Piccolotti, Pierce, Quigg, Richardson, Vella, Weed

NOES:

ABSENT: Bronitsky, Kasperzak, Kasten, Keith, Marsalli, Reed

Irene M O'Connell
Chair, Board of Directors
Bay Area Water Supply and
Conservation Agency

ATTEST:
Nicole Sandkulla

City of Calistoga

RESOLUTION 2014-052

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CALISTOGA, COUNTY OF NAPA, STATE OF CALIFORNIA, ADOPTING THE SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN UPDATE AND DESIGNATING THE CITY MANAGER AND/OR THE PUBLIC WORKS DIRECTOR AS AGENTS OF THE CITY

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area jointly submitted an IRWM grant application for state consideration where a condition for funding required the Bay Area IRWM Plan to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds did adopt the Bay Area IRWM Plan before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the Bay Area IRWM Plan be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a grant was received to update the Bay Area IRWM Plan, that Plan Update having been completed in the fall of 2013 and submitted to the Department of Water Resources in January 2014; and

WHEREAS, a series of workshops were held on the initial Bay Area IRWM Plan and recently the Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments, and make recommendations; and

WHEREAS, the Draft Bay Area IRWM Plan Update was posted on the internet and made available for public comment; and

WHEREAS, the Bay Area IRWM Plan Update before the City Council for consideration incorporates changes based on comments received during the public

review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the Bay Area IRWM Plan Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects, and periodically updating the Bay Area IRWM Plan as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, adoption of the Bay Area IRWM Plan Update does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the Bay Area IRWM Plan Update participants to implement any or all of the projects; and

WHEREAS, the Bay Area IRWM Plan Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWM Plan does not prohibit or affect in any way a participating agencies' planning efforts separate from the IRWM Plan; and

WHEREAS, the Bay Area IRWM Plan Update is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines Sections 15262 and 15306 because the IRWM Plan Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved.

NOW, THEREFORE, BE IT RESOLVED, by the City Council of the City of Calistoga, as follows:

1. Hereby finds that the facts set forth in the recitals to this Resolution are true and correct, and establish the factual basis for the City Council's adoption of this Resolution.

2. Hereby determines that this action is exempt from CEQA pursuant to CEQA Guidelines Sections 15262 and 15306 because the IRWM Plan Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved.

3. Hereby adopts the San Francisco Bay Area Integrated Regional Water Management Plan Update and any subsequent amendments thereto.

4. Hereby authorizes the City Manager and/or the Public Works Director to act as agents for the City for the purposes of signing any required documentation related to the IRWM Plan Update.

5. Hereby authorizes the City Manager and/or the Public Works Director to act as agents for the City to submit a Proposition 84/IRWMP grant application, including any application forms, contracts, and other documents necessary to secure Prop 84 grant funding.

6. This Resolution shall take effect immediately upon its adoption.

PASSED, APPROVED, AND ADOPTED by the City Council of the City of Calistoga at its regular meeting held this **17th day of June 2014** by the following vote:

AYES:	**Councilmembers Kraus, Lopez-Ortega and Barnes, Vice Mayor Dunsford and Mayor Canning**
NOES:	**None**
ABSTAIN:	**None**
ABSENT:	**None**

CHRIS CANNING, Mayor

ATTEST:

KATHY FLAMSON, Deputy City Clerk

City of Napa

ATTEST
This document is a correct copy of the original on file in the office of the City Clerk of the City of Napa, County of Napa, State of California
By [signature] Date 2/7/14

RESOLUTION R2014-67

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF NAPA, STATE OF CALIFORNIA, ADOPTING THE SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN UPDATE

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area jointly submitted an IRWM grant application for state consideration where a condition for funding required the Bay Area IRWM Plan to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds, including the City of Napa, did adopt the Bay Area IRWM Plan before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the Bay Area IRWM Plan be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a grant was received to update the Bay Area IRWM Plan, that Plan Update having been completed in the fall of 2013 and submitted to the Department of Water Resources in January 2014; and

WHEREAS, a series of workshops were held on the initial Bay Area IRWM Plan and recently the Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments, and make recommendations; and

WHEREAS, the Draft Bay Area IRWM Plan Update was posted on the internet and made available for public comment; and

WHEREAS, the Bay Area IRWM Plan Update before the City Council for consideration incorporates changes based on comments received during the public

review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the Bay Area IRWM Plan Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects, and periodically updating the Bay Area IRWM Plan as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, adoption of the Bay Area IRWM Plan Update does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the Bay Area IRWM Plan Update participants to implement any or all of the projects; and

WHEREAS, the Bay Area IRWM Plan Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWM Plan does not prohibit or affect in any way a participating agencies' planning efforts separate from the IRWM Plan; and

WHEREAS, the Bay Area IRWM Plan Update is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines Sections 15262 and 15306 because the IRWM Plan Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the City Council has considered all information related to this matter, as presented at the public meetings of the City Council identified herein, including any supporting reports by City Staff, and any information provided during public meetings.

NOW, THEREFORE, BE IT RESOLVED, by the City Council of the City of Napa, as follows:

1. The City Council hereby finds that the facts set forth in the recitals to this Resolution are true and correct, and establish the factual basis for the City Council's adoption of this Resolution.

2. The City Council hereby determines that this action is exempt from CEQA pursuant to CEQA Guidelines Sections 15262 and 15306 because the IRWM Plan Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved.

3. The City Council does hereby adopt the San Francisco Bay Area Integrated Regional Water Management Plan Update.

4. This Resolution shall take effect immediately upon its adoption.

I HEREBY CERTIFY that the foregoing Resolution was duly adopted by the City Council of the City of Napa at a public meeting of said City Council held on the 6th day of May, 2014, by the following vote:

AYES: Sedgley, Inman, Mott, Pedroza, Techel

NOES: None

ABSENT: None

ABSTAIN: None

ATTEST: Dorothy Roberts
City Clerk

Approved as to form:

Michael W. Barrett
City Attorney

City of Sunnyvale

The City of Sunnyvale will adopt the IRWM plan and submit to DWR in August 2014.

Contra Costa Water District

CERTIFIED A TRUE COPY OF THE ORIGINAL

Mary A. Neher

Mary A. Neher, District Secretary
Contra Costa Water District

RESOLUTION NO. 14-08

A RESOLUTION OF THE BOARD OF DIRECTORS OF CONTRA COSTA WATER DISTRICT ADOPTING THE SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN UPDATE

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area jointly submitted an IRWM grant application for state consideration where a condition for funding required the Bay Area IRWM Plan to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds did adopt the Bay Area IRWM Plan before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the Bay Area IRWM Plan be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a grant was received to update the Bay Area IRWM Plan, that Plan having been completed in the fall of 2013 and submitted to the Department of Water Resources in January 2014; and

WHEREAS, a series of workshops were held on the initial Bay Area IRWM Plan and recently the Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the Draft Bay Area IRWM Plan Update was posted on the internet and made available for public comment; and

WHEREAS, the Bay Area IRWM Plan Update before the Board for consideration incorporates changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the Bay Area IRWM Plan Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the Bay Area IRWM Plan as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, adoption of the Bay Area IRWM Plan Update does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the Bay Area IRWM Plan Update participants to implement any or all of the projects; and

WHEREAS, the Bay Area IRWM Plan Update is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the IRWM Plan Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the IRWM Plan Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWM does not prohibit or effect in any way a participating agencies' planning efforts separate from the IRWM Plan; and

NOW THEREFORE, BE IT RESOLVED that the Board of Directors of the Contra Costa Water District does hereby adopt the San Francisco Bay Area IRWM Plan Update.

* * * * * * * * * *

The foregoing Resolution was duly and regularly adopted at a meeting held on the 16th day of April 2014 by the Board of Directors of Contra Costa Water District by the following vote of the Board:

AYES: Boatmun, Borba, Burgh, Campbell

NOES:

ABSENT: Wandry

ABSTAIN:

Joseph L. Campbell, President

ATTEST:

Mary A. Neher
District Secretary

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DERWA
RESOLUTION NO. 14-2

RESOLUTION OF THE BOARD OF DIRECTORS OF DSRSD•EBMUD RECYCLED WATER AUTHORITY ADOPTING THE "SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN UPDATE"

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area jointly submitted an IRWM grant application for state consideration where a condition for funding required the San Francisco Bay Area IRWM Plan (BAIRWMP) to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds did adopt the BAIRWMP before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the BAIRWMP be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a grant was received to update the BAIRWMP, that 2013 Plan

Update having been completed in January 2014 and the Department of Water Resources has completed its review and required no changes; and

WHEREAS, a series of workshops were held on the initial BAIRWMP and recently the Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the Draft BAIRWMP Update was posted on the BAIRWMP website (http://bairwmp.org/) and made available for public comment; and

WHEREAS, the BAIRWMP Update incorporates changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the BAIRWMP Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the BAIRWMP as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, adoption of the BAIRWMP Update does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the BAIRWMP Update participants to implement any or all of the projects; and

WHEREAS, both DSRSD and EBMUD has reviewed the BAIRWMP Update and determined that it is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the BAIRWMP Update consists of basic

data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the BAIRWMP Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the BAIRWMP Update does not prohibit or effect in any way a participating agencies' planning efforts separate from the BAIRWMP.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the DSRSD•EBMUD Recycled Water Authority, a Joint Powers Authority located in the counties of Alameda and Contra Costa, California, as follows:

The 2013 San Francisco Bay Area Integrated Regional Water Management Plan Update is hereby adopted.

ADOPTED by the Board of Directors of DSRSD•EBMUD Recycled Water Authority at its regular meeting held on the 23rd day of June 2014, and passed by the following vote:

AYES: 4 - Directors Katy Foulkes, Frank Mellon, Georgean M. Vonheeder-Leopold, D.L. (Pat) Howard

NOES: 0

D.L. (Pat) Howard, Chair

ATTEST: Nancy Gamble Hatfield
Nancy Gamble Hatfield, Authority Secretary

CERTIFIED AS A TRUE AND CORRECT COPY OF THE ORIGINAL ON FILE IN THE OFFICE OF DUBLIN SAN RAMON SERVICES DISTRICT
Secretary Nancy G. Hatfield

JUN 25 2014

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Dublin San Ramon Services District (DSRSD)

RESOLUTION NO. 20-14

RESOLUTION OF THE BOARD OF DIRECTORS OF DUBLIN SAN RAMON SERVICES DISTRICT ADOPTING THE SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN UPDATE

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area jointly submitted an IRWM grant application for state consideration where a condition for funding required the San Francisco Bay Area IRWM Plan (BAIRWMP) to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds did adopt the BAIRWMP before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the BAIRWMP be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a grant was received to update the BAIRWMP, that Plan Update having been completed in January 2014 and the Department of Water Resources has completed its review and required no changes; and

WHEREAS, a series of workshops were held on the initial BAIRWMP and recently the

Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the Draft BAIRWMP Update was posted on the BAIRWMP website (http://bairwmp.org/) and made available for public comment; and

WHEREAS, the BAIRWMP Update incorporates changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the BAIRWMP Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the BAIRWMP as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, adoption of the BAIRWMP Update does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the BAIRWMP Update participants to implement any or all of the projects; and

WHEREAS, the District has reviewed the BAIRWMP Update and determined that it is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the BAIRWMP Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the BAIRWMP Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the BAIRWMP Update does not prohibit or effect in any way a participating

agencies' planning efforts separate from the BAIRWMP.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF DUBLIN SAN RAMON SERVICES DISTRICT, a public agency located in the counties of Alameda and Contra Costa, California as follows:

The San Francisco Bay Area Integrated Regional Water Management Plan Update is hereby adopted.

ADOPTED by the Board of Directors of Dublin San Ramon Services District, a public agency in the State of California, counties of Alameda and Contra Costa, at its special meeting held on the 22nd day of April 2014, and passed by the following vote:

AYES: 5 - Directors Richard M. Halket, Dawn L. Benson, D.L. (Pat) Howard, Edward R. Duarte, Georgean M. Vonheeder-Leopold

NOES: 0

ABSENT: 0

Georgean M. Vonheeder-Leopold

Georgean M. Vonheeder-Leopold, President

ATTEST: Nicole Genzale for

Nancy G. Hatfield, District Secretary

CERTIFIED AS A TRUE AND CORRECT COPY OF THE ORIGINAL ON FILE IN THE OFFICE OF DUBLIN SAN RAMON SERVICES DISTRICT
Secretary

Nicole Genzale for Nancy G. Hatfield

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East Bay Municipal Utility District (EBMUD)

RESOLUTION NO. 33973-14

ADOPTING THE SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN UPDATE

Introduced by Director Coleman ; Seconded by Director Linney

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines require that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, the Bay Area agencies, including EBMUD, that received funding in previous grant rounds adopted the Bay Area IRWM Plan in 2006 before such funds were received; and

WHEREAS, a grant was received to update the Bay Area IRWM Plan, that updated Plan having been completed in the fall of 2013 and submitted to the Department of Water Resources in January 2014; and

WHEREAS, a series of workshops were held on the initial Bay Area IRWM Plan and recently the Plan Update to provide stakeholders, including Bay Area local governments and the public, an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the Bay Area IRWM Plan Update was posted on the internet and made available for public comment; and

WHEREAS, the Bay Area IRWM Plan Update before the Board for consideration incorporates changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the Bay Area IRWM Plan Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the Bay Area IRWM Plan as conditions warrant, provided funding and resources are available to carry out these activities; and

WHEREAS, adoption of the Bay Area IRWM Plan Update does not entail a direct commitment of resources, and implementation of each project will be the responsibility of the project

proponent and any applicable project partners, and there is no joint commitment or responsibility by the Bay Area IRWM Plan Update participants to implement any or all of the projects; and

WHEREAS, the IRWM Plan Update is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the IRWM Plan Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the IRWM Plan Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWM does not prohibit or effect in any way a participating agencies' planning efforts separate from the IRWM Plan;

NOW, THEREFORE, BE IT RESOLVED that the EBMUD Board of Directors does hereby adopt the 2013 Bay Area IRWM Plan Update. In taking this action, the EBMUD Board acknowledges that the resultant 2013 Bay Area IRWM Plan identifies several EBMUD projects as high priority projects worthy of grant funding. EBMUD agrees with this priority and shares the interests of the other stakeholders in the success of the Bay Area IRWM Plan.

ADOPTED this 8th day of April, 2014 by the following vote:

AYES: Directors Coleman, Foulkes, Linney, McIntosh, Mellon, Patterson, and President Katz.

NOES: None.

ABSENT: None.

ABSTAIN: None.

Andy Katz

President

ATTEST:

Lynelle M. Lewis

Secretary

APPROVED AS TO FORM AND PROCEDURE:

Jane Coleman

General Counsel

Marin Municipal Water District

RESOLUTION NO. 8258

RESOLUTION OF THE BOARD OF DIRECTORS OF THE MARIN MUNICIPAL WATER DISTRICT ADOPTING THE SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan must be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area jointly submitted an IRWM grant application for state consideration where a condition for funding required the Bay Area IRWM Plan to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds did adopt the Bay Area IRWM Plan before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the Bay Area IRWM Plan be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a grant was received to update the Bay Area IRWM Plan, that Plan having been completed in the fall of 2013; and

WHEREAS, a series of workshops were held on the initial Bay Area IRWM Plan and recently the Plan update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the draft updated Bay Area IRWM Plan was posted on the internet and made available for public comment; and

WHEREAS, the updated Bay Area IRWM Plan before the Board for consideration incorporates changes based on comments received during the public

review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the Bay Area IRWM Plan provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the Bay Area IRWM Plan as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, adoption of the Bay Area IRWM Plan does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the Bay Area IRWM Plan participants to implement any or all of the projects; and

WHEREAS, the Bay Area IRWM Plan is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the Bay Area IRWM Plan consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the Bay Area IRWM Plan is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the Bay Area IRWM Plan does not prohibit or effect in any way a participating agencies' planning efforts separate from the Bay Area IRWM Plan; and

NOW THEREFORE, BE IT RESOLVED that the Marin Municipal Water District Board of Directors does hereby adopt the San Francisco Bay Area Integrated Regional Water Management Plan.

PASSED AND ADOPTED this first day of April, 2014 by the following vote of the Board.

AYES: Directors Crosse, Gibson, Quintero and Russell

NOES: None

ABSENT: Director Koehler

President, Board of Directors

ATTEST:

Secretary

Napa Sanitation District

RESOLUTION NO. 14-003

RESOLUTION OF THE NAPA SANITATION DISTRICT ADOPTING THE SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN UPDATE

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area jointly submitted an IRWM grant application for state consideration where a condition for funding required the Bay Area IRWM Plan to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds did adopt the Bay Area IRWM Plan before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the Bay Area IRWM Plan be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a grant was received to update the Bay Area IRWM Plan, that Plan having been completed in the fall of 2013 and submitted to the Department of Water Resources in January, 2014; and

WHEREAS, a series of workshops were held on the initial Bay Area IRWM Plan and recently the Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the Draft Bay Area IRWM Plan Update was posted on the internet and made available for public comment; and

WHEREAS, the Bay Area IRWM Plan Update before the Board for consideration incorporates changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the Bay Area IRWM Plan Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the Bay Area IRWM Plan as conditions warrant, providing funding and resources are available to carry out these

activities; and

WHEREAS, adoption of the Bay Area IRWM Plan Update does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the Bay Area IRWM Plan Update participants to implement any or all of the projects; and

WHEREAS, the District Engineer has reviewed the Bay Area IRWM Plan Update and determined that it is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the IRWM Plan Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the IRWM Plan Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWM does not prohibit or effect in any way a participating agencies' planning efforts separate from the IRWM Plan; and

NOW, THEREFORE BE IT RESOLVED that the Napa Sanitation District Board of Directors does hereby adopt the Bay Area IRWM Plan Update.

I hereby certify that the foregoing Resolution was duly and regularly adopted by the Board of Directors of the Napa Sanitation District, at its regularly scheduled meeting on the 2nd day of April, 2014, by the following vote:

AYES: GRAVETT, LUCE, MOTT, SHINNAMON, TECHEL
NOES: NONE
ABSENT: NONE
ABSTAIN: NONE

Chair, Board of Directors

ATTEST:

Clerk, Board of Directors

San Francisco Public Utilities Commission

PUBLIC UTILITIES COMMISSION
City and County of San Francisco

RESOLUTION NO. **14-0059**

WHEREAS, The State electorate has approved multiple statewide bond measures since 2000 to fund water and natural resource projects and programs, including $5.4 billion under Proposition 84, of which $1 billion has been devoted to projects that are part of an Integrated Regional Water Management Plan (IRWMP); and

WHEREAS, The benefits of integrated planning for water resources management activities increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, State statute and guidelines require that before grant funds will be provided for water management projects that are part of the IRWMP, the governing boards of participating agencies must adopted the IRWMP; and

WHEREAS, The SFPUC participated in the development of a Bay Area IRWMP with other Bay Area water agencies, wastewater agencies, stormwater and flood protection agencies, and watershed management groups; and

WHEREAS, Several of the agencies participating in the Bay Area IRWMP have jointly submitted a grant application for state consideration where one condition of funding requires the Bay Area IRWMP to be adopted by May 11, 2014; and

WHEREAS, The Bay Area agencies that received grant funding in previous grant rounds did adopt the 2006 Bay Area IRWMP before such funds were received; and

WHEREAS, More recent state statutes and guidelines require that the Bay Area IRWMP be updated before agencies may receive future IRWM grant funding; and

WHEREAS, A grant was received to update the Bay Area IRWMP, and the update was completed in the fall of 2013 and the 2013 Bay Area IRWMP was submitted to the CA Department of Water Resources in January 2014; and

WHEREAS, The draft 2013 Bay Area IRWMP was made available for public review and comment from August 21, 2013 through September 3, 2013; and

WHEREAS, The 2013 Bay Area IRWMP incorporates changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, The 2013 Bay Area IRWMP provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects, and periodically updating the Bay Area IRWMP as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, Adoption of the Bay Area IRWMP does not entail a direct commitment of resources, and implementation of each project will be the responsibility of the project proponent

and any applicable project partners, and there is no joint commitment or responsibility by the 2013 Bay Area IRWMP participants to implement any, or all of the projects; and

WHEREAS, On April 4,2014 the Environmental Review Officer concurred with the Bureau of Environmental Management that the 2013 Bay Area IRWMP is exempt from environmental review according to California Environmental Quality Act (CEQA) Guidelines Section 15262 (Feasibility and Planning Studies); and

WHEREAS, The 2013 Bay Area IRWMP is meant to be complementary to participating agencies' individual plans and programs, and does not supersede such plans and programs, and adoption of the 2013 Bay Area IRWMP does not prohibit nor affect in any way a participating agency's planning efforts separate from the IRWMP; now, therefore, be it

RESOLVED, That the San Francisco Public Utilities Commission does hereby adopt the 2013 Bay Area Integrated Regional Water Management Plan.

I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of April 22, 2014.

Donna Word

Secretary, Public Utilities Commission

San Mateo County Resource Conservation District

SAN MATEO COUNTY RESOURCE CONSERVATION DISTRICT
BOARD OF DIRECTORS

RESOLUTION NO. 2014-5

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area jointly submitted an IRWM grant application for state consideration where a condition for funding required the Bay Area IRWM Plan to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds did adopt the Bay Area IRWM Plan before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the Bay Area IRWM Plan be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a grant was received to update the Bay Area IRWM Plan, that Plan having been completed in the fall of 2013 and submitted to the Department of Water Resources in January 2014; and

WHEREAS, a series of workshops were held on the initial Bay Area IRWM Plan and, recently, the Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the Draft Bay Area IRWM Plan Update was posted on the internet and made available for public comment; and

WHEREAS, the Bay Area IRWM Plan Update before the Board for consideration incorporates changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

SAN MATEO COUNTY RESOURCE CONSERVATION DISTRICT
RESOLUTION NO. 2014-5

WHEREAS, the Bay Area IRWM Plan Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the Bay Area IRWM Plan as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, adoption of the Bay Area IRWM Plan Update does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the Bay Area IRWM Plan Update participants to implement any or all of the projects; and

WHEREAS, the Executive Director of the San Mateo County Resource Conservation District has reviewed the Bay Area IRWM Plan Update and determined that it is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the IRWM Plan Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the IRWM Plan Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWM does not prohibit or effect in any way a participating agencies' planning efforts separate from the IRWM Plan; and

NOW, THEREFORE, BE IT RESOLVED, that the San Mateo County Resource Conservation District Board of Directors does hereby adopt the Bay Area IRWM Plan Update.

The foregoing adopted by the Executive Board this 26th day of June, 2014.

TJ Glauthier
President

Santa Clara Valley Water District

BOARD OF DIRECTORS
SANTA CLARA VALLEY WATER DISTRICT

RESOLUTION NO. 14- 48

ADOPTING THE 2013 SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN

WHEREAS, the California electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, the Bay Area Clean Water Agencies (BACWA) applied for and received a Proposition 84 IRWM implementation grant from the California Department of Water Resources (DWR) and the Santa Clara Valley Water District (District) is a local project sponsor receiving funding through the Proposition 84 IRWM implementation grant; and

WHEREAS, the grant agreement between BACWA and DWR requires that BACWA and all local project sponsors adopt an IRWM Plan that meets the requirements contained in Part 2.2 of Division 6 of the California Water Code, commencing with Section 10530, by May 11, 2014; and

WHEREAS, the District has entered into a grant agreement with DWR for the Lower Silver Creek and Lake Cunningham Project that requires timely adoption of an IRWM Plan that meets the requirements contained in Part 2.2 of Division 6 of the California Water Code, commencing with Section 10530; and

WHEREAS, DWR awarded Marin Municipal Water District, on behalf of the Bay Area IRWM Coordinating Committee, a grant to update the 2006 Bay Area IRWM Plan to meet the requirements contained in Part 2.2 of Division 6 of the California Water Code, commencing with Section 10530; and

WHEREAS, the Coordinating Committee published a notice of intent to update the IRWM Plan consistent with Government Code Section 6066, conducted two public workshops on the IRWM Plan update, posted the draft 2013 IRWM Plan chapters on its website for public review period, posted the draft 2013 IRWM Plan on its website for a 30-day public review period, incorporated public comments into the 2013 IRWM Plan, submitted the 2013 IRWM Plan to DWR for review, and published a notice of intent to adopt the 2013 IRWM Plan consistent with Government Code Section 6066; and

WHEREAS, 2013 IRWM Plan provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the IRWM Plan as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, adoption of the 2013 IRWM Plan does not entail a commitment of resources to or implementation of any project, and there is no joint commitment or responsibility by the IRWM Plan participants to implement any or all of the projects; and

WHEREAS, the 2013 San Francisco Bay Area IRWM Plan does not constitute a project under the California Environmental Quality Act because it does not have a potential for resulting in direct or reasonably foreseeable indirect physical change in the environment; and

WHEREAS, the IRWM Plan is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWM does not prohibit or affect in any way a participating agency's planning efforts separate from the IRWM Plan; and

NOW, THEREFORE BE IT RESOLVED by the Board of Directors of the Santa Clara Valley Water District does hereby adopt the 2013 San Francisco Bay Integrated Regional Water Management Plan.

PASSED AND ADOPTED by the Board of Directors of Santa Clara Valley Water District by the following vote on April 22, 2014

AYES:	Directors	Santos, Hsueh, Estremera, Keegan, Kennedy, LeZotte, Schmidt
NOES:	Directors	None
ABSENT:	Directors	None
ABSTAIN:	Directors	None

SANTA CLARA VALLEY WATER DISTRICT

By: Tony Estremera
TONY ESTREMERA
Chair/Board of Directors

ATTEST: MICHELE L. KING, CMC

Michele L. King
Clerk/Board of Directors

Solano County Water Agency

RESOLUTION NUMBER 2014-1

RESOLUTION OF THE SOLANO COUNTY WATER AGENCY

RESOLUTION OF THE SOLANO COUNTY WATER AGENCY ADOPTING THE SAN FRANCISCO BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN PURSUSANT TO THE SAFE DRINKING WATER, WATER QUALITY AND SUPPLY, FLOOD CONTROL, RIVER AND COASTAL PROTECTION BOND ACT OF 2006 (PROPOSITION 84)

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area jointly submitted an IRWM grant application for state consideration where a condition for funding required the Bay Area IRWM Plan to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds did adopt the Bay Area IRWM Plan before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the Bay Area IRWM Plan be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a grant was received to update the Bay Area IRWM Plan, that Plan having been completed in the fall of 2013 and approved by the Department of Water Resources in the Summer of 2014; and

WHEREAS, a series of workshops were held on the initial Bay Area IRWM Plan and recently the Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the Draft Bay Area IRWM Plan Update was posted on the internet and made available for public comment; and

WHEREAS, the Bay Area IRWM Plan Update before the Board for consideration incorporates changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan; and periodically updating the Bay Area IRWM Plan as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, adoption of the Bay Area IRWM Plan Update does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the Bay Area IRWM Plan Update participants to implement any or all of the projects; and

WHEREAS, the Bay Area IRWM Plan Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and

WHEREAS, the Board of Directors has reviewed the Bay Area IRWM Plan Update and determined that it is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the IRWM Plan Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the IRWM Plan Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWM does not prohibit or effect in any way a participating agencies' planning efforts separate from the IRWM Plan; and

NOW THEREFORE, BE IT RESOLVED that the Board of Directors does hereby adopt the Bay Area IRWM Plan Update.

Approved and Adopted on the 10th day of April, 2014. I, the undersigned, hereby certify that the foregoing Resolution was duly adopted by SOLANO COUNTY WATER AGENCY following a roll call vote:

Ayes: Directors Patterson, Batchelor, Price, Holdener, Crossley, Richardson, Spering, Vasquez, Thomson, Kluge, Sanchez, Hardy and Davis

Noes: None

Abstain: None

Absent: Directors Hannigan, and Seifert

SOLANO COUNTY STATE OF CALIFORNIA WATER AGENCY

David B. Okita, Secretary to the
Board of Directors of the
Solano County Water Agency

Resolution 2014-01.doc

Sonoma County Water Agency

County of Sonoma
State of California

THE WITHIN INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE

ATTEST: APR 2 2 2014

VERONICA A. FERGUSON, Clerk/Secretary
BY C Woodson
DEPUTY CLERK/ASST SECRETARY

Item Number: 12

Date: April 22, 2014

Resolution Number: 14-0155

☑ 4/5 Vote Required

CONCURRENT RESOLUTION OF THE BOARD OF DIRECTORS OF THE SONOMA COUNTY WATER AGENCY AND BOARD OF DIRECTORS OF THE SONOMA VALLEY COUNTY SANITATION DISTRICT, DETERMINING THAT ADOPTION OF THE 2013 BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN (2013 PLAN) WILL NOT HAVE A SIGNIFICANT ADVERSE EFFECT ON THE ENVIRONMENT; ADOPTING THE 2013 PLAN; AND AUTHORIZING THE WATER AGENCY GENERAL MANAGER TO FILE A NOTICE OF EXEMPTION.

Whereas, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

Whereas, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

Whereas, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

Whereas, The Sonoma County Water Agency (Agency) and Sonoma Valley County Sanitation (District) were one of several of the participating agencies in the Bay Area that jointly submitted an IRWM grant application for state consideration where a condition for funding required the Bay Area IRWM Plan to be adopted by January 1, 2007; and

Whereas, The Water Agency and District were amongst those Bay Area agencies that received the aforementioned funding and did adopt the Bay Area IRWM Plan before such funds were received; and

Whereas, more recent state statutes and guidelines require that the Bay Area IRWM Plan be updated before agencies may receive future IRWM grant funding; and

Whereas, a planning grant was received by the San Francisco Bay Area IRWMP Coordinating Committee (Coordinating Committee) to update the Bay Area IRWM Plan. The Coordinating Committee is comprised of representatives from Bay Area water supply agencies,

c Borker, Hultberg, refile, g

wastewater agencies, flood control agencies, ecosystem management and restoration agencies, regulatory agencies, non-governmental organizations, and members of the public; and

Whereas, the draft update (Draft Bay Area IRWM Plan Update) was completed in the fall of 2013 and submitted to the Department of Water Resources in January 2014; and

Whereas, a series of workshops were held on the Draft Bay Area IRWM Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments and make recommendations; and

Whereas, the Draft Bay Area IRWM Plan Update was posted on the internet and made available for public comment; and

Whereas, the Draft Bay Area IRWM Plan Update was finalized and adopted by the Coordinating Committee in a public meeting on October 28, 2013 after incorporating changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan (Final 2013 Bay Area IRWM Plan); and

Whereas, the Final 2013 Bay Area IRWM Plan, which is slated for adoption by all agencies represented on the Coordinating Committee, is an information gathering and regional planning document, which provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the Bay Area IRWM Plan as conditions warrant, provided funding and resources are available to carry out these activities; and

Whereas, adoption of the Final 2013 Bay Area IRWM Plan does not entail a direct commitment of resources for implementation of any project, as these commitments will be the responsibility of the particular project proponent and any applicable project partners, and there is no joint commitment or responsibility by the Final 2013 Bay Area IRWM Plan participants to implement any or all of the projects; and

Whereas, this Board has reviewed the Bay Area IRWM Plan Update and has determined it is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the Bay Area IRWM Plan Update contemplates basic data collection and research that will not result in a serious or major disturbance to an environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved, adopted, or funded; and

Whereas, the Bay Area IRWM Plan Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and this Board's adoption of the Bay Area IRWM Plan Update does not prohibit or affect in any way a participating agency's planning efforts separate from the Bay Area IRWM Plan.

Now, Therefore, Be It Resolved that the Boards of Directors of the Sonoma County Water Agency and the Sonoma Valley County Sanitation District hereby find, determine, certify, and declare as follows:

1. All of the above recitals are true and correct.

2. This Board's adoption of the 2013 Update to the San Francisco Bay Area Integrated Regional Water Management Plan is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because it consists of basic data collection that would not result in a serious or major disturbance to an environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved, adopted or funded.

3. The 2013 Update to the San Francisco Bay Area Integrated Regional Water Management Plan is adopted.

4. The General Manager of the Sonoma County Water Agency is authorized and directed to file a Notice of Exemption for the 2013 Update to the San Francisco Bay Area Integrated Regional Water Management Plan.

Sonoma County Water Agency Directors:

Gorin: Aye Zane: Aye McGuire: Aye Carrillo: Absent Rabbitt: Aye

Ayes: 4 Noes: 0 Absent: 1 Abstain: 0

So Ordered.

Sonoma Valley County Sanitation Directors:

Rabbitt: Aye Gorin: Aye Rouse: Absent

Ayes: 2 Noes: 0 Absent: 1 Abstain: 0

So Ordered.

Stinson Beach County Water District

STINSON BEACH COUNTY WATER DISTRICT
RESOLUTION NO. GB-2014-06

RESOLUTION TO ADOPT THE 2014 IRWM PLAN

WHEREAS, the State electorate approved multiple statewide bond measures since 2000, including Propositions 50 and 84, to fund water and natural resource projects and programs, including Integrated Regional Water Management (IRWM); and

WHEREAS, the benefits of integrated planning for water resources management activities include increased efficiency or effectiveness, enhanced collaboration across agencies and stakeholders, and improved responsiveness to regional needs and priorities; and

WHEREAS, state statute and guidelines required that an IRWM Plan be adopted by the governing boards of participating agencies before IRWM grant funds would be provided for water resources management projects that are part of the IRWM Plan; and

WHEREAS, several of the participating agencies in the Bay Area jointly submitted an IRWM grant application for state consideration where a condition for funding required the Bay Area IRWM Plan to be adopted by January 1, 2007; and

WHEREAS, the Bay Area agencies that received funding in previous grant rounds did adopt the Bay Area IRWM Plan before such funds were received; and

WHEREAS, more recent state statutes and guidelines require that the Bay Area IRWM Plan be updated before agencies may receive future IRWM grant funding; and

WHEREAS, a grant was received to update the Bay Area IRWM Plan, that Plan having been completed in the fall of 2013 and submitted to the Department of Water Resources in January 2014; and

WHEREAS, a series of workshops were held on the initial Bay Area IRWM Plan and, recently, the Plan Update to provide stakeholders, including Bay Area local governments, an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the Draft Bay Area IRWM Plan Update was posted on the internet and made available for public comment; and

WHEREAS, the Bay Area IRWM Plan Update before the Board for consideration incorporates changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the Bay Area IRWM Plan Update provides an implementation framework that calls for tracking accomplishments, developing lists of prioritized projects and periodically updating the Bay Area IRWM Plan as conditions warrant, providing funding and resources are available to carry out these activities; and

WHEREAS, adoption of the Bay Area IRWM Plan Update does not entail a direct commitment of resources and implementation of each project, as such will be the responsibility of the project proponent and any applicable project partners, and there is no joint commitment or responsibility by the Bay Area IRWM Plan Update participants to implement any or all of the projects; and

WHEREAS, it has been determined that the Bay Area IRWM Plan update is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the IRWM Plan Update consists of basic data collection that would not

result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the IRWM Plan Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWM does not prohibit or effect in any way a participating agency's planning efforts separate from the IRWM Plan; and

NOW, THEREFORE, BE IT RESOLVED, by the Board of Directors of the Stinson Beach County Water District Board that it does hereby adopt the Bay Area IRWM Plan Update.

INTRODUCED AND ADOPTED this 21st day of June 2014 at a duly held Board of Directors meeting by the following vote:

AYES: Baskin, Boucke, Cross, Nelsen, Zell

NOES:

ABSTAIN:

ABSENT:

Barbara Boucke

Barbara Boucke, Board of Directors President
Stinson Beach County Water District

ATTEST: (Seal)

Ed Schmidt

Ed Schmidt, Secretary to the Board/General Manager
Stinson Beach County Water District

Zone 7 Water Agency

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
BOARD OF DIRECTORS

RESOLUTION NO 14-4359

INTRODUCED BY DIRECTOR RAMIREZ HOLMES
SECONDED BY DIRECTOR PALMER

Adoption of the 2013 Integrated Regional Water Management Plan

WHEREAS, state statute and guidelines require that Integrated Regional Water Management Plans (IRWMP) be adopted by the governing boards of participating agencies before applying for IRWMP grant funding; and

WHEREAS, Zone 7 and other participating agencies adopted the original San Francisco Bay Area IRWMP in 2006; and

WHEREAS, more recent state statutes and guidelines require that the Bay Area IRWMP be updated before agencies are eligible to receive additional or future IRWMP grant funding; and

WHEREAS, a grant was received to update the original Bay Area IRWMP, that Update having been completed in the Fall of 2013 and submitted to the California Department of Water Resources in January 2014; and

WHEREAS, the Draft 2013 Bay Area IRWMP Update was completed then posted on the internet and made available for public comment and a series of workshops were provided to stakeholders, including Bay Area local governments, creating an opportunity to ask questions, provide comments and make recommendations; and

WHEREAS, the 2013 Bay Area IRWMP Update incorporated changes based on comments received during the public review period in the areas of environmental justice, technical project data, and other elements of the Plan; and

WHEREAS, the Zone 7 Water Agency Board of Directors has reviewed the Bay Area IRWMP Update and determined that it is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306 because the IRWMP Update consists of basic data collection that would not result in the disturbance of any environmental resource and involves planning studies for possible actions that the participating agencies have not yet approved; and

WHEREAS, the 2013 IRWMP Update is meant to be complementary to participating agencies' individual plans and programs and does not supersede such plans and programs, and adoption of the IRWMP does not prohibit or affect in any way a participating agencies' planning efforts separate from the IRWMP.

NOW, THEREFORE, BE IT RESOLVED, that the Zone 7 Board of Directors does hereby adopt the 2013 Bay Area IRWMP.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS FIGUERS, GRECI, PALMER, RAMIREZ HOLMES, STEVENS

NOES: NONE

ABSENT: DIRECTORS MACHAEVICH, QUIGLEY

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a Resolution adopted by the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District on April 16, 2014.

By W. H. Ator
President, Board of Directors

Project Consistency with an Adopted IRWM Plan

The 2013 Bay Area IRWM Plan Update integrates long-term planning and high-quality project implementation in an adaptive management framework — fostering coordination and communication among the diverse stakeholders in the region. Focus areas for the Bay Area IRWM Plan include water supply and water quality, wastewater and recycled water, flood protection and stormwater management, as well as watershed management, habitat protection, and restoration. The overall objectives of the Bay Area IRWM Plan are to develop coordination, collaboration, and communication among Bay Area agencies responsible for water- and habitat-related issues, achieve greater efficiencies, and build public support for vital projects. The 2013 Plan Update expands upon the 2006 IRWM Plan, documents progress toward meeting IRWM Plan objectives, and identifies ongoing regional needs and issues.

The San Francisco Bay IRWM Region's 2014 IRWM Drought Relief Program (Bay DRP) grant proposal includes 11 projects that comprise a geographically diverse and well-integrated implementation program that will provide major drought relief benefits to the Bay Area's diverse population. These projects include water supply enhancement (emphasizing both large scale benefits and communities most in need) recycling, and effective drought preparedness measures across the region. On May 28, 2014, the Bay Area IRWM Coordinating Committee unanimously approved projects for inclusion in the Bay DRP grant proposal at its May 28, 2014 meeting.

All projects in this Proposal are included in the 2013 Plan Update, either as adopted by the Bay Area IRWM Coordinating Committee on March 24, 2014 (see meeting notes at the end of this file) or via Appendix F-1 to the 2013 Bay Area IRWM Plan, which lists projects added by the CC on May 28, 2014 (at the end of this file).

As requested in the Proposal Solicitation Package (PSP), demonstration of project consistency with the IRWM Plan is provided on the following pages of this Attachment. The Proposal and its 11 high-priority drought relief projects comprise a geographically diverse and well-integrated implementation program with multiple water supply, recycled water, drought preparedness, and human-right-to-water benefits. This section demonstrates that this Proposal contains significant, dedicated, and well-defined projects that meet multiple Program Preferences of the DWR Prop 84 IRWM Guidelines. The Bay DRP consists of grant administration and 11 drought relief projects that address four primary benefits:

- Water Supply Enhancement
- Recycled Water
- Human Right to Water
- Drought Preparedness

To facilitate review, the projects are grouped by primary benefit type, as listed in **Table 1-2**, below.

The overarching goals of the 2013 Bay Area IRWM Plan are as follows:

Goal 1. Promote environmental, economic, and social sustainability.

Goal 2. Improve water supply reliability and quality.

Goal 3. Protect and improve watershed health and function and Bay water quality.

Goal 4. Improve regional flood management.

Goal 5. Create, protect, enhance, and maintain environmental resources and habitats.

The five goals listed above address applicable Basin Plan objectives, 20x2020 water efficiency goals, and the requirements of California Water Code (CWC) Section 10540(c). Objectives for the Bay Area Region were developed to support the goals. Demonstration of each project's consistency with the 2014 Bay Area IRWM Plan objectives is provided immediately following **Table 1-2**.

Table 1-2. Bay DRP Project Identification Numbers and Organization

Primary Project Benefit	Project ID#	Project Proponent	Project Title
Water Supply Enhancement	1	San Francisco Public Utilities Commission (SFPUC)	Lower Cherry Aqueduct Emergency Rehabilitation Project
	2	Santa Clara Valley Water District (SCVWD)	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment
	3	Zone 7 Water Agency (Zone 7)	Zone 7 Water Supply Drought Preparedness Project
Recycled Water	4	Napa Sanitation District	Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines
	5	SCVWD and City of Sunnyvale	Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline
	6	DERWA*	DERWA Phase 3 Recycled Water Expansion Project
	7	City of Calistoga	Calistoga Recycled Water Storage Facility
Human Right to Water	8	San Mateo County Resource Conservation District	Drought Relief for South Coast San Mateo County
	9	Stinson Beach County Water District	Stinson Beach Water Supply & Drought Preparedness Plan
Drought Preparedness	10	StopWaste**	Bay Area Regional Drought Relief Conservation Program
	11	Marin Municipal Water District (MMWD)	WaterSMART Irrigation with AMI/AMR
Administration	12	Association of Bay Area Governments (ABAG)/ San Francisco Estuary Partnership (SFEP)	Grant Administration

**DERWA: Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) Recycled Water Authority*

***This Project will be implemented by a group of 12 project proponents led by Alameda County StopWaste.org (StopWaste). Participating agencies and organizations include: Alameda County Water District, Bay Area Water Supply and Conservation Authority, City of Napa, Contra Costa Water District, EBMUD, MMWD, SFPUC, SCVWD, Solano County Water Agency, Sonoma County Water Agency, StopWaste, and Zone 7.*

Project 1. SFPUC – Lower Cherry Aqueduct Emergency Rehabilitation Project

The Project aligns with regional priority needs in the Bay Area IRWM Plan as follows:

Objective 1.3: Plan for and adapt to more frequent extreme climate events. With snowpack forecasted to decrease due to a warming climate, the ability to increase access to water storage and maximize flexibility in moving water between reservoirs within the Regional Water System will be key to SFPUC's ability to continue meeting demand. The Lower Cherry Aqueduct (LCA) Emergency Rehabilitation Project will allow SFPUC to adaptively manage water supplies under changing climate conditions.

Objective 1.4: Reduce energy use and/or use renewable resources where appropriate. Water delivered through the Lower Cherry Aqueduct will be transported to the Bay Area primarily by gravity, resulting in very low energy costs per million gallons delivered.

Objective 2.1: Provide adequate water supplies to meet demands. The LCA Emergency Rehabilitation Project will directly and immediately increase water supply for the region by more than 150,000 acre-feet (AF), thereby alleviating drought-year needs. It will also provide ongoing access to storage for potable water.

Objective 2.2: Provide clean, safe, reliable drinking water. The water provided through the LCA is expected to be of high quality due to its source and associated protected watershed.

Objective 2.7: Provide for groundwater recharge while protecting groundwater resources from overdraft. By providing water to all of SFPUC's customers, the LCA Emergency Rehabilitation Project will bolster water supplies for customers that also draw water from the Santa Clara Valley Water District (SCVWD), reducing overdraft from the SCVWD's groundwater supplies.

Project 2. SCVWD – Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment

The Project aligns with regional priority needs in the Bay Area IRWM Plan as follows:

Objective 2.1: Provide adequate water supplies to meet demands. The Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment Project will enable SCVWD's treated-water customers to continue to receive treated drinking water from the Rinconada Water Treatment Plant (WTP) that meets drinking water standards for trihalomethanes (THMs) throughout the distribution system. Some customers are unable to meet their demands without Rinconada WTP supplies.

Objective 2.2: Provide clean, safe, reliable drinking water. This Project improves treated-water quality so that SCVWD and its treated-water customers can meet drinking water standards for THMs throughout the distribution system.

Objective 2.6: Expand water storage and conjunctive management of surface and groundwater. Since the 1930s, SCVWD's water supply strategy has been to maximize conjunctive use, to enhance water supply reliability. Provision of treated water provides in-lieu groundwater recharge and reduces the need to pump groundwater.

Project 3. Zone 7 Water Agency – Zone 7 Water Supply Drought Preparedness Project

The Project aligns with regional priority needs in the Bay Area IRWM Plan as follows:

Objective 1.2: Encourage implementation of integrated, multi-benefit projects. The Zone 7 Water Agency's (Zone 7's) Zone 7 Water Supply Drought Preparedness Project provides a new source to tap the existing groundwater storage (Chain of Lakes Well No. 5 [COL-5]) and provides for the recharge of up to 15 million gallons per day (MGD) of groundwater discharges back into the groundwater basin for use at a later date.

Objective 1.3: Plan for and adapt to more frequent extreme climate events. An additional well will allow Zone 7 to provide more groundwater during periods of extreme drought. Also, once this Project is implemented, the mining company discharges will recharge the groundwater basin and allow Zone 7 to supply more water through its wells during extreme droughts.

Objective 1.4: Reduce energy use and/or use renewable resources where appropriate. The pipeline portion of this Project is a gravity-fed line so that no energy is required to move the water from Cope Lake to Lake I. A previous project was looking to pump the water from Cope Lake into Lake I.

Objective 2.6: Expand water storage and conjunctive management of surface and groundwater. With the pipeline portion of the Project, the water from mining activities that was previously discharged into the Arroyo Mocho and eventually flowed in the Bay now will be placed into Lake I, where it can percolate and recharge the Main Groundwater Basin, from which Zone 7 and others pump potable supplies. This will further enhance the ongoing conjunctive management of surface water and groundwater.

Objective 2.7: Provide for groundwater recharge while protecting groundwater resources from overdraft. Specifically with regard to CWC Section 10540(c) requirements, the Project protects and improves water supply reliability and reduces the threat of overdrafting of groundwater resources. The new well portion of the Project increases the amount of groundwater that may be used to replace the diminishing supplies from the State Water Project (SWP).

Objective 4.1: Manage floodplains to reduce flood damages to homes, businesses, schools, and transportation. In the future, when a diversion structure is built to channel floodwaters into the Chain of Lakes (the network of mined gravel pits), the pipeline will better enable floodwater to be detained in Lake I and also help recharge the groundwater basin.

Project 4. Napa Sanitation District – Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines

The Project aligns with regional priority needs in the Bay Area IRWM Plan as follows:

Objective 1.2: Encourage implementation of integrated, multi-benefit projects. The Los Carneros Water District (LCWD) and Milliken-Sarco-Tulocay (MST) Recycled Water Pipeline Project will deliver 1,950 AF of recycled water, with the additional benefits of reducing groundwater overdraft, increasing available potable water, and reducing pollution in the Napa River and San Francisco Bay.

Objective 2.1: Provide adequate water supplies to meet demands. The Project will directly provide recycled water for agricultural and irrigation purposes to areas that are groundwater deficient or have seen surface water quality drastically reduced due to drought conditions.

Objective 2.5: Increase recycled water use. This Project will provide the pipeline infrastructure necessary to increase recycled water usage in the community by 1,950 AF per year (AFY).

Objective 2.6: Expand water storage and conjunctive management of surface and groundwater. This Project will bring much-needed recycled water to the LCWD and MST areas. Neither area is served by a municipal water supply, and properties rely upon groundwater, surface water diversions, or both for agricultural, irrigation, and potable water needs.

Objective 2.7: Provide for groundwater recharge while protecting groundwater resources from overdraft. The LCWD area relies upon groundwater and surface water diversion. This area has seen significant reductions in surface water availability, with many storage ponds unable to retain even half the water that would normally be needed to maintain agricultural production. This Project will provide the LCWD area with 1,250 AF of recycled water for the first year after construction, increasing to 1,600 AF after additional phases of distribution are completed. By providing recycled water to the LCWD area, surface water will remain in creeks and streams, benefitting fish and other wildlife.

The MST groundwater aquifer is overdrafted by an estimated 2,000 AFY. This Project will offset 350 AFY of groundwater use initially, increasing to 700 AFY as more customers connect to the pipeline. This pipeline is also the backbone of a much larger plan (Phase 2) to build recycled water distribution to deliver 2,000 AF of recycled water to the MST area.

Objective 3.3: Minimize point-source and non-point-source pollution. By diverting 1,950 AF of treated wastewater from the Napa River, the Napa Sanitation District will decrease nutrient loading into the Napa River, which flows into the San Pablo/San Francisco Bay system. Based on current effluent quality, this diversion of treated wastewater will reduce pollutant loading by more than 3 metric tons of nitrogen, 12 metric tons of biochemical oxygen demand consumed over 5 days (BOD_5), and 18 metric tons of total suspended solids (TSS) annually.

Project 5. SCVWD-City of Sunnyvale – Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline

The Project aligns with regional priority needs in the Bay Area IRWM Plan as follows:

Objective 1.2: Encourage implementation of integrated, multi-benefit projects. The Project will benefit SCVWD's water supply reliability by permanently reducing 1,680 AFY of potable water demand, and it will improve San Francisco Bay by reducing pollutant loading to San Francisco Bay.

Objective 2.2: Provide clean, safe, reliable drinking water. The Project will increase regional water reliability and long-term sustainability by providing a drought-proof water supply that is not subject to cutbacks from the SWP.

Objective 2.5: Increased recycled water use. The Project will reliably produce a minimum of 1,680 AFY (1.5 MGD) to meet current recycled water demand (1,120 AFY) and projected demand (560 AFY) to be served by the Wolfe Road Pipeline. It will reliably increase production capacity to 4,480 AFY (4 MGD) to supply existing customers with additional recycled water, if demanded. Plant production capacity in excess of existing demand will facilitate future planned expansion of the distribution system and corresponding recycled water use.

Objective 2.7: Provide for groundwater recharge while protecting groundwater resources from contamination. The Wolfe Road Pipeline is the first phase of a multi-phase project and is sized to convey 11,202 (10 MGD) of highly treated recycled water to SCVWD for future groundwater recharge.

Objective 3.3: Minimize point-source and non-point-source pollution. The Project will reduce nitrogen, organics, and solids pollutant loadings to the San Francisco Bay.

Project 6. DERWA – DERWA Phase 3 Recycled Water Expansion Project

The Project aligns with regional priority needs in the Bay Area IRWM Plan as follows:

Objective 1.1: Work with local land, water, wastewater and stormwater agencies, project proponents and other stakeholders to develop policies, ordinances and programs that promote IRWM goals, and to determine areas of integration among projects. The DERWA Phase 3 Recycled Water Expansion Project involves coordination of the local water and wastewater service providers, as well as coordination with local governments, for the provision of recycled water service to support a sustainable regional water supply and sustainable community development.

Objective 1.2: Encourage implementation of integrated, multi-benefit projects. This Project will provide a local, reliable, drought-proof recycled water supply; reduce demands on the Delta, thereby improving its ecosystem and making more water available for downstream water users; and reduce pollutant discharge to the San Francisco Bay.

Objective 1.3: Plan for and adapt to more frequent extreme climate events. This Project will provide a new, reliable local water supply that reduces dependency on imported water supplies that are adversely affected by extreme climate events such as drought.

Objective 1.4: Reduce energy use and/or use renewable resources where appropriate. This Project will increase the use of local water supplies and decrease the energy consumption required to treat potable water, pump imported water supplies into the Tri-Valley, and pump treated wastewater out of the Tri-Valley. DSRSD will realize an overall reduction in energy use of 444,360 kilowatt-hours (kWh) annually. This Project will decrease EBMUD's potable water demand, resulting in reduced energy use to treat potable water.

Objective 1.6: Secure adequate support, funding and partnerships to effectively implement plan. This Project will be implemented through a partnership between two East Bay water suppliers and funded through the local agencies' water rates, developer connection fees, and state and federal funding opportunities.

Objective 2.4: Implement water use efficiency to meet or exceed state and federal requirements. Reducing potable water use by 867 AFY will help project proponents maintain compliance with SB X7-7 goals.

Objective 2.5: Increased recycled water use. This Project will provide the distribution infrastructure to supply an additional 867 AFY of recycled water to customers in the East Bay. The recycled water distribution system will be expanded to areas where current demand exists for non-potable service but no facilities exist through which the service may be provided. This Project will replace existing customers' current potable water demands that are

being used for landscape irrigation. By increasing the recycled water use in the region, this Project allows for sustainable development in the region.

Objective 3.3: Minimize point-source and non-point-source pollution. This Project will divert 867 AFY of treated wastewater from discharge to the San Francisco Bay, resulting in a reduction of pollutant loading to the Bay. This Project will benefit the Bay by reducing approximately 38.5 metric tons of nitrogen, 4 metric tons of carbonaceous biochemical oxygen demand (CBOD), and 7 metric tons of TSS from being added to the San Francisco Bay annually.

Project 7. City of Calistoga – Calistoga Recycled Water Storage Facility

The Project aligns with regional priority needs in the Bay Area IRWM Plan as follows:

Objective 1.2: Encourage implementation of integrated, multi-benefit projects. The Calistoga Recycled Water Storage Facility Project will deliver 25 AFY of recycled water, with the additional benefits of reducing demands on the Delta, reducing groundwater overdraft, increasing available potable water, and reducing pollution in the Napa River and San Francisco Bay.

Objective 2.5: Increased recycled water use. Calistoga is in a Stage II Water Emergency due to existing drought conditions. As a result of the drought, more new recycled water customers want to connect to the City's recycled water system and the City anticipates increased recycled water demand if the drought continues. The new recycled water storage pond will allow the City to store more water for existing, new, and upcoming recycled water customers. The new pond will initially support approximately 25 AFY of new customers, increasing the City's average annual recycled water use by 14%.

Objective 2.6: Expand water storage and conjunctive management of surface and groundwater. The City receives half of its water supply from the SWP. Increasing the City's recycled water supply will have a conjunctive benefit by reducing reliance on existing SWP water.

Objective 3.7: Control of Pollutants of Concern. The new recycled storage facility will be consistent with the Bay Area IRWM Plan goals of controlling "pollutants of concern" and improving downstream water quality of the Napa River and San Francisco Bay. The Napa River in Calistoga is a Section 303(d)-listed water body, impaired by total maximum daily loads (TMDLs), specifically pathogens and sediments. The City is already working with the San Francisco Bay Regional Water Quality Control Board (RWQCB) to reduce additional discharge to the Napa River. Reduced discharge will decrease nutrient loadings (i.e., nitrogen, BOD, and TSS) to sensitive downstream habitats.

Project 8. San Mateo County RCD – Drought Relief for South Coast San Mateo County

The Project aligns with regional priority needs in the Bay Area IRWM Plan as follows:

Objective 1.1: Work with local land, water, wastewater and stormwater agencies, project proponents and other stakeholders to develop policies, ordinances and programs that promote IRWM goals, and to determine areas of integration among projects. This Project will provide greater water management flexibility and water security within San Mateo County's south coast region, including the Pescadero-Butano and San Gregorio creek watersheds, through coordinated region-wide water management and infrastructure improvements.

Objective 1.2: Encourage implementation of integrated, multi-benefit projects. The Project addresses immediate human and environmental water supply needs. It also promotes environmental, economic, and social sustainability.

Objective 1.3: Plan for and adapt to more frequent extreme climate events. The Project will provide water management flexibility that will facilitate adaption to extreme climate events.

Objective 1.8: Promote community education, involvement and stewardship. This Project benefits communities that rely entirely on local water supply sources. Collaboration with agricultural water users is focused on education for land and water stewardship to protect resources.

Objective 1.10: Enhance monitoring network and information sharing to support proper management of watersheds. The Project involves the coordination of water management and information sharing among a variety of agricultural and community stakeholders.

Objective 2.1: Provide adequate water supplies to meet demands. The Project includes a combination of immediate actions aimed to minimize drought impacts across the region as well as actions to improve both immediate and long-term water supply and water quality reliability.

Objective 2.2: Provide clean, safe, reliable drinking water. The Project will provide a more reliable drinking water supply to approximately 4,050 residents and 9,000 County park visitors throughout the south coast of San Mateo County.

Objective 2.4: Implement water use efficiency to meet or exceed state and federal requirements. The Project will repair broken pipes and leaks to improve efficiency in storage and distribution of potable and agricultural water supplies.

Objective 2.6: Expand water storage and conjunctive management of surface and groundwater. This Project will expand water storage and conjunctive management of surface water and groundwater resources.

Objective 5.1: Protect, restore, and rehabilitate habitat for species protection/Objective 5.3: Enhance wildlife populations and biodiversity (species richness). Better management of stream flows will protect and restore important stream habitat for salmon and other species.

Project 9. Stinson Beach County Water District – Stinson Beach Water Supply & Drought Preparedness Plan

The Project aligns with regional priority needs in the Bay Area IRWM Plan as follows:

Objective 2.1: Provide adequate water supplies to meet demands. The Stinson Beach Water Supply & Drought Preparedness Plan includes a water supply component (additional groundwater supply) and water savings/ conservation components (leak reduction resulting from pipeline replacements and improved metering to identify and reduce water system losses). Both components will increase water supply to meet demands, thereby alleviating water supply needs for dry seasons and drought years.

Objective 2.2: Provide clean, safe, reliable drinking water. The water supply and water savings/conservation components of the Project will increase water supply available to meet demand, thereby enhancing drinking water supply reliability that is critically important for an isolated water district that has no feasible physical or technological options to connect interties or transfer water with other water purveyors.

Objective 2.6: Expand water storage and conjunctive management of surface and groundwater. Sources of water supply for the Stinson Beach County Water District include existing groundwater wells and small creek flows. Historically, the District relied on groundwater for approximately 1/3 of its total supply and surface water sources for the other 2/3 of its supply. In recent years, the trend has reversed and the District now relies more on groundwater and less on surface water. The Stinson Beach Water Supply & Drought Preparedness Plan specifically includes supplemental groundwater supplies (a new groundwater well) as part of its Project, which will enhance the District's ability to conjunctively manage its surface water and groundwater supplies.

Objective 5.1: Protect, restore, and rehabilitate habitat for species protection. In addition to providing multiple benefits for increased water supply reliability and water conservation during water shortages, this Project provides benefits for fish, wildlife, and watershed resource management for environmental stewardship, which would result from a reduced dependence on surface water. New sources of groundwater supply are generally more reliable than surface water sources and would enable the District to reduce diversions from stream sources during dry or drought years, thereby increasing surface water supply for habitat and species protection.

Project 10. StopWaste – Bay Area Regional Drought Relief Conservation Program

The Project aligns with regional priority needs in the Bay Area IRWM Plan as follows:

Objective 1.1: Work with local land, water, wastewater and stormwater agencies, project proponents and other stakeholders to develop policies, ordinances and programs that promote IRWM goals, and to determine areas of integration among projects. The 12 public agencies participating in the Bay Area Regional Drought Relief Conservation Program have the statutory authority to enter into a grant agreement and a demonstrated ability to

ensure the performance of the Project implementation and tracking of funds. Each agency has implemented mandatory or voluntary emergency measures targeting a reduction in water use in response to the drought.

Objective 1.2: Encourage implementation of integrated, multi-benefit projects. Using water efficiently is a foundational action for water management, one that serves to mitigate ecosystem conflicts and adapt to the immediate and long-term economic, social, and environmental impacts of water shortages resulting from climate change.

Objective 1.3: Plan for and adapt to more frequent extreme climate events. The Project will reduce water demand by increasing indoor and outdoor water use efficiency and increase supply reliability by sustaining the existing water supply in the most cost-effective manner, vital to reducing drought impacts to the greatest degree possible.

Objective 2.1: Provide adequate water supplies to meet demands. An immediate and long-term reduction in potable water demand of approximately 1,200 AFY will be achieved as a result of implementing this Project, with the majority of the water-saving benefits occurring in the Bay-Delta watershed.

Objective 2.2: Provide clean, safe, reliable drinking water. The Project will increase local water supply reliability and quality in multiple ways: Existing drought-reduced water supplies will be conserved to the greatest extent possible, extending the timeline during which agencies can reliably meet community demands; installing high-efficiency plumbing and irrigation fixtures will allow the public to maintain healthful living conditions while simultaneously reducing demand and protecting water supplies from contaminated urban runoff; water quality in supply reservoirs will be improved, reducing the need for chemical treatment to control algae.

Objective 2.4: Implement water use efficiency to meet or exceed state and federal requirements. By combining near-term drought response with long-term water conservation measures, this Project will leverage the drought emergency to help meet target per-capita water use reductions by 2020.

Objective 3.3: ***Minimize point-source and non-point-source pollution.*** The Project will reduce runoff from the urban landscape that contains fertilizers, pesticides, and herbicides.

Project 11. MMWD – WaterSMART Irrigation with AMI/AMR

The Project aligns with regional priority needs in the Bay Area IRWM Plan as follows:

Objective 1.8: Promote community education, involvement and stewardship. The WaterSMART Irrigation with AMI/AMR (Advanced Metering Infrastructure/Advanced Meter Reading [AMI/AMR]) Project will conduct outreach to and communication with landscape irrigation account consumers. The outreach will aim to foster greater understanding about impacts associated with irrigation methods and a greater sense of stewardship and buy-in for extending water supplies and implementing efficient irrigation practices.

Objective 1.9: Support data management for climate change vulnerabilities. Once this Project is implemented, MMWD's and customers' ability to track water usage will be enhanced, and the data will be available for analysis as climate change vulnerabilities are evaluated.

Objective 1.10: Enhance monitoring network and information sharing to support proper management of watersheds: This Project constitutes a big step in MMWD's long-range goal of incorporating AMI/AMR throughout its service area, which will ultimately result in making real-time water use data available to every consumer in a web-based format. The availability of this information will in turn allow consumers to study, understand, and consequently modify their individual water use patterns, as well as to detect leaks early. This Project therefore will contribute to enhanced information sharing that will support proper management of recycled and potable water use in the watersheds within MMWD's service area.

Objective 2.1: Provide adequate water supplies to meet demands. This Project will save 400 AF annually, freeing up water supply to meet other demands, and these savings will occur every year once the Project is built.

Objective 2.4: Implement water use efficiency to meet or exceed state and federal requirements. This Project will save 400 AF annually, thereby contributing to MMWD's ability to successfully meet the 20% demand reduction by 2020 per state mandate. Irrigation efficiency standards, including Assembly Bill (AB) 1881, the Water Conservation in Landscaping Act, are incorporated into MMWD's municipal code and require all new landscape areas to comply

with rigorous standards for irrigation system design and operation. This Project will make it possible for all MMWD irrigation customers to meet these conservation goals and requirements by providing incentives for efficiency hardware upgrades, scientific water budgets based on AB 1881 standards, weekly monitoring of actual consumption at each water meter, and a report delivered to each customer comparing weekly consumption to the budget target. This combination of improved irrigation equipment, accurate water budgets, and increased reporting frequency will provide the foundation for this Project to achieve the necessary conservation savings.

SF Bay Area IRWMP Coordinating Committee

Monday, March 24, 2014, 1:00 – 2:30 p.m.

Meeting Location:
East Bay Municipal Utility District (EBMUD)
375 11th St., Oakland, CA
Large Training Room – 2nd Floor
Dial in: (888) 232-3867, Access code: 970289

Meeting Objectives:

- Adopt 2013 BAIRWMP
- Discuss next steps regarding the 2013 Plan, including DWR review
- Discuss next steps for Prop 84 Round 3
- Discuss introduced legislation relating to IRWM

Agenda:

1:00 – 1:05	Welcome and Introductions	Chair
1:05 – 1:25	Final 2013 BAIRWMP • Adoption by the Coordinating Committee • DWR Review • Next Steps	Chair / T. Grim
1:25 – 1:55	PSC Updates: Status and Next Steps • Changes to Round 3 • Regional/Subregional Funding Allocation • RD 3 Applicant/consultant	Chair / M. Gerhart
1:55 – 2:10	Legislation relating to IRWM • Emergency Drought Legislation – SB 103&104 • AB 1731 • AB 1874 • SB 1049	Chair
2:10 – 2:20	Announcements and Next Steps • Action items from meeting • Future meeting times and locations	Chair

Attachments:

1. February 24, 2014 CC meeting summary
2. March 3, 2014 PSC meeting notes
3. SF Chronicle Public Notice of Intent to Adopt BAIRWMP
4. DWR Plan Review Process Draft Results
5. Schedule of future CC meetings

SF Bay Area IRWMP Coordinating Committee
Meeting Summary
March 24, 2014

1. Roll Call—Appointed FA representatives present

WS-WQ	WW-RW	FP-SW	Watershed	Other
• Thomasin Grim, MMWD • Brad Sherwood, SCWA • Marie Valmores, CCWD	• Linda Hu, EBMUD • Cheryl Muñoz, SFPUC • David Williams, BACWA	• Mark Boucher, CCCFCWCD • Carol Mahoney, Zone 7	• Matt Gerhart, SCC • Jennifer Krebs, SFEP • Harry Seraydarian, NBWA	• Steve Ritchie, Chair, SFPUC • Norma Camacho, Vice Chair, SCVWD

Others Present:
Kevin Booker, Sonoma Valley CSD
Teresa Eade, StopWaste
Paul Gilbert-Snyder, EBMUD
Christy Kennedy, RMC
Carl Morrison, Morrison & Associates
Michelle Novotny, SFPUC
Molly Petrick, SFPUC
Mark Seedall, CCWD
Jeanny Wang, UC Berkeley
Renee Webber, NBWRA

By phone:
Chris Choo, MCFCWD
Robyn Navarra, Zone 7
Bruce Shaffer, DWR
Melissa Sparks, DWR
Jake Spaulding, SCWA

2. Final 2013 BAIRWMP

Thomasin Grim stated the objective to have the group adopt the 2013 Bay Area Integrated Regional Water Management Plan. Jennifer Krebs made a motion to adopt the Plan. Harry Seraydarian seconded the motion. All present approved, so the 2013 Plan was officially adopted by the Coordinating Committee.

Matt Gerhart thanked Ms. Grim for her work. Ms. Grim said that everyone had worked hard on the Plan.

Ms. Grim stated that DWR had finished their review of the Plan. They only had one "no," which was that in the Project Review Process, we did not include the status of Plan adoption.

Steve Ritchie asked whether we need to do anything about DWR's comment. The group didn't think any action needed to be taken.

Mr. Ritchie asked whether there are other steps that need to occur.

Ms. Grim replied that there is a 30-day review period that began on March 17th. The CC could make comments or other members of the public could make comments that we could address.

Bruce Shaffer stated that DWR will render its final review decision on April 17th. He did not anticipate any problems.

Ms. Grim said there is one piece of unresolved business, which is the request KJ made for $117,000 in additional funds. The PUT reviewed their request, and created a detailed response. The PUT thinks about $50,000 of the charges seem warranted. Based on future expenditures anticipated as of last June, about $35,600 would still be available through the 4-party agreement, so we need to close this out. There is no need to do another review of the request, since that has already been done.

Carl Morrison asked whether we need to wait until the 30-day comment period is over.

Ms. Grim said regardless we should discuss today what we should do. The 4-party agreement is one way to pay Kennedy/Jenks, but it might not be the only way. If that's the only way we could pay them, then we should call a meeting of the 4-party agreement.

Teresa Eade asked whether the PUT is recommending a payment of $50,000.

Ms. Grim replied the PUT hadn't gone so far as to make a recommendation, but they said $50,000 seems like a justifiable claim.

Mr. Gerhart noted the $35,600 is just the amount that we think we would have left.

Ms. Grim agreed. That analysis was done back in June, and the number might be different now.

Ms. Krebs asked, other than the 4-party agreement, whether are there other organizations who might have money to contribute.

Mr. Seraydarian stated that NBWA had contributed $10,000 to the completion of the Round 2 application several years ago. NBWA doesn't have any more. Unless there are other people with money, this is a 4-party agreement decision.

Ms. Grim said that, if that's true, the next steps are to convene a call of the four parties. The group agreed on that path forward.

Molly Petrick stated we don't want to go back and fundraise for things that still need to be done, so we need to ensure there's enough money left to complete what we need to do.

Mr. Morrison asked who the four parties are.

Ms. Grim replied that the four parties are the State Coastal Conservancy, Marin Municipal Water District, Bay Area Clean Water Agencies, and the Contra Costa County Flood Control and Water Conservation District.

Action Items:

- Ms. Grim will convene a call of the four parties to discuss how much to pay Kennedy/Jenks.

3. PSC Updates

Mr. Gerhart stated that there's a lot we don't know about Round 3 and a lot has been changing. Since the last CC meeting, the drought legislation passed (SB 103 & SB 104). The latest we've been hearing is that there will be two rounds, including one expedited drought round. The PSP and guidelines for that expedited round should be released by April 1st. DWR needs to put the PSP out for a month for public review. It will be finalized by June 1st, and applications will be due August 1st. There will be at least a 60-day application period. It is still unclear how the allocation for the expedited round is going to work, e.g. whether there will be an allocation by funding area, or statewide. The regions will be the eligible entities to apply. There had been a discussion of allowing people to apply for more money than is allocated to their region. DWR might use up the $200M for regions that would need it most. So regions that are not deemed highest priority might not get their 40% in this round.

Participants in the PSC call on Friday expressed concern that we could apply and not get any money. The PSC is saying we might want to comment on this issue to DWR before the guidelines come out. We would like to suggest that regional targets be included; it shouldn't be a statewide competition. They also think DWR needs to be cost-effective in their resources and very clear in their guidance.

Mr. Seraydarian said that his understanding is that DWR can't allocate more than the total for a funding region.

Mr. Gerhart replied that the remainder of the money not spent in a drought round would be spent in a future round, and at the end of that round everyone would get trued up by funding area.

Mark Boucher noted that it could be a statewide grant round where you can get up to your funding amount. If you couldn't get much you would have to decide whether it's worth applying.

Mr. Morrison noted that some of the regions where it's needed the most are so small that you might not even reach the $200M.

Mr. Gerhart said the PSC didn't agree whether we are a region of high need or not. He asked Melissa Sparks to confirm the accuracy of his comments on process.

Ms. Sparks replied that Mr. Gerhart captured the situation accurately. Rest assured that after the final round what's remaining in the region should come back to you. Funding targets for funding areas cannot be changed. The method of distribution will be in the PSP and guidelines. When they're in draft review you can send comments to DWR. The draft PSP is with executive management. They are waiting to see if they approve of it. The deadline is April 1st and we are hoping to stick with that.

Mr. Gerhart asked whether it would be better for the group to just comment on the draft, and Ms. Sparks confirmed it would.

Mr. Gerhart noted the second round wouldn't be until later in the year, and would have a separate guidance. This drought round will be streamlined. We are hoping DWR can carry through some of the streamlining into the future.

Mr. Boucher asked what the rounds are being called.

Ms. Sparks replied DWR is calling them the 2014 Drought Solicitation and the 2015 IRWM Solicitation.

Mr. Gerhart noted that a separate pot of money in the drought legislation uses Cap & Trade revenue; that is a statewide competition not going through the regions. It isn't IRWM money. It's focused on energy reductions and water supply. It is good timing to have all of the applications for subregional and regional funding. By the end of April we will be able to peel off the drought projects and get going on the submittal.

Mr. Boucher noted he's a subregional lead and he has received proposals. What should he do with them?

Mr. Gerhart replied projects should be submitted to projects@bairwmp.org. Chris Choo, Mark Boucher, and Matt Gerhart get the emails.

Mr. Morrison said they should compare notes after the deadline date to make sure they all get the same proposals.

Steve Ritchie commented that we need to just keep doing what we're doing. Compared to other regions, we're doing well. We can hop on this faster than others.

Mr. Gerhart discussed the subregional vs. regional funding allocations. The PSC looked at the past practice, and in the past regional projects got credited to a subregion. Some regional projects were credited against subregional targets. We are not proposing to change that, and he wanted to get the group's input.

Robyn Navarra asked whether regional conservation projects do not have submit subregionally.

Mr. Gerhart said that, last time, Brian Campbell figured out how to split up the regional projects subregionally.

Mr. Seraydarian suggested Ms. Navarra submit regionally. Splitting it up is down the road. We can divide it up if necessary.

Ms. Navarra noted that she doesn't want to be excluded in the event that the numbers don't work out and then we're missing conservation from the subregions.

Mr. Gerhart said we need to be able to elaborate where it breaks down subregionally so we can understand how it breaks down by region.

Molly Petrick asked whether the decision to allocate regional projects to subregions was a policy call the CC ever made. The regional priorities dictate the subregional activities. Let's say recycled water gets

funded regionally, then as a subregion the West has to spend a certain chunk of their money on recycled water.

Mr. Seraydarian noted that for Round 1 the whole application was regional. We ended up meeting the subregional amounts in round 1, but with regional projects. In Round 2, we did a hybrid.

Ms. Petrick stated that she didn't know that the money for the regional conservation project was coming out of the West Subregion. It was not clear.

Mr. Gerhart agreed that he didn't recall a policy call on it. The split happened consciously by reducing the pool of money that's available.

Mr. Morrison stated the people participating in the West subregion meetings were aware of the policy.

Mr. Gerhart said we can bring the issue back to the CC as a policy decision. We were going to wait until we had some idea of the projects, etc.

Ms. Krebs stated we also asked the agencies which project was their top project. Conservation was the top project in SCVWD.

Ms. Grim asked whether anyone has done the math to see whether it would make a difference. We either allocate it to each subregion, or we take it off the top.

Ms. Petrick said that, for this round, a floor/ceiling of regional/subregional pots of money doesn't make sense if we keep using this method.

Mr. Gerhart noted there are few truly regional projects.

Ms. Petrick said that people submitting regional projects should coordinate with people looking at subregional projects.

Mr. Gerhart noted that in the past it's been the same people, and we can cross-compare what's happening regionally with what's happening sub-regionally.

Teresa Eade said that the IRWM grants are trying to get us to do integrated programs regionally. But we also want each of our own projects. We've made a lot of progress talking with one another and working together, but this kind of thing is a growing pain of the process. I think this round does have some regional, innovative ideas coming forward.

Mr. Gerhart committed to putting the decision on the agenda of a future CC meeting. Obviously, the process will all be colored by the PSP for the drought round.

Mr. Gerhart then discussed possible grant administration for Round 3. Jennifer Krebs and SFEP have applied to be grant administrators for Round 3.

Ms. Krebs distributed the key points of their proposal and discussed them. SFEP is proposing to have one consultant for both rounds. They will try to send an RFQ out in April, with proposals due back in April. They will try to have a consultant on board in May so that we're ready to run with an application.

The last time we had a small subcommittee to decide what would be in the RFQ and who we will choose. Current volunteers for the Oversight Committee are Carl Morrison, Tracy Hemmeter, Cheryl Munoz, Linda Hu, Mark Boucher, and Harry Seraydarian. Ms. Krebs asked whether they can charge $1,000 per project selected to be a proponent to oversee the grant round. It takes a lot of staff time to oversee. During the grant we would charge what we have been charging, which is 5% or less.

Mr. Gerhart commented that another factor is how quickly this would go out. Ms. Krebs thinks there's a way to get the pool of interested folks through an RFQ and then do a faster application.

Ms. Krebs added that maybe we have a per project cost that is baseline, and then we could vary it based on the complexity of the project.

Mr. Morrison asked whether this would be for submitting both solicitations, and Ms. Krebs confirmed that was correct.

Ms. Grim asked whether the committee could say that we like the idea of SFEP/ABAG being the applicant and not agree right away to everything in the proposal.

Mr. Gerhart replied that if we do want to get going with a consultant application process, Ms. Krebs needs some affirmation from the group.

Mr. Seraydarian said that since we only have one choice at this point, we should affirm SFEP and give them the blessing to put out an RFQ. But the subcommittee could adjust the process.

Ms. Grim stated she is not comfortable agreeing fully with everything being proposed. She might be fine with it, but it's too early to say right now. It needs to be further vetted. $1000 seems arbitrary. She also doesn't know how we could get a consultant on board to write proposals that we don't know anything about.

Mr. Seraydarian replied that we are approving SFEP as an applicant and pursuing an RFQ. We are not approving anything else.

Mr. Gerhart said we need to have a process to get input to Ms. Krebs or the subcommittee.

Ms. Krebs stated she thinks there's a way to commit to a ceiling for consulting services without promising how much we're going to pay. We don't know how many applicants we're going to have in either round. We're going to word the RFQ to allow flexibility, and then we'd spell it out more explicitly in the contract.

Ms. Petrick noted we don't know if the cost/benefit is going to be included. The RFQ might be different depending whether or not it's included. Last time they brought in David Mitchell to do the cost/benefit analysis.

Ms. Krebs commented that everyone wants David Mitchell again.

Ms. Grim asked what if there's one project for one water agency, or just a couple projects, in the next drought round. She wondered about the wisdom about getting too far down the road.

Mr. Ritchie said the plan is to put the RFQ out on April 14th. The PSP is supposed to be out on April 1st. That's enough time to modify. We should maintain flexibility.

Mr. Seraydarian said it's possible that the application process is so streamlined that we might not need a consultant. If DWR is willing to fund locally "not cost effective" projects, then they can't require a cost/benefit analysis. But history has told us that we will need a consultant.

Linda Hu said she appreciated the fact that Jennifer Krebs and SFEP has stepped up.

Ms. Petrick asked whether we could delay until April 28th in order to bring the matter to the CC again. It seems like we're asking for approval of something we don't know anything about yet.

Mr. Morrison commented that we've used SFEP before.

Dave Williams stated that since it's an RFQ, when you have more details you negotiate a scope of work and the contract. The CC would have time for input.

Mr. Boucher agreed, and added that on-call contracts are picked based on a consultant's qualifications based on a general scope of work. This is similar. We want someone who can do this kind of work and do it well. To get ahead of the game, this is what we have to do.

Mr. Seraydarian stated that we're better off knowing what consulting firms are interested at our next meeting in April. We will be better informed if we go with the RFQ.

Mr. Boucher said there's a limited number of consultants who do this well, and we don't want to be late to the dance. If we don't act soon enough, we might not get the consultant that's best for us.

Mr. Gerhart proposed we move forward and bring the responding set of consultants back to the CC at the April meeting. He asked whether anyone objected, and no one in the group did.

Action Items:

- The group will consider commenting on the draft PSP once it is issued.
- The subregional vs. regional funding allocations decision will be on the agenda of a future CC meeting.
- Jennifer Krebs and SFEP will move forward with issuing an RFQ and bring the results back to the CC at the April 28th meeting.

4. Legislation

Michelle Novotny discussed legislation related to IRWM that has been introduced at the state level. She had clarified that AB 1731 (Perea) would require not less than 10% of IRWM funding in each region be used for planning and projects that address water supply or water quality needs for disadvantaged communities.

Mr. Seraydarian noted the dilemma is still going to be how DWR defines what is eligible for disadvantaged communities. For water supply the Bay Area Region doesn't have too many communities that currently qualify.

Mr. Gerhart stated the bill author would be defining that.

Ms. Novotny then discussed AB 1874 (Gonzalez), which would require DWR to develop a streamlined application process for the funding of regional projects and programs, and prompt review and payment of invoices associated with grants, and SB 1049 (Pavley) which would require IRWM groups to include all water providers in the watershed and to include projects that reduce energy used to acquire, transport, treat, or distribute water as regional projects. The group did not have comment on either bill.

5. Announcements

Carol Mahoney announced that she will be on a panel at a CA Water Policy Conference for IRWM. They sent a list of questions, such as what has been the most significant accomplishment of IRWM planning to date. Mr. Ritchie and Mr. Morrison noted they will be in the audience.

Mr. Seraydarian stated the NBWA annual conference is coming up on April 11th. Congressman Jared Huffman will be the luncheon keynote. He was a Co-author on the House drought relief bill.

Mr. Shaffer announced that the CA Water Plan update 2013 is having its final meeting this Wednesday in Sacramento. Go to www.waterplan.water.ca.gov to find out more. The California Finance Coordinating Committee will be holding seven workshops giving information on getting grants and loans from state. For information go to www.cfcc.ca.gov. Also, the California Department of Public Health will now be collecting public water system statistics for DWR. For information go to www.drinc.ca.gov/ear.

The next meeting will be held on April 28th 2014, at the Zone 7 offices in Livermore. Mr. Morrison volunteered to pick people up at Pleasanton BART if anyone needs a ride.

Appendix F-1

Projects Added to the 2013 Bay Area IRWMP by the Coordinating Committee on May 28, 2014

Appendix F-1: Projects Added to the Plan

In anticipation of a third round of Proposition 84 funding, the Coordinating Committee in early 2014 solicited regional and subregional project concept proposals. The solicitation resulted in a total of 54 projects submitted, with the total amount sought for funding exceeding $420 million. These projects were then scored using 10 factors that had been developed for this concept proposal solicitation**.** Table F-1-1 lists the scoring factors and potential score for each factor. In some cases just a yes or no answer was all that was required.

Subsequent to the scoring, statewide drought legislation was passed and DWR essentially divided the third round in two parts with the first specifically addressing the drought. The Coordinating Committee then evaluated and rescored the submitted regional and subregional concept proposals as to how they would respond to the drought. The Bay Area regional factors in Table F-1-1 as well as scoring criteria developed after review of the DWR's Drought Solicitation Guidelines and Draft Proposal Solicitation Package (PSP) were key in selecting projects to include in the Drought Solicitation Proposal.

The eight projects listed in Table F-1-2 were ranked highly both because of Plan priorities and drought specific needs and are hereby added to the Plan. Submitted project concept proposals not evaluated for the Drought Round are being carried forward for evaluation under DWR's anticipated final Prop 84 IRWM round in 2015.

Table F-1-1: Project Scoring Factors

Factor	Criteria	Scoring (or yes or no)
1	In the Plan?	(Y/N)
	Goals/Objectives	1 to 3 points (Total of 200 points allocated among the 5 goals; 10 points per objective until 40 points maximum per goal [for flood goal, 40 points if all objectives addressed]) Tier into 3 categories: 1 – 1-66 of 200 2 – 67-123 of 200 3 – 124-200 of 200
2	Readiness to proceed	1 to 3 points 1 – Conceptual or early planning 2 – In CEQA or final design phase 3 – CEQA and all permitting complete – can start construct before April 2015
3	Provides 25% match?	(Y/N)
4	Provides at least two physical benefits?	(Y/N)
	Physical benefits	1 to 3 points 1 - Does not discuss benefits or evidence of minor benefits for project type 2 - Evidence of moderate benefits for project type 3 - Evidence of high level of benefit for project type
5	Benefit-Cost	1 to 3 points 1 - Not discussed or B/C below 1 2 - B/C between 1-3 3 - B/C above 3
6	Cash for consultant to prepare proposal?	(Y/N)
7	Collaboration with other entities	1 to 3 points 1 - Does not discuss or only narrow collaboration 2 - Moderate level of partners, some limitations to partnership 3 - Broad collaboration appropriate to project type
8	Degree of integrated benefits	1 to 4 points 1 - Benefits in only one FA or resource area 2 - Benefits 2 FAs or resource areas 3 - Benefits in 3 FAs or resource areas 4 - Benefits in 4 FAs or resource areas
9	Proposal indicates scalability?	(Y/N)
10	Regionality (for regional proposals only)	1 to 3 points 1 - Does not discuss or constrained to approx 1/3 of relevant part of region or less 2 - Brings benefits to a significant proportion of relevant region (up to 2/3) 3 - Benefits large portions in nearly all of relevant regions

Table F-1-2: Projects Added and Project IRWMP Factors Score

	Project	Total IRWMP Factors Score
1	Bay Area Regional Water Supply and Conservation Project	16.8 / 21
2	Bay Area Regional Recycled Water Project: • Calistoga Recycled Water Storage Facility • Continuous Recycled Water Production Facilities and Wolfe Road Recycled Water Pipeline Extension	16.7 / 21
3	Drought Response & Water Supply Reliability on the Central Coast	13.2 / 18
4	Enhancing and Balancing Beneficial Uses of Water Resources in the Pescadero-Butano Watershed	13.1 / 18
5	Lower Cherry Aqueduct Emergency Rehabilitation Project	12.3 / 21
6	MMWD WaterSMART Irrigation with AMI/AMR	11.5 / 18
7	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment for Drought Water Quality Conflicts	9.6 / 18
8	Zone 7 Water Supply Drought Preparedness Project	12.6 / 18

Urban Water Management Compliance

Table 1-3 lists agency contact information and the status of Urban Water Management compliance for project proponents that meet the requirements of an "urban water supplier" according to the CWC. Each of the urban water suppliers listed below has received acknowledgement from DWR that their urban water management plans (UWMPs) have been verified. Table 1-3 also indicates the status of self-certification documentation for compliance with requirements of AB 1420 and water metering requirements contained in CWC Section 525 *et seq*. Electronic copies of DWR UWMP verification letters, AB 1420, and water metering self-certifications are included in the following pages. Hard copies of AB 1420 and CWC Section 525 self-certification documentation with wet signatures are submitted to DWR separately.

Table 1-3. Urban Water Suppliers Included in the Proposal

Agency Name	Agency Contact	DWR Verification of Urban Water Management Plan	AB 1420 Self-Certification Documentation	Water Metering Compliance Self-Certification
Alameda County Water District*	Primary Contact: Stephanie Nevins (510) 668-4207 stephanie.nevins@acwd.com Secondary Contact: Stephanie Penn 510-668-6534 stephanie.penn@acwd.com	DWR verification letter included with Application.	Self-certification form included with Application.	Self-certification form included with Application.
City of Calistoga	Michael Kirn (707) 942-2828 mkirn@ci.calistoga.ca.us	Not applicable; the City has 1,575 water connections and delivers 775 AFY of water. The City is not required to prepare a UWMP.	Not applicable; the City is not an urban water supplier.	Self-certification form included with Application.
City of Napa*	Patrick Costello (707) 257-9309 pcostello@cityofnapa.org	DWR verification letter included with Application.	Self-certification form included with Application.	Self-certification form included with Application.
City of Sunnyvale	Mansour Nasser (408) 730-7578 mnasser@sunnyvale.ca.gov	DWR verification letter included with Application.	Self-certification form included with Application.	Self-certification form included with Application.
CCWD*	Lucinda Shih (925) 688-8168 lshih@ccwater.com	DWR verification letter included with Application.	Self-certification form included with Application.	Self-certification form included with Application.
DSRSD	Rhodora Biagtan (925) 875-2255 biagtan@dsrsd.com	DWR verification letter included with Application.	Self-certification form included with Application.	Self-certification form included with Application.
EBMUD*	Priyanka Jain (510) 287-1153 pjain@ebmud.com	DWR verification letter included with Application.	Self-certification form included with Application.	Self-certification form included with Application.
MMWD*	Jon LaHaye (415) 945-1589 jlahaye@marinwater.org	DWR verification letter included with Application.	Self-certification form included with Application.	Self-certification form included with Application.

Agency Name	Agency Contact	DWR Verification of Urban Water Management Plan	AB 1420 Self-Certification Documentation	Water Metering Compliance Self-Certification
Napa Sanitation District	Jeff Tucker (707) 258-6000 ext. 512 jtucker@napasan.com	Not applicable; Napa Sanitation District is not a potable water supplier.	Not applicable.	Self-certification form included with Application.
SFPUC*	Fan Lau (415) 554-2498 flau@sfwater.org	DWR verification letter included with Application.	Self-certification form included with Application.	Self-certification form included with Application.
SCVWD*	James O'Brien (408) 630-2443 jobrien@valleywater.org	DWR verification letter included with Application.	Self-certification form included with Application.	Self-certification form included with Application.
San Mateo County RCD	Not necessary.	Not applicable; Napa Sanitation District is not a potable water supplier.	Not applicable.	Self-certification form included with Application.
Solano County Water Agency*	Andrew Florendo (707) 455-1111 aflorendo@scwa2.com	Solano County Water Agency is not an urban water supplier but submitted a UWMP to DWR. The plan has been accepted by DWR. Documentation included with application.	Not applicable; Solano County Water Agency is not an urban water supplier.	Not applicable; Solano County Water Agency is not an urban water supplier.
Sonoma County Water Agency*	Sherry Barbic (707) 521-1806 Sherry.Barbic@scwa.ca.gov	DWR verification letter included with Application.	Self-certification form included with Application.	Self-certification form included with Application.
Stinson Beach County Water District	Ed Schmidt (415) 868-1333 ed@stinson-beach-cwd.dst.ca.us	Not Applicable; Stinson Beach CWD is not an urban water supplier. However, the District has implemented many of the Best Management Practices aimed at water conservation that larger agencies include in their UWMPs.	Not applicable; Stinson Beach CWD is not an urban water supplier.	Self-certification form included with Application.
Zone 7 Water Agency*	Amparo Flores (925) 454-5019 aflores@zone7water.com	DWR verification letter included with Application.	Self-certification form included with Application.	Self-certification form included with Application.

**Indicates Participating Agency of the Bay Area Regional Drought Relief Conservation Program (Project 10)*

Alameda County Water District

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

July 25, 2012

Mr. Walt Wadlow
General Manager
Alameda County Water District
P.O. Box 5110
Fremont, California 94537-5110

Dear Mr. Wadlow:

The Department of Water Resources (DWR) has reviewed the Alameda County Water District's (ACWD) Self-Certification Statement – Table 1 submitted on July 6, 2012, regarding implementation of the Urban Best Management Practices (BMPs).

The purpose of DWR's review is to determine ACWD's eligibility to receive water management grant or loan funds. DWR has followed the *AB 1420 Compliance Requirements* dated January 1, 2009. For detailed information, please visit http://www.water.ca.gov/wateruseefficiency/finance/.

Based on DWR's review of the information in Table 1, ACWD has and is currently implementing the BMPs consistent with AB 1420 and, therefore, is eligible to receive water management grant or loan funds.

DWR reserves the right to request additional information and documentation, including reports from ACWD to substantiate the accuracy of the information provided in Table 1. DWR may reverse or modify its eligibility determination and notify you and the funding agency if inaccuracies are found in the supporting documentation or in Table 1.

If you have any questions, please contact me at (916) 651-7034 or Betsy Vail at (916) 651-9667.

Sincerely,

Peter Brostrom
Urban Water Unit
Water Use and Efficiency Branch

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR
COMPLIANCE WITH WATER METERING REQUIREMENTS
FOR FUNDING APPLICATIONS

Funding Agency name: California Department of Water Resources

Funding Program name: Proposition 84 Funding

Applicant (Agency name): Alameda County Water District, applying through Bay Area Clean Water Agencies

Project Title (as shown on application form): Regional Conservation Programs

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

☒ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Walter L. Wadlow
Name of Authorized Representative
(Please print)

Signature

General Manager, Alameda County Water District
Title

6/23/14
Date

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1, and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory: Walter L. Wadlow **Title of Signatory:** General Manager **Signature of signatory** _____ **Date** 6/23/14

Application Date: 21-Jul-14

Proposal Identification Number: N/A **CUWCC Member? Yes/No** YES

Has Urban Water Supplier submitted a 2005 Urban Water Management Plan? Yes/No Yes **Is the UWM Plan Deemed Complete by DWR? Yes/No** Yes

Applicant Name: San Francisco Bay Area Regional Conservation Programs

Project Title: San Francisco Bay Area Regional Priority Projects and Programs

Applicant's Contact Information: **Name:** Stephanie Penn **Phone:** 510.668.4207 **E-mail:** stephanie.nevins@acwd.com

Participants:

Retailer (List Below)	*Wholesaler (List Below)*
Alameda County Water District	

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs		Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008 and 2009-2010) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers		Yes	N/A	No			✓				Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes
	✓	BMP 2 Residential Plumbing Retrofit		Yes	N/A	No			✓				Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes
✓	✓	BMP 3 System Water Audits, Leak Detection		Yes	N/A	No	✓						Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes
✓	✓	BMP 3 Leak Repairs		Yes	N/A	No	✓						Yes	N/A	and 5/17/11	N/A	Yes
	✓	BMP 4 Metering with Commodity Rates for All New connections		Yes	N/A	No	✓						Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes
	✓	BMP 4 Retrofit of Existing Connections		Yes	N/A	No	✓						Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008 and 2009-2010) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 5 Large Landscape Conservation Programs and Incentives	Yes	N/A	No			✓				Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes
	✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Yes	N/A	No			✓				Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes
✓	✓	BMP 7 Public Information	Yes	N/A	No	✓						Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes
✓	✓	BMP 8 School Education	Yes	N/A	No	✓						Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes
	✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Yes	N/A	No			✓				Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes
✓		BMP 10 Wholesale Agency Assistance Programs	Yes	N/A	No	✓						Yes, not a wholesaler	N/A	12/29/2008 and 5/17/11	N/A	Yes
	✓	BMP 11 Conservation Pricing	Yes	N/A	No	✓						Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes
✓	✓	BMP 12 Conservation Coordinator	Yes	N/A	No	✓						Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes
	✓	BMP 13 Water Waste Prohibitions	Yes	N/A	No	✓						Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes
	✓	BMP 14 Residential ULFT Replacement Programs	Yes	N/A	No			✓				Yes	N/A	12/29/2008 and 5/17/11	N/A	Yes

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

City of Calistoga

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR COMPLIANCE WITH WATER METERING REQUIREMENTS FOR FUNDING APPLICATIONS

Funding Agency name: Department of Water Resources

Funding Program name: 2014 Drought IRWMP Implementation Round 3

Applicant (Agency name): City of Calistoga

Project Title (as shown on application form): Calistoga Recycled Water Storage Facility

Please check one of the boxes below and sign and date this form.

☒ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Michael Kirn
Name of Authorized Representative
(Please print)

Michael Kirn
Signature

Public Works Director
Title

June 2, 2014
Date

City of Napa

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

November 10, 2011

Mr. Patrick Costello
Water Resources Analyst
City of Napa
1340 Clay Street
Napa, California 94559-0660

Dear Mr. Costello:

The Department of Water Resources (DWR) has reviewed the City of Napa's 2010 Urban Water Management Plan (UWMP) received on June 11, 2011. The California Water Code (CWC) directs DWR to report to the legislature once every five years on the status of submitted plans. In meeting this legislative reporting requirement, DWR reviews all submitted plans.

DWR's review of the City of Napa's 2010 plan has found that the plan has addressed the requirements of the CWC. DWR's review of plans is limited to assessing whether suppliers have addressed the required legislative elements. In its review, DWR does not evaluate or analyze the supplier's UWMP data, projections, or water management strategies. This letter simply acknowledges that the City of Napa's UWMP has addressed these requirements. The results of the review will also be provided to DWR's Financial Assistance Branch.

If you have any questions regarding the review of the plan or urban water management planning please don't hesitate to email or call.

Sincerely,

Peter Brostrom
UWMP Program Manager
brostrom@water.ca.gov
(916) 651-7034

cc: Kim Rosmaier
DWR North Central Regional Office

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR
COMPLIANCE WITH WATER METERING REQUIREMENTS
FOR FUNDING APPLICATIONS

Funding Agency name: Department of Water Resources

Funding Program name: 2014 IRWM Drought Solicitation (Proposition 84)

Applicant (Agency name): City of Napa

Project Title (as shown on application form): Bay Area Drought Relief Program (Bay DRP)

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

■ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Phil Brun
Name of Authorized Representative
(Please print)

Signature

Deputy Director of Public Works
Title

7/01/14
Date

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1, and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory: PHIL BRUN Title of Signatory: Deputy Director of Public Works Signature of signatory: [signature] Date: 7/01/14

Application Date: July 21, 2014

Proposal Identification Number: CUWCC Member? Yes/No: Yes

Has Urban Water Supplier submitted a 2010 Urban Water Management Plan? Yes/No: Yes

Is the UWM Plan Deemed Complete by DWR? Yes/No: Yes

Applicant Name: Association of Bay Area Governments (ABAG)

Project Title: Bay Area Drought Relief Program (Bay DRP) - 2014 IRWMP Drought Solicitation (Proposition 84)

Applicant's Contact Information: Name: Patrick Costello Phone: (707) 257-9309 E-mail: pcostello@cityofnapa.org

Participants:

Retailer (List Below)	*Wholesaler (List Below)*
City of Napa	

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2011-2012) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
		✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers	Yes					X				Yes		6/3/2014		Yes
		✓	BMP 2 Residential Plumbing Retrofit	Yes					X				Yes		6/3/2014		Yes
	✓	✓	BMP 3 System Water Audits, Leak Detection	Yes			X						Yes		6/3/2014		Yes
	✓	✓	BMP 3 Leak Repairs	Yes			X						Yes		6/3/2014		Yes
		✓	BMP 4 Metering with Commodity Rates for All New connections	Yes			X						Yes		6/3/2014		Yes
		✓	BMP 4 Retrofit of Existing Connections	Yes			X						Yes		6/3/2014		Yes
		✓	BMP 5 Large Landscape Conservation Programs and Incentives	Yes					X				Yes		6/3/2014		Yes

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional[9] *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2011-2012) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Yes					X				Yes		6/3/2014		Yes
	✓	✓	BMP 7 Public Information	Yes			X						Yes		6/3/2014		Yes
	✓	✓	BMP 8 School Education	Yes			X						Yes		6/3/2014		Yes
		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Yes					X				Yes		6/3/2014		Yes
	✓		BMP 10 Wholesale Agency Assistance Programs	Not Applicable													
		✓	BMP 11 Conservation Pricing	Yes			X						Yes		6/3/2014		Yes
	✓	✓	BMP 12 Conservation Coordinator	Yes			X						Yes		6/3/2014		Yes
		✓	BMP 13 Water Waste Prohibitions	Yes			X						Yes		6/3/2014		Yes
		✓	BMP 14 Residential ULFT Replacement Programs	Yes					X				Yes		6/3/2014		Yes

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

CUWCC BMP Coverage Report 2012

6298 City of Napa

GPCD in 2006: 152.07

GPCD in 2012 145.28

GPCD Target for 2018: 134.15

Biennial GPCD Compliance Table

ON TRACK

		Target		Highest Acceptable Bound	
Year	Report	% Base	GPCD	% Base	GPCD
2010	1	96.4%	**157.70**	100%	**163.59**
2012	2	92.8%	**151.81**	96.4%	**157.70**
2014	3	89.2%	**145.92**	92.8%	**151.81**
2016	4	85.6%	**140.03**	89.2%	**145.92**
2018	5	82.0%	**134.15**	82.0%	**134.15**

CUWCC BMP Retail Coverage Report 2011

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

6298 City of Napa

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name:	Patrick Costello
Title:	Water Resources Analyst
Email:	pcostello@cityofnapa.org

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.			
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.	CONAPA_6298_2011_BMP_1-1_WaterShortageRegs.pdf		In a moderate or severe water shortage, Napa Municipal Code Chapters 13.10 and 13.12 (or updated versions) become activated, addressing prohibitions and limitations on water use with administrative citations and civil fines.
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.	Copy_of_CONAPA_6298_2011_BMP_1-1_WELO.pdf		City of Napa has adopted a local Water Efficient Landscape Ordinance (WELO) for new development that is more stringent than the State Model WELO, with a Maximum Applied Water Allowance of just 60% of Reference Evapotranspiration.
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.	Copy_of_CONAPA_6298_2011_BMP_1-1_HPBO.pdf		City of Napa has adopted local High Performance Building Regulations that are more stringent in their mandatory water efficiency measures than the State counterpart (CALGreen). For example, non-residential construction must reduce indoor use by 30%.

CUWCC BMP Retail Coverage Report 2011

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices **ON TRACK**

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Retail Coverage Report 2012

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

6298 City of Napa

1. Conservation Coordinator provided with necessary resources to implement BMPs?

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CUWCC BMP Retail Coverage Report 2012

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices **ON TRACK**

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control **ON TRACK**

6298 City of Napa

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
CONAPA_6298_2011_BMP_1-2_AWWA.xls	
AWWA Water Audit Validity Score?	69
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	Yes
Component Analysis?	No
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repar unreported leaks to the extent cost effective?	Yes
Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
64			17			

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control **ON TRACK**

6298 City of Napa

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
CONAPA_6298_2012_BMP_1-2_AWWA.xls	
AWWA Water Audit Validity Score?	69
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	Yes
Component Analysis?	No
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repar unreported leaks to the extent cost effective?	Yes
Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
43			17			

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

6298 City of Napa

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	1225
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes

Date: 6/7/2013

Uploaded file name:

Completed a written plan, policy or program to test, repair and replace meters	Yes

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

6298 City of Napa

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	1228
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes

Date: 6/7/2013

Uploaded file name: Feasibility Study - City of Napa.pdf

Completed a written plan, policy or program to test, repair and replace meters	Yes

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Consrvation Pricing

On Track

6298 City of Napa

Implementation (Water Rate Structure)

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Comodity Charges	(M) Total Revenue Fixed Carges
Single-Family	Uniform	Yes	9100933	29571
Multi-Family	Uniform	Yes	2525871	8207
Commercial	Uniform	Yes	2684518	8723
Institutional	Uniform	Yes	1175076	0
Dedicated Irrigation	Uniform	Yes	835735	0
Agricultural	Uniform	Yes	231332	0
Other	Uniform	Yes	1489074	22135
			18042539	**68636**

Calculate: V / (V + M) **100 %**

Implementation Option: Use Annual Revenue As Reported

☐ Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: No

At Least As effective As No

Exemption No

Comments:

In 2011, nearly all customers were billed using uniform volumetric rates only. Fixed charges come primarily from Fire Hydrant Benefit Zone properties, construction hydrants, and an agency export meter.

CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Consrvation Pricing

On Track

6298 City of Napa

Implementation (Water Rate Structure)

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Comodity Charges	(M) Total Revenue Fixed Carges
Single-Family	Increasing Block	Yes	9035579	1522775
Multi-Family	Uniform	Yes	2697090	8205
Commercial	Uniform	Yes	2927065	6796
Institutional	Uniform	Yes	1574926	0
Dedicated Irrigation	Uniform	Yes	1029818	0
Agricultural	Uniform	Yes	278405	0
Other	Uniform	Yes	3202997	24000
			20745880	**1561776**

Calculate: V / (V + M) **93 %**

Implementation Option: Use Annual Revenue As Reported

☐ Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: No

At Least As effective As No

Exemption No

Comments:

A bimonthly fixed service charge and tiered (increasing block) rates were introduced in late 2011 for single-family residential accounts. Nearly all other customers remain uniform volumetric rates only.

CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

6298 **City of Napa** **Retail**

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

The name of agency, contact name and email address if not CUWCC Group 1 members

Harbison Appliance

Did at least one contact take place during each quater of the reporting year? Yes

Public Outreach Program List	Number
Newsletter articles on conservation	8
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	15
Website	18
Landscape water conservation media campaigns	14
General water conservation information	21
Email Messages	9
Total	**85**

Did at least one contact take place during each quater of the reporting year? Yes

Number Media Contacts	Number
Articles or stories resulting from outreach	9
Editorial board visits	1
News releases	4
Newspaper contacts	10
Radio contacts	2
Television contacts	1
Written editorials	2
Online Advertisings	1
Total	**30**

Did at least one website update take place during each quater of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Total	59700
Total Amount:	**59700**

CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

Public Outreah Additional Programs
Displays at Public Events
Educational Workshops
Presentations to Community Groups

Description of all other Public Outreach programs

High-Efficiency Clothes Washer Rebate promotional eventsBay-Friendly Landscaping & Gardening Coaltion

Comments:

At Least As effective As No

Exemption No 0

CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

6298 **City of Napa** **Retail**

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

The name of agency, contact name and email address if not CUWCC Group 1 members

Harbison Appliance

Did at least one contact take place during each quater of the reporting year? Yes

Public Outreach Program List	Number
Newsletter articles on conservation	6
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	18
Website	22
Landscape water conservation media campaigns	13
General water conservation information	22
Email Messages	11
Total	**92**

Did at least one contact take place during each quater of the reporting year? Yes

Number Media Contacts	Number
Articles or stories resulting from outreach	5
News releases	3
Newspaper contacts	6
Radio contacts	2
Written editorials	1
Online Advertisings	2
Total	**19**

Did at least one website update take place during each quater of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Total	54700
Total Amount:	**54700**

Public Outreah Additional Programs
Displays at Public Events

CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

Public Outreah Additional Programs
Educational Workshops
Presentations to Community Groups

Description of all other Public Outreach programs

High-Efficiency Clothes Washer Rebate promotionBay-Friendly Landscaping & Gardening Coalition

Comments:

At Least As effective As No

Exemption No 0

CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

6298 City of Napa **Retail**

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Materials meet state education framework requirements? Yes

Water Education Foundation (WEF) Materials
Project WET Curriculum & Activity Guide, Conserve Water Educators Guide
Water Week Teaching Kit (Channing Bete)
Various activity booklets

Materials distributed to K-6? Yes

"The Story of Drinking Water" (AWWA)
"Conserve Water" (Project WET Foundation)
"We Can Conserve Water" (Channing Bete)
"My Book About Water" (Channing Bete)
"About the Water Cycle" (Channing Bete)

Materials distributed to 7-12 students? Yes (Info Only)

WEF "Project Water Science" - series of hands-on exercises to teach water quality, supply, conservation

Annual budget for school education program: 4500.00

Description of all other water supplier education programs

Water Conservation Classroom Presentation, Water Treatment Plant Field Trip, free curriculum materials. The City participates in the Environmental Education Coalition of Napa County (EECNC) which produces a local teachers guide and plans Earth Day.

Comments:

Budget expenditures do not include staff time.

At Least As effective As No

Exemption No 0

CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

6298 City of Napa **Retail**

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Comments:

Budget expenditures do not include staff time.

At Least As effective As No

Exemption No 0

City of Sunnyvale

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

September 20, 2013

Mr. Gary Luebbers
City Manager
City of Sunnyvale
Post Office Box 3707
Sunnyvale, California 94088-3707

Dear Mr. Luebbers:

The Department of Water Resources (DWR) has reviewed the City of Sunnyvale's 2010 Urban Water Management Plan (UWMP) received on July 27, 2011. The California Water Code (CWC) directs DWR to report to the legislature once every five years on the status of submitted plans. In meeting this legislative reporting requirement, DWR reviews all submitted plans.

DWR's review of Sunnyvale's 2010 UWMP has found that the plan has generally addressed the overall requirements of the CWC. DWR recommends that when updating this plan in 2015:

> The City should better account for all the end uses and/or disposal of the wastewater treated in its service area. In the 2010 UWMP the volume of wastewater treated to recycled standards and the volume disposed of in the South San Francisco Bay do not add up to the total volume of wastewater treated in the service area. By including this data, the City of Sunnyvale will better meet the requirements of the Water Code, Section 10633 (a) and (b).

DWR's review of plans is limited to assessing whether suppliers have addressed the required legislative elements. In its review, DWR does no evaluate or analyze the supplier's UWMP data, projections, or water management strategies. This letter is simply meant to acknowledge that the City of Sunnyvale's 2010 UWMP has addressed these requirements. The results of the review will also be provided to DWR's Financial Assistance Branch.

If you have any questions regarding the review of the plan or urban water management planning, please do not hesitate to contact me.

Sincerely,

Peter Brostrom
UWMP Program Manager
Brostrom@water.ca.gov
(916) 651-7034

cc: Brendan McCarthy, Admin. Aide
City of Sunnyvale

cc: Kim Rosmaier
DWR North Central Regional Office

cc: Gwen Huff
DWR Headquarters

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR
COMPLIANCE WITH WATER METERING REQUIREMENTS
FOR FUNDING APPLICATIONS

Funding Agency name: Department of Water Resources

Funding Program name: 2014 Drought IRWMP Implementation Round 3

Applicant (Agency name): City of Sunnyvale

Project Title (as shown on application form): Sunnyvale Continuous Recycled Water Facilities and Wolfe Road Pipeline

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

☒ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

MANSOUR NASSER
Name of Authorized Representative
(Please print)

Mansour Nasser
Signature

Water & Sewer Division Manager
Title

June 9, 2014
Date

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1, and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory MANSOUR NASSER Title of Signatory Water + Sewer Division Manager Signature of signatory [signature] Date 6/20/14

Application Date:

Proposal Identification Number: CUWCC Member? Yes/No No

Has Urban Water Supplier submitted a 2005 Urban Water Management Plan? Yes/No Yes

Is the UWM Plan Deemed Complete by DWR? Yes/No Yes

Applicant Name: City of Sunnyvale

Project Title:

Applicant's Contact Information: Name: Mansour Nasser Phone: 408-730-7578 E-mail: mnasser@sunnyvale.ca. gov

Participants:

Retailer (List Below)	*Wholesaler (List Below)*
City of Sunnyvale	*Santa Clara ~~County~~ Water District* Valley

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs		Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD (b)	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers			Yes												
	✓	BMP 2 Residential Plumbing Retrofit			Yes												
✓	✓	BMP 3 System Water Audits, Leak Detection		Yes					X				No			Sunnyvale 2010 UWMP 7/27/2011	Yes
✓	✓	BMP 3 Leak Repairs		Yes					X				Yes			Sunnyvale 2010 UWMP 7/27/2012	Yes
	✓	BMP 4 Metering with Commodity Rates for All New connections		Yes					X				Yes			Sunnyvale 2010 UWMP 7/27/2013	Yes
	✓	BMP 4 Retrofit of Existing Connections		Yes [a]					X				Yes			Sunnyvale 2010 UWMP 7/27/2014	Yes
	✓	BMP 5 Large Landscape Conservation Programs and Incentives			Yes												

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
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		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs		Yes												
	✓	✓	BMP 7 Public Information	Yes	Yes				X				Yes			Sunnyvale 2010 UWMP 7/27/2014	Yes
	✓	✓	BMP 8 School Education	Yes	Yes				X				Yes			Sunnyvale 2010 UWMP 7/27/2014	Yes
		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts		Yes												
	✓		BMP 10 Wholesale Agency Assistance Programs	N/A													
		✓	BMP 11 Conservation Pricing	Yes					X				Yes			Sunnyvale 2010 UWMP 7/27/2014	Yes
	✓	✓	BMP 12 Conservation Coordinator	Yes					X				Yes			Sunnyvale 2010 UWMP 7/27/2014	Yes
		✓	BMP 13 Water Waste Prohibitions	Yes					X				Yes			Sunnyvale 2010 UWMP 7/27/2014	Yes
		✓	BMP 14 Residential ULFT Replacement Programs		Yes												

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.
(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.
(a) ALL EXISTING CUSTOMERS HAVE METERS
(b) GPCD Compliance Option requires addressing the foundational BMPs only (Foundational BMPs are: 3,4,7,8,11,12, and 13)

AB 1420 Self- Certification Statement Table 2

Provide Schedule, Budget, and Finance Plan to Demonstrate Commitment to Implement All BMP's to Become in Compliance with BMP Implementation - Commencing Within 1st Year of Agreement for Which Applicant Receives Funds.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1 and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1 and Table 2, and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory: MANSOUR NASSER Title of Signatory: Water + Sewer Division Manager Signature of signatory: [signature] Date: 6/20/14

Application Date:

Proposal Identification Number:

CUWCC Member? Yes/No: No

Applicant Name: City of Sunnyvale

Is the UWM Plan Deemed Complete by DWR? Yes/No: Yes

Project Title:

Applicant's Contact Information: Name: Mansour Nasser

Participants:	Retailer (List Below)		
	City of Sunnyvale		

C1	C2	C3	C4	C5	*C6	C7	C8	**C9	**C10	**C11	C12			C13	C14	C15	C16	C17	C18	C19
				BMP Implemented by Retailers and/or Wholesalers				Compliance Options / Alternative Conservation Approaches (1)			BMP is Exempt (2)			Implementation Scheduled to Commence within 1st Year of Agreement						
CUWCC 2010 Flex Track BMPs	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer Yes/No	Wholesaler Yes/No	Regional Yes/No	Alternative Conservation Approaches Yes/No	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	Start Date (MM/YR)	Completion Level (%)	BMP Completion Date (MM/YR)	Budget (Dollars)	Funding Source & Finance Plan to Implement BMPs	Meets CUWCC Coverage Yes/No	Funds Requested, if Available. (See AB 1420 Compliance Table 3) Yes/No
	1. Utility Operations Programs																			
1.11	✓	✓	BMP 12 Conservation Coordinator																	
1.12		✓	BMP 13 Water Waste Prohibitions																	
1.13	✓	✓	BMP 10 Wholesale Agency Assistance Programs																	
1.20	✓	✓	BMP 3 System Water Audits, Leak Detection/Repair	Yes						X				1/1/2015	0%	Ongoing	$11,000	SEE NOTE 3	Yes	No
1.30		✓	BMP 4 Metering with Commodity Rates for All New/Retrofit of Existing connections																	
1.40		✓	BMP 11 Conservation Pricing																	
	2. Educational Programs																			
2.10	✓	✓	BMP 7 Public Information																	
2.20	✓	✓	BMP 8 School Education																	
	3. Residential																			
3.11		✓	BMP 1 Indoor Water Survey for Single/Multi-Family Residential Customers																	
3.12			BMP 1 Outdoor Water Survey for Single/Multi-Family Residential Customers																	
3.20		✓	BMP 2 Residential Plumbing Retrofit																	
3.30		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs																	

CUWCC 2010 Flex Track BMPs	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	BMP Implemented by Retailers and/or Wholesalers				Compliance Options / Alternative Conservation Approaches (1)			BMP is Exempt (2)			Implementation Scheduled to Commence within 1st Year of Agreement						
				Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	Alternative Conservation Approaches Yes/No	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	Start Date (MM/YR)	Completion Level (%)	BMP Completion Date (MM/YR)	Budget (Dollars)	Funding Source & Finance Plan to Implement BMPs	Meets CUWCC Coverage Yes/No	Funds Requested, if Available. (See AB 1420 Compliance Table 3) Yes/No
3.30		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs																	
3.40		✓	BMP 14 Residential ULFT Replacement Programs																	
4. Commercial, Industrial, Institutional																				
4.00		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts																	
5. Landscape																				
5.00		✓	BMP 5 Large Landscape Conservation Programs and Incentives																	

*C6: Wholesaler may also be a retailer (supplying water to end water users)
**C9, ** C10, and **C11: Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.
(1) For details, please see http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, or lack of legal authority, as detailed in the CUWCC MOU.
(3) City Budget Project ID 824281: Leak Detection and Condition Assessment Program

Contra Costa Water District

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1, and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory for Jerry Brown Title of Signatory General Manager Signature of Signatory [signature] Date June 9, 2014

Application Date:

Proposal Identification Number: CUWCC Member? Yes/No Yes

Has Urban Water Supplier submitted a 2010 Urban Water Management Plan? Yes/No Yes Is the UWM Plan Deemed Complete by DWR? Yes/No Yes

Applicant Name: Contra Costa Water District

Project Title:

Applicant's Contact Information: Name: Chris Dundon Phone: (925) 688-8136 E-mail: cdundon@ccwater.com

Participants:

Retailer (List Below)	*Wholesaler (List Below)*

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2011-2012) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers	Yes			✓						Yes		8/22/2013		Yes
	✓	BMP 2 Residential Plumbing Retrofit	Yes			✓						Yes		8/22/2013		Yes
✓	✓	BMP 3 System Water Audits, Leak Detection	Yes	Yes		✓						Yes	Yes	8/22/2013		Yes
✓	✓	BMP 3 Leak Repairs	Yes	Yes		✓						Yes	Yes	8/22/2013		Yes
	✓	BMP 4 Metering with Commodity Rates for All New connections	Yes			✓						Yes		8/22/2013		Yes
	✓	BMP 4 Retrofit of Existing Connections	Yes			✓						Yes		8/22/2013		Yes

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1, and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory for Jerry Brown Title of Signatory General Manager Signature of Signatory [signature] Date June 9, 2014

Application Date:

Proposal Identification Number: CUWCC Member? Yes/No Yes

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Applicant Name: Contra Costa Water District

Project Title:

Applicant's Contact Information: Name: Chris Dundon Phone: (925) 688-8136 E-mail: cdundon@ccwater.com

Participants:

Retailer (List Below)	*Wholesaler (List Below)*

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2011-2012) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers	Yes			✓						Yes		8/22/2013		Yes
	✓	BMP 2 Residential Plumbing Retrofit	Yes			✓						Yes		8/22/2013		Yes
✓	✓	BMP 3 System Water Audits, Leak Detection	Yes	Yes		✓						Yes	Yes	8/22/2013		Yes
✓	✓	BMP 3 Leak Repairs	Yes	Yes		✓						Yes	Yes	8/22/2013		Yes
	✓	BMP 4 Metering with Commodity Rates for All New connections	Yes			✓						Yes		8/22/2013		Yes
	✓	BMP 4 Retrofit of Existing Connections	Yes			✓						Yes		8/22/2013		Yes

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2011-2012) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
		✓	BMP 5 Large Landscape Conservation Programs and incentives	Yes			✓						Yes		8/22/2013		Yes
		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Yes			✓						Yes		8/22/2013		Yes
	✓	✓	BMP 7 Public Information	Yes	Yes		✓						Yes	Yes	8/22/2013		Yes
	✓	✓	BMP 8 School Education	Yes	Yes		✓						Yes	Yes	8/22/2013		Yes
		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Yes			✓						Yes		8/22/2013		Yes
	✓		BMP 10 Wholesale Agency Assistance Programs		Yes		✓							Yes	8/22/2013		Yes
		✓	BMP 11 Conservation Pricing	Yes			✓						Yes		8/22/2013		Yes
	✓	✓	BMP 12 Conservation Coordinator	Yes	Yes		✓						Yes	Yes	8/22/2013		Yes
		✓	BMP 13 Water Waste Prohibitions	Yes			✓						Yes		8/22/2013		Yes
		✓	BMP 14 Residential ULFT Replacement Programs	Yes			✓						Yes		8/22/2013		Yes

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2011-2012) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
		✓	BMP 5 Large Landscape Conservation Programs and incentives	Yes			✓						Yes		8/22/2013		Yes
		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Yes			✓						Yes		8/22/2013		Yes
	✓	✓	BMP 7 Public Information	Yes	Yes		✓						Yes	Yes	8/22/2013		Yes
	✓	✓	BMP 8 School Education	Yes	Yes		✓						Yes	Yes	8/22/2013		Yes
		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Yes			✓						Yes		8/22/2013		Yes
	✓		BMP 10 Wholesale Agency Assistance Programs		Yes		✓							Yes	8/22/2013		Yes
		✓	BMP 11 Conservation Pricing	Yes			✓						Yes		8/22/2013		Yes
	✓	✓	BMP 12 Conservation Coordinator	Yes	Yes		✓						Yes	Yes	8/22/2013		Yes
		✓	BMP 13 Water Waste Prohibitions	Yes			✓						Yes		8/22/2013		Yes
		✓	BMP 14 Residential ULFT Replacement Programs	Yes			✓						Yes		8/22/2013		Yes

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

October 27, 2011

RECEIVED
NOV 03 2011
Contra Costa Water District
Planning Dept.

Mr. Jeff Quimby
Contra Costa Water District
1331 Concord Avenue
Concord, California 94524

Dear Mr. Quimby:

The Department of Water Resources (DWR) has reviewed the Contra Costa Water District's (CCWD) 2010 Urban Water Management Plan (UWMP) received on July 5, 2011. The California Water Code (CWC) directs DWR to report to the legislature once every five years on the status of submitted plans. In meeting this legislative reporting requirement, DWR reviews all submitted plans.

DWR's review of the CCWD's 2010 plan has found that the plan has addressed the requirements of the CWC. DWR's review of plans is limited to assessing whether suppliers have addressed the required legislative elements. In its review, DWR does not evaluate or analyze the supplier's UWMP data, projections, or water management strategies. This letter is simply meant to acknowledge that the CCWD has addressed these requirements. The results of the review will also be provided to DWR's Financial Assistance Branch.

If you have any questions regarding the review of the plan or urban water management planning please don't hesitate to email or call.

Sincerely,

Peter Brostrom
UWMP Program Manager
brostrom@water.ca.gov
(916) 651-7034

cc: Kim Rosmaier
DWR North Central Regional Office

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR
COMPLIANCE WITH WATER METERING REQUIREMENTS
FOR FUNDING APPLICATIONS

Funding Agency name: Department of Water Resources

Funding Program name: Proposition 84 IRWM Grant Program, Round 3

Applicant (Agency name): Contra Costa Water District

Project Title (as shown on application form): Bay Area Regional Water Conservation Program

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

X As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

for Jerry Brown
Name of Authorized Representative
(Please print)

Signature

General Manager
Title

June 9, 2014
Date

Dublin San Ramon Services District (DSRSD)

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

September 29, 2011

DSRSD SEP30'11PM 1:25

Ms. Rhodora Biagtan, P.E.
Dublin San Ramon Services District
7051 Dublin Boulevard
Dublin, California 94568

Dear Ms. Biagtan:

The Department of Water Resources (DWR) has reviewed the Dublin San Ramon Services District's (DSRSD) 2010 Urban Water Management Plan received on July 1, 2011. The UWMP Act directs DWR to report to the legislature once every five years on the status of submitted plans. In meeting this legislative reporting requirement, DWR reviews all submitted plans.

DWR's review of DSRSD's 2010 plan has found that the plan has addressed the requirements of the UWMP Act and SBX7-7. The results of this review will also be provided to DWR's Financial Assistance Branch.

If you have any questions regarding the review of the plan, SBX7-7, or urban management planning, please don't hesitate to email or call.

Sincerely,

Peter Brostrom
UWMP Program Manager
brostrom@water.ca.gov
(916) 651-7034

cc: Martin Berbach
DWR's North Central Regional Office

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR COMPLIANCE WITH WATER METERING REQUIREMENTS FOR FUNDING APPLICATIONS

Funding Agency name: California Department of Water Resources

Funding Program name: Prop 84 Implementation Grant (2014 IRWM Drought Grant)

Applicant (Agency name): Association of Bay Area Governments

Project Title (as shown on application form):

DERWA Phase 3 Recycled Water Expansion

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

☒ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Rhodora N. Biagtan
Name of Authorized Representative
(Please print)

Rhodora N. Biagtan
Signature

Engineering Services Manager/District Engineer
Title

6/23/14
Date

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1, and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory: Rhodora Biagtan Title of Signatory: Engineering Services Manager/District Engineer Signature of signatory: Rhodora N. Biagtan Date 6/23/14

Application Date:

Proposal Identification Number: CUWCC Member? Yes/No: Yes

Has Urban Water Supplier submitted a 2005 Urban Water Management Plan? Yes/No: Yes

Is the UWM Plan Deemed Complete by DWR? Yes/No: Yes

Applicant Name: Dublin San Ramon Services District

Project Title: DERWA Phase 3 Recycled Water Expansion

Applicant's Contact Information: Name: Rhodora N. Biagtan Phone: 925-875-2255 E-mail: biagtan@dsrsd.com

Participants:

Retailer (List Below)	*Wholesaler (List Below)*
Dublin San Ramon Services District	*Zone 7 Water Agency*

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs		Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers		Yes				X					No		5/27/2009		Yes
	✓	BMP 2 Residential Plumbing Retrofit		Yes				X					No		5/27/2009		Yes
✓	✓	BMP 3 System Water Audits, Leak Detection		Yes			X						Yes		5/27/2009		Yes
✓	✓	BMP 3 Leak Repairs		Yes			X						Yes		5/27/2009		Yes
	✓	BMP 4 Metering with Commodity Rates for All New connections		Yes			X						Yes		5/27/2009		Yes
	✓	BMP 4 Retrofit of Existing Connections		Yes			X						Yes		5/27/2009		Yes

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
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	✓	BMP 5 Large Landscape Conservation Programs and Incentives	Yes			X						Yes		5/27/2009		Yes
	✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Yes			X						Yes		5/27/2009		Yes
✓	✓	BMP 7 Public Information	Yes			X						Yes		5/27/2009		Yes
✓	✓	BMP 8 School Education	Yes			X						Yes		5/27/2009		Yes
	✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Yes				X					No		5/27/2009		Yes
✓	✓	BMP 10 Wholesale Agency Assistance Programs		Yes								No		5/27/2009		Yes
	✓	BMP 11 Conservation Pricing	Yes			X						Yes		5/27/2009		Yes
✓	✓	BMP 12 Conservation Coordinator	Yes			X						Yes		5/27/2009		Yes
	✓	BMP 13 Water Waste Prohibitions	Yes			X						Yes		5/27/2009		Yes
	✓	BMP 14 Residential ULFT Replacement Programs	Yes			X						Yes		5/27/2009		Yes

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

AB 1420 Self- Certification Statement Table 2

Provide Schedule, Budget, and Finance Plan to Demonstrate Commitment to Implement All BMP's to Become in Compliance with BMP Implementation - Commencing Within 1st Year of Agreement for Which Applicant Receives Funds.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1 and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1 and Table 2, and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory: Rhodora N. Biagtan Title of Signatory: Engineering Services Manager/District Engineer Signature of signatory Rhodora N. Biagtan Date 6/23/14

Application Date:

Proposal Identification Number:

CUWCC Member? Yes/No Yes

Applicant Name: Dublin San Ramon Services District

Is the UWM Plan Deemed Complete by DWR? Yes/No Yes

Project Title: DERWA Phase 3 Recycled Water Expansion

Applicant's Contact Information: Name Rhodora N. Biagtan

Participants:	Retailer (List Below)		
	Dublin San Ramon Services District		

C1	C2	C3	C4	C5	*C6	C7	C8	**C9	**C10	**C11	C12			C13	C14	C15	C16	C17	C18	C19
				BMP Implemented by Retailers and/or Wholesalers				Compliance Options / Alternative Conservation Approaches (1)			BMP is Exempt (2)			Implementation Scheduled to Commence within 1st Year of Agreement						
CUWCC 2010 Flex Track BMPs	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer Yes/No	Wholesaler Yes/No	Regional Yes/No	Alternative Conservation Approaches Yes/No	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	Start Date (MM/YR)	Completion Level (%)	BMP Completion Date (MM/YR)	Budget (Dollars)	Funding Source & Finance Plan to Implement BMPs	Meets CUWCC Coverage Yes/No	Funds Requested, if Available. (See AB 1420 Compliance Table 3) Yes/No
1. Utility Operations Programs																				
1.11	✓	✓	BMP 12 Conservation Coordinator	Yes					X	X				on-going		on-going				
1.12		✓	BMP 13 Water Waste Prohibitions	Yes					X	X				on-going		on-going				
1.13	✓	✓	BMP 10 Wholesale Agency Assistance Programs	Yes					X	X				on-going		on-going				
1.20	✓	✓	BMP 3 System Water Audits, Leak Detection/Repair	Yes					X	X				on-going		on-going				
1.30		✓	BMP 4 Metering with Commodity Rates for All New/Retrofit of Existing connections	Yes					X	X				on-going		on-going				
1.40		✓	BMP 11 Conservation Pricing	Yes					X	X				on-going		on-going				
2. Educational Programs																				
2.10	✓	✓	BMP 7 Public Information	Yes					X	X				on-going		on-going				
2.20	✓	✓	BMP 8 School Education	Yes					X	X				on-going		on-going				
3. Residential																				
3.11		✓	BMP 1 Indoor Water Survey for Single/Multi-Family Residential Customers	Yes					X	X				on-going and as requested		on-going and as requested				
3.12		✓	BMP 1 Outdoor Water Survey for Single/Multi-Family Residential Customers	Yes					X	X				on-going and as requested		on-going and as requested				
3.20		✓	BMP 2 Residential Plumbing Retrofit	Yes					X	X				on-going and as requested		on-going and as requested				
3.30		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Yes					X	X				on-going and as requested		on-going and as requested				

CUWCC 2010 Flex Track BMPs	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	BMP Implemented by Retailers and/or Wholesalers				Compliance Options / Alternative Conservation Approaches (1)			BMP is Exempt (2)			Implementation Scheduled to Commence within 1st Year of Agreement						
				Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	Alternative Conservation Approaches Yes/No	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	Start Date (MM/YR)	Completion Level (%)	BMP Completion Date (MM/YR)	Budget (Dollars)	Funding Source & Finance Plan to Implement BMPs	Meets CUWCC Coverage Yes/No	Funds Requested, if Available. (See AB 1420 Compliance Table 3) Yes/No
3.40		✓	BMP 14 Residential ULFT Replacement Programs	Yes					X	X				on-going and as requested		on-going and as requested				
4. Commercial, Industrial, Institutional																				
4.00		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Yes					X	X				on-going		on-going				
5. Landscape																				
5.00		✓	BMP 5 Large Landscape Conservation Programs and Incentives	Yes			Yes		X	X				on-going		on-going				

*C6: Wholesaler may also be a retailer (supplying water to end water users)
**C9, ** C10, and **C11: Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.
(1) For details, please see http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, or lack of legal authority, as detailed in the CUWCC MOU.

East Bay Municipal Utility District (EBMUD)

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., Governor

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

RECEIVED
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WATER RESOURCES PLANNING DIV.

R.M.

Richard Sykes
Lena Tam
Karen Donovan
Emilia Wisniewski
Joe Tam
Mike Tognolini
Linda Hu
Bill Kirkpatrick
Bill Maggiore
Richard Harris

772.13.01
DOX
DOUG WALLACE

November 30, 2011

Ms. Priyanka Jain
East Bay Municipal Utilities District
375 Eleventh Street
Oakland, California 94607-4240

Dear Ms. Jain:

The Department of Water Resources (DWR) has reviewed the East Bay Municipal Utilities District's (EBMUD) 2010 Urban Water Management Plan (UWMP) received on August 27, 2011. The California Water Code (CWC) directs DWR to report to the legislature once every five years on the status of submitted plans. In meeting this legislative reporting requirement, DWR reviews all submitted plans.

DWR's review of the EBMUD's 2010 plan has found that the plan has addressed the requirements of the CWC. DWR's review of plans is limited to assessing whether suppliers have addressed the required legislative elements. In its review, DWR does not evaluate or analyze the supplier's UWMP data, projections, or water management strategies. This letter simply acknowledges that the EBMUD's UWMP has addressed these requirements. The results of the review will also be provided to DWR's Financial Assistance Branch.

If you have any questions regarding the review of the plan or urban water management planning please don't hesitate to email or call.

Sincerely,

Peter Brostrom
UWMP Program Manager
brostrom@water.ca.gov
(916) 651-7034

cc: Kim Rosmaier
DWR North Central Regional Office

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR
COMPLIANCE WITH WATER METERING REQUIREMENTS
FOR FUNDING APPLICATIONS

Funding Agency name: Department of Water Resources

Funding Program name: 2014 IRWM Drought Solicitation (Prop 84 Grant Program)

Applicant (Agency name): East Bay Municipal Utility District

Project Title (as shown on application form): DERWA Phase 3 Recycled Water Expansion

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

X As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Sherri A. Hong
Name of Authorized Representative
(Please print)

Sherri A. Hong
Signature

Manager of Customer and Community Services
Title

6/26/14
Date

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1, and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory Richard W. Harris Title of Signatory Manager of Water Conservation Signature of signatory [signature] Date 6/25/14

Application Date:

Proposal Identification Number: NA CUWCC Member? Yes/No Yes

Has Urban Water Supplier submitted a 2010 Urban Water Management Plan? Yes/No Yes Is the UWM Plan Deemed Complete by DWR? Yes/No Yes

Applicant Name: East Bay Municipal Utility District

Project Title: DERWA Phase 3 Recycled Water Expansion

Applicant's Contact Information: Name: Linda Hu Phone: 510-287-1691 E-mail: lhu@ebmud.com

Participants:

Retailer (List Below)	*Wholesaler (List Below)*
East Bay Municipal Utility District	

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers	Y			✓	✓						August-12			Y
	✓	BMP 2 Residential Plumbing Retrofit	Y			✓							August-12			Y
✓	✓	BMP 3 System Water Audits, Leak Detection	Y			✓							August-12			Y
✓	✓	BMP 3 Leak Repairs	Y			✓							August-12			Y
	✓	BMP 4 Metering with Commodity Rates for All New connections	Y			✓							August-12			Y
	✓	BMP 4 Retrofit of Existing Connections	Y			✓							August-12			Y

CUWCC 2010 Flex Track BMPs	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	BMP Implemented by Retailers and/or Wholesalers				Compliance Options / Alternative Conservation Approaches (1)			BMP is Exempt (2)			Implementation Scheduled to Commence within 1st Year of Agreement						
				Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	Alternative Conservation Approaches Yes/No	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	Start Date (MM/YR)	Completion Level (%)	BMP Completion Date (MM/YR)	Budget (Dollars)	Funding Source & Finance Plan to Implement BMPs	Meets CUWCC Coverage Yes/No	Funds Requested, if Available. (See AB 1420 Compliance Table 3) Yes/No
3.30		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Y				✓						Jan-94	100	Dec-10			Y	
3.40		✓	BMP 14 Residential ULFT Replacement Programs	Y				✓						Jan-96	80	Dec-15			Y	
4. Commercial, Industrial, Institutional																				
4.00		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Y				✓						Jan-93	100	Dec-10	$3M - $5M annual budget	* See above	Y	
5. Landscape															**80**					
5.00		✓	BMP 5 Large Landscape Conservation Programs and Incentives	Y				✓						Jan-93		Dec-15	$3M - $5M annual budget	* See above	Y	

*C6: Wholesaler may also be a retailer (supplying water to end water users)
**C9, ** C10, and **C11: Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.
(1) For details, please see http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, or lack of legal authority, as detailed in the CUWCC MOU.

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			**Compliance Options/Alternative Conservation Approaches (1)**			**BMP Is Exempt (2)**			**BMP Implementation Requirements Met**				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 5 Large Landscape Conservation Programs and Incentives	Y			✓							August-12			Y
	✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Y			✓							August-12			Y
✓	✓	BMP 7 Public Information	Y			✓							August-12			Y
✓	✓	BMP 8 School Education	Y			✓							August-12			Y
	✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Y			✓							August-12			Y
✓		BMP 10 Wholesale Agency Assistance Programs	Y			✓							August-12			Y
	✓	BMP 11 Conservation Pricing	Y			✓							August-12			Y
✓	✓	BMP 12 Conservation Coordinator	Y			✓							August-12			Y
	✓	BMP 13 Water Waste Prohibitions	Y			✓							August-12			Y
	✓	BMP 14 Residential ULFT Replacement Programs	Y			✓	✓						August-12			Y

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

AB 1420 Self- Certification Statement Table 2

Provide Schedule, Budget, and Finance Plan to Demonstrate Commitment to Implement All BMP's to Become in Compliance with BMP Implementation - Commencing Within 1st Year of Agreement for Which Applicant Receives Funds.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1 and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1 and Table 2, and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory Richard W. Harris Title of Signatory Manager of Water Conservation Signature of signatory [signature] Date 6/25/14

Application Date:

Proposal Identification Number: NA

CUWCC Member? Yes/No: Yes

Applicant Name: East Bay Municipal Utility District

Is the UWM Plan Deemed Complete by DWR? Yes/No: Yes

Project Title: DERWA Phase 3 Recycled Water Expansion

Applicant's Contact Information: Name Linda Hu

	Retailer (List Below)		
Participants:	East Bay Municipal Utility District		

C1	C2	C3	C4	C5	*C6	C7	C8	**C9	**C10	**C11	C12			C13	C14	C15	C16	C17	C18	C19
				BMP Implemented by Retailers and/or Wholesalers				Compliance Options / Alternative Conservation Approaches (1)			BMP is Exempt (2)			Implementation Scheduled to Commence within 1st Year of Agreement						
CUWCC 2010 Flex Track BMPs	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer Yes/No	Wholesaler Yes/No	Regional Yes/No	Alternative Conservation Approaches Yes/No	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	Start Date (MM/YR)	Completion Level (%)	BMP Completion Date (MM/YR)	Budget (Dollars)	Funding Source & Finance Plan to Implement BMPs	Meets CUWCC Coverage Yes/No	Funds Requested, if Available. (See AB 1420 Compliance Table 3) Yes/No
1. Utility Operations Programs																				
1.11	✓	✓	BMP 12 Conservation Coordinator	Y				✓						Jan-93	100	Dec-10	$3M - $5M annual budget shared among all programs as demanc, actifity and coverage requirements warrants	Water System General Fund; Water Conservation Master Plan*; supplemental state and federal grants	Y	
1.12		✓	BMP 13 Water Waste Prohibitions	Y				✓						Jan-93	100	Dec-10			Y	
1.13	✓	✓	BMP 10 Wholesale Agency Assistance Programs					✓												
1.20	✓	✓	BMP 3 System Water Audits, Leak Detection/**Repair**	Y				✓						Jan-93	100	Dec-10			Y	
1.30		✓	BMP 4 Metering with Commodity Rates for All New/**Retrofit of Existing** connections	Y				✓						Jan-93	100	Dec-10			Y	
1.40		✓	BMP 11 Conservation Pricing	Y				✓						Jul-95	100	Dec-10			Y	
2. Educational Programs																				
2.10	✓	✓	BMP 7 Public Information	Y				✓						Juan-93	100	Dec-10	$3M - $5M annual budget	* See above	Y	
2.20	✓	✓	BMP 8 School Education	Y				✓						Juan-94	100	Dec-10			Y	
3. Residential																				
3.11		✓	BMP 1 **Indoor** Water Survey for Single/Multi-Family Residential Customers	Y				✓						Jan-93	80	Dec-15	$3M - $5M annual budget	* See Above	Y	
3.12			BMP 1 **Outdoor** Water Survey for Single/Multi-Family Residential Customers	Y				✓						Jan-93	80	Dec-15			Y	
3.20		✓	BMP 2 Residential Plumbing Retrofit	Y				✓						Jan-93	100	Dec-10			Y	

Marin Municipal Water District

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR
COMPLIANCE WITH WATER METERING REQUIREMENTS
FOR FUNDING APPLICATIONS

Funding Agency name: California Department of Water Resources

Funding Program name: Proposition 84 IRWM – Drought Round

Applicant (Agency name): Marin Municipal Water District

Project Title (as shown on application form):

MMWD WaterSMART Irrigation with AMI/AMR

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

☒ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Krishna Kumar
Name of Authorized Representative

Signature

General Manager
Title

06/16/2014
Date

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification StatementTable 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1,and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, theFunding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory: Krishna Kumar **Title of Signatory:** General Manager **Signature of Signatory:** [signature] **Date:** 06/16/2014

Application Date:

Proposal Identification Number: **CUWCC Member? Yes/No** Yes

Has Urban Water Supplier submitted a 2005 Urban Water Management Plan? Yes/No Yes **Is the UWM Plan Deemed Complete by DWR? Yes/No** Yes

Applicant Name: Marin Municipal Water District

Project Title: WATERSMART IRRIGATION WITH WATER METERS (AMI/AMR)

Applicant's Contact Information: **Name:** Daniel Carney **Phone:** 415-945-1522 **E-mail:** dcarney@marinwater.org

Participants:

Retailer (List Below)	*Wholesaler (List Below)*

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			**Compliance Options/Alternative Conservation Approaches (1)**			**BMP Is Exempt (2)**			**BMP Implementation Requirements Met**				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers	Yes					✓								
	✓	BMP 2 Residential Plumbing Retrofit	Yes					✓								
✓	✓	BMP 3 System Water Audits, Leak Detection	Yes					✓								
✓	✓	BMP 3 Leak Repairs	Yes					✓								
	✓	BMP 4 Metering with Commodity Rates for All New connections	Yes					✓								
	✓	BMP 4 Retrofit of Existing Connections	Yes					✓								

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 5 Large Landscape Conservation Programs and Incentives	Yes					✓								
	✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Yes					✓								
✓	✓	BMP 7 Public Information	Yes					✓								
✓	✓	BMP 8 School Education	Yes					✓								
	✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Yes					✓								
✓		BMP 10 Wholesale Agency Assistance Programs														
	✓	BMP 11 Conservation Pricing	Yes					✓								
✓	✓	BMP 12 Conservation Coordinator	Yes					✓								
	✓	BMP 13 Water Waste Prohibitions	Yes					✓								
	✓	BMP 14 Residential ULFT Replacement Programs	Yes					✓								

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

October 28, 2011

Mr. Jon LaHaye
Marin Municipal Water District
220 Nellen Avenue
Corte Madera, California 94925-1169

Dear Mr. LaHaye:

The Department of Water Resources (DWR) has reviewed the Marin Municipal Water District's (MMWD) 2010 Urban Water Management Plan (UWMP) received on August 5, 2011. The California Water Code (CWC) directs DWR to report to the legislature once every five years on the status of submitted plans. In meeting this legislative reporting requirement, DWR reviews all submitted plans.

DWR's review of MMWD's 2010 plan has found that the plan has addressed the requirements of the CWC. DWR's review of plans is limited to assessing whether suppliers have addressed the required legislative elements. In its review, DWR does not evaluate or analyze the supplier's UWMP data, projections, or water management strategies. This letter simply acknowledges that MMWD's UWMP has addressed these requirements. The results of the review will also be provided to DWR's Financial Assistance Branch.

If you have any questions regarding the review of the plan or urban water management planning please don't hesitate to email or call.

Sincerely,

Peter Brostrom
UWMP Program Manager
brostrom@water.ca.gov
(916) 651-7034

cc: Kim Rosmaier
DWR North Central Regional Office

Napa Sanitation District

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR
COMPLIANCE WITH WATER METERING REQUIREMENTS
FOR FUNDING APPLICATIONS

Funding Agency name: Department of Water Resources

Funding Program name: 2014 IRWM Drought Grant Implementation Round 3

Applicant (Agency name): Napa Sanitation District

Project Title (as shown on application form): Los Carneros Water District and Miliken-Sarco-Tulocay Recycled Water Pipelines

Please check one of the boxes below and sign and date this form.

[X] As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

[ ] As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Jeff Tucker
Name of Authorized Representative
(Please print)

Signature

Director of Administrative Services/Chief Financial Officer
Title

6/25/14
Date

San Francisco Public Utilities Commission

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1, and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory: Steven R. Ritchie Title of Signatory: SFPUC Assistant General Manager, Water Enterprise Signature of signatory _____ **Date** 7/3/14

Application Date:

Proposal Identification Number: [ ] **CUWCC Member? Yes/No** Yes

Has Urban Water Supplier submitted a 2010 Urban Water Management Plan? Yes/No Yes **Is the UWM Plan Deemed Complete by DWR? Yes/No** Yes

Applicant Name: San Francisco Estuary Project

Project Title: Bay Area Regional Conservation and Education Program and Regional Groundwater Storage and Recovery Project - Southwest Side Basin, North San Mateo County

Applicant's Contact Information: **Name:** Julie Ortiz, Water Conservation Manager **Phone:** 415 551-4539 **E-mail:** jnortiz@sfwater.org

Participants:

Retailer (List Below)	*Wholesaler (List Below)*
San Francisco Public Utilities Commission (retailer and wholesaler)	

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			**Compliance Options/Alternative Conservation Approaches (1)**			**BMP Is Exempt (2)**			**BMP Implementation Requirements Met**				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2011-2012) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers	Yes					√				Yes		December 17, 2013		Yes
	✓	BMP 2 Residential Plumbing Retrofit	Yes					√				Yes		December 17, 2013		Yes
✓	✓	BMP 3 System Water Audits, Leak Detection	Yes	Yes				√				Yes	Yes	December 17, 2013		Yes
✓	✓	BMP 3 Leak Repairs	Yes	Yes				√				Yes	Yes	December 17, 2013		Yes
	✓	BMP 4 Metering with Commodity Rates for All New connections	Yes					√				Yes		December 17, 2013		Yes
	✓	BMP 4 Retrofit of Existing Connections	Yes					√				Yes		December 17, 2013		Yes

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2011-2012) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
		✓	BMP 5 Large Landscape Conservation Programs and Incentives	Yes					√				Yes		December 17, 2013		Yes
		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Yes					√				Yes		December 17, 2013		Yes
✓		✓	BMP 7 Public Information	Yes	Yes				√				Yes	Yes	December 17, 2013		Yes
✓		✓	BMP 8 School Education	Yes	Yes				√				Yes	Yes	December 17, 2013		Yes
		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Yes					√				Yes		December 17, 2013		Yes
✓			BMP 10 Wholesale Agency Assistance Programs		Yes				√					Yes	December 17, 2013		Yes
		✓	BMP 11 Conservation Pricing	Yes					√				Yes		December 17, 2013		Yes
✓		✓	BMP 12 Conservation Coordinator	Yes					√				Yes		December 17, 2013		Yes
		✓	BMP 13 Water Waste Prohibitions	Yes					√				Yes		December 17, 2013		Yes
		✓	BMP 14 Residential ULFT Replacement Programs	Yes					√				Yes		December 17, 2013		Yes

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

October 27, 2011

Ms. Molly Petrick
San Francisco Public Utilities Commission
1155 Market Street, 11th Floor
San Francisco, California 94103

Dear Ms. Petrick:

The Department of Water Resources (DWR) has reviewed the San Francisco Public Utilities Commission's (SFPUC) 2010 Urban Water Management Plan (UWMP) received on June 22, 2011. The California Water Code (CWC) directs DWR to report to the legislature once every five years on the status of submitted plans. In meeting this legislative reporting requirement, DWR reviews all submitted plans.

DWR's review of the SFPUC's 2010 plan has found that the plan has addressed the requirements of the CWC. DWR's review of plans is limited to assessing whether suppliers have addressed the required legislative elements. In its review, DWR does not evaluate or analyze the supplier's UWMP data, projections, or water management strategies. This letter is simply meant to acknowledge that the SFPUC has addressed these requirements. The results of the review will also be provided to DWR's Financial Assistance Branch.

If you have any questions regarding the review of the plan or urban water management planning please don't hesitate to email or call.

Sincerely,

Peter Brostrom
UWMP Program Manager
brostrom@water.ca.gov
(916) 651-7034

cc: Kim Rosmaier
DWR North Central Regional Office

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR
COMPLIANCE WITH WATER METERING REQUIREMENTS
FOR FUNDING APPLICATIONS

Funding Agency name: California Department of Water Resources

Funding Program name: Proposition 84 IRWM Implementation Grant Program, Round 3

Applicant (Agency name): San Francisco Public Utilities Commission

Project Title (as shown on application form): 1) Lower Cherry Aqueduct Emergency Rehabilitation Project

2) Bay Area Regional Drought Relief and Water Conservation Project

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

X As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Steve Ritchie
Name of Authorized Representative
(Please print)

Signature

Assistant General Manager, Water Enterprise
Title

6/18/14
Date

San Mateo County Resource Conservation District

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR
COMPLIANCE WITH WATER METERING REQUIREMENTS
FOR FUNDING APPLICATIONS

Funding Agency name: California State Water Resources Control Board

Funding Program name: Integrated Regional Watershed Management Program

Applicant (Agency name): San Mateo County Resource Conservation District

Project Title (as shown on application form): Drought Relief for South Coast San Mateo County

Please check one of the boxes below and sign and date this form.

☒ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Kellyx Nelson
Name of Authorized Representative
(Please print)

Signature

Executive Director
Title

June 2, 2014
Date

Santa Clara Valley Water District

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

October 27, 2011

Mr. James O'Brien
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118

Dear Mr. O'Brien:

The Department of Water Resources (DWR) has reviewed the Santa Clara Valley Water District's (SCVWD) 2010 Urban Water Management Plan (UWMP) received on June 22, 2011. The California Water Code (CWC) directs DWR to report to the legislature once every five years on the status of submitted plans. In meeting this legislative reporting requirement, DWR reviews all submitted plans.

DWR's review of SCVWD's 2010 plan has found that the plan has addressed the requirements of the CWC. DWR's review of plans is limited to assessing whether suppliers have addressed the required legislative elements. In its review, DWR does not evaluate or analyze the supplier's UWMP data, projections, or water management strategies. This letter simply acknowledges that SCVWD's UWMP has addressed these requirements. The results of the review will also be provided to DWR's Financial Assistance Branch.

If you have any questions regarding the review of the plan or urban water management planning please don't hesitate to email or call.

Sincerely,

Peter Brostrom
UWMP Program Manager
brostrom@water.ca.gov
(916) 651-7034

cc: Kim Rosmaier
DWR North Central Regional Office

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR
COMPLIANCE WITH WATER METERING REQUIREMENTS
FOR FUNDING APPLICATIONS

Funding Agency name: California Department of Water Resources

Funding Program name: Integrated Regional Water Management

Applicant (Agency name): Santa Clara Valley Water District

Project Title (as shown on application form): Bay Area Drought Relief Program

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

☒ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Beau Goldie
Name of Authorized Representative
(Please print)

Signature

Chief Executive Officer
Title

6-11-14
Date

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1 is the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory: Beau Goldie **Title of Signatory:** Chief Executive Officer **Signature of signatory** [signature] **Date** 6-11-14

Application Date: July 18, 2014

Proposal Identification Number: **CUWCC Member? Yes/No** Yes

Has Urban Water Supplier submitted a 2005 Urban Water Management Plan? Yes/No Yes **Is the UWM Plan Deemed Complete by DWR? Yes/No** Yes

Urban Water Supplier has also submitted a 2010 Urban Water Management Plan that has been deemed complete by DWR.

Applicant Name: Association of Bay Area Governments

Project Title: Bay Area Drought Relief Program

Applicant's Contact Information: **Name:** Jerry De La Piedra **Phone:** 408-630-2257 **E-mail:** jdelapiedra@valleywater.org

Participants:

Retailer (List Below)	*Wholesaler (List Below)*
	Santa Clara Valley Water district

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			**Compliance Options/Alternative Conservation Approaches (1)**			**BMP Is Exempt (2)**			**BMP Implementation Requirements Met**				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers														
	✓	BMP 2 Residential Plumbing Retrofit														
✓	✓	BMP 3 System Water Audits, Leak Detection		Yes		Yes							Yes	8/24/2013		Yes
✓	✓	BMP 3 Leak Repairs		Yes		Yes							Yes	8/24/2013		Yes
	✓	BMP 4 Metering with Commodity Rates for All New connections														
	✓	BMP 4 Retrofit of Existing Connections														

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			**Compliance Options/Alternative Conservation Approaches (1)**			**BMP Is Exempt (2)**			**BMP Implementation Requirements Met**				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 5 Large Landscape Conservation Programs and Incentives														
	✓	BMP 6 High-Efficiency Washing Machine Rebate Programs														
✓	✓	BMP 7 Public Information		Yes		Yes							Yes	8/24/2013		Yes
✓	✓	BMP 8 School Education		Yes		Yes							Yes	8/24/2013		Yes
	✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts														
✓		BMP 10 Wholesale Agency Assistance Programs		Yes		Yes							Yes	8/24/2013		Yes
	✓	BMP 11 Conservation Pricing														
✓	✓	BMP 12 Conservation Coordinator		Yes		Yes							Yes	8/24/2013		Yes
	✓	BMP 13 Water Waste Prohibitions														
	✓	BMP 14 Residential ULFT Replacement Programs														

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

Solano County Water Agency

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

June 6, 2014

RECEIVED
JUN 20 2014
SOLANO COUNTY WATER AGENCY

Mr. David Okita
General Manager
Solano County Water Agency
810 Vaca Valley Parkway #203
Vacaville, California 95688

Dear Mr. Okita:

The Department of Water Resources (DWR) has reviewed the Solano County Water Agency's (Agency) 2010 Urban Water Management Plan (UWMP) received on July 21, 2011. The California Water Code (CWC) directs DWR to report to the legislature once every five years on the status of submitted plans. In meeting this legislative reporting requirement, DWR reviews all submitted plans.

DWR's review of Agency's 2010 Plan has found that the Plan has addressed the overall requirements of the CWC. DWR's review of plans is limited to assessing whether suppliers have addressed the required legislative elements. In its review, DWR does not evaluate or analyze the supplier's UWMP data, projections, or water management strategies. This letter simply acknowledges that the Agency's UWMP has addressed these requirements. The results of the review will also be provided to DWR's Financial Assistance Branch.

If you have any questions regarding the review of the plan or urban water planning, please don't hesitate to email or call.

Sincerely,

Peter Brostrom
UWMP Program Manager
Brostrom@water.ca.gov
(916) 651-7034

cc: Andrew Florendo
Sr. Water Resources Specialist
Solano County Water Agency

Kim Rosmaier
DWR North Central Regional Office

Gwen Huff
DWR Headquarters

Sonoma County Water Agency

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1, and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory Grant Davis Title of Signatory General Manger Signature of signatory Pamela Jeane for GD Date 6/17/14

Application Date:

Proposal Identification Number: CUWCC Member? Yes/No yes

Has Urban Water Supplier submitted a 2005 Urban Water Management Plan? Yes/No yes Is the UWM Plan Deemed Complete by DWR? Yes/No yes

Applicant Name:

Project Title:

Applicant's Contact Information: Name: Kevin Booker Phone: 707-547-1912 E-mail: kbooker@scwa.ca.gov

Participants:

Retailer (List Below)	*Wholesaler (List Below)*
	Sonoma County Water Agency

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
		✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers														
		✓	BMP 2 Residential Plumbing Retrofit														
	✓	✓	BMP 3 System Water Audits, Leak Detection		yes		x							no	1/9/2009		
	✓	✓	BMP 3 Leak Repairs		yes		x							yes	1/9/2009		
		✓	BMP 4 Metering with Commodity Rates for All New connections														
		✓	BMP 4 Retrofit of Existing Connections														
		✓	BMP 5 Large Landscape Conservation Programs and Incentives														
		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs														
	✓	✓	BMP 7 Public Information		yes		x							yes	1/9/2009		
	✓	✓	BMP 8 School Education		yes		x							yes	1/9/2009		
		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts														
	✓		BMP 10 Wholesale Agency Assistance Programs		yes		x							yes	1/9/2009		
		✓	BMP 11 Conservation Pricing														
	✓	✓	BMP 12 Conservation Coordinator		yes		x							yes	1/9/2009		
		✓	BMP 13 Water Waste Prohibitions														
		✓	BMP 14 Residential ULFT Replacement Programs														

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

AB 1420 Self- Certification Statement Table 2

Provide Schedule, Budget, and Finance Plan to Demonstrate Commitment to Implement All BMP's to Become in Compliance with BMP Implementation - Commencing Within 1st Year of Agreement for Which Applicant Receives Funds.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1 and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1 and Table 2, and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory Grant Davis Title of Signatory General Manager Signature of signatory Pamela Jensen for GD Date 6/17/14

Application Date:

Proposal Identification Number: CUWCC Member? Yes/No yes

Applicant Name: Sonoma County Water Agency Is the UWM Plan Deemed Complete by DWR? Yes/No yes

Project Title:

Applicant's Contact Information: Name Carrie Pollard

Retailer (List Below)		
Participants:		

C1	C2	C3	C4	C5	*C6	C7	C8	**C9	**C10	**C11	C12			C13	C14	C15	C16	C17	C18	C19
				BMP Implemented by Retailers and/or Wholesalers				Compliance Options / Alternative Conservation Approaches (1)			BMP is Exempt (2)			Implementation Scheduled to Commence within 1st Year of Agreement						
CUWCC 2010 Flex Track BMPs	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer Yes/No	Wholesaler Yes/No	Regional Yes/No	Alternative Conservation Approaches Yes/No	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	Start Date (MM/YR)	Completion Level (%)	BMP Completion Date (MM/YR)	Budget (Dollars)	Funding Source & Finance Plan to Implement BMPs	Meets CUWCC Coverage Yes/No	Funds Requested, if Available. (See AB 1420 Compliance Table 3) Yes/No
1. Utility Operations Programs																				
1.11	✓	✓	BMP 12 Conservation Coordinator		yes			x											yes	
1.12		✓	BMP 13 Water Waste Prohibitions																	
1.13	✓	✓	BMP 10 Wholesale Agency Assistance Programs		yes			x											yes	
1.20	✓	✓	BMP 3 System Water Audits, Leak Detection/**Repair**		yes			x											yes	
1.30		✓	BMP 4 Metering with Commodity Rates for All New/**Retrofit of Existing** connections																	
1.40		✓	BMP 11 Conservation Pricing																	
2. Educational Programs																				
2.10	✓	✓	BMP 7 Public Information		yes			x											yes	
2.20	✓	✓	BMP 8 School Education		yes			x											yes	
3. Residential																				
3.11		✓	BMP 1 **Indoor** Water Survey for Single/Multi-Family Residential Customers																	
3.12			BMP 1 **Outdoor** Water Survey for Single/Multi-Family Residential Customers																	
3.20		✓	BMP 2 Residential Plumbing Retrofit																	
3.30		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs																	
3.40		✓	BMP 14 Residential ULFT Replacement Programs																	
4. Commercial, Industrial, Institutional																				
4.00		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts																	
5. Landscape																				
5.00		✓	BMP 5 Large Landscape Conservation Programs and Incentives																	

*C6: Wholesaler may also be a retailer (supplying water to end water users)
**C9, ** C10, and **C11: Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.
(1) For details, please see http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, or lack of legal authority, as detailed in the CUWCC MOU.

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

September 28, 2011

Mr. George Lincoln
Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, California 95403

Dear Mr. Lincoln:

The Department of Water Resources (DWR) has reviewed the Sonoma County Water Agency's (SCWA) 2010 Urban Water Management Plan received on July 20, 2011. The UWMP Act directs DWR to report to the legislature once every five years on the status of submitted plans. In meeting this legislative reporting requirement, DWR reviews all submitted plans.

DWR's review of SCWA's 2010 plan has found that the plan has addressed the requirements of the UWMP Act and SBX7-7. The results of this review will also be provided to DWR's Financial Assistance Branch.

If you have any questions regarding the review of the plan, SBX7-7, or urban water management planning, please don't hesitate to email or call.

Sincerely,

Peter Brostrom
UWMP Program Manager
brostrom@water.ca.gov
(916) 651-7034

cc: Kim Rosmaier
North Central Regional Office

ORIGINAL DOCUMENT
SONOMA COUNTY WATER AGENCY

OCT - 3 2011

To: Lincoln

CF/40-0-1 Urban Water Management Plan - 2010

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR
COMPLIANCE WITH WATER METERING REQUIREMENTS
FOR FUNDING APPLICATIONS

Funding Agency name: Department of Water Resources

Funding Program name: Bay Area Drought Relief Program

Applicant (Agency name): Sonoma County Water Agency

Project Title (as shown on application form): _____

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

☒ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Grant Davis
Name of Authorized Representative
(Please print)

Pamela Jeane for GD
Signature

General Manager
Title

6/17/14
Date

Stinson Beach County Water District

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR COMPLIANCE WITH WATER METERING REQUIREMENTS FOR FUNDING APPLICATIONS

Funding Agency name: Department of Water Resources

Funding Program name: 2014 IRWMP Implementation Grant Program

Applicant (Agency name): Stinson Beach County Water District

Project Title (as shown on application form): Water Supply & Drought Preparedness Plan

Please check one of the boxes below and sign and date this form.

[X] As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

[ ] As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

EDWARD SCHMIDT
Name of Authorized Representative (Please print)

Edward Schmidt
Signature

General Manager
Title

June 9, 2014
Date

Zone 7 Water Agency

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1, and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory G.F. Duering **Title of Signatory** General Manager **Signature of signatory** _____ **Date** 06/05/2014

Application Date:

Proposal Identification Number: _____ **CUWCC Member? Yes/No** Yes

Has Urban Water Supplier submitted a 2010 Urban Water Management Plan? Yes/No Yes **2010** **Is the UWM Plan Deemed Complete by DWR? Yes/No** Yes

Applicant Name: Zone 7 Water Agency, Alameda Flood Control and Water Conservation

Project Title:

Applicant's Contact Information: **Name:** Robyn Navarra **Phone:** 925.454.5065 mavarra@zone7water.com

Participants:

Retailer (List Below)	*Wholesaler (List Below)*
	Zone 7 Water Agency

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs		Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2009-2010) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers			No		No							No			No
	✓	BMP 2 Residential Plumbing Retrofit			No		No							No			No
✓	✓	BMP 3 System Water Audits, Leak Detection			Yes		Yes							Yes	2012		Yes
✓	✓	BMP 3 Leak Repairs			Yes		Yes							Yes	2012		Yes
	✓	BMP 4 Metering with Commodity Rates for All New connections			No		No							No			No
	✓	BMP 4 Retrofit of Existing Connections			No		No							No			No
	✓	BMP 5 Large Landscape Conservation Programs and Incentives			Yes		Yes							Yes	2012		Yes

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
				BMP Implemented by Retailers and/or Wholesalers / *BMP*			Compliance Options/Alternative Conservation Approaches (1)			BMP Is Exempt (2)			BMP Implementation Requirements Met				
	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2009-2010) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs		Yes		No							Yes	2012		Yes
✓		✓	BMP 7 Public Information		Yes		Yes							Yes	2012		Yes
✓		✓	BMP 8 School Education		Yes		Yes							Yes	2012		Yes
		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts		Yes		No							Yes	2012		Yes
✓			BMP 10 Wholesale Agency Assistance Programs		Yes		Yes							Yes	2012		Yes
		✓	BMP 11 Conservation Pricing		No		No							No			No
✓		✓	BMP 12 Conservation Coordinator		Yes		Yes							Yes	2012		Yes
		✓	BMP 13 Water Waste Prohibitions		No		No							Yes	2012		Yes
		✓	BMP 14 Residential ULFT Replacement Programs		Yes		Yes							Yes	2012		Yes

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

AB 1420 Self- Certification Statement Table 2

Provide Schedule, Budget, and Finance Plan to Demonstrate Commitment to Implement All BMP's to Become in Compliance with BMP Implementation - Commencing Within 1st Year of Agreement for Which Applicant Receives Funds.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1 and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1 and Table 2, and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory G. F. Duerig Title of Signatory General Manager Signature of signatory Date 06/04/2014

Application Date:

Proposal Identification Number:

CUWCC Member? Yes/No Yes

Applicant Name: Zone 7 Water Agency

Is the UWM Plan Deemed Complete by DWR? Yes/No Yes

Project Title:

Applicant's Contact Information: Name Robyn Navarra 925.454.5065

	Retailer (List Below)		
Participants:	City of Pleasanton (not a signatory)	Zone 7 Water Ageny	
	City of Livermore		
	Dublin San Ramon Service District		
	California Water Service Company (Livermore)		

C1	C2	C3	C4	C5	*C6	C7	C8	**C9	**C10	**C11	C12			C13	C14	C15	C16	C17	C18	C19
				BMP Implemented by Retailers and/or Wholesalers				Compliance Options / Alternative Conservation Approaches (1)			BMP is Exempt (2)			Implementation Scheduled to Commence within 1st Year of Agreement						
CUWCC 2010 Flex Track BMPs	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer Yes/No	Wholesaler Yes/No	Regional Yes/No	Alternative Conservation Approaches Yes/No	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	Start Date (MM/YR)	Completion Level (%)	BMP Completion Date (MM/YR)	Budget (Dollars)	Funding Source & Finance Plan to Implement BMPs	Meets CUWCC Coverage Yes/No	Funds Requested, if Available. (See AB 1420 Compliance Table 3) Yes/No
1. Utility Operations Programs																				
1.11	✓	✓	BMP 12 Conservation Coordinator	Ye	Yes			Yes						1-Mar-14	100%	3/1/2014	150,000.00	Capital Improvemer	Yes	
1.12		✓	BMP 13 Water Waste Prohibitions	Yes				Yes						1-Mar-14	100%	3/1/2014		Capital Improvemer	Yes	
1.13	✓	✓	BMP 10 Wholesale Agency Assistance Programs	Yes	Yes			Yes						1-Mar-14	100%	3/1/2014	263,000.00	Capital Improvemer	Yes	
1.20	✓	✓	BMP 3 System Water Audits, Leak Detection/**Repair**	Yes	Yes			Yes						1-Mar-14	100%	3/1/2014		Capital Improvemer	Yes	
1.30		✓	BMP 4 Metering with Commodity Rates for All New/**Retrofit of Existing** connections		Yes			Yes						1-Mar-14	100%	3/1/2014		Capital Improvemer	Yes	
1.40		✓	BMP 11 Conservation Pricing		Yes			Yes						1-Mar-14	100%	3/1/2014		Capital Improvemer	Yes	
2. Educational Programs																				
2.10	✓	✓	BMP 7 Public Information	Yes	Yes			Yes						1-Mar-14	100%	3/1/2014	50,000	Capital Improvemer	Yes	
2.20	✓	✓	BMP 8 School Education	Yes	Yes			Yes						1-Mar-14	100%	3/1/2014	129,000.00	Capital Improvemer	Yes	
3. Residential																				
3.11		✓	BMP 1 **Indoor** Water Survey for Single/Multi-Family Residential Customers	Yes	No			Yes						1-Mar-14	100%	3/1/2014		Capital Improvemer	Yes	
3.12			BMP 1 **Outdoor** Water Survey for Single/Multi-Family Residential Customers	Yes	No			Yes						1-Mar-14	100%	3/1/2014		Capital Improvemer	Yes	
3.20		✓	BMP 2 Residential Plumbing Retrofit	Yes	Yes			Yes						1-Mar-14	100%	3/1/2014		Capital Improvemer	Yes	

CUWCC 2010 Flex Track BMPs	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	BMP Implemented by Retailers and/or Wholesalers				Compliance Options / Alternative Conservation Approaches (1)			BMP is Exempt (2)			Implementation Scheduled to Commence within 1st Year of Agreement						
				Retailer Yes/No	Wholesaler Yes/No	Regional Yes/No	Alternative Conservation Approaches Yes/No	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	Start Date (MM/YR)	Completion Level (%)	BMP Completion Date (MM/YR)	Budget (Dollars)	Funding Source & Finance Plan to Implement BMPs	Meets CUWCC Coverage Yes/No	Funds Requested, if Available. (See AB 1420 Compliance Table 3) Yes/No
3.30		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Yes	Yes			Yes						1-Mar-14	100%	3/1/2014	200,000.00	Capital Improvemer	Yes	
3.40		✓	BMP 14 Residential ULFT Replacement Programs	Yes	Yes			Yes						1-Mar-14	100%	3/1/2014	100,000.00	Capital Improvemer	Yes	
4. Commercial, Industrial, Institutional																				
4.00		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Yes	Yes			Yes						1-Mar-14	100%	3/1/2014	100,000.00	Capital Improvemer	Yes	
5. Landscape																				
5.00		✓	BMP 5 Large Landscape Conservation Programs and Incentives	Yes	Yes			Yes						1-Feb-11	100%	3/1/2014	58,000.00	Capital Improvemer	Yes	

*C6: Wholesaler may also be a retailer (supplying water to end water users)
**C9, ** C10, and **C11: Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.
(1) For details, please see http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, or lack of legal authority, as detailed in the CUWCC MOU.

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., Governor

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

RECEIVED

SEP 22 2011

September 19, 2011

G. F. Duerig
General Manager
Alameda County Flood Control and
Water Conservation District Zone 7
100 North Canyons Parkway
Livermore, California 94551-9486

Good day.

The Department of Water Resources (DWR) has reviewed the Alameda County Flood Control and Water Conservation District Zone 7 (Zone 7) 2010 Urban Water Management Plan (UWMP) received on December 24, 2010.

The UWMP Act directs DWR to report to the legislature once every five years on the status of submitted plans. In meeting this legislative reporting requirement, DWR reviews all submitted plans.

DWR's review of Zone 7's 2010 plan has found that the plan has addressed the requirements of the UWMP Act and SBX7-7. The results of this review will also be provided to DWR's Financial Assistance Branch.

If you have any questions regarding the review of the plan, SBX7-7 or urban water management planning, please don't hesitate to email or call.

Sincerely

Peter Brostrom
UWMP Program Manager
brostrom@water.ca.gov
(916) 651 7034

cc: Kim Rosmaier
North Central Regional Office

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR COMPLIANCE WITH WATER METERING REQUIREMENTS FOR FUNDING APPLICATIONS

Funding Agency name: Department of Water Resources

Funding Program name: Proposition 84 IRWM Grant Program, Round 3

Applicant (Agency name): Alameda County, Zone 7 Water Agency

Project Title (as shown on application form): Bay Area Regional Water Conservation Program

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

☒ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

G. F. Duerig
Name of Authorized Representative (Please print)

Signature

General Manager
Title

June 12, 2014
Date

Agricultural Water Management Compliance

None of the project proponents included in the Bay DRP Proposal qualify as agricultural water suppliers pursuant to CWC Section 10608.12. **Table 1-4** provides clarifying information submitted by the project proponents.

Table 1-4. Agricultural Water Suppliers Included in the Proposal

Agency Name	Agency Contact	DWR Verification of Agricultural Water Management Plan
Alameda County Water District*	Not Applicable	ACWD is not an agricultural water supplier.
City of Calistoga	Not Applicable	The City of Calistoga is not an agricultural water supplier.
City of Napa*	Not Applicable	The City of Napa is not an agricultural water supplier.
City of Sunnyvale	Not Applicable	The City of Sunnyvale is not an agricultural water supplier.
CCWD*	Not Applicable	CCWD is not an agricultural water supplier.
DSRSD	Not Applicable	DSRSD is not an agricultural water supplier.
EBMUD*	Not Applicable	EBMUD is not an agricultural water supplier.
MMWD*	Not Applicable	MMWD is not an agricultural water supplier.
Napa Sanitation District	Not Applicable	Napa Sanitation District is not an agricultural water supplier.
SFPUC*	Not Applicable	SFPUC is not an agricultural water supplier.
SCVWD*	Not Applicable	SCVWD provides water to less than 2,000 irrigation acres and therefore does not meet the definition of "agricultural water supplier" and is not required to prepare an AWMP.
Solano County Water Agency*	Not Applicable	Solano County Water Agency is not an agricultural water supplier.
Sonoma County Water Agency*	Not Applicable	Sonoma County Water Agency is not an agricultural water supplier.
Stinson Beach County Water District	Not Applicable	Stinson Beach CWD does not provide water to 10,000 or more irrigated acres and therefore is not an agricultural water supplier.
Zone 7 Water Agency*	Not Applicable	Zone 7 provides less than 8,000 AF of water for approximately 3,500 irrigated acres and therefore is not an agricultural water supplier.

**Indicates Participating Agency of the Bay Area Regional Drought Relief Conservation Program (Project 10)*

Surface Water Diverter Compliance

Table 1-5 lists project proponents that divert surface water supply and are subject to the State Water Resources Control Board's (SWRCB's) diversion reporting requirements per CWC Section 5100 and agency contact information. Surface Water Diverter compliance documentation from these agencies is included in the following pages. A text discussion of surface water diversion compliance is provided below Table 1-5.

Table 1-5. Surface Water Diverters Included in the Proposal

Agency Name	Agency Contact
Alameda County Water District*	Evan Buckland (510) 668-6539, evan.buckland@acwd.com
City of Calistoga	Michael Kirn (707) 942-2828, mkirn@ci.calistoga.ca.us
City of Napa*	Patrick Costello (707) 257-9309, pcostello@cityofnapa.org
CCWD*	Lucinda Shih (925) 688-8168, lshih@ccwater.com
EBMUD*	Lena L. Tam (510) 287-1240, ltam@ebmud.com
MMWD*	Krishna Kumar (415) 945-1460, kkumar@marinwater.org
SFPUC*	Ellen Levin (415) 934-5704, elevin@sfwater.org
SCVWD*	Aaron Baker (408) 630-2135, abaker@valleywater.org
Solano County Water Agency*	Andrew Florendo (707) 455-1111, aflorendo@scwa2.com
Sonoma County Water Agency*	Sherry Barbic (707) 521-1806, Sherry.Barbic@scwa.ca.gov
Stinson Beach County Water District	Ed Schmidt (415) 868-1333, ed@stinson-beach-cwd.dst.ca.us
Zone 7 Water Agency*	Sal Segura (925) 454-5068, ssegura@zone7water.com

**Indicates Participating Agency of the Bay Area Regional Drought Relief Conservation Program (Project 10)*

Compliance with California Water Code, Division 2, Part 5.1

Alameda County Water District – Alameda County Water District currently diverts surface water from Alameda Creek and Arroyo Valle and submits annual Progress Reports to the SWRCB under Permit Numbers 008428 and 011320, respectively.

City of Calistoga – The Calistoga Water District currently diverts surface water from Kimball Creek in northern Napa County for municipal use under License No. 009615 and License No. 009616. In accordance with the reporting requirements specified in California Code of Regulations Title 23, Section 847, the District files an annual Report of Licensee with the SWRCB. For water diverted and used in 2013, the District filed its annual report with the SWRCB in May 2014. As such, the District is in compliance with the SWRCB's reporting requirements through June 30, 2015, which is the next deadline for reporting amounts of surface water diverted and used in 2014.

City of Napa – The City of Napa diverts and stores surface water from Conn Creek in central Napa County for municipal use under Permit No. 006960 and filed a Request for License on December 28, 2007. The City of Napa also diverts and stores surface water from Milliken Creek near Napa for municipal purposes under Permit No. 018448 and License No. 005208. In accordance with the reporting requirements specified in California Code of Regulations, Title 23, Section 847, the City files annual Progress Reports by Permittee and Reports of Licensee with the SWRCB. For water diverted and used in 2013, the City filed all required reports on June 29, 2014. As such, the City is in compliance with the SWRCB's reporting requirements through June 30, 2015, which is the next deadline for reporting amounts of surface water diverted and used.

CCWD – CCWD diverts water under its own water rights permits and licenses, as well as under U.S. Bureau of Reclamation's (Reclamation's) Central Valley Project (CVP) water rights permits through CCWD's CVP contract. In accordance with the reporting requirements specified in California Water Code, Division 2, Part 5.1, Section 5100 *et seq*., CCWD files Progress Reports by Permittee and Reports of Licensee with the SWRCB annually for Permits 19856, 20749, and 20750 and Licenses 10514 and 11712. CCWD filed reports for water diverted in calendar year 2012 on June 20, 2013. As such, CCWD is in compliance with the SWRCB reporting requirements. Reports for calendar year 2013 have been submitted and were received by the SWRCB on June 24, 2014. Reclamation is responsible for submitting the reports for the CVP water rights.

EBMUD – EBMUD diverts surface water for various beneficial uses, including municipal and industrial, domestic, and hydropower generation. EBMUD's water rights are a combination of post-1914, pre-1914, and riparian rights from the Mokelumne River in Amador and Calaveras counties and from several small creeks in the east San Francisco Bay area. In accordance with the reporting requirements specified in California Water Code, Division 2, Part 5.1, Section 5100 *et seq*., EBMUD files its water rights reports for each of its licenses and permits every year, and files Supplemental Statements of Diversion and Use for the riparian and pre-1914 water rights every 3 years. As such, EBMUD is in compliance with the SWRCB's reporting requirements through June 30, 2015, which is the next deadline for reporting amounts of surface water diverted and used

MMWD – In accordance with the reporting requirements specified in California Water Code, Division 2, Part 5.1, Section 5100 *et seq*., MMWD files Supplemental Statements of Diversion and Use with the SWRCB on 3year intervals. For water diverted and used in 2009, 2010, and 2011, MMWD filed its 3-year Supplemental Statements in June 2012. The next deadline for reporting water diversions under MMWD's pre-1914 water rights claims is June 30, 2015. As such, MMWD is in compliance with the SWRCB's surface water diversion reporting requirements.

SFPUC – SFPUC submits Supplemental Statements of Water Diversion and Use in accordance with Section 5100 of the California Water Code. SFPUC is on a schedule of submitting Supplemental Statements every 3 years. The last submittals were in 2011, covering the period 2008-2010. SFPUC is preparing the next 3-year submittal now, to cover 2011-2013. SFPUC prepares and submits separate forms for each point of diversion, which includes all SFPUC reservoirs and also diversion dams. San Antonio Reservoir is an exception to this pattern; SFPUC submits a Report of Licensee annually for that facility, which contains similar information to that found on the Supplemental Statement reports. The difference in schedule is due to the later development of San Antonio Reservoir (post-1914 water rights reports are now due annually, as of 2010).

SCVWD – SCVWD currently diverts surface water and submits Progress Reports by Permittee and Reports of Licensee with the SWRCB from the following creeks in Santa Clara County under appropriative water rights claims: Almaden (Permits 004916 and 004920, Licenses 002205 and 002209), Calero (Permit 004919 and License 002208), Coyote (Permits 005061, 005062, 008494, 014704; Licenses 007211, 002210, 007212, 010607), Guadalupe (Permits 003009,

004917, 005428; Licenses 006943, 002206, 002837), Llagas (Permits 008488 and 012933, Licenses 006404 and 009829), Los Gatos (Permits 003010, 004921, 007689; Licenses 011791, 006944, 005729), Penitencia (Permit 006565), Stevens (Permit 004918, License 002207), and Uvas (Permit 010000, License 006422). SCVWD is in compliance with the SWRCB's surface water diversion reporting requirements; SCVWD filed diversion reports to the SWRCB on June 27, 2014.

Solano County Water Agency – Solano County Water Agency currently diverts surface water from Putah Creek and submits annual Progress Reports to the SWRCB under Permit Numbers 010657 and 010658. Solano County Water Agency submitted a Progress Report to the SWRCB on June 26, 2014, and is in compliance with the SWRCB's surface water diversion reporting requirements.

Sonoma County Water Agency – The Sonoma County Water Agency holds four water-right permits for the diversion and beneficial use of water in the Russian River system. Sonoma County Water Agency is exempt from filing requirements under California Water Code, Division 2, Part 5.1, Section 5100 *et seq*., because its diversion is a permitted appropriation. Sonoma County Water Agency submits annual reports to the SWRCB under its appropriative rights claims (CWC Division 2, Part 2, Section 5101) and is in compliance with CWC requirements.

Stinson Beach County Water District – Stinson Beach CWD currently diverts surface water from four small creeks in coastal Marin County for municipal use under pre-1914 appropriative water rights claims. In accordance with the reporting requirements specified in California Water Code, Division 2, Part 5.1, Section 5100 *et seq*., the District files Supplemental Statements of Diversion and Use with the SWRCB at 3-year intervals. For water diverted and used in 2009, 2010, and 2011, the District filed its 3-year Supplemental Statements with the SWRCB in June 2012. As such, Stinson Beach CWD is in compliance with the SWRCB's reporting requirements through June 30, 2015, which is the next deadline for reporting amounts of surface water diverted and used in 2012, 2013, and 2014.

Zone 7 Water Agency – Zone 7 currently diverts surface water from Arroyo Del Valle in Livermore and submits annual Progress Reports to the SWRCB under Permit No. 11319. Zone 7 submitted a Progress Report to the SWRCB on June 25, 2014, and is in compliance with the SWRCB's surface water diversion reporting requirements.

Alameda County Water District

e-WRIMS Water Right Search Results

Criteria: Displaying Water Rights where Holder Name like '*alameda county water district*'.

Search Results: previous 1-2 of 2 next

Appl ID	Permit ID	License ID	Water Right Type	Status	Holder Name	Date	Face Amt	County	Source	View Reports	Water Right	Map It	Export to Excel
A013279	008428		Appropriative	Permitted	ALAMEDA COUNTY WATER DISTRICT	08/05/1949	40000 acre-ft/yr	Alameda	ALAMEDA CREEK	View Reports	View Permit	Map It	Download to Excel
A017003	011320		Appropriative	Permitted	ALAMEDA COUNTY WATER DISTRICT	04/16/1956	60000 acre-ft/yr	Alameda	ARROYO VALLE	View Reports	View Permit	Map It	Download to Excel

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e-WRIMS RMS Reports

Restart Search

Reports Submitted for A013279

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/30/2014	View
2012	Progress Report by Permittee	06/26/2013	View
2011	Progress Report by Permittee	06/22/2012	View
2010	Progress Report by Permittee	06/27/2011	View

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e-WRIMS RMS Reports

Restart Search

Reports Submitted for A017003

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/30/2014	View
2012	Progress Report by Permittee	06/26/2013	View
2011	Progress Report by Permittee	06/22/2012	View
2010	Progress Report by Permittee	06/27/2011	View

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City of Calistoga

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

STATE WATER RESOURCES CONTROL BOARD

eWRIMS

Report Management System

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Filter: Show all reports

Note: You can print your report(s) using your browser print function after selecting "View" in the Action column below.

Page **1**

Water Right ID	Primary Owner	Face Value (acre-ft/yr)	County	Source	Type	Year / Revision	Status	Date Submitted	Action
A015874	CITY OF CALISTOGA	90.0	Napa	KIMBALL CREEK	Report of Licensee	2013 / 1	Submitted	05/28/2014	View Amend
A015874	CITY OF CALISTOGA	90.0	Napa	KIMBALL CREEK	Report of Licensee	2012 / 1	Submitted	05/01/2013	View Amend
A015874	CITY OF CALISTOGA	90.0	Napa	KIMBALL CREEK	Report of Licensee	2011 / 1	Submitted	03/09/2012	View Amend
A015874	CITY OF CALISTOGA	90.0	Napa	KIMBALL CREEK	Report of Licensee	2010 / 1	Submitted	05/24/2011	View Amend
A015874	CITY OF CALISTOGA	90.0	Napa	KIMBALL CREEK	Report of Licensee	2009 / 2	Submitted	03/09/2012	View Amend
A015874	CITY OF CALISTOGA	90.0	Napa	KIMBALL CREEK	Report of Licensee	2009 / 1	Submitted	05/24/2011	View
A015874	CITY OF CALISTOGA	90.0	Napa	KIMBALL CREEK	Report of Licensee	2008 / 1	Submitted	05/24/2011	View Amend

Add a Report for a Previous Year

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

STATE WATER RESOURCES CONTROL BOARD

eWRIMS

Report Management System

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Filter: Show all reports

Note: You can print your report(s) using your browser print function after selecting "View" in the Action column below.

Page **1**

Water Right ID	Primary Owner	Face Value (acre-ft/yr)	County	Source	Type	Year / Revision	Status	Date Submitted	Action
A009376	CITY OF CALISTOGA	606.0	Napa	KIMBALL CREEK	Report of Licensee	2013 / 1	Submitted	05/28/2014	View Amend
A009376	CITY OF CALISTOGA	606.0	Napa	KIMBALL CREEK	Report of Licensee	2012 / 2	Submitted	05/28/2014	View Amend
A009376	CITY OF CALISTOGA	606.0	Napa	KIMBALL CREEK	Report of Licensee	2012 / 1	Submitted	05/01/2013	View
A009376	CITY OF CALISTOGA	606.0	Napa	KIMBALL CREEK	Report of Licensee	2011 / 1	Submitted	03/09/2012	View Amend
A009376	CITY OF CALISTOGA	606.0	Napa	KIMBALL CREEK	Report of Licensee	2010 / 2	Submitted	03/09/2012	View Amend
A009376	CITY OF CALISTOGA	606.0	Napa	KIMBALL CREEK	Report of Licensee	2010 / 1	Submitted	05/24/2011	View
A009376	CITY OF CALISTOGA	606.0	Napa	KIMBALL CREEK	Report of Licensee	2009 / 2	Submitted	03/09/2012	View Amend
A009376	CITY OF CALISTOGA	606.0	Napa	KIMBALL CREEK	Report of Licensee	2009 / 1	Submitted	05/24/2011	View
A009376	CITY OF CALISTOGA	606.0	Napa	KIMBALL CREEK	Report of Licensee	2008 / 2	Submitted	03/09/2012	View Amend
A009376	CITY OF CALISTOGA	606.0	Napa	KIMBALL CREEK	Report of Licensee	2008 / 1	Submitted	05/24/2011	View

Add a Report for a Previous Year

City of Napa

e-WRIMS Water Right Search Results

Criteria: Displaying Water Rights where Holder Name like '*city of napa*'.

Search Results: previous 1-7 of 7 next

Appl ID	Permit ID	License ID	Water Right Type	Status	Holder Name	Date	Face Amt	County	Source	View Reports	Water Right	Map It	Export to Excel
A003172	001821	005208	Appropriative	Licensed	CITY OF NAPA	12/06/1922	2000 acre-ft/yr	Napa	MILLIKEN CREEK	View Reports	View License	Map It	Download to Excel
A010990	006960		Appropriative	Permitted	CITY OF NAPA	03/01/1945	43134.9 acre-ft/yr	Napa	CONN CREEK	View Reports	View Permit	Map It	Download to Excel
A025712	018448		Appropriative	Permitted	CITY OF NAPA	04/06/1978	2350 acre-ft/yr	Napa	MILLIKEN CREEK	View Reports	View Permit	Map It	Download to Excel
NJ000015			Non Jurisdictional	Active	CITY OF NAPA	06/28/2011	57 acre-ft/yr	Napa		View Reports	N/A	Map It	Download to Excel
NJ000016			Non Jurisdictional	Active	CITY OF NAPA	06/28/2011	23 acre-ft/yr			View Reports	N/A	Map It	Download to Excel
NJ000037			Non Jurisdictional	Active	CITY OF NAPA	10/28/2011	0 acre-ft/yr	Napa		View Reports	N/A	Map It	Download to Excel
NJ000038			Non Jurisdictional	Active	CITY OF NAPA	10/28/2011	0 acre-ft/yr			View Reports	N/A	Map It	Download to Excel

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Restart Search

Reports Submitted for A003172

Year	Type	Date Received	Action
2013	Report of Licensee	06/29/2014	View
2012	Report of Licensee	06/30/2013	View
2011	Report of Licensee	06/30/2012	View
2010	Report of Licensee	07/01/2011	View
2009	Report of Licensee	07/01/2011	View
2008	Report of Licensee	07/01/2011	View

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Restart Search

Reports Submitted for A010990

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/29/2014	View
2012	Progress Report by Permittee	06/30/2013	View
2011	Progress Report by Permittee	06/30/2012	View
2010	Progress Report by Permittee	07/01/2011	View

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Restart Search

Reports Submitted for A025712

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/29/2014	View
2012	Progress Report by Permittee	06/30/2013	View
2011	Progress Report by Permittee	06/30/2012	View
2010	Progress Report by Permittee	07/01/2011	View

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Contra Costa Water District

June 5, 2014

Statement of Compliance
State Water Resources Control Board Surface Water Diversion Reporting Requirements
Contra Costa Water District

Contra Costa Water District (CCWD) diverts water under its own water rights permits and licenses as well as under U.S. Bureau of Reclamation (Reclamation) Central Valley Project (CVP) water rights permits through CCWD's CVP contract. In accordance with the reporting requirements specified in the California Water Code, Division 2, Part 5.1, Section 5100 et seq., CCWD files Progress Reports by Permittee and Reports of Licensee with the State Water Resources Control Board (SWRCB) annually for Permits 19856, 20749, and 20750, and Licenses 10514 and 11712. CCWD filed reports for water diverted in calendar year 2012 on June 20, 2013. As such, CCWD is in compliance with the SWRCB reporting requirements. Reports for water diverted in calendar year 2013 are due June 30, 2014, and CCWD will be submitting those reports in a timely fashion. Reclamation is responsible for submitting the reports for the CVP water rights.

Contact information:
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Senior Water Resources Specialist
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lshih@ccwater.com

e-WRIMS Water Right Search Results

Criteria: Displaying Water Rights where Water Right Type = Appropriative; Holder Name like '*contra costa water district*'.

Search Results: previous 1-6 of 6 **next**

Appl ID	Permit ID	License ID	Water Right Type	Status	Holder Name	Date	Face Amt	County	Source	View Reports	Water Right	Map It	Export to Excel
A005941	003167	010514	Appropriative	Licensed	CONTRA COSTA WATER DISTRICT	06/13/1928	14880 acre-ft/yr	Contra Costa	MALLARD SLOUGH	View Reports	View License	Map It	Download to Excel
A020245	020749		Appropriative	Permitted	CONTRA COSTA WATER DISTRICT	06/05/1961	95850 acre-ft/yr	Contra Costa, San Joaquin	OLD RIVER, Victoria Canal	View Reports	View Permit	Map It	Download to Excel
A025516A	020750		Appropriative	Permitted	CONTRA COSTA WATER DISTRICT	09/30/1977	9640 acre-ft/yr	Contra Costa	KELLOGG CREEK	View Reports	View Permit	Map It	Download to Excel
A025829	017639	011712	Appropriative	Licensed	CONTRA COSTA WATER DISTRICT	09/21/1978	1.5 acre-ft/yr	Contra Costa	UNST	View Reports	View License	Map It	Download to Excel
A027893	019856		Appropriative	Permitted	CONTRA COSTA WATER DISTRICT	09/28/1983	11900 acre-ft/yr	Contra Costa	MALLARD SLOUGH	View Reports	View Permit	Map It	Download to Excel
A029322	020612	013587	Appropriative	Licensed	CONTRA COSTA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT	02/27/2004	0.3 acre-ft/yr	Contra Costa	UNST	View Reports	View License	Map It	Download to Excel

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Reports Submitted for A005941

Year	Type	Date Received	Action
2013	Report of Licensee	06/23/2014	View
2012	Report of Licensee	06/20/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View
2009	Report of Licensee	07/01/2011	View
2008	Report of Licensee	07/01/2011	View

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Reports Submitted for A020245

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/24/2014	View
2013	Progress Report by Permittee	06/23/2014	View
2012	Progress Report by Permittee	06/20/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	07/01/2011	View
2009	Progress Report by Permittee	05/26/2010	View

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Reports Submitted for A025516A

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/24/2014	View
2013	Progress Report by Permittee	06/23/2014	View
2012	Progress Report by Permittee	06/20/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	07/01/2011	View
2009	Progress Report by Permittee	05/26/2010	View

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Restart Search

Reports Submitted for A025829

Year	Type	Date Received	Action
2013	Report of Licensee	06/23/2014	View
2012	Report of Licensee	06/20/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View
2009	Report of Licensee	07/01/2011	View
2008	Report of Licensee	07/01/2011	View

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Reports Submitted for A027893

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/23/2014	View
2012	Progress Report by Permittee	06/20/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	07/01/2011	View
2009	Progress Report by Permittee	05/26/2010	View

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East Bay Municipal Utility District

e-WRIMS Water Right Search Results

Criteria: Displaying Water Rights where Holder Name like '*EAST BAY MUNICIPAL UTILITY DISTRICT*'.

Search Results: previous 1-15 of 15 next

Appl ID	Permit ID	License ID	Water Right Type	Status	Holder Name	Date	Face Amt	County	Source	View Reports	Water Right	Map It	Export to Excel
A000465	001329	001749	Appropriative	Licensed	EAST BAY MUNICIPAL UTILITY DISTRICT	09/18/1916	16880 acre-ft/yr	Contra Costa	SAN PABLO CREEK	View Reports	View License	Map It	Download to Excel
A002593	001256	000358	Appropriative	Licensed	EAST BAY MUNICIPAL UTILITY DISTRICT	10/17/1921	4691.4 acre-ft/yr	Contra Costa	UNST	View Reports	View License	Map It	Download to Excel
A004228	002459	011109	Appropriative	Licensed	EAST BAY MUNICIPAL UTILITY DISTRICT	09/22/1924	316250 acre-ft/yr	Amador	MOKELUMNE RIVER	View Reports	View License	Map It	Download to Excel
A004768	002529	001388	Appropriative	Licensed	EAST BAY MUNICIPAL UTILITY DISTRICT	09/11/1925	470456.6 acre-ft/yr	Amador	MOKELUMNE RIVER	View Reports	View License	Map It	Download to Excel
A005128	003587	006062	Appropriative	Licensed	EAST BAY MUNICIPAL UTILITY DISTRICT	07/27/1926	300193.6 acre-ft/yr	Amador	MOKELUMNE RIVER	View Reports	View License	Map It	Download to Excel
A006707	003607	001750	Appropriative	Licensed	EAST BAY MUNICIPAL UTILITY DISTRICT	06/21/1930	30407.1 acre-ft/yr	Alameda	SAN LEANDRO CREEK	View Reports	View License	Map It	Download to Excel
A013156	010478		Appropriative	Permitted	EAST BAY MUNICIPAL UTILITY DISTRICT	06/16/1949	434962.2 acre-ft/yr	Amador, San Joaquin	MOKELUMNE RIVER	View Reports	View Permit	Map It	Download to Excel
A015201	010479		Appropriative	Permitted	EAST BAY MUNICIPAL UTILITY DISTRICT	02/16/1953	303392.1 acre-ft/yr	Amador	MOKELUMNE RIVER	View Reports	View Permit	Map It	Download to Excel
A018672	012513	010797	Appropriative	Licensed	EAST BAY MUNICIPAL UTILITY DISTRICT	04/27/1959	30200 acre-ft/yr	Contra Costa	BEAR CREEK, SAN PABLO CREEK	View Reports	View License	Map It	Download to Excel
A025056	017378		Appropriative	Permitted	EAST BAY MUNICIPAL UTILITY DISTRICT	04/29/1976	853000 acre-ft/yr	San Joaquin	MOKELUMNE RIVER	View Reports	View Permit	Map It	Download to Excel
S000633			Statement of Div and Use	Claimed	EAST BAY MUNICIPAL UTILITY DISTRICT	05/02/1967	0 acre-ft/yr	Alameda	SAN LEANDRO CREEK	View Reports	View Statement	Map It	Download to Excel
S000634			Statement of Div and Use	Claimed	EAST BAY MUNICIPAL UTILITY DISTRICT	05/02/1967	0 acre-ft/yr	Contra Costa	UNST	View Reports	View Statement	Map It	Download to Excel
S020476			Statement of Div and Use	Claimed	EAST BAY MUNICIPAL UTILITY DISTRICT	07/29/2010	624729 acre-ft/yr	San Joaquin	Mokelumne River	View Reports	View Statement	Map It	Download to Excel
S020477			Statement of Div and Use	Claimed	EAST BAY MUNICIPAL UTILITY DISTRICT	07/29/2010	654557 acre-ft/yr	Calaveras	Mokelumne River	View Reports	View Statement	Map It	Download to Excel
S021241			Statement of Div and Use	Claimed	EAST BAY MUNICIPAL UTILITY DISTRICT	02/13/2002	448300 acre-ft/yr	San Joaquin	Camanche Dam	View Reports	View Statement	Map It	Download to Excel

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Reports Submitted for A000465

Year	Type	Date Received	Action
2013	Report of Licensee	06/27/2014	View
2012	Report of Licensee	06/28/2013	View
2011	Report of Licensee	06/28/2012	View
2010	Report of Licensee	06/30/2011	View
2009	Report of Licensee	06/30/2011	View
2008	Report of Licensee	06/30/2011	View

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Restart Search

Reports Submitted for A002593

Year	Type	Date Received	Action
2013	Report of Licensee	06/27/2014	View
2012	Report of Licensee	06/28/2013	View
2011	Report of Licensee	06/27/2014	View
2011	Report of Licensee	06/28/2012	View
2010	Report of Licensee	06/30/2011	View
2009	Report of Licensee	06/30/2011	View
2008	Report of Licensee	06/30/2011	View

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Restart Search

Reports Submitted for A004228

Year	Type	Date Received	Action
2013	Report of Licensee	06/27/2014	View
2012	Report of Licensee	06/28/2013	View
2011	Report of Licensee	06/28/2012	View
2010	Report of Licensee	06/29/2011	View
2009	Report of Licensee	06/29/2011	View
2008	Report of Licensee	06/29/2011	View

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Restart Search

Reports Submitted for A004768

Year	Type	Date Received	Action
2013	Report of Licensee	06/27/2014	View
2012	Report of Licensee	06/28/2013	View
2011	Report of Licensee	06/27/2014	View
2011	Report of Licensee	06/28/2012	View
2010	Report of Licensee	06/29/2011	View
2009	Report of Licensee	06/29/2011	View
2008	Report of Licensee	06/29/2011	View

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Restart Search

Reports Submitted for A005128

Year	Type	Date Received	Action
2013	Report of Licensee	06/27/2014	View
2012	Report of Licensee	06/28/2013	View
2011	Report of Licensee	06/28/2012	View
2010	Report of Licensee	06/29/2011	View
2009	Report of Licensee	06/29/2011	View
2008	Report of Licensee	06/29/2011	View

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e-WRIMS RMS Reports

Restart Search

Reports Submitted for A006707

Year	Type	Date Received	Action
2013	Report of Licensee	06/27/2014	View
2012	Report of Licensee	06/28/2013	View
2011	Report of Licensee	06/28/2012	View
2010	Report of Licensee	06/30/2011	View
2009	Report of Licensee	06/30/2011	View
2008	Report of Licensee	06/30/2011	View

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e-WRIMS RMS Reports

Restart Search

Reports Submitted for A013156

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/27/2014	View
2012	Progress Report by Permittee	06/28/2013	View
2011	Progress Report by Permittee	06/28/2012	View
2010	Progress Report by Permittee	06/29/2011	View

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e-WRIMS RMS Reports

Restart Search

Reports Submitted for A015201

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/27/2014	View
2012	Progress Report by Permittee	06/28/2013	View
2011	Progress Report by Permittee	06/27/2014	View
2011	Progress Report by Permittee	06/28/2012	View
2010	Progress Report by Permittee	06/29/2011	View

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e-WRIMS RMS Reports

Restart Search

Reports Submitted for A018672

Year	Type	Date Received	Action
2013	Report of Licensee	06/27/2014	View
2012	Report of Licensee	06/28/2013	View
2011	Report of Licensee	06/28/2012	View
2010	Report of Licensee	06/30/2011	View
2009	Report of Licensee	06/30/2011	View
2008	Report of Licensee	06/30/2011	View

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Restart Search

Reports Submitted for A025056

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/27/2014	View
2012	Progress Report by Permittee	06/28/2013	View
2011	Progress Report by Permittee	06/27/2014	View
2011	Progress Report by Permittee	06/28/2012	View
2010	Progress Report by Permittee	06/29/2011	View

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Reports Submitted for S000633

Year	Type	Date Received	Action
2013	Supplemental Statement of Water Diversion and Use	06/27/2014	View
2012	Supplemental Statement of Water Diversion and Use	06/27/2014	View
2011	Supplemental Statement of Water Diversion and Use	06/27/2014	View
2010	Supplemental Statement of Water Diversion and Use	06/30/2011	View
2009	Supplemental Statement of Water Diversion and Use	06/30/2011	View
2008	Supplemental Statement of Water Diversion and Use	06/30/2011	View

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Reports Submitted for S000634

Year	Type	Date Received	Action
2013	Supplemental Statement of Water Diversion and Use	06/27/2014	View
2012	Supplemental Statement of Water Diversion and Use	06/27/2014	View
2011	Supplemental Statement of Water Diversion and Use	06/27/2014	View
2010	Supplemental Statement of Water Diversion and Use	06/30/2011	View
2009	Supplemental Statement of Water Diversion and Use	06/30/2011	View
2008	Supplemental Statement of Water Diversion and Use	06/30/2011	View

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Reports Submitted for S020476

Year	Type	Date Received	Action
2012	Supplemental Statement of Water Diversion and Use	02/21/2014	View
2011	Supplemental Statement of Water Diversion and Use	06/28/2012	View
2010	Supplemental Statement of Water Diversion and Use	06/28/2012	View
2009	Supplemental Statement of Water Diversion and Use	06/28/2012	View

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Restart Search

Reports Submitted for S020477

Year	Type	Date Received	Action
2012	Supplemental Statement of Water Diversion and Use	02/21/2014	View
2011	Supplemental Statement of Water Diversion and Use	06/28/2012	View
2010	Supplemental Statement of Water Diversion and Use	06/28/2012	View
2009	Supplemental Statement of Water Diversion and Use	06/28/2012	View

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Reports Submitted for S021241

Year	Type	Date Received	Action
No reports submitted.			

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Marin Municipal Water District

e-WRIMS Water Right Search Results

Criteria: Displaying Water Rights where Holder Name like '*MARIN MUNICIPAL WATER DISTRICT*'.

Search Results: previous 1-25 of 25 next

Appl ID	Permit ID	License ID	Water Right Type	Status	Holder Name	Date	Face Amt	County	Source	View Reports	Water Right	Map It	Export to Excel
A009892	005633		Appropriative	Permitted	MARIN MUNICIPAL WATER DISTRICT	05/09/1940	66198.9 acre-ft/yr	Marin	LAGUNITAS CREEK	View Reports	View Permit	Map It	Download to Excel
A014278	009390		Appropriative	Permitted	MARIN MUNICIPAL WATER DISTRICT	04/30/1951	8550 acre-ft/yr	Marin	LAGUNITAS CREEK	View Reports	View Permit	Map It	Download to Excel
A017317	012800		Appropriative	Permitted	MARIN MUNICIPAL WATER DISTRICT	10/08/1956	29000 acre-ft/yr	Marin	LAGUNITAS CREEK, NICASIO CREEK	View Reports	View Permit	Map It	Download to Excel
A022148	015195	012807	Appropriative	Licensed	MARIN MUNICIPAL WATER DISTRICT	05/13/1965	901 acre-ft/yr	Marin	ARROYO SAUSAL	View Reports	View License	Map It	Download to Excel
A024928	016892		Appropriative	Permitted	MARIN MUNICIPAL WATER DISTRICT	11/17/1975	23235 acre-ft/yr	Marin	ARROYO SAUSAL	View Reports	View Permit	Map It	Download to Excel
A026242	018546		Appropriative	Permitted	MARIN MUNICIPAL WATER DISTRICT	02/28/1980	8300 acre-ft/yr	Marin	LAGUNITAS CREEK	View Reports	View Permit	Map It	Download to Excel
A027937	019516		Appropriative	Revoked	MARIN MUNICIPAL WATER DISTRICT	05/25/1999	0 acre-ft/yr			View Reports	View Permit	Map It	Download to Excel
S000671			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	05/16/1967	0 acre-ft/yr	Marin	RATTLESNAKE CREEK	View Reports	View Statement	Map It	Download to Excel
S000672			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	05/16/1967	0 acre-ft/yr	Marin	SPIKE BUCK CREEK	View Reports	View Statement	Map It	Download to Excel
S000673			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	05/16/1967	0 acre-ft/yr	Marin	LAGUNA CREEK	View Reports	View Statement	Map It	Download to Excel
S000674			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	05/16/1967	0 acre-ft/yr	Marin	FERN CREEK	View Reports	View Statement	Map It	Download to Excel
S000675			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	05/16/1967	0 acre-ft/yr	Marin	FERN CREEK	View Reports	View Statement	Map It	Download to Excel
S000676			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	05/16/1967	0 acre-ft/yr	Marin	OLD MILL CREEK	View Reports	View Statement	Map It	Download to Excel
S000677			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	05/16/1967	0 acre-ft/yr	Marin	OLD MILL CREEK	View Reports	View Statement	Map It	Download to Excel
S000678			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	05/16/1967	0 acre-ft/yr	Marin	CASCADE CREEK	View Reports	View Statement	Map It	Download to Excel
S000679			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	05/16/1967	0 acre-ft/yr	Marin	UNST	View Reports	View Statement	Map It	Download to Excel
S000680			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	05/16/1967	0 acre-ft/yr	Marin	LAGUNA CREEK	View Reports	View Statement	Map It	Download to Excel
S000681			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	05/16/1967	0 acre-ft/yr	Marin	WEST FORK RATTLESNAKE CREEK	View Reports	View Statement	Map It	Download to Excel
S004745			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	01/01/1975	0 acre-ft/yr	Marin	PHOENIX LAKE	View Reports	View Statement	Map It	Download to Excel
S004746			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	01/01/1975	0 acre-ft/yr	Marin	LAKE LAGUNITAS	View Reports	View Statement	Map It	Download to Excel
S014038			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	07/06/1993	36200 acre-ft/yr	Marin	LAGUNITAS CREEK	View Reports	View Statement	Map It	Download to Excel
S014039			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	07/06/1993	0 acre-ft/yr	Marin	LAGUNITAS CREEK	View Reports	View Statement	Map It	Download to Excel
S014040			Statement of Div and Use	Claimed	MARIN MUNICIPAL WATER DISTRICT	07/06/1993	0 acre-ft/yr	Marin	LAGUNITAS CREEK	View Reports	View Statement	Map It	Download to Excel
UN000349			Not Determined	Closed	MARIN MUNICIPAL WATER DISTRICT	08/02/2012	0 acre-ft/yr			View Reports	N/A	Map It	Download to Excel
WW0005			Waste Water Change	Completed	MARIN MUNICIPAL WATER DISTRICT	04/10/1991	580 acre-ft/yr			View Reports	N/A	Map It	Download to Excel

Return to Water Right Public Search Form Download to Excel Map It

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Reports Submitted for A009892

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/26/2014	View
2012	Progress Report by Permittee	06/28/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	06/30/2011	View
2009	Progress Report by Permittee	05/28/2010	View

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Restart Search

Reports Submitted for A014278

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/26/2014	View
2012	Progress Report by Permittee	06/28/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	06/30/2011	View
2009	Progress Report by Permittee	05/28/2010	View

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Reports Submitted for A017317

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/25/2014	View
2012	Progress Report by Permittee	06/28/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	06/30/2011	View
2009	Progress Report by Permittee	05/28/2010	View

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Reports Submitted for A022148

Year	Type	Date Received	Action
2013	Report of Licensee	06/18/2014	View
2012	Report of Licensee	06/26/2013	View
2011	Report of Licensee	06/22/2012	View
2010	Report of Licensee	06/30/2011	View
2009	Report of Licensee	06/30/2011	View

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Restart Search

Reports Submitted for A024928

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/18/2014	View
2012	Progress Report by Permittee	06/26/2013	View
2011	Progress Report by Permittee	06/22/2012	View
2010	Progress Report by Permittee	06/30/2011	View
2009	Progress Report by Permittee	05/28/2010	View

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Reports Submitted for A026242

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/26/2014	View
2012	Progress Report by Permittee	06/28/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	06/30/2011	View
2009	Progress Report by Permittee	05/28/2010	View

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San Francisco Public Utilities Commission

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Water Right ID	Primary Owner	Face Value (acre-ft/yr)	County	Source	Type	Year / Revision	Status	Date Submitted	Action
A018475	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	15,500.0	Alameda	SAN ANTONIO CREEK	Report of Licensee	2013 / 1	Submitted	06/26/2014	View Amend
A018475	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	15,500.0	Alameda	SAN ANTONIO CREEK	Report of Licensee	2012 / 1	Submitted	06/26/2013	View Amend
A018475	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	15,500.0	Alameda	SAN ANTONIO CREEK	Report of Licensee	2011 / 1	Submitted	06/29/2012	View Amend
A018475	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	15,500.0	Alameda	SAN ANTONIO CREEK	Report of Licensee	2010 / 1	Submitted	06/28/2011	View Amend
A018475	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	15,500.0	Alameda	SAN ANTONIO CREEK	Report of Licensee	2009 / 1	Submitted	06/28/2011	View Amend
A018475	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	15,500.0	Alameda	SAN ANTONIO CREEK	Report of Licensee	2008 / 1	Submitted	06/28/2011	View Amend
S002635	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	TUOLUMNE RIVER	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/26/2014	View Amend
S002635	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	TUOLUMNE RIVER	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/26/2014	View Amend
S002635	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	TUOLUMNE RIVER	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/26/2014	View Amend
S002635	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	TUOLUMNE RIVER	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/30/2011	View Amend

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Water Right ID	Primary Owner	Face Value (acre-ft/yr)	County	Source	Type	Year / Revision	Status	Date Submitted	Action
S002635	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	TUOLUMNE RIVER	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/30/2011	View Amend
S002635	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	TUOLUMNE RIVER	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/30/2011	View Amend
S002636	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	ELEANORE CREEK	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/26/2014	View Amend
S002636	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	ELEANORE CREEK	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/26/2014	View Amend
S002636	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	ELEANORE CREEK	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/26/2014	View Amend
S002636	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	ELEANORE CREEK	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/30/2011	View Amend
S002636	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	ELEANORE CREEK	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/30/2011	View Amend
S002636	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	ELEANORE CREEK	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/30/2011	View Amend
S002637	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	TUOLUMNE RIVER	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/27/2014	View Amend
S002637	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	TUOLUMNE RIVER	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/27/2014	View Amend

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Water Right ID	Primary Owner	Face Value (acre-ft/yr)	County	Source	Type	Year / Revision	Status	Date Submitted	Action
S002637	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	TUOLUMNE RIVER	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/27/2014	View Amend
S002637	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	TUOLUMNE RIVER	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/30/2011	View Amend
S002637	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	TUOLUMNE RIVER	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/30/2011	View Amend
S002637	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	TUOLUMNE RIVER	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/30/2011	View Amend
S002638	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	CHERRY CREEK	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/26/2014	View Amend
S002638	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	CHERRY CREEK	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/26/2014	View Amend
S002638	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	CHERRY CREEK	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/26/2014	View Amend
S002638	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	CHERRY CREEK	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/30/2011	View Amend
S002638	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	CHERRY CREEK	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/30/2011	View Amend
S002638	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	CHERRY CREEK	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/30/2011	View Amend

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Water Right ID	Primary Owner	Face Value (acre-ft/yr)	County	Source	Type	Year / Revision	Status	Date Submitted	Action
S009453	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	CALAVERAS CREEK	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/26/2014	View Amend
S009453	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	CALAVERAS CREEK	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/26/2014	View Amend
S009453	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	CALAVERAS CREEK	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/26/2014	View Amend
S009453	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	CALAVERAS CREEK	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/28/2011	View Amend
S009453	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	CALAVERAS CREEK	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/28/2011	View Amend
S009453	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	CALAVERAS CREEK	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/28/2011	View Amend
S009453	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	CALAVERAS CREEK	Supplemental Statement of Water Diversion and Use	2007 / 1	In Progress		Start View
S014379	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	CHERRY CREEK	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/27/2014	View Amend
S014379	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	CHERRY CREEK	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/27/2014	View Amend
S014379	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	CHERRY CREEK	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/27/2014	View Amend

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Water Right ID	Primary Owner	Face Value (acre-ft/yr)	County	Source	Type	Year / Revision	Status	Date Submitted	Action
S014379	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	CHERRY CREEK	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/30/2011	View Amend
S014379	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	CHERRY CREEK	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/30/2011	View Amend
S014379	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Tuolumne	CHERRY CREEK	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/30/2011	View Amend
S015857	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	UPPER ALAMEDA CREEK	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/26/2014	View Amend
S015857	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	UPPER ALAMEDA CREEK	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/26/2014	View Amend
S015857	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	UPPER ALAMEDA CREEK	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/26/2014	View Amend
S015857	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	UPPER ALAMEDA CREEK	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/28/2011	View Amend
S015857	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	UPPER ALAMEDA CREEK	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/28/2011	View Amend
S015857	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Alameda	UPPER ALAMEDA CREEK	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/28/2011	View Amend
S015858	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Merced	ALAMEDA CREEK	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/26/2014	View Amend

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Water Right ID	Primary Owner	Face Value (acre-ft/yr)	County	Source	Type	Year / Revision	Status	Date Submitted	Action
S015858	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Merced	ALAMEDA CREEK	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/26/2014	View Amend
S015858	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Merced	ALAMEDA CREEK	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/26/2014	View Amend
S015858	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Merced	ALAMEDA CREEK	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/28/2011	View Amend
S015858	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Merced	ALAMEDA CREEK	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/28/2011	View Amend
S015858	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	Merced	ALAMEDA CREEK	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/28/2011	View Amend
S015859	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN MATEO CREEK	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/27/2014	View Amend
S015859	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN MATEO CREEK	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/27/2014	View Amend
S015859	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN MATEO CREEK	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/27/2014	View Amend
S015859	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN MATEO CREEK	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/28/2011	View Amend
S015859	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN MATEO CREEK	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/28/2011	View Amend

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Water Right ID	Primary Owner	Face Value (acre-ft/yr)	County	Source	Type	Year / Revision	Status	Date Submitted	Action
S015859	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN MATEO CREEK	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/28/2011	View Amend
S015860	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	PILARCITOS LAKE	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/27/2014	View Amend
S015860	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	PILARCITOS LAKE	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/27/2014	View Amend
S015860	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	PILARCITOS LAKE	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/27/2014	View Amend
S015860	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	PILARCITOS LAKE	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/29/2011	View Amend
S015860	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	PILARCITOS LAKE	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/29/2011	View Amend
S015860	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	PILARCITOS LAKE	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/29/2011	View Amend
S015861	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN ANDREAS CREEK	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/27/2014	View Amend
S015861	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN ANDREAS CREEK	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/27/2014	View Amend
S015861	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN ANDREAS CREEK	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/27/2014	View Amend

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Water Right ID	Primary Owner	Face Value (acre-ft/yr)	County	Source	Type	Year / Revision	Status	Date Submitted	Action
S015861	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN ANDREAS CREEK	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/29/2011	View Amend
S015861	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN ANDREAS CREEK	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/29/2011	View Amend
S015861	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN ANDREAS CREEK	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/29/2011	View Amend
S015977	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	PILARCITOS CREEK	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/27/2014	View Amend
S015977	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	PILARCITOS CREEK	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/27/2014	View Amend
S015977	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	PILARCITOS CREEK	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/27/2014	View Amend
S015977	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	PILARCITOS CREEK	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/30/2011	View Amend
S015977	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	PILARCITOS CREEK	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/30/2011	View Amend
S015977	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	PILARCITOS CREEK	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/29/2011	View Amend
S015980	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN MATEO CREEK	Supplemental Statement of Water Diversion and Use	2013 / 1	Submitted	06/27/2014	View Amend

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Water Right ID	Primary Owner	Face Value (acre-ft/yr)	County	Source	Type	Year / Revision	Status	Date Submitted	Action
S015980	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN MATEO CREEK	Supplemental Statement of Water Diversion and Use	2012 / 1	Submitted	06/27/2014	View Amend
S015980	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN MATEO CREEK	Supplemental Statement of Water Diversion and Use	2011 / 1	Submitted	06/27/2014	View Amend
S015980	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN MATEO CREEK	Supplemental Statement of Water Diversion and Use	2010 / 1	Submitted	06/29/2011	View Amend
S015980	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN MATEO CREEK	Supplemental Statement of Water Diversion and Use	2009 / 1	Submitted	06/29/2011	View Amend
S015980	CITY AND COUNTY OF SAN FRANCISCO PUC AGM WATER ENTERPRISE	0.0	San Mateo	SAN MATEO CREEK	Supplemental Statement of Water Diversion and Use	2008 / 1	Submitted	06/29/2011	View Amend

Santa Clara Valley Water District

CIWQS

e-WRIMS Water Right Search Results

Criteria: Displaying Water Rights where Holder Name like "Santa Clara Valley Water District".

Search Results: previous 1-10 of 10 next

Appl ID	Permit ID	License ID	Water Right Type	Status	Holder Name	Date	Face Amt	County	Source	View Reports	Water Right	Map It	Export to Excel
A005653	003039	006943	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	08/01/1927	3302 acre-ft/yr	Santa Clara	GUADALUPE CREEK	View Reports	View License	Map It	Download to Excel
A005654	003010	011791	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	08/01/1927	8090 acre-ft/yr	Santa Clara	LOS GATOS CREEK	View Reports	View License	Map It	Download to Excel
A007140	005051	007211	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	12/09/1931	24560 acre-ft/yr	Santa Clara	COYOTE CREEK	View Reports	View License	Map It	Download to Excel
A007141	004916	002208	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	12/09/1931	2500 acre-ft/yr	Santa Clara	ALMADEN CREEK	View Reports	View License	Map It	Download to Excel
A007142	004917	002206	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	12/09/1931	3500 acre-ft/yr	Santa Clara	GUADALUPE CREEK	View Reports	View License	Map It	Download to Excel
A007143	004918	002207	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	12/09/1931	4000 acre-ft/yr	Santa Clara	STEVENS CREEK	View Reports	View License	Map It	Download to Excel
A008098	004919	002208	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	09/11/1934	3500 acre-ft/yr	Santa Clara	CALERO CREEK	View Reports	View License	Map It	Download to Excel
A008099	004920	002209	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	09/11/1934	6000 acre-ft/yr	Santa Clara	ALMADEN CREEK	View Reports	View License	Map It	Download to Excel
A008397	004921	005944	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	07/10/1935	1594 acre-ft/yr	Santa Clara	LOS GATOS CREEK	View Reports	View License	Map It	Download to Excel
A008368	006062	002210	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	07/10/1935	6000 acre-ft/yr	Santa Clara	COYOTE CREEK	View Reports	View License	Map It	Download to Excel
A009466	006428	002837	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	11/16/1936	325.3 acre-ft/yr	Santa Clara	GUADALUPE CREEK	View Reports	View License	Map It	Download to Excel
A011010	006565		Appropriative	Permitted	SANTA CLARA VALLEY WATER DISTRICT	03/23/1945	3500 acre-ft/yr	Santa Clara	PENITENCIA CREEK	View Reports	View Permit	Map It	Download to Excel
A011761	007659	005729	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	03/03/1947	30000 acre-ft/yr	Santa Clara	LOS GATOS CREEK	View Reports	View License	Map It	Download to Excel
A013016	006494	007212	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	04/04/1949	71100 acre-ft/yr	Santa Clara	COYOTE CREEK	View Reports	View License	Map It	Download to Excel
A013791	008485	005404	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	05/14/1950	7500 acre-ft/yr	Santa Clara	LLAGAS CREEK	View Reports	View License	Map It	Download to Excel
A013808	010030	006422	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	06/08/1950	24400 acre-ft/yr	Santa Clara	UVAS CREEK	View Reports	View License	Map It	Download to Excel
A019679	012933	009629	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	08/19/1960	7300 acre-ft/yr	Santa Clara	LLAGAS CREEK	View Reports	View License	Map It	Download to Excel
A021128	014734	010807	Appropriative	Licensed	SANTA CLARA VALLEY WATER DISTRICT	01/21/1963	22100 acre-ft/yr	Santa Clara	COYOTE CREEK	View Reports	View License	Map It	Download to Excel

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2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A005654

Year	Type	Date Received	Action
2012	Report of Licensee	08/27/2013	View
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2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A007140

Year	Type	Date Received	Action
2012	Report of Licensee	08/27/2013	View
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2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A007141

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2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A007142

Year	Type	Date Received	Action
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2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A007143

Year	Type	Date Received	Action
2012	Report of Licensee	08/27/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A008098

Year	Type	Date Received	Action
2012	Report of Licensee	08/27/2013	View
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2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A008099

Year	Type	Date Received	Action
2012	Report of Licensee	06/27/2013	View
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2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A008387

Year	Type	Date Received	Action
2012	Report of Licensee	08/27/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A008388

Year	Type	Date Received	Action
2012	Report of Licensee	06/27/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A009455

Year	Type	Date Received	Action
2012	Report of Licensee	06/27/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A011010

Year	Type	Date Received	Action
2012	Progress Report by Permittee	06/27/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	07/01/2011	View

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Reports Submitted for A011751

Year	Type	Date Received	Action
2012	Report of Licensee	06/27/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A013016

Year	Type	Date Received	Action
2012	Report of Licensee	06/27/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A013791

Year	Type	Date Received	Action
2012	Report of Licensee	06/27/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A013886

Year	Type	Date Received	Action
2012	Report of Licensee	06/27/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A019879

Year	Type	Date Received	Action
2012	Report of Licensee	06/27/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A021128

Year	Type	Date Received	Action
2012	Report of Licensee	06/27/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View

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Solano County Water Agency

e-WRIMS Water Right Search Results

Criteria: Displaying Water Rights where Holder Name like '*solano county water agency*'.

Search Results: previous 1-2 of 2 next

Appl ID	Permit ID	License ID	Water Right Type	Status	Holder Name	Date	Face Amt	County	Source	View Reports	Water Right	Map It	Export to Excel
A011199	010657	013876	Appropriative	Licensed	SOLANO COUNTY WATER AGENCY	05/28/2013	948337 acre-ft/yr	Napa	PUTAH CREEK	View Reports	View License	Map It	Download to Excel
A012578	010658	013877	Appropriative	Licensed	SOLANO COUNTY WATER AGENCY	05/28/2013	58899 acre-ft/yr	Napa, Solano	PUTAH CREEK	View Reports	View License	Map It	Download to Excel

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Reports Submitted for A011199

Year	Type	Date Received	Action
2013	Report of Licensee	06/26/2014	View
2012	Progress Report by Permittee	06/14/2013	View
2011	Progress Report by Permittee	05/16/2012	View
2010	Progress Report by Permittee	12/21/2011	View

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Reports Submitted for A012578

Year	Type	Date Received	Action
2013	Report of Licensee	06/26/2014	View
2012	Progress Report by Permittee	06/14/2013	View
2011	Progress Report by Permittee	05/16/2012	View
2010	Progress Report by Permittee	12/21/2011	View

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Sonoma County Water Agency

e-WRIMS Water Right Search Results

Criteria: Displaying Water Rights where Holder Name like '*sonoma county water agency*'.

Search Results: previous 1-15 of 15 next

Appl ID	Permit ID	License ID	Water Right Type	Status	Holder Name	Date	Face Amt	County	Source	View Reports	Water Right	Map It	Export to Excel
A012919A	012947A		Appropriative	Permitted	Sonoma County Water Agency	01/21/1975	160044 acre-ft/yr	Mendocino, Sonoma	EAST FORK RUSSIAN RIVER	View Reports	View Permit	Map It	Download to Excel
A015736	012949		Appropriative	Permitted	Sonoma County Water Agency	10/24/1961	14479.6 acre-ft/yr	Sonoma	RUSSIAN RIVER	View Reports	View Permit	Map It	Download to Excel
A015737	012950		Appropriative	Permitted	Sonoma County Water Agency	10/24/1961	21778.8 acre-ft/yr	Sonoma	RUSSIAN RIVER	View Reports	View Permit	Map It	Download to Excel
A015779	012951	007615	Appropriative	Licensed	Sonoma County Water Agency	03/17/1954	75 acre-ft/yr	Sonoma	RUSSIAN RIVER	View Reports	View License	Map It	Download to Excel
A019351	016596		Appropriative	Permitted	Sonoma County Water Agency	07/09/1973	375316 acre-ft/yr	Sonoma	DRY CREEK, RUSSIAN RIVER	View Reports	View Permit	Map It	Download to Excel
A022431	015311	009408	Appropriative	Licensed	Sonoma County Water Agency	06/15/1970	600 acre-ft/yr	Sonoma	SANTA ROSA CREEK, SPRING CREEK, UNST	View Reports	View License	Map It	Download to Excel
A026624	019566		Appropriative	Permitted	Sonoma County Water Agency	11/18/1980	209953.5 acre-ft/yr	Sonoma	DRY CREEK	View Reports	View Permit	Map It	Download to Excel
A027362	018725		Appropriative	Permitted	Sonoma County Water Agency	06/14/1982	113 acre-ft/yr	Sonoma	RUSSIAN RIVER	View Reports	View Permit	Map It	Download to Excel
A029745	020589		Appropriative	Revoked	Sonoma County Water Agency	08/30/1996	0 acre-ft/yr			View Reports	View Permit	Map It	Download to Excel
A029897			Appropriative	Cancelled	Sonoma County Water Agency	01/01/1500	0 acre-ft/yr			View Reports	N/A	Map It	Download to Excel
A030934			Appropriative	Cancelled	Sonoma County Water Agency	12/05/2008	27 acre-ft/yr			View Reports	N/A	Map It	Download to Excel
A030981			Appropriative	Pending	Sonoma County Water Agency	11/15/1999	52126.4 acre-ft/yr	Sonoma	RUSSIAN RIVER	View Reports	N/A	Map It	Download to Excel
E000004			Cert of Right - Power	Certified	Sonoma County Water Agency	02/09/1988	0 acre-ft/yr	Sonoma	DRY CREEK	View Reports	N/A	Map It	Download to Excel
UN000545			Not Determined	Active	Sonoma County Water Agency	08/16/2012	0 acre-ft/yr			View Reports	N/A	Map It	Download to Excel
UN000575			Not Determined	Active	Sonoma County Water Agency	04/26/2013	0 acre-ft/yr			View Reports	N/A	Map It	Download to Excel

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Reports Submitted for A012919A

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2013	Progress Report by Permittee	06/30/2014	View
2012	Progress Report by Permittee	06/30/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	07/01/2011	View

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Reports Submitted for A015736

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/30/2014	View
2012	Progress Report by Permittee	06/30/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	07/01/2011	View

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Reports Submitted for A015737

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/30/2014	View
2012	Progress Report by Permittee	06/30/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	07/01/2011	View

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Reports Submitted for A015779

Year	Type	Date Received	Action
2013	Report of Licensee	06/30/2014	View
2012	Report of Licensee	06/30/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A019351

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/30/2014	View
2012	Progress Report by Permittee	06/30/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	07/01/2011	View

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Reports Submitted for A022431

Year	Type	Date Received	Action
2013	Report of Licensee	06/30/2014	View
2012	Report of Licensee	06/30/2013	View
2011	Report of Licensee	06/29/2012	View
2010	Report of Licensee	07/01/2011	View

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Reports Submitted for A026624

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/30/2014	View
2012	Progress Report by Permittee	06/30/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	07/01/2011	View

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Restart Search

Reports Submitted for A027362

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/30/2014	View
2012	Progress Report by Permittee	06/30/2013	View
2011	Progress Report by Permittee	06/29/2012	View
2010	Progress Report by Permittee	07/01/2011	View

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Stinson Beach County Water District

e-WRIMS Water Right Search Results

Criteria: Displaying Water Rights where Holder Name like '*stinson beach*'.

Search Results: previous 1-6 of 6 next

Appl ID	Permit ID	License ID	Water Right Type	Status	Holder Name	Date	Face Amt	County	Source	View Reports	Water Right	Map It	Export to Excel
S008571			Statement of Div and Use	Claimed	STINSON BEACH COUNTY W D	01/01/1980	0 acre-ft/yr	Marin	FITZHENRY CREEK	View Reports	View Statement	Map It	Download to Excel
S008572			Statement of Div and Use	Claimed	STINSON BEACH COUNTY W D	01/01/1980	0 acre-ft/yr	Marin	WEBB CREEK	View Reports	View Statement	Map It	Download to Excel
S008573			Statement of Div and Use	Inactive	STINSON BEACH COUNTY W D	06/28/2012	0 acre-ft/yr			View Reports	View Statement	Map It	Download to Excel
S008574			Statement of Div and Use	Inactive	STINSON BEACH COUNTY W D	06/28/2012	0 acre-ft/yr			View Reports	View Statement	Map It	Download to Excel
S008575			Statement of Div and Use	Claimed	STINSON BEACH COUNTY W D	01/01/1975	0 acre-ft/yr	Marin	STINSON GULCH	View Reports	View Statement	Map It	Download to Excel
S008576			Statement of Div and Use	Claimed	STINSON BEACH COUNTY W D	01/01/1980	0 acre-ft/yr	Marin	BLACK ROCK CREEK	View Reports	View Statement	Map It	Download to Excel

Return to Water Right Public Search Form Download to Excel Map It

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e-WRIMS RMS Reports

Restart Search

Reports Submitted for S008571

Year	Type	Date Received	Action
2011	Supplemental Statement of Water Diversion and Use	06/21/2012	View
2010	Supplemental Statement of Water Diversion and Use	06/21/2012	View
2009	Supplemental Statement of Water Diversion and Use	06/21/2012	View

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e-WRIMS RMS Reports

Restart Search

Reports Submitted for S008572

Year	Type	Date Received	Action
2011	Supplemental Statement of Water Diversion and Use	06/21/2012	View
2010	Supplemental Statement of Water Diversion and Use	06/21/2012	View
2010	Supplemental Statement of Water Diversion and Use	04/26/2012	View
2009	Supplemental Statement of Water Diversion and Use	06/21/2012	View

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e-WRIMS RMS Reports

Restart Search

Reports Submitted for S008575

Year	Type	Date Received	Action
2011	Supplemental Statement of Water Diversion and Use	06/21/2012	View
2010	Supplemental Statement of Water Diversion and Use	06/21/2012	View
2009	Supplemental Statement of Water Diversion and Use	06/21/2012	View

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e-WRIMS RMS Reports

Restart Search

Reports Submitted for S008576

Year	Type	Date Received	Action
2011	Supplemental Statement of Water Diversion and Use	06/21/2012	View
2010	Supplemental Statement of Water Diversion and Use	06/21/2012	View
2009	Supplemental Statement of Water Diversion and Use	06/21/2012	View

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Zone 7 Water Agency

e-WRIMS Water Right Search Results

Criteria: Displaying Water Rights where Holder Name like '*ALAMEDA COUNTY F C & W C D (ZONE 7) *'.

Search Results: previous 1-2 of 2 next

Appl ID	Permit ID	License ID	Water Right Type	Status	Holder Name	Date	Face Amt	County	Source	View Reports	Water Right	Map It	Export to Excel
A017002	011319		Appropriative	Permitted	ALAMEDA COUNTY F C & W C D (ZONE 7)	04/16/1956	60000 acre-ft/yr	Alameda	ARROYO VALLE, Arroyo Valle	View Reports	View Permit	Map It	Download to Excel
NJ000029			Non Jurisdictional	Active	ALAMEDA COUNTY F C & W C D (ZONE 7)	03/23/2012	0 acre-ft/yr			View Reports	N/A	Map It	Download to Excel

Return to Water Right Public Search Form Download to Excel Map It

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e-WRIMS RMS Reports

Restart Search

Reports Submitted for A017002

Year	Type	Date Received	Action
2013	Progress Report by Permittee	06/25/2014	View
2012	Progress Report by Permittee	06/19/2013	View
2011	Progress Report by Permittee	06/22/2012	View
2010	Progress Report by Permittee	07/01/2011	View

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Groundwater Management Plan Compliance

Table 1-6 lists project sponsors that are groundwater users and the status of groundwater management plan (GWMP) compliance. Applicable GWMP self-certifications are included in the following pages.

Table 1-6. Groundwater Management Plan Compliance

Project	Agency	Status of Groundwater Management Plan
City of Calistoga	Michael Kirn (707) 942-2828 mkirn@ci.calistoga.ca.us	Groundwater is managed by Napa County. The Napa County Groundwater Monitoring Plan self-certification form stating compliance with GWMP requirements is included with the application.
City of Sunnyvale	Mansour Nasser (408) 730-7578 mnasser@sunnyvale.ca.gov	Self-certification form stating compliance with GWMP requirements is included with the application.
DSRSD	Not Applicable	Not applicable; the DSRSD service area lies over the Livermore-Amador Valley water basin, which is managed by DSRSD's water supplier, Zone 7 Water Agency. Refer to Zone 7 Water Agency's self-certification form.
EBMUD*	Michael Tognolini (510) 287-0125 mtognoli@ebmud.com	Self-certification form stating compliance with GWMP requirements is included with the application.
SFPUC*	Carolyn Cooper (415) 554-2496 ccooper@sfwater.org	Self-certification form stating compliance with GWMP requirements is included with the application.
SCVWD*	Behzad Ahmadi (408) 630-2324 bahmadi@valleywater.org	Self-certification form stating compliance with GWMP requirements is included with the application.
Sonoma County Water Agency*	Sherry Barbic (707) 521-1806 Sherry.Barbic@scwa.ca.gov	Self-certification form stating compliance with GWMP requirements is included with the application.
Stinson Beach County Water District	Not Applicable	Not applicable; the service area of Stinson Beach CWD is located within the boundary of the San Francisco Bay Hydrologic Region, as defined in DWR Bulletin 118 – Update 2003. Bulletin 118 does not identify any groundwater basins in the San Francisco Bay Hydrologic Region that include or are near Stinson Beach CWD's service area. It is the District's understanding that it does not need to adopt or implement a GWMP, in accordance with Sections 10750-10756 of the CWC, which pertain to the groundwater basins identified in DWR Bulletin 118.
Zone 7 Water Agency*	Tom Rooze (925) 454-5069 trooze@zone7water.com	Activities involving groundwater management are carried out in accordance with Zone 7's GWMP, which has been approved by DWR. The resolution of the GWMP, as well as other relevant documentation, is included with the application.

**Indicates Participating Agency of the Bay Area Regional Drought Relief Conservation Program (Project 10)*

California Department of Water Resources
Integrated Regional Water Management Grant Programs

CERTIFICATION FOR GROUNDWATER MANAGEMENT PLAN COMPLIANCE FOR THE PROPOSITION 84, IMPLEMENTATION AND PROPOSITION 1E, STORMWATER FLOOD MANAGEMENT GRANT PROGRAMS

Grant Program: ☒ Implementation ☐ SWFM

IRWM Region: Bay Area, North Sub-region

Agency name: City of Calistoga

Project Title (as shown on application form): Calistoga Recycled Water Storage Facility

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that the agency has prepared and implemented a GWMP in compliance with CWC §10753.7.

☒ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that the agency participates or consents to be subjected to an existing GWMP, basin-wide management plan, or other IRWM program or plan that meets the requirements of CWC §10753.7(a).

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that agency consents to be subjected to a GWMP that will will meet the requirements of CWC §10753.7 and be completed within 1-year of the grant application submittal date.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California that the agency conforms to the requirements of an adjudication of water rights in the subject groundwater basin.

I understand that the Department of Water Resources will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Department of Water Resources may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Michael Kirn

Name of Authorized Representative
(Please print)

Michael Kirn

Signature

Public Works Director

Title

6/2/14

Date

California Department of Water Resources
Integrated Regional Water Management Grant Programs

CERTIFICATION FOR GROUNDWATER MANAGEMENT PLAN COMPLIANCE FOR THE PROPOSITION 84, IMPLEMENTATION AND PROPOSITION 1E, STORMWATER FLOOD MANAGEMENT GRANT PROGRAMS

Grant Program: ☒ Implementation ☐ SWFM

IRWM Region: San Francisco Bay Area

Agency name: City of Sunnyvale

Project Title (as shown on application form): Bay Area Drought Relief Program

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that the agency has prepared and implemented a GWMP in compliance with CWC §10753.7.

☒ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that the agency participates or consents to be subjected to an existing GWMP, basin-wide management plan, or other IRWM program or plan that meets the requirements of CWC §10753.7(a).

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that agency consents to be subjected to a GWMP that will will meet the requirements of CWC §10753.7 and be completed within 1-year of the grant application submittal date.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California that the agency conforms to the requirements of an adjudication of water rights in the subject groundwater basin.

I understand that the Department of Water Resources will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Department of Water Resources may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

MANSOUR NASSER
Name of Authorized Representative
(Please print)

Mansour Nasser
Signature

Water + Sewer Division Manager
Title

June 9, 2014
Date

California Department of Water Resources
Integrated Regional Water Management Grant Programs

CERTIFICATION FOR GROUNDWATER MANAGEMENT PLAN COMPLIANCE FOR THE PROPOSITION 84, IMPLEMENTATION AND PROPOSITION 1E, STORMWATER FLOOD MANAGEMENT GRANT PROGRAMS

Grant Program: X Implementation ☐ SWFM

IRWM Region: San Francisco Bay Area (ID 27)

Agency name: East Bay Municipal Utility District

Project Title (as shown on application form): DERWA Phase 3 Recycled Water Expansion

Please check one of the boxes below and sign and date this form.

X As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that the agency has prepared and implemented a GWMP* in compliance with CWC §10753.7. *[* Note: GWMP for the East Bay Plain Basin, Southern Subbasin]*

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that the agency participates or consents to be subjected to an existing GWMP, basin-wide management plan, or other IRWM program or plan that meets the requirements of CWC §10753.7(a).

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that agency consents to be subjected to a GWMP that will will meet the requirements of CWC §10753.7 and be completed within 1-year of the grant application submittal date.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California that the agency conforms to the requirements of an adjudication of water rights in the subject groundwater basin.

I understand that the Department of Water Resources will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Department of Water Resources may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Michael T. Tognolini
Name of Authorized Representative
(Please print)

Signature

Manager of Water Supply Improvements Division
Title

6/26/14
Date

California Department of Water Resources
Integrated Regional Water Management Grant Programs

CERTIFICATION FOR GROUNDWATER MANAGEMENT PLAN COMPLIANCE FOR THE PROPOSITION 84, IMPLEMENTATION AND PROPOSITION 1E, STORMWATER FLOOD MANAGEMENT GRANT PROGRAMS

Grant Program: ☒ Implementation ☐ SWFM

IRWM Region: San Francisco Bay Area

Agency name: San Francisco Public Utilities Commission

Project Title (as shown on application form): 1) Lower Cherry Aqueduct Emergency Rehabilitation Project 2) Bay Area Regional Drought Relief and Water Conservation Program

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that the agency has prepared and implemented a GWMP in compliance with CWC §10753.7.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that the agency participates or consents to be subjected to an existing GWMP, basin-wide management plan, or other IRWM program or plan that meets the requirements of CWC §10753.7(a).

X As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that agency consents to be subjected to a GWMP that will meet the requirements of CWC §10753.7 and be completed within 1-year of the grant application submittal date.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California that the agency conforms to the requirements of an adjudication of water rights in the subject groundwater basin.

I understand that the Department of Water Resources will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Department of Water Resources may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Steve Ritchie
Name of Authorized Representative
(Please print)

Signature

Assistant General Manager, Water Enterprise
Title

6/18/14
Date

California Department of Water Resources
Integrated Regional Water Management Grant Programs

CERTIFICATION FOR GROUNDWATER MANAGEMENT PLAN COMPLIANCE FOR THE PROPOSITION 84, IMPLEMENTATION AND PROPOSITION 1E, STORMWATER FLOOD MANAGEMENT GRANT PROGRAMS

Grant Program: ☒ Implementation ☐ SWFM

IRWM Region: San Francisco Bay Area

Agency name: Santa Clara Valley Water District

Project Title (as shown on application form): Bay Area Drought Relief Program

Please check one of the boxes below and sign and date this form.

☒ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that the agency has prepared and implemented a GWMP in compliance with CWC §10753.7.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that the agency participates or consents to be subjected to an existing GWMP, basin-wide management plan, or other IRWM program or plan that meets the requirements of CWC §10753.7(a).

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that agency consents to be subjected to a GWMP that will will meet the requirements of CWC §10753.7 and be completed within 1-year of the grant application submittal date.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California that the agency conforms to the requirements of an adjudication of water rights in the subject groundwater basin.

I understand that the Department of Water Resources will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Department of Water Resources may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Beau Goldie
Name of Authorized Representative
(Please print)

Signature

Chief Executive Officer
Title

6-11-14
Date

California Department of Water Resources
Integrated Regional Water Management Grant Programs

CERTIFICATION FOR GROUNDWATER MANAGEMENT PLAN COMPLIANCE FOR THE PROPOSITION 84, IMPLEMENTATION AND PROPOSITION 1E, STORMWATER FLOOD MANAGEMENT GRANT PROGRAMS

Grant Program: ☒ Implementation ☐ SWFM

IRWM Region: San Francisco Bay

Agency Name: Sonoma County Water Agency

Project Title (as shown on application form): Bay Area Drought Relief Program

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that the agency has prepared and implemented a GWMP in compliance with CWC §10753.7.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that the agency participates or consents to be subjected to an existing GWMP, basin-wide management plan, or other IRWM program or plan that meets the requirements of CWC §10753.7(a).

☒ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California, that agency consents to be subjected to a GWMP that will will meet the requirements of CWC §10753.7 and be completed within 1-year of the grant application submittal date.

☐ As the authorized representative for the agency, I certify under penalty of perjury under the laws of the State of California that the agency conforms to the requirements of an adjudication of water rights in the subject groundwater basin.

I understand that the Department of Water Resources will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Department of Water Resources may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

Grant Davis
Name of Authorized Representative
(Please print)

Pamela Jeane for GD
Signature

General Manager
Title

6/17/14
Date

Attachment 3. Status of GWMP

Zone 7's Groundwater Management Plan (GWMP) was adopted by the Zone 7 Board of Directors in September 2005. Copies of documents pertaining to the adoption of Zone 7's GWMP are attached below and include the resolution by Zone 7's Board of Directors approving and adopting the Final Groundwater Management Plan and associated CEQA documentation. The resolution was signed on September 21, 2005, and the GWMP was transmitted to DWR on September 23, 2005 (see attached letter).

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

100 NORTH CANYONS PARKWAY, LIVERMORE, CA 94551 PHONE (925) 454-5000

September 23, 2005

Mary Scruggs
Division of Planning and Local Assistance
Conjunctive Water Management Branch
PO Box 942836
Sacramento, CA 94236-0001

Subject: **Transmittal of Zone 7's Groundwater Management Plan**

Dear Ms. Scruggs:

Alameda County Flood Control and Water Conservation District, Zone 7 (Zone 7 Water Agency) is pleased to present our newly-adopted Groundwater Management Plan. Zone 7 Water Agency is a water wholesaler that delivers water to four retail water supply agencies, Dublin-San Ramon Services District, California Water Service Company and the Cities of Livermore and Pleasanton. The four retailers have formed the Tri-Valley Water Retail Group which has endorsed the plan (see attached letter). A copy of the Board Resolution adopting the plan is also attached.

Please feel free to contact me at (925) 454-5016, if you have any questions concerning the Groundwater Management Plan.

Sincerely,

G.F. Duerig
Acting Assistant General Manager

Attachments

cc (without attachments):
Kim Rosmaier, CA DWR – Central District
Dave Lunn
Tom Rooze
Sal Segura

Tri-Valley Water

A cooperativ
the City of Liv
Dublin San R
and the Calif

CC: J.D
DL
JO

RECEIVED

September 14, 2005

Mr. Dale Myers, General Manager
Zone 7 Water Agency
100 N. Canyons Parkway
Livermore, CA 94550

Subject: Zone 7's Draft Groundwater Management Plan for Livermore-Amador Groundwater Basin-August 2005

Dear Mr. Myers:

The Tri-Valley Water Retailers Group thanks you and your staff for the opportunity to review Zone 7's draft *Groundwater Management Plan for Livermore-Amador Groundwater Basin* (GMP) dated August 2005. Specific comments on this important management document have been provided earlier by individual retail agencies to Jill Duerig of your staff. As stated in the Executive Summary, Zone 7 prepared the GMP to compile and document all of its current groundwater management policies and programs in a single document, and to satisfy the intent of the State's Groundwater Management Planning Act. The water retailers understand that the Planning Act is broad, and recognize that the Zone's GMP may not need to address specific issues regarding Zone 7's groundwater use and management that are still being worked out locally. The compilation of current management practices in a single GMP document will be helpful to provide retailers and Zone 7 a useful starting point for discussing future amendments to groundwater management policies and procedures that address these specific local issues.

The Tri-Valley Water Retailers Group acknowledges Zone 7's adoption of this GMP as a starting point for future local discussions and decisions on groundwater management. As such, we endorse transmittal of the Plan to the State Department of Water Resources, with the understanding that Zone 7 and the retailers will continue to work together toward mutually agreed upon groundwater management goals.

We look forward to working with Zone 7 in the future, using the GMP as a starting point, to frame, develop or modify groundwater management policies and procedures for the safe production, improved water quality and long-term sustainability of the Tri-Valley's valuable local groundwater resource.

Please provide a copy of this letter to your Board of Directors for their information in their consideration of the *Groundwater Management Plan for Livermore-Amador Groundwater Basin*.

Sincerely,

Bert Michalczyk

Bert Michalczyk
Chair, Tri-Valley Water Retailers Group

BM:ngh

Cc: Dan McIntyre, City of Livermore
John Freeman, California Water Service Company
Rob Wilson, City of Pleasanton

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BOARD OF DIRECTORS

RESOLUTION NO 06-2796

INTRODUCED BY DIRECTOR MARCHAND
SECONDED BY DIRECTOR STEVENS

RESOLUTION APPROVING AND ADOPTING THE FINAL GROUNDWATER MANAGEMENT PLAN

WHEREAS, following publication of notice and conducting a public hearing, a Notice of Intent to Draft and Adopt a Groundwater Management Plan ("Notice of Intent") was adopted by the Zone 7 Board on August 21, 2005; and

WHEREAS, Zone 7 published said Notice of Intent in accordance with the requirements set forth in the California Groundwater Management Planning Act (Water Code Sections 10750, et seq.); and

WHEREAS, such notice also included a written statement describing the manner in which interested parties could participate in providing input on the groundwater management plan;

WHEREAS, copies of the Draft Groundwater Management Plan were made available for public review in local libraries, at the Zone 7 office and on the Zone 7 website; and

WHEREAS, Zone 7 distributed additional copies of the Draft Groundwater Management Plan to its water retail agencies, Dublin San Ramon Services District, California Water Service Company and the Cities of Livermore and Pleasanton; and

WHEREAS, Zone 7 received public comments on the document; and

WHEREAS, comments received were addressed in drafting a final version of the Groundwater Management Plan; and

WHEREAS, on September 21, 2005 the Zone 7 Board of Directors conducted a second public hearing on the September 2005 Groundwater Management Plan; and

WHEREAS, the Zone 7 Board of Directors considered both written and oral comments received on the Groundwater Management Plan;

NOW, THEREFORE, THE ZONE 7 BOARD OF DIRECTORS DOES HEREBY RESOLVE that the September 2005 Groundwater Management Plan referenced and incorporated herein, is hereby approved and adopted by this Board of Directors and shall be the basis for Zone 7's groundwater management policy for future activities.

BE IT FURTHER RESOLVED, as the GMP is a compilation of existing Zone 7 policies and practices and does not involve any changes or additions thereto, the Board of Directors hereby finds that the GMP is not project for purposes of CEQA and is thus exempt therefrom and directs the Clerk of the Board to file a Notice of Exemption with the County Clerk in compliance with CEQA Guideline 15062.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS CONCANNON, GRECI, KALTHOFF, KOHNEN, MARCHAND, QUIGLEY, STEVENS

NOES: NONE

ABSENT: NONE

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a resolution Adopted by the Board of Directors of Zone 7 of Alameda County Flood Control and Water Conservation District on

September 21, 2005

By _____
President, Board of Directors

NOTICE OF EXEMPTION

To: ☐ Office of Planning and Research
For U.S. Mail:
P.O. Box 3044
Sacramento, CA 95812-3044

Street Address:
1400 Tenth Street, Room 121
Sacramento, CA 94514

To: ☒ County Clerk
County of Alameda
1106 Madison Street
Oakland, CA 94612

From: ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA 94551

Lead Agency (if different from above):

Project Title: Groundwater Management Plan for Livermore-Amador Groundwater Basin

Project Location – Specific: Livermore-Amador Valley

Project Location – City: Cities of Livermore, Pleasanton, Dublin and Unincorporated Eastern Alameda County

Project Location – County: Alameda

Description of Nature, Purpose, and Beneficiaries of Project:

The Zone 7 Groundwater Management Plan (GMP) is a summary written to combine all of Zone 7's existing groundwater management efforts into a single document. The GMP provides a detailed description of Zone 7's existing groundwater management practices throughout the Livermore-Amador Valley Groundwater Basin and a description of the regulatory setting that involves a GMP.

Name of Public Agency Approving Project: Zone 7 Water Agency

Name of Person or Agency Carrying Out Project: Zone 7 Water Agency

Exempt Status: *(check one)*

☐ Ministerial (Sec. 21080(b)(1); 15268);

☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));

☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));

☐ Categorical Exemption. State type and section number:

☒ Statutory Exemptions. State code number: 14 CCR 15061.b.3

Reasons why project is exempt:

This Groundwater Management Plan is a requirement in the preparation and for the adoption of an Urban Water Management Plan pursuant to Section 10652 of the Water Code. The Plan is merely a compilation and summary of existing policies and practices without any changes or additions thereto thus there is no possibility that this plan will have a significant effect on the environment, therefore per the general rule of CEQA Guideline 15061.b.3, this activity is not subject to CEQA.

Lead Agency Contact Person: Mary Lim
Area Code/Telephone/Ext: 925-454-5036

If filed by Applicant:

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? ☐ Yes ☐ No

Signature: Mary Lim Date: 9/22/05 Title: Environmental Services Program Manager

☑ Signed by Lead Agency

Date received for filing at OPR: _____

☐ Signed by Applicant

Form 4. Environmental Declaration

*ENVIRONMENTAL DECLARATION

(Calif. Fish and Game Code Sec. 711.4)

NAME AND ADDRESS OF APPLICANT OR LEAD AGENCY:

Zone 7 Alameda County Flood Control and Water Conservation District

100 North Canyons Parkway

Livermore, CA 94551

FOR COURT USE ONLY

FILING NO.

CLASSIFICATION OF ENVIRONMENTAL DOCUMENT:

1. NOTICE OF EXEMPTION/STATEMENT OF EXEMPTION — PLU117

☒ A—STATUTORILY OR CATEGORICALLY EXEMPT
$25.OO (Twenty-Five Dollars) – CLERK's FEE

☐ B—DE MINIMUS IMPACT – CERTIFICATE OF FEE EXEMPTION REQUIRED — PLU 117
$25.OO (Twenty-Five Dollars) – CLERK's FEE

2. NOTICE OF DETERMINATION – FEE REQUIRED

☐ A—NEGATIVE DECLARATION — PLU 116
$1,250.OO (Twelve Hundred Fifty Dollars) – STATE FILING FEE
$25.OO (Twenty-Five Dollars) – CLERK's FEE

☐ B—ENVIRONMENTAL IMPACT REPORT — PLU 115
$850.OO (Eight Hundred Fifty Dollars) – STATE FILING FEE
$25.OO (Twenty-Five Dollars) – CLERK's FEE

3. ☐ OTHER (Specify)_____ — PLU117
$25.OO (Twenty-Five Dollars) – CLERK's FEE

* THIS FORM MUST BE COMPLETED AND SUBMITTED WITH ALL ENVIRONMENTAL DOCUMENTS FILED WITH THE ALAMEDA COUNTY CLERK'S OFFICE.

FIVE COPIES OF ALL NECESSARY DOCUMENTATION ARE REQUIRED FOR FILING PURPOSES.

APPLICABLE FEES MUST BE PAID AT THE TIME OF FILING AN ENVIRONMENTAL DOCUMENT WITH THE ALAMEDA COUNTY CLERK'S OFFICE.

MAKE CHECK PAYABLE TO: ALAMEDA COUNTY CLERK

Rev. 1/15/91–1056

Check Date: 09/21/2005

DP

Check No. 1014249

Invoice Number		Invoice Date	Voucher ID	Gross Amount	Discount Available	Paid Amount
9-19-05Exemptior	ZONE7	9/19/2005	00012582	25.00	0.00	25.00

Invoice Type : Government Fees

Use Tax : 0.00

Payment Comments: NOTICE OF EXEMPTION

RETURN CHECK TO QIC 90201 ATTN: M CHUN

Approved 09/20/2005 15.24.06 by ABAUTIST

Vendor Number	Vendor Name			Total Discounts$0.00	
0000032647	COUNTY OF ALAMEDA				
Check Number	Date		Total Amount	Discounts Taken	Total Paid Amount
1014249	9/21/2005		$25.00	$0.00	$25.00

CASGEM Compliance

California Statewide Groundwater Elevation Monitoring (CASGEM) eligibility for project proponents included in this Proposal is presented in Table 1-7 below. All Proposal project proponents with service areas within CASGEM Program high- and medium-priority groundwater basins are eligible for funding. Monitoring entities for all high- and medium-priority groundwater basins affected by the Proposal have been designated, or are in the process of being established and will be designated by the date of grant award. Supplemental documentation for Monitoring Entities in the process of being established are provided, as indicated in the table.

Agency service area GIS shapefiles for service area boundaries of project proponents are organized in separate folders within the zipped folder included in Attachment 1, File 10 of 11.

Table 1-7. CASGEM Compliance

Project Proponent	Project Number	Agency Service Area	Project Location and Coordinates[1]	GIS Shapefile(s) included with Application?[2]	Groundwater Basin	CASGEM Basin Priority	Monitoring Entity
Alameda County Water District*	10	The cities of Fremont, Newark, and Union City.	The Project includes Alameda County Water District's Service Area; Lat: 37.796714° Long: -122.266058°	Yes	Niles Cone subbasin (Basin Number 2-9.01)	Medium	Alameda County Water District
City of Calistoga	7	City of Calistoga	City of Calistoga; Lat: 38.578408° Long: -122.579200°	Yes	Napa Valley subbasin (Basin Number 2-2.01)	Medium	Napa County; CASGEM plan has been submitted to DWR and is in the final stages of approval.
City of Napa*	10	City of Napa	The Project includes all of the City of Napa; Lat: 38.296841° Long: -122.289419°	Yes	Napa Valley subbasin (Basin Number 2-2.01)	Medium	Napa County is in the process of finalizing a CASGEM plan. The plan has been submitted to DWR and is in the final stages of approval.
City of Sunnyvale	5	City of Sunnyvale	The Project will take place at the Sunnyvale Water Pollution Control Plan (1444 Borregas Avenue in Sunnyvale) and will add the Wolfe Road pipeline. Recycled water from the plant and pipeline will be used in Santa Clara County; Lat: 37.418282° Long: -122.020927°	No; refer to SCVWD's shapefile	Santa Clara subbasin (Basin Number 2-9.02)	Medium	SCVWD
CCWD*	10	Central and Eastern Contra Costa County.	The Project includes CCWD's entire service area; Lat: 37.796714° Long: -122.266058°	Yes	Tracy subbasin (Basin Number 5-22.01), Arroyo Del Hambre Valley (2-31), Pittsburg Plain (2-4), Clayton Valley (2-5), Ygnacio Valley (2-6)	Tracy subbasin: Medium Arroyo Del Hambre Valley, Pittsburg Plain, Clayton Valley, Ygnacio Valley: Very Low	Tracy subbasin: Diablo Water District is coordinating with DWR and plans to monitor the Tracy subbasin beneath CCWD's service area. Diablo Water District is an eligible entity per CWC Section 10927. **Relevant documentation is included with the application.**
DSRSD	6	The cities of Dublin, Pleasanton, and San Ramon and surrounding areas.	The Project consists of three pipeline projects in the cities of San Ramon and Dublin. The pipelines will serve customers in these cities; Lat: 37.716648° Long: -121.926575°	Yes	Livermore Valley (Basin Number 2-10)	Medium	Zone 7 Water Agency
EBMUD*	6, 10	331-square-mile service area extending from the cities of Crockett in the north to San Lorenzo in the south, east from San Francisco to Walnut Creek, and south through the San Ramon Valley.	The DERWA Project (Project 6) consists of three pipeline projects in the cities of San Ramon and Dublin. The pipelines will serve customers in these cities; Lat: 37.716648° Long: -121.926575° Project 10 includes EBMUD's service area; Lat: 37.796714° Long: -122.266058°	Yes	East Bay Plain subbasin (Basin Number 2-9.04), San Ramon Valley (Basin Number 2-7), Castro Valley (Basin Number 2-8)	East Bay Plain: Medium San Ramon Valley and Castro Valley: Very Low	EBMUD is coordinating with DWR to finalize a groundwater management plan. **Documentation is included with the application.**
MMWD*	10, 11	Marin County	Projects 10 and 11 will be implemented throughout Marin County; Lat: 37.976388° Long: -122.581550°	Yes	Sand Point Arena (Basin Number 2-27), Ross Valley (2-28), San Rafael Valley (2-29), Novato Valley (2-30)	Very Low	Not applicable

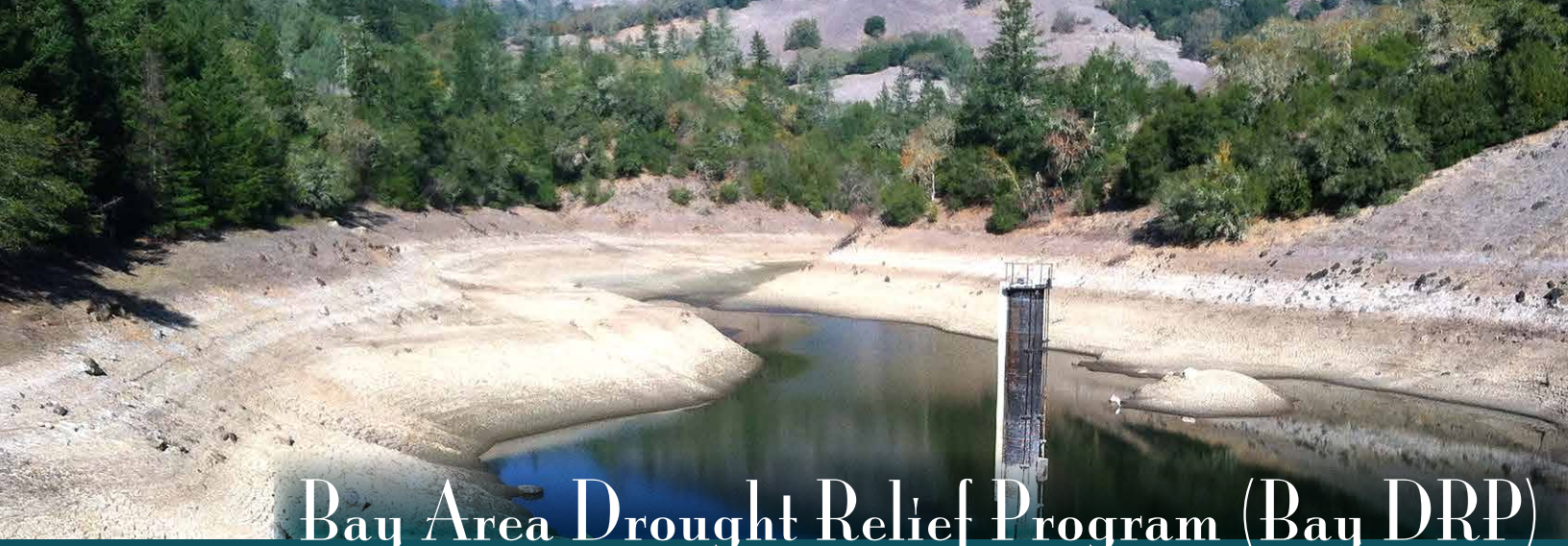
Project Proponent	Project Number	Agency Service Area	Project Location and Coordinates[1]	GIS Shapefile(s) included with Application?[2]	Groundwater Basin	CASGEM Basin Priority	Monitoring Entity
Napa Sanitation District	4	City of Napa and a small unincorporated area around the City of Napa	The Project will construct pipelines to transport water in Napa County and will transport water to lands within Napa County; Lat: 38.240282° Long: -122.326983°; and Lat: 38.279721° Long: -122.271825°	Yes	Napa Valley subbasin (Basin Number 2-2.01)	Medium	Napa County is in the process of finalizing a CASGEM plan. The plan has been submitted to DWR and is in the final stages of approval.
SFPUC*	1, 10	Counties of San Francisco, San Mateo, Santa Clara, and Alameda	Project 1 is located at the Lower Cherry Aqueduct, within the Hetch Hetchy Regional Water System. The service area includes communities within the San Francisco Bay Area; Lat: 37.935660° Long: -119.896621° Project 10 includes SFPUC's service area; Lat: 37.796714° Long: -122.266058°	Yes	The Lower Cherry Aqueduct Project does not overlie a groundwater basin. For the Regional Conservation Program (Project 10) being implemented in San Francisco, the following groundwater information applies. There are seven groundwater basins underlying the City and County of San Francisco: Westside (Basin Number 2-35), Downtown (2-40), Islais Valley (2-33), Marina (2-39), Lobos (2-38), South San Francisco (2-37), and Visitacion Valley (2-32).	All seven groundwater basins underlying the City and County of San Francisco: Westside have a priority ranking of Very Low.	Not applicable
San Mateo County RCD	8	San Mateo County	The Project will take place in San Mateo County; Lat: 37.291197° Long: -122.302593°	Yes	Pescadero Valley (Basin Number 2-26) and San Gregorio Valley (Basin Number 2-24)	Very Low	Not applicable
SCVWD*	2, 5, 10	Santa Clara County	Project 2 will occur at Rinconada Water Treatment Plant, which serves communities in Santa Clara County; Lat: 37.256616° Long: -121.983423° Project 5 will take place at the Sunnyvale Water Pollution Control Plan (1444 Borregas Avenue in Sunnyvale) and will add the Wolfe Road pipeline. Recycled water from the plant and pipeline will be used in Santa Clara County; Lat: 37.418282° Long: -122.020927° Project 10 includes SCVWD's service area; Lat: 37.796714° Long: -122.266058°	Yes	Santa Clara subbasin (Basin Number 2-9.02)	Medium	SCVWD
Solano County Water Agency*	10	Solano County	The Project includes Solano County Water Agency's entire service area; Lat: 37.796714° Long: -122.266058°	Yes	Suisun-Fairfield Valley (Basin Number 2-3) and Solano subbasin (Basin Number 5-21.66)	Suisun-Fairfield Valley: Very Low; Solano subbasin: Medium	Solano County Water Agency
Sonoma County Water Agency*	10	Sonoma County	The Project includes Sonoma County Water Agency's southern service area; Lat: 37.796714° Long: -122.266058°	Yes	Sonoma Valley subbasin (Basin Number 2-2.02	Medium	Sonoma County Water Agency is designated as the monitoring entity for Sonoma Valley subbasin and is working toward meeting CASGEM compliance.
Stinson Beach County Water District	9	Town of Stinson Beach and immediate surrounding area	The Project will construct infrastructure to provide water to the Town of Stinson Beach; Lat: 37.899758° Long: -122.639792°	Yes	Stinson Beach County Water District does not overlie DWR-identified groundwater basins	Not applicable	Not applicable

Project Proponent	Project Number	Agency Service Area	Project Location and Coordinates[1]	GIS Shapefile(s) included with Application?[2]	Groundwater Basin	CASGEM Basin Priority	Monitoring Entity
Zone 7 Water Agency*	3, 10	Eastern Alameda County	Project 3 includes a proposed well near Lake I and a pipeline between Cope Lake and Lake I. The Project is located in the Livermore Valley, between the cities of Livermore and Pleasanton. The Project serves communities in the Livermore-Amador Valley area. Cope Lake Pipeline: Lat: 37.683889° Long: -121.848889° Chain of Lakes Well No. 5: Lat: 37.691667° Long: -121.848056° Project 10 includes Zone 7 Water Agency's entire service area; Lat: 37.796714° Long: -122.266058°	Yes	Livermore Valley (Basin Number 2-10)	Medium	Livermore Valley: Zone 7 Water Agency Zone 7 Water Agency is also planning to monitor the Tracy subbasin (Basin Number 5-22.01; Medium CASGEM Basin Priority) and is currently working with DWR to finalize monitoring plans. **Relevant documentation is included with the application**

[1]*Because Project 10 (Bay Area Regional Drought Relief Conservation Program) includes agencies throughout the Bay Area, the Project coordinates shown in the table indicate the geographic center of the Bay Area.*
[2]*GIS shapefiles are provided in Attachment 1, File 10 of 11.*

Water Conservation Programs and Measures

Water drought relief projects included in this Proposal are all locally cost effective, and therefore qualify for funding support. Descriptions of project benefits quantified and annualized over the life of each project included in the Proposal are provided in Attachment 3. Other than the references provided with Attachment 3, no further documentation is submitted.



Bay Area Drought Relief Program (Bay DRP)

Attachment 2

Drought Impacts

Association of Bay Area Governments

Proposition 84

Integrated Regional Water Management

2014 Drought Grant Application

Drought Impacts and Funding Need 1
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Anticipated Water Conservation Measures if the Drought Continues 9
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The reference list and references for Attachment 2 are provided in File 2 of 3.

Supporting documents (i.e., drought declarations and conservation directives) from project sponsor agencies are provided in Attachment 2, File 3 of 3.

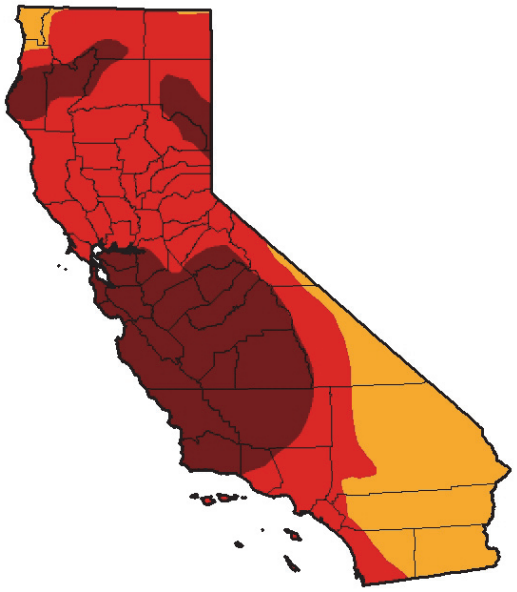
List of Acronyms and Abbreviations

ACWD	Alameda County Water District
AF	acre-feet
Bay DRP	Bay Area Drought Relief Program
cf	cubic foot
CCWD	Contra Costa Water District
CVP	Central Valley Project
DBPs	disinfection byproducts
Delta	Sacramento-San Joaquin River Delta
DSRSD	Dublin-San Ramon Services District
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
gpcd	gallons per capita per day
IRWM	Integrated Regional Water Management
MCL	maximum contaminant level
MMWD	Marin Municipal Water District
MST	Milliken-Sarco-Tulocay
Proposal	the proposal being submitted in response to the 2014 IRWM
PSP	Proposal Solicitation Package
RWQCB	Regional Water Quality Control Board
San Mateo County RCD	San Mateo County Resource Conservation District
SCVWD	Santa Clara Valley Water District
SFPUC	San Francisco Public Utilities Commission
SWP	State Water Project
THMs	trihalomethanes
Zone 7	Zone 7 Water Agency

Drought Impacts and Funding Need

Water supplies for the San Francisco Bay Integrated Regional Water Management (IRWM) Region include local surface water and reservoirs, groundwater, Sierra Nevada watersheds, and the Sacramento-San Joaquin River Delta (Delta). These supplies rely on local Bay Area precipitation and runoff, precipitation and snowpack in the Sierra Nevada Mountains, and precipitation in the northern and central parts of the state, all of which have been affected by the drought declared on January 17, 2014. Precipitation in the San Francisco Bay Region was only 60% of average over the period October 1, 2013, to May 1, 2014 (DWR, 2014a). Snow water content in the San Joaquin River Basin (including the Mokelumne and Tuolomne river watersheds, which supply the Bay Area) was at 20% of average on May 1, 2014 (DWR, 2014a). Lake Oroville, the principal reservoir for the State Water Project (SWP), was at 44% of its capacity on June 25, 2014 (53% of its historical average for the date) (DWR, 2014b). Exacerbating the water shortage situation, 2014 comes on the heels of 2013, which was one of the driest calendar years on record in the Bay Region (DWR, 2014c). Notably, 2012 was also a below-average water year (DWR, 2014d).

According to the U.S. Drought Monitor (June 24, 2014), Alameda, Contra Costa, Santa Clara, San Mateo, and San Francisco counties are experiencing "exceptional drought" conditions, while Marin, Sonoma, Napa, and Solano counties in the North Bay are under "extreme drought" conditions (National Drought Mitigation Center, 2014). The graphic below illustrates drought conditions in the Bay Area and California as a whole.



U.S. Drought Monitor

California

June 24, 2014

(Released Thursday, Jun. 26, 2014)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	100.00	76.69	32.98
Last Week 6/17/2014	0.00	100.00	100.00	100.00	76.69	32.98
3 Months Ago 3/25/2014	0.00	100.00	99.80	95.21	71.78	23.42
Start of Calendar Year 12/31/2013	2.61	97.39	94.25	87.53	27.59	0.00
Start of Water Year 10/1/2013	2.63	97.37	95.95	84.12	11.36	0.00
One Year Ago 6/25/2013	0.00	100.00	98.21	92.61	0.00	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Eric Luebehusen
U.S. Department of Agriculture

http://droughtmonitor.unl.edu/

Drought Impacts Experienced

The Bay Area has already experienced substantial impacts due to the 2014 drought. To date, emergency water shortage proclamations have been issued by the cities of St. Helena, Calistoga, and American Canyon in Napa County, the County of Sonoma, the Sonoma County Water Agency, Alameda County Water District, Zone 7 Water Agency, and the City of Mountain View (see File 3 of 3 for proclamations). The San Mateo County Sheriff noted in an Office of Emergency Services report of June 2, 2014, that streams "are beginning to dry up in the rural western part of the county" (Molver, 2014).

At risk of not meeting existing drinking water demands	The Bay Area's water supply is a mix of local groundwater, surface water, and water sources from outside the region (Sierra Nevada Mountains and Delta). While Bay Area water agencies are managing their local and imported water sources for maximum efficiency, several agencies are at risk of not meeting existing drinking water demands: • The Zone 7 Water Agency (Zone 7), the primary wholesaler for the Alameda-Livermore Valley (in the East Bay), will not meet all its drinking water demands this year. Zone 7 will receive only 5% of its SWP allotment this year (SWP normally provides 80% of Zone 7's annual supply). As a result, Zone 7 must rely on approximately 18,300 acre-feet (AF) of SWP Carryover Water and 20,500 AF of available groundwater supplies in 2014. This supply will only provide approximately 75% of Zone 7's water demands. The population Zone 7 serves is approximately 216,000 people (Zone 7 Water Agency, 2010: p. 2-6). • The Santa Clara Valley Water District (SCVWD), the primary wholesaler for Santa Clara County (South Bay), is receiving 50% of its Central Valley Project (CVP) municipal and industrial water allocation and only 5% of its SWP normal-year allocation. Due to these cutbacks, existing drinking water demands will not be met and the agency has reduced treated drinking water deliveries by 20% (SCVWD, 2014a: p. 4). Overall, the total estimated 2014 supply for Santa Clara County is 238,000 AF (SCVWD, 2014b: p. 3), which is about 60% of average (SCVWD, 2013a: p. 14). SCVWD serves 2 million people (SCVWD, 2013b). • In Napa County (North Bay), the lack of surface water supplies has triggered increased pumping in the already-overdrafted Milliken-Sarco-Tulocay (MST) groundwater basin, a declared Groundwater Deficiency Area that serves approximately 4,800 people. Landowners who have lost access to groundwater have begun to truck in their potable water supply. Calistoga (population 5,155) is currently in a Stage II Water Emergency with mandatory 20% conservation required. Calistoga is receiving only 5% of its SWP allotment this year and is relying almost completely on carryover water to accommodate the water demand. If the drought continues, Calistoga may run out of water supply next year. • In the Town of La Honda in San Mateo County, the local domestic water supplier has requested a 20% reduction in water use and is considering mandatory 50% water rationing for all customers (Cuesta La Honda Guild, 2014a; Cuesta La Honda Guild, 2014b). Some individual residents have already begun trucking in water from other areas. Alpine Creek, which may become dry over the summer months, is the only source of water for approximately 70 customers in the La Honda community, as well Camp Glenwood Boys Ranch and Sam McDonald Park. The County has informed the State and County Offices of Emergency Services, the State Department of Public Health, and other agencies of this potential emergency (County of San Mateo Department of Public Works, 2014a). • The Stinson Beach County Water District has implemented a Water Rationing Ordinance requiring a 20% reduction in domestic water use.
At risk of not meeting existing agricultural water demands	The Bay Area is world renowned for its viticulture and has significant agricultural water demand in the South and North subregions. The Bay Area is at risk of not meeting agricultural demands due to the drought, whether from reductions in SWP/CVP allotments or unavailability of local surface supplies: • SCVWD is discontinuing deliveries of raw surface water to agricultural customers (SCVWD, 2014c: p. 3). The District's CVP agricultural allocation for 2014 is zero. • Due to the drought, several agricultural landowners in the Los Carneros area of Napa County are trucking in water for use on their crops. A June 2014 survey in Carneros indicated that most irrigation supply pond levels are less than 33% of normal this year. Most growers have increased groundwater use to make up deficits in addition to truck imports. • Because of the drought, agricultural water demands in San Mateo County will not be met. The San Gregorio Creek Watermaster sent notices (May 16, 2014) to curtail irrigation water use to 2 days per week and curtail outside domestic use and commercial stock watering in the watershed (Fulwiler, 2014).
At risk of not meeting ecosystem water	The Bay Area Region is home to sensitive habitats and many endangered and threatened species, including salmonids such as steelhead and salmon, which spawn and rear in freshwater streams. Examples of ecosystem impacts due to the drought are described below:

demands	• In Santa Clara County, the lack of rainfall and cutbacks in imported water have reduced streamflow and affected habitat for special-status species, including steelhead (SCVWD 2014d). SCVWD has curtailed releases to creeks resulting in dry creek. Rodeo, Regnart, Calabazas, Saratoga, Alamitos and Calero Creeks in Santa Clara County were dry as of May 2014 and will remain dry until significant rainfall occurs (SCVWD, 2014d). • In coastal San Mateo County, flows in the San Gregorio Watershed are 10% of average this year (USGS, 2013; USGS, 2014). This perennial stream will dry up this summer and affect fish and wildlife such as California red-legged frog, coho salmon, steelhead, and tidewater goby. The photo on the right shows a steelhead stranded in a shallow pool in La Honda Creek (tributary to San Gregorio Creek). • At Stinson Beach in western Marin County, surface water sources in small creeks that drain the coast side of Bolinas Ridge are greatly reduced, resulting in reduced water supply for the Stinson Beach County Water District and fish and wildlife that share the limited surface water resources.
Drinking water MCL violations	Drinking water maximum contaminant level (MCL) violations will occur if the drought continues and treated water providers are forced to use alternate water supply sources with poorer water quality. This is a regional issue across the Bay Area and is illustrated by conditions at SCVWD's Rinconada Water Treatment Plant in Los Gatos. The quality of source water for the treatment plant has declined due to the drought. Since January 2014, source water delivered to the plant has been high in total dissolved solids, total organic carbon, and bromide, which are precursors to formation of disinfection byproducts (DBPs) such as trihalomethanes (THMs). SCVWD has been forced to apply costly water treatment additives (i.e., powdered activated carbon). Without this treatment additive, concentrations of THMs in drinking water supplies will exceed MCLs. MCL violations for THMs have not occurred yet in 2014, but THM levels have come close to reaching the MCL. As the drought continues, contaminant levels will exceed allowable limits without additional treatments or use of additives.
Groundwater basin overdraft	Groundwater basins in the Bay Area support potable and agricultural water demand. Due to the drought and reduced surface water supply, groundwater pumping has increased in the region, particularly where agricultural irrigation demand is high. The Bay Area Drought Relief Program (Bay DRP) will address groundwater drought impacts: • Increased pumping in Santa Clara County has lowered groundwater levels and increased overdraft. In April 2014, groundwater levels in San Jose were about 22 feet lower than in April 2013, and 21 feet lower than the 5-year average (SCVWD, 2014e). SCVWD's groundwater recharge program has been significantly reduced due to the drought. The SCVWD estimates only 25% (about 25,000 AF) of the normal recharge water supply will be available for recharge into local basins in 2014 (SCVWD, 2014c: p. 2). • The drought has worsened groundwater overdraft in the MST basin in Napa County. The MST is in overdraft by an estimated 2,000 AF/year. The MST area includes both rural residential properties and agricultural properties that rely solely on groundwater. Of the groundwater pumped, 45% is used for agriculture, 29% for open-space irrigation, and 27% for domestic use. The drought has significantly reduced natural aquifer recharge to the basin.

Discharge water TMDL violations	Over 200 water bodies in the Bay Area are water quality impaired. The Regional Water Quality Control Board (RWQCB) has established 12 TMDLs to address these impairments. San Francisco Bay dischargers are restricted from discharging sediment, mercury, and certain toxic substances in excess of TMDL requirements. Under the current drought conditions, water supplies are reduced, but water pollutants will likely continue to be discharged to the Bay. With implementation of the recycled water projects included in this Proposal, wastewater discharges to the Bay will be reduced over time to help protect against future exceedances of water quality standards (by reducing discharge of water quality contaminants carried in treated wastewater). Without the recycled water projects included in this Proposal, wastewater discharge contaminants in the future may exceed TMDL requirements.
Other drought-related adverse impacts	The drought has resulted in other adverse impacts, including impacts to recreation and park closures. Many parks along the coast have limited water storage and are dependent upon small streams (which are in turn dependent on regular local rainfall) and are therefore vulnerable to fluctuations in climate and precipitation: • Lack of water in Pescadero Creek has prompted San Mateo County to close the Memorial Park Campground for the 2014 camping season (Murtert, 2014). Beginning June 16, water was shut off to drinking fountains, showers, and toilets. The 2,250 people who made reservations to camp in the park in 2014 will have the option of either receiving a refund, transferring their reservations to the 2015 season, or, in some cases, making reservations to camp at other county parks. This closure is the first in the park's history (Murtert, 2014).

As described above, the Bay Area Region is already experiencing six of the seven specific drought impacts identified on page 20 of the Proposal Solicitation Package (PSP): at risk of not meeting existing drinking water demands; at risk of not meeting existing agricultural water demands; at risk of not meeting ecosystem water demands; drinking water MCL violations; groundwater basin overdraft; and other drought-related adverse impacts (i.e., recreational impacts). The Bay Area Region is **severely** impacted by 2014 regional drought conditions. Documentation of drought declarations and conservation directives issued by Proposal project sponsors is provided in Attachment 2, File 3 of 3.

Potential Impacts if Drought Continues

If drought or dry-year conditions continue into 2015, remaining water supplies in the Bay Area Region would be further reduced, which would necessitate mandatory and severe rationing (targeting 40-60% reductions for some areas). Water quality impacts (e.g., formation of DBPs, increased salinity), ecosystem impacts, groundwater overdraft, and other regional water management and resource impacts would also worsen. Examples of potential impacts if the drought continues into 2015 are presented below and are organized by sub-region.

East Sub-Region: Dublin-San Ramon Services District (DSRSD) and the East Bay Municipal Utility District (EBMUD) are at risk of not meeting drinking water and other demands if the drought continues into 2015. DSRSD supplies potable and recycled water to approximately 18,000 customers in Alameda and Contra Costa counties (DSRSD, 2011: p. 1), while EBMUD serves approximately 1.34 million people in the East Bay (EBMUD, 2011: p. 1-2). DSRSD's available water supply has been reduced by more than 25% in 2014 and the District has issued a 25% mandatory conservation ordinance. DSRSD purchases its entire water supply from Zone 7, which, as mentioned above, will receive only 5% of its SWP allotment in 2014. DSRSD is already in Stage 3 of its Water Shortage Contingency Plan. If the drought continues and storage cannot meet public health and safety needs, DSRSD would then declare Stage 4, which could result in discontinuation of service to non-essential facilities in 2015.

EBMUD's available water supply is well below average. EBMUD obtains 90% of its water supply from the Mokelumne River watershed in the Sierra Nevada Mountains. Due to the 2014 drought, EBMUD's post-1914 water right supply from the Mokelumne River was reduced by 4,000 AF as of May 2014 and may continue at this reduced level until water conditions improve in the state (SWRCB, 2014). As of June 2014, precipitation in the Mokelumne River watershed (including snowfall) is only 54% of average and the EBMUD storage system is at 71% capacity (EBMUD, 2014a). EBMUD has a limited drought-year supplemental supply through a CVP contract with the U.S. Bureau of Reclamation. This supply was reduced by 50% this year and is expected to be further reduced next year if the drought continues.

The Contra Costa Water District (CCWD) could face significant water quality impacts if the drought continues into 2015. CCWD receives 100% of its supply from the Delta and serves 500,000 people in the Cities of Antioch, Concord,

Martinez, and Pittsburg. While it normally blends water obtained from the Delta with higher quality water from Los Vaqueros Reservoir during the summer months to reduce salinity levels, this year salt levels have been rising earlier than normal (Sommer, 2014: p. 4). While treatment plants can handle high salinity levels, poor water quality raises their operating costs (Sommer, 2014: p. 4).

South Sub-Region: If the drought continues, SCVWD may need to implement Stage 5 of its Water Shortage Contingency Plan, which could require water use reductions of up to 50%. As SCVWD is the wholesale water provider for the Santa Clara Valley, such mandatory cutbacks would affect many cities (e.g., City of Sunnyvale), people, and businesses in the Bay Area. Existing drinking water demands and agricultural water demands would not be met, and more creeks and ponds would go dry. Ongoing water quality and groundwater overdraft issues would be exacerbated.

West Sub-Region: The San Francisco Public Utilities Commission (SFPUC), which is the retail water provider to San Francisco, much of the Peninsula, and also a wholesale provider to numerous cities and agencies in the South and East Sub-Regions, has requested 10% voluntary rationing across its service area in 2014. Assuming its customers continue to heed that call for conservation, SFPUC is not immediately faced with the prospect of mandatory rationing. If the drought continues into the winter of 2014/15 and beyond, SFPUC will need to maintain or increase rationing and possibly move to mandatory cutbacks. That could result in rationing of some individual wholesale customers up to 40%.

In San Mateo County, ongoing drinking water and agricultural water supply shortages, ecosystem impacts, and other adverse impacts (e.g., recreation facility closures) would continue and worsen if the drought persists. Drinking water would require continued trucking in and agricultural water users in the area would be forced to fallow fields. MCL violations could also occur as Skylonda Mutual Water Company and Cuesta La Honda Guild both have water quality problems that arise when surface water supplies are low. Skylonda has low-producing wells with high barium levels. Cuesta La Honda has an unlined reservoir with turbidity issues when water levels are low.

North Sub-Region: If the drought continues into 2015, ongoing water supply and groundwater overdraft issues in the Napa Valley would continue and worsen. Landowners in Napa Sanitation District's service area are already trucking in water, and the need for this practice would continue and worsen into 2015. Other agricultural water users in the area already overpump groundwater and will also likely be forced to truck in water or allow fields to go fallow if groundwater levels decline further into 2015, such that groundwater wells are no longer productive.

The City of Calistoga faces the real possibility of running out of water if the drought continues into 2015. About 50% of the City's current water supply is from the SWP and the balance is from Kimball Reservoir (a local surface water supply reservoir). The City is currently meeting its demands with SWP carry-over water. If the drought continues and the carry-over water ceases, the City could run out of water in 2015. If the drought continues and flows in the Napa River are reduced further, the City's existing treated wastewater effluent discharges may result in TMDL and discharge permit violations (i.e., reduced mixing with Napa River flows and increased nutrient concentrations).

If the drought continues into 2015, Marin Municipal Water District (MMWD) could be forced to implement mandatory rationing, potentially up to 50%. Currently, a request for 25% voluntary reduction in water use remains in effect, and greater mandatory cutbacks may be necessary in the future. MMWD's water supply is extremely vulnerable because it depends upon regular local rainfall. Local storage is limited, so even when maximized, the supply does not last long.

Similar to MMWD, Stinson Beach's water supply is extremely vulnerable to variations in precipitation and climate. If the drought continues into 2015, Stinson Beach County Water District will enact more severe water rationing (beyond the current mandatory 20%), likely resulting in park closures and recreational impacts. Each year large numbers of summer vacationers visit the Town of Stinson Beach, Mt. Tamalpais State Park, and the Golden Gate National Recreational Area surrounding the town, increasing SBCWD's water demand from 3 million gallons per month in the winter to 6 million gallons per month in the summer.

Summary of Drought Impacts

In summary, the Bay Area Region has experienced numerous impacts from the 2014 drought, including being at risk to not meet drinking water, agricultural, and ecosystem water demands. The drought has also caused water quality and groundwater impacts in the Region. As described above, these impacts will become greater and more severe if the drought continues into 2015. The projects included in this Proposal will provide immediate relief to people, wildlife, and the economy of the Region by helping to alleviate these impacts. Many of the projects included in the Proposal would support water supply reliability and delivery of safe drinking water to Bay Area communities in need.

Water Conservation Measures

As a result of the 2014 drought, water conservation measures and restrictions have been implemented by virtually all water service providers in the San Francisco Bay Region, including the member agencies in this Proposal. New 2014 measures and restrictions are being implemented on top of past and ongoing conservation efforts that have been in place for many years. The Bay Area's per-capita water use is 157 gallons per capita per day (gpcd), among the lowest in the state (BAIRWMP, 2013: p. 4-21). This low usage rate is the result of past and ongoing conservation programs and incentives.

Regional and agency-wide conservation has been implemented since 2012 through the Bay Area Regional Conservation Program (see Project 10). Water conservation efforts have included rebates and incentives for high-efficiency devices and lawn-to-landscape conversions, education and workshops on conservation, and direct installation of water-saving devices. While these efforts have accomplished significant water use reduction, more conservation is needed. Due to the severity of the 2014 drought, voluntary and mandatory cutbacks have already proven necessary across the Bay Area despite the Region's relatively low existing water usage. More severe rationing will likely be required without additional conservation programs.

Water Conservation Measures Being Implemented

Table 2-1 summarizes our proposal team's current conservation measures to address the 2014 drought. The project proponents included in this Proposal represent the major water providers in the Bay Area, and their conservation measures represent region-wide conservation efforts. Documentation of all water conservation directives is provided in Attachment 2, File 3 of 3.

Table 2-1. 2014 Conservation Measures Implemented by Proposal Project Proponents

Sub-Region	Project Proponent*	Voluntary/ Mandatory	Target Reduction	Date Adopted
East	Alameda County Water District	Mandatory	**20%**	March 13, 2014
	CCWD	Voluntary	15%	March 19, 2014
	DSRSD	Mandatory	**25%**	May 5, 2014
	EBMUD	Voluntary	10%	February 11, 2014
	Zone 7 Water Agency	Mandatory	**25%**	January 29, 2014
South	SCVWD	Mandatory	**20%**	February 25, 2015
	City of Sunnyvale	Mandatory	**20%**[1]	February 25, 2015
West	SFPUC	Voluntary	10%	January 31, 2014
	San Mateo County RCD	Voluntary	**20%**[2]	March 7, 2014
North	City of Calistoga	Mandatory	**20%**	February 4, 2014
	City of Napa	Voluntary	**20%**	May 20, 2014
	MMWD	Voluntary	**25%**	January 21, 2014
	Sonoma County Water Agency	Voluntary	**20%**	February 3, 2014
	Stinson Beach County Water District	Mandatory	**20%**[3]	April 1, 2014
	Solano County Water Agency	N/A	N/A[4]	N/A
	Number of Agencies Implementing 20% (or More) Reduction Conservation Measures:		11/15 **(73%)**	

*Some agencies are participants in multiple projects.
[1] Sunnyvale is following its wholesaler's (SCVWD's) directive.
[2] In San Mateo County, the local water provider (Cuesta La Honda Guild) targeted a 20% reduction, but conservation efforts have

achieved a 30% reduction in water use in 2014.

[3] The District's April 1, 2014 Water Rationing Ordinance required mandatory water use restrictions for domestic and commercial users equivalent to 27% and 20% mandatory restrictions, respectively.

[4] A 20% reduction applies to the City of Benicia only – Solano County Water Agency has not issued a conservation directive for its service area.

As shown in Table 2-1, 73% of water supply project proponents are implementing mandatory or voluntary conservation measures of at least 20%. This proportion of proponents is within the 60-79% bracket described in the PSP, which equates to a score of 4 points out of 5.

The percentage of project proponents implementing 2014 conservation measures of 20% or more should be considered in light of existing and ongoing conservation efforts. Past conservation efforts, and efforts already in place, have enabled some water agencies to avoid making deeper cuts in water use (i.e., 20% or more) during the 2014 drought. EBMUD and SFPUC are two of the largest water suppliers in the Region and both have successful long-term, ongoing conservation programs/measures. EBMUD and SFPUC are both currently asking customers for less than a 20% reduction in water use based on the effectiveness of past and ongoing programs. EBMUD customers have already reduced water use by 17% since 2007 (EBMUD, 2014a). In EBMUD's service area, the average per capita water use (indoor and outdoor) for a single-family residential customer was 100 gallons per day in 2009 (EBMUD, 2011b: p. 1-3).. Average water use in California as a whole is 198 gallons per capita per day (gpcd) (DWR, 2013: p. 6). SFPUC retail customers also have low existing per-capita water use. In 2010, per-capita water use in SFPUC's retail water service area was approximately 85 gpcd, while residential per-capita use was 50 gpcd (SFPUC, 2011: p. 33-34). San Francisco and cities in EBMUD's service area (e.g., Berkeley, Oakland) also have higher population densities and less outdoor landscaping than in other parts of the Bay Area Region and state. These factors have allowed EBMUD and SFPUC to avoid implementing stricter water rationing despite the severity of the 2014 drought.

In addition to the numerical conservation targets listed in Table 2-1, project proponents have implemented more specific conservation measures and water use restrictions. For the water providers and partners hardest hit by the 2014 drought, such as Zone 7, DSRSD, San Mateo County RCD, City of Calistoga, SBCWD, and SWP/CVP contractors, conservation efforts have intensified, resulting in immediate actions to address drought impacts. Conservation measures have included water shortage pricing, restrictions on timing and frequency of water use, prohibitions on excessive water use (e.g., refilling pools, hosing off sidewalks), reduced deliveries, conservation incentives (rebates), and penalties for non-compliance.

For example, Zone 7 Water Agency has enacted a number of measures, as dictated by Stage 2 of its Water Shortage Action Plan, including the following prohibitions: no watering during or less than three days after a rain event; no irrigation that results in ponding, flooding, excessive runoff, or marshy conditions; no watering during daylight hours; no refilling swimming pools; no use of non-recycling decorative fountains. DSRSD, which purchases water from Zone 7, has implemented water shortage rates (e.g., 2.8 times baseline for Tier 3 residential customers and all potable irrigation customers), as well as restricting commercial and residential irrigation and other water uses (e.g., watering only allowed two days per week from June to September, no hosing off sidewalks) (DSRSD, 2014). To ensure compliance, DSRSD has established the following enforcement and penalty provisions (DSRSD, 2014):

1st Violation:	District issues warning orally (telephone call, site visit) or in writing (door hanger, letter) specifying the violation and what the customer must do to correct it
2nd Violation:	$250 penalty
3rd Violation:	Additional $500 penalty
4th Violation:	Additional $1,000 penalty
5th Violation:	Reduction in water delivered to that customer via a flow restrictor or disconnection of water service

EBMUD is offering a discount landscaping mulch coupon program, in partnership with CCWD, as well as a free WaterSmart Home Survey Kit (EBMUD, 2014b) to help its customers conserve more water.

ACWD has declared a water shortage emergency and adopted water use regulations and restrictions similar to those adopted by DSRSD and Zone 7, including irrigation restrictions (e.g., two days per week during the period June 1

through September 30) and prohibitions on certain water uses (e.g., hosing off sidewalks). To ensure compliance, ACWD has given notice to its customers that it will enforce its water use restrictions as follows: (1) written warning; (2) on-site notification; (3) termination of water service; (4) reconnection charge for restoration of water service.

SCVWD has reduced treated water deliveries to its wholesale customers by 20% and agricultural demands are not being met at all in 2014. SCVWD has also offered landscape conversion rebates, a "Laundry to Landscape" graywater rebate program, and rebates for efficient commercial food steamers and clothes washers (SCVWD 2014f).

In support of its current 10% water use reduction goal, SFPUC has directed its customers to take the following actions:

- Minimize indoor water use: take shorter showers, run only full loads in dishwasher and clothes washer.
- Limit landscape watering to twice per week and adjust irrigation to avoid overspray and runoff.
- Minimize water used to clean sidewalks and outdoor surfaces unless required for public health purposes.
- Provide water only upon request at restaurants.
- Minimize car washing or use a commercial car wash; avoid washing cars at home.
- Repair or replace inefficient or leaking equipment as soon as possible.

SFPUC, as a participant in the Bay Area Regional Conservation Program, also offers rebates to residential customers who replace their toilets and washers with high-efficiency models, as well as rebates and incentives for rainwater harvesting, commercial toilet and urinal replacement, commercial washer and other equipment replacement, and Laundry-to-Landscape gray-water starter kits (SFPUC, 2014).

In coordination with SFPUC, the City of San Francisco has taken action to address the drought. Executive Directive 14-01, issued by the Mayor's Office on February 10, 2014, called on all city departments to take immediate steps to reduce water consumption with a goal of achieving a 10% reduction (Office of the Mayor, City and County of San Francisco, 2014). The directive requires all departments to (1) develop a Water Conservation Plan that includes an inventory of all departmental plumbing fixtures and their flow rates, a timeline for retrofitting inefficient plumbing fixtures with high-efficiency models, and a list of best management practices for water conservation (e.g., maintenance of medians and other landscapes); (2) educate staff and visitors on water conservation practices; (3) explore the use of non-potable water for street cleaning; and (4) develop alternative sources of water supply (e.g., groundwater, recycled water, foundation drainage) (Office of the Mayor, City and County of San Francisco, 2014).

In rural San Mateo County, a number of conservation measures have been implemented. The San Gregorio Creek Watermaster issued a notice to second-priority water users to curtail their diversions from San Gregorio Creek to 2 days per week (Fulwiler, 2014). The County of San Mateo Department of Public Works (2014b) requested that customers conserve water, including the following water-saving tips:

- Landscape with plants and flowers that use 50% less water.
- Clean driveways and sidewalks with a broom instead of a hose to save about 150 gallons per month.
- Run full loads in the washing machine and dishwasher to save about 800 gallons per month.
- Take 5-minute showers while using a low-flow showerhead to save about 600 gallons per month.

Signs urging water conservation have also been placed along Highway 84 and at the entrance to the community of La Honda in San Mateo County. These and other voluntary conservation measures have successfully reduced residential water use in La Honda by 30%. In addition, due to low water levels in Pescadero Creek, the San Mateo County Parks Department has closed several campgrounds for the 2014 camping season due to lack of adequate water supply (Murtert, 2014).

MMWD has issued a dry-year water ordinance, which includes prohibitions on washing sidewalks and driveways, restrictions on irrigation (no runoff or overspray allowed), requirements for high-efficiency indoor plumbing fixtures and water-efficient landscaping in new buildings/developments, and other measures (MMWD, 2011: p. 119a-119l). MMWD has also provided rebates for water-efficient appliances (MMWD, 2014a).

The City of Calistoga has declared a Stage II Water Emergency, including restrictions on outdoor irrigation and on water use in restaurants, hotels, and spas. Violation of City-mandated best management practices is subject to issuance of a notice of violation or other citation and also subject to monetary penalties.

In Stinson Beach, SBCWD is using the following enforcement and penalty provisions (in effect April 1, 2014) to achieve its mandatory rationing allocation (125 gallons per residence per day):

1. Notice #1 (a warning notice) will be sent with the May bill to reduce water usage if the customer's monthly usage for April exceeds 125 gallons per residence per day (55 cubic feet per month).
2. If a subsequent over-usage occurs, Notice #2 (a violation notice) will be sent no earlier than June and a fine of $400 will be charged.
3. If another subsequent over-usage (violation) occurs, Notice #3 will be sent no earlier than July, a cease-and-desist order will be issued, water will be turned off, and water service will be terminated.
4. Excessive water consumption in violation of the ordinance will result in termination of water service. A charge shall be paid prior to reactivating a service that has been terminated.

Anticipated Water Conservation Measures if the Drought Continues

If drought or dry-year conditions continue into 2015, Bay Area water providers will be forced to implement additional mandatory and severe conservation measures, as prescribed in the Water Shortage Contingency Plans in their Urban Water Management Plans, and/or as dictated by their ordinances and decisions made by governing boards. For many project proponents, the next step in their contingency plans is the emergency stage, with mandatory rationing up to 50%. For other proponents, the next step is a shift from voluntary to mandatory rationing. If the drought continues into 2015, treated and untreated water deliveries may be cut back substantially or discontinued altogether, water use prohibitions may be enacted or expanded, and parks and other public facilities may be closed. Examples of possible conservation measures to be implemented by project proponents if the drought continues are provided below.

East Sub-Region: If the drought continues into 2015, DSRSD will likely enact Stage 4 (the final stage) of its Water Shortage Contingency and Drought Plan, required for a 50% or greater water supply shortage (DSRSD, 2011: p. 124). Stage 4 would enact additional measures on top of Stage 3 measures that are currently in place, including (1) shut down or prohibit use of any water at water theme parks; (2) prohibit turf irrigation and allow hand watering of other landscaping only on Saturday or Sunday; (3) prohibit draining and refilling of public swimming pools unless required for health or structural reasons; and (4) prohibit use of non-efficient washing machines at laundromats (DSRSD, 2011: pp. 126-127). Stage 4 of DSRSD's Water Shortage Contingency and Drought Plan also includes increased rates, with water supply shortage rates at 3.8 times the baseline rate for Tier 3 residential customers and all potable irrigation customers (i.e., $5.53 per cubic foot [cf]), consistent with a 50% water use curtailment (DSRSD, 2014).

South Sub-Region: If the drought persists into 2015, SCVWD could enter Stage 5 (the final stage) of its contingency plan (already in Stage 4), which requires 50% mandatory water use reduction. Stage 5 of SCVWD's plan is considered an emergency and is triggered when projected groundwater reserves are below 150,000 AF (SCVWD, 2010: p. 6-4). As described in SCVWD's Urban Water Management Plan, in this last stage, water supply would be available only to meet health and safety needs (SCVWD, 2010: p. 6-4). Because SCVWD is a water wholesaler, the cities and water retailers it serves would be responsible for implementing water contingency plan actions identified in their own Urban Water Management Plans to achieve the 50% water use reduction necessary for a Stage 5 emergency (SCVWD, 2010: p. 6-4).

West Sub-Region: If the drought continues into the winter of 2014/15 and beyond, SFPUC will need to maintain or increase rationing and potentially move to mandatory cutbacks. This could result in rationing customers up to 40%. SFPUC is currently in Stage 1 (of 3) of its Water Shortage Allocation Plan. Stage 2 is triggered when overall system shortage exceeds 20% and involves mandatory restrictions for a target water use reduction of 11-20% (SFPUC, 2011: p. 61). Stage 3 is triggered when overall system shortage exceeds 50% and involves mandatory actions/restrictions necessary to achieve a target water use of greater than 20% (SFPUC, 2011: p. 61). Mandatory actions required in Stage 2 and 3 include the following: (1) no water waste, no irrigation runoff into street or gutters; (2) no water for cleaning sidewalks, driveways; (3) restaurants to provide water only upon request; (4) new construction water connections to have mandatory water-saving fixtures; and (5) all cooling water must be recycled (SFPUC, 2011: p. 62).

If the drought continues in San Mateo County, mandatory and severe conservation measures may be implemented and community facilities may be closed. The Board of the Cuesta La Honda Guild is looking into modifying the agency's bylaws so that mandatory 50% allotment reductions can be extended beyond 3 months if needed. Memorial Park campgrounds will likely be closed again in 2015 if the drought persists, as well as other community facilities.

North Sub-Region: MMWD could move to mandatory rationing if the drought continues. MMWD's rationing levels, identified in its Water Shortage Contingency Plan, are dictated by water supply conditions, as shown in Table 2-2.

Table 2-2. MMWD Water Shortage Contingency – Water Supply Conditions and Rationing Levels

Stage	Water Supply Conditions	% Reduction
Alert Stage (Voluntary Rationing)	Total reservoir storage is less than 50,000 AF on April 1	10%
Mandatory Rationing	Total reservoir storage is less than 40,000 AF on April 1	25%
Water Shortage Emergency	Total reservoir storage on December 1 is projected to be in the vicinity of, or less than, 30,000 AF	Up to 50%

Source: MMWD, 2011: p. 5-4

As of June 29, total reservoir storage in MMWD's system was 59,971 AF (75% of total, or 90% of average storage for that date) (MMWD, 2014b). However, as in other coastal areas in the Region (e.g., San Mateo County, Stinson Beach), Marin's water supply is extremely vulnerable because it depends upon immediately local rainfall in Marin watersheds and local storage is limited, so even when maximized, the supply does not provide multi-year coverage. If the drought continues into 2015, MMWD may be forced to consider mandatory rationing of 25-50%.

If the drought continues, mandatory conservation measures already being implemented in Calistoga and Stinson Beach will be continued and expanded. Calistoga may run out of water supply if the drought continues. Outdoor irrigation for landscaping and agriculture would be further restricted and non-essential uses of water (e.g., parks) may be discontinued altogether.

Summary of Water Conservation Measures

In summary, water conservation measures are being implemented by virtually all the water providers in the Bay Area. Of the project proponents included in this Proposal, 73% are implementing mandatory or voluntary measures of 20% or greater and many are implementing measures restricting wasteful or unnecessary uses of water, such as hosing off sidewalks and refilling swimming pools. The projects included in this Proposal would provide immediate drought relief to people, wildlife, and the economy of the San Francisco Bay Region and may avoid the necessity of implementing many of the more extreme, economically damaging conservation measures described above.

File 2 of 3: Drought References

These are the references cited in Attachment 2. Copies of the references provided in this file are numbered at the top to match the list below.

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Reference 1

San Francisco Bay Area
Integrated Regional Water Management Plan

September 2013

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enhance, and maintain environmental resources and habitats.

Existing Bay Area Efforts

There is widespread implementation of this management strategy throughout the Bay Area. Over the last twenty plus years, the population in the Bay Area has increased significantly while water use has remained relatively constant, due in part to increases in urban water use efficiency (refer to Section 2.4, Chapter 2). An analysis of statewide and regional water consumption estimated that the Bay Area's per capita water use was among the lowest in the state, at 157 gallons per capita per day (DWR 2010).

Most Bay Area water agencies are members of the California Urban Water Conservation Council (CUWCC) and have committed to implementing Best Management Practices (BMPs) to reduce California's long-term urban water demands. In 2009 the CUWCC adopted changes to the list of BMPs to provide more flexibility in achieving water conservation while identifying BMPs all members are expected to implement ("Foundational BMPs") as a matter of their regular course of business, including Utility Operations (metering, water loss control, pricing, use of a conservation coordinator, wholesale agency assistance programs and water waste ordinances) and Education (public information and school education programs).

Additionally, as described in Section 2.4, the Water Conservation Bill of 2009 requires progress towards a statewide 20 percent reduction in per capita water use by 2020, and mandated that each urban retail supplier establish a water use target in the 2010 UWMPs. The legislation further requires that retailers report an interim 2015 water use target, their baseline daily per capita use, and 2020 compliance daily per capita use, along with the basis for determining those estimates.

Conservation programs being implemented by Bay Area water agencies, often in partnership with land use agencies, include:

- Residential Water Surveys
- Residential Plumbing Retrofits
- High Efficiency Toilet (HET) Rebates
- System Water Audits
- Metering
- Large Landscape Programs
- Washing Machine Rebates
- Public Information Programs
- School Education Programs
- Regional Water Campaigns
- Commercial, Industrial, Institutional Programs
- Wholesale Assistance
- Conservation Pricing
- Conservation Coordinator
- Water Waste Prohibitions
- Replacement
- Weather-based Irrigation Controller
- Bay Friendly Landscape Program

4.2.2 Strategies to Improve Operational Efficiency

This set of management strategies targets improvements in the efficiency, reliability and effectiveness of water supply storage and delivery systems to provide multiple benefits associated with water supply reliability, flood hazard management, environmental resource protection, and, in some cases, public access and recreation.

Reference 2

COUNTY OF SAN MATEO
DEPARTMENT OF PUBLIC WORKS

James C. Porter
Director

County Government Center
555 County Center, 5th Floor
650-363-4100 T
650-361-8220 F
www.smcgov.org

POTENTIAL WATER SHORTAGE!!! CONSERVATION NEEDED!!!

June 6, 2014

Re: Water Conservation in CSA-7

Dear CSA-7 Water System Customers:

On January 31, 2014 we asked that you conserve water in every way possible due to the drought conditions. We thank you for your efforts to date.

As you are aware, Alpine Creek (Creek) is CSA-7's only source of water approved by the California Department of Public Health. CSA-7 has been monitoring the depth of the Creek flow at the system intake for the last few months. Based on our recent monitoring, it appears that the Creek may become dry over the summer months. Should the Creek reach a critical depth above the system intake, CSA-7 will not be able to draw water from the Creek.

CSA-7 has informed the State and County Offices of Emergency Services, the County's Environmental Health Division, and the State Department of Public Health of its current situation and the potential need to acquire water from other sources. To prepare for this potential emergency, staff is working with these agencies and other water providers in the County to formulate a contingency plan should CSA-7 not be able to pump water from the Creek.

Conserving water can be as simple as turning off water when not in use, fixing leaks, washing full loads of laundry, etc. More information on water conservation can be found at:

http://www.wateraware.org/

We appreciate your ongoing efforts in conserving water and will inform you if there are changes to the current situation. If you have any questions please call (650) 363-4100.

Very truly yours,

Mark Chow

Mark Chow, P.E.
Principal Civil Engineer
Utilities-Flood Control-Watershed Protection

mc
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cc: Supervisor Horsley, District 3, County of San Mateo
James C. Porter, P.E., Director of Public Works
Ann M. Stillman, P.E., Deputy Director of Public Works

Reference 3

COUNTY OF SAN MATEO

BOARD OF SUPERVISORS
DAVE PINE
CAROLE GROOM
DON HORSLEY
WARREN SLOCUM
ADRIENNE J. TISSIER

Department of Public Works

JAMES C. PORTER
DIRECTOR

555 COUNTY CENTER, 5TH FLOOR • REDWOOD CITY • CALIFORNIA 94063-1665 • PHONE (650) 363-4100 • FAX (650) 361-8220

WATER CONSERVATION ALERT!!!

January 31, 2014

Re: Water Conservation in CSA-7

Dear CSA-7 Water System Customers:

On January 17, 2014 Governor Edmund G. Brown, Jr. declared a drought state of emergency and encouraged all Californians to conserve water in every way possible. As you are aware, Alpine Creek is CSA-7's only source of water approved by the California Department of Public Health. Although CSA-7 has not yet received a notice from the Watermaster requiring mandatory reductions in water diversion from Alpine Creek, it is unpredictable how long the drought will continue and its prolonged effect on CSA-7's water supply.

Conserving water can be as simple as turning off water when not in use, fixing leaks, washing full loads of laundry, etc. More information on water conservation can be found at:

http://www.wateraware.org/

We appreciate your efforts in conserving water. If you have any questions please call (650) 363-4100.

Very truly yours,

Mark Chow

Mark Chow, P.E.
Principal Civil Engineer
Utilities-Flood Control-Watershed Protection

mc
G:\users\utility\water_CSA-7\CUSTOMER\CSA7 Conservation Letter 2014.doc

cc: Supervisor Horsley, District 3, County of San Mateo
James C. Porter, P.E., Director of Public Works
Ann M. Stillman, P.E., Deputy Director of Public Works

Save Water Right at Home

In California, water is a limited resource. Add to this a growing population and it's clear we need to work together to stretch our existing water supplies. You can help by conserving water inside and outside your home. And, don't forget, saving water saves energy and money and it's easy to do!

Indoor water saving tips

- Only run full loads in the washing machine and if you are purchasing a new washer sometime soon, purchase a water and energy saving model.
- Don't let the water run while you're washing dishes or brushing your teeth.
- Use water-saving showerheads and take shorter showers.
- Only run full loads in the dishwasher.
- Fix leaky faucets and toilets – if the toilet flapper valve leaks, it's an easy problem to fix and stops enormous waste of water.

This article, in English and four other languages, can be submitted to local newspapers, magazines or used in newsletters to encourage water conservation. It is available for free from www.wateraware.org

Outdoor water saving tips

- Use drip irrigation for your flowers, trees and garden.
- Stop watering before water starts to flow from your yard to the gutter.
- Know how to use your automatic sprinkler system, and set your time to local watering hours. Turn it off during rainy seasons and don't let sprinklers run if it's raining. Water your yard in the early morning or late evening to minimize evaporation and don't use the sprinklers on windy days.
- Maintain your sprinkler systems and fix leaking pipes.
- Make sure your sprinklers are directed toward watering the yard, not the sidewalk or driveway.
- Consider replacing part of your lawn with a deck, patio or low water-use plants. Grass is one of the highest users of water in outdoor landscaping.
- Instead of a hose, use a broom to clean driveways and walkways.
- Use a shutoff nozzle on your hose.
- Cover pools and spas to reduce evaporation.

By following these easy tips, an average California family can help save this much water:

- Landscaping with plants and flowers that need a little water can use 50 percent less water
- Only watering the lawn when it needs it saves about 1500 gallons a month
- Covering the pool saves about 1000 gallons a month
- Cleaning the driveway and sidewalk with a broom instead of a hose saves about 150 gallons each time
- Running full loads in the washing machine and dishwasher saves about 800 gallons a month
- Taking five minute showers while using a low-flow showerhead can save about 600 gallons of water a month
- Fixing leaky faucets and pipes saves about 140 gallons a month

Reference 4

Cuesta La Honda Guild
Common Interest Development

Professionally managed by RealManage

March 7, 2014

Dear Guild Members and Water Account Holders,

As the third year of record-low rainfall begins, the Guild is taking several steps to manage our water supply until the next rainy season and beyond.

Members of the Water Resources Committee have made a model of water diversion, storage and use to assess if we are in immediate danger of running critically low on water, and, if current weather patterns continue, how long supplies might last. The two creeks from which we divert our raw water, Mindego and Woodhams, have had low but steady flows since last spring. At these flows, Cuesta would be able to meet typical water use year-round, although the reserves in our reservoirs would be lower than normal. However, we do not know if those flows will indeed continue or if they may drop if rainfall remains low. If supply in these creeks drops, conservation efforts will be required to avoid a critical shortage. For example, if creek flow drops 50% over the next year, and if we continue to use water at current rates, we project a shortage by the fall of 2015. However, under the same scenario, a 20% reduction in water use would assure supply through 2015 until the next wet season. If we are lucky, next year will bring more rain – but we may not be lucky.

This colorful sign, painted by LH resident at the request of the CLHG Board, may be repainted and moved occasionally.

The good news: Many La Honda residents already have begun to conserve water aggressively. Voluntary conservation in late January and early February has reduced average use by about 25-30%. Please keep up the good work!

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To maintain a sufficient supply, we need to keep conserving water by at least 20% throughout the year. That is why, on February 19, the Board adopted an emergency water rationing measure to halve the current allotment per account (the amount included in your monthly Guild payment) to 600 cubic feet / month (from 1200 cubic feet / month), and to charge for any amounts above the basic allocation according to a new tiered-pricing plan. The plan will go into effect after **a 15-day comment period. It will remain in effect for up to 120 days, although the Board will be continually reevaluating and might adjust the policy.**

Recent rain has lifted our total rainfall during July-February from 20% to 30% of the 20-year median – still well below normal. Many La Honda residents have expressed their deep concern for stretching our water supply through the year. Thank you -- and keep using water carefully!

Sincerely,
The Cuesta La Honda Guild Board of Directors

MOTION ADOPTED BY CUESTA LA HONDA GUILD BOARD OF DIRECTORS FEBRUARY 19, 2014

To adopt a water-rationing program per the provisions of Civil Code 4360, Section d, and the rule change will suspend the existing monthly allotment and water over-usage fees of Operating Procedure 304.4, to be replaced by a new allotment and fee schedule to be determined by the Board. The rationing program will start April 1, after meter readings are accomplished, and will remain in place for 120 days, although throughout that period the term and rates will be subject to Board review and possible adjustment.
For each service connection, charges will be as follows

Water use per month (cubic feet)	Water use per month (gallons)	Charge per cubic foot	Total additional fee at this rate of water use
up to 600 cubic feet	4,488 gallons, or almost 150 gallons/day in a 30-day month	$0 (this amount comes with your monthly dues)	0
601-800 cubic feet	an additional 1,489 gallons, or about 50 gallons/day in a 30-day month	$0.12	$24
801-1000 cubic feet	an additional 1,489 gallons, or about 50 gallons/day in a 30-day month	$0.25	$74
1001-1200 cubic feet	an additional 1,489 gallons, or about 50 gallons/day in a 30-day month	$0.35	$144
Greater than 1,200 cubic feet		$0.50	$0.50 per additional cubic foot

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Reference 5

Cuesta La Honda Guild
Common Interest Development

Professionally managed by RealManage

Official Notice of the Cuesta La Honda Guild April General Membership Meeting Wednesday, April 16, 2014 – 7:00 PM The Guild Clubhouse

You are invited to attend the April Membership Meeting of the Cuesta La Honda Guild, a California non-profit Corporation, being held on **Wednesday, April 16, 2014 at 7:00 PM.**

AGENDA

- Confirmation of Quorum of Members
- Call to Order and Welcoming Remarks
- Review of Informational Minutes of the November 2013 General Membership Meeting
- Fall General Membership Meeting Date: Wednesday, November 19, 2014
- Homeowners' Forum
- Financial Report
  - 2014 Budget
  - Current 2014 Balance Sheet
  - CPA 2013 Year End Review
- Recreation Committee Projects
- Pool Season - Pool Opens Saturday, May 24, 2014
- Public Works Projects - Public Works Manager, Peter Lyon
- Water Committee – Drought issues/Water conservation – David Ehrhardt
- Adjourn (Estimate at 8 p.m.)

The Board appreciates your cooperation and involvement and looks forward to seeing you at the **General Membership Meeting, Wednesday, April 16, 2014.** A brief Board Meeting will be held prior to the General Membership Meeting at 6:30 PM, and the Board Meeting will resume after if time allows.

Thank you, Cuesta La Honda Guild Board of Directors

Strong voluntary water conservation allows water rationing to be rescinded.

At the February Board of Directors meeting, the BOD passed a motion to initiate an emergency water-rationing plan for Cuesta La Honda. As explained in a previous mailing, the record drought, combined with unusually high water use in the fall and early part of January, prompted concern that if the drought continues through next year, water demand at these high rates of use would outstrip supply. This concern was supported by modeling water supply over the next two years. The BOD responded by informing the community of the problem, encouraging water conservation, and adopting the rationing plan.

The rationing plan was adopted with the goal of encouraging a reduction in water use by at least 20%. This level of reduction was predicted in the water model to significantly extend the Guild's water supply in the event of sustained drought, getting the system through 2015 to the winter of 2016, provided that stream flow slows but does not stop. The adoption of the conservation plan was also meant to indicate clearly the seriousness of the situation to the community. Fortunately, since public education efforts began, Guild water use has dropped about 30%, exceeding the goal of a 20% reduction. This reduction has been sustained, so at the March meeting, the BOD rescinded the rationing plan for the time being. Good job Cuesta!

It is important that the community understand that this does not mean we are out of the woods. Conservation needs to be continued and increased as warm weather approaches. The Guild is closely monitoring water use, trends in stream flow, and reservoir levels. Changes in water supply or demand may prompt the need for new conservation goals. The BOD would much rather see conservation goals met by voluntary efforts rather than the "big stick" of a rationing plan with a lower base allotment and overuse fees, but it is prepared to implement a rationing plan if voluntary efforts fail to meet those conservation goals.

After the motion passed in February to adopt a rationing plan, the BOD received a number of letters and comments from Guild members. This feedback is valuable for decision makers and we thank the community for their engagement. We would like to take this opportunity to respond to a few of the many good questions that were asked and issues that were raised.

Why was the base allotment in the rationing plan set at 50% of the normal allotment, when the goal is a 20% reduction in use? Designing and implementing a rationing plan is not an exact science. A cutoff level for the base allotment needs to be established and a fee structure designed. The goal is to achieve a certain level of reduced water use, not to achieve a revenue stream. Some customers already use an

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absolute minimum of water, and would have a hard time reducing their use further, while others use more than the base allotment. At the last meter reading, where overall water use was higher than normal, about 80% of Guild water accounts had used 50% or less of the base allotment This was the basis for the 50% percent reduction in the base allotment in the rationing plan.

The USGS estimates that the average water use per person is 80-100 gallons per day. The Guild's proposed base allotment (600 cubic feet per month) would have been less than half of that for a family of four. This would have been be difficult and/or near impossible for a family of 4, and rather impossible for a larger family. The proposed allotment reduction was indeed a tight squeeze for a family of four. It is hard to find a one-size-fits-all solution, which is why, in the event of adopting a mandatory rationing plan, the Board plans to offer a case-by-case appeal process. The USGS data indicated how much water was used per capita, not what a reasonable minimum amount of treated water should be per person. The USGS data for a family of 4 is above the normal allotment in Cuesta. The last time water meters were read, in January, only nine accounts were over the normal allotment. The nine accounts included the Guild's account because of a leak in the pool (which has since been stopped). The point of a rationing plan is to motivate strong water conservation practices, not to impose undue hardship.

It is speculation that next year may be as dry as this year. This is true, but it is also speculation that the weather will return to normal. This drought is unusual in recent history, and there is no way to know if next year will be a return to "normal" or not. Preparing for the possibility of a second dry year is easier if we build raw water reserves now at modest levels of conservation, rather than having to protect those reserves with much deeper cuts in use later.

The proposed conservation plan expires in three months and, if needed, cannot be re-implemented as an emergency measure. While the law allows the BOD to implement a change in fee structure on an emergency basis for three months, it does not permit extending such a change by the same mechanism. That would require a change to the Guild's bylaws. Therefore, the BOD is drafting an amendment to the Guild's bylaws, as part of our Drought Contingency Plan, which would allow for more flexible implementation of a water-rationing plan, should it be need in the future. This amendment will of course be subject to comment and approval by the membership.

Sincerely,

Cuesta La Honda Guild Board of Directors

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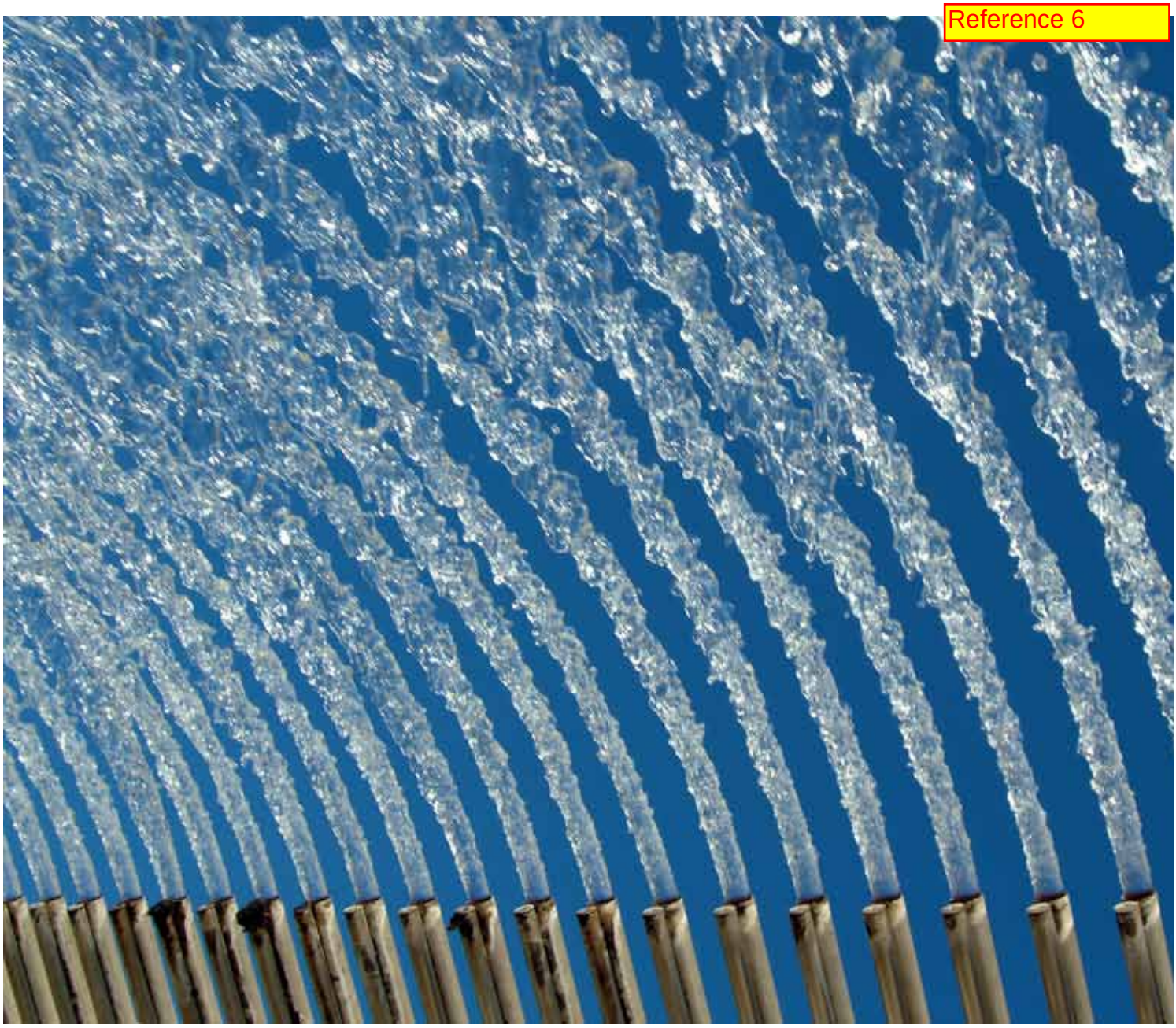
Reference 6



Dublin San Ramon Services District

2010 Urban Water Management Plan

JUNE 2011

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Executive Summary

ES.1 Overview

Dublin San Ramon Services District (DSRSD) is subject to the California Urban Water Management Planning Act (UWMP Act) and SBx7_7, the Water Conservation Act of 2009. DSRSD is an urban water supplier that delivered 8,801 acre-feet (AF) of potable water and 1,729 AF of recycled water to approximately 17,955 customers[1] in the City of Dublin in Alameda County, California, and the Dougherty Valley area of San Ramon in Contra Costa County, California in 2010.

The UWMP Act requires urban water suppliers to report, describe, and evaluate water deliveries and uses, water supply sources, efficient water uses, and demand management measures (DMMs), including implementation strategy and schedule. DSRSD prepared this *2010 Urban Water Management Plan* (UWMP) to conform to the UWMP Act as updated, Senate Bill (SB) 610 Water Supply Assessments and SB 221 Written Verifications of Water Supply, Assembly Bill (AB) 1420 (implementation of the Water Conservation Act of Water Demand Management Measures), and SBx7_7, the Water Conservation Act of 2009. The latter requires urban water suppliers to report base daily per capita water use (baseline), an urban water use target, an interim urban water use target, and compliance daily per capita water use.

Additionally, DSRSD has applied for the California Department of Water Resources (DWR) Proposition 84 Round 1 Implementation Grant as part of the San Francisco Bay Area Integrated Regional Water Management Plan. Completion of this 2010 UWMP is a condition of receiving a grant award.

ES.2 Plan Preparation, Coordination and Adoption

The preparation and adoption of this 2010 UWMP is discussed in detail in Section 1. DSRSD coordinated with Zone 7 Water Agency (Zone 7, the region's water wholesaler) and the region's other water retailers to compile a complete assessment of the region's available

1. DSRSD Engineering Department, number of DSRSD potable and recycled water meters as of December 31, 2010.

into the California Aqueduct for use by contractors downstream of Semitropic; the water quality of this ―pump-in" water will therefore have an effect on these contractors. Arsenic criteria were established for this pump-in by the DWR Facilitation Group to mitigate any impacts to the downstream contractors, and DWR, Semitropic, and the banking partners have been testing arsenic treatment options since 2008. While the presence of arsenic in the Semitropic groundwater bank is likely to increase the cost of this water storage option, it is not likely to affect its overall reliability.

5.2.2 Recycled Water Quality

The recycled water that DSRSD distributes comes from DSRSD's RWTF, which is described in Section 4.5.2. Wastewater effluent from DSRSD's regional wastewater treatment plant is treated to produce Title 22 disinfected tertiary recycled water. DSRSD anticipates no significant changes to the land uses in DSRSD's wastewater service area; therefore, it does not anticipate any changes to the quality of the wastewater effluent that it treats to recycled water quality. DSRSD's water service area is over the fringe basin of the Livermore-Amador Valley, which is not used for potable water supplies; thus, its recycled water distribution is not limited by its impact to groundwater supplies. For all of these reasons, DSRSD does expect recycled water quality issues to impact its ability to reliably deliver recycled water to its customers.

5.3 Water Shortage Contingency and Drought Plan

Water Code Sections 10632(a), 10632(c), 10632(d), 10632(e), 10632(f), 10632(g), and 10632(h)

DSRSD's Water Shortage Contingency and Drought Plan addresses situations when catastrophic water supply interruptions occur due to regional power outage, earthquake, or other disasters; and when drought occurs due to environmental, climatic, or legal issues. The plan is based on DSRSD Ordinance No. 323, DSRSD's Emergency Response Plan (ERP), and DSRSD Code Section 4.10.030(C), which are described in further detail below. The adoption of this Water Shortage Contingency and Drought Plan is concurrent with the adoption of DSRSD's 2010 UWMP and supersedes any previous water shortage contingency plan.

The DSRSD Board of Directors adopted Ordinance No. 323[76] in June 2009 to update both its water conservation program and its program for managing DSRSD water supplies during any water shortage condition declared by the DSRSD Board of Directors. The ordinance also

76. District Ordinance No. 323, An Ordinance Repealing Ordinance Nos. 242 and 244, Establishing a Water Conservation Program and a Program for Management of the Water Supplies of the District During Any Water Shortage Condition declared by the Board of Directors of DSRSD and Establishing Regulations and Restrictions on the Delivery and Consumption of Water and Penalties for Ordinance Violations During a Declared Water Shortage Condition, adopted by the District Board of Directors on June 2, 2009.

established regulations and restrictions on the delivery and consumption of water and penalties for ordinance violations during a declared water shortage. A copy of Ordinance No. 323, as well as DSRSD's adopted Water Conservation Program[77], is provided in Appendix P. This ordinance addresses both water emergencies (catastrophic water interruptions) and drought conditions. During water emergencies, DSRSD Ordinance No. 323 authorizes the DSRSD General Manager to declare a water emergency and initiate implementation of the ERP. The ERP provides DSRSD with a standardized response and recovery protocol to prevent, minimize, and mitigate injury and damage resulting from emergencies or disaster of natural or man-made origins. DSRSD updates the ERP periodically to ensure that newly developed parts of its service area and the associated infrastructure are taken into account.

When DSRSD recodified its code in November 2010, Section 4.10.030(C) (included in Appendix Q) was added to regulate water use during any type of water shortage. This provision authorizes the DSRSD general manager to prescribe and enforce rules governing water allocation and use of water. It also provides the DSRSD general manager with guidelines for allocating water supply during shortages.

5.3.1 Stages of Action

Water Code Section 10632(a), 10632(c)

The ERP and the Water Conservation Program adopted in DSRSD Ordinance 323 include four stages of water demand reductions, summarized in Table 5-9, which can be implemented depending on the severity of conditions. The plan does not provide numeric targets for triggering a shortage stage, nor specific reduction percentages, except in emergency situations. The intent is to maintain some degree of flexibility for DSRSD to respond to water supply shortages. Numeric minimum targets provide a guideline for quick decision-making only during emergencies.

Normal supply conditions are those periods when DSRSD water supplies are adequate or more than adequate to meet the ordinary demands and requirements of DSRSD's water customers for the current year and a reasonable planning horizon, typically five years.[78] A water shortage condition occurs when the supply of potable water available to DSRSD for distribution and sale may not be adequate to meet ordinary water demands without reducing the supply to the extent that water supply is insufficient to meet human consumption, sanitation, fire protection, and other beneficial uses. During non-emergency times, when DSRSD anticipates or identifies that water supplies (as a result of climatic conditions, regulatory changes, legal mandates, environmental regulations, or any other cause) may not be adequate to meet the normal water supply needs of its customers, the DSRSD Board of

77. Adopted by Resolution 20-09, June 16, 2009.

78. DSRSD normally provides Zone 7 a five-year water demand projection and Zone 7 responds with confirmation that it will be able to meet the projected demand.

Table 5-9. Stages to Address Water Supply Shortages (DWR Table 35)		
Stage No.	**Water Supply Conditions[1]**	**% Shortage[2]**
1	Identifiable events lead to a reasonable probability that in the next few years, DSRSD potable water supplies will not be adequate to meet the normal water demands and requirements of DSRSD's water customers and users.	5% or greater
2	Identifiable events lead to a reasonable probability that in the current or upcoming year, DSRSD potable water supplies will not be adequate to meet the normal water demands and requirements of DSRSD's water customers and users.	15% or greater
3	Identifiable events lead to a reasonable conclusion that in the current year, DSRSD potable water supplies will not be adequate to meet the normal water demands and requirements of DSRSD's water customers and users.	30% or greater
4	Stage 3 water shortage provisions have been in effect and water use reduction have not been achieved to maintain adequate water supply for health and safety, or when new events require greater water conservation.	50% or greater

[1] *Stages as defined in DSRSD Ordinance 323.*

[2] *In accordance with ERP Action Plan 9 - Water Supply Interruption. To be followed only during emergency*

Directors may determine that a water shortage exists and consider a resolution to declare a water shortage condition and associated stage for water conservation.

For example, the DSRSD Board of Directors declared Stage 1 Water Shortage Condition and requested 20 percent voluntary water conservation by resolution in June 2009 in response to reduced deliveries from the SWP and a third year of below normal precipitation. A copy of Resolution 34-09 is included in Appendix R. In form, this resolution provides a template for any future resolution in situations where the DSRSD Board of Directors needs to declare a water shortage.

During times of emergency, the DSRSD general manager is authorized to declare a water emergency and implement the provisions in the ERP, including appropriate action plans to address imminent water supply shortages.[79] When an imminent water supply interruption occurs, the DSRSD general manager may declare the necessary stage for water conservation.

79. DSRSD Ord. 323.

5.3.1.1 Stage 1 and 2 – Voluntary Water Conservation

Stage 1 water conservation is voluntary. Stage 2 water conservation may also be voluntary, as deemed appropriate by the DSRSD Board of Directors. The Board declares these stages when it determines, with reasonable probability, that the water supply may not be adequate to meet all demands in the current year or next few years. DSRSD may be able to deliver its customers' normal water demands but wants help from customers to ensure adequate supply. At these stages, DSRSD uses public outreach and customer service to encourage the best management practices in DSRSD's water conservation program, as described in Section 6. Because water reduction measures are voluntary, no penalties are applied.

5.3.1.2 Stage 2, 3, and 4 – Mandatory Prohibitions and Restrictions

Water Code 10632(d) and 10632 (e)

In Stage 2, water conservation may be declared mandatory. In Stages 3 and 4, water conservation is always mandatory. Stage 2 water conservation is declared mandatory if Stage 2 voluntary water conservation targets are not met and when, due to definable events, there is greater certainty water supplies will be inadequate to meet customer demands during the current year or upcoming year. Stage 3 mandatory water conservation is declared when, due to definable events, there is firm certainty that the water supply will be inadequate to meet customers' demands in the current year. If Stage 3 mandatory water conservation is in effect and the reduction goal is not being met, or if a new definable event occurs that requires increasing the goal, the DSRSD Board of Directors may declare Stage 4 mandatory water conservation. During times of imminent water supply interruption, the DSRSD general manager is authorized to make a determination and declare an appropriate stage of water conservation in response to the emergency at hand. If water supplies are reduced by 50 percent for a single year, the DSRSD Board of Directors may declare Stage 4 water conservation and require the prohibitions and water consumption reduction measures described below to be mandatory.

In Table 5-10, mandatory water prohibition measures are itemized, along with the stage under which each prohibition becomes mandatory. Stage 2 measures become mandatory if the DSRSD Board of Directors declares mandatory Stage 2 water conservation. In Table 5-11, water consumption reduction measures are itemized, along with the stage under which each measure takes effect. If a measure is declared mandatory for a lower level stage, it is also mandatory for higher stage levels.

Table 5-10. Water Shortage Contingency — Mandatory Water Prohibition Measures (DWR Table 36)	
Mandatory Prohibitions[1]	**Stage When Prohibition Becomes Mandatory[2]**
Street washing (CII)	
Prohibit use of potable water, unless necessary for public health and safety	Stage 3
Landscape irrigation (SFR, MFR, CII)	
No turf irrigation, hand water other landscaping only on Saturday or Sunday	Stage 4
Public swimming pools (SFR, MFR,CII)	
Prohibit drain and refill, unless required for health or structural needs	Stage 4
Water theme parks (CII)	
Shut down; prohibit use of any water	Stage 4
Private swimming pools, spas, fountains, ponds (SFR, MFR, CII)	
Prohibit potable water use for ornamental ponds and fountains; drain and refill only for health or structural needs	Stage 3
Prohibit draining and refilling and initial filling of swimming pools and spas	Stage 4
Private pavement (SFR, MFR, CII)	
Prohibit use of potable water to wash pavement, unless required for health and safety	Stage 3
Private exterior washing of autos, boats, buildings (SFR, MFR, CII)	
Prohibit washing with potable water	Stage 4
New or additional service (SFR, MFR, CII)	
Prohibition of connection subject to SB610 definition	Stage 3
Water for construction (CII)	
Only recycled water (potable can be used for public health and safety projects) for construction meters	Stage 3
Laundromats (CII)	
Prohibit use of non-efficient washing machines	Stage 4

[1] SFR: single-family resident ; MFR: multifamily resident; CII: commercial, industrial, institutional customers.

[2] Stage 2 measures are mandatory if DSRSD Board of Directors or general manager declares mandatory Stage 2 water conservation.

Table 5-11. Water Shortage Contingency — Consumption Reduction Methods (DWR Table 37)	
Consumption Reduction Methods	**Stage When Method Takes Effect**
Landscape irrigation (SFR, MFR, CII)[1]	
Shut-off nozzles; no runoff, over spray, or saturation of landscape	Stage 1
Irrigate from 9 p.m. to 6 a.m.; train/educate regarding water conserving irrigation systems and dry climate plants	Stage 1
Irrigate only on odd/even days (per odd/even address); turn off auto sprinklers when raining	Stage 2
Irrigate only Mondays and Thursdays	Stage 3
No turf irrigation, hand water other landscaping only on Saturday or Sunday	Stage 4
Public swimming pools (SFR, MFR,CII)	
Must be leak proof	Stage 2
Cover when not in use; equip with recalculating pump	Stage 3
Drain and refill only per health or structural needs	Stage 4
Water theme parks (CII)	
Require they reclaim and recycle water	Stage 3
Private swimming pools, spas, fountains, ponds (SFR, MFR, CII)	
Must be leak proof	Stage 1
Cover when not in use; equip with recirculating pump	Stage 2
Private pavement (SFR, MFR, CII)	
Use broom and bucket	Stage 2
Private exterior washing of autos, boats, buildings (SFR, MFR, CII)	
Use hose with shut-off nozzle and do so on a permeable surface	Stage 1
Use bucket, no more than once a month; encourage use of commercial wash services that recycle water	Stage 2
Only wash vehicles at commercial establishments that recycle water; use broom on buildings, pavement	Stage 3
New or additional service (SFR, MFR, CII)	
Connection subject to SB610 definition	Stage 3
Water for construction (CII)	
Use recycled water if cost effective; otherwise potable water use okay	Stage 1
Only recycled water (potable can be used for public health and safety projects) for construction meters	Stage 3
Restaurants (CII)	
Offer rebates on low flow rinse nozzles; post water conservation messages on bathroom mirrors	Stage 1
Require use of low flow rinse nozzles; require they serve water only on request	Stage 2
Laundromats (CII)	
Use only water-efficient washing machines	Stage 4

[1] *SFR: single-family resident ; MFR: multifamily resident; CII: commercial, industrial, institutional customers.*

Table 5-12. Water Shortage Contingency — Penalties and Charges (DWR Table 38)	
Penalties or Charges	**Stage When Penalty Takes Effect**
Penalty/fines for excess use	Stage 3
Charge for excess use	Stage 3
Cost to investigate and correct violations	Stage 3
Flow Restriction	Stage 4
Submetering	Stage 4
Discontinuance of Service	Stage 4

5.3.2 Penalties and Charges

Water Code Section 10632(f)

When mandatory water use reduction is declared at any of the above stages, the DSRSD Board of Directors will adopt a progressive schedule of fines to be levied against customers and users for successive violations of water use restrictions established in Stages 3 and 4. Additionally, water customers and users are subject to Chapter 1.30, Enforcement, of the DSRSD Code, which provides general penalties, remedies for violations, penalties of increasing severity, and imposition of costs. Violations may be punishable as misdemeanors or infractions, depending on the severity of the violation. The DSRSD general manager is authorized to apply penalties as he or she deems appropriate, including flow restriction, submetering, and discontinuance of water service, until the violation is corrected. DSRSD may also seek damage and/or remedies, including fees or fines and the amount of costs incurred by DSRSD to investigate and correct the violation. In Table 5-12, penalties and charges and the stage when they take effect are summarized.

5.3.3 Emergency Actions

Water Code Section 10632(c)

Water supplies may be interrupted in the future due to a regional power outage, a natural disaster such as an earthquake, or an accidental pipeline break. The ERP includes action plans that are to be used in response to such events and incidents. The action plans for various emergencies leading to water supply interruptions is included in Appendix S. Action Plan 9 specifically outlines plans to manage water supply for a range of events, including situations involving catastrophic loss of water supply. Below are several situations that DSRSD has considered.

5.3.3.1 Emergency Interconnections

DSRSD currently has five emergency pipeline interties, three with EBMUD and two with the City of Pleasanton, for rapid emergency response. The interties are strictly for emergency conditions, such as a major pipeline break, supply contamination, or interruption of deliveries due to earthquake, flood, or other disaster. These connections would allow either agency to obtain water from the other agency during an emergency. DSRSD is currently exploring an emergency intertie with the City of Livermore.

Reference 7

Dublin San Ramon Services District
Water, wastewater, recycled water

NEWS RELEASE - For immediate release

7051 Dublin Boulevard, Dublin, CA 94568-3018 | www.dsrsd.com

May 6, 2014

Contact: Sue Stephenson, 925-875-2295 (office)
925-998-6562 (cell), stephenson@dsrsd.com

Drought Actions to Reduce Water use 25% Overall

At a special meeting Monday, May 5, 2014, at 6:00 p.m., the Dublin San Ramon Services District Board of Directors took the following drought-related actions:

- Adopted Stage 3 shortage rates (See Attachment 1)
- Adopted water use limitations, enforcements and penalties (See Attachment 2)
- Approved a Wise Water User credit program (See Attachment 3)
- Approved enhancements to rebate programs (See Attachment 4)

"This is a serious drought," says Operations Manager Dan Gallagher and drought coordinator at DSRSD, "Six of the past seven years have been dry. The snowpack is 5% of normal. These dry conditions could persist even beyond this year, because multi-year droughts are common in California. The bottom line is we must reduce our water use now or the demand will exceed the supply. That's why our Board took all these actions."

Founded in 1953, Dublin San Ramon Services District serves 157,000 people, providing potable and recycled water service to Dublin and the Dougherty Valley area of San Ramon, wastewater collection and treatment to Dublin and south San Ramon, and wastewater treatment to Pleasanton (by contract). More information about the District can be obtained at www.dsrsd.com.

#

Attachment 1

Current Water Consumption Rates
And Water Supply Shortage Rates

	Baseline (per ccf)	Stage 1 (per ccf)	Stage 2 (per ccf)	Stage 3 (per ccf)	Stage 4 (per ccf)
Associated Water Use Curtailment	0%	10%	20%	35%	50%
Residential Customers					
Tier 1 (0-10 ccf)	$0.51	$0.57	$0.641	$0.897	$1.308
Tier 2 (11-34 ccf)	$1.08	$1.35	$1.67	$2.15	$3.50
Tier 3 (over 34 ccf)	$1.44	$1.87	$2.80	$4.02	$5.53
Commercial Customers					
Winter (Nov-Apr) All ccf	$1.03	$1.12	$1.23	$1.55	$1.95
Summer (May-Oct) All ccf	$1.23	$1.44	$1.72	$2.16	$3.08
Potable Irrigation Customers					
All ccf	$1.44	$1.87	$2.80	$4.02	$5.53

Dublin San Ramon Services District
Water, wastewater, recycled water

7051 Dublin Blvd.
Dublin, CA 94568
www.dsrsd.com

Community Drought Emergency

LIMITS and ALTERNATIVES, VIOLATIONS and PENALTIES

We must preserve our water supply to protect public health and safety. Customers must comply with a mandatory 25% reduction in water use.

Total residential water use must not exceed 640 gallons of water per day–the equivalent of 50 units per bimonthly bill. (A reasonable amount of water for residential customer use is 55 gallons per person, per day. How much does your household use? Your bill shows your water use in units. One unit of water is 748 gallons.) **The most effective means of reducing water consumption is to cut irrigation by 60%. Fix all leaks immediately.**

RESIDENTIAL AND COMMERCIAL OUTDOOR WATERING

Rebates are available for Smart Controllers and turf grass replacement, visit www.dsrsd.com for details.

Watering can be done any time of day with an efficient drip system, a bucket, or a watering can. Other means of watering have limitations. **If you use potable water to irrigate, you must cut irrigation by 50-60% and comply with these requirements:**

1 IF you have met ALL of the conditions listed below:

- If it is done on the following weekly/monthly schedule:
  - One day per week in May, Oct., and Nov.
  - Two days per week June, July, Aug., and Sept.
  - No watering Dec., Jan., Feb., and March
- If the watering occurs after 6:00 p.m. or before 9:00 a.m., and
- If it is not raining, and it has been at least three days since it rained, and
- If there is no runoff, ponding, flooding, or marshy conditions

2 THEN you may water your yard following these mandatory guidelines:

- With a hose equipped with shut-off nozzle (free shutoff nozzles from DSRSD)
- With a hose equipped with a rotating or oscillating device (must be monitored)
- Irrigation rate must be half of the local evapotranspiration rate: ½ inch/week June thru Sept.; ⅜ inch/week Oct. thru May
- New landscaping planted before May 6, 2014, may be watered daily for the first 30 days, every other day for the next 60 days, per the weekly/monthly schedule (shown on left)

RESIDENTIAL AND COMMERCIAL WATER USE

PROHIBITED uses of water…	Alternatives
Washing driveways, sidewalks, walkways, patios, parking lots, tennis courts, exteriors of buildings or homes, and other impervious surfaces	Sweep areas with a broom
Washing vehicles, boats, trailers	Wash vehicles at a professional car wash that recirculates the water
Filling new swimming pool/spa	Delay construction
Refilling existing swimming pool/spa	Must demonstrate public health/safety need and receive prior written approval from DSRSD
"Topping - off" existing swimming pool/spa	**OK if it's covered*** when not in use, and need is due to evaporation or splash-out, and there are no leaks.
Decorative fountains and/or water features visible from areas accessible by the public	Leave them empty, unless they provide habitat for aquatic species

* One $50 rebate for pool/spa cover per household. Visit www.dsrsd.com for details.

Individuals may file an appeal or apply for an exemption by downloading a form at http://www.dsrsd.com/news_and_event/droughtwatch.html, or call Customer Service at (925) 828-8524 to request a form via email.

Revised 5/21/2014

VIOLATIONS AND PENALTIES

The use of water in violation of limitations or the waste and unreasonable use of water is a misdemeanor pursuant to the California Water Code Section 71644. A District customer who violates any water use limitations or wastes water or uses an unreasonable amount of water will be subject to the following enforcement and penalty provisions:

1st violation	District issues warning orally (telephone call, site visit) or in writing (door hanger, letter) specifying the violation and what the customer must do to make it right
2nd violation	$250 penalty
3rd violation	Additional $500 penalty
4th violation	Additional $1,000 penalty
5th violation	Reduction in water delivered to that customer via a flow restrictor or disconnection of water service

For additional details and exceptions to the limitations, violations and penalties, please refer to the ordinances posted on the website at http://www.dsrsd.com/news_and_event/droughtwatch.html

Reference 8

State of California
The Natural Resources Agency
Department of Water Resources

California Water Plan

Update 2013

Investing in Innovation and Infrastructure

Volume 1 — The Strategic Plan

PUBLIC REVIEW DRAFT

October 2013

Edmund G. Brown Jr.
Governor
State of California

John Laird
Secretary for Resources
The Natural Resources Agency

Mark Cowin
Director
Department of Water Resources

Chapter 3. Urban Water Use Efficiency

Urban water use efficiency focuses on reducing water waste and accomplishing tasks using the least amount of water possible in municipal and industrial settings. Californians have made great progress in urban water use efficiency over the past few decades. At the individual level, the benefits of water use efficiency may appear small, incremental, or difficult to see; but when Californians act together as a community to conserve water, the cumulative effect is significant and the benefits are widespread.

Increased efficiencies can be attributed to several factors; urban water suppliers' implementation of Best Management Practices, plumbing codes requiring more efficient fixtures, the model water efficient landscape ordinance, new technologies in the commercial/industrial sector, and mandates for converting unmetered connections to metered.

However, with tighter environmental constraints on the delta, increasing population, and the necessity of adapting to climate change, even greater efficiencies will be needed, and are achievable. When faced with an increasing demand for water, water agencies can consider options for increasing supplies or reduce demand, or a combination of both, to meet this need. Increasing the water supply includes the possible costs of purchasing additional water, capital cost of production and distribution systems, water supply treatment facilities, energy costs, and wastewater treatment facilities. Reducing demand through increased water use efficiency is generally a lower cost method for meeting increased demand.

In November 2009, The Water Conservation Act of 2009, Senate Bill Number 7 of the 7th Extraordinary session (SBX 7-7), was enacted as part of a five bill package that focused on improving the reliability of California's water supply and restoring the ecological health of the Sacramento-San Joaquin Delta. SBx7-7 had multiple urban and agricultural water use efficiency provisions. The key urban conservation measure established a statewide goal of reducing urban per capita water use by 20% by 2020. To achieve this goal, the legislation directs urban retail water suppliers to set individual 2020 per capita water use targets and begin implementing conservation measures to achieve those goals. Meeting this statewide goal of 20% decrease in demand will result in almost 2 Million Acre Feet (MAF) reduction in urban water use in 2020.

Beyond the goal of achieving 20% reduction by 2020, there are important benefits to increasing urban water use efficiency, including:

- Reduced stress on the environment of the beleaguered Sacramento-San Joaquin Delta
- Reduced landscape runoff (contaminated with fertilizers, pesticides, and road debris) to surface waters
- Ability to stretch existing water supplies
- Ability to provide water for surface or groundwater storage in wet years
- Delayed capital cost of new infrastructure to treat and deliver water
- Reduced demand for wastewater treatment, including capital costs and ongoing treatment costs
- Reduced water-related energy demands and associated greenhouse gas emissions
- Better capacity to meet the water demand of California's growing population

This chapter will present the practices already employed in urban water conservation, as well as describing how further efficiencies can be made, and how the goal of 20% reduction by 2020 can be met.

Impact of 20x2020

Projecting forward to the year 2020, with statewide population expected to be in the range of 44 million people, a decrease in per capita water use of 20% will equate to an annual demand reduction of 2 million acre feet of water.

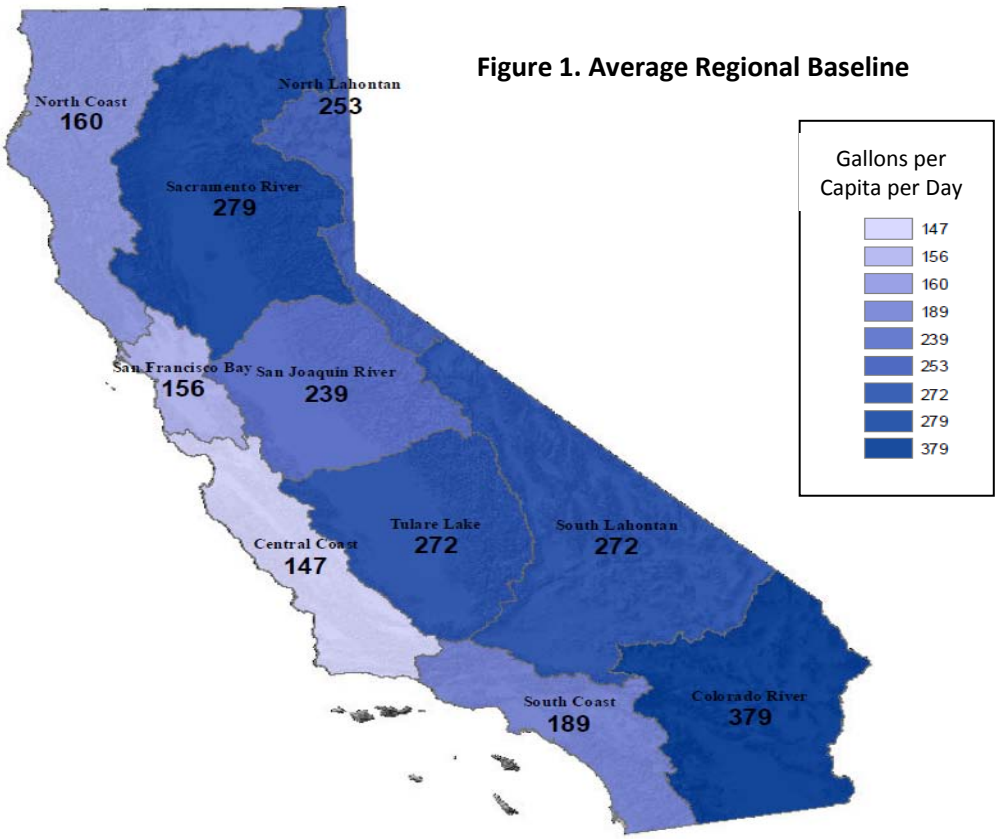
The requirement that all urban retail water suppliers quantify per capita baseline water use, set water use targets, and then show actual reductions in 2015 and 2020 has caused suppliers across the state to rethink their conservation programs and service area water use. 20x2020's emphasis on quantification forces suppliers to ensure the effectiveness of water conservation actions.

Baseline Water Use Reported in Urban Water Management Plans

The statewide average baseline water use is 198[1] gallons per capita per day (gpcd) based on UWMPs from 342 retail water agencies. Though suppliers could choose any 10 consecutive years from between 1995 and 2010, most of the suppliers choose baseline periods from 1996 to 2004.

The California map below (Figure 1) shows how baseline water use differs regionally across the state with generally lower water use along the coast and increasing water use in the inland valleys. The coastal areas generally have lower water use due to the marine climate and lower evapotranspiration rates, smaller irrigated landscape areas, and previous conservation program. Many of the coastal communities along the central coast and southern California were strongly impacted by the 1988-92 drought and subsequently implemented a number of water use efficiency programs to improve their water supply reliability. Low or high per capita water use is not necessarily an indicator of efficiency as the climate and land use factors listed above can have a significant effect on water use

Figure 1. Average Regional Baseline

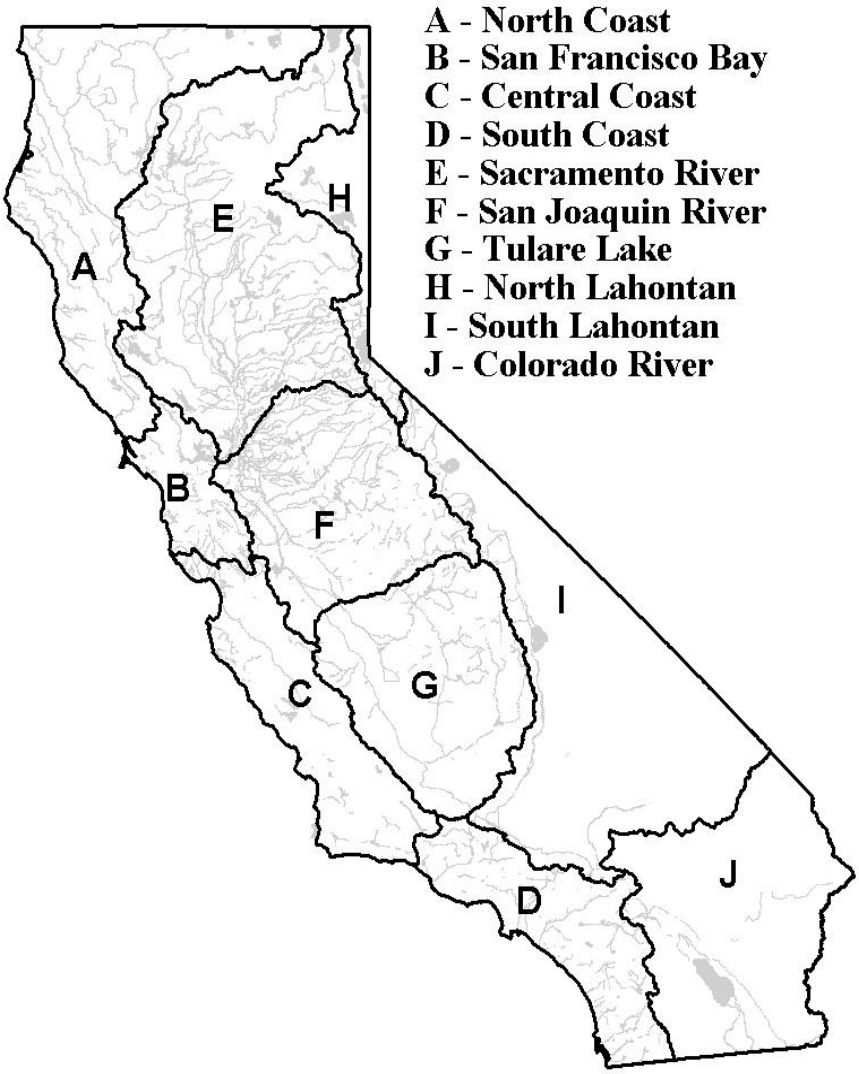


[1] Population weighted

Reference 9

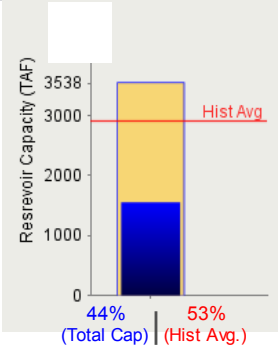
Summary of Water Conditions in California, May 1, 2014 (percent of average)

Hydrologic Region	Precip Oct 1-date	Snow Water Content	Reservoir Storage 30-Apr	Runoff Oct 1-date	Runoff Apr thru Jul Forecast	Runoff Water Year Forecast
North Coast	50	0	65	35	25	30
San Francisco Bay	60	--	85	20	--	--
Central Coast	45	--	25	5	--	--
South Coast	40	--	75	15	--	--
Sacramento River	60	10	75	40	40	40
San Joaquin River	50	20	70	35	30	30
Tulare Lake	50	15	50	30	30	25
North Lahontan	65	10	50	50	30	35
South Lahontan	50	20	95	60	45	50
Colorado River	40	--	--	--	--	--
Statewide	**50**	**15**	**70**	**35**	**35**	**35**
Previous Years, Statewide						
May 1, 2013	75	15	95	70	45	60
May 1, 2012	75	40	115	65	70	60
May 1, 2011	135	185	110	130	165	145
May 1, 2010	110	140	95	75	115	90
May 1, 2009	80	60	80	60	70	70
May 1, 2008	85	65	85	60	70	60
May 1, 2007	65	25	105	55	45	50
May 1, 2006	140	185	115	170	180	165



Reference 10

LAKE OROVILLE - STORAGE CONDITIONS AS OF JUNE 25, 2014



Data as of Midnight: June 25, 2014

- Current Storage: 1,552,796 AF
- 44% of Total Capacity
- 53% of Historical Avg. For This Date
- (Total Capacity: 3,537,577 AF)
- (Avg. Storage for Jun 25: 2,904,190 AF)

Change Date: 25-Jun-2014

Refresh Data

Major Reservoir Current Conditions Graphs

Printable Version of Current Data

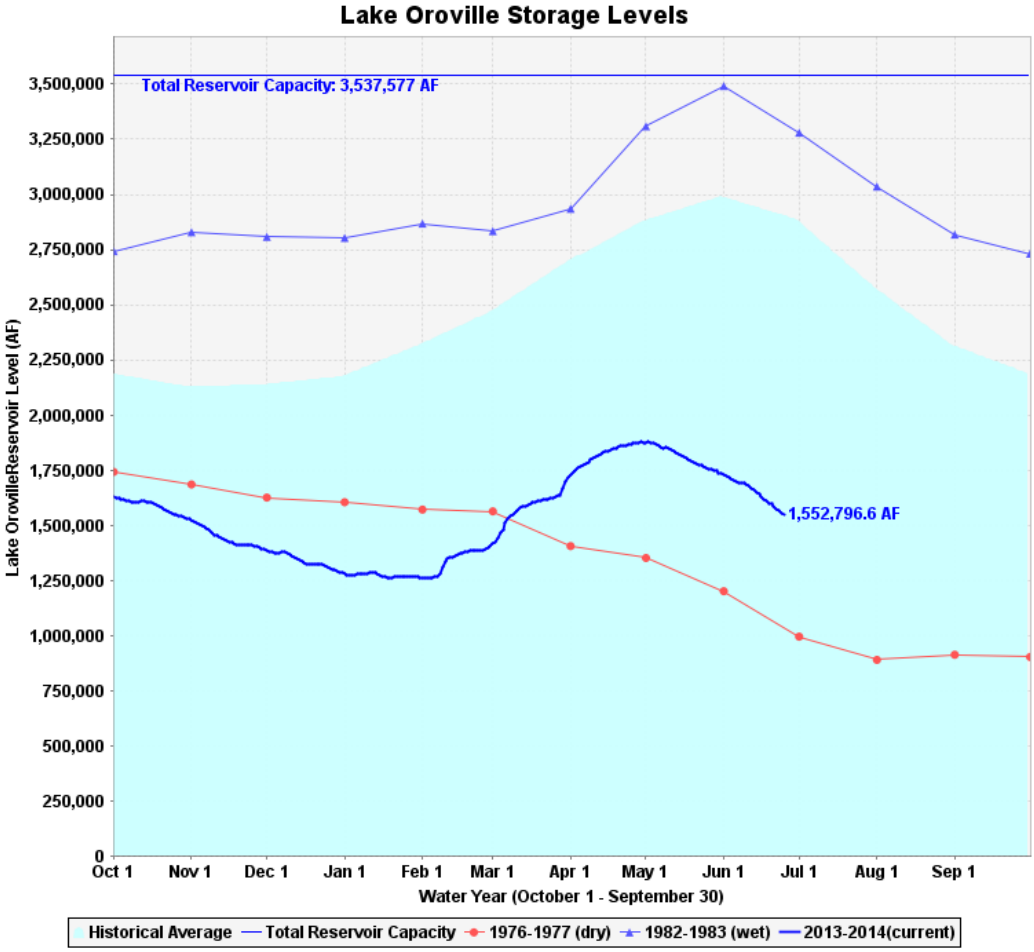
Lake Oroville Storage Level Graph: Choose water years to plot:

1976-1977 (dry)
1982-1983 (wet)
1988-1989
1989-1990
1990-1991

(ctrl+click for multiple selections)

Draw chart

(chart legend appears at bottom)



Reference 11

Breaking Drought News

One of California's Driest Years Ever

Calendar year 2013 closed as the driest year in recorded history for many areas of California, and the severe drought is continuing this year.

On January 17, Gov. Edmund G. Brown Jr. declared a drought state of emergency and directed state officials to take all necessary actions in response and on April 25, Governor Brown asked all Californians to redouble their efforts to conserve water, instructed agencies to cut red tape to get water to farmers more quickly, ensure that people have safe drinking water, protect vulnerable wildlife species and prepare for an extreme fire season. Read the executive order at http://gov.ca.gov/news.php?id=18496.

The proclamation is available here: http://www.gov.ca.gov/news.php?id=18368.

Water Deliveries Slightly Boosted

There was a bit of good news on April 18 as the Department of Water Resources (DWR) announced an increase from 0 to 5 percent in the State Water Project allocation (water delivery estimate) for the remainder of the year. If it stands, this will be the lowest SWP (SWP) allocation since deliveries began in the 1960s. The allocation -- changed or unchanged – will be finalized later this spring. Also on April 18, the federal Bureau of Reclamation announced that senior water rights holders in the Sacramento Valley would receive 75 percent rather than 40 percent of contracted water supplies this year.

Drought Barriers Cancelled for 2014

February and March storms that slightly boosted water deliveries also eliminated the immediate need for salinity barriers in the Sacramento-San Joaquin Delta to control saltwater intrusion from San Francisco Bay, as described in this April 18 news release. The rock barriers would have been installed at Sutter and Steamboat sloughs near Courtland and False River near Oakley. DWR continued to assess water supply and demand in the weeks following the April 18 announcement and concluded in late May that the barriers will not be needed in 2014. Planning and permitting will continue for the barriers' possible installation in 2015 if drought conditions persist into a fourth consecutive dry year.

The fifth and final snow survey of the season on May 1 recorded manual and electronic readings of the statewide snowpack's water content – which normally provides about a third of the water for California's farms and cities – at a mere 18 percent of average for the date. By late May, the Sierra snowpack's water equivalent statewide had decreased to almost zero.

When Governor Brown declared a drought State of Emergency in January, he directed state officials to take all necessary actions to prepare for water shortages. CAL FIRE recently announced it hired 125 additional firefighters to help address the increased fire threat due to drought conditions, the California Department of Public Health identified and offered assistance to communities at risk of severe drinking water shortages and the California Department of Fish and Wildlife restricted fishing on some waterways due to low water flows worsened by the drought. Also in January, the California Natural Resources Agency, the California Environmental Protection Agency and the California Department of Food and Agriculture also released the California Water Action Plan, which will guide state efforts to enhance water supply reliability, restore damaged and destroyed ecosystems and improve the resilience of our infrastructure.

Governor Brown has called on all Californians to voluntarily reduce their water usage by 20 percent and the Save Our Water campaign has announced four new public service announcements that encourage residents to conserve. Last December, the Governor formed a Drought Task Force to review expected water allocations and California's preparedness for water scarcity. In May 2013, Governor Brown issued an Executive Order to direct state water officials to expedite the review and processing of voluntary transfers of water.

For more information on drought, see http://www.water.ca.gov/waterconditions/droughtinfo.cfm.

Resources

- Drought Home
- Governor's Drought Declaration
- Water Conditions
- Drought Background
- Emergency Drought Barriers
- Publications
- Groundwater Info Center

Featured Information

- California Drought – U.S. Geological Survey - New
- Drought Response – Groundwater, April 2014
- 2014 Drought Operations Plan
- Daily Hydrologic Overview - interactive
- Klamath/San Joaquin/Sacramento Hydroclimatic Reconstructions from Tree Rings
- Treering Report Appendix.zip (data files)
- ACWA Launches Interactive Map Showing Local Response Actions
- Cal OES Drought Page
- Governor's letter, Interagency Drought Task Force
- DWR-CSUF Agricultural Drought Preparedness Workshop
- Experimental Seasonal Forecast
- Experimental Seasonal Forecast Presentation
- California Data Exchange Center
- Climate Summary Map – temperature
- Climate Summary Map – precipitation
- Spatial CIMIS
- Selected cities' precipitation

Media Contacts:

Ted Thomas
Chief, Media & Public Information
Work: (916) 653-9712
Cell: (916) 798-1701

Drought Media Outreach Materials

STAY CONNECTED

WRCC climate region dry years, ranked by inches of precipitation:

Click for a more detailed view.

Statewide		❶ North Coast		❷ North Central		❸ Northeast		❹ Sacramento-Delta		❺ Sierra	
Year	Rainfall	Year	Rainfall	Year	Rainfall	Year	Rainfall	Year	Rainfall	Year	Rainfall
2013	7.0	2013	22.7	2013	14.2	2013	7.9	2013	5.1	2013	10.4
1898	11.6	1976	32.3	1976	22.4	1924	10.6	1923	7.7	1976	17.0
1923	11.7	1923	36.5	1898	22.7	1923	11.5	1917	8.1	1898	21.6
1976	13.1	1985	37.6	1923	25.1	1976	12.0	1976	8.1	1947	21.8
1917	13.3	1929	38.9	1910	27.3	1908	12.5	1898	8.6	1908	22.1

❻ San Joaquin Valley		❼ Central Coast		❽ South Coast		❾ South Interior		❿ Mojave		⓫ Sonoran	
Year	Rainfall	Year	Rainfall	Year	Rainfall	Year	Rainfall	Year	Rainfall	Year	Rainfall
2013	2.9	2013	4.9	2013	5.3	1947	7.2	2013	2.7	... 66 entries to .09	
1947	4.5	1923	10.9	1947	5.5	1953	7.2	1953	2.8	1949, '55, '57	4.3
1917	5.2	1917	11.0	1989	5.6	1989	7.3	1929	2.9		
1898	5.5	1929	11.3	1898	6.0	2007	7.3	1989	2.9	2003	4.3
1929	5.7	1898	11.3	1953	6.1	1999	8.1	1947	3.1	1958	4.4
						1961	8.1			2013	4.4
						2013	8.2				

Note: records date back to 1895.
Source: Western Regional Climate Center

CURRENT WATER CONDITIONS

- PRECIPITATION
- SNOWPACK
- RESERVOIRS
- GROUNDWATER & MODELED SOIL MOISTURE

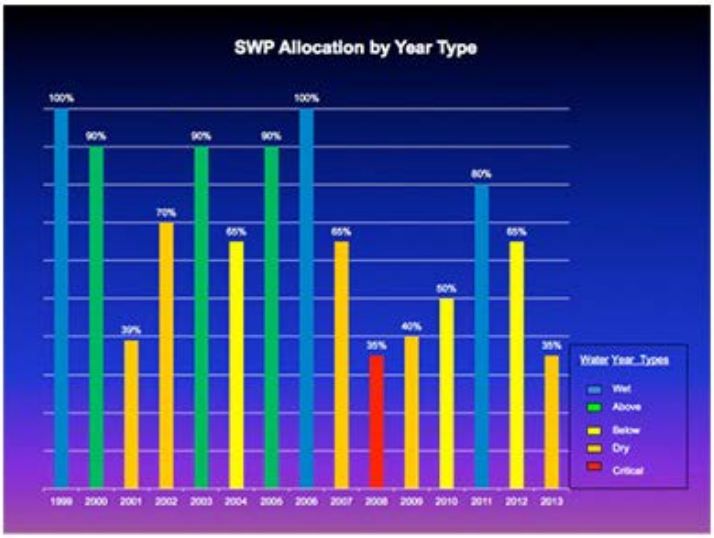
Copyright © 2014 State of California
Last Modified: 05/30/2014

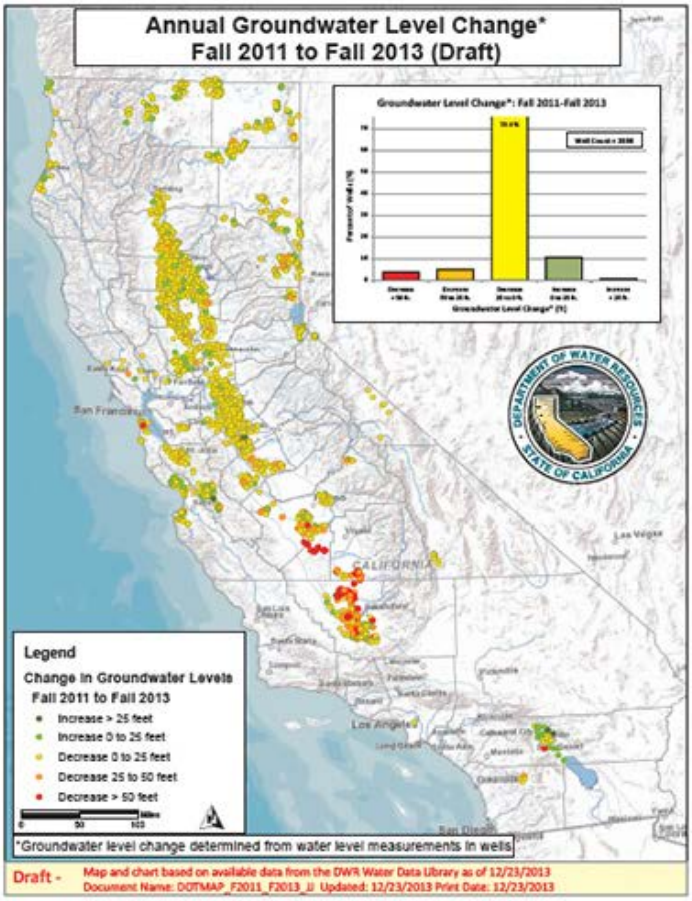
Reference 12

Drought Information

Water years 2012 and 2013 were dry statewide, especially in parts of the San Joaquin Valley and Southern California. Water year 2014, which began on October 1st, continues this trend. Precipitation in some areas of the state is tracking at about the driest year of record. Statewide reservoir storage going into our wet season was about 75 percent of average for this time of year, and impacts of two dry years on statewide groundwater levels are also evident. On average, about half of California's statewide precipitation occurs in December, January, and February, with only a handful of large winter storms accounting for the difference between a wet year and a dry one. DWR's late November experimental seasonal forecast for the water year sees mostly dry conditions for the state. It is still too early, however, to call this water year, and Mother Nature may surprise us. About half of the years with similarly dry first quarters in the historical record of northern Sierra precipitation, for example, caught up to average by the end of the season. However, a normal precipitation year would not be enough to overcome low soil moisture and water storage conditions; many water users would need a wet year to be made whole.

For background on droughts in California and answers to frequently asked questions, see the column below.





Reference 13

Urban Water Management Plan 2010

EBMUD

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comment period was also mailed to all parties included in EBMUD's UWMP 2010 mailing list on May 6, 2011, and was posted on EBMUD's website. In addition to the public hearing EBMUD held a public comment meeting on the Draft UWMP 2010 on April 21, 2011 to further encourage public involvement.

The UWMP 2010 was modified, where appropriate, to incorporate comments received from the public, interested organizations, and other agencies. Appendix C contains a summary of the comments received and EBMUD's responses to those comments.

At its meeting on June 28, 2011, the EBMUD Board of Directors adopted the UWMP 2010 and the 2010 Water Shortage Contingency Plan. A copy of the adoption resolution is included in Appendix D. By July 27, copies of the adopted UWMP 2010 were sent to the California Department of Water Resources (DWR), the California State Library, and cities and counties within EBMUD's service area and posted on EBMUD's website.

East Bay Municipal Utility District

Formation

East Bay Municipal Utility District, a public utility, was formed under the Municipal Utility District (MUD) Act, passed by the California Legislature in 1921. The MUD Act permits formation of multi-purpose government agencies to provide public services on a regional basis. In accordance with the MUD Act's provisions, voters in the San Francisco East Bay Area created EBMUD in 1923 to provide water service. In 1929, EBMUD first began water deliveries from the Sierra Nevada Mountains to the East Bay when construction of Pardee Dam and the first Mokelumne Aqueducts was completed.

Table 1-1 Urban Water Management Planning Act and Amendments

Bill	Introduced by	Chaptered
AB 2661	Klehs	1990
AB 11X	Filante	1991
AB 1869	Speier	1991
AB 892	Frazee	1993
SB 1017	McCorquodale	1994
AB 2853	Cortese	1994
AB 1845	Cortese	1995
SB 1011	Polanco	1995
AB 2552	Bates	2000
SB 553	Kelley	2000
SB 610	Costa	2001
AB 901	Daucher	2001
SB 672	Machado	2001
SB 1348	Brulte	2002
SB 1384	Costa	2002
SB 1518	Torlakson	2002
AB 105	Wiggins	2004
SB 318	Alpert	2004
SB 1087	**Florez**	**2005**
AB 1420	**Laird**	**2007**
SBx7-7	**Steinberg**	**2009**
AB 2409	**Nestande**	**2010**

The MUD Act was amended in 1941 to enable formation of special districts. In 1944, voters in six East Bay cities elected to form EBMUD's Special District No. 1 to treat wastewater from their jurisdictions prior to it being released into the San Francisco Bay. Wastewater treatment for those cities began in 1951 and later expanded to annex the Stege Sanitary District, which includes Kensington, El Cerrito, and parts of Richmond.

Board of Directors

EBMUD is governed by a seven-member Board of Directors, publicly elected to four-year terms from wards within EBMUD's service area. The Board determines overall policies, which are implemented under the direction of the General Manager. Activities of EBMUD are guided by the following Mission Statement:

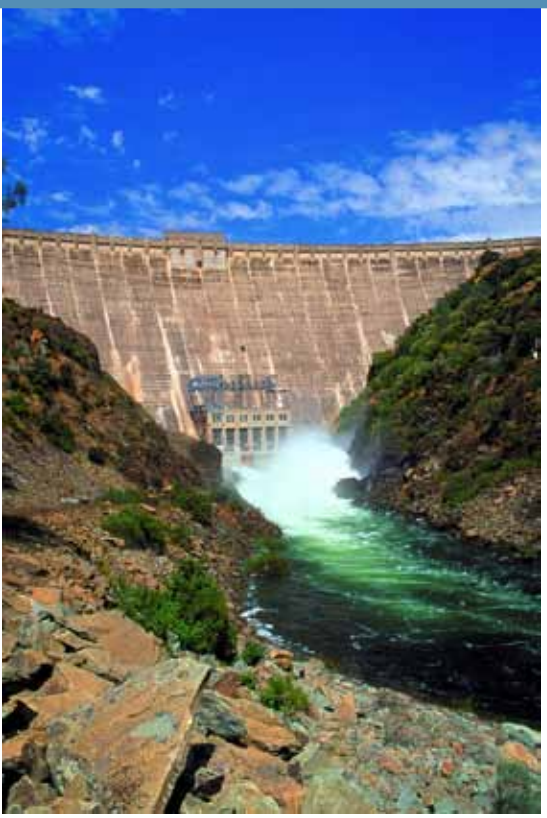
> *To manage the natural resources with which the District is entrusted; to provide reliable, high quality water and wastewater services at fair and reasonable rates for the people of the East Bay; and to preserve and protect the environment for future generations.*

Service Area

EBMUD supplies water and provides wastewater treatment for significant parts of Alameda and Contra Costa counties. Based on 2010 census data, approximately 1.34 million people are served by EBMUD's water system in a 332-square-mile area extending from Crockett on the north, southward to San Lorenzo (encompassing the major cities of Oakland and Berkeley), eastward from San Francisco Bay to Walnut Creek, and south through the San Ramon Valley. The wastewater system serves approximately 650,000 people in an 88-square-mile area of Alameda and Contra Costa counties along the Bay's east shore, extending from Richmond on the north, southward to San Leandro. EBMUD customers include residential, industrial, commercial, institutional and irrigation water users.

Reference 14

East Bay
Municipal Utility District



Water Conservation Master Plan

2011

water SMART

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    G. EBMUD 2009 and 2010 Annual Report of Best Management Practices to the CUWCC

1.2.2.3 EBMUD Water Use Data

Historical and Projected Demand

EBMUD customer accounts are metered and consumption patterns are continually tracked for water conservation purposes. Tracking water use patterns, peaking factors and seasonal use provide valuable data for identifying conservation potential and savings. Figure 1-3 shows how total metered and seasonal water consumption is distributed among six key customer categories. Single-family residential constitutes the largest customer water use category, followed by multi-family residential, industrial and petroleum, commercial, irrigation, and institutional users. Seasonal winter and summer demand is illustrated in Figure 1-4.

EBMUD has conducted a series of end use demand studies to assist in mapping demand patterns by household size and type of plumbing fixtures, appliances and landscape irrigation. These studies, along with detailed water use surveys, have helped benchmark customer demand by household and individual indoor uses. The 2008-2009 pre-drought average per capita water use (indoor and outdoor) for a single-family residential customer totals approximately 100 gallons per day or 280 gallons per day for an average household of 2.8 persons.

Market sector demand patterns are used in water conservation planning and evaluation to determine effectiveness of implemented measures and to prioritize them based on savings targets and future conservation potential. See Figure 1-5 for historical metered water use and customer account totals for single-family residential, multi-family residential, industrial and petroleum, commercial,

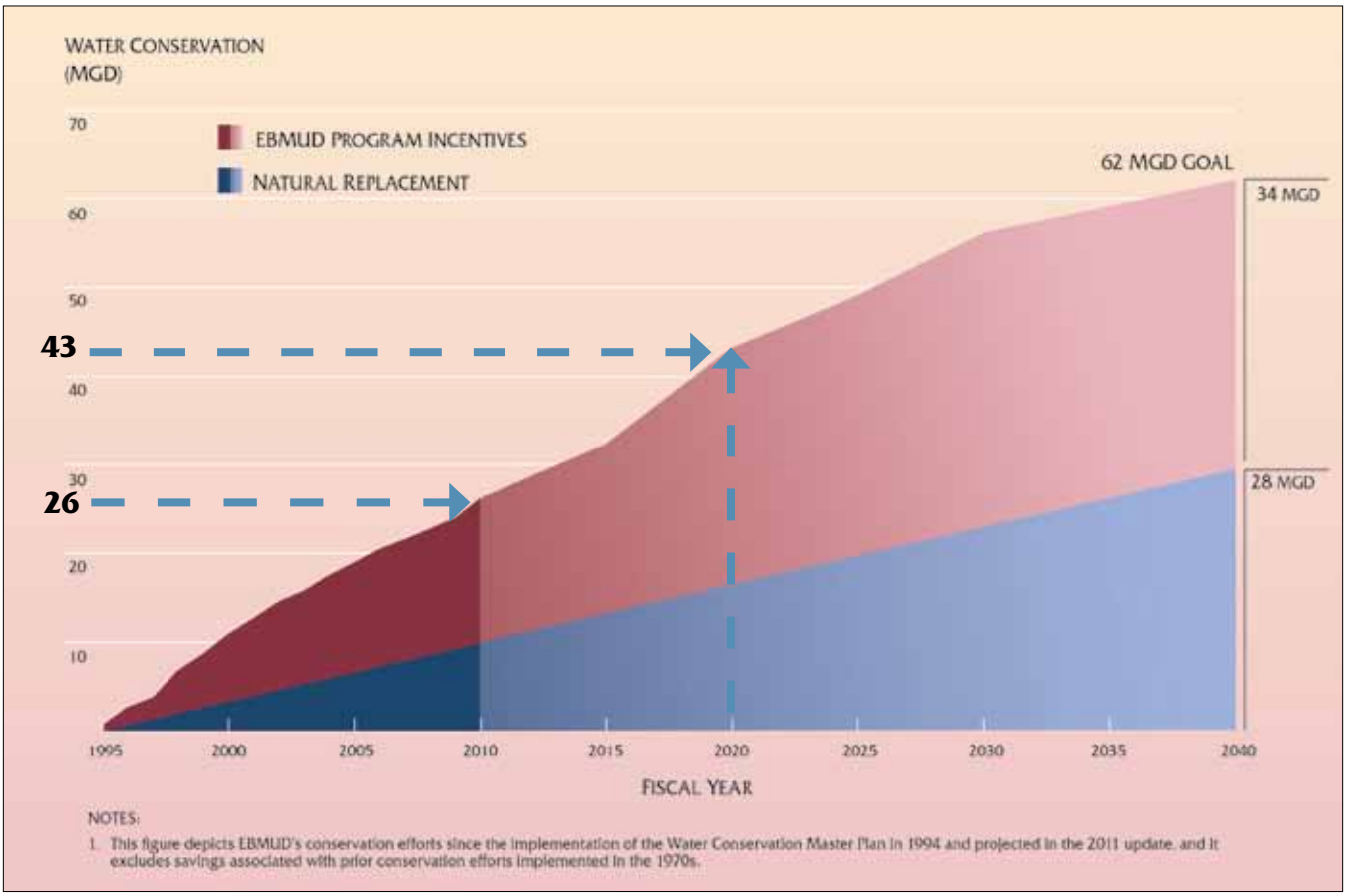

Figure 1-1 Water Conservation Savings and Goals (1995 – 2040)
Source: 2010 EBMUD Urban Water Management Plan

Reference 15

Latest Water Supply Update

In one of the driest years ever, EBMUD asks the East Bay to stretch its water supplies - and taps the Sacramento River for the first time.

NEARLY ALL OF EBMUD'S WATER SUPPLY ORIGINATES IN THE MOKELUMNE RIVER WATERSHED.

Reduced runoff from this year's storms means EBMUD reservoirs will not refill this year. Due to these excessively dry conditions in the Mokelumne River watershed where most of the East Bay's water originates, EBMUD asks all its customers to continue to cut back their water use by ten percent. In addition, it will draw on dry year supplies from the Sacramento River to fill local reservoirs this spring.

EBMUD monitors precipitation and reservoir levels daily. As of June 9, 2014, EBMUD had 451,190 acre feet of water stored in all its reservoirs combined. Our reservoirs are more than half full, or 71 percent of average. Precipitation since July in the Mokelumne basin was 25.85 inches, which is 54 percent of average.

As temperatures rise, water use will increase as it does every year. Voluntarily cutting back water use now will stretch supplies in anticipation of this summer's increased demand for water.

What happens next?

In 1976-77, East Bay residents and the East Bay economy felt the pain of severe mandatory water rationing. To prevent such hardship from occurring again, EBMUD invested for more than three decades in improving the water supply and making conservation a way of life in the East Bay.

Today, the East Bay is better prepared than it has ever been to cope with a severe drought.

This year EBMUD purchased supplies of water from the Sacramento River that will flow into local EBMUD reservoirs in May and June. The costs of buying, treating and delivering this drought year water supply are more expensive than our Mokelumne River supplies. EBMUD will absorb the cost of delivering Sacramento River water this May and June and avoid implementing a surcharge on customer bills. However, if additional water is needed later this year, a 14 percent supplemental supply surcharge may be applied to flow charges – resulting in a temporary increase of $6 for the average customer.

EBMUD's water system is able to handle short-term droughts with a combination of conservation and Sacramento River supplies. By saving water today, we are better able to handle next year's water needs – especially if the drought continues.

How to cut ten percent

Since before the last drought started in 2007, customers have cut back 17 percent. To everyone who has made conservation a way of life, we thank you.

To stretch our supply even more this year, we ask you to cut ten percent of your current water use.

EBMUD is fortunate that employees and customers alike are conservation minded. We promise that if mandatory rationing becomes necessary in the future, customer allocations won't be based on use during this voluntary cutback period.

What you can do today is:

- **Slow your flow**. Use our WaterSmart Home Survey Kit to evaluate your home's water use and find leaks and inefficient fixtures.
- **Find and fix leaks**. Toilet and irrigation systems contain some of the biggest and sneakiest leaks.
- **Watch your watering.** When you turn on your irrigation system, look for signs of leaks, overspray and run-off. The temperatures may be warming, but nights are still cool this spring. Remember your plants need water only one day a week this time of year.

Popular Pages in Water Supply

Daily Water Supply Report

Water System Map

Pipeline Repairs Reveal Water Legacy

Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan

Urban Water Management Plan

Water Supply Management Program 2040

News

Reference 16

WaterSmart Center

In dry years like this, water conservation stretches the East Bay's supply of reliable, high-quality drinking water.

Many customers have made many of the recommended water use reductions at home and work. We thank you for using water wisely every day.

Others may be able to conserve even more. Check the list below for additional opportunities to save water.

Here's how:

Popular Pages in Water and Wastewater

Project Updates

Water Supply

Wastewater Collection and Treatment

Rates and Charges

Water Quality

Water Rates & Service Charges

News

Mulch Coupon Program - New for 2014!

Save water, control weeds, and nourish the soil with mulch, a gardener's best friend. EBMUD has teamed up with Contra Costa Water District to offer discount coupons at mulch retailers across the East Bay.

Change Your Landscape

Convert your thirsty lawn to a sustainable landscape and upgrade your irrigation equipment to efficient drip systems and self-adjusting controllers. Rebates are available for up to $2,500 for single- and multi-family residences of four units or less and up to $20,000 for commercial and multi-family sites of five or more units.

Find and Fix Leaks

Toilet tanks and broken sprinklers are common culprits of household leaks. A few minutes is all you need to check for leaks in the most common places. One in four homes has a toilet leak! View the video below to see how to fix a toilet leak.

Mike's tip: How to easily find and fix a toilet leak

WaterSmart Home Survey Kit

Are you as water efficient as you can be? Slow the flow in your house with EBMUD's free kit. It includes worksheets, toilet tank dye tabs, a flow-meter bag and step-by-step instructions for you to better manage your home's water use.

WaterSmart Tips

Whether you want a quick fix or are committed to long-term conservation projects, find tips here.

Residential Services and Rebates

Commercial Services and Rebates

Irrigation Services and Rebates

Reference 17

STETSON ENGINEERS INC.

2171 E. Francisco Blvd., Suite K • San Rafael, California 94901
Phone: (415) 457-0701 • FAX: (415) 457-1638 • Web site: www.stetsonengineers.com

Northern California • Southern California • New Mexico • Arizona • Nevada • Colorado

May 16, 2014

Re: San Gregorio Creek Water Availability – Notice to 2nd Priority Water Users to Reduce Diversions

Dear Water User:

As you are aware, water flowing in the San Gregorio Creek Stream System continues to be significantly below normal due to limited rainfall received this past winter. **Our projections indicate that the available water supply has become insufficient to meet all 2nd priority water right allocations (irrigation, outside domestic and commercial stock watering uses).**

The 1993 Decree specifies priorities of rights wherein no water user is entitled to divert any water until the allotments to all higher priorities have been satisfied and further requires all water users with the same priority to share equitably in any supply shortage. We have notified or are completing the process of notifying all 4th and 3rd priority water users to cease diverting so that the 2nd priority allotments may be satisfied.

This letter is written to respectfully request that you, as having a 2nd priority water right, stop diverting water for <u>two</u> days of each week (until further notice), beginning May 19, 2014, according to your Point of Diversion (POD) Number as set forth in the schedule below:

Point of Diversion Numbers	No Diversions During Day of Week*
POD #1 through #35	Sundays and Tuesdays
POD #36 through #70	Mondays and Wednesdays
POD #71 through #105	Tuesdays and Thursdays
POD #106 through #140	Wednesdays and Fridays
POD #141 through #175	Thursdays and Saturdays
POD #176 through #210	Fridays and Sundays
POD #211 through #245	Saturdays and Mondays
POD#1000 through #1002	Saturdays and Mondays

* *Note: Four of the largest irrigators in the lower portion of the watershed will be on a specific rotation schedule, different than above, which also includes two days each of no diversions.*

Your Point of Diversion Number(s) with 2nd Priority uses are shown on the attachment to this letter. Please use your Point of Diversion Number(s) from the attachment and the above schedule to determine which days of the week you should not divert any water.

Beginning May 19, 2014 (and until further notice) you are also requested to not divert water at a rate that is greater than your Decreed allocation, taken continuously over a 24-hour period. By way of example, if your total daily allocation is 5,000 gallons per day, then your maximum allowable diversion rate, beginning May 19, would be calculated as follows:

$$\frac{5{,}000}{24 \times 60} = 3.5 \text{ gallons per minute} \quad \text{(EXAMPLE)}$$

In the upcoming weeks and months, subsequent notices for further reductions in diversions will be necessary. Please be advised that based on a comparison with historical droughts, lower San Gregorio Creek may go dry this summer. Please contact me if you have any questions or require additional information.

Sincerely,

Julian Fulwiler, P.E.
Stetson Engineers Inc.
Watermaster for San Gregorio Creek

cc: (representative letter)
Honorable George A. Miram

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Reference 18

Mountain View council declares 'Stage 1' emergency

By Jason Green

Daily News Staff Writer

POSTED: 04/02/2014 12:27:17 AM PDT
UPDATED: 04/02/2014 12:46:47 AM PDT

0 COMM

Even as rain pelted the Bay Area, the Mountain View City Council unanimously called a water shortage e

The "Stage 1" declaration authorizes city staff to ramp up efforts to educate the public about conservation programs and prohibited nonessential water uses, which include washing a vehicle with a running hose and serving water in a restaurant except upon request.

"This is something that we need to do," Councilman Mike Kasperzak said before the 7-0 vote. "And while it is raining, we are still so far behind and we are at th of the typical rainy season."

Indeed, the Sierra Nevada snowpack, a critical source of water for California, was 32 percent of average Tuesday, the lowest level on April 1 since 1988, when it was percent of average.

The council's decision follows Gov. Jerry Brown's declaration of a drought state of emergency on Jan. 17. Urban water suppliers including the San Francisco Public Utilities Commission and the Santa Clara Valley Water District have since called on customers to reduce consumption by 10 and 20 percent respectively.

Mountain View gets 87 percent of its drinking water from the San Francisco Public Utilities Commission, 9 percent from the Santa Clara Valley Water District and t rest from city wells.

The council also passed an ordinance that adds its Urban Water Management Plan to the municipal code. A drought emergency stages, with the first reflecting a 10 percent shortage.If the drought worsens, the council could declare a "Stage 2" emergency, which would reflect a 25 percent shor and prohibit the watering of yards between 9 a.m. and 5 p.m. The time to fix broken water systems would be shaved from 10 to five days, and at-home vehicle wash would be banned unless done by bucket.

A "Stage 3" emergency, which would involve a shortage of up to 40 percent, would shut down commercial car washes that do not use re-circulating systems and pr drinking water from being used to fill pools.

Called when a shortage exceeds 40 percent, a "Stage 4" emergency would provide just 24 hours to fix broken water systems and irrigation of public parks, pl fields and school grounds to once per week.

The city already has the authority to install flow-restriction devices on the water lines of customers who use water in prohibited ways and ultimately discontinue ser The ordinance would extend those measures to violations of provisions outlined in the plan. It would also add the associated costs to the city's master fee schedule ar adjust them annually for inflation.

A handful of residents pushed the council not to adopt what they called a "draconian" ordinance.

"I think that doing something like that is unconscionable, because you don't know particularly what those circumstances are," Jim Neal said about the prospect of t city turning off someone's water.

Councilman Jac Siegel said written notices and a hearing would lead up to any such action.

"The objective is not to turn people's water off," he said. "It's to get their attention and hopefully they'll respond a to contact the and work with them."

Bay Area News Group Staff Writer Paul Rogers contributed to this report.

Email Jason Green at jgreen@dailynewsgroup.com (mailto:jgreen@dailynewsgroup.com); follow him at twitter (http://twitter.com/jgreendailynews).

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Former Survivor contestant Caleb Bankston killed in train derailment (http://www.mercurynews.com/entertainment/ci_26030917/former-survivor-contestant-caleb-bankston-killed-train-derailment?source=most_viewed)

Review: 'Snowpiercer' a wild dystopian ride with Chris Evans (http://www.mercurynews.com/entertainment/ci_26032544/review-snowpiercer-a-wild-dystopian-ride-chris-evans?source=most_viewed)

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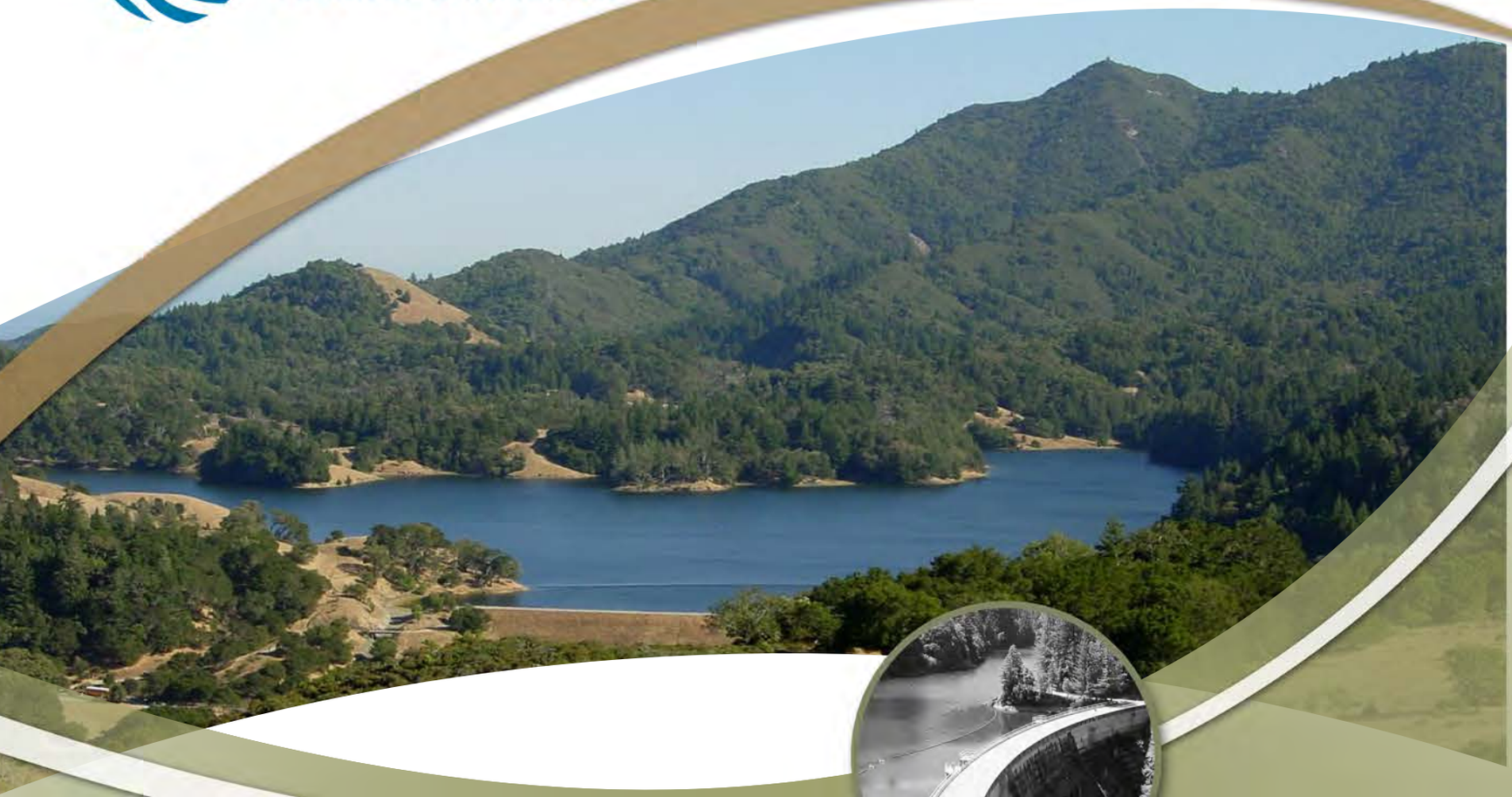
Reference 19

MARIN MUNICIPAL WATER DISTRICT



2010 Urban Water Management Plan
Marin Municipal Water District

June, 2011

HDR

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and sanitation needs are met. Therefore, discretionary water uses, such as using potable water for irrigation, are expected to be reduced to a greater extent.

Table 5-2
Water Shortage Contingency — Water Supply Conditions and Rationing Levels

Stage	Water Supply Conditions	% Reduction
Alert Stage (Voluntary Rationing)	Total reservoir storage is less than 50,000 ac-ft on April 1	10%
Mandatory Rationing	Total reservoir storage is less than 40,000 ac-ft on April 1	25%
Water Shortage Emergency	Total reservoir storage on December 1 is projected to be in the vicinity of, or less than 30,000 ac-ft	up to 50%

Table 5-3
Allocation Plan — Proposed Cutbacks at Different Rationing Levels

Billing Codes	20% Rationing	25% Rationing	30% Rationing	40% Rationing	50% Rationing
Billing Code 1-5 (Residential)	25%	32%	32%	46%	55%
Billing Code 6 (Institutional)	20%	25%	30%	40%	50%
Billing Code 7 (Business)	15%	20%	25%	35%	45%
Billing Code 8 (Irrigation)	45%	50%	60%	75%	90%

5.4.2 Water Waste Prohibitions

The District has implemented on-going prohibitions to reduce water waste. There are additional prohibitions that are put into action during dry periods. Table 5-4 provides a summary of on-going and dry period prohibitions.

5.4.3 Penalties

Any customer violating the regulations and restrictions on water use set forth above shall receive a written warning for the first such violation. Upon a second violation, the customer shall receive a written warning and the District may cause a flow restrictor to be installed in the service. If a flow restrictor is placed, the cost of installation and removal shall be paid by the violator. Any willful violation occurring subsequent to the issuance of the second written warning shall constitute a misdemeanor and may be referred to the Marin County district attorney's office for prosecution. The District may also disconnect the water service. If water service is disconnected, it shall be restored only upon payment of the turn-on charge fixed by the District Board of Directors.

Appropriate rate penalties will be developed and presented to the Board at the time of rationing program implementation. In addition to financial penalties, these may include installation of flow restrictors and shut-off of service.

Title 13

WATER SERVICE CONDITIONS AND WATER CONSERVATION MEASURES

Chapters:

13.01 Eliminated (Ord. 346, 1993)
13.02 Water Conservation and Dry Year Water Use Reduction Program
13.03 Water Budgets and Related Conservation Measures

Chapter 13.02

WATER CONSERVATION AND DRY YEAR WATER USE REDUCTION PROGRAM*

Sections:

13.02.010 Declaration of purpose.
13.02.015 Declaration of Water Shortage Emergency.
13.02.020 Water waste prohibitions.
13.02.021 Water Conservation: Normal Year Water Conservation
13.02.030 Water use reduction in dry periods.
13.02.040 Calculation of allowable water use.
13.02.050 Variances.
13.02.060 Enforcement.
13.02.065 Unauthorized water use.
13.02.070 Further prohibitions.
13.02.080 Penalty for violations.
13.02.090 Appeals.
13.02.100 Remedies/cumulative.
13.02.110 Chapter controlling.

13.02.010 Declaration of purpose. The purpose of this chapter is to provide a water conservation plan to minimize the effect of a shortage of water on the district's consumers and to adopt provisions that will significantly reduce the consumption of water during an extended dry weather period (drought), thereby extending the available water for the district's consumers while reducing the hardship on the general public to the greatest extent possible, voluntary conservation efforts having proved insufficient to achieve these ends. The programs developed in this chapter are triggered based on lake storages developed by computer simulations performed utilizing the district's seven reservoirs with approximately eighty thousand acre-feet of total capacity and up to nine thousand acre-feet per year of imported water. (Ord. 387 §1, 1999; Ord. 316 §2 (part), 1991).

* Prior ordinance history: Ords. 279, 286, 290 and 314.

13.02.015 Declaration of Water Shortage Emergency. When the district's lake storage on December 1 is projected to be in the vicinity of, or less than, thirty thousand acre-feet, the board may declare by resolution a Water Shortage Emergency as defined in the Water Code and then advise the State Water Resources Control Board of the need to conserve local storage. (Ord. 387 §1, 1999)

13.02.020 Water waste prohibitions. No customer of the district shall make, cause, use or permit the use of potable water from the district for residential, commercial, industrial, agricultural, governmental or any other purpose in a manner contrary to any provision of this section.

(1) Prohibited Nonessential Uses Applicable to All Consumers. It is unlawful for any person, firm, partnership, association, corporation, or political entity to use water from the district for the following nonessential uses:

(A) The washing of sidewalks, walkways, driveways, parking lots and all other hard-surfaced areas by direct hosing, except as may be permitted by current regulations pertaining to urban water runoff pollution prevention as defined by the Marin County Stormwater Pollution Prevention Program and other controlling agencies;

(B) The escape of water through breaks or leaks within the consumer's plumbing or private distribution system for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of forty-eight hours after the consumer discovers such a leak or break, or receives notice from the district of such leak or break, whichever occurs first, is a reasonable time within which to correct such leak or break;

(C) Non-recycling decorative water fountains.

(D) Restrictions on Irrigation. Irrigation shall not be conducted in a manner or to an extent that allows water to run off or overspray the areas being watered. Every consumer is required to have his/her water distribution lines and facilities under control at all times to avoid water waste.

(E) Any excess water runoff flowing onto the public right of way at a rate of 1 gallon per minute or greater not caused by storm water or naturally occurring groundwater, is prohibited.

(2) Restrictions on Reverse-Osmosis Units. The installation of reverse-osmosis water purifying systems not equipped with an automatic shutoff unit is prohibited.

(3) The following are prohibited for new connections:

(A) Single-pass cooling systems for air conditioning or other cooling system applications unless required for health or safety reasons;

(B) Non-recirculating systems for conveyer carwash applications. (Ord. 421 §2, 2011; Ord. 387 §1, 1999; Ord. 332 §1, 1992; Ord. 316 §2 (part), 1991).

13.02.021 Water Conservation: Normal Year Water Conservation.

(1) Declaration of Purpose. The purpose of this chapter is to provide a water conservation plan to maximize the water supply during periods of relatively normal rainfall and to minimize the effect of a shortage of water on the district's consumers during an extended dry weather period (drought). The normal year conservation programs in this chapter are based on industry standards promulgated by the American Rainwater Catchment Systems Association (ARCSA), Bay-Friendly Landscape and Gardening Practices (Bay-Friendly), Best Management Practices developed by the California Urban Water Conservation Council (CUWCC), California Department of Water

MMM. Submeter: a separate meter that is located on the private side of the water system and is plumbed to measure all water that flows only through the irrigation system. This meter is to be used by the owner to monitor irrigation water use and will not be read or maintained by the District.

NNN. Swing Joint: an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

OOO. Turf: A mat layer of monocotyledonous plants with shallow rooting structures requiring frequent watering during the growing season; i.e., cool or warm season grass consisting, but not limited to Blue, Rye, Fescue, Bent, Bermuda, Kikuyu, St. Augustine, Zoysia, and Buffalo.

PPP. Valve: a device used to control the flow of water in the irrigation system.

QQQ. Valve Manifold: a one-piece manifold for use in a sprinkler valve assembly that includes an intake pipe having a water inlet and a plurality of ports adapted for fluid connection to inlets.

RRR. Water Budget: an allocation of water based on plant water needs, used to determine the billing tiers for customers with dedicated landscape irrigation meters, for example.

SSS. Water Feature: a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscape area.

TTT. Weather Based or Sensor Based Irrigation Control Technology: uses local weather and landscape conditions to tailor irrigation schedules to actual conditions on the site or uses historical weather data.

UUU. WUCOLS: the Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000.

(Ord. 421 §3(part), 2011: Ord. 403 §4, 2004: Ord. 394 §1, 2001: Ord. 385 §1(part), 1999): Ord. 326 §1(part), 1991).

(3) Requirements for All Services.

A. Pressure Regulation. A pressure-regulating valve shall be installed and maintained by the consumer if static service pressure exceeds 80 pounds per square inch (psi), and be set at a maximum operating pressure of 60 psi at the regulator outlet. The pressure-regulating valve shall be located between the meter

and the first point of water use, or first point of division in the pipe, and pressure-relief valves and other plumbing safety devices shall be installed as required by local codes. The operating pressure requirement may be waived if the consumer presents evidence satisfactory to the District that high pressure is necessary in the design and that no water will be wasted as a result of higher pressure operation.

B. Interior Plumbing Fixtures. All plumbing installed, replaced or moved in any new or existing service shall be high-efficiency fixtures and shall meet the following minimum requirements:

1. High-efficiency Clothes Washers: Residential or commercial clothes washers that meet the current highest water efficiency standards as defined by the District. The General Manager shall have authority to grant a variance from the requirements of this section based upon financial hardship.

2. High-efficiency Lavatory Faucet: The maximum flow rate shall not exceed 1.5 gallons per minute (gpm) at a pressure of 60 pounds per square inch (psi) at the inlet, when water is flowing.

3. High-efficiency Shower Head: The manufacturer shall specify a maximum flow rate equal to or less than 2.0 gallons per minute (gpm), at a pressure of 60 pounds per square inch (psi) at the inlet, when water is flowing.

4. High-efficiency Toilet: Any WaterSense listed toilet rated at an effective flush volume of no greater than 1.28 gallons.

5. High-efficiency Urinal: The average water consumption shall not exceed 0.25 gallons per flush (gpf).

C. Pool Covers. Pool covers are required for all new outdoor swimming pools. (Ord. 421 §3(part), 2011; Ord. 385 §1(part), 1999); Ord. 326 §1(part), 1991).

(4) Non-Residential Interior Plumbing Fixtures. All plumbing installed, moved or replaced in any new or existing service shall be high-efficiency fixtures and shall meet the following minimum requirements: (Ord. 421 §3(part), 2011).

A. Faucets. Lavatory faucets, other than public lavatory or metering faucets, shall deliver 1.5 gallons, or less of water per minute.

1. **Metered Faucets** Self-closing or self-closing metering faucets shall be installed on lavatories intended to serve the transient public, such as those in, but not limited to, service stations, train stations, airports, restaurants, and convention halls. Metered faucets shall deliver no more than .25 gallons of water per use. Self-closing faucets shall deliver no more than .5 gallon per minute.

2. **Public Lavatory** (other than metering) faucets shall deliver 0.5 gallons, or less, of water per minute.

3. **Kitchen, Bar and Utility/Service** (other than hand-washing sinks) faucets shall deliver 2.2 gallons, or less, of water per minute.

B. Private Use, Public Use. *Pursuant to the International Plumbing Code (IPC):* "In the classification of plumbing fixtures, "private" applies to fixtures in residences and apartments, and to fixtures in nonpublic toilet rooms of hotels and motels and similar installations in buildings where the plumbing fixtures are intended for utilization by a family or an individual…"public" applies to fixtures in general toilet rooms of schools, gymnasiums, hotels, airports, bus and railroad stations, public buildings, bars public comfort stations, office buildings, stadiums, stores, restaurants and other installations where a number of fixtures are installed so that their utilization is similarly unrestricted".

C. Commercial Equipment Specifications.

1. **Dishwashers.** Dishwashers are machines designed to clean and sanitize plates, glasses, cups, bowls, utensils, and trays by applying sprays of detergent solution (with or without blasting media granules) and a sanitizing final rinse. Dishwashers shall meet the current specifications set by the Consortium for Energy Efficiency's (CEE) "High Efficiency Specifications for Commercial Dishwashers and any and all amendments thereto".

2. **Steamers.** A "steamer" or "steam cooker" is a device with one or more food steaming compartments in which the energy in the steam is transferred to the food by direct contact. Steamers shall meet the current specifications set by the CEE's "High Efficiency Specifications for Commercial Steamers and any and all amendments thereto".

3. **Pre-Rinse Spray Valves.** Pre-rinse valves use a spray of water to remove food waste from dishes prior to cleaning in a dishwasher. Pre-rinse spray valves shall (1) deliver 1.3 gallons, or less, of water per minute based on tested performance by the FSTC and (2) meets the cleaning performance standard of 26 seconds per plate or less, based on the ASTM *Standard Test Method for Performance of Pre-Rinse Spray Valves and any and all amendment thereto*.

4. **Dipper Wells.** A "dipper well" is a basin into which clean tap water flows constantly to provide a fresh supply of water for soaking utensils. The run-off goes down the drain. Dipper well flow rate shall be .3 gallon, or less, per minute.

5. **Ice Machines.** Ice machine are a factory-made assembly (not necessarily shipped in one package) consisting of a condensing unit and ice-making section operating as an integrated unit, with means for making and

harvesting ice. It is an assembly that makes up to 4,000 lbs of ice per day at Standard Ratings Conditions, as defined in Section 5.2.1 of ARI Standard 810-2006, and may also include means for storing or dispensing ice, or both. Ice machines shall (1) be Energy Star qualified and (2) meet the current highest Tier specification set by the CEE's "High Efficiency Specifications for Air-Cooled Ice Machines and any and all amendments thereto".

6. **Clothes Washers.** "Commercial clothes washer" means a soft mount front-loading or soft mount top loading clothes washer with clothes container compartment no greater than 3.5 ft^3 for horizontal axis clothes washers, or nor greater than 4.0 ft^3 for vertical axis clothes washers, that is designed for use in (1) applications where the occupants of more than one household will be using it, such as multi-family housing common areas and coin laundries, or (2) other commercial applications. Commercial clothes washers shall meet the minimum Modified Energy Factor (MEF) and maximum Water Factor (WF) corresponding to the highest efficiency machines on the most recent CEE "High Efficiency Specification for Commercial, Family-Sized Clothes Washers and any and all amendments thereto". As of January 1, 2007, the highest efficiency machines have a minimum MEF of 2.20 and a maximum WF of 4.5.

7. **Heating, Ventilation and Air Conditioning (HVAC) Equipment.** HVAC Equipment shall eliminate all once-through cooling, replacing with an air-cooled system or a cooling tower. For cooling towers, the following are recommended:

   (a) flow submeters on make-up and bleed-off lines; submeters should, at a minimum, be capable of totaling the flow.

   (b) conductivity controllers that activate the blowdown valve for dissolved solids control.

   (c) overflow sensors on the overflow pipes.

   (d) baffles or drift eliminators.

   All cooling towers shall be monitored and maintained in a manner consistent with applicable regulatory guidelines and manufacturers recommendations.

(5) Water Efficient Landscaping

A. After January 1, 2011, this chapter shall apply to all of the following:

1. New construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than 1,000 square feet requiring a building or landscape permit, plan check or design review;

2. New construction and rehabilitated landscapes which are developer or contractor-installed in single-family and multi-family projects with a landscape area equal to or greater than 1,000 square feet requiring a building or landscape permit, plan check, or design review;

3. New construction and rehabilitated landscapes which are homeowner-provided in single family and multi-family residential projects with a total project landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check or design review.

B. This chapter shall not apply to:

1. Registered local, state or federal historical sites;

2. Ecological restoration projects that do not require a permanent irrigation system;

3. Mined-land reclamation projects that do not require a permanent irrigation system; or

4. Plant collections, as part of botanical gardens and arboretums open to the public.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

C. Landscape Design Plan. For each landscape project subject to this chapter applicants shall submit a landscape design plan in accordance with the following:

1. Amendments, Mulching and Soil Conditioning: A minimum of 8" of non-mechanically compacted soil shall be available for water absorption and root growth in planted areas.

2. Incorporate compost or natural fertilizer into the soil to a minimum depth of 8" at a minimum rate of 6 cubic yards per 1000 square feet or per specific amendment recommendations from a soils laboratory report.

3. A minimum 3" layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers or direct seeding applications.

4. Plants.

   (a) Selected plants shall not cause the Estimated Total Water Use to exceed the Maximum Applied Water Allowance (see calculation in Appendix A).

   (b) Plants with similar water use needs shall be grouped together in distinct hydrozones and where irrigation is required, the distinct hydrozones shall be irrigated with separate valves.

   (c) Low and moderate water use plants can be mixed, but the entire hydrozone will be classified as moderate water use for MAWA calculations.

   (d) High water use plants shall not be mixed with low or moderate water use plants.

   (e) All non-turf plants shall be selected, spaced, and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site.

   (f) Turf shall not be allowed in the following conditions: Slopes exceeding 10%, planting areas 8 feet wide or less, street medians, traffic islands, planter strips adjacent to hardscape, or bulbouts of any size.

   (g) Invasive plants as listed by the Cal-IPC are prohibited. Weedy species, listed as invasive in California at (www.cal-ipc.org/ip/inventory/index.php) shall not be planted. Please check the species you might be thinking of planting against these lists, broken out by plant type. Exemptions may be granted on a case by case basis if District staff determine that the proposed location, species, size, number of plants, and other cultural methods are not likely to cause harm to the watershed ecosystem.

   (h) Fire Safe Landscape Practices. The requirements in this chapter are intended to support, and be in compliance with, all local and State requirements related to Fire Safe Landscaping practices, including, but not limited to, requirements for Wildlife Urban Interface zones as specified by the local authority.

(i) Identify any applicable rain harvesting, graywater, or catchment technologies (e.g. rain gardens, cisterns, etc.). Applicants are encouraged to employ alternative irrigation techniques as appropriate, and where permitted by law.

(j) Identify location and installation details of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Appropriate stormwater best management practices are encouraged in the landscape design.

5. Water Features.

(a) Re-circulating water systems shall be used for water features.

(b) Recycled water shall be used when available and approved for use onsite.

D. Irrigation Design Plan.

1. For each landscape project subject to this chapter applicants shall submit an irrigation design plan that is designed, and installed, to meet irrigation efficiency criteria as described in Appendix A (MAWA) and in accordance with the following:

(a) Irrigation systems with meters 1 ½" or greater require a high-flow sensor that can detect high flow conditions and have the capabilities to shut off the irrigation system.

(b) Isolation valves shall be installed at the point of connection and before each valve or valve manifold.

(c) High-efficiency controllers, weather-based, or other sensor based self-adjusting irrigation controllers shall be required.

(d) Rain sensors shall be installed for each irrigation controller.

(e) Pressure regulation and/or booster pumps shall be installed so that all components of the irrigation system operate at the manufacturer's recommended optimal pressure.

(f) Irrigation systems shall be designed to prevent runoff or overspray onto non-targeted areas, and wherever overhead irrigation is located directly adjacent to hardscape areas, where runoff water flows into the curb and gutter; all spray heads shall be setback a minimum of 24" from hardscape edges.

(g) Low volume or bubbler irrigation is required where plant height at maturity will affect the uniformity of a high volume overhead spray system.

(h) Minimum 24" setback of overhead spray irrigation is required where turf is directly adjacent to a continuous hardscape area where runoff water flows into the curb and gutter.

(i) Slopes greater than 15% shall not be irrigated with an irrigation system with a precipitation rate exceeding 0.75 inches per hour (or lower if appropriate for site conditions as determined the District). This restriction may be modified if the irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

(j) A single valve shall not irrigate hydrozones that mix high water use plants with moderate or low water use plants.

(k) Trees shall be placed on separate irrigation valves except when planted in turf areas.

(l) Sprinkler heads, rotors and other emission devices on a valve shall have matched precipitation rates.

(m) For all irrigation systems, coverage to sustain plant material in a healthy condition and provide irrigation efficiency shall be required. Head-to-head coverage is required for high volume spray systems unless otherwise directed by the manufacturer's specifications.

(n) Swing joints or other pipe protection components are required on above-ground irrigation piping.

(o) Check valves shall be installed to prevent low-head drainage.

E. Separate District landscape water service meters shall be required for all new landscapes, other than single-family and two-unit residential landscapes, for which the irrigated area is equal to or greater than 1,000 square feet.

1. A private submeter shall be required for all rehabilitated landscapes, other than single-family and two-unit residential landscapes, for which the irrigated landscape area is equal to or greater than 1,000 square feet.

2. A private submeter shall be required for all points of connection on single-family and two-unit residential sites for which the irrigated landscape area is equal to or greater than 2,500 square feet.

F. Documentation for Compliance. The following documentation is to be presented to the District at each of the three steps of review defined below. This documentation shall be required for compliance with this chapter. 13.02.021

1. STEP 1: DESIGN REVIEW. For those landscape projects that require Design Review, applicants shall submit the following documentation to the District:

(a) Completed Appendix A, Maximum Applied Water Allowance (MAWA)

(b) A landscape planting design plan that accurately and clearly identifies and depicts new and existing trees, shrubs, groundcovers, turf, and any other planting areas; plants by botanical name, common name, and plant factor; plant sizes and quantities; property lines, new and existing building footprints, streets, driveways, sidewalks and other hardscape features; pools, fountains, water features.

(c) An irrigation design plan drawn at the same scale as the planting plan that:

(i) Accurately and clearly identifies and depicts irrigation system point(s) of connection;

(ii) Accurately and clearly identifies and depicts irrigation system components, e.g. controller, pipe, remote-control valves, sprinklers, rain shut-off device, check valves, pressure regulating devices, backflow prevention devices, and other required devices

(iii) Includes the Hydrozone Table (See Appendix B).

(iv) For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff, and water waste. A grading design plan drawn at the same scale as the planting design plan shall be submitted as part of the Landscape Documentation Package. Items 1(a-e) below are required for all projects.

(1) The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:
(a) height of graded slopes:
(b) drainage patterns:
(c) pad elevations;
(d) finish grade: and
(e) stormwater retention improvements, if applicable.

(2) It is highly recommended that, when site conditions allow, project applicants consider grading so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes.

The grading design plan shall contain the following statement: "I have complied with the criteria of this chapter and applied them accordingly for the efficient use of water in the grading design plan" and shall bear the signature of a licensed professional or contractor as authorized by law.

(d) For homeowner-provided projects, a completed Homeowner's Irrigation Design Statement, Appendix B, which describes irrigation methods and design actions that will be employed to meet the irrigation specifications of this chapter, may be submitted in lieu of the irrigation design plan.

2. STEP 2: COMPLETION OF INSTALLATION. Upon installation and completion of the landscape, applicant shall submit Appendix D, the Certificate of Completion.

The certificate shall be accompanied by an irrigation audit that contains the following:

(a) Operating pressure of the irrigation system.

(b) Distribution uniformity of overhead irrigation.

(c) Precipitation rate of overhead irrigation.

(d) Report of any overspray or broken irrigation equipment.

(e) Irrigation schedule including:

(f) Plant establishment irrigation schedule.

(i) Regular irrigation schedule by month including: plant type, root depth, soil type, slope factor, shade factor, irrigation interval (days per week), irrigation runtimes, number of start times per irrigation day, gallons per minute for each valve, precipitation rate, distribution uniformity and monthly estimated water use calculations.

(ii) An irrigation maintenance schedule timeline shall be attached to the certificate of completion that includes: Routine inspections, adjustment and repairs to the irrigation system, aerating and dethatching turf areas, replenishing mulch, fertilizing, pruning and weeding.

3. STEP 3: FINAL INSPECTION. A final inspection shall be performed by District staff to verify compliance with this chapter. Once the completion form is received, the District will conduct an inspection to check for proper installation and operation of all landscape and irrigation elements per the approved plan; however, the District reserves the right to perform site inspections at any time before, during, or after irrigation system and landscape installation and to require corrective measures if requirements of this chapter are not satisfied. If corrective measures are necessary, the District will set the water budget to zero until corrective measures are completed.

   Advanced notice is required for all inspections. Inspections can be requested for either morning or afternoon during regular business hours. Final approval shall not be completed until the landscape inspection is approved. An extension of the approval process, to complete landscape and irrigation installation, shall be requested and shall be approved District staff.

(Ord. 421 §3(part), 2011).

(6) Drinking Water Served Upon Request Only.

By January 1, 2011, eating or drinking establishments, including but not limited to a restaurant, hotel, café, cafeteria, bar, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

(7) Commercial Lodging Establishments Must Provide Guests Option to Decline Daily Linen Services.

By January 1, 2011, hotels, motels and other commercial lodging establishments shall provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments shall prominently display notice of this option in each bathroom using clear and easily understood language.

(8) Grey Water Systems. This section is reserved for future provisions regarding grey water systems.

(9) Rain Water Harvesting Systems. This section is reserved for future provisions regarding rain water harvesting systems.

(10) Other Provisions. The General Manager will consider and may allow the substitution of design alternatives and innovation which may equally reduce water consumption for any of these requirements. The General Manager may accept documentation methods, water allowance determination, and landscape and irrigation design requirements of the State of California Model Water Efficient Landscape Ordinance instead of Chapters 14-30.040 and 14-30.050 of these requirements where it can be demonstrated that the State procedure will more effectively address the design requirements of the project.

(11) Provisions For Appeal. The applicant or any affected person may appeal the final decision of staff regarding plan check or final inspection to the General Manager, The decision of the General Manager shall be final. An appeal regarding plan check shall be submitted prior to the installation of the landscape or it will be deemed to have been waived.

(12) **Forms.** The following forms shall be submitted as described in this chapter: Appendix A, Maximum Applied Water Allowance; Appendix B, Homeowner's Irrigation Design Statement; Appendix C, Hydrozone Table; Appendix D, Certificate of Completion. (Ord. 421 §3(part), 2011; Ord. 414 §2, 2010)

Rebates

Get Paid to Save

Rebates are back! We're pleased to offer rebates on high-efficiency toilets, high-efficiency clothes washers, and smart irrigation controllers.

In addition to getting a rebate on your purchase, you will continue to save money, and water, in the long term by replacing old water-wasting toilets, clothes washers, and irrigation controllers with new water-efficient models.

For an overview of our rebate programs, see our brochure (/DocumentCenter/View/124). For program-specific information—including qualifying models, terms and conditions, and other important information—choose from the links below:

- High-Efficiency Clothes Washer Rebates (http://ca-marinwater.civicplus.com/164/Clothes-Washers)
- High-Efficiency Toilet Rebates (http://ca-marinwater.civicplus.com/166/Toilets)
- Smart Irrigation Controller Rebates (http://ca-marinwater.civicplus.com/165/Irrigation-Controllers)

What's New

High-efficiency urinal rebates (http://ca-marinwater.civicplus.com/167/Urinals) are now available for commercial customers.

Documents

- Rebates: (/DocumentCenter/View/124)Get Paid to Save Brochure (/DocumentCenter/View/124)

Funding for this rebate comes from the Marin Municipal Water District and the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006, administered by State of California, Department of Water Resources.

Bay Area water agencies are coordinating to provide this rebate program, funded in part

Reference 22

Drought Information

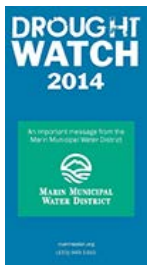
July 1, 2014 Update

Total rainfall at Lake Lagunitas for the rainfall year ending June 30 will top out at 33.40 inches, which is about 64% of the annual average. This marks the third consecutive year of below average rainfall, and the reservoir storage levels reflect those low numbers.

The MMWD Board of Directors' call for 25% voluntary rationing is still in place. Customers who are already low water users (65 gallons per person per day for residential customers) do not need to reduce further.

(http://visitor.constantcontact.com/manage/optin?v=001ZfiuR_73g8oCVVqiYN3gx5SoeVMq4_Jl7oqzJYfADvMuzjFFePbZfJS3imozxauFfhzJn4_UXZ352mxagVA88TRiwdUjjZPovq6m2ltCIH-z0ScTlw3eC1YXYHZWIyBOBx_hPHUfTJA%3D)

Mailer
Feb 2014



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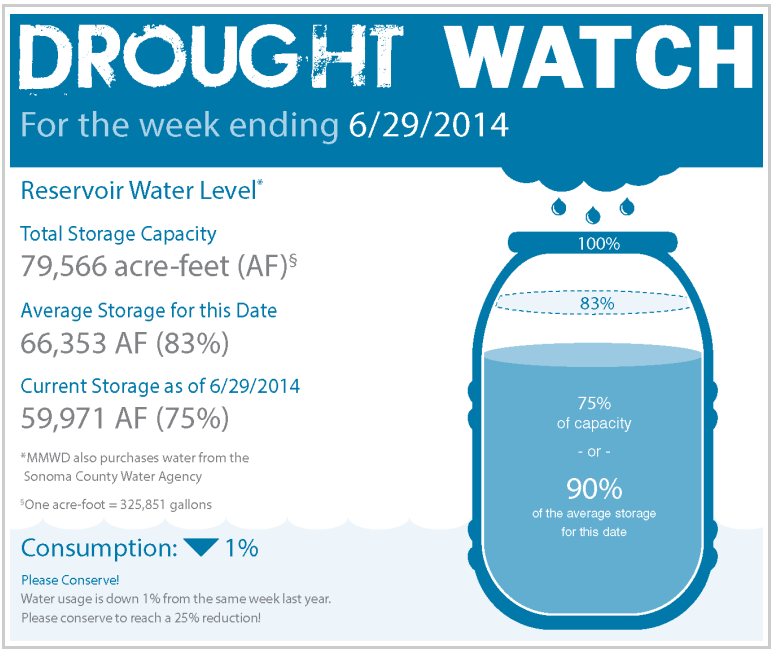


Note: Although consumption is down only 1% compared with the same week last year, we received almost two inches of rain from June 23 - 25 in 2013.

What is your water footprint? Take a tour with National Geographic's calculator.

(http://environment.nationalgeographic.com/environment/freshwater/change-the-course/water-footprint-calculator/?utm_source=NatGeocom&utm_medium=Email&utm_content=multi_20140526&utm_camp

Reference 23

SHERIFF'S OFFICE
A TRADITION OF SERVICE SINCE 1856

OFFICE OF EMERGENCY SERVICES
AND HOMELAND SECURITY

Date Event Began: **June 2, 2014**
Report as of: **June 26, 2014**
EOC Activation level: County **OES Duty Officer Coordination only**
Event Location: **County of San Mateo**
Areas Affected:
1. Alpine Creek, County Service Area 7 (CSA7), La Honda
2. Pescadero Creek, Redwood Glen Camp, Loma Mar
3. Eucalyptus trees throughout the County/Op Area
Weather: P**atchy fog overnight and mornings, drier daytime seasonal trend, highs in the 80s.**
Current Situation: **A couple of streams are beginning to dry up in the rural western part of the County affecting CSA7 in La Honda and the Redwood Glen Conference Center and Camp in Loma Mar.**
Overall Prognosis: **Worsening**
Name and Contact Information of Person Completing this Report: **Brian Molver, County OES Duty Officer**

CURRENT SITUATION	RESPONSE	LOCATIONS, COMMENTS, ETC.
PUBLIC/ENVIRON. HEALTH	Monitoring	Public Health is monitoring and Environmental Health is checking smaller water systems.
AGGRICULTURE	Monitoring	The County Agriculture Commissioner is in contact with the affected communities
PRIVATE WATER SYSTEMS	Redwood Glen Loma Mar, CA	Redwood Glen Christian Camp and Conference Center is struggling with increasing their drinking water infrastructure as for years, they have contracted with County Parks to pump potable water from Memorial Park. Their water system is being assessed for serviceability.
PUBLIC WATER SYSTEMS	Conserving	10 percent reduction by all consumers was asked by PUC and the County in February
COUNTY WATER SYSTEMS	Alpine Creek	County Service Area (CSA) 7 - La Honda, monitoring intake from creek to raw water reservoir. Threat of critical shortage if stream flow continues to diminish.
WATER HAULING	Yes	Some water hauling by area residences has been ongoing and CSA7 may begin hauling soon.
PARK CLOSURES	Memorial Park	Memorial Park closed Public Works reviewing cost of upgrading the water treatment plant.
FIRE HAZARD	HIGH	Very dry - Low to Moderate risk of large fires in the absence of a "High Risk" event.
COUNTY PARKS	Eucalyptus Situation	A situation exists not only in County but Statewide as thousands of stressed Eucalyptus trees dropping millions of seedpods where stands of trees already are considered an invasive problem.
DROUGHT TASK FORCE	TBD	Not formed at this time
AMERICAN RIVERS AGENCY	Monitoring	American Rivers and their partners are implementing an innovative approach to address the issue of water supply in the San Gregorio Watershed and the legal transfer of agricultural water rights from low-flow summer diversions to winter storage diversions and keeps County OES apprized of critical issues.
SHERIFF'S OES	Coordinating	OES Coordinator is reporting situations in Op Area WebEOC and CalEOC weekly and gathering intelligence. Also participates in weekly Coastal Region Drought Conference Calls.
PUBLIC WORKS	Monitoring	County Public Works Watershed Protection is monitoring the CSA7 situation and checking other services area for drought related issues

COUNTY PROCLAMATION	DATE REQUESTED	DATE GRANTED	COUNTY PROCLAMATION	DATE REQUESTED	DATE GRANTED
LOCAL	NA		GUBERNATORIAL	NA	
CAL OES SECRETARY'S	NA		PRESIDENTIAL	NA	

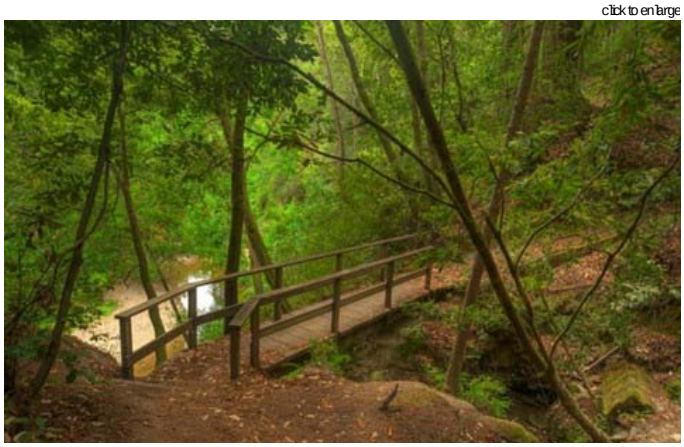
Reference 24

News » Peninsula July 06, 2014

Drought forces some campsite closures in San Mateo County parks

By Emilie Mutert

click to enlarge



COURTESY SAN MATEO COUNTY PARKS

The campgrounds at Memorial Park in Loma Mar have been shuttered for the remainder of the 2014 season as a result of ongoing drought conditions.

RELATED STORIES

SF water use decreasing but more savings needed
By Chris Roberts

Water use continues as normal despite California drought
By Chris Roberts

Fall Strawberry Music Festival canceled at Camp Mather due to lingering impacts from Rim Fire
By Laura Dudnick

The San Mateo County Parks Department has announced that the campsites at its Memorial Park grounds in Loma Mar will be closed for the duration of the 2014 camping season due to ongoing drought conditions.

Park officials were forced to shutter the popular site for the first time in response to the statewide drought that has reduced water levels in Pescadero Creek, the main water source for the park. Lower creek levels, combined with increasing water temperatures, have also led to an algae bloom in the creek, officials said.

But the primary driving force for the closure is that with the limited supply of creek water, the department is not able to properly operate the campsites, Parks Director Marlene Finley said.

> "The main reason is lack of water," Finley said. "We've been monitoring water levels, and we thought we had a few more inches before we would have to close the campground. But the low water combined with the algae made it so we couldn't keep the water flowing."
>
> Finley remains hopeful that camping can resume in the redwood-dense, 499-acre park in 2015.
>
> "It all depends on whether we continue in this drought cycle or get a sufficient amount of rain," she said.

In the meantime, the 2,250 people who made reservations to camp in the park this season are being contacted by staff members and given the option of either receiving a refund, transferring their reservations to the 2015 season or, in some cases, making reservations to camp at other county parks.

"It was a difficult decision because so many people count on their summer vacation at Memorial campground. For some, they've been coming to Memorial to camp for generations," Finley said.

This season's closure is the first in the history of Memorial Park, which is dedicated to the memory of World War I soldiers and this year celebrates 90 years of being a park. The camping fees lost this year are expected to cost the Parks Department about $300,000 to $350,000, Finley said.

The 26.6-mile-long Pescadero Creek, which flows from the Santa Cruz Mountains, is the county's longest stream and also the only water source to Memorial Park.

Park rangers will continue to monitor the creek water levels and track its further developments. The Parks Department is in the process of hiring a contractor to install 10,000-gallon holding tanks in Memorial Park to help alleviate the lack of creek water.

An application for state funding has also been submitted by the Resource Conservation District for San Mateo County. The application requests funding for a 2 million-gallon holding tank, which would collect water throughout the year and replace the current half-million-gallon tank, which is nonfunctioning due to a crack. Installation of such a container could take up to two years, Finley said.

There are two other parks within the Pescadero Creek Complex: Sam McDonald Park, at which youth campsites have also been closed this season due to drought-related reasons, and Pescadero Creek Park, which remains open to visitors. All the day-use areas at Memorial Park currently remain open as well, but visitors are advised to bring their own drinking water.

More Peninsula »

Tags: Peninsula, San Mateo County Parks Department, Memorial Park, campsites, Pescadero Creek, Marlene Finley, Sam McDonald Park

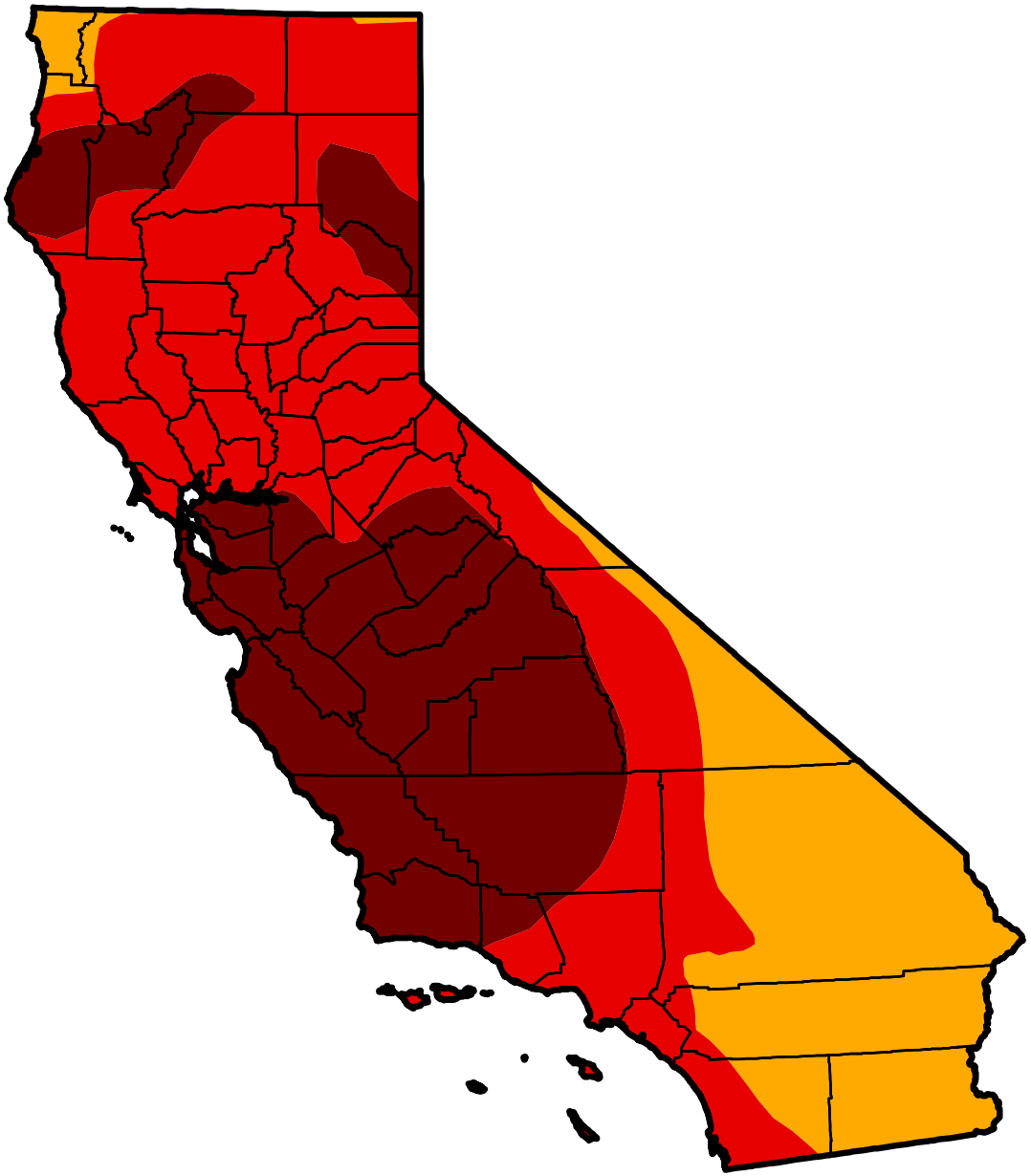
EMILIE MUTERT
Contact Us

Tweet g+1 0 Favorite Share

Reference 25

U.S. Drought Monitor

California



June 24, 2014

(Released Thursday, Jun. 26, 2014)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	100.00	76.69	32.98
Last Week *6/17/2014*	0.00	100.00	100.00	100.00	76.69	32.98
3 Months Ago *3/25/2014*	0.00	100.00	99.80	95.21	71.78	23.42
Start of Calendar Year *12/31/2013*	2.61	97.39	94.25	87.53	27.59	0.00
Start of Water Year *10/1/2013*	2.63	97.37	95.95	84.12	11.36	0.00
One Year Ago *6/25/2013*	0.00	100.00	98.21	92.61	0.00	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

Eric Luebehusen

U.S. Department of Agriculture

http://droughtmonitor.unl.edu/

Reference 26

Office of the Mayor
City & County of San Francisco

Edwin M. Lee

Executive Directive 14-01
Water Conservation – City Departments
February 10, 2014

San Francisco is a leader in using water wisely. Our citizens have some of the lowest water use in California, and the City has taken steps to help residents and businesses become even more efficient in their water use. In 2009, the City and County of San Francisco passed two water conservation ordinances for residential and commercial properties to install high-efficiency plumbing fixtures. The San Francisco Public Utilities Commission (SFPUC) offers financial incentives and technical assistance to replace inefficient plumbing fixtures for retail water customers. Additionally, San Francisco is diversifying our water supply by developing groundwater and recycled water.

Snowmelt from the Sierra Nevada is the primary drinking water source for 2.6 million people in the Bay Area. In 2013, California experienced one of the driest years on record, setting the stage for reduced water storage levels and possible first year drought conditions. These conditions have persisted in 2014, which could be the driest water year in the state's history. Precipitation has been less than 10 percent of normal so far for the year. After two years of below-average rainfall in California, Governor Jerry Brown declared a statewide drought in January 2014.

Given the current conditions in California, the City and County of San Francisco is requesting its water customers to reduce overall water consumption by 10 percent. Reducing water usage is essential to stretching our water supplies during this time of drought.

City agencies have made great strides to use less water. Since the last period of voluntary rationing in 2007, water use by City departments has declined by 22%. While many departments have implemented water conservation measures, there is still room to improve and save more water. Therefore, with this Executive Directive, I am outlining actions City departments should pursue to further reduce their consumption of water.

Further reduce consumption by 10 percent. All departments are directed to take steps immediately to reduce their water consumption with a goal of achieving a 10 percent reduction. Department heads are requested to report innovative conservation strategies to the SFPUC (contacts below) for the purpose of sharing best practices with other Departments. This reporting will be voluntary.

Develop a Water Conservation Plan. By August 1, 2014 all departments shall develop a Water Conservation Plan that includes:

- A departmental contact for water conservation efforts.
- An inventory of all departmental plumbing fixtures and their flow rates, including toilets, urinals, faucets, and showerheads.
- Timeline for retrofitting inefficient plumbing fixtures with high-efficiency models.
- A list of best management practices that departments will implement to achieve water-efficient operations and maintenance of parks, medians and other irrigated landscapes.

1 Dr. Carlton B. Goodlett Place, Room 200, San Francisco, California 94102-4641
(415) 554-6141

Educate staff and visitors on water conservation practices. Effective immediately, all departments shall educate employees and facility visitors about the efficient use of water at City facilities and the need to conserve.

Explore the use of non-potable water for street cleaning. City departments should explore the feasibility of replacing potable water with non-potable water sources for street cleaning.

Develop alternative sources of water supply. The SFPUC is directed to develop alternative sources of water supplies for both potable and non-potable uses. All departments shall cooperate with the SFPUC in developing these alternative water supplies. These alternatives shall include, but not be limited to: Cherry Lake; groundwater; recycled water; and foundation drainage.

The SFPUC can provide departments with assistance to comply with this Executive Directive. Please contact Steven Ritchie, Assistant General Manager, SFPUC (415-934-5736, sritchie@sfwater.org) or Paula Kehoe, Director of Water Resources, SFPUC (415-554-0792, pkehoe@sfwater.org).

This Executive Directive shall be effective immediately, and remain in place until rescinded or amended by future Directive.

Edwin M. Lee
Mayor, City & County of San Francisco

Reference 27

Santa Clara Valley Water District

Urban Water Management Plan

2010

Sections

1 Introduction
2 Service area and Water Supply System
3 Water Supply Sources
4 Historical Water Use and Demand Projections
5 Demand Management Measures
6 Water Shortage Contingency Planning
7 Water Recycling
8 Water Quality
9 Addressing Threats to Supply Reliability
10 Water Supply Reliability
11 Appendices

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Table 6-1 Water Shortage Contingency Plan

Stage	Stage Title	Projected GW Reserves	Response	Suggested Reduction in Water Use[1]	Communication and outreach effort
Stage 1	Normal	Above 300,000 AF	Continue regular outreach activities in this stage to promote ongoing implementation of conservation and implementation of BMPs.		• Maintain public information and outreach focused on long term, ongoing conservation actions (e.g., water saving appliances, repairing leaks, and low-water use landscaping).
Stage 2	Alert	250,000 to 300,000 AF	This stage is meant to warn customers that current water use is tapping into groundwater reserves – a signal that groundwater levels are dropping to meet demands. Communications are needed to set the tone for the onset of shortages. Request water users to reduce water use by as much as 10%. Coordinate ordinances with cities and warn and prepare for a stage 3 situation.	0-10% demand reduction	• Expand on Stage 1 efforts • Intensify public information and advertising campaign • Focus messages on shortage situation and immediate behavioral changes
Stage 3	Severe	200,000 to 250,000 AF	Shortage conditions are worsening, requiring close coordination with retailers and cities to enact ordinances and water use restrictions. Requires significant effort and behavioral change by water users. Increase outreach campaign to save water.	10-20% demand reduction	• Expand and intensify Stage 2 activities • Further expand outreach efforts • Modify messages to reflect more severe shortage condition and need for immediate behavioral changes
Stage 4	Critical	150,000 to 200,000 AF	This is the most severe stage in a multiyear drought. Encourage retailers and cities to enforce their plans which could include fines for repeated violations.	20-40% demand reduction	• Strengthen and expand Stage 3 activities • Further expand outreach efforts • Open drought information center
Stage 5	Emergency	Below 150,000 AF	This last stage is meant to address a more immediate crisis such as a major infrastructure failure. Water supply would be available only to meet health and safety needs.	Up to 50% demand reduction	• Daily updates on water shortage emergency (media briefings, web update, social media outlets) • Activate EOC

Notes:

(1) When the District Board calls for short-term water conservation, the cities and water retailers will consider the implemention of water contingency plan actions identified in their Urban Water Management Plans in order to achieve the necessary shortage response. The District works with the water retailers and cities to help coordinate these activities.

Reference 28

Santa Clara Valley Water District

42nd Annual Report

FY 2013-14

Protection and Augmentation of Water Supplies

February 2013

Protection and Augumentation of Water Supplies

42nd Annual Report

2013-2014

Sections

1 Present Water Requirements and Water Supply Availability

2 Future Water Requirements and Water Supply Availability

3 Programs to Sustain Supply Reliability

4 Financial Outlook of Water Utility System

5 Appendices

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Brian Schmidt – District 7

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Graphic Services
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Cover photos:
Photo on left - Silicon Valley Advanced Water Purification Center
Photo on right - Main Avenue Ponds facing northward

However, two retailers (the City of San Jose and the City of Santa Clara) have interruptible contracts. San Francisco is scheduled to make a decision about whether to provide supply guarantees to these water retailers by 2018.

Recycled Water

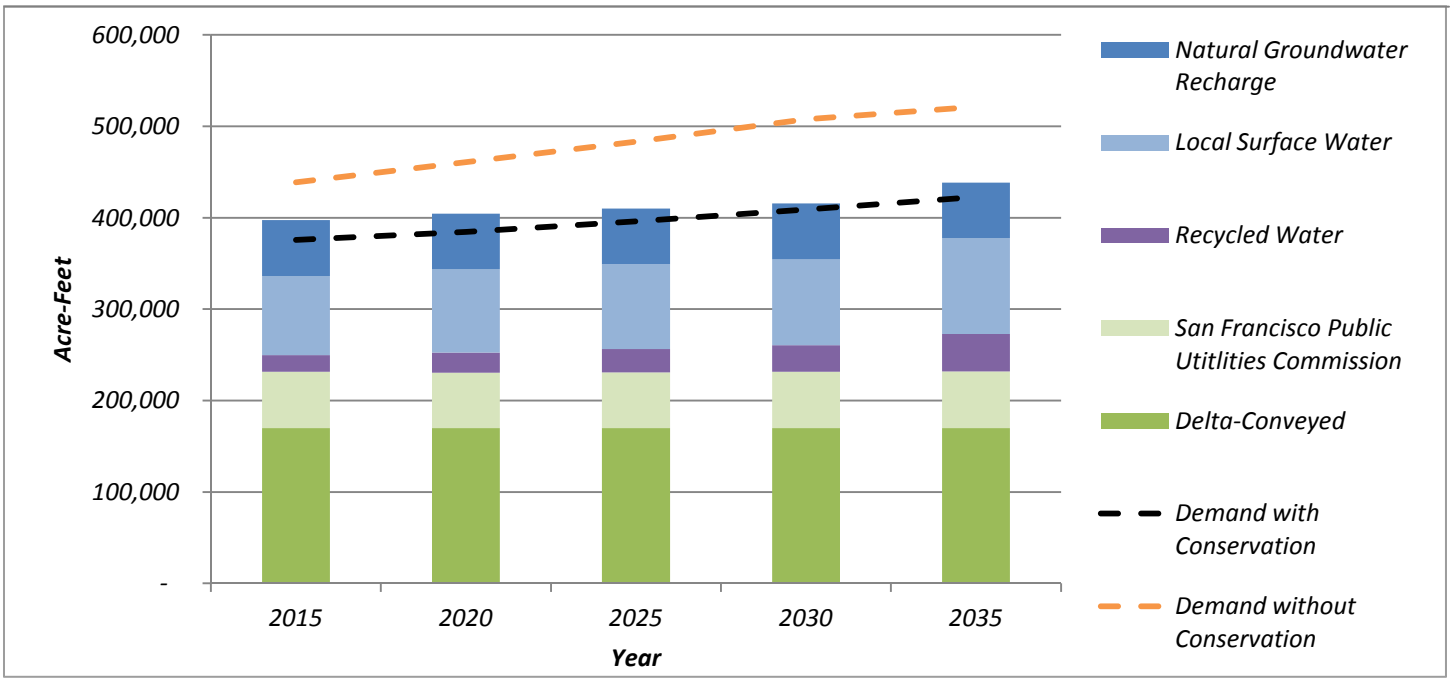
Recycled water use is expected to increase in the long-term. The UWMP projects that approximately 29,200 acre-feet per year of year 2030 demands will be met with recycled water. In addition, the water supply strategy in the board-adopted 2012 Water Supply and Infrastructure Master Plan (Water Master Plan) includes developing another 20,000 acre-feet per year of advanced treated recycled water for potable reuse by 2030. Additional studies and outreach are necessary before the water district can begin project-specific planning.

Local Surface Water and Natural Groundwater Recharge

Local surface water supplies are expected to increase over current levels after the water district completes seismic retrofits on several dams so the dams can be operated at full capacity. In addition, the Water Master Plan calls for constructing and rehabilitating pipelines between reservoirs and groundwater recharge ponds and constructing new groundwater recharge ponds. These new and rehabilitated facilities will increase the water district's ability to use local runoff to meet water demands. Natural groundwater recharge is not expected to change over the planning horizon.

Figure 2-2.1 shows projected average supplies and demands through year 2035. The projection assumes existing supplies and infrastructure are maintained and that the Water Master Plan is fully implemented. In this case, average water supplies will be sufficient to meet future water demands.

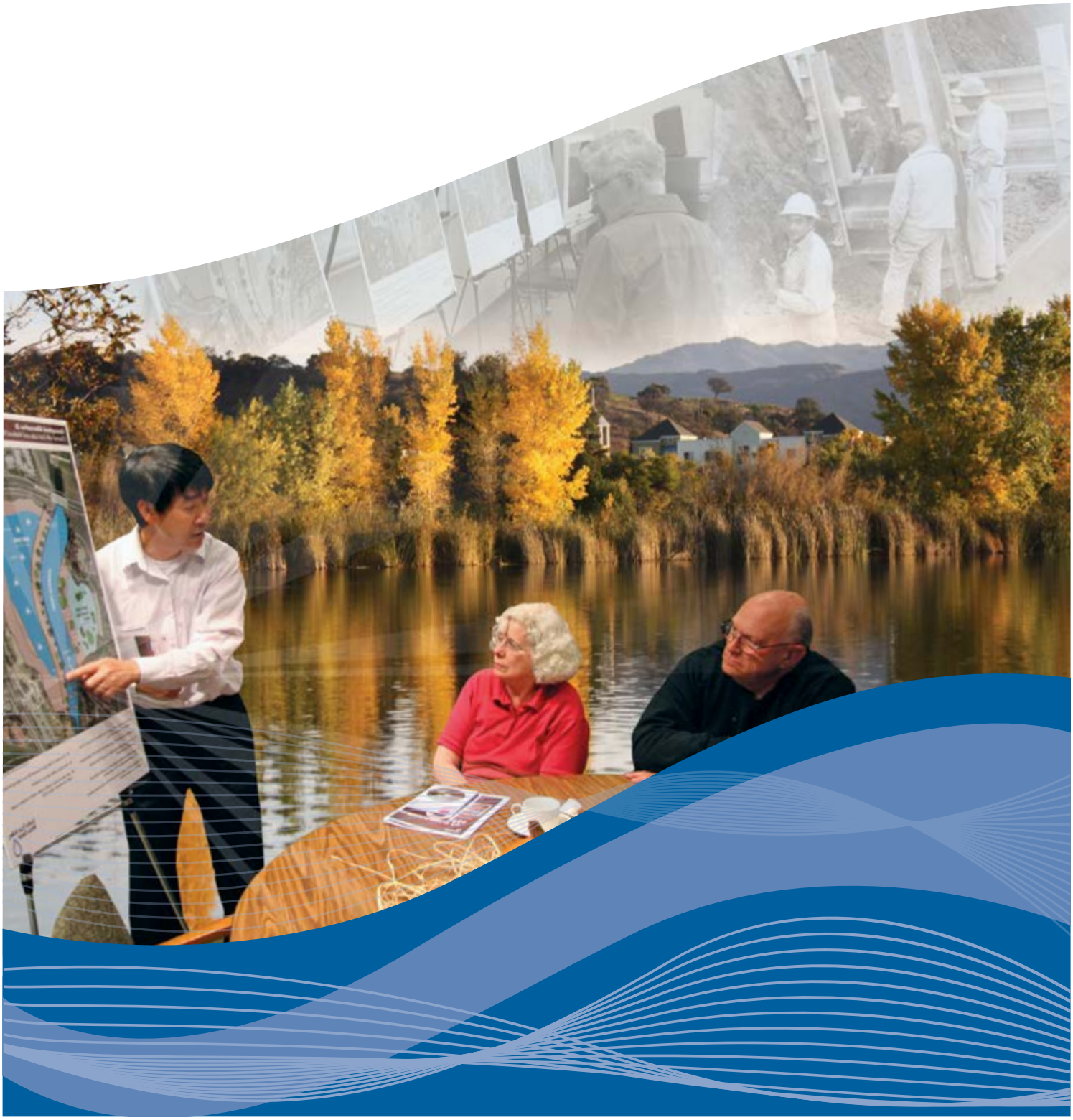
Figure 2-2.1 Average Supply & Demand Comparison, Santa Clara County



Reference 29

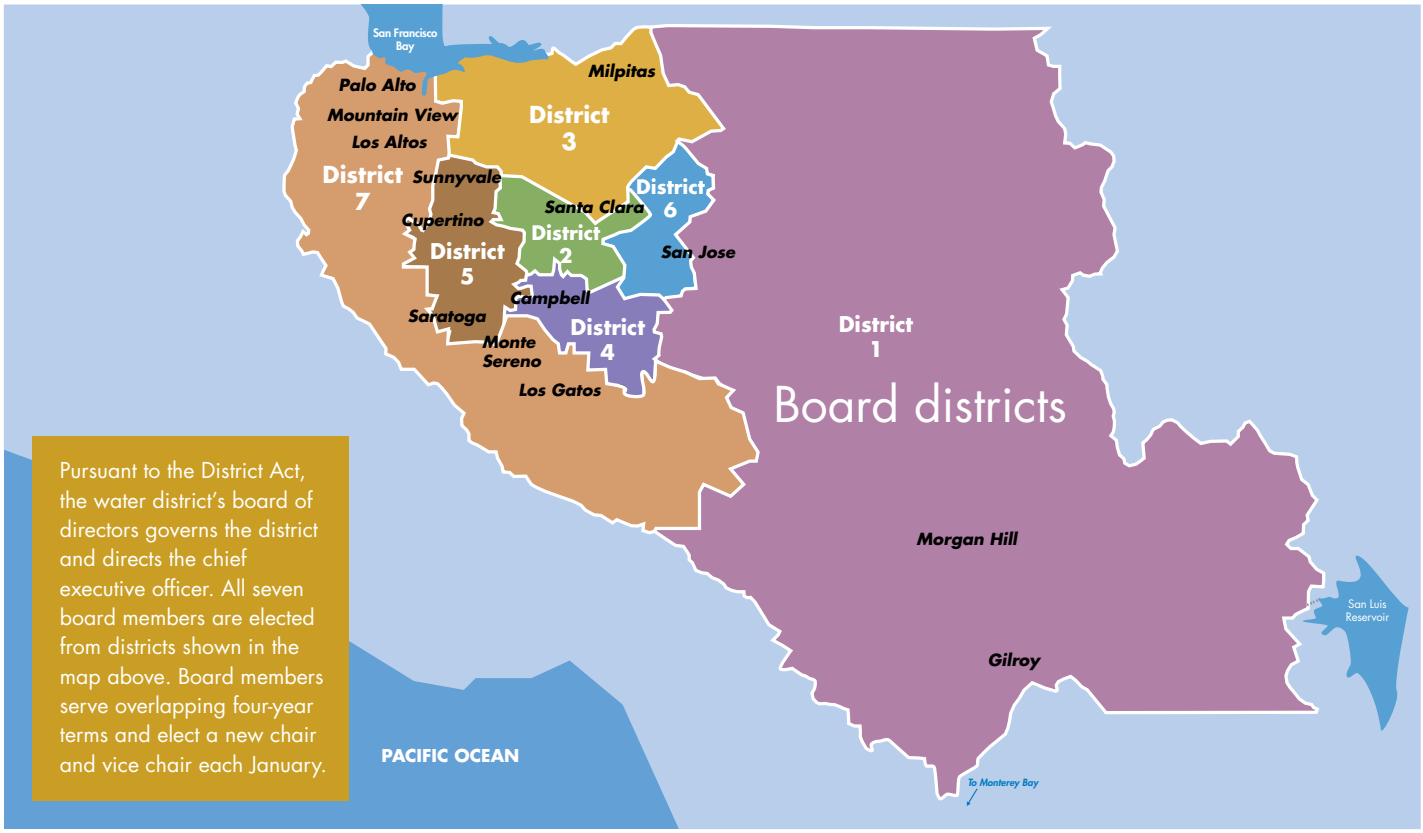
Santa Clara Valley Water District

FY 2012-13
Annual Report



The mission of the district

is to provide Silicon Valley safe, clean water for a healthy life, environment, and economy.



Pursuant to the District Act, the water district's board of directors governs the district and directs the chief executive officer. All seven board members are elected from districts shown in the map above. Board members serve overlapping four-year terms and elect a new chair and vice chair each January.

District at a glance

Cities served: 15
Water retailers served: 12
Population served: 2 million residents and commuters
Budget: $285.2 million **FY 2012–13**
Water used in the county:
Approximately 362,700 acre-feet (AF) **FY 2012–13**
Water imported: 188,000 AF **FY 2012–13**
Groundwater recharged: 90,000 AF **FY 2012–13**

Reservoirs: 10, combined capacity of 169,000 AF
Treatment plants: 3, delivered 129,500 AF **FY 2012–13**
Pumping plants: 3
Miles of streams maintained: 275
Miles of pipelines: 143
Mercury removed from waterways:
More than 4,200 pounds since 2000
Acres of wildlife habitat restored: 569

Reference 30

Santa Clara Valley Water District

FC 1703 (08-17-11)

Meeting Date:	3/25/14
Agenda Item No.:	4.1
Manager:	J. Maher
Extension:	2073
Director:	All

SUPPLEMENTAL BOARD AGENDA MEMORANDUM

SUBJECT: Update on 2014 Water Supply and Drought Response

REASON FOR SUPPLEMENTAL MEMORANDUM:

To allow for inclusion of the most current water supply information.

RECOMMENDATION:

Receive, review, and discuss updated information on 2014 water supply and drought response.

SUMMARY:

Severe drought continues to impact both statewide and local water supply conditions. On February 25, the Board approved a resolution setting a county-wide water use reduction target equal to 20 percent of 2013 water use, or approximately 72,000 acre-feet, and recommending that retail water agencies, municipalities and the county implement mandatory measures as needed to accomplish the target. This action was based on the District's Water Shortage Contingency Plan[1] and estimated 2014 water supply conditions that showed groundwater reserves could reach the Stage 3 ("Severe") level by the end of the year if water use reduction measures are not implemented. Updated information on 2014 water supply and operations is presented, along with an update on the District's drought response strategies.

A. Update on 2014 Water Supply and Operations

Despite some precipitation since the last update on February 25, water supply conditions statewide and locally have not measurably improved. Table 1 shows updated estimates of 2014 water supply and use in Santa Clara County. End-of-year groundwater storage is still projected to drop to the Stage 3 "Severe" range (200,000 to 250,000 acre-feet) if the 20 percent water use reduction target is not achieved.

1. Imported Water Supply

In this update, District imported water supplies have been reduced by 5,420 acre-feet to reflect more conservative estimates of 2013 State Water Project (SWP) carryover deliveries and supplemental water. The Bureau of Reclamation's (Reclamation's) February announcement of 2014 Central Valley Project (CVP) allocations provided 50% of "historic use" for municipal and industrial water service, confirmed by letter to equal 65,000 acre-feet for the District. However, the unprecedented allocations of only 40% to senior water rights holders and wildlife refuges, along with the State Water Resources Control Board's

[1] Santa Clara Valley Water District's 2010 Urban Water Management Plan, http://www.valleywater.org/Services/WaterSupplyPlanning.aspx

In order to conserve the limited supplies of imported water for the treatment plants, nearly all releases of imported water to creeks and ponds for groundwater recharge were discontinued at the end of January, with the exception of releases to Madrone Channel and upper Coyote Creek. Staff has been coordinating with the regulatory agencies and other stakeholders regarding the District's raw water operations. A March 2014 version of the Reservoir and Creek Dry Back Conditions Neighborhood Update (Attachment 2) has been prepared, posted at many of the recharge facilities, distributed to the public and placed on the District's Drought 2014 website (http://www.valleywater.org/drought2014/).

3. Untreated Surface Water Deliveries

In addition to eliminating nearly all groundwater recharge to conserve limited surface water supplies for drinking water, the District's operations plans include curtailment of untreated surface water deliveries. Over the years, a limited number of permits have been issued by the District to allow untreated surface water to be diverted from District facilities and creeks to irrigate landscape, agriculture, golf courses and other non-potable uses. Water delivered under current permits (99 total) is approximately 3,500 acre-feet annually, and represents approximately 1 percent of county's municipal and industrial water use, and 5 percent of the county's agricultural water use. Since February 25, staff has initiated communication with these surface water customers to let them know that alternate sources of supply will need to be used in 2014, and that alternate sources will need to be developed if not readily available.

On March 13, a meeting was held with surface water permittees that receive deliveries from District pipelines to discuss the curtailment of surface water. After receiving feedback from the surface water permittees, a letter was prepared and sent to all (72) pipeline surface water users on March 21, 2014. The letter notifies them that releases of District surface water will cease on May 1, 2014, but provides for extensions of time to develop alternate sources of supply. Extensions of time will be considered for agricultural and commercial users that need to refurbish a well or undertake other work to access groundwater or another source of supply. Staff is prepared to assist surface water permittees with pursuit of grants or other drought relief funding, expedited well permitting, and other actions.

The District currently has 27 permittees that divert surface water from creeks. Given reduced releases from District reservoirs, elimination of imported water releases and lack of rainfall, the ability to divert from creeks has already been severely limited for some time. Staff has been in communication with creek diverters and will be following up with a formal letter shortly notifying them of the unavailability of District supply.

4. Treated Water Operations

With limited surface water supplies, the District expects to be able to meet only 80% of treated water contract demands from March through December 2014. Staff has been proactively working with the treated water retailers, meeting individually with each retailer and scheduling joint retailer subcommittee meetings, to inform them of the need to cut back treated water deliveries by 20%. On March 20, a formal letter and water delivery schedule reflecting 20% reductions from March through December were sent to each retailer requesting concurrence with the reduced schedule.

Reference 31

Santa Clara Valley Water District

FC 1703 (08-17-11)

Meeting Date:	2/25/14
Agenda Item No.:	2.1
Manager:	J. Maher
Extension:	2073
Director:	All

CONFORMED COPY

SUPPLEMENTAL BOARD AGENDA MEMORANDUM

SUBJECT: Update on 2014 Water Supply Outlook

REASON FOR SUPPLEMENTAL MEMORANDUM:

To allow for inclusion of the most current water supply information.

RECOMMENDATION:

A. Receive, review, and discuss updated information on the 2014 water supply outlook; and

B. *Adopt a resolution calling for 20 percent water use reductions through December 31, 2014.

SUMMARY:

This provides the monthly update on the 2014 water supply outlook as directed by the Board. On January 28, 2014, the Board received the initial water supply outlook and took the following actions:

1. Pursuant to the District's Water Shortage Contingency Plan[1], the Board set a preliminary water use reduction target equal to 10 percent of 2013 county-wide water use, or approximately 36,000 acre-feet; and,
2. Approved a budget adjustment of $500,000 to augment the District's Water Conservation Program and related public outreach; and,
3. Authorized the CEO to pursue engagement in administrative and legislative efforts that support drought response.
4. Directed the CEO to provide monthly updates on 2014 water supply conditions, along with additional recommendations as needed.

This update presents changes to water supply conditions that have occurred since January 28, and recommends that the Board adopt a resolution calling for 20 percent water use reductions through December 31, 2014.

A. 2014 Water Supply Outlook

Although one or two storms have occurred since the initial 2014 water supply outlook, conditions both statewide and locally have not improved, and the extent of water supply and operational challenges is becoming clearer. Developments since January 28 are summarized in the following section, and the resulting changes in estimated 2014 water supply and use are shown in Table 1. Compared to the initial 2014 water supply outlook, it is now projected that an additional 69,000 acre-feet would be withdrawn from groundwater reserves if additional water

[1] Santa Clara Valley Water District 2010 Urban Water Management Plan, http://www.valleywater.org/Services/WaterSupplyPlanning.aspx

ADOPTED

FEB 25 2014

Table 1. Estimated 2014 Water Supply and Use

Estimated Supplies (AF)	Jan. 28, 2014 Initial Outlook Dry Conditions (90% exceedence)	Feb. 25, 2014 Updated Outlook Critically Dry Conditions (99% exceedence)
Local surface water	34,000	26,300
Natural groundwater recharge	47,100	38,600
Imported – District	149,000	106,200
Imported – Hetch Hetchy	57,000	44,000
Recycled water	23,000	23,000
Total	**310,100**	**238,100**
Estimated Use (AF)		
Groundwater pumping	173,200	201,200
Treated water deliveries--District	121,000	107,300
Surface water, SJWC treated water	5,000	300
Imported—Hetch Hetchy	57,000	44,000
Recycled water	23,000	23,000
Total	**379,200**	**375,800**
Net from Groundwater Reserves (AF)	**69,100**	**137,700**
Estimated End-of-Year Groundwater Storage (AF)	**273,900**	**205,300**

B. Operational Challenges

1. Delta Water Quality

A primary objective of the District is continued delivery of safe, clean drinking water from its treatment plants. With critically dry conditions and limited storage available in Sacramento valley reservoirs, Delta outflow has not been sufficient to maintain water quality, which can effectively limit or eliminate imported water as a source of supply for the treatment plants. In late January and early February, concentrations of chloride, bromide and total dissolved solids increased substantially in the interior Delta, with Electroconductivity (EC), an indicator of salinity, exceeding standards set at Clifton Court in the south Delta. The elevated bromide concentrations associated with higher EC and high concentrations of total organic carbon are difficult to treat at the District's drinking water treatment plants, particularly if source water is also affected by algal growth in the south Delta. Treatment concerns include not only taste and odor issues, but elevated levels of disinfection byproducts that may be challenging to maintain below the maximum contaminant level (MCL). Staff is currently working with the retail water agencies and optimizing treatment processes to deal with these issues.

Following State Water Resource Control Board approval on January 31 of the Temporary Urgency Petition submitted by DWR and Reclamation, the Delta Cross Channel gates were opened for a week to allow more fresh water from the Sacramento River to flow into the interior Delta. The rainfall that occurred on February 7-10 also helped to improve water

Reference 32

Santa Clara Valley Water District

FC 1703 (08-17-11)

Meeting Date:	5/27/14
Agenda Item No.:	4.1
Manager:	J. Maher
Extension:	2073
Director:	All

SUPPLEMENTAL BOARD AGENDA MEMORANDUM

SUBJECT: Update on 2014 Water Supply and Drought Response

REASON FOR SUPPLEMENTAL MEMORANDUM:

To allow for inclusion of the most current drought response information and include an additional recommendation*.

RECOMMENDATION:

A. Receive, review, and discuss updated information on 2014 water supply and drought response efforts;

B. Authorize the Chief Executive Officer (CEO) to approve budget adjustments in FY14 and FY15 totaling up to $500,000 from the Water Utility Operating and Capital Reserve to augment the Water Conservation Program and related outreach;

*C. Determine, by a four-fifths vote, that there is a need to continue the emergency action declared by the CEO on May 14, 2014, pursuant to Public Contract Code §22050 and District Resolution 05-67 in support of the California Aqueduct Reverse Flow Project.

SUMMARY:

The District's comprehensive drought response is being implemented through fifteen strategies grouped into four general categories: (A) water supply and operations; (B) water use reduction; (C) drought response opportunities; and (D) administrative and financial management. Highlights of new information for each strategy are included in Attachment 1 (May 2014 Drought Response Strategy Updates). The staff presentation (Attachment 2) for this month's update will focus on four key topics:

	Topic	Drought Response Strategy
1	Water Use Reduction Program	#4, Reduce water use by 20%
2	Environmental Management of Raw Water Operations	#2, Manage and deliver raw water supplies
3	Untreated Surface Water Customers	#2, Manage and deliver raw water supplies
4	California Aqueduct Reverse Flow Project	#1, Secure imported water supplies

SUBJECT: Update on 2014 Water Supply and Drought Response

(05/27/14)

1. Water Use Reduction Program

On January 31, 2014, the Board set a preliminary countywide water use reduction target of 10 percent, and on February 25, 2014, set the final target of 20 percent. Staff has been working with water retailers, municipalities and the county to increase water conservation efforts and public outreach, and implement other actions to reduce water use. As these efforts begin to take effect, preliminary water use data for the months of February and March indicate that cumulative countywide savings of approximately 12 percent were realized, compared to the same period in 2013. Water use and savings reports by retailer are included in Attachment 3. A summary of the District's new programs and updated conservation rebates is included in Attachment 4, and a summary of conservation programs and actions undertaken by water retailers and municipalities is included in Attachment 5.

On April 22, the Board approved a budget adjustment of $250,000 to plan, develop and initiate a major summer conservation marketing campaign before July 1, 2014. At that time, staff informed the Board that additional funding up to $500,000 would be needed in FY15 to fully implement the plan and launch the campaign through the summer months. Staff expected to make a subsequent budget recommendation in FY15. However, staff has learned that there is a need to secure media buys earlier than planned, and is now requesting CEO authority to approve budget adjustments in FY14 and FY15 totaling up to $500,000 from the Water Utility Capital and Operating Reserve as needed to implement the summer conservation marketing campaign.

2. Environmental Management of Raw Water Operations

Due to very limited local and imported surface water supplies, the District's managed groundwater recharge program is significantly curtailed this year. In total, only 25% of the amount normally released for groundwater recharge, or about 25,000 acre-feet, will be available for recharge this year. Dry conditions in creeks and recharge ponds and resulting impacts on aquatic species are a concern of fish and wildlife regulatory agencies, local municipalities and the general public who see these visible signs of the drought. The current public information fact sheets on "Reservoir and local stream conditions" and "Groundwater recharge pond maintenance" are included in Attachment 6.

At the April 22, 2014, Board meeting, a Board Member Request was made for "a report on the mortality of aquatic species in percolation ponds, streams and creeks as a result of the drought, and to include the feasibility of moving these species above reservoirs." (R-14-0016). The District has been working closely with the California Department of Fish and Wildlife (CDFW) and other regulatory agency staff to address fish and wildlife impacted by the drought. In normal rainfall years, District water utility operations provide aquatic habitat for native and non-native species alike. In drought conditions, aquatic habitats are impacted first and more severely than other habitats, causing some animals to migrate, change behavior, or die off. District biologists are providing stream condition reports to agency staff to assist in documenting the effects of the drought, but neither the District nor CDFW has an estimate of fish and wildlife losses. Over the years, many non-native species have colonized local streams, reservoirs and recharge ponds, sometimes through releases by the local community. Losses of these non-native species will likely benefit local fish and wildlife species that have evolved to withstand the climate extremes of their native habitat.

CDFW is the state agency responsible for managing local fish and wildlife resources and issuing appropriate permits to allow work in habitat areas and to rescue or relocate species when warranted. The widespread nature of the drought has made relocation of native species difficult to support, and as a result, CDFW has developed a policy that severely limits the instances where rescue or relocation of fish species can be approved (CDFW Departmental Bulletin No. 2013-04, Issued March 20, 2013). The permit approved by CDFW for the District's pond maintenance work will not include rescue or relocation of wildlife, with the exception of western pond turtles that may be present in Alamitos or Los Capitancillos ponds.

3. Untreated Surface Water Customers

Due to very limited local and imported surface water supplies, on March 21, 2014, notices were sent to 72 water users that currently have District permits for delivery of untreated surface water from raw water pipelines informing them that service would be discontinued on May 1. The notice provided a process for agricultural and commercial water users to apply for extensions of time, if needed, to put in place alternate sources of supply. In total, the District received and granted 25 applications from agricultural and commercial water users for extension of service to June 30, 2014, including five golf courses in northern Santa Clara County and 15 agricultural accounts on the Half Road Lateral in south county (six accounts for parcels owned or leased by the Mariani family). Due to operational limitations on the Half Road Lateral, which is a privately owned system, extending service for agricultural water users essentially means that service is continuing for the whole system (38 accounts), but the amount provided during the 2-month extension will be 80 percent of metered 2013 water use and intended for agricultural use only. Staff is continuing to work with Half Road Lateral customers not only on the immediate issue of establishing an alternate supply, but on options for more viable long-term operation and management of this system.

The District also received a total of nine applications from non-commercial municipal and industrial accounts which did not meet the criteria for a time extension. Generally, these accounts use untreated surface water for domestic landscape irrigation. Over the years, several untreated surface water accounts have installed hydrants despite being informed that the District does not operate or maintain the raw water system in a manner that can be relied upon for fire protection, and that under the District's "Rules and Regulations for Delivery of Surface Water", the service is interruptible and at the user's risk. The turnouts for these accounts will remain unsecured, but water users are being informed that landscape irrigation and other non-qualifying uses must cease until further notice.

4. California Aqueduct Reverse Flow Project

This District participates in the Semitropic Water Bank (Semitropic), which is located in Kern County, about 200 miles south of the Delta on the California Aqueduct (see location map). Because the District is located "upstream" of Semitropic, the return of banked water is normally accomplished by exchanges within the State Water Project (SWP): Semitropic pumps groundwater into the California Aqueduct for delivery to other SWP contractors downstream, and the District takes delivery of an equal amount of SWP water pumped from the Delta that would otherwise go to those contractors.

Reference 33

Neighborhood Update - May 2014

Reservoir and local stream conditions

Santa Clara Valley Water District

Los Capitancillos groundwater recharge ponds in South San Jose are at its lowest level in years.

Lack of rainfall continues to affect creeks and reservoirs

To conserve water in the midst of one of the driest seasons on record, the Santa Clara Valley Water District is modifying its operations. Because of the lack of local rainfall and cut backs in water imported from state and federal water projects, groundwater recharge operations in ponds and creeks have been cut back to conserve drinking water supplies for use this summer.

A priority of the water district is continued delivery of safe, clean water from its drinking water treatment plants to local water providers and municipalities. Imported water typically provides more than 85 percent of the supply for the water district's three drinking water treatment plants. In dry and critically dry years, when local water is limited, up to 99 percent of treated water is from imported water sources.

To ensure adequate drinking water supplies through the summer, imported and local water is being stored in Anderson, Coyote and Calero reservoirs. Despite the few spring storms there has been little local runoff, and all other district reservoirs continue to drop to minimum storage levels. As a result water releases to creeks and ponds are being curtailed.

Reservoir and creek conditions in your area

Cupertino/Saratoga/Los Gatos area:

- Releases from Stevens Creek Reservoir will provide limited flows in Stevens Creek until reservoir water levels fall below intake structures later in the year.
- Rodeo, Regnart, Calabazas and Saratoga creeks will remain dry until significant rainfall occurs.
- Los Gatos Creek flows will be reduced as water levels in Lexington Reservoir fall.
- McClellan, Page, Sunnyoaks, Budd, McGlincy, Oka and Camden ponds will go dry during the spring and are scheduled for maintenance this summer.

South San Jose/Almaden area:

- Alamitos and Calero creeks will remain dry until significant rainfall occurs.
- Almaden Lake's elevation will continue to fall over the summer and water quality will decline in the lake.
- Los Capitancillos, Alamitos and Guadalupe ponds will likely be dry by May and are scheduled for maintenance in May and June.

East San Jose area:

- Upper Penitencia Creek and most adjacent recharge ponds will remain dry until significant rainfall occurs.
- Piedmont, Capitol and Helmsley ponds will dry back this summer. Ponds at Penitencia Creek Park (City of San José), Penitencia Creek County Park (County of Santa Clara), and Overfelt Garden Park (City of San José) will not be supplied with water until drought conditions end.

Gilroy/Morgan Hill/South San Jose area:

- Releases of imported water to Coyote Creek and Madrone Channel are expected to continue at the current rate, but may be further reduced depending on water supply conditions.
- Releases of local water from Uvas and Chesbro dams will provide limited flows in Uvas and Llagas creeks, but expect drying creeks as the water in the reservoir is exhausted this summer.
- Main Avenue and San Pedro ponds will be dry by June and are scheduled for maintenance this summer.

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Wildlife impacts

Throughout the drought, the water district has worked closely with California Department of Fish and Wildlife (CDFW) to address fish and wildlife impacted by the drought. CDFW is the state agency that is responsible for managing local fish and wildlife resources and issuing appropriate permits to allow work in habitat areas and to rescue or relocate species when warranted.

In normal rainfall years, water supply operations in local streams and recharge ponds provide water and aquatic habitat for native and non-native species alike. It is district policy to conduct its water supply operations and maintenance activities in an environmentally sensitive manner, including reservoir releases, stream and pond recharge operations and maintenance.

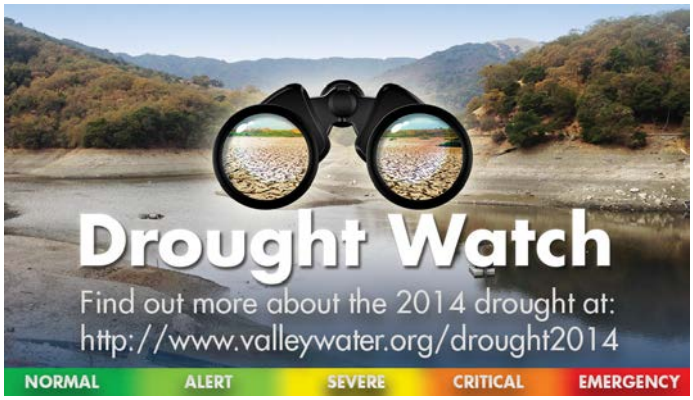
When water is lacking, aquatic habitats are impacted first and more severely than other habitats, causing migration, behavior changes and die-off of some animals. Lack of water means wildlife become concentrated in any remaining suitable habitat, increasing competition for remaining resources and increasing the chances for disease outbreaks due to close contact.

The widespread nature of the drought has made relocation of any native species difficult to support and, as a result, CDFW has developed a policy that severely limits the instances where rescue or relocation of fish species can be approved.

Operations and recharge pond maintenance will not include rescue or relocation of wildlife from streams or ponds. There are many non-native species that have colonized local streams and reservoirs. The loss of non-native species will likely have a long term benefit to the local fish and wildlife that have evolved to withstand the climate extremes of their native habitat.

Unfortunately, these dry creek and pond conditions are occurring statewide. The water district will continue to coordinate with CDFW staff in addressing the drought effects on native and non-native species.

Guadalupe Creek during the week of March 17, 2014.



CONTACT US

For more information, contact the **Drought Hotline** at **(408) 630-2000**, or visit our website at valleywater.org and use our **Access Valley Water** customer request and information system. With three easy steps, you can use this service to find out the latest information on district projects or to submit questions, complaints or compliments directly to a district staff person.

Follow us on: /scvwd /valleywater /valleywater

To get eNews, email info@valleywater.org

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May 2014

Water Tracker

Santa Clara Valley Water District

Reference 34

A monthly assessment of trends in water supply and use for Santa Clara County, California

Outlook as of May 1, 2014

Severe drought conditions continue throughout California. With very little local watershed runoff, many of the District's 10 reservoirs are at less than 40% of their 20-year average storage. Many creeks and recharge ponds are drying as a result of the lack of surface water available. Anderson Reservoir is currently being filled with imported water to ensure adequate treatment plant supplies this summer and is expected to reach the maximum storage limit on May 5th. Both the federal Central Valley Project and State Water Project continue to face regulatory and water quality challenges due to limited Central Valley runoff, and this will continue to affect imported water deliveries to the county in coming months. On February 25th, the Board passed a resolution calling for retail water agencies, municipalities, and the county to implement mandatory measures as needed to reach a 20% water use reduction target in 2014. Achieving the 20% target will avoid groundwater dropping to the "Severe" range and ensure adequate reserves for 2015.

Weather

Rainfall in San Jose

- Month of April = 0.67 inch
- Total-to-date = 6.10 inches or 44% of average to date
  (Rainfall year is July 1 to June 30)

May 1 Northern Sierra snowpack water content is about 7% of average for this date

Local Reservoirs

- Total May 1 storage = 82,824 acre-feet*
  - » 67% of 20-year average for this date
  - » 49% of total capacity
  - » 67% of restricted capacity storage (169,009 acre-feet total storage capacity limited by seismic restrictions to 122,924 acre-feet)
- Low storage levels in Chesbro, Guadalupe, Uvas, and Stevens Creek reservoirs at 9%, 12%, 13%, and 15% of their total capacities, respectively

*Total includes approximately 34% imported water, including 13,200 acre-feet stored in April

Imported Water

- 2014 State Water Project (SWP) and Central Valley Project (CVP) allocations:
  - » SWP allocation: 5% = 5,000 acre-feet (increased from Zero% to 5% on April 18)
  - » CVP allocations: 50% for Municipal and Industrial uses and Zero% for Irrigation for an approximate total of 65,000 acre-feet
- 2013 SWP and CVP estimated carryover supplies available for 2014: 31,227 acre-feet
- Reservoir storage information, as of May 1, 2014:
  - » Shasta Reservoir at 53% of capacity (61% of average for this date)
  - » Oroville Reservoir at 53% of capacity (65% of average for this date)
  - » San Luis Reservoir at 47% of capacity (52% of average for this date)
- Semitropic groundwater bank reserves: approximately 262,665 acre-feet as of May 1. Withdrawal of banked reserves may be limited by SWP operational constraints, with the available quantity to be determined
- Exchanges and transfers executed in FY14: continuing to pursue several potential agreements; one small transaction completed in April to support San Joaquin River flows
- Estimated Hetch Hetchy deliveries to Santa Clara County:
  - » Month of April = 2,900 acre-feet
  - » 2014 Total = 12,300 acre-feet, or 98% of the five-year average
  - » 2014 preliminary reduction = 10% announced by SFPUC on January 31

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Treated Water

- Below average demands of 6,500 acre-feet delivered in April
- This total is 74% of the five-year average for April
- Estimated year-to-date = 25,600 acre-feet or 87% of the five-year average

Groundwater

- Groundwater Storage: Total storage at the end of 2014 is projected to be 208,000 acre-feet, which falls within Stage 3 (Severe) of the Water Shortage Contingency Plan. If the 20% water use reduction target set by the Board on February 25 is achieved, 2014 end-of-year storage will be within the range of Stage 2 (Alert) and near Stage 1 (normal)
- Santa Clara Plain:
  - » The April managed recharge estimate is 600 acre-feet. The year-to-date managed recharge estimate is 7,100 acre-feet, or 44% of the five-year average
  - » The April groundwater pumping estimate is 13,100 acre-feet. The year-to-date groundwater pumping estimate is 37,300 acre-feet, or 190% of the five-year average
  - » The groundwater level in Santa Clara Plain (San Jose) is about 22 feet lower than last year and 21 feet lower than the five-year average
- Coyote Valley:
  - » The April managed recharge estimate is 540 acre-feet. The year-to-date managed recharge estimate is 2,700 acre-feet, or 76% of the five-year average
  - » The April groundwater pumping estimate is 930 acre-feet. The year-to-date groundwater pumping estimate is 3,200 acre-feet, or 95% of the five-year average
  - » The groundwater level in Coyote Valley is about 3 feet lower than last year and 8 feet lower than the five-year average
- Llagas Subbasin:
  - » The April managed recharge estimate is 520 acre-feet. The year-to-date managed recharge estimate is 3,200 acre-feet, or 42% of the five-year average
  - » The April groundwater pumping estimate is 3,400 acre-feet. The year-to-date groundwater pumping estimate is 13,400 acre-feet, or 155% of the five-year average
  - » The groundwater level in Llagas Subbasin (San Martin) is about 21 feet lower than last year and 27 feet lower than the five-year average

Conserved Water

- Saved 56,000 acre-feet in FY13 from long-term program (baseline year is 1992)
- Long-term program goal is to save nearly 60,000 acre-feet in FY14
- Based on the District's Water Shortage Contingency Plan, the Board set a 2014 water use reduction target of 20%, in addition to long-term program savings
- District will be reporting on progress towards meeting the call for 20%, starting in May

Recycled Water

- Estimated April 2014 production = 1,800 acre-feet (billed semi-annually)
- Estimated year-to-date = 5,700 acre-feet or 167% of the five-year average
- Silicon Valley Advanced Water Purification Center was completed and began delivery of high quality treated recycled water for blending with existing nonpotable water on March 25, 2014

CONTACT US

For more information, contact **Customer relations** at **(408) 630-2880**, or visit our website at valleywater.org and use our **Access Valley Water** customer request and information system. With three easy steps, you can use this service to find out the latest information on district projects or to submit questions, complaints or compliments directly to a district staff person.

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To get eNews, email info@valleywater.org

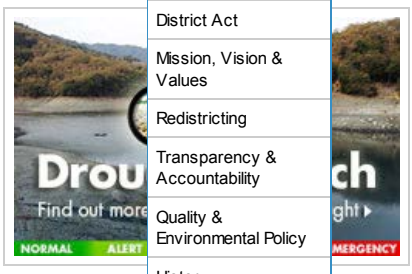
Reference 35

SAFE, CLEAN WATER PROGRAM
CLEAN SAFE CREEKS PLAN
WATER CONSERVATION
Rebates
Homes
Businesses
Landscaping
Agriculture
Free Conservation Items
Events And Workshops
Conservation Program Reports & Studies
GRANTS
TEACHERS & STUDENTS
ADOPT A CREEK
FIVE-YEAR CAPITAL IMPROVEMENT PROGRAM (CIP)
CREEKSIDE PROPERTY PROGRAM
COMPREHENSIVE WATER RESOURCES MANAGEMENT PLAN
DAM SAFETY PROGRAM

Water Conservation

In consideration of the worsening water supply outlook for Santa Clara County, the Santa Clara Valley Water District Board of Directors unanimously passed a resolution calling for mandatory measures to reach a water use reduction target equal to 20 percent of 2013 water use.

- Read complete news release here



Related Information
Water Saver Home
Water Use Efficiency Strategic Plan - Phase I
Water Conservation Program Updates July 2014

New Rebate Increases:

Water conservation rebates have increased! As of April 22, certain rebate amounts for several key programs have doubled, while others have increased significantly. These increases are temporary, through September 30, 2014, and certain restrictions apply.

- Landscape Conversion Rebate Program. Rebates have increased to $2 per square foot for converting high water using landscape to qualifying low water using landscape. The rebate amount within a cost-sharing partner area increased to $3 to $4 per square foot. For more information, please call the Water Conservation Hotline at (408) 630-2554. Click here for more information.

- Irrigation Hardware Upgrades Rebate Program. Several irrigation hardware rebates have increased, for dedicated landscape meters, flow sensors and hydrometers, and Weather-Based Irrigation Controllers. Click here for more information.

- Graywater Laundry to Landscape Rebate Program. Receive up to $200 per residential site for properly connecting a clothes washer to a graywater irrigation system. Click here for more information or call the Water Conservation Hotline at (408) 630-2554 to schedule a pre-inspection.

- Commercial Rebate Programs: Several rebates for commercial facilities have increased, including the rebate for Connectionless Food Steamers, Commercial High-Efficiency Clothes Washers and the Custom/Measured Rebate Program. Click here for more information.

Program Changes, As of January 1st:

As of January 1st, these programs were added or had their rebate increased:

- NEW High Efficiency Toilet Rebate Program. Replace your inefficient toilets and you may be eligible to receive up to $125 per PREMIUM model High-Efficiency Toilet and up to $50 per Non-PREMIUM High-Efficiency Toilet, no pre-inspection required. Click here for more information.

- New rebate amounts for the Residential High-Efficiency Clothes Washer Rebate Program. Purchase and install a qualifying high-efficiency clothes washer and you may be eligible to receive up to $200 for a combined Water Agency and PG&E Rebate on a qualifying Energy Star Most Efficient clothes washer, or up to $50 for a Water Agency Rebate on a qualifying CEE Tier 3 qualifying clothes washer. Click here for more information.

- NEW Safe, Clean Water and Natural Flood Protection Program. Water conservation research grants for agencies and organizations to study and pilot-test new and innovative water conservation programs and efficient technologies are now being offered. The primary goal is to identify water savings devices and strategies that can assist the district in meeting its long-term water savings goal of 98,500 acre-feet per year by 2030. Click here for more information.

- NEW rebate amounts for the Submeter Rebate Program. As of Jan 1, 2014, rebate amounts have increased for submeters. Mobile home parks and condominium complexes can receive up to $150 per installed submeter for changing from a master water meter to individual water submeters. Click here for more information.

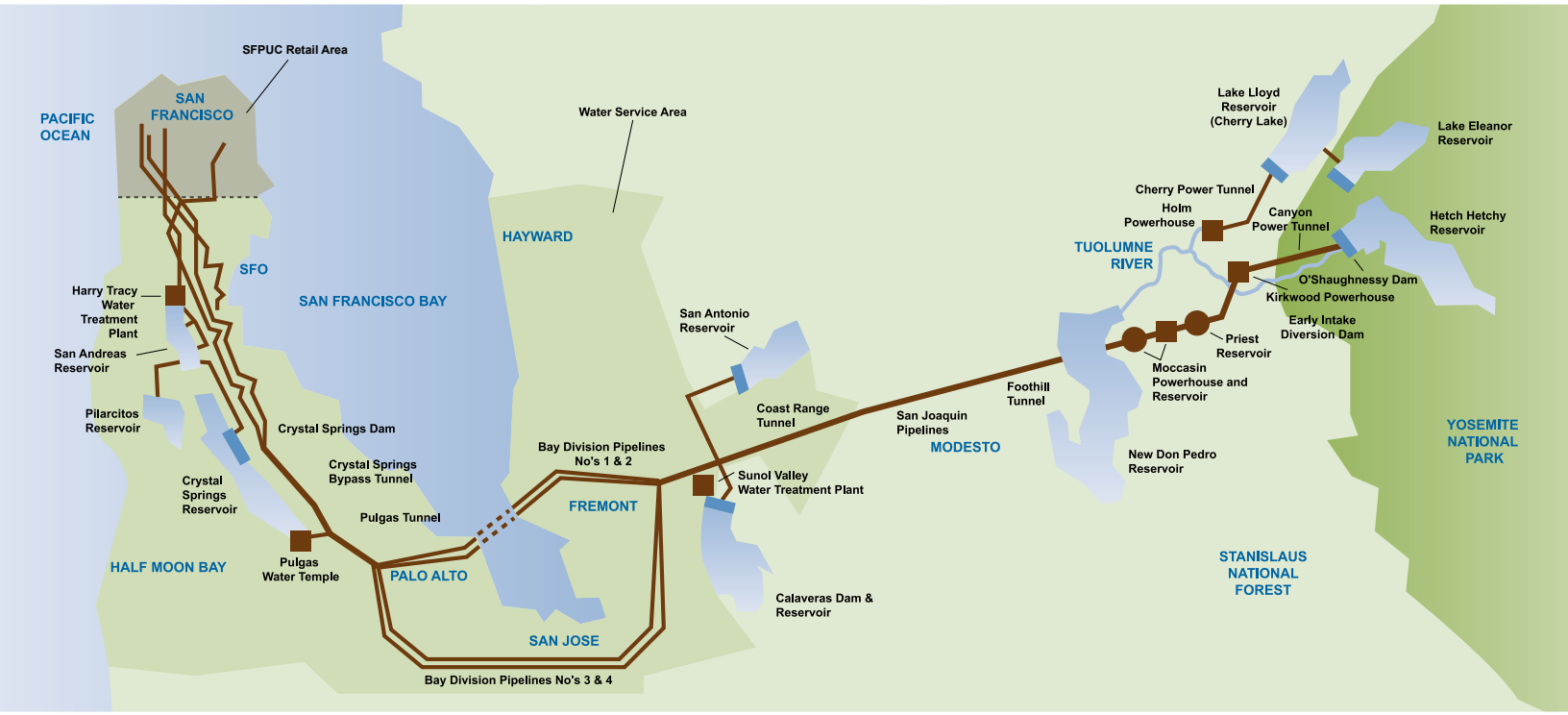
Reference 36

2010 Urban Water Management Plan

for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

June 2011



San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

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This section focuses on the projection of the SFPUC's water demands. Retail demands are based on recent demographic information and a detailed analysis of the SFPUC's retail water use characteristics. Wholesale Customer demands for SFPUC supplies are based on projections developed by Wholesale Customers. This section also presents the baseline and target per capita water consumption rate, as required by SB X7-7.

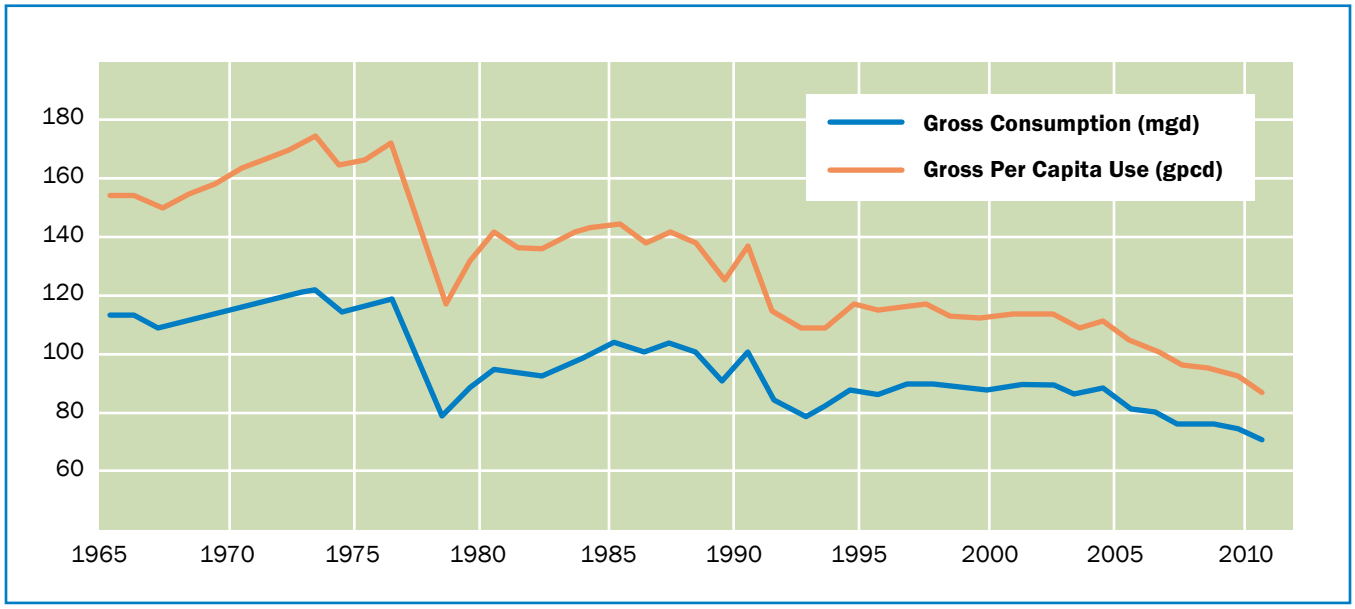
4.1 RETAIL WATER DEMANDS

Water use within San Francisco is currently below historic consumption. Both the total consumption and the per capita use of water have been on a general decline in San Francisco since the mid-1970s. Many factors have contributed to this reduction in water use, including significant changes to the mix of industrial and commercial businesses and their associated water demand, and the general characteristics of water use by San Francisco water customers. In particular, the severe droughts of 1976-77 and 1987-92, changes in plumbing codes, and conservation programs (either voluntarily embraced by residents and businesses or mandated by San Francisco), have apparently affected water demands.

Figure 6 shows the historical record of retail water deliveries by San Francisco for the 1965 through 2010 period in terms of both total deliveries and gross per capita consumption (gallons per capita per day, or gpcd).

While the gross per capita consumption is not a true measure of the water used by an individual (since it includes water use by all categories of customers, e.g., industrial, commercial and losses), it does provide insight when comparing water use among regions. The current per capita consumption rate by San Francisco in-City water customers is 85.6 gpcd, one of the lowest in the state.

Figure 6: Historical San Francisco Water Consumption



4.1.1 Current Retail Demand

All of the SFPUC's Retail Customers have been metered since 1916. In 2010, total SFPUC retail water use was 77.7 mgd. Of this demand, in-City Retail Customers used approximately 71 million gallons per day (mgd)[10]. Water use by suburban Retail Customers totaled approximately 4.1 mgd, and groundwater irrigation use was approximately 2.2 mgd.

Water use in 2010 was lower than expected. This decreased demand can be attributed to three main reasons. First, the very wet spring and cool summer California experienced in 2010 depressed urban water demand across the state. Second, 2008 and 2009 were both dry and the SFPUC asked its customers to reduce their water consumption by 10%. While rainfall returned to normal or above normal in 2010, the reductions in water use have continued. Third, the sharp economic decline which started in 2008 pushed down commercial and industrial demands. When preparing the 2005 UWMP, the number of jobs in 2010 was projected to be 692,420. According to the 2010 estimates from the California Employment Development Department, the number of jobs in 2010 was closer to 545,000.

Residential Water Use: Single-family units comprise approximately 32% of the total households in San Francisco, and use approximately 40% of the total water delivered to the residential sector. The remainder of residential water (60%) is used by multi-family units such as apartments.

Combined, the single-family and multi-family residential sectors have a current per capita consumption rate of approximately 50 gpcd. Due to San Francisco's moderate climate and high density housing, residential water use is used almost entirely indoors. For multi-family units, the average outdoor water use is considered negligible. Outdoor water use makes up less than 10% of single-family residential uses, on average.

Non-residential Water Use: Non-residential water use accounts for approximately 30% of San Francisco's retail water demands. This includes all sectors of water users not designated as residential, such as manufacturing, transportation, trade, finance, and government employment sectors, and the large services sector.

Unaccounted for Water Loss: Unaccounted for Water Loss represents both unbilled authorized consumption (including metered high pressure fire fighting consumption, unmetered main flushing, street cleaning and dust control and low pressure fire hydrant use) and unbilled unauthorized consumption (including water lost to the system through all types of leaks, breaks and overflows). These losses are assumed to be approximately 6.9% of total in-City demand. Meter under-registration is also considered unbilled unauthorized consumption and is captured in the demand calculations for each billing sector. It is assumed that meter under-registration is 2.2% of residential demand and 2.1% of non-residential demand. Total loss in the City due to meter under-registration, unbilled authorized consumption and unbilled unauthorized consumption is approximately 9% of in-City demand.

10 This only refers to in-City retail demand, not total retail demand (which includes Retail Customers outside of the city and county boundary, such as Lawrence Livermore National Laboratory), and this does not include groundwater.

Table 27: SFPUC Retail Water Shortage Stages of Action

STAGE	ACTIONS	TRIGGER PT. (% SYSTEM SHORTAGE)	TARGET WATER USE REDUCTION (%)
1 - Voluntary	• Voluntary rationing request of customers • Customers are alerted to water supply conditions • Remind customers of existing water use prohibitions	10-20%	5 – 10%
	• Customers are alerted to water supply conditions		
	• Remind customers of existing water use prohibitions		
	• Education on, and possible acceleration of, incentive programs (e.g., toilet rebates)		
2 - Mandatory	• All Stage 1 actions implemented	21-50%	11 – 20%
	• All customers receive an "allotment" of water based on the Inside/Outside allocation method (based on base year water usages for each account)		
	• Water use above the "allocation" level will be subject to excess use charges, installation of flow restrictor devices and shut-off of water		
3 - Mandatory	• Same actions as in Stage 2 with further reduced allocations	>50%	>20%

Table 28 summarizes potential prohibitions that may be enforced during a drought. **Appendix E** discusses various measures employed during the 1987-92 drought in an attempt to achieve a 45% reduction in Retail Customer demands (as applied to the pre-drought demand). These measures included absolute limitations on water use based on residential customer classification and a proportion of historical use within the non-residential sectors. Although not anticipated to be required in the near-term, San Francisco would employ similar procedures to accommodate system-wide water shortages in excess of 20%, if necessary.

The Retail Water Shortage Allocation plan is provided in **Appendix F**.

Table 28: Potential Prohibitions That May Be Enforced During a Drought

#	WATER SHORTAGE CONTINGENCY – MANDATORY PROHIBITIONS[1]	STAGE
1	Water waste, including but not limited to, any flooding or runoff into the street or gutters, was prohibited.	2, 3
2	Hoses could not be used to clean sidewalks, driveways, patios, plazas, homes, businesses, parking lots, roofs, awnings or other hard surfaces areas.	2, 3
3	Hoses used for any purpose had to have positive shutoff valves.	2, 3
4	Restaurants served water to customers only upon request.	2, 3
5	Potable water was not to be used to clean, fill or maintain levels in decorative fountains.	2, 3
6	Use of additional water was not allowed for new landscaping or expansion of existing facilities unless low water use landscaping designs and irrigation systems were employed.	2, 3
7	Water service connections for new construction were granted only if water saving fixtures or devices were incorporated into the plumbing system.	2, 3
8	Use of potable water for consolidation of backfill, dust control or other non-essential construction purposes was prohibited.	2, 3
9	Irrigation of lawns, play fields, parks, golf courses, cemeteries, and landscaping of any type with potable water would be reduced by at least the amount specified for outside use in the adopted rationing plan.	2, 3
10	Verified water waste as determined by the Water Department would serve as prima facie evidence that the allocation assigned to the water account is excessive; therefore, the allocation was subject to review and possible reduction, including termination of service.	2, 3
11	Water used for all cooling purposes was to be recycled.	2, 3
12	The use of groundwater and/or reclaimed water for irrigation of golf courses, median strips, and similar turf areas was strongly encouraged.	2, 3
13	The use of groundwater and/or reclaimed water for street sweepers/washers was strongly encouraged.	2, 3

1. Prohibitions prescribed in the 1987-92 drought that **may be** enforced during a future drought.

Wholesale Customer Water Shortage Plan (Tier 2 Drought Implementation Plan, or DRIP):

Section 3.11.C of the WSA authorizes the Wholesale Customers to adopt a methodology for allocating the collective wholesale allocation among the individual Wholesale Customers. In 2000, the Wholesale Customers adopted the Interim Water Shortage Allocation Plan among Suburban Customers, which details how the SFPUC water allocated to wholesale customers collectively was to be allocated to each individual Wholesale Customer. The Tier 2 Drought Implementation Plan (DRIP), which was adopted by the Wholesale Customers, provides an update to the 2000 Interim Water Shortage Allocation Plan Among Suburban Customers. The allocation included in the DRIP is based on a formula that takes two primary factors into account: (1) each agency's Supply Assurance from SFPUC, with certain exceptions, and (2) each agency's purchases from SFPUC during the 3 years preceding adoption of the Plan. **Appendix G** contains a copy of the Tier 1 WSAP.

Reference 37

Save Resources and Money

Residential Toilet

Single and multi-family residents are eligible for cash rebates when they replace their high-flow toilets with qualifying high-efficiency toilets.

Residential Washer

Residential customers can receive a cash rebate for the purchase of select high-efficiency clothes washers.

Solar

Applicable to commercial, industrial and other general uses served through a separate meter or battery of meters.

More Rebates and Incentives

- Rainwater Harvesting
- Commercial Toilet
- Commercial Washer
- Commercial Equipment Grants
- Direct High-Efficiency Toilet Installation
- Commercial Urinal
- Commercial Solar

Laundry-to-Landscape Graywater Program

Use your clothes washer water for irrigation! For just $5 you can purchase a laundry-to-landscape graywater starter kit that includes a 3-way valve, piping, fittings, and more. Click here for more information!

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Reference 38

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- QUEST
- Science on the SPOT

Science | KQED Public Media for Northern CA
Explore award-winning multimedia coverage of science and environment news, trends and events from the Bay Area and beyond

Record Drought Could Hurt Water Quality

Lauren Sommer, KQED Science | February 11, 2014 | 1 Comment

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Low water levels in the reservoir behind Shasta Dam in November. (Molly Samuel/KQED)

This weekend's heavy rainfall was a welcome sight, but it wasn't enough to end California's record drought. State officials are still facing tough choices about how to make the low water supply last through the year.

But with little water in streams and rivers, declining water quality could be an even bigger challenge, potentially raising problems for drinking water and causing harmful algal blooms.

State officials made their first major water quality decision at the end of January, ordering that reservoir operators in Northern California limit water releases from dams. About 144,000 acre-feet of water will be held back this month, water that's normally required to flow into rivers and the Sacramento-San Joaquin Delta.

The freshwater will be used later in the year to keep seawater away from drinking water intakes. The Delta is where freshwater from rivers mixes with saltwater from San Francisco Bay. When there isn't enough freshwater pushing against the Bay's tides, saltwater creeps into the Delta, where canals and aqueducts draw water that

supplies 25 million Californians.

"Failing to take this action could result in our reservoirs running out of water later in the year, which means no available water to prevent saltwater intrusion in the Delta," said Mark Cowin of the Department of Water Resources. "That would result in ruined water supplies both in the Delta and south of the Delta and major environmental impacts."

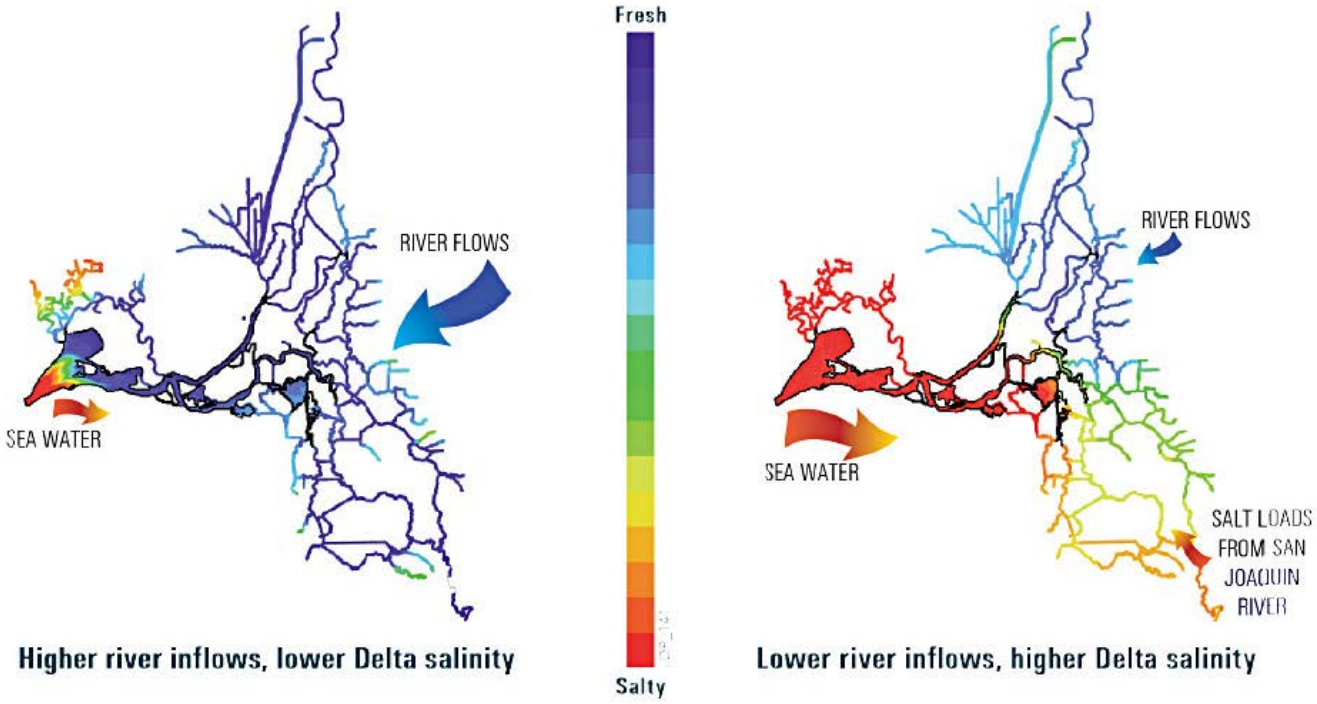
Challenges for Water Districts

Even beyond saltwater intruding, water quality in the Delta is likely to suffer due to salty agricultural runoff, which is concentrated as the slow-moving water evaporates.

"The San Joaquin River at this point is primarily agricultural drainage and wastewater treatment effluent," explained William Fleenor of UC Davis's Center for Watershed Sciences. "Those concentrations will be in the Delta and we won't be flushing them out as fast."

Water districts that rely on the Delta for drinking water say it's a cause for concern.

"We're watching salinity levels very closely," said Jennifer Allen, spokesperson for the Contra Costa Water District.



Seawater (in red) from San Francisco Bay pushes into the Delta when freshwater from rivers is low (blue). (Resource Management Associates, cited in Delta Plan)

Contra Costa Water District gets 100 percent of its supply from the Delta and serves 500,000 people in Antioch, Concord, Martinez and Pittsburg. The district withdraws that water through the Contra Costa Canal, which taps into the Delta not far from the saltwater-freshwater mixing zone.

During the 1976-77 drought, salt levels in their water exceeded public health limits, prompting water rationing

orders.

The district has since built the Los Vaqueros Reservoir, which stores higher quality water from the wet months that can be blended with lower quality water coming from the Delta in dry months.

That's something the district normally does, but "what's different this year is that we've notice the salt levels rising earlier than normal," said Allen. Los Vaqueros Reservoir is in relatively good shape this year, holding 79 percent of its storage capacity.

The poor water quality could also reach massive pumps in the South Delta that feed water to the Bay Area, Central Valley and Southern California. That includes Santa Clara County and East Bay cities like Fremont and Livermore. But officials have announced that very little water will be delivered through that system, simply because of the dry conditions.

Water treatment plants are built to handle salt, as well as other contaminants like bromide and organic carbon, but poor water quality raises their operating costs.

"It'll cost them more to treat," said Fleenor. "It's quite expensive to remove chloride"

Water quality problems are only expected to get worse with sea level rise, which would push saltwater farther into the Delta. A UC Davis study found that water treatment costs could more than double with a one-foot rise in sea level.

Effects on Agriculture

More on Water:

Sacramento-San Joaquin Delta

Drought Watch 2014

What is California's Delta?

Farmers and residents living in the Delta itself also have an eye on their water supply.

Reference 39

CALIFORNIA
Water Boards

RECEIVED
JUN 02 2014
WATER RESOURCES PLANNING DIV.

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

May 27, 2014

EAST BAY MUNICIPAL UTILITY DISTRICT
PO BOX 24055 MS 901
OAKLAND, CA 94623

In Regards to Water Right(s): S020476, S020477

NOTICE OF UNAVAILABILITY OF WATER AND IMMEDIATE CURTAILMENT FOR THOSE DIVERTING WATER IN THE SACRAMENTO AND SAN JOAQUIN RIVER WATERSHEDS WITH A POST-1914 APPROPRIATIVE RIGHT

On January 17, 2014, Governor Edmund G. Brown, Jr. proclaimed a State of Emergency (Proclamation) to address the record dry conditions around the State. On the same day, as directed by the Proclamation, the State Water Resources Control Board (State Water Board) issued a statewide notice of water shortages and potential for future curtailment of water right diversions.

Curtailment of Post-1914 Water Rights:
Based upon the most recent reservoir storage and inflow projections, along with forecasts for future precipitation events, the State Water Board has determined that the existing water supply in the Sacramento and San Joaquin River watersheds is insufficient to meet the needs of all water rights holders. With this notice, the State Water Board is notifying all holders of post-1914 appropriative water rights within the Sacramento and San Joaquin River watersheds of the need to immediately stop diverting under their post-1914 water rights, with the exceptions discussed below. This condition of curtailment will continue until water conditions improve. Even if there is water physically available at your point of diversion, that water is necessary to meet senior water right holders' needs or is water released from storage that you are not entitled to divert. If precipitation occurs in the following weeks or months, you should not commence diversion before being notified by the State Water Board that water is legally available for diversion under your priority of right.

Permission to initiate diversions during or following significant rainfall events may be posted at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/index.shtml#notices. You can get immediate email updates from the State Water Board about these notices by subscribing to "Drought Updates" at: http://www.waterboards.ca.gov/resources/email_subscriptions/

Compliance Certification Required:
Curtailed post-1914 diverters are required to document receipt of this notice by completing an online Curtailment Certification Form (Form) within seven days. The Form confirms cessation of diversion under the specific post-1914 water right, and, if applicable, identifies the alternate water supply to be used in lieu of the curtailed water right. Completion of the Form and identification of alternate rights can avoid unnecessary enforcement proceedings.

Please complete the Form for each post-1914 water right identified through this curtailment at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/ewrims/curtailment/

If you are unable to complete the form online, you should download the Form at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/ewrims/curtailment/curtailment_certification_form.pdf and email your response to: SWRCB-Curtailment-Certification@waterboards.ca.gov.

Warning of Potential Future Curtailment of Senior Rights:
You may have received this notice because the State Water Board's records show you divert water under a riparian or pre-1914 water right. As such, it is important that you conserve water due to declining supplies. If current conditions persist, the State Water Board may curtail some pre-1914 and riparian water rights in the near future. If you are a riparian or pre-1914 water right holder located downstream of major reservoir operations (such as the Central Valley Project or State Water Project) which are releasing water from storage and you do not have a contract or transfer order authorizing diversion of the released water, you are not permitted to divert the released water quantity.

Exceptions to Curtailment:
If your post-1914 diversion is your only source for human health and safety purposes, you may contact the State Water Board with information supporting that there is no other available supply and maximum conservation has been implemented. The State Water Board may be able to assist with identifying alternatives on a case-by-case basis. Additionally, if your diversion is for hydroelectric generation and all water diverted is returned to the stream, you may continue to divert under your post-1914 permit or license. If you continue to divert under either of the above circumstances, you must identify that on the Form and provide the information requested.

Potential Enforcement:
Those who are found to be diverting water beyond what is legally available to them may be subject to administrative fines, cease and desist orders, or prosecution in court. The State Water Board may levy fines of $1,000 per day of violation and $2,500 for each acre-foot diverted or used in excess of a valid water right. (See Water Code, §§ 1052,1055.) Additionally, if the State Water Board issues a Cease and Desist Order against an unauthorized diversion, violation of any such order can result in a fine of $10,000 per day. (See Water Code, §§ 1831, 1845.)

The State Water Board is encouraging diverters to work together to reach local voluntary agreements that not only provide solutions that help local communities with water shortages, but also prevent impacts to other legal users of water and do not cause unreasonable effects on fish and wildlife. If you have any questions, please call our Curtailment Hotline at (916) 341-5342, contact us by email at: SWRCB-Curtailment-Certification@waterboards.ca.gov, or review our drought year webpage at:
http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/index.shtml

Sincerely,

Thomas Howard

Thomas Howard
Executive Director

Reference 40

Water-Data Report 2013

11162570 San Gregorio Creek at San Gregorio, CA

San Gregorio Creek Basin

LOCATION.--Lat 37°19′33″, long 122°23′08″ referenced to North American Datum of 1927, San Mateo County, CA, Hydrologic Unit 18050006, in San Gregorio Grant, on right bank, at downstream side of bridge on Stage Road (Old Coast Highway), 0.1 mi south of town of San Gregorio, and 1.4 mi upstream from mouth.

DRAINAGE AREA.--50.9 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1969 to September 1994, May 2001 to September 2005, July 2007 to current year.
SEDIMENT DATA: Water years 1986, 1990-1993.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 11.40 ft above NGVD of 1929.

REMARKS.--Records rated good except for flows below 5 ft^3/s, which are rated fair. No regulation or known diversion upstream from station. Low flow affected by domestic use.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,910 ft^3/s, Jan. 4, 1982, gage height, 21.28 ft, from rating curve extended above 560 ft^3/s, on basis of contracted-opening measurement of peak flow; no flow for many days in some years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Dec. 22, 1955, reached a stage of 15.6 ft, from floodmarks, discharge, 3,620 ft^3/s, based on contracted-opening measurement of peak flow.

PEAK DISCHARGES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and (or) maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec 2	1315	3,540	16.14
Dec 23	1830	*4,960	*18.66

11162570 San Gregorio Creek at San Gregorio, CA—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1.1	1.8	119	69	16	11	9.5	4.8	3.1	1.7	0.72	0.20
2	0.90	3.1	918	60	15	10	9.8	4.0	3.0	1.3	0.49	0.49
3	0.71	2.5	169	52	15	10	9.2	3.9	3.0	1.2	0.51	0.34
4	0.41	1.8	64	47	15	10	14	3.8	2.9	1.3	0.88	0.34
5	0.45	1.6	133	44	15	10	14	4.0	3.0	1.4	0.95	0.13
6	0.45	1.4	80	52	14	14	11	4.1	3.1	1.3	0.79	0.00
7	0.54	1.3	49	43	14	12	11	4.1	3.1	1.4	0.68	0.01
8	0.64	1.3	36	39	16	21	11	4.1	3.1	1.2	0.87	0.03
9	0.54	1.3	29	37	15	15	11	4.1	2.9	0.97	1.4	0.10
10	0.55	1.6	24	37	14	12	9.6	4.1	2.7	0.95	1.5	0.03
11	0.80	1.5	20	34	13	11	9.0	4.2	2.8	1.2	1.3	0.23
12	0.99	1.4	25	32	13	11	8.8	4.3	2.7	1.1	1.4	0.15
13	1.2	1.4	21	30	13	10	8.6	4.2	2.4	1.2	0.65	0.01
14	1.1	1.4	17	28	12	10	8.3	3.9	2.3	1.5	0.64	0.08
15	1.1	1.3	16	26	12	9.8	8.6	3.9	2.3	1.5	0.43	0.23
16	1.1	1.3	17	26	12	9.7	8.1	4.0	2.1	1.2	0.96	0.20
17	0.86	5.6	45	25	12	9.5	7.8	4.0	1.8	1.3	0.57	0.12
18	0.77	18	42	24	12	9.4	7.3	3.3	1.6	1.4	0.58	0.09
19	0.85	7.7	29	23	15	9.2	6.9	3.4	1.5	1.4	0.79	0.12
20	0.84	4.8	24	22	17	9.3	6.5	3.6	1.5	1.6	0.34	0.13
21	0.85	18	82	21	13	9.3	6.5	3.3	1.5	1.6	0.39	0.57
22	2.0	8.8	625	20	12	9.2	6.3	3.1	1.5	1.2	0.26	3.2
23	4.2	5.2	1,730	20	12	8.8	6.2	3.2	1.7	1.1	0.13	1.8
24	3.3	4.2	689	20	12	8.4	6.3	3.1	2.4	0.92	0.15	0.93
25	2.5	4.0	315	19	11	8.4	6.3	3.2	3.0	0.75	0.33	0.67
26	2.4	3.7	427	19	11	8.1	6.3	3.3	2.9	0.79	0.50	0.40
27	2.2	3.5	230	18	11	7.9	6.3	3.2	2.9	0.51	0.46	0.29
28	1.8	24	144	17	10	7.8	6.3	3.5	2.5	1.0	0.39	0.29
29	1.6	15	185	17	---	7.8	5.9	3.6	2.2	1.3	0.06	0.22
30	1.2	249	107	16	---	7.8	5.0	3.4	2.1	0.69	0.17	0.20
31	1.2	---	83	16	---	9.0	---	3.2	---	0.59	0.19	---
Total	39.15	397.5	6,494	953	372	316.4	251.4	115.9	73.6	36.57	19.48	11.60
Mean	1.26	13.2	209	30.7	13.3	10.2	8.38	3.74	2.45	1.18	0.63	0.39
Max	4.2	249	1,730	69	17	21	14	4.8	3.1	1.7	1.5	3.2
Min	0.41	1.3	16	16	10	7.8	5.0	3.1	1.5	0.51	0.06	0.00
Ac-ft	78	788	12,880	1,890	738	628	499	230	146	73	39	23

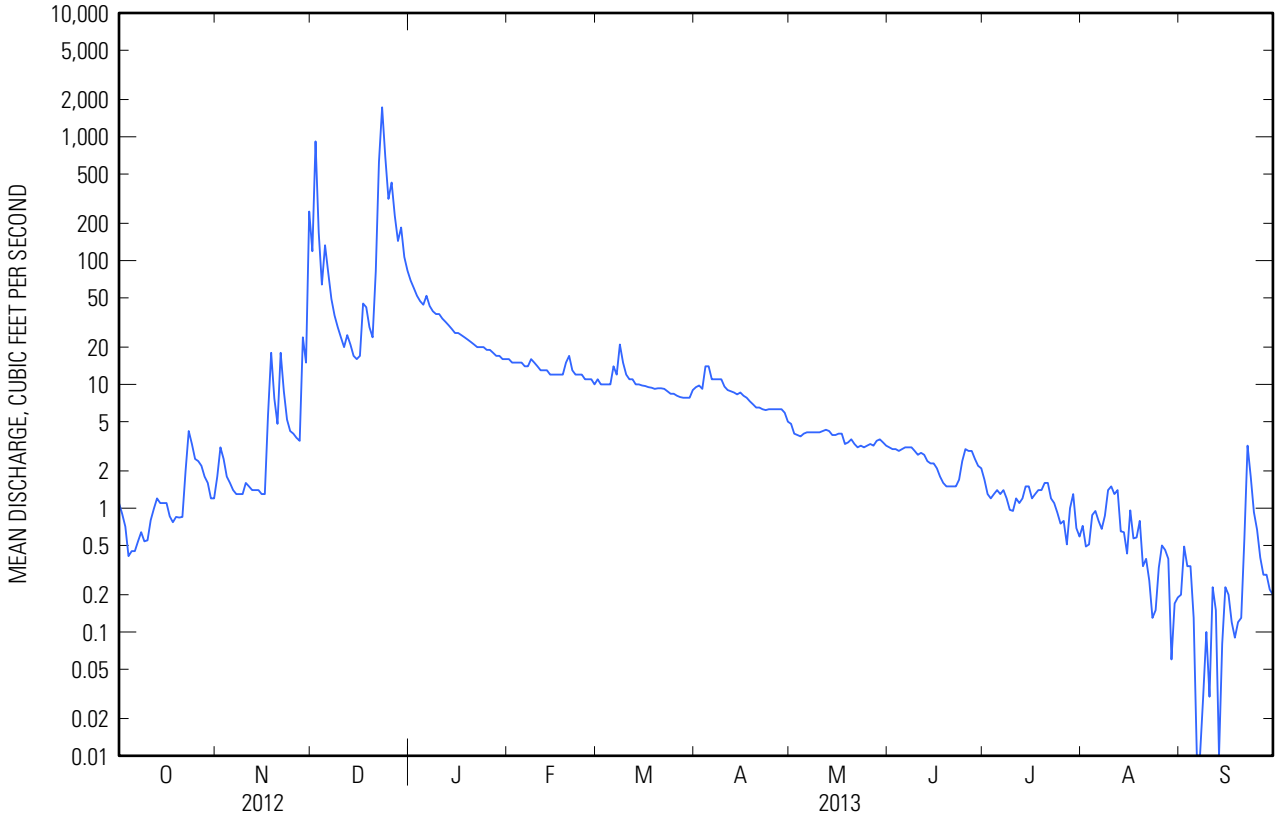
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 2013, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	3.01	19.8	55.7	84.3	96.0	86.9	39.7	12.6	6.09	3.02	1.65	1.25
Max	11.6	162	297	345	379	432	259	68.5	20.5	11.7	6.68	4.46
(WY)	(1984)	(1973)	(1984)	(1982)	(1986)	(1983)	(1982)	(1983)	(1982)	(1974)	(1982)	(1983)
Min	0.00	0.71	1.70	1.17	2.21	2.98	1.05	1.42	0.35	0.02	0.00	0.00
(WY)	(1978)	(1977)	(1977)	(1991)	(1977)	(1977)	(1977)	(1977)	(1981)	(1988)	(1977)	(1977)

11162570 San Gregorio Creek at San Gregorio, CA—Continued

SUMMARY STATISTICS

	Calendar Year 2012		Water Year 2013		Water Years 1970 - 2013	
Annual total	14,353.47		9,080.60			
Annual mean	39.2		24.9		33.9	
Highest annual mean					111	1983
Lowest annual mean					1.16	1977
Highest daily mean	1,730	Dec 23	1,730	Dec 23	4,120	Jan 4, 1982
Lowest daily mean	0.41	Oct 4	0.00	Sep 6	0.00	Aug 11, 1972
Annual seven-day minimum	0.51	Oct 4	0.08	Sep 5	0.00	Aug 11, 1972
Maximum peak flow			4,960	Dec 23	7,910	Jan 4, 1982
Maximum peak stage			18.66	Dec 23	21.28	Jan 4, 1982
Instantaneous low flow					0.00	Sep 16, 1992
Annual runoff (ac-ft)	28,470		18,010		24,580	
10 percent exceeds	84		29		65	
50 percent exceeds	5.1		3.6		4.9	
90 percent exceeds	0.87		0.44		0.35	



Reference 41

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# ---------------------------------- WARNING ------------------------
-
# The data you have obtained from this automated U.S. Geological Survey database
# have not received Director's approval and as such are provisional and subject to
# revision.  The data are released on the condition that neither the USGS nor the
# United States Government may be held liable for any damages resulting from its
use.
# Additional info: http://waterdata.usgs.gov/nwis/?provisional
#
# File-format description:  http://waterdata.usgs.gov/nwis/?
tab_delimited_format_info
# Automated-retrieval info: http://help.waterdata.usgs.gov/faq/automated-retrievals
#
# Contact:   gs-w_support_nwisweb@usgs.gov
# retrieved: 2014-07-11 16:54:54 EDT       (sdww02)
#
# Data for the following 1 site(s) are contained in this file
#    USGS 11162570 SAN GREGORIO C A SAN GREGORIO CA
# ---------------------------------------------------------------------------------
-
#
# Data provided for site 11162570
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#
# Data-value qualification codes included in this output:
#     A  Approved for publication -- Processing and review completed.
#     P  Provisional data subject to revision.
#
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USGS    11162570        2014-01-11      0.87    A
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USGS	11162570	2014-01-29	0.54	A
USGS	11162570	2014-01-30	0.56	A
USGS	11162570	2014-01-31	0.70	A
USGS	11162570	2014-02-01	0.74	A
USGS	11162570	2014-02-02	1.4	A
USGS	11162570	2014-02-03	3.1	A
USGS	11162570	2014-02-04	2.7	A
USGS	11162570	2014-02-05	2.1	A
USGS	11162570	2014-02-06	4.4	A
USGS	11162570	2014-02-07	7.5	A
USGS	11162570	2014-02-08	12	A
USGS	11162570	2014-02-09	62	A
USGS	11162570	2014-02-10	59	A
USGS	11162570	2014-02-11	16	A
USGS	11162570	2014-02-12	8.0	A
USGS	11162570	2014-02-13	5.5	A
USGS	11162570	2014-02-14	4.3	A
USGS	11162570	2014-02-15	3.6	A
USGS	11162570	2014-02-16	3.4	A
USGS	11162570	2014-02-17	3.3	A
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USGS	11162570	2014-02-19	2.5	A
USGS	11162570	2014-02-20	2.4	A
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USGS	11162570	2014-02-22	2.1	A
USGS	11162570	2014-02-23	2.0	A
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USGS	11162570	2014-02-25	1.9	A
USGS	11162570	2014-02-26	2.1	A
USGS	11162570	2014-02-27	9.6	A
USGS	11162570	2014-02-28	28	A
USGS	11162570	2014-03-01	42	A
USGS	11162570	2014-03-02	24	A
USGS	11162570	2014-03-03	15	A
USGS	11162570	2014-03-04	12	A
USGS	11162570	2014-03-05	9.1	A
USGS	11162570	2014-03-06	9.9	A
USGS	11162570	2014-03-07	9.7	A
USGS	11162570	2014-03-08	7.9	A
USGS	11162570	2014-03-09	6.9	A
USGS	11162570	2014-03-10	5.9	A
USGS	11162570	2014-03-11	5.2	A
USGS	11162570	2014-03-12	4.5	A
USGS	11162570	2014-03-13	4.2	A
USGS	11162570	2014-03-14	4.0	A
USGS	11162570	2014-03-15	3.6	A
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USGS	11162570	2014-03-19	3.0	A
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USGS	11162570	2014-03-21	2.9	A
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USGS	11162570	2014-03-23	2.7	A

USGS	11162570	2014-03-24	2.7	A
USGS	11162570	2014-03-25	2.7	A
USGS	11162570	2014-03-26	2.9	A
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USGS	11162570	2014-04-05	12	A
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USGS	11162570	2014-05-06	1.9	P
USGS	11162570	2014-05-07	1.9	P
USGS	11162570	2014-05-08	2.0	P
USGS	11162570	2014-05-09	2.1	P
USGS	11162570	2014-05-10	2.1	P
USGS	11162570	2014-05-11	1.4	P
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USGS	11162570	2014-05-30	0.17	P
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USGS	11162570	2014-06-02	0.56	P
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USGS	11162570	2014-06-12	0.06	P
USGS	11162570	2014-06-13	0.04	P
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USGS	11162570	2014-06-22	0.02	P
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USGS	11162570	2014-06-24	0.03	P
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USGS	11162570	2014-06-26	0.04	P
USGS	11162570	2014-06-27	0.12	P
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USGS	11162570	2014-06-29	0.00	P
USGS	11162570	2014-06-30	0.00	P
USGS	11162570	2014-07-01	0.00	P
USGS	11162570	2014-07-02	0.02	P
USGS	11162570	2014-07-03	0.02	P
USGS	11162570	2014-07-04	0.00	P
USGS	11162570	2014-07-05	0.02	P
USGS	11162570	2014-07-06	0.01	P
USGS	11162570	2014-07-07	0.00	P
USGS	11162570	2014-07-08	0.00	P
USGS	11162570	2014-07-09	0.00	P
USGS	11162570	2014-07-10	0.00	P

Reference 42

2010 URBAN WATER MANAGEMENT PLAN

December 15, 2010

Zone 7 Water Agency
Livermore, CA

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2.3 EXISTING WATER USE SECTORS

Zone 7's service area is home to a diverse, vibrant, and rapidly growing community that supports a population of approximately 216,000 people and a myriad of vital and dynamic commercial, agricultural, and industrial enterprises. The eastern reaches of Zone 7's service area include oil wells and acres of energy generating windmills, while other areas include large employers such as AT&T, Oracle, Providian Financial, SAP, and Lawrence Livermore National Laboratory. This area also supports a number of award-winning wineries. Examples of industrial water users include: Applied Biosystems (biotech), Clorox Services Company (chemical company), Roche Molecular Systems (medical research and development), and A-1 Enterprise (waste hauler).

As discussed previously, Zone 7 provides wholesale treated water to the Retailers, who use this water for M&I purposes within their service areas; through this arrangement, Zone 7 indirectly serves approximately 66,000 residential, commercial, industrial, institutional, and landscape water use accounts. Two of the Retailers—DSRSD and Livermore—also provide recycled water for landscape irrigation to supplement treated water supply. In addition to supplying treated water, Zone 7 also supplies raw or untreated water for agricultural purposes to 3,500 acres in the service area, primarily consisting of vineyards in the southern portion of the Livermore Valley. Agriculture in the Livermore area also produces olives, pistachios, and prime beef.

As shown in Table 2-1, water accounts within Zone 7's service area are primarily residential (90%). Water use details are further discussed in Chapter 9.

Table 2-1. 2009 Accounts by Water Use Sectors Directly and Indirectly Served by Zone 7[(a)]

Water Use Sector	Accounts	% of Total
Single-Family Residential	57,198	86%
Multi-Family Residential	2,327	4%
Commercial/Institutional	3,807	6%
Industrial	175	0.3%
Landscape	1,844	3%
Agriculture	14	0.02%
Other	868	1%
TOTAL	**66,233**	**100%**

[(a)] Based on data provided by Cal Water, DSRSD, Livermore, and Pleasanton, and Zone 7's annual water supply reports. These values do not include recycled water, but do include untreated surface water provided to agriculture.

2.4 POPULATION GROWTH

As shown on Figure 2-2, the population within Zone 7's service area has increased by 65% between 1990 and 2009, and is projected to grow by another 35% by 2040, from 216,000 in 2009 to 291,000; a majority of the projected growth occurs within the next 10 years. Population projections within Zone 7's service area over the next 20 years are presented in Table 2-2. As

File 3 of 3: Agency Drought Declarations and Conservation Directives

Local drought declarations, conservation directives, and other supporting documents are provided in this section. Documentation is organized by project sponsor agency as listed below.

Alameda County Water District

Contra Costa Water District

City of Calistoga

City of Napa

Dublin San Ramon Services District

East Bay Municipal Utility District

Marin Municipal Water District

San Francisco Public Utilities Commission

San Mateo County RCD

Santa Clara Valley Water District

Sonoma County Water Agency

Stinson Beach County Water District

Zone 7 Water Agency

Other Agencies (e.g., Wholesale Customers)

Alameda County Water District

Alameda County Water District. March 13, 2014. An Ordinance of Alameda County Water District Declaring a Water Shortage Emergency and Adopting Water Use Regulations, Restrictions and Guidelines for the Water Shortage Emergency.

_____. March 17, 2014. Alameda County Water District Declares Water Shortage Emergency.

_____. January 17, 2014. Press Release – Alameda County Water District Asks Customers to Reduce Water Usage by 20%.

ORDINANCE NO. 2014-01

AN ORDINANCE OF ALAMEDA COUNTY WATER DISTRICT DECLARING A WATER SHORTAGE EMERGENCY AND ADOPTING WATER USE REGULATIONS, RESTRICTIONS AND GUIDELINES FOR THE WATER SHORTAGE EMERGENCY.

BE IT ORDAINED by the Board of Directors of ALAMEDA COUNTY WATER DISTRICT as follows:

SECTION 1. DECLARATION OF A WATER SHORTAGE EMERGENCY.

The Board of Directors finds and declares as follows:

(a) The District's primary sources of supplies include: imported water from the State Water Project (40%); imported water from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (20%); and local supplies originating from rainfall and runoff from the Alameda Creek Watershed (40%).

(b) On January 17, 2014, Edmund G. Brown, Governor of California, proclaimed a State of Emergency to exist in the State of California due to severe drought conditions.

(c) On January 31, 2014, the California Department of Water Resources (DWR) announced that the 2014 State Water Project (SWP) allocation for all SWP Contractors is zero percent (0%) of the Contractors' contractual maximum SWP allocations due to the exceptionally dry conditions.

(d) Locally, Calendar Year 2013 was the driest year on record with only 23% of the long-term average precipitation, impacting local surface water and groundwater supplies.

(e) Additional findings supporting the actions in this Ordinance are set forth in the staff report for this Ordinance and the March 13, 2014 staff presentation to the Alameda County Water District Board of Directors which are incorporated into this Ordinance by this reference.

(f) On February 13, 2014, at a properly noticed regular Board meeting, the Board considered whether to declare that a water shortage emergency condition exists within the water service area of the District, and decided to hold a public hearing in March 2014 on this issue and to provide District customers an opportunity to be heard to protest against the declaration and to present their needs to the Board of Directors.

(g) Notice of the public hearing was published pursuant to law one time at least seven days prior to the date of the public hearing in The Argus, a newspaper of general circulation, printed and published within the water service area of the District.

(h) The full text of this Ordinance was published in The Argus at least five days prior to the date of the public hearing.

(i) The full text of this Ordinance was posted in the office of the District and posted on the District's website at least five days prior to the public hearing.

(j) At the public hearing all persons present were given an opportunity to be heard and all persons desiring to be heard were heard.

(k) The public hearing was called, noticed and held in all respects as required by law.

(l) This Board heard and has considered each protest against the water shortage emergency declaration and all comments presented at the public hearing.

(m) The Board of Directors declares that a water shortage emergency condition exists and prevails within the water service area of this District. The water shortage exists by reason of the fact that the ordinary demands and requirements of the water consumers in the Alameda County Water District service area cannot be met and satisfied by the water supplies now available to the District without depleting the water supply or diminishing its quality to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

SECTION 2. PURPOSE AND AUTHORITY.

The purpose of this Ordinance is to conserve the water supply of the District for the greatest public benefit with particular regard to public health, fire protection and domestic use; to conserve water by reducing and restricting nonessential water use that if continued would constitute waste; and to the extent necessary by reason of drought and the existing water shortage emergency condition, to reduce water use fairly and equitably. This Ordinance is adopted pursuant to the District's authority under Sections 350 et seq. and 31026 et seq. of the California Water Code.

The water supply of the District includes water from the District's distribution system, as well as groundwater from the Niles Cone Groundwater Basin, which the District manages and regulates pursuant to its authority under the Replenishment Assessment Act of the Alameda County Water District, Chapter 1942 of the Statutes of 1961. The Niles Cone Groundwater Basin is an essential component of the District's water supply and must be conserved during this water shortage emergency. This Ordinance applies to all water from the District's water distribution system and to all wells, public and private, within the District's service boundary that produce water from the Niles Cone Groundwater Basin.

SECTION 3. EFFECT OF ORDINANCE.

This Ordinance shall take effect immediately, shall supersede and control over any other ordinance or regulation of the District in conflict herewith, and shall remain in effect until the Board of Directors declares that the water shortage emergency has ended.

SECTION 4. WATER USE LIMITATIONS.

(a) Mandatory Restrictions on Water Use.
During the water shortage emergency condition, and to preserve the water supply for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection, the following uses of water are prohibited:

(1) Use of water in violation of ACWD Ordinance No. 2008-01 Prohibiting Wasteful Use of Water;

(2) Use of water for the irrigation of lawns or other landscaped areas on consecutive days. With the exception of Item (3) below, landscape irrigation cannot be more frequent than:

- One day per week for the period of April 1 through May 31;
- Two days per week for the period of June 1 through September 30;
- One day per week for the period of October 1 through November 30.
- One day per week for the period of December 1 through March 31. Landscape irrigation during this period should be avoided except during an extended dry period. During this period landscape irrigation while it is raining is prohibited.

This section does not apply to the following categories of use:

- Watering or irrigating by use of a hand-held bucket or similar container.
- Watering for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
- Maintenance of existing landscape necessary for fire protection.
- Maintenance of existing landscape for soil erosion control.
- Maintenance of plant materials identified to be rare or essential to the well-being of protected species.
- Maintenance of turf at sports fields, playing fields, and other active recreation use areas within public parks, school grounds, golf course greens, and day care centers, provided that such irrigation does not exceed 3 days per week for the period of June 1through September 30 and 2 days per week for the period of October 1 through May 31. Landscape irrigation during the period of December 1 through March 31 should be avoided except during an extended dry period.
- Actively irrigated environmental mitigation projects.
- Maintenance of vegetation, including fruit trees and shrubs, intended for consumption.

Increasing the frequency and/or duration of irrigation run times to offset the above restrictions on days of allowable irrigation is contrary to the purpose of this Ordinance, and is therefore prohibited.

(3) Use of water for the irrigation of new landscape installed after January 1, 2014 cannot be more frequent than three times per week throughout the year, provided that all of the following conditions are met:

a. The newly installed landscape replaces turf grass that was regularly maintained and irrigated.
b. The new landscape consists solely of drought tolerant plants and is consistent with the requirements for drought tolerant landscaping established in the District's Turf Replacement Program.
c. The new landscape is irrigated solely by drip irrigation, or another low-volume irrigation type such as micro-spray, micro-jet or micro-bubbler where no emitter produces more than 2 gallons of water per hour, or by hose equipped with a quick-acting positive shutoff nozzle.
d. Mulch is used around the new landscaping to minimize evaporative losses.

(4) Use of water for lawn or garden watering, or any other landscape irrigation, in a manner which results in excessive ponding, flooding and/or excessive runoff in gutters or other waterways, patios, driveways, walks or streets;

(5) Use of water for washing sidewalks, walkways, driveways, patios, parking lots, tennis courts or other hard-surfaced areas;

(6) Use of hoses for any purpose, including washing cars, boats, trailers or other vehicles and machinery, without a quick-acting positive shutoff nozzle;

(7) The use of water for cleaning building or mobile home exteriors, including windows, except for the preparation of such exterior surfaces for the purpose of repair or repainting (only allowed with the use of a pressurized washing device equipped with a quick-acting positive shutoff nozzle);

(8) The draining and refilling of all existing swimming pools, except for protection of public health and safety;

(9) Use of single pass cooling systems in new (non-residential) connections ;

(10) Use of non-recirculating systems in new conveyer car wash and commercial laundry systems;

(11) Use of non-recycling decorative water fountains.

Depending on the continued severity of the drought and water shortage emergency, the District may update this Ordinance to impose additional water use restrictions as conditions warrant. Any updates to this Ordinance will be adopted pursuant to the District's authority under Sections 350 et seq. and 31026 et seq. of the California Water Code.

(b) Enforcement of Restrictions.

(1) Written Warning: If the District determines that a customer is using water in violation of this Ordinance, the District will send a written warning to the customer that lists the name and address of the person on the account, identifies the wasteful use of water that violates the mandatory restrictions on water use, requests that the customer

stop such wasteful use, informs the customer about the process for applying for an exception from the requirements of this Ordinance, and informs the customer that failure to comply with this Ordinance may result in the termination of service.

(2) On-site Notification: The District may, after issuing a written warning, and if the customer does not request an exception, conduct a follow-up visit in order to ascertain whether wasteful use of water is still occurring. In the event that continued waste of water that violates the mandatory restrictions on water use is observed, and no exception has been granted, the District will make reasonable efforts to notify an adult residing at the property if a residential account or an adult working on the property if a non-residential account, and will issue a second written warning by on-site notification of wasteful water use and the customer will be charged the field service visit charge established in the District's Rate and Fee Schedule, Section 3A. This second written warning will include all the information included in the first written warning and will be hand delivered to the adult on the premises or posted on the premises.

(3) Termination of Water Service: In the event that District personnel observe continued waste of water that violates the mandatory restrictions on water use occurring at a customer's premises more than 48 hours after the on-site notification, it shall be deemed to be a willful violation of the mandatory restrictions on water use, and the General Manager may authorize termination of water service.

(4) Restoring Water Service: The reconnection charge established in the District's Rate and Fee Schedule, Section 3E must be paid before the District will restore service. In addition, the customer must have stopped the wasteful use of water and have paid all charges owed to the District under this Ordinance, and all other rates and fees owed, before the District will restore water service.

(c) Violation is a Misdemeanor.

Pursuant to California Water Code Section 31029, use of water in violation of the restrictions on water use set forth in Section 4 of this Ordinance is a misdemeanor.

SECTION 5. WATER USE GUIDELINES.

During the water shortage emergency condition, customers are urged to adhere to the following guidelines to conserve the limited water supply available:

(1) Use water for beneficial purposes in a manner which minimizes the use of water, and repair leaks as soon as possible.

(2) Replace non-conserving plumbing fixtures (e.g. toilets, showerheads, faucets, clothes washers) with newer, water efficient models.

(3) Reduce indoor water use by taking the following actions:

a. Turn off the tap while brushing teeth, shaving, and washing hands
b. Run dishwashers and washing machines with full loads only
c. Take shorter showers

(4) Landscape Guidelines:

Irrigate early in the morning (before 10:00 a.m.), to minimize evaporation.

Installation of new landscaping should utilize best known irrigation and horticultural practices for efficient water use.

Existing systems should be evaluated and repaired to minimize evaporation.

Use drought tolerant plant species wherever possible for replacement and at all new landscape installations. Installation of non-drought tolerant landscaping, including turf, should be avoided.

Use non-potable water from rain water capture and/or graywater for landscape irrigation. Graywater should not be used in vegetable gardens where food is a root crop or touches the ground surface. Regulations for the design and construction of graywater systems can be found in Chapter 16A of the California Plumbing Code. Most graywater systems also require permits from the local cities.

(5) Use non-potable water for construction purposes unless it is not appropriate and/or not available. If reclaimed water is used, the proposed conditions of use must meet the requirements of the San Francisco Bay Regional Water Quality Control Board.

(6) Non-residential customers should utilize systems which recycle water when possible.

(7) Restaurants should serve water to customers only when requested.

SECTION 6. APPLICATION PROCEDURE FOR EXCEPTIONS.

Consideration of written applications for exceptions regarding the mandatory restrictions on water use set forth in Section 4 shall be as follows:

(a) A customer may submit a written application for an exception to the mandatory restrictions on water use to the District's Drought Management Coordinator or designee. The application must be on the District's form and must include the customer name, account number(s), a description of the proposed water use and estimated duration and quantity of water use (e.g., gallons per day), and a description of the reason an exception is requested.

(b) The Drought Management Coordinator or designee will consider each application for an exception to the mandatory restrictions on water use based on the criteria established for residential and nor-residential customers. If the criteria is satisfied, the Drought Management Coordinator or designee may grant exceptions for reasons that include

benefits and/or needs of water to be used, potential adverse economic impacts, implementation complexities/issues, and mitigation measures/offsets.

(c) A customer may appeal a denial of an application by submitting a written appeal to the General Manager on the District's form and include the reasons why the customer disagrees with the denial.

SECTION 7. EXEMPTION FROM CEQA.

The District Board of Directors finds that the actions taken in this Ordinance are exempt from provisions of the California Environmental Quality Act of 1970 because they are immediate actions necessary to prevent or mitigate an emergency, as described in section 15269(c), and to assume the maintenance, restoration, or enhancement of a natural resource, as described in section 15307, of the Guidelines promulgated under said Act.

SECTION 8. SEVERABILITY.

If any provision of this Ordinance is held to be invalid or unenforceable, that holding will not affect the remainder of the Ordinance, which shall remain in full force and effect.

SECTION 9. PUBLICATION AND POSTING OF ORDINANCE.

The Board of Directors direct that the full text of this Ordinance be published in The Argus and that a certified copy of the full text of this Ordinance be posted in the Office of the District and on the District's website within ten days from the date this Ordinance is adopted and identifying how each Director voted on this Ordinance.

PASSED AND ADOPTED this 13th day of March, 2014, by the following vote:

AYES: Directors Koller, Gunther, Huang, and Sethy

NOES: Director Weed

ABSENT: None

/s/ PAUL S. SETHY
Paul S. Sethy, President
Board of Directors
Alameda County Water District

ATTEST:

/s/ ANDREW WARREN
Andrew Warren, Assistant District Secretary
Alameda County Water District

APPROVED AS TO FORM:

/s/ PATRICK T. MIYAKI
Patrick T. Miyaki, Attorney
Alameda County Water District

PRESS RELEASE

FOR IMMEDIATE RELEASE: March 17, 2014
CONTACT: Frank Jahn, (510) 668-4209

ALAMEDA COUNTY WATER DISTRICT DECLARES WATER SHORTAGE EMERGENCY

Mandatory Water-Use Restrictions in Effect Until Further Notice

Fremont, CA – On March 13, the Alameda County Water District Board of Directors declared a water shortage emergency within Fremont, Newark, and Union City and adopted an ordinance that includes mandatory water-use restrictions.

"The exceptionally dry conditions forced our hand," noted ACWD Board president Paul Sethy. "Without mandatory conservation, we won't be able to meet ordinary water demands without depleting our supply or reducing its quality."

The bulk of the restrictions relate to landscape irrigation. Lawns and other landscaping may be watered no more than one day per week during the fall, spring, and winter, and no more than two days per week during the summer. Public parks, school grounds, golf courses, and day care centers are allowed one extra day of irrigation per week, as is new drought-tolerant landscaping that replaces irrigated turf. Irrigation while it is raining is prohibited, as is irrigation that results in ponding or excessive runoff.

Other water use restrictions include prohibitions against hosing off sidewalks and driveways, using hoses without shut-off nozzles, and the draining and refilling of swimming pools.

Enforcement of the restrictions will involve a three-step process. Violators will first be sent a written warning via U.S. mail. A second warning will be issued during an on-site visit if violations persist. Continued violations may result in termination of water service.

Exceptions to the water-use restrictions will be considered on a case-by-case basis.

"Our customers have always risen to the task of conserving water during previous droughts," said ACWD General Manager Walt Wadlow. "It's our sincere hope that they'll respond again as we cope with the worst water supply emergency in the District's 100 year history."

Violations of the mandatory restrictions can be reported to ACWD by calling (510) 668-4299 or visiting www.acwd.org/reportwaste.

PRESS RELEASE

California is currently experiencing the driest conditions in its recorded history. The Sierra snowpack, which accounts for the bulk of the state's drinking water, is currently at 28% of normal. The Department of Water Resources has informed ACWD that it will receive 0% of its annual allocation from the State Water Project which typically accounts for 40% of the District's supply. Additionally, local runoff, which accounts for another 40% of the District's supply, is currently at only about 33% of normal.

For information on how to conserve water, visit the Drought Resource Center at www.acwd.org or call the Drought Hotline at (510) 668-4470.

# # #

For 100 years, the Alameda County Water District has supplied water to the residents and businesses of southern Alameda County. ACWD supplies drinking water to the more than 336,000 people living in the cities of Fremont, Newark, and Union City. For more information, please visit www.acwd.org.

Alameda County Water District www.acwd.org
(510) 668-4200 43885 S. Grimmer Blvd. Fremont, CA 94538

PRESS RELEASE

FOR IMMEDIATE RELEASE: January 17, 2014
CONTACT: Walt Wadlow, 510-668-4201

ALAMEDA COUNTY WATER DISTRICT ASKS CUSTOMERS TO REDUCE WATER USAGE BY 20%

Request comes in Support of Governor Brown's Proclamation of a Drought Emergency

Fremont, CA – Alameda County Water District announced today that it is requesting Tri-City area residents, businesses, and institutions to voluntarily cut back on their water use by 20% in response to Governor Brown's declaration of a statewide drought emergency.

ACWD relies on local runoff from the Alameda Creek watershed for 40% of its supplies. The State Water Project provides 40% of the ACWD's supplies, with the balance of 20% purchased from the San Francisco Public Utilities Commission's (SFPUC's) Hetch-Hetchy water system.

In light of the continued dry conditions, both locally and in the Sierras, and recent information from California Department of Water Resources officials regarding State Water Project availability, ACWD is currently updating its water supply forecasts. With no significant precipitation in the forecast, the District is concerned and continues to monitor the situation very closely. ACWD staff is closely coordinating with officials from the California Department of Water Resources and the SFPUC regarding water supply conditions of the State Water Project and Hetch-Hetchy system, respectively.

Because of the ongoing dry conditions, and uncertainties with both local and imported water supply availability, ACWD is requesting that customers voluntarily cut back on their water use by 20%. Below, please find guidelines on how customers can help by reducing their water use.

"We are taking this third dry year very seriously," said Board President Paul Sethy. "Our customers' water conservation efforts in the past have really helped lessen the impacts of dry conditions. Continuing these habits and developing new ones will be crucial this year. We will also continue to update the community as new information becomes available."

"ACWD has a comprehensive water conservation program with plenty of incentives, tools and technical information to help our customers save water," noted ACWD Water Conservation Supervisor Stephanie Nevins. "If customers have been thinking about

taking advantage of the rebates and incentives ACWD offers, now is the time," Nevins went on to say.

ACWD officials encourage customers to conserve water in the following ways:

- Find and fix leaks. Leaky faucets, showers, toilets and irrigation systems can waste a lot of water.
- Significantly reduce, or if possible, eliminate landscape water use during these shorter days and cooler nights.
- Cover exposed soil with mulch.
- Operate clothes washers and dishwashers with full loads only.
- Take shorter showers.
- Turn off the tap when brushing teeth or shaving.
- Use a broom instead of a hose to clean driveways and walkways.
- Get your car washed at a commercial car wash that recycles water.
- Install high-efficiency clothes washers.
- Replace older, high water use fixtures and devices with water efficient models (toilets, showerheads, faucet aerators).
- Reduce lawn areas and choose native and drought tolerant plants for your landscapes.

For additional information on ACWD's water conservation programs, including rebates on turf replacement and high efficiency clothes washers, please visit the ACWD website at www.acwd.org.

# # #

For 100 years, the Alameda County Water District has supplied water to the residents and businesses of southern Alameda County. ACWD supplies drinking water to the more than 336,000 people living in the cities of Fremont, Newark, and Union City. For more information, please visit www.acwd.org.

Contra Costa Water District

Contra Costa Water District. March 19, 2014. Resolution No. 14-06 – A Resolution of the Board of Directors of Contra Costa Water District Establishing a 15% Voluntary Drought Management Program Necessary to Sufficiently Conserve Available Water Supply.

_____. March 19, 2014. Agenda Docket Form, Subject: 15% Voluntary Drought Management Program.

_____. 2014. CCWD Asks Customers to Voluntarily Cut Water Use by 15 Percent.

CERTIFIED A TRUE COPY OF THE ORIGINAL

Wendy E. Chriss
for Mary A. Neher, District Secretary
Contra Costa Water District

RESOLUTION NO. 14-06

A RESOLUTION OF THE BOARD OF DIRECTORS OF CONTRA COSTA WATER DISTRICT ESTABLISHING A 15% VOLUNTARY DROUGHT MANAGEMENT PROGRAM NECESSARY TO SUFFICIENTLY CONSERVE AVAILABLE WATER SUPPLY

WHEREAS, on January 17, 2014 Governor Jerry Brown declared that a state of emergency exists within the State of California due to drought conditions and called on all water districts to implement their water shortage contingency plans; and

WHEREAS, the United States Bureau of Reclamation (Reclamation) announced its initial 2014 water year allocations for the Central Valley Project and has forecast that the water supply available to Contra Costa Water District (CCWD/District) to be no more than 50% of its historical allocation under a median forecast; and

WHEREAS, drought conditions contribute to further uncertainty regarding regulatory conditions in the Sacramento-San Joaquin Delta that affect the amount and quality of water that can be legally moved from Reclamation's reservoirs to pumping plants in the Delta, including the District's; and

WHEREAS, although estimated water deliveries by Reclamation will be adequate to meet conservation minded, reasonable indoor and business water needs, outdoor water uses will require supplies from the Los Vaqueros Reservoir and other sources; and

WHEREAS, the District continues to enforce an Excess Use Charge, focusing on discretionary outdoor water use; nevertheless, additional conservation and waste prevention measures are necessary to further manage demands within the District to ensure sufficient water is available to meet reasonable domestic, municipal and industrial water needs of the District's customers in 2014; and

WHEREAS, the District focus is on further reducing outdoor water use to save water in the Los Vaqueros Reservoir for next year.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the CCWD that the Board hereby finds and determines that:

1. Based upon the facts recited above, and upon the authority contained in Water Code §350 et seq., §375 et seq., §31021 et seq., §31024 et seq., and §31026 et seq., drought conditions exist that can affect water supply and quality available to the District; and

2. Conservation and measures to prevent waste and unreasonable use are necessary to manage demands so that reasonable water needs of District customers can be met in 2014; and

3. Customers are hereby requested to voluntarily reduce their water use by 15% and to be conservation minded in their everyday use of water, with water use during the period of 2005 – 2007 used as the baseline for reduction; and

4. Customers are hereby requested to voluntarily reduce their outdoor landscape irrigation water use by 25% to assist in meeting the overall 15% water use reduction goal; and

5. The good drought watering practices, attached hereto as Exhibit A and incorporated herein as if fully set forth, are necessary to conserve water, promote effective water supply planning, assure reasonable and beneficial use of water, prevent waste and unreasonable use of water, and prevent unreasonable methods of use of water within the District; and said good watering practices are necessary to assure that sufficient supplies of water will be available to meet the needs of, and to protect the health and safety of, the District's customers and other members of the public.

* * * * * * * * * *

The foregoing Resolution was duly and regularly adopted at a meeting held on the 19th of March 2014 by the Board of Directors of the Contra Costa Water District by the following vote of the Board:

AYES: Boatmun, Burgh, Borba, Campbell, Wandry

NOES:

ABSTAIN:

ABSENT:

Joseph L. Campbell, President

ATTEST:

Mary A. Neher
District Secretary

GOOD DROUGHT WATERING PRACTICES

The following uses of water supplied by the District have been determined to be wasteful and are prohibited at any time when a 15% Voluntary Drought Management Program is in effect:

Single Family and Multi-Family Residential Customers

a. Using District-furnished water for non-recirculating decorative fountains or filling decorative lakes or ponds.
b. Washing paved or other hard-surfaced areas, including sidewalks, walkways, driveways, patios, and parking areas with District-furnished water.
c. Outside watering with District-furnished water that results in excessive flooding or runoff into a gutter, drain, patio, driveway, walkway or street.
d. Outside watering of landscaping during the daylight hours of 9AM-5PM.
e. Washing a vehicle, trailer or boat with District-furnished water using a hose without a shut off nozzle.

Non-residential Customers

a. Using District-furnished water for non-recirculating decorative fountains or for filling decorative lakes or ponds.
b. Washing paved or other hard-surfaced areas, including sidewalks, walkways, driveways, patios, and parking areas with District-furnished water.
c. Outside watering with District-furnished water that results in excessive flooding or runoff into a gutter, drain, patio, driveway, walkway or street.
d. Outside watering of landscaping during the daylight hours of 9AM-5PM.
e. Recycled water use for dust control, where available.

CONTRA COSTA WATER DISTRICT

Agenda Item No. **5.**
Meeting Date: March 19, 2014
Resolution: (X) Yes ( ) No

AGENDA DOCKET FORM

SUBJECT: 15% VOLUNTARY DROUGHT MANAGEMENT PROGRAM

SUMMARY: The Governor of California declared a statewide drought emergency on January 17, 2014 and called upon local urban water suppliers and municipalities to implement their local water shortage contingency plans consistent with their urban water management plans. The District's Urban Water Management Plan (UWMP) provides guidelines for ensuring adequate water supplies are available to reliably meet water demands during both normal and dry year conditions.

In accordance with the UWMP, the District is proposing to address the current drought conditions by implementing a 15% Voluntary Drought Management Program (Program) that would focus on reducing outdoor water use. Customer compliance with the Program would be voluntary, although the District will continue the application of its existing excess use charge to discourage the wasteful use of water. To assist customers in achieving the 15% reduction goal, the District will increase outreach, education, and conservation services. Resolution No. 14-06 (Attachment 1) would authorize the Program with an effective date of April 1, 2014. In support of the increased conservation services, an enhancement to the lawn-to-garden rebate program is being proposed and would become effective immediately upon adoption.

(Continued on page 2)

FISCAL IMPACT: The adopted FY14 budget provides sufficient funding to initiate the 15% Voluntary Drought Management Program. The District has grant funding available through Proposition 84 to partially offset the cost of the conservation incentives, including the proposed changes to the lawn-to-garden rebate program. Sufficient funding to implement the proposed changes exists within the Finance Department's FY14 budget. The FY15 budget request, scheduled for Board review in May 2014, will reflect the anticipated impacts of the Program on water revenues and operations.

RECOMMENDED ACTIONS: a) Adopt Resolution No. 14-06 establishing a 15% Voluntary Drought Management Program necessary to sufficiently conserve available water supply; and b) Approve an increase in the lawn-to-garden rebate from $0.50 to $1.00 per square foot, and an underwriting incentive for initial design consultation not to exceed $150.00 per lawn-to-garden rebate participant.

Desiree Castello Director of Finance	Brice J. Bledsoe Assistant General Manager	Jerry Brown General Manager

JB/DC:dmg

Attachments: 1) Resolution No. 14-06; 2) Draft Report of the Public Information and Conservation Committee Meeting – February 13, 2014

AGENDA DOCKET FORM

SUMMARY: *(continued from page 1)*

A number of parameters were considered in developing and proposing the Program including: the investments made to expand the Los Vaqueros (LV) Reservoir; projected water quality conditions at the District's intakes; the initial Central Valley Project (CVP) water supply allocation announced by the Bureau of Reclamation in February 2014, which is the District's primary source of water; and the need to ensure sufficient carryover storage in LV Reservoir should the drought continue into 2015. These parameters were discussed with the Board of Directors on March 5, 2014.

The District's CVP supplies are projected to meet conservation-minded indoor and business/industrial demands. Outdoor demands will be met through a combination of LV Reservoir storage, groundwater supply, and available water transfers. By targeting reductions in discretionary outdoor water use, the District can manage overall water demands in order to preserve storage in LV Reservoir in the event of a continuing drought, without impacting the economy in the service area. The District will increase customer outreach and public education with messages highlighting the many resources available to help customers save both water and money.

Baseline for Measuring 15% Conservation Goal

Customers who meet their water use reduction goals will realize savings on their water bill. Program compliance is voluntary and customers have the option to determine how best to implement reductions. Residential customers can measure progress toward the 15% goal by comparing current usage to the historical (baseline) consumption reflected on the back of each water bill, which changes through the year for seasonal variation. This baseline reflects average water use for each residence during 2005-2007. This time period is consistent with the amounts used during the 2009 Drought Program and has been chosen so that those who have begun conserving will not be penalized. The District recognizes that since the Water Conservation Program was initiated in the late 1980's, water use in the service area has decreased by 20% despite a 40% increase in population. In addition, to provide equity to customers with changed conditions (such as an increase in the number of residents) the District has established an exceptions process to modify baseline consumption.

Excess Use Charge

The District established an excess use charge in 2009 to encourage conservation of discretionary outdoor water use and the charge remains in place today. No changes to the excess use charge are being proposed at this time as compliance with the recommended program would be voluntary. In addition, District customers are familiar with the current provisions and any such changes would require initiation of a Proposition 218 notification process.

The District's residential, irrigation, and agricultural customers with a baseline usage below 1,000 gallons per day (gpd) pay an excess use charge if use exceeds 1,000 gpd. For customers with baseline usage above 1,000 gpd, the threshold is the historical use. Usage above the not-to-exceed threshold incurs an excess usage charge of two times the quantity charge. This is meant to penalize wasteful, outdoor water use.

Conservation Incentives

The District's Water Use Efficiency Program offers a range of conservation services to assist District customers in meeting the 15% conservation goal. Examples include free conservation site surveys, rebates for water-efficient fixtures and landscape conversions, coupons for mulch for use in landscaping and for local car washes using recycled water. The District also provides numerous outreach programs, workshops, and educational materials.

Compared to last year, customer requests to date for conservation surveys, rebates, information, and equipment (such as low-flow showerheads) have increased. Over the past three years, the lawn-to-garden rebate has been successful in saving outdoor water use and maximizing water savings during the summer and fall periods. This provides additional water reliability benefits and offsets the need to draw down the LV Reservoir. Customer surveys suggest that participation would be improved with an increased rebate in comparison to the cost of lawn-to-garden conversion. Customers have also voiced concern with landscape design and choosing appropriate plants.

To address these participation barriers, the District is proposing two changes to give customers an outdoor water savings option during this drought. The first is to increase the rebate from $0.50 to $1.00 per square foot (sq. ft.). A comparison to other water agency programs found that most rebates range from $1.00 to $2.00 per sq. ft., with a few as high as $3.00 per sq. ft. Modifying the rebate will increase the cost of the program by $100,000 (assuming 200,000 sq. ft. of lawn is replaced). The second proposed change is to underwrite a portion of the cost of an initial design consultation. The District would underwrite up to $150 in design consultation costs per participant. This incentive has been successful for other agencies and has resulted in both increased participation and higher quality garden designs. Designers would be screened by the District to meet minimum business and experience standards. These enhancements were reviewed by the Public Information and Conservation Committee on February 13, 2014 (Attachment 2).

Good Drought Program Watering Practices

The Program includes good watering practices to supplement the District's current prohibitions against the wasteful use of water. The watering practices included in Exhibit A to the attached Resolution are necessary to conserve water and prevent waste and unreasonable use of water. These prohibitions will remain in place while the Program is in effect.

DRAFT REPORT OF THE PUBLIC INFORMATION AND CONSERVATION COMMITTEE MEETING
February 13, 2014

(Excerpt)

Meeting Attendance:

Directors: Vice President Karl Wandry and Director John Burgh, Chair

Staff: Jerry Brown, Michele Bautista, Brice Bledsoe, Desiree Castello, Chris Dundon, Oliver Symonds, and Jennifer Allen

FY13 Water Use Efficiency Program Update

The Public Information and Conservation (PIC) Committee received a report on the District's Water Use Efficiency Program (Program) and the results achieved during Fiscal Year 2013 (FY13). The Program is an integral component of the District's long-term water supply plan and offers a range of conservation services to customers including free conservation site-surveys, rebates for water-efficient fixtures and landscape conversions, and a number of educational and outreach programs and materials. Demand for several of the conservation services was down in FY13, including multi-family, commercial, and large landscape surveys and high-efficiency toilet rebates. Demand for single family surveys and washers remained fairly level. The District has recently seen an increase in requests for conservation surveys, rebates, information, and equipment (such as low-flow showerheads) in response to Governor Jerry Brown's January 2014 declaration of a state-wide drought emergency. Preparations are underway to ensure customer needs continue to be met as demands for incentives increase. The Board of Directors will be updated on any further modifications to the Program when the Drought Management Program is considered in March 2014.

The Program has evolved over the years to increase water savings, improve cost-effectiveness, and adapt to changing conditions. After 20 years, the District will conclude its High-Efficiency Toilet (HET) Rebate Program at the end of this year. Key reasons include: 1) AB 715, which took effect in January 2014 and requires that only HETs be sold in the state, and 2) the District's estimate that 70% of toilets in the service area already meet this requirement. The District plans to shift the cost reduction from ending the toilet program to increase investment in the Lawn-to-Garden Rebate Program. This program has been successful in maximizing water savings during the summer and fall periods, offsetting the need to draw down Los Vaqueros Reservoir. Participation has been lower than anticipated and staff proposes to address barriers by increasing the rebate from $0.50 to $1.00 per square foot (sq. ft.) and underwriting some of the cost of an initial design consultation. Other agencies have found these actions have resulted in both increased participation and higher quality garden designs. Ending the HET Program will save approximately $250,000 per year (assuming 2,000 HETs at $125). Increasing the Lawn-to-

Garden rebate level from $0.50 to $1.00 per sq. ft. will increase the cost of the program by $100,000 (assuming 200,000 sq. ft. of lawn is replaced).

In response a question from Director Burgh, staff confirmed that the lawn-to-garden rebates are available to the District's wholesale and retail customers. Vice President Wandry asked whether the rebates were available for replacing backyard lawns. Staff explained that the program focuses on the front lawn as it generally receives lower use by customers and the District benefits from neighbors viewing the new gardens and witnessing the benefits of the program.

Staff is also monitoring the California Urban Water Conservation Council's possible revision to the Best Management Practice for conservation water rates. Depending on the outcome of the revision process, future policy issues may be brought to the Board.

DC:dmg

Optional Insurance For Residential Water Service Now Available
CCWD Lifeline Rate Information
Easy Pay, It Really Is Easy
Pay Your CCWD Bill By Credit Card
Sign Up For Paperless Billing
Guide to Navigating Paperless Billing Signup
CCWD Has Many Options For Paying Your Bill
Protect Your Water Pipes When it Gets Cold
Starting New Water Service With CCWD
Learn How To Read Your Water Meter
Read Your Meter, & We'll Do The Math!
Call Before You Dig
Meter Reading
Backflow Prevention Program
Opening Your Account
For Your Protection
Historical Water Use
A Leak in the Street
Water Rates
Billing Procedures
Closing Your Account
Access to Meter
Project Update
Re-establishing Credit

Customer Service

How Can We Serve You?

CCWD Asks Customers To Voluntarily Cut Water Use By 15 Percent

Most customers can save by reducing watering in their yards

The Contra Costa Water District's Voluntary Drought Program for 2014 is asking customers to reduce their overall water use by 15 percent from their historical use.

The program was approved by the CCWD Board of Directors on March 19 and will be in effect on April 1. Most customers can meet the voluntary goal by cutting back on how much watering you do in your yard.

Historical use for your property can be found on the back of your water bill, You can also contact Customer Service at (925) 688-8044 or send us an e-mail.

- ***The historical use is an average of 2005–2007 water use at your residence.***
- ***If the circumstances at your household have changed, such as additional people living in the house, please fill out this exception form. (Note, if you previously submitted a form, you don't need to send another one.)***

Recent conservation efforts are appreciated and are not counted against customers.

California is facing a significant water crisis after several consecutive dry years. In January, Gov. Jerry Brown formally declared a statewide drought emergency. The severity of the water shortage stems from the small amount of precipitation and snow pack received this winter.

Calculate How Much Water You Can Use in Gallons Per Day (GPD) Under the 15%Voluntary Drought Management Program

Historical Use (GPD)

(historical use is on the back of your bill)

Calculate Target Use

Your Target Use:

Have questions?
Here is our list of FAQ's

Flushing Program Reduced to Save Water & Protect Water Quality

The District is not increasing water rates as a component of this drought program. **Customers who meet the voluntary conservation goals under the Drought Program will save money on their water bills by using less water.**

The goal of this Program is to reduce consumption to conserve available water supplies and save water in theLos Vaqueros Reservoir .

The Drought Program focuses on reducing outside water use, while minimizing impacts to jobs and the local economy. The District discourages the following wasteful watering practices.

More tips and advice are available from our Conservation Program.

Tips for Saving Water Right Now

QUICK FIX

Something you can do right now

Reduce Landscape Watering Schedule

The typical home sprinkler system delivers at 10 gallons every minute. If your schedule is set to water for 10 minutes, that means 100 gallons of water are used. And that is just for one sprinkler station. Try reducing your schedule by one watering day for significant savings.

SMART PURCHASE

An affordable way to save more, get a rebate!

Buy High-Efficiency Toilets

Toilets installed prior to 1994 use 3.5 to 5 gallons per flush. Modern toilets with a WaterSense label use only 1.28 gallons per flush. Through the end of the year, CCWD provides $125 rebates to eligible customers for the purchase of high-efficiency toilets. Look here for eligibility

GREAT INVESTMENT

A big idea for long-term savings, earn up to $1,000 in rebates

Lose the Lawn and Get a Garden

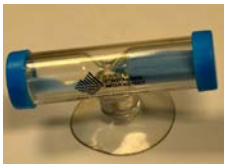
Lawns are the biggest water user at most homes. A typical front lawn (750 sq. ft.) will use more than 28,000 gallons in a year. Replace your existing lawn with water-wise landscaping and reduce its water use by half. CCWD provides up to

SAVE UP TO 400 GALLONS PER WEEK!	information. **SAVE UP TO 5,500 GALLONS PER YEAR!**	$1,000 in rebates to replace a water-thirsty lawn with a water-wise garden. Look here for program information, or call (925) 688-8320. **SAVE UP TO 14,000 GALLONS PER YEAR!**

Helpful Links

CCWD's Conservation Section has all kinds of resources, tips & rebates

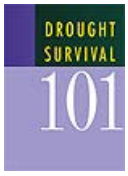
The Association of California Water Agencies and the California Department of Water Resources have joined forces to produce this useful website.



Free Water Saving Devices from CCWD, including our four-minute shower timer.

10 Easy Ways to Save Water Indoors

10 Easy Ways to Save Water Outdoors



Drought Survival 101 Trees

Drought Survival 101 Lawn

Drought Survival 101 Mulch

Learn How To Read Your Water Meter With This Video, And We'll Calculate Your Gallons Per Day.

Irrigate Like the Pros: See How To Schedule Your Home Watering

Need To Stay Up to Date on the Drought?

Subscribe to our Water Conservation Newsletter

Can't Wait? Follow us on Twitter

Your City May Have its own Water Management Program. Look below to see more information:

City of Calistoga

City of Calistoga. February 4, 2014. Resolution 2014 – 013 – Resolution of the City Council of the City of Calistoga, County of Napa, State of California, Declaring a Stage II Water Emergency.

_____. May 20, 2014. Resolution 2014 – 034, Resolution of the City Council of the City of Calistoga, County of Napa, State of California, Amending Resolution No. 2014-013 to Change the Stage II Water Emergency Best Management Practices.

RESOLUTION 2014 - 013

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CALISTOGA, COUNTY OF NAPA, STATE OF CALIFORNIA, DECLARING A STAGE II WATER EMERGENCY

WHEREAS, the City of Calistoga obtains its drinking water from the State Water Project (SWP) and its Kimball Reservoir Water Treatment Facility; and

WHEREAS, for the current rain season, the City of Calistoga and most regions of California have experienced unusually low precipitation levels in December 2013 and January 2014; and

WHEREAS, Since October, 2013 the Kimball Reservoir Water Treatment Plant has been off-line and producing no potable water for the City of Calistoga; and

WHEREAS, for the current year, the State Department of Water Resources has projected an initial SWP allocation of five percent; and

WHEREAS, as of January 31, 2014 the City of Calistoga's Kimball Reservoir held 5 acre feet of water, well below typical levels for January; and

WHEREAS, the North Bay Aqueduct is currently the City's only potable water supply; and

WHEREAS, on September 3, 2013, the City adopted Resolution No. 2013-082 declaring a Stage I Water Emergency and implementing voluntary restrictions on water use with a conservation goal of ten percent; and

WHEREAS, On January 17, 2014 the Governor declared a State of Emergency in California due to the current drought conditions and called for statewide voluntary twenty percent conservation of water and requested that local agencies implement water shortage contingency plans; and

WHEREAS, on February 4, 2014 the City Council received the report from the Public Works Director that the Stage I voluntary conservation measures have failed to achieve the desired water conservation goal of ten percent reduction in water use.

NOW, THEREFORE BE IT RESOLVED that the City Council of the City of Calistoga finds that the Stage I program did not achieve the desired water use reduction.

BE IT FURTHER RESOLVED that the City Council of the City of Calistoga finds that a Stage II Water Emergency for the City of Calistoga exists and mandatory water conservation measures are needed to achieve a desired water conservation goal of twenty percent under last year's water usage.

BE IT FURTHER RESOLVED, that the City Council of the City of Calistoga approves the Best Management Practices (BMPs) for water conservation as shown on Exhibit A attached hereto, and declares that any violation of the BMPs is subject to a notice of violation or other form of citation, and economic penalties as authorized by Section 13.04.350 of the Calistoga Municipal Code.

BE IT FURTHER RESOLVED, that the City Manager is authorized and directed to take the necessary action to implement and beginning March 1, 2014 enforce the Stage II mandatory water conservation efforts to achieve the desired goal of a twenty percent reduction in water use as compared to the previous year's water use, and beginning March 1, 2014 impose economic penalties as specified in Exhibit B attached hereto.

PASSED, APPROVED, AND ADOPTED by the City Council of the City of Calistoga at a regular meeting held this **4th day of February, 2014**, by the following vote:

AYES:	**Vice Mayor Dunsford, Councilmembers Barnes, Lopez-Ortega and Kraus and Mayor Canning**
NOES:	**None**
ABSTAIN:	**None**
ABSENT:	**None**

CHRIS CANNING, Mayor

ATTEST:

Kathy Flamson

KATHY FLAMSON, Deputy City Clerk

Exhibit A

City of Calistoga, 2014 Best Management Practices ("BMP") for Water Conservation

All Water Customers:

1. Outdoor irrigation with potable water only during the early morning hours to reduce evaporation loss with an odd/even address watering schedule (odd addresses water Tuesday and Thursday and even water Monday and Wednesday). No outdoor irrigation on Friday, Saturday or Sunday with potable water.
2. No initial filling or draining of swimming pools with potable water. Pools can be topped off to prevent damage to pumps and equipment.
3. No washing sidewalks, buildings, driveways, patios, or other paved areas with potable water
4. No noncommercial washing of privately owned motor vehicles, trailers and boats except from a bucket and hose equipped with an automatic shut-off nozzle
5. Prohibiting any use of water from a fire hydrant, except for fighting fires and line flushing required by regulatory agencies.
6. No use of potable water for dust control or compaction at construction sites
7. Inspect all irrigation systems, repair leaks, and adjust spray heads to provide optimum coverage and eliminate avoidable over-spray.
8. Run full loads through dishwasher
9. Wash full loads of laundry

Restaurants

1. Tap water provided to customers only upon request
2. Scrape all dishes prior to rinsing
3. Run full loads through dishwasher
4. Wash full loads of linens

Hotels and Spas

1. Bed linens and towels changed only upon guest request
2. Wash full loads of linens/laundry
3. Inspect all irrigation systems, repair leaks, and adjust spray heads to provide optimum coverage and eliminate avoidable over-spray
4. No washing sidewalks, driveways, patios, or other paved areas with potable water
5. Prohibit any use of water from a fire hydrant, except for fighting fires and line flushing required by regulatory agencies
6. No initial filling or draining of swimming pools using potable water. Pools can be topped off to prevent damage to pumps and equipment.
7. No noncommercial washing of privately owned motor vehicles, trailers and boats except from a bucket and hose equipped with an automatic shut-off nozzle
8. Outdoor irrigation with potable water only during the early morning hours to reduce evaporation loss with an odd/even address watering schedule (odd addresses water Tuesday and Thursday and even water Monday and

Exhibit A (continued)

Wednesday). No outdoor irrigation on Friday, Saturday or Sunday with potable water.

Violation of a BMP is subject to issuance of a notice of violation or other citation and subject to monetary penalties. Violations are cumulative unless there are no violations during the subsequent billing cycle.

Exhibit B

City of Calistoga, Monetary Penalties for Violation of Water Conservation Best Management Practices ("BMP")

A violation occurs if a BMP is observed to be violated and documented by City staff. The first violation would result in a written warning being issued to the person in responsible care of the water account. Subsequent BMP violations would result in the issuance of a notice of violation or citation and result in a "Tiered Surcharge multiplier" being accessed to any water use above Tier 1 usage on the subsequent water bill for multiple tiered water users, or the Tier 1 water use for single tiered water users. Violations are cumulative unless there are no violations during the subsequent billing cycle.

Violation	Surcharge Multiplier
First	0 – written warning issued
Second	1.20
Third	1.35
Fourth	1.50
Fifth	Suspension of water service for seven days, surcharge multiplier of 2.0, payment of all delinquent charges, and a restart charge of $150

RESOLUTION 2014 -034

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CALISTOGA, COUNTY OF NAPA, STATE OF CALIFORNIA, AMENDING RESOLUTION NO. 2014-013 TO CHANGE THE STAGE II WATER EMERGENCY BEST MANAGEMENT PRACTICES

WHEREAS, on February 4, 2014 the City Council adopted Resolution No. 2014-013 which declared that a Stage II Water Emergency for the City of Calistoga exists and mandatory water conservation measures are needed to achieve a desired water conservation goal of twenty percent under last year's water usage; and

WHEREAS, this resolution approved Best Management Practices (BMPs) for water conservation to reach the desired 20% reduction in water use; and

WHEREAS, since March 1, 2014 these BMP's have been used by many water users; and

WHEREAS, it has been determined that there is need to revise the BMP's based upon the recommendation by water users; and

WHEREAS, at the City Council meeting of May 20, 2014 the recommendation to change the outdoor irrigation days was considered and public input was received; and

WHEREAS, it is in the public interest and general welfare to amend the BMP's contained in Resolution No. 2014-013 to achieve water conservation objectives in a manner that is beneficial to all users.

NOW, THEREFORE BE IT RESOLVED that the City Council of the City of Calistoga amends City Council Resolution No. 2014-013, Exhibit A City of Calistoga, 2014 Best Management Practices (BMP's) for Water Conservation to read as set forth in Exhibit A attached hereto.

NOW, BE IT FURTHER RESOLVED that the other provisions of City Council Resolution No. 2014-013 are not changed by this resolution and shall remain in effect.

PASSED, APPROVED, AND ADOPTED by the City Council of the City of Calistoga at a regular meeting held this 20th day of May, 2014, by the following vote:

AYES:	**Councilmember Kraus, Vice Mayor Dunsford, Councilmembers Lopez-Ortega and Barnes and Mayor Canning**
NOES:	**None**
ABSTAIN:	**None**
ABSENT:	**None**

CHRIS CANNING, Mayor

ATTEST:

Kathy Flamson, Deputy City Clerk

Exhibit A

City of Calistoga, 2014 Best Management Practices ("BMP") for Water Conservation

All Water Customers:

1. **Outdoor irrigation with potable water only during the early morning hours to reduce evaporation loss with an odd/even address watering schedule (odd addresses water Tuesday and Friday and even water Monday and Thursday). No outdoor irrigation on Saturday or Sunday with potable water.**
2. No initial filling or draining of swimming pools with potable water. Pools can be topped off to prevent damage to pumps and equipment.
3. No washing sidewalks, buildings, driveways, patios, or other paved areas with potable water
4. No noncommercial washing of privately owned motor vehicles, trailers and boats except from a bucket and hose equipped with an automatic shut-off nozzle
5. Prohibiting any use of water from a fire hydrant, except for fighting fires and line flushing required by regulatory agencies.
6. No use of potable water for dust control or compaction at construction sites
7. Inspect all irrigation systems, repair leaks, and adjust spray heads to provide optimum coverage and eliminate avoidable over-spray.
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1. Bed linens and towels changed only upon guest request
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7. No noncommercial washing of privately owned motor vehicles, trailers and boats except from a bucket and hose equipped with an automatic shut-off nozzle

Violation of a BMP is subject to issuance of a notice of violation or other citation and subject to monetary penalties. Violations are cumulative unless there are no violations during the subsequent billing cycle.

City of Napa

City of Napa City Council. May 20, 2014. DRAFT – Regular Meeting Minutes for the City Council of the City of Napa.

_____. May 20, 2014. Agenda Report Re: Report on Water Supplies and Conservation Efforts.

_____. May 20, 2014. 2014 California Drought, City of Napa: Report on Water Supplies Conservation Efforts Presentation.

DRAFT

REGULAR MEETING MINUTES
FOR THE CITY COUNCIL OF THE CITY OF NAPA

MAY 20, 2014

3:30 PM Afternoon Session
6:30 PM Evening Session

City Hall Council Chambers
955 School Street

1. CALL TO ORDER: 3:30 PM

1.A Roll Call

PRESENT: Mott, Pedroza, Sedgley, Inman, Techel
ABSENT: None

2. AGENDA REVIEW AND SUPPLEMENTAL REPORTS:

Deputy City Clerk Lisa Blackmon reported the supplemental items were PowerPoint presentations by staff for items 6A, 6B, and 6C.

3. SPECIAL PRESENTATIONS:

3.A Proclamation "Affordable Housing Month"

City Council read the Proclamation designating May 2014 "Affordable Housing Month".

3.B Proclamation "National Public Works Week"

City Council read the Proclamation designating May 18 - 24, 2014 as "National Public Works Week".

4. PUBLIC COMMENT: None

5. CONSENT CALENDAR:

Moved, seconded (Mott / Pedroza) to approve the Consent Calendar as presented with the exception of Item 5F which was pulled for discussion.

Motion carried:

AYES: Mott, Pedroza, Sedgley, Inman, Techel
NOES: None
ABSENT: None

5.A Approval of the City Council Meeting Minutes

Approved the May 6, 2014 Regular City Council Meeting Minutes.

5.B Modify the City Council Calendar to set a July 11, 2014 Regular City Council Meeting

Adopted Resolution R2014-82 setting a Regular City Council meeting to Friday July 11, 2014 at 3:30 P.M.

5.C Approve the Memorandum of Understanding between the City of Napa and the Management Unit of the Napa Police Department.

Approved the Memorandum of Understanding between the City of Napa and the Management Unit of the Napa Police Department (MUNPD) for the term January 1, 2014 through December 31, 2015, and authorize the Assistant City Manager to sign the MOU on behalf of the City.

5.D Closeout of Napa Valley Corporate Park Reassessment District No. 1997-1.

Adopted Resolution R2014-83 declaring the Napa Valley Corporate Park Reassessment District No. 1997-1 Redemption Fund as surplus, ordering the disposition of surplus amounts, and approving the District Closeout Analysis and Findings Report.

5.E Appropriation of Transportation Fund for Clean Air (TFCA) Funds for Electric Vehicle Charging Stations

Adopted Resolution R2014-84 authorizing the City Manager to execute an agreement with Napa County Transportation and Planning Agency (NCTPA) for a grant of $12,144 in TFCA funds for the purchase and installation of three electric vehicle charging stations, and determine that the project is not subject to CEQA.

5.F Guideline Changes to the First Time Homebuyer Down Payment Assistance Program

Pulled by Councilmember Pedroza for discussion.

Andrea Clark, Affordable Housing Representative, provided an overview of the First Time Homebuyer Down Payment Assistance Program and the proposed changes.

Moved, seconded (Pedroza / Inman) to adopt Resolution R2014-85 authorizing guideline changes to the First Time Homebuyer Down Payment Assistance Program and determine the recommended action is not subject to CEQA.

Motion carried:

AYES: Mott, Pedroza, Sedgley, Inman, Techel
NOES: None
ABSENT: None

5.G Professional Services Agreement to prepare an Environmental Impact Report (EIR).

Adopted Resolution R2014-86 approving a Professional Services Agreement between the City and First Carbon Solutions to complete preparation of the Solano Square at Justin-Siena EIR in an amount not to exceed $251,000 to complete preparation of an Environmental Impact Report ("EIR"), and authorizing the City Manager to execute the Agreement on behalf of the City, and determine the recommended action is not subject to CEQA as it results in no physical changes to the environment.

6. ADMINISTRATIVE REPORTS:

6.A Fiscal Year 2013-14 Third Quarter Report

Finance Director Roberta Raper provided detailed information on the Third Quarter Financial Report; City Manager Mike Parness provided a status report on project tracking, capital projects, and the customer relationship management web-based application.

Moved, seconded (Inman / Sedgley) to adopt Resolution R2014-87 approving and adopting amendments to the Budget for the 2013-14 Fiscal Year.

Motion carried:

AYES: Mott, Pedroza, Sedgley, Inman, Techel
NOES: None
ABSENT: None

6.B Stormwater Program Update

City Council received an update on the recent and planned National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System year 1 and 2 permit requirements.

Gerardo Mendez, Engineering Assistant and Jamison Crosby, Program Manager for the Napa Countywide Stormwater Pollution Prevention Program provided information on the program, permitting requirements, an overview of accomplishments for year one and plans and goals for year two.

6.C Report on Water Supplies and Conservation Efforts

Water General Manager Joy Eldridge provided an overview of the Governor's drought declarations, the City of Napa's current water supply status, the supply position for 2014 and 2015 and ongoing conservation efforts.

Moved, seconded (Pedroza / Inman) to receive a report on Water Supplies and Conservation Efforts in light of the 2014 drought declaration for the State of California and determine that the action is not subject to CEQA.

Motion carried:

AYES: Mott, Pedroza, Sedgley, Inman, Techel
NOES: None
ABSENT: None

6.D Response to 2013-14 Grand Jury Report item "VINE Management and Ridership"

City Manager Parness briefed the Council on the City's response.

Moved, seconded (Sedgley / Mott) to approve the City response to the 2013-14 Grand Jury report's Recommendation 8 regarding VINE Management and Ridership.

Motion carried:

AYES: Mott, Pedroza, Sedgley, Inman, Techel
NOES: None
ABSENT: None

7. CONSENT HEARINGS:

Mayor Techel announced the Consent Hearing items and called for public comment. There being none, the hearings were open and closed without comment.

Moved, seconded (Inman / Pedroza) to approve the Consent Hearings calendar as presented.

Motion carried:

AYES: Mott, Pedroza, Sedgley, Inman, Techel
NOES: None
ABSENT: None

7.A Citywide Landscape Maintenance Assessment District, FY 2014-2015

Adopted Resolution R2014-88 approving Engineer's Report and ordering annual levy of assessment for the Citywide Landscape Maintenance District, FY 2014-2015, and determine that these actions are exempt from CEQA pursuant to CEQA Guidelines Section 15301(h).

7.B Napa Valley Corporate Park Landscape and Lighting Assessment District, Fiscal Year 2014-2015

Adopted Resolution R2014-89 approving Engineer's Report and ordering annual levy of assessment for the Napa Valley Corporate Park Landscape and Lighting District, Fiscal Year 2014-2015, and determine that these actions are exempt from CEQA pursuant to CEQA Guidelines Section 15301(h).

8. COMMENTS BY COUNCIL OR CITY MANAGER: None.

CITY COUNCIL RECESS 5:33 P.M. to 6:30 P.M.

CITY COUNCIL MEETING: EVENING SESSION 6:30 P.M.

9. CALL TO ORDER:

9.A Roll Call

PRESENT: Mott, Pedroza, Sedgley, Inman, Techel
ABSENT: None

10. PLEDGE OF ALLEGIANCE:

11. AGENDA REVIEW AND SUPPLEMENTAL REPORTS:
The City Clerk announced that Item 16 A included a PowerPoint presentation.

12. SPECIAL PRESENTATIONS:

12. A Proclamation "Mental Health Awareness Month"

Mayor Techel and City Councilmembers read the Proclamation designating May 2014 as "Mental Health Awareness Month"; the

Proclamation was accepted by staff members from the Napa County Mental Health Services Division.

13. PUBLIC COMMENT:

Dorothy Glaros requested that the City provide some pavement and signage improvements to her property.

There were no other public comments.

14. ADMINISTRATIVE REPORTS:

14.A Potential Napa River Dredging Special Financing District Formation

Julie Lucido, Senior Civil Engineer, explained staff is seeking direction on whether to pursue public outreach efforts for a possible future formation of a Community Facilities District to fund maintenance dredging of the Napa River.

Mayor Techel called for public comment.

Bernhardt Krevet, stated the Friends of the Napa River are in support of the formation of the District.

Steve Vartan, an Officer of the Napa Valley Yacht Club, stated the Club supports the formation of the District.

John Salmon, member of the Napa Valley Yacht Club, reiterated the Yacht Club's support and suggested city staff ask the Corps of Engineers to consider releasing its jurisdiction from the Kennedy Park ramp in order to form more district funding in the future.

Discussion ensued. Rick Thomasser, representing the Napa County Flood District provided information regarding the boundaries of the river, maintaining the shoal areas, and funding dredge maintenance. Councilmember Mott stated he would like more information with respect to the 2/3 voting requirement and the nexus between the registered voters and the business owners. General Council discussion ensued.

It was the consensus of the City Council to direct staff to move forward with public outreach efforts concerning the possible future formation of a Community Facilities District to fund dredging of the Napa River.

15. CONSENT HEARINGS:

15.A Annexation of 2063, 2065, 2075, 2083 and 2091 West Pueblo Avenue.

Mayor Techel announced the Consent Hearing items and called for public comment; one individual indicated a wish to speak. Mayor Techel stated the item would then be pulled from Consent and be considered as a full Public Hearing. Staff came forward for a report.

Ken MacNab, Planning Manager, stated the item is a routine application for five properties on West Pueblo and would be considered an “island” annexation. He stated it was staff understanding that all owners of the five properties did not object to the annexation.

Mayor Techel called for public testimony.

Robert Lockhart, property owner at 2065 West Pueblos stated he recently purchased the property and voiced his opposition to the annexation. Discussion ensued.

Councilmember Sedgley noted that the agenda and resolution had two different addresses listed for one property. It was noted for the record that the correct address was 2091 West Pueblo. General discussion regarding county “pockets” ensued.

Randy Gularte, Realtor, explained he was the listed applicant for the annexation, on behalf of Raymond Canepa, who has requested annexation of lots on 2075 and 2083 West Pueblo. He reviewed his outreach efforts to the residents. He stated Dave Tiesso at 2063 responded he did not support annexation, and Mr. Lockhart had just purchased the property and had not been informed of the annexation application. He explained at the time he had made the application, it was a “neutral” issue.

Mayor Techel asked Mr. Gularte to verify that both 2065 and 2063 were opposed; Mr. Gularte responded affirmatively.

Dave Tiesso, property owner at 2063 West Pueblo verified he was opposed to the annexation.

Lengthy discussion ensued regarding the impacts of annexation, the reasons why Local Agency Formation Commissions (LAFCO) encourages eliminating island annexation, the fact that two properties were opposed, and possible resolutions to the concerns by the two property owners opposed to the annexation.

Mr. Gularte stated he would like to relay the residents' concerns to the developer of the property to attempt to resolve concerns.

Mayor Techel suggested delaying the process; Mr. MacNab stated there will be time between action today and the LAFCO proceedings. Councilmember Mott noted the area is in the General Plan and is developable land to provide more housing stock. Discussion ensued.

Moved, seconded (Sedgley / Mott) to adopt a resolution requesting that the Local Agency Formation Commission (LAFCO) initiate proceedings for the annexation of the five properties at 2063, 2065, 2075, 2083 and 2095 West Pueblo Avenue and a determination that any environmental impacts were adequately examined by the Environmental Impact Report (EIR) adopted for Envision Napa 2020.

Motion carried:

AYES: Mott, Pedroza, Sedgley, Inman
NOES: Techel
ABSENT: None

16. PUBLIC HEARINGS/APPEALS:

16.A Zoning Regulation Amendment for winery- and hotel-uses in Napa Valley Corporate Park and repeal of the Napa Valley Corporate Park Specific Plan

Councilmember Mott recused from the vote as he owns property within 500 feet of the subject property. Councilmember Mott left the meeting.

Mike Allen, Planner, provided a report regarding the Zoning Amendment and the repeal of the Napa Corporate Park Specific Plan.

Shawna Shaffner, representing Napa Valley Commons Owners Association stated she was available to answer questions and introduced Mr. Ned Pike, one of the owners, who was also present.

Lengthy discussion ensued including the water issue, wine production zoning use, whether there would be retail in the corporate park, the design of the buildings, and wine production in the industrial park.

Moved, seconded (Sedgley / Inman) to (1) adopt a resolution approving a Negative Declaration for the Napa Valley Commons Zoning Amendment; (2) adopt a resolution repealing the Napa Valley Corporate Park Specific Plan; and (3) approve first reading and introduction of an ordinance amending Section 17.14.020 of the Industrial Park Zoning District pertaining to winery- and hotel-related uses.

AYES:	Pedroza, Sedgley, Inman, Techel
NOES:	None
ABSTAIN:	None
RECUSED:	Mott

17. COMMENTS BY COUNCIL OR CITY MANAGER:

Councilmember Sedgley announced that longtime Napa resident Joseph Imboden recently passed away.

The meeting was adjourned in memory of Joseph Imboden.

18. ADJOURNMENT: 8:30 P.M.

18. The Mayor announced the next regularly scheduled meeting of the City of Napa City Council would be June 3, 2014.

Dorothy Roberts, City Clerk

CITY OF NAPA CITY COUNCIL
AGENDA REPORT

ADMIN CALENDAR
AGENDA ITEM 6.C.
Date: May 20, 2014

To: Honorable Mayor and Members of City Council

From: Jacques R. LaRochelle, Public Works Director

Prepared by: Joy Eldredge, Water General Manager

Subject: Report on Water Supplies and Conservation Efforts

ISSUE STATEMENT:

Receive a report on Water Supplies and Conservation Efforts in light of the 2014 drought declaration for the State of California and determine that the action is not subject to CEQA.

DISCUSSION:

The City of Napa Public Works Water Division operates and maintains the water supply, treatment, transmission and distribution system that serves over 85,000 customers within the City of Napa and surrounding areas. The water supplies consist of two local surface water reservoirs Lake Hennessey (31,000 acre-feet (A-Ft)) and Milliken Reservoir (1,390 A-Ft) as well as entitlements from the State Water Project (SWP) (21,900 A-Ft.)

In a typical year, the total customer demands are 15,400 A-Ft with variability due to annual climactic differences. The Governor's drought declaration called for voluntary conservation of 20% and called on water suppliers and municipalities to implement their local water shortage contingency plans. The water supply status of municipal, industrial and agricultural entities varies widely across the state. At this time, the City of Napa Water Supplies are in a better position than most entities largely due to prudent water supply planning and effective long-term water conservation programs. Lake Hennessey is at 80% of full capacity holding 24,000 A-Ft while Milliken Reservoir is at 100% of capacity holding 1,390 A-Ft of water.

The SWP allocation is announced throughout the rainy season. Supplies vary each year taking in to consideration the status of existing reservoir capacities throughout the state and the available snowpack in the Sierras which serves as a substantial natural reservoir. The current allocation of the SWP gives 5% of allocations to be made available after September 1, 2014. For the City of Napa that results in 1,095 A-Ft available later this year. Fortunately the City also has 11,300 A-Ft of carryover water from recent years that is available.

Details regarding our water supply status are defined in staff's update to Council on February 4, 2014 (See Attachment 1.) Due to significant investments made over the last eight years our supplies have become more reliable, especially in a drought year.

Since the last update provided to Council in February 2014 there has been a lot of uncertainty as to the availability of carryover water in 2014. There were concerns that the Barker Slough Pump Station (BSPP), our SWP intake, would be subject to pumping curtailment i.e. the pumps would be turned off completely. In addition there were concerns that the salinity gradient in the delta would creep far enough north to compromise the water quality at BSPP making the water unpalatable for a period of time starting in the summer months.

In preparation for this scenario, staff had been working closely with Solano County Water Agency over the past two months to come to terms on an alternate source of supply that would not be subject to these pumping restrictions and could be used during this extreme year. Although subject to approvals and agreements with the United States Bureau of Reclamation, the State Water Resources Control Board, and the State Department of Water Resources, it was deemed feasible that this water stored in Lake Berryessa could have been diverted from the Putah South Canal, tied into the North Bay Aqueduct (NBA) and pumped to the NBA terminal tanks where it could be treated at the Barwick Jamieson Treatment Plant. Staff has since deemed these agreements unnecessary this year but considers the efforts valuable to facilitate regional coordination and increase reliability in the event of a natural or unforeseen disaster.

The City of Napa has sufficient supplies to withstand the 2014 drought. Staff implemented a focused outreach campaign in February through April to avoid an uptick in demand as seen in the two previous major droughts in 1976-77 and 1987-1992 and customers have responded. Demands reduced in late February after the initial rains hit however when the weather warmed in late March and flora started blooming during the longer days, it became obvious that customers were foregoing the temptation to resume typical irrigation patterns. This is a result of educated customers who are aware of wise water use and reduced their seasonal consumption due to uncertainty surrounding the drought.

Now it is certain that the City's water supplies are sufficient to maintain normal demands through 2014 and we will be in a solid position at the start of 2015. However, staff will continue with its conservation and outreach programs encouraging customers to continue wise use of our valuable resource.

A multi-faceted approach has been and will continue be used to disseminate this information. Information will be:
posted on the City's website www.cityofnapa.org/water
mailed directly via a newsletter to all customers in May,
published in the City Update in the Register on May 6th,
displayed at community events such as the Home & Garden Show, Farmer's Market, etc.

FINANCIAL IMPACTS:

Although the last four months have exhibited volatile swings from high to low demands typical for the time of year, there are no financial impacts to the Water Enterprise Fund through the third quarter this fiscal year. During the upcoming summer months when demands are typically the highest, revenue may be less than expected if customers respond fervently to the statewide drought messaging. Additionally if there is no rainfall contributing to reservoir recharge through late spring 2015, it is anticipated that the next stage of drought planning may be necessary and that may negatively impact revenues.

CEQA:

The Public Works Director has determined that the Recommended Action described in this Agenda Report is not subject to CEQA, pursuant to CEQA Guidelines Section 15060(c).

DOCUMENTS ATTACHED:

Attachment 1: February 4, 2014 Council Report on Water Supplies and Conservation Efforts.

NOTIFICATION:

None.

RECOMMENDED ACTION:

Staff recommends that the City Council move, second and approve each of the actions set forth below, in the form of the following motion. Move to:

> Accept the Report on Water Supplies and Conservation Efforts in light of the 2014 drought declaration for the State of California.

CITY OF NAPA CITY COUNCIL
AGENDA REPORT

ADMIN CALENDAR
AGENDA ITEM 11.A.
Date: February 04, 2014

To: Honorable Mayor and Members of City Council

From: Jacques R. LaRochelle, Public Works Director

Prepared by: Joy Eldredge, Water General Manager

Subject: Report on Water Supplies and Conservation Efforts

ISSUE STATEMENT:

Accept the Report on Water Supplies and Conservation Efforts in light of Governor Jerry Brown's January 17, 2014 drought declaration for the State of California.

DISCUSSION:

The City of Napa Public Works Water Division operates and maintains the water supply, treatment, transmission and distribution system that serves over 85,000 customers within the City of Napa and surrounding areas. The water supplies consist of two local surface water reservoirs Lake Hennessey (31,000 acre-feet (A-Ft)) and Milliken Reservoir (1,390 A-Ft) as well as entitlements from the State Water Project (SWP) (21,900 A-Ft.)

In a typical year, the total customer demands are 15,400 A-Ft with variability due to annual climactic differences. The Governor's drought declaration called for voluntary conservation of 20% and called on water suppliers and municipalities to implement their local water shortage contingency plans. The water supply status of municipal, industrial and agricultural entities varies widely across the state. At this time, the City of Napa Water Supplies are in a better position than most entities largely due to prudent water supply planning and effective long-term water conservation programs. Lake Hennessey is at 71% of full capacity holding 22,000 A-Ft while Milliken Reservoir is at 62% of capacity holding 800 A-Ft of water.

The SWP allocation is announced throughout the rainy season. Supplies vary each year taking in to consideration the status of existing reservoir capacities throughout the state and the available snowpack in the Sierras which serves as a substantial natural reservoir. The current allocation of the SWP gives 5% of allocations. For the City of Napa that results in 1,095 A-Ft available this year.

Fortunately, our supplies have become more reliable due to actions taken over the last eight years including:

2006 - purchased 1,000 A-Ft of water supply entitlements from the City of St Helena,

2009 - purchased 1,100 A-Ft of water supply entitlements from the Town of Yountville,
2010 - accelerated SWP entitlements from 16,100 A-Ft to 21,900 A-Ft,
2011- completed upgrades of the Barwick Jamieson Treatment Plant.

These investments are instrumental in preparing the City of Napa to withstand a drought. The increases to the entitlements have resulted in the availability of carryover water in 2012 and 2013 such that 11,300 A-Ft is available to bolster the 1,095 A-Ft currently allocated this year.

The 2007 Water Bonds were used to invest in water quality upgrades and increase treatment capacity from 12 to 20 million gallons per day (MGD) thereby gaining the capability to take beneficial use of the increased SWP allocations.

These water supply investments are paying off, however the other main factor for our solid water supply situation this year is attributed to our effective conservation programs. For more than a decade the City of Napa has been educating it's customers and providing incentives to implement water-use efficiency programs for both indoor and outdoor uses. Our commitment to conservation was memorialized with the 2002 Memorandum of Understanding when we joined the California Urban Water Conservation Council (CUWCC) and has us tracking Best Management Practices and documenting our progress to meet the statewide conservation mandate established by SBx7-7 calling for 20% reduction of consumption measured in gallons per capita per day (GPCPD) by the year 2020. Key programs include but are not limited to:

high-efficiency toilet rebates,
water-efficient washing machine rebates,
cash for grass/turf buyback program,
sprinkler times - the free irrigation app,
Waterwise Workshop series including Water-wise Gardening,
Landscaper Training, and
Water Education for Teachers (WET) Program

These programs have proven effective in maintaining system peak demands thereby avoiding the need for the next increment of storage or increase in pipe sizes, and allowing the capital investments to be used for renewal and replacement of existing aging infrastructure. In fact, a comparison of year 2002 to 2012 which had similar weather patterns, shows an increase in population of 6,000 persons over the nine-year period, while customer demands dropped by 1,800 A-Ft.

At this time, the City of Napa has sufficient supplies to withstand a drought that is equivalent to the 1976-77 drought and the 1987-1992 drought. However, both of those drought periods resulted in increases of customer demands in the first year by 2,000 and 1,500 A-Ft respectively due to the lack of rain and increased irrigation during the winter. Therefore, a focused outreach campaign will include educational information regarding the reduced need for irrigation during the winter due to the dormancy of plants and grasses while the daylight hours are shorter than in summer. Customers will be asked to continue with wise and efficient use of their water as a way of life and be aware to not use more water than they used in recent years. The City's water supplies are sufficient to maintain normal demands through 2014 and 2015.

A multi-faceted approach will be used to disseminate this information. Information will be:
posted on the City's website www.cityofnapa.org/water
mailed directly via a one-page newsletter to all customers in early February,
published in the City Update in the Register on February 4th ,
presented by guest speakers to leadership groups and civic organizations
advertised on the local radio station KVON,
participate in the morning radio show on KVON February 3rd.

The Water Division is deferring the fulll hydrant flushing program that would have flushed one-third of the system this year. The annual flushing is important to maintaining water quality so it is likely flushing in select areas will be necessary to maintain compliance. All efforts will be made to minimixe the amout of water used during these efforts.

FINANCIAL IMPACTS:

There are no anticipated financial impacts to the Water Enterprise Fund this fiscal year. However, if there is no rainfall contributing to reservoir recharge throughout 2014 and through February 2015, it is anticipated that the next Stage of drought planning would be necessary. As called for in the next stage of drought response interruptible agricultural accounts would need to be cut off as well as hydrant meters serving locations outside City limits. Implementing these limitations and calling for additional conservation would reduce revenues in that fiscal year by 10 - 20% or an estimated $2.5 million (M) - $5M.

CEQA:

The Public Works Director has determined that the Recommended Action described in this Agenda Report is not subject to CEQA, pursuant to CEQA Guidelines Section 15060(c).

DOCUMENTS ATTACHED:

None

NOTIFICATION:

None

RECOMMENDED ACTION:

No formal action necessary.

> Accept the Report on Water Supplies and Conservation Efforts in light of Governor Jerry Brown's January 17, 2014 drought declaration for the State of California.

"You don't know the value of water until the well runs dry"

- Ben Franklin

2014 California Drought

City of Napa: Report on Water Supplies and Conservation Efforts

City of Napa Report on Water Supplies and Conservation Efforts

May 20, 2014

Governor's Drought Declarations

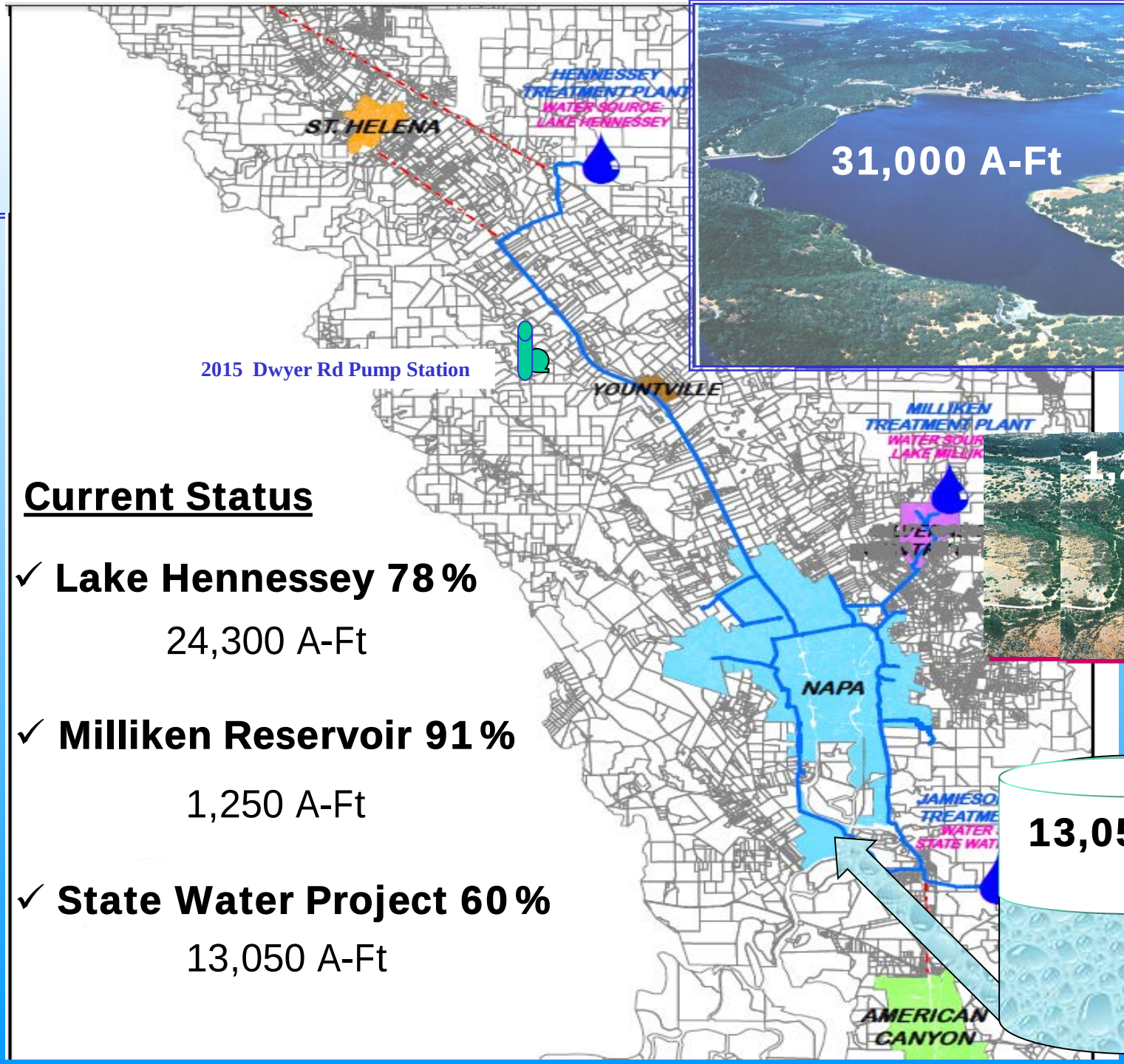
Jan 2014

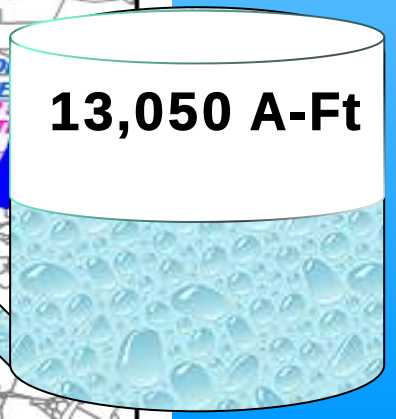
- **Voluntary reduction of consumption by 20 %**
- **Implement local water shortage contingency plans**

May 2014

- **Expedite voluntary water transfers and exchanges**
- **Avoid waste**

  i.e. Wash cars at facilities that recycle the water





Current Status

- ✓ **Lake Hennessey 78 %**

  24,300 A-Ft

- ✓ **Milliken Reservoir 91 %**

  1,250 A-Ft

- ✓ **State Water Project 60 %**

  13,050 A-Ft

City of Napa Report on Water Supplies and Conservation Efforts

May 20, 2014

Water Supply Status

Annual Demand ~ 15,400 A-Ft per year

2014 Supply

State Water Project	**11,300 A-Ft**	**Carryover**
	650 A-Ft	**Article 21**
	1,100 A-Ft	**5% Allocation**
	13,050 A-Ft	**Total**

City of Napa Report on Water Supplies and Conservation Efforts

May 20, 2014

Water Supply Status

Annual Demand ~ 15,400 A-Ft per year

2014 Supply Plan

✓ **State Water Project**	**10,600 A-Ft carryover**
✓ **Local Reservoirs**	**4,800 A-Ft**
	15,400 A-Ft

2015 Supply Position

✓ **State Water Project**	**2,450 A-Ft**	**carryover**
	1,100 A-Ft +/-	**5% +/-**
	3,800 A-Ft	**Advanced Table A**
✓ **Local Reservoirs**	**20,850 A-Ft +**	**66% +**
	28,200 A-Ft +	

City of Napa Report on Water Supplies and Conservation Efforts

May 20, 2014

Interruptible Ag and Hydrant Meters

No Interruptions

Ag customers – 22 accounts 165 A-Ft $350k/yr

Hydrant meters– 45 accounts 47 A-Ft $190k/yr

City of Napa Report on Water Supplies and Conservation Efforts

May 20, 2014

Activity Since January Update

- River Outflows
  - ✓ salinity gradient at Barker Slough
  - ✓ summer diversion restrictions
- Solano Intertie
- 5% Allocation available Sept 1

City of Napa Report on Water Supplies and Conservation Efforts

May 20, 2014

Heightened Conservation: Spring/Summer 2014

Community Events

- Earth Day
- COPE Kids' Day
- Bay-Friendly Garden Tour
- Lose Your Lawn Workshop
- Home & Garden Show
- Watershed Open House
- Farmers Market
- Town & Country Fair

Presentations

- Rotary Clubs
- Realtor Groups
- SIR Luncheons
- HOAs, etc.

Advertising

- "Californians Don't Waste"
  - Posters, Local Magazine Ads

- Local Radio Ads re: irrigation

Mailer

Restaurant Cards

Water Waste Response

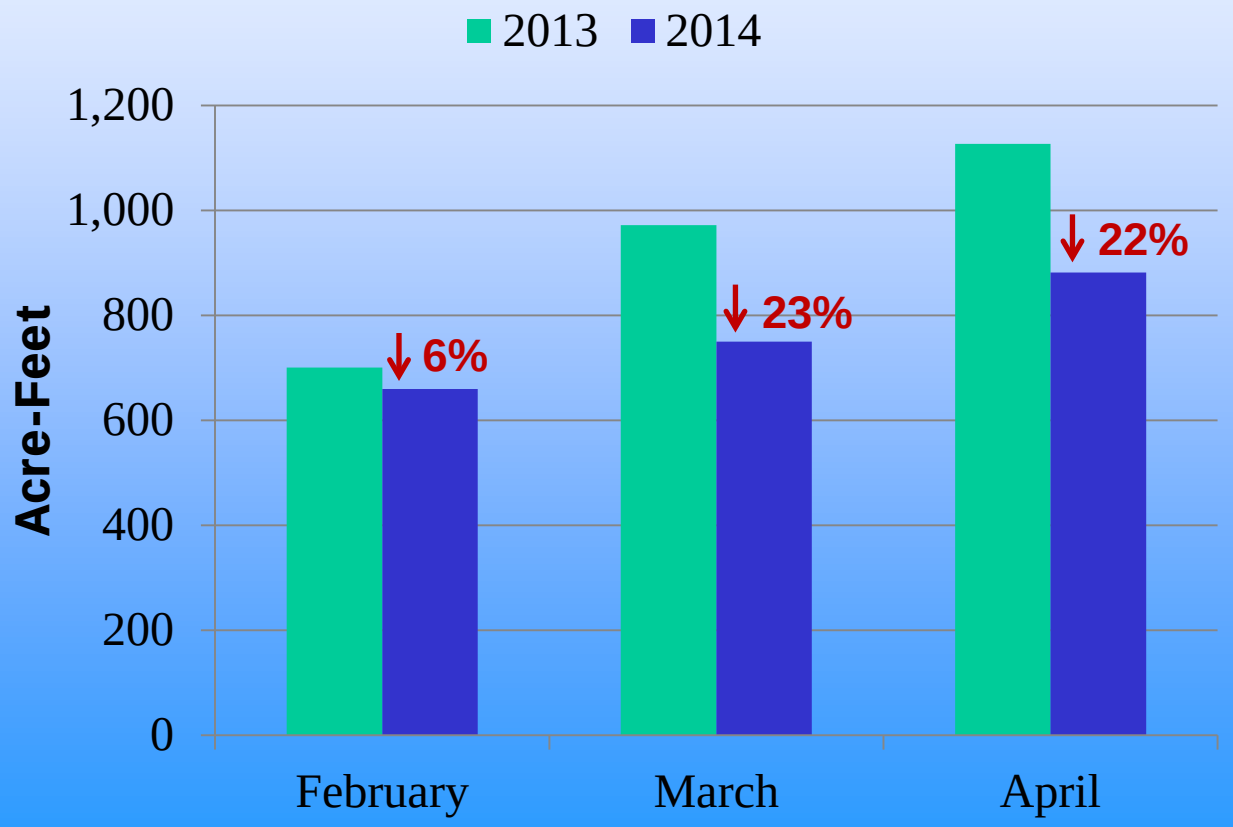
Regular Programs

www.cityofnapa.org/water

City of Napa Report on Water Supplies and Conservation Efforts

May 20, 2014

City of Napa Water Use vs. 2013
[since Governor's Drought Declaration]



May (to date)
↓ 25%

City of Napa Report on Water Supplies and Conservation Efforts

May 20, 2014

Drought Restrictions

- Mandatory, Temporary (e.g., outdoor watering ban)
- Typical water demand may return after restrictions lifted

vs.

Long-Term Water Conservation

- Primarily incentive-based (e.g., Toilet Rebates)
- Permanent demand reductions
- Helps stretch supplies, enter drought in better position
- Uptick in program participation during drought

City of Napa Report on Water Supplies and Conservation Efforts

May 20, 2014

City of Napa Water Supply

We have enough to use and not enough to waste.

Determines our starting position for 2015.

City of Napa Report on Water Supplies and Conservation Efforts

May 20, 2014

Questions?

Free water conserving devices and information available at:

Water Administration Building

1340 Clay Street

www.CityofNapa.org/Water

Dublin San Ramon Services District

Dublin San Ramon Services District. May 5, 2014. Resolution No. 26-14 – Resolution of the Board of Directors of Dublin San Ramon Services District to Update and Declare a Continuing Community Drought Emergency, and Rescind Resolution 10-14.

_____. May 5, 2014. Resolution No. 27-14 – Resolution of the Board of Directors of Dublin San Ramon Services District Declaring a Stage 3 Water Supply Shortage Under Chapter 4.10 of the District Code, Clarifying Resolution No. 11-13 and Rescinding Resolution No. 18-13.

_____. May 5, 2014. Ordinance No. 333 – An Urgency Ordinance of Dublin San Ramon Services District Adopting Water Use Limitations during the Community Drought Emergency.

_____. May 5, 2014. Ordinance No. 334 – An Urgency Ordinance of Dublin San Ramon Services District Adopting Penalties and Provisions for the Enforcement of Water Use Limitations during the Community Drought Emergency.

RESOLUTION NO. 26-14

RESOLUTION OF THE BOARD OF DIRECTORS OF DUBLIN SAN RAMON SERVICES DISTRICT TO UPDATE AND DECLARE A CONTINUING COMMUNITY DROUGHT EMERGENCY, AND RESCIND RESOLUTION NO. 10-14

WHEREAS, the State of California has and continues to experience record dry conditions, with 2013 being the driest year on record; and

WHEREAS, January 2014, normally a very wet month, was critically dry and is now the driest January on record; and

WHEREAS, meteorological and hydrological conditions improved somewhat since early February 2014, but 2014 remains a critically dry year as classified by the State of California; and

WHEREAS, on January 17, 2014 California Governor Edmund G. Brown issued a Proclamation of a State of Emergency, and encouraged all Californians to reduce their water usage by 20%; and

WHEREAS, the Zone 7 Water Agency issued a Proclamation of a Local Drought Emergency on January 29, 2014 and authorized their General Manager to "establish appropriate levels of conservation consistent with the California State of Drought Emergency and local conditions;" and

WHEREAS, in conformance with the January 29, 2014 proclamation by the Zone 7 Water Agency the General Manager established a system-wide conservation goal of 20% for 2014 as compared to 2013 usage, which was based on demand reductions of 5% for indoor water use and 40% for outdoor water use; and

WHEREAS, on January 31, 2014 the Department of Water Resources reduced from 5% to 0% the anticipated allocation of water to customers of the State Water Project, including the Zone 7 Water Agency; and

WHEREAS, on February 18, 2014 the District declared a State of Community Drought Emergency and established a goal of curtailing overall District water usage by twenty percent

(20%) base on five percent (5%) curtailment of inside water use and forty percent (40%) curtailment of outside water use as compared to the same period in 2013; and

WHEREAS, on February 24, 2014 the City of Livermore declared a Water Shortage Emergency; and

WHEREAS, on March 18, 2014 the City of Dublin declared a Local Drought Emergency; and

WHEREAS, on March 18, 2014 the City of Pleasanton approved an urgency ordinance amending their water conservation plan as needed to protect the immediate threat of the potentially significant drought to preserve public health and safety; and

WHEREAS, on April 9, 2014 the California Department of Water Resources announced that as of that time 2014 water allocations to the State Water Contractors (including Zone 7) will remain at or near 0%; and

WHEREAS, on April 16, 2014 the Zone 7 Water Agency directed the local water supply retailers and untreated water customers to assure a 25% total reduction for 2014 with 5% coming from indoor curtailment and 50-60% from outdoor curtailment, and adopting mandatory conservation measures to achieve these reductions; and

WHEREAS, on April 18, 2014 the California Department of Water Resources announced that anticipated 2014 water allocations to the State Water Contractors (including Zone 7) will be increased to 5% but only on condition that delivery of water occur after September 1, 2014; and

WHEREAS, on April 25, 2014 Governor Edmund G. Brown proclaimed a Continued State of Emergency in the State of California and ordered that California residents should refrain from wasting water, specifying many practices that waste water and directing urban water suppliers to implement drought response plans to limit outdoor irrigation and other wasteful water practices; and

WHEREAS, through April 30, 2014, water use curtailment in the District has been 5.7% for the calendar year as a whole and 16.7% since the February 18, 2014 declaration of a

Community Drought Emergency thus not achieved the needed level of curtailment to date as compared to the same periods in 2013; and

WHEREAS, the California Emergency Services Act and the California Water Code empowers local agencies to declare a state of emergency, which allows the agency to expend funds and promulgate orders and regulations necessary to provide for the protection of life and property, and to invoke exceptions allowed by law to normal contracting, purchasing, and California Environmental Quality Act (CEQA) requirements so that the Agency can more quickly take action and respond to rapidly changing conditions.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF DUBLIN SAN RAMON SERVICES DISTRICT, a public agency located in the Counties of Alameda and Contra Costa, California, that:

1. Resolution No. 10-14 is hereby rescinded and replaced it in its entirety with this Resolution.
2. A State of Emergency has existed since February 18, 2014 and continues to prevail in the community served by the District by reason of the fact that the ordinary demands and requirements of the water consumers in the District's service area cannot be met and satisfied by the water supplies now available to the District without depleting the water supply to the extent that there would be insufficient water for human consumption, sanitation, and/or fire protection as a result of the ongoing drought and the resulting reductions to and restrictions on the available water supply.
3. For the remainder of calendar year 2014, the General Manager is authorized and directed to take all appropriate steps and actions as may be within the General Manager's authority and/or as approved by the Board to curtail system wide water usage in the District by twenty five percent (25%) overall with five percent (5%) coming from indoor curtailment and fifty to sixty percent (50-60%) from outdoor curtailment as compared to the same period in calendar year 2013.

4. The General Manager is authorized and directed to initiate appropriate operational actions including but not limited to the temporary curtailment or cessation of service to individual customers and/or areas of the District as may be appropriate to ensure the continued integrity of the community water supply system for health and safety purposes and, in such circumstances, to timely notify the Board of such actions taken.
5. As it relates to contracting and purchasing actions associated with the District's response to the need for curtailing water usage under this Declaration of a Community Emergency, the General Manager is hereby authorized to make decisions about invoking exceptions to normal contracting and purchasing requirements as allowed by California law.
6. As it relates to California Environmental Quality Act (CEQA) actions associated with the District's response to the need for curtailing water usage under this Declaration of a Community Emergency, the General Manager is hereby authorized to make decisions regarding invoking exemptions to CEQA as allowed by California law.
7. As it relates to obtaining staffing resources to accomplish actions associated with the District's response to the need for curtailing water usage under this Declaration of a Community Emergency, the Board affirms the existing language included in Personnel Rule 2.03 that allows the General Manager in an emergency to make appointments without the requirement for first establishing an eligibility list.
8. In order to satisfy the requirements of the California Emergency Services Act which contemplates ongoing review of the need for continuing the local emergency, so that the declared emergency shall not remain in effect when conditions no longer warrant, the General Manager shall inform the Board, at its first meeting of each calendar month that this declaration remains in effect, of (a) developments regarding the water supply available to Zone 7 and the District, (b) the water demand in the District's service area and in the Tri-Valley, (c) operational issues encountered or anticipated to be encountered

related to the effect of the limited water supply on the District's water system (d) pertinent policy level decisions made at the local, regional and State level related to the drought and (e) other information relevant to the continuing need for the State of Community Drought Emergency.

9. The State of Emergency shall exist until either: (a) the Board takes action to rescind this Declaration of Continuing State of Community Drought Emergency, or (b) December 31, 2014, whichever occurs first.

10. The General Manager is authorized and directed to undertake actions related to the District's response to this drought in accordance with the authority and approval of this resolution.

ADOPTED by the Board of Directors of Dublin San Ramon Services District, a public agency in the State of California, counties of Alameda and Contra Costa, at its special meeting held on the 5th day of May 2014, and passed by the following vote:

AYES: 5 - Directors Richard M. Halket, Dawn L. Benson, D.L. (Pat) Howard, Edward R. Duarte, Georgean M. Vonheeder-Leopold

NOES: 0

ABSENT: 0

Georgean M. Vonheeder-Leopold

Georgean M. Vonheeder-Leopold, President

ATTEST: Nancy G. Hatfield

Nancy G. Hatfield, District Secretary

CERTIFIED AS A TRUE AND CORRECT COPY OF THE ORIGINAL ON FILE IN THE OFFICE OF DUBLIN SAN RAMON SERVICES DISTRICT
Secretary Nancy G. Hatfield

MAY 05 2014

H:\Board\2014\05-05-14Spc\2 - Emergency Declaration\Updated Declaration of a Community Drought Emergency RESO - Final.docx

RESOLUTION NO. 27-14

RESOLUTION OF THE BOARD OF DIRECTORS OF DUBLIN SAN RAMON SERVICES DISTRICT DECLARING A STAGE 3 WATER SUPPLY SHORTAGE UNDER CHAPTER 4.10 OF THE DISTRICT CODE, CLARIFYING RESOLUTION NO. 11-13 AND RESCINDING RESOLUTION NO. 18-13

WHEREAS, on February 21, 2012, the District adopted Ordinance No. 329 to incorporate into the District Ordinance Code, provisions from its Water Shortage Contingency and Drought Plan, Ordinance No. 323, and Emergency Response Plan, each of which was included in the approved 2010 Urban Water Management Plan; and

WHEREAS, the State of California has and continues to experience record dry conditions, with 2013 being the driest year on record; and

WHEREAS, January 2014, normally a very wet month, was critically dry and is now the driest January on record; and

WHEREAS, meteorological and hydrological conditions improved somewhat since early February 2014 but 2014 remains a critically dry year as classified by the State of California; and

WHEREAS, on January 17, 2014 California Governor Edmund G. Brown issued a Proclamation of a State of Emergency, and encouraged all Californians to reduce their water usage by 20%; and

WHEREAS, the Zone 7 Water Agency issued a Proclamation of a Local Drought Emergency on January 29, 2014 and authorized their General Manager to "establish appropriate levels of conservation consistent with the California State of Drought Emergency and local conditions;" and

WHEREAS, in conformance with the January 29, 2014 proclamation by the Zone 7 Water Agency the General Manager established a system-wide conservation goal of 20% for

2014 as compared to 2013 usage, which was based on demand reductions of 5% for indoor water use and 40% for outdoor water use; and

WHEREAS, on January 31, 2014 the Department of Water Resources reduced from 5% to 0% the anticipated allocation of water to customers of the State Water Project, including the Zone 7 Water Agency; and

WHEREAS, on March 18, 2014 the City of Dublin declared a Local Drought Emergency; and

WHEREAS, on March 18, 2014 the City of Pleasanton approved an urgency ordinance amending their water conservation plan as needed to protect the immediate threat of the potentially significant drought to preserve public health and safety; and

WHEREAS, on February 24, 2014 the City of Livermore declared a Water Shortage Emergency; and

WHEREAS, on April 16, 2014 the Zone 7 Water Agency directed the local water supply retailers and untreated water customers to assure a 25% total reduction in overall demand for 2014 with 5% coming from indoor curtailment and 50-60% from outdoor curtailment, and adopted mandatory conservation measures to achieve these reductions; and

WHEREAS, on April 18, 2014 the California Department of Water Resources announced that anticipated 2014 water allocations to the State Water Contractors (including Zone 7) will be increased to 5% but only on condition that delivery of water occur after September 1, 2014; and

WHEREAS, On April 25, 2014 Governor Edmund G. Brown proclaimed a Continued State of Emergency in the State of California and ordered that California residents should refrain from wasting water, specifying many practices that waste water and directing urban water

suppliers to implement drought response plans to limit outdoor irrigation and other wasteful water practices; and

WHEREAS, achieving that level of water use curtailment requires a multi-faceted approach of public outreach, use restrictions and prohibitions and economic incentives to curtail water use; and

WHEREAS, the District has previously adopted Resolution No. 11-13, Establishing Water Rates Under Chapter 4.40 of the District Code and Rescinding Resolution No. 32-09, which established Water Consumption Rates During a Water Shortage (Stages 1-4) in accordance with Dublin San Ramon Services District Code Section 4.40.020; and

WHEREAS, in accordance with the January 2013 Water Rate Study for Stage 3 Water Conservation Rates, the incremental revenues generated by this action are to be used to support anticipated additional expenses necessary for public information and water conservation efforts to achieve the needed water curtailment levels.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF DUBLIN SAN RAMON SERVICES DISTRICT, a public agency located in the counties of Alameda and Contra Costa, California as follows:

1. Effective immediately upon the adoption of this Resolution and to remain in effect until terminated by Resolution of the Board of Directors, a Stage 3 - Severe Reduction Water Shortage Condition, as codified as section 4.10.030.C.1.c. of the District Code (enacted by Ordinance 329, adopted February 21, 2012), now exists in the District's water service area.

2. The references in Resolution No. 11-13 to "Ordinance No. 323" and to a "resolution declaring the existence of any stage of a water shortage condition pursuant to Resolution

No. 20-09, Approving a Water Conservation Program in Accordance with Ordinance No. 323" have at all times since the adoption of Resolution No. 11-13 been intended to refer, and have referred, and do refer, to the provisions of section 4.10.030.C.1 of the District Code.

3. Stage 3 Water Consumption Rates During a Water Shortage, as adjusted in accordance with Board Resolution No. 11-13, and as authorized by Section 4.40.020 of the District Code (Provision of Potable Water Service), are activated by the preceding actions and accordingly are in effect upon adoption, but such rates shall not be operative until June 1, 2014, and such rates shall thereafter remain in effect until terminated by Resolution of the Board of Directors. For ease of reference, the Rates operative on June 1, 2014 are attached to this Resolution as Exhibit A.

4. The specific Water Use Limitations are set forth in Ordinance No. 333, an Urgency Ordinance of Dublin San Ramon Services District Adopting Water Use Prohibitions and Restrictions for the Duration of the 2014 Community Drought Emergency, enacted contemporaneously with this Resolution, as such Ordinance may be amended, revised, or superseded from time to time.

5. The progressive schedule of penalties or fines that may be levied by District for successive violations of these water use restrictions are set forth in Ordinance No. 334, an Urgency Ordinance of Dublin San Ramon Services District Adopting Procedures and Penalties for the Enforcement of Water Use Restrictions and Prohibitions for the 2014 Community Drought Emergency, enacted contemporaneously with this Resolution, as such Ordinance may be amended, revised, or superseded from time to time.

6. Resolution No. 18-13, which rescinded Resolution 34-09, which was the District's prior declaration of a Stage I - Minimal Reduction Water Shortage Condition, is rescinded effective immediately upon the adoption of this Resolution.

ADOPTED by the Board of Directors of Dublin San Ramon Services District, a public agency in the State of California, Counties of Alameda and Contra Costa, at its special meeting held on the 5th day of May 2014, by the following vote:

AYES: 5 - Directors Richard M. Halket, D.L. (Pat) Howard, Dawn L. Benson, Edward R. Duarte, Georgean M. Vonheeder-Leopold

NOES: 0

ABSENT: 0

Georgean M. Vonheeder-Leopold

Georgean M. Vonheeder-Leopold, President

ATTEST:

Nancy G. Hatfield

Nancy G. Hatfield, District Secretary

CERTIFIED AS A TRUE AND CORRECT COPY OF THE ORIGINAL ON FILE IN THE OFFICE OF DUBLIN SAN RAMON SERVICES DISTRICT
Secretary Nancy G. Hatfield

MAY 05 2014

EXHIBIT A

WATER CONSUMPTION RATES AND WATER SUPPLY SHORTAGE RATES TO BE EFFECTIVE JUNE 1, 2014

	Stage 3 (per ccf)
Associated Water Use Curtailment	35%
Residential Customers	
Tier 1 (0-10 ccf)	$0.897
Tier 2 (11-34 ccf)	$2.15
Tier 3 (over 34 ccf)	$4.02
Commercial Customers	
Winter (Nov-Apr) All ccf	$1.55
Summer (May-Oct) All ccf	$2.16
Potable Irrigation Customers	
All ccf	$4.02

All other rates remain unchanged

ORDINANCE NO. 333

AN URGENCY ORDINANCE OF DUBLIN SAN RAMON SERVICES DISTRICT ADOPTING WATER USE LIMITATIONS DURING THE COMMUNITY DROUGHT EMERGENCY

WHEREAS, the State of California has and continues to experience record dry conditions, with 2013 being the driest year on record; and

WHEREAS, January 2014, normally a very wet month, was critically dry and is now the driest January on record; and

WHEREAS, meteorological and hydrological conditions improved somewhat since early February 2014 but 2014 remains a critically dry year as classified by the State of California; and

WHEREAS, on January 17, 2014 California Governor Edmund G. Brown issued a Proclamation of a State of Emergency, and encouraged all Californians to reduce their water usage by 20%; and

WHEREAS, the Zone 7 Water Agency issued a Proclamation of a Local Drought Emergency on January 29, 2014 and authorized their General Manager to "establish appropriate levels of conservation consistent with the California State of Drought Emergency and local conditions"; and

WHEREAS, in conformance with the January 29, 2014 proclamation by the Zone 7 Water Agency the General Manager established a system-wide conservation goal of 20% for 2014 as compared to 2013 usage, which was based on demand reductions of 5% for indoor water use and 40% for outdoor water use; and

WHEREAS, on January 31, 2014 the Department of Water Resources reduced from 5% to 0% the anticipated allocation of water to customers of the State Water Project, including the Zone 7 Water Agency; and

WHEREAS, on February 18, 2014 the District declared a State of Community Drought Emergency and established a goal of curtailing overall District water usage by twenty percent (20%) base on five percent (5%) curtailment of inside water use and forty percent (40%) curtailment of outside water use as compared to the same period in 2013; and

WHEREAS, on March 18, 2014 the City of Dublin declared a Local Drought Emergency; and

WHEREAS, on March 18, 2014 the City of Pleasanton approved an urgency ordinance amending their water conservation plan as needed to protect the immediate threat of the potentially significant drought to preserve public health and safety; and

WHEREAS, on February 24, 2014 the City of Livermore declared a Water Shortage Emergency; and

WHEREAS, on April 16, 2014 the Zone 7 Water Agency directed the local water supply retailers and untreated water customers to assure a 25% total reduction for 2014 with 5% coming from indoor curtailment and 50-60% from outdoor curtailment directed that the local water supply retailers adopt various mandatory conservation measures to achieve these reductions; and

WHEREAS, on April 18, 2014 the California Department of Water Resources announced that anticipated 2014 water allocations to the State Water Contractors (including Zone 7) will be increased to 5% but only on condition that delivery of water occur after September 1, 2014; and

WHEREAS, On April 25, 2014 Governor Edmund G. Brown proclaimed a Continued State of Emergency in the State of California and ordered that California residents should refrain from wasting water, specifying many practices that waste water and directing urban water suppliers to implement drought response plans to limit outdoor irrigation and other wasteful water practices; and

WHEREAS, the Zone 7 Water Agency supplies all of the potable water currently available to the District for distribution and use by its customers; and

WHEREAS, Zone 7's primary sources of supplies include: imported water from the State Water Project (80%); local groundwater supplies originating from rainfall, and runoff, and recharge (20%); and

WHEREAS, on May 5, 2014 the District Board of Directors declared that a State of Emergency has existed since February 18, 2014 and continues to prevail in the community served by the District by reason of the fact that the ordinary demands and requirements of the water consumers in the District's service area cannot be met and satisfied by the water supplies now available to the District without depleting the water supply to the extent that there would be insufficient water for human consumption, sanitation, and/or fire protection as a result of the ongoing drought and the resulting reductions to and restrictions on the available water supply.

NOW, THEREFORE, BE IT ORDAINED by the Board of Directors of Dublin San Ramon Services District as follows:

SECTION 1. PURPOSE AND AUTHORITY. The purpose of this Ordinance is to conserve the water supply of the District for the greatest public benefit with particular regard to public health and safety, fire protection, and domestic (indoor) use; to conserve water by enacting Water Use Limitations that are intended to preserve the District's ability to meet human health and safety needs with its limited water supply; to conserve a sufficient amount of water so that the demand for water does not exceed the supply, which otherwise would force the imposition of additional and/or stricter drought stage declarations, restrictions, or prohibitions; and to the extent necessary, reduce water use fairly and equitably. This Ordinance is adopted pursuant to

the District's authority under Sections 350 et seq. and 71640 et seq. of the California Water Code, which derive in part from Section 2 of Article X of the California Constitution.

SECTION 2. EFFECT OF ORDINANCE.

(a) This Ordinance shall take effect immediately, shall supersede and control over any other ordinance or regulation of the District in conflict herewith, and shall remain in effect until the Community Drought Emergency has ended.

(b) The Water Use Limitations specified herein shall apply throughout the District's water service area.

SECTION 3. WATER USE LIMITATIONS.

(a) Prohibitions on Water Use. During the Community Drought Emergency, and to preserve the water supply for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection, the following uses of water are prohibited except to the extent allowed under Section 3 (d) "Exemptions" of this Ordinance:

(1) Any and all waste and/or unreasonable use of potable water as determined by the District.

(2) Any and all use of potable water in violation of DSRSD District Code Section 4.10.030 (G), including but not limited to:

(i) Waste through leakage of defective or inoperable plumbing, piping or other water-use equipment;

(ii) Gutter flooding;

(iii) Single pass cooling systems in new constructions;

(iv) Non-recirculating systems in a new conveyer car wash and commercial laundry systems;

(v) Non-recycling decorative water fountains;

(vi) The use of water suitable for potable domestic use for non-potable uses, including irrigation of cemeteries, golf courses, parks, highway landscaped areas, and industrial and irrigation uses, when suitable recycled water is available to an area, for which the District has recycled water purveyorship authority.

(3) Any and all use of potable water for outdoor lawn and landscaping watering and irrigation, except to the extent allowed by exemptions described herein (nursery stock and plants available for immediate sale at commercial establishments are not considered "landscaping").

(4) Any and all use of potable water for non-potable purposes, where and when the District is ready, willing and able to furnish recycled water from its recycled water distribution system, and recycled water is permitted to be applied to that use.

(5) Any and all use of potable water for soil compaction and dust control purposes.

(6) Cleaning, Washing, Maintenance:

(i) Any and all use of potable water for street sweeping, gutter flooding, sewer or storm drain cleaning and maintenance purposes or other similar uses;

(ii) Any and all use of potable water for hosing down or pressure washing driveways, sidewalks, walkways, patios, parking lots, tennis courts, or other impervious surfaces;

(iii) Any and all vehicle washing, including autos, trucks, boats, trailers, recreational vehicles, etc., except to those allowed by exemptions described herein;

(iv) Any and all use of potable water for cleaning the exteriors of buildings or homes.

(7) Swimming Pools, Spas, and Water Themed Play Areas:

(i) Any and all use of potable water for filling of new swimming pools or spas;

(ii) Any and all use of potable water for refilling existing swimming pools or spas due to leaks, splash-out, and evaporative losses (i.e. "Topping Off");

(iii) Any and all uses of potable water as replacement water for existing water themed publicly owned "play areas" to recharge the play area with water due to leaks, splash-out, and evaporative losses (i.e. "Topping Off");

(iv) Any and all draining and subsequent refilling of existing swimming pools or spas, except where required for the protection of public health and safety, and upon the prior written approval of the District, which approval shall specify allowable refill times and rates.

(8) Any and all escape of potable water from pipe breaks or leaks after the customer has been notified of the probable existence of the break or leak by the District, or after the customer had or should have had reasonable knowledge of the pipe break or leak.

(9) Any and all use of potable water in any decorative fountain and/or other decorative water feature that is visible from areas accessible by the public.

(b) Restrictions on Water Use. During the Community Drought Emergency, and to preserve the water supply for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection the following water uses are restricted:

(1) Serving water at restaurants unless in response to an unsolicited request by the customer;

(2) The use of water in the bathrooms and/or lavatories of all non-domestic water customers of the District unless water conservation messages are posted in appropriate and effective locations in the bathrooms and/or lavatories of said customers.

(c) General Prohibition and Restriction.

(1) The use of an unreasonable and/or inappropriate amount of potable water as determined by the District considering the use to which the water is being put, even if otherwise in conformance with the prohibitions and restrictions on water use herein, is a violation of this Ordinance.

(2) Residential customers who use water at the rate of more than 640 gallons per day over the course of a week (the volume equivalent of about 50 units per bimonthly billing period, which is approximately 50% in excess of the threshold for Tier 3 consumption) are hereby found to be using an unreasonable and/or inappropriate amount of water.

(3) Indoor residential use that does not exceed health and safety needs shall generally be considered to be reasonable and appropriate. The State of California has determined (*Central Valley Project and State Water Project - Drought Operations Plan and Operational Forecast (April 1, 2014 through November 15, 2014)*) that health and

safety uses are approximately 55 gallons per person per day. This usage approximately corresponds to Tier One (10 unit) usage in the District's rate schedules assuming between two and three persons per household.

(d) Exemptions to Prohibitions and Restrictions. During the Community Drought Emergency, the following exemptions to the above listed prohibitions and restrictions are allowed:

(1) Outdoor Lawn and Landscaping Watering and Irrigation Exemptions:

(i) Drip or similarly high efficiency system watering and irrigation if no runoff, ponding, flooding or marshy conditions result;

(ii) Hand watering using a bucket, watering can or similar container without any direct connection to a potable water supply and if no runoff, ponding, flooding or marshy conditions result;

(iii) Hand watering or irrigation using a shut-off nozzle equipped hose only between the hours of 6:00 PM and 9:00 AM and on an application schedule not greater than approximately fifty (50%) of the evapotranspiration rate needed for the customer's landscaping (for lawns, approximately one half inch per week from June through September and three-eighths inch per week at other times of the year), in accordance with the weekly / monthly schedule below, if no runoff, ponding, flooding or marshy conditions result, and if it is not raining during the time of the watering or irrigation and the watering or irrigation does not take place less than three days after rain;

(iv) Semiautomatic watering and irrigation using oscillating or rotating devices connected to a hose of flexible connection that can be easily moved only while under the continual direct observation of a customer, only between the hours of

6:00 PM and 9:00 AM and on an application schedule not greater than approximately fifty (50%) of the evapotranspiration rate needed for the customer's landscaping (for lawns, approximately one half inch per week from June through September and three-eighths inch per week at other times of the year), in accordance with the weekly / monthly schedule below, if no runoff, ponding, flooding or marshy conditions result, and if it is not raining during the time of the watering or irrigation and the watering or irrigation does not take place less than three days after rain;

(v) Watering and irrigation systems using permanent irrigation piping and sprinkler heads that are not controlled by a functioning automatic timing device only between the hours of 6:00 PM and 9:00 AM and on an application schedule not greater than approximately fifty (50%) of the evapotranspiration rate needed for the customer's landscaping (for lawns, approximately one half inch per week from June through September and three-eighths inch per week at other times of the year), in accordance with the weekly / monthly schedule below, if no runoff, ponding, flooding or marshy conditions result, and if it is not raining during the time of the watering or irrigation and the watering or irrigation does not take place less than three days after rain;

(vi) Watering and irrigation systems using permanent irrigation piping and sprinkler heads that are controlled by a functioning automatic timing device only between the hours of 6:00 PM and 9:00 AM and on an application schedule not greater than approximately fifty (50%) of the evapotranspiration rate needed for the customer's landscaping (for lawns, approximately one half inch per week from

June through September and three-eighths inch per week at other times of the year), in accordance with the weekly / monthly schedule below, if no runoff, ponding, flooding or marshy conditions result, and if it is not raining during the time of the watering or irrigation and the watering or irrigation does not take place less than three days after rain;

(vii) Weekly / Monthly Irrigation schedule where applicable:

- One day per week (and not on consecutive days) during the months of April and May;
- Two days per week (and not on consecutive days) during the months of June, July, August and September;
- One day per week (and not on consecutive days) during the months of October and November; and
- At no time during the months of December, January, February and March.

(viii) Watering and irrigation of newly planted landscaping which was planted before the effective date of this Ordinance may be watered or irrigated every day for the first thirty days from the date it was planted and may only be watered or irrigated every other day for the next sixty days after the date it was planted provided that said watering or irrigation occur only between the hours of 6:00 PM and 9:00 AM and on an application schedule not greater than the evapotranspiration rate needed for the customer's landscaping (for lawns, approximately one inch per week from June through September and three-quarters inch per week at other times of the year) and if no runoff, ponding, flooding or marshy conditions result; and if it is

not raining during the time of the watering or irrigation and the watering or irrigation does not take place less than three days after rain;

(ix) Potable water may be used for watering or irrigation for very short periods of time for the express purpose of adjusting or repairing a potable irrigation system, as long as the system is continually and directly supervised by the owner or the owner's representative while the water is turned on.

(2) Cleaning, Washing, Maintenance Exemptions:

(i) Vehicle washing at commercial facilities or automobile dealerships, as long as the washing utilizes buckets or a self-contained washing system without any direct connection to a potable water supply;

(ii) Vehicle washing done at a commercial car wash facility that recirculates water;

(iii) Cleaning building or home exteriors if for the express purpose of preparing the exterior surfaces for repair and/or repainting, if done using a pressurized washing device equipped with a quick-acting positive shutoff nozzle;

(iv) Cleaning windows using potable water as long as a bucket or similar container is used, without any direct connection to a potable water supply.

(3) Swimming Pools, Spas and Water Themed Play Area Exemptions:

(i) "Topping off" of existing private swimming pools and spas (i.e. a pool or spa at a residence that is only available for use by the occupants and their guests) if the swimming pool or spa is covered to reduce evaporation when not in use, but only to the extent that the need for "Topping Off" is not due to leaks;

(ii) "Topping off" of existing semi-private swimming pools (i.e. a pool owned and professionally maintained by a home owner association, an apartment or condominium complex, or a membership club) if the pool is covered to reduce evaporation when not available for use, but only to the extent that the need for "Topping Off" is not due to leaks. If the pool is not equipped with a cover as of the effective date of this Ordinance, "Topping Off" will be allowed only until the earlier of (a) the installation of a pool cover or (b) four months from the effective date of this Ordinance;

(iii) "Topping off" of existing semi-private spa (i.e., a spa owned and professionally maintained by a home owner association, an apartment or condominium complex, or a membership club) if the spa is covered to reduce evaporation when not available for use, but only to the extent that the need for "Topping Off" is not due to leaks;

(iv) "Topping off" of existing public swimming pools (i.e., a pool that is available for use by the public at large) if the swimming pool is covered to reduce evaporation when not available for use, but only to the extent that the need for "Topping Off" is not due to leaks;

(v) "Topping off" of existing water themed publically owned "play areas" to the extent that the need for "Topping Off" is not due to leaks, and then only to the extent that the need for "Topping Off" is related to evaporative losses or to splash-out occurring when the water themed play area is used on hot days;

(vi) The draining and subsequent refilling of swimming pools and spas if needed for the protection of public health and safety, but only upon the prior written

approval of the District, which approval shall specify allowable refill times and rates.

(4) Decorative water features that, as of the effective date of this Ordinance, are in existence and which intentionally provide habitat for aquatic species.

(5) Notwithstanding anything in this Ordinance to the contrary, potable water may be used to actively irrigate or otherwise provide water to environmental mitigation projects in existence as of the effective date of this Ordinance and have been duly approved by regulatory authorities provided the project has active and valid permits.

SECTION 4. APPLICATION PROCEDURE FOR EXEMPTIONS FROM WATER USE LIMITATIONS.

The exclusive procedure for consideration of written applications from customers for exemptions from these Water Use Limitations described herein will be as follows:

(a) A customer may submit a written application for an exemption from a Water Use Limitation to the District's Drought Coordinator. The application must be on the District's form and must include the customer name, account number(s), a description of the limitation from which the customer is seeking an exemption, the reason(s) why the exemption is requested, the justification for the exemption, and the specific actions the customer proposes to take to achieve a functionally equivalent level of water curtailment. If a Notice of Violation has been issued to the customer, the customer must first resolve the violation including the payment of any and all penalties and/or costs before the Drought Coordinator will consider an application for an exemption from a Water Use Limitation;

(b) The District Drought Coordinator will consider each application for a waiver of a Water Use Limitation based on the information provided by the customer in the application. The Drought Coordinator may grant an exemption of a particular Water Use Limitation if the application is deemed reasonable. An exemption shall not be granted if, in the opinion of the Drought Coordinator, doing so would endanger the public health and safety;

(c) A customer may appeal the Drought Coordinator's denial of an application for an exemption from a Water Use Limitation within ten (10) calendar days by submitting a written appeal to the Board of Directors on the District's form and specify the reasons why the customer disagrees with the Drought Coordinator's denial;

(d) If a previous application for an exemption of a Water Use Limitation has been denied, a new application for exemption of the same Water Use Limitation is not permitted and will not be considered.

SECTION 5. ADMINISTRATIVE IMPLEMENTATION. The General Manager is authorized and directed to establish appropriate administrative procedures consistent with the provisions of this ordinance and to take reasonable and appropriate action to fully implement the provisions of this ordinance.

SECTION 6. EXEMPTION FROM CEQA. The District Board of Directors finds that the actions taken in this Ordinance are exempt from provisions of the California Environmental Quality Act of 1970 (CEQA) because they are immediate actions necessary to prevent or mitigate an emergency, as described in subdivision (b)(4) of Public Resources Code section 21080 and in section 15269(c) of the Guidelines promulgated under said Act and codified in Title 14 of the Code of California Regulations (CEQA Guidelines), and to assume the

maintenance, restoration, or enhancement of a natural resource, as described in section 15307, of the CEQA Guidelines.

SECTION 7. SEVERABILITY. If any provision of this Ordinance is held to be invalid or unenforceable, that holding will not affect the remainder of the Ordinance, which shall remain in full force and effect.

ADOPTED by the Board of Directors of Dublin San Ramon Services District, a public agency in the State of California, Counties of Alameda and Contra Costa, at its special meeting held on the 5th day of May 2014, by the following vote:

AYES: 5 - Directors Richard M. Halket, Edward R. Duarte, Dawn L. Benson, D.L. (Pat) Howard, Georgean M. Vonheeder-Leopold

NOES: 0

ABSENT: 0

Georgean M. Vonheeder-Leopold

Georgean M. Vonheeder-Leopold, President

ATTEST:

Nancy G. Hatfield

Nancy G. Hatfield, District Secretary

CERTIFIED AS A TRUE AND CORRECT COPY OF
THE ORIGINAL ON FILE IN THE OFFICE OF
DUBLIN SAN RAMON SERVICES DISTRICT
Secretary Nancy G. Hatfield
MAY 0 5 2014

ORDINANCE NO. 334

AN URGENCY ORDINANCE OF DUBLIN SAN RAMON SERVICES DISTRICT ADOPTING PENALTIES AND PROVISIONS FOR THE ENFORCEMENT OF WATER USE LIMITATIONS DURING THE COMMUNITY DROUGHT EMERGENCY

WHEREAS, the State of California has and continues to experience record dry conditions, with 2013 being the driest year on record; and

WHEREAS, January 2014, normally a very wet month, was critically dry and is now the driest January on record; and

WHEREAS, meteorological and hydrological conditions improved somewhat since early February 2014 but 2014 remains a critically dry year as classified by the State of California; and

WHEREAS, on January 17, 2014 California Governor Edmund G. Brown issued a Proclamation of a State of Emergency, and encouraged all Californians to reduce their water usage by 20%; and

WHEREAS, the Zone 7 Water Agency issued a Proclamation of a Local Drought Emergency on January 29, 2014 and authorized their General Manager to "establish appropriate levels of conservation consistent with the California State of Drought Emergency and local conditions"; and

WHEREAS, in conformance with the January 29, 2014 proclamation by the Zone 7 Water Agency the General Manager established a system-wide conservation goal of 20% for 2014 as compared to 2013 usage, which was based on demand reductions of 5% for indoor water use and 40% for outdoor water use; and

WHEREAS, on January 31, 2014 the Department of Water Resources reduced from 5% to 0% the anticipated allocation of water to customers of the State Water Project, including the Zone 7 Water Agency; and

WHEREAS, on February 18, 2014 the District declared a State of Community Drought Emergency and established a goal of curtailing overall District water usage by twenty percent

(20%) base on five percent (5%) curtailment of inside water use and forty percent (40%) curtailment of outside water use as compared to the same period in 2013; and

WHEREAS, on March 18, 2014 the City of Dublin declared a Local Drought Emergency; and

WHEREAS, on March 18, 2014 the City of Pleasanton approved an urgency ordinance amending their water conservation plan as needed to protect the immediate threat of the potentially significant drought to preserve public health and safety; and

WHEREAS, on February 24, 2014 the City of Livermore declared a Water Shortage Emergency; and

WHEREAS, on April 16, 2014 the Zone 7 Water Agency directed the local water supply retailers and untreated water customers to assure a 25% total reduction for 2014 with 5% coming from indoor curtailment and 50-60% from outdoor curtailment directed that the local water supply retailers adopt various mandatory conservation measures to achieve these reductions; and

WHEREAS, on April 18, 2014 the California Department of Water Resources announced that anticipated 2014 water allocations to the State Water Contractors (including Zone 7) will be increased to 5% but only on condition that delivery of water occur after September 1, 2014; and

WHEREAS, on April 25, 2014 Governor Edmund G. Brown proclaimed a Continued State of Emergency in the State of California and ordered that California residents should refrain from wasting water, specifying many practices that waste water and directing urban water suppliers to implement drought response plans to limit outdoor irrigation and other wasteful water practices; and

WHEREAS, the Zone 7 Water Agency supplies all of the potable water currently available to the District for distribution and use by its customers; and

WHEREAS, Zone 7's primary sources of supplies include: imported water from the State Water Project (80%); local groundwater supplies originating from rainfall, and runoff, and recharge (20%); and

WHEREAS, on May 5, 2014 the District Board of Directors declared that a State of Emergency has existed since February 18, 2014 and continues to prevail in the community served by the District by reason of the fact that the ordinary demands and requirements of the water consumers in the District's service area cannot be met and satisfied by the water supplies now available to the District without depleting the water supply to the extent that there would be insufficient water for human consumption, sanitation, and/or fire protection as a result of the ongoing drought and the resulting reductions to and restrictions on the available water supply.

WHEREAS, on May 5, 2014 the District Board of Directors adopted an urgency ordinance specifying Water Use Limitations that are to be effective during the Community Drought Emergency.

NOW, THEREFORE, BE IT ORDAINED by the Board of Directors of Dublin San Ramon Services District as follows:

SECTION 1. PURPOSE AND AUTHORITY. The purpose of this Ordinance is to conserve the water supply of the District for the greatest public benefit with particular regard to public health and safety, fire protection, and domestic (indoor) use; to conserve water by enforcing Water Use Limitations that if continued would endanger the District's ability to meet human health and safety needs with its limited water supply; to conserve a sufficient amount of water so that the demand for water does not exceed the supply, which otherwise would force the imposition of additional and/or stricter drought stage declarations, restrictions, or prohibitions; and to the extent necessary, authorize and direct staff to enforce said Water Use Limitations fairly and equitably. This Ordinance is adopted pursuant to the District's authority under

Sections 350 et seq. and 71640 et seq. of the California Water Code, which derive in part from Section 2 of Article X of the California Constitution.

SECTION 2. EFFECT OF ORDINANCE.

(a) This Ordinance shall take effect immediately, shall supersede and control over any other ordinance or regulation of the District in conflict herewith, and shall remain in effect until the Community Drought Emergency has ended and all Water Use Violations have been finally resolved.

(b) The provisions of this Ordinance shall apply throughout the District's water service area.

SECTION 3. ENFORCEMENT ACTIONS.

(a) Violation of Water Use Limitations.

During the Community Drought Emergency, certain Water Use Limitations have been established by a separate Ordinance of the District. A District customer who intentionally or unintentionally violates any Water Use Limitation will be subject to the following penalties and enforcement provisions:

(1) For first violations, customers will be issued either an oral or written warning, at the discretion of the District, and the warning will identify the violation and specify what the customer must do to cure the violation and a compliance schedule for curing the violation. Oral warnings will occur via telephone call or a site visit by District staff. Written warnings will be in the form of a door hanger tag, a letter sent via postal carrier, or another functionally equivalent method.

(2) For second violations, customers will be subject to a penalty of $250 in accordance with Chapter 1.3.010 (General Penalty) of the District Code. The violation and the assessment of the penalty will be communicated to the customer via a written Notice of Violation.

(3) For third violations, customers will be subject to an additional penalty of $500 in accordance with Chapter 1.3.010 (General Penalty) of the District Code. The violation and the assessment of the penalty will be communicated to the customer via a written Notice of Violation.

(4) For fourth violations, customers will be subject to an additional penalty of $1,000 in accordance with Chapter 1.3.010 (General Penalty) of the District Code. The violation and the assessment of the penalty will be communicated to the customer via a written Notice of Violation.

(5) For fifth and any subsequent violations, customers will be subject to reductions in the amount of water delivered to the customer, as determined by the District, at its sole discretion. The violation, and the amount of reduction and method by which the reduction will be achieved will be communicated to the customer via a written Notice of Violation.

A. If feasible and if sufficient to prevent a re-occurrence of the violation, as determined by the District at its sole discretion, a flow restrictor or other physical limitation will be installed on the customer's meter connection that will limit the flow of water to the home. If installed, the flow restrictor or other physical limitation will allow enough water to meet health and safety needs (i.e. most indoor water uses), but will limit the pressure and flow to a level that will not allow the Water Use Violation to continue.

B. If a flow restrictor or other physical limitation is not feasible or appropriate for any reason, as determined by the District at its sole discretion, or if a flow

restrictor would allow the Water Use Violation to continue unabated, or if a flow restrictor would allow the delivery of quantities of water equivalent to the amount consumed by the activity giving rise to the Water Use Violation, then the customer's service connection will be disconnected from the District water system (i.e., by closing and locking the service valve and/or by physically removing the water meter).

Where feasible and appropriate, a door hanger tag will be left at the service location informing the occupants of the action taken and the steps that must be taken before the District will consider removing the physical limitation. Full payment of all outstanding penalties, fees, and costs and certification by the customer that the violation has been corrected and will not reoccur will be required before the physical limitation or other physical limitation will be removed or service restored.

(b) Notice of Violation.

The Notice of Violation will identify the violation and specify what the customer needs to do to cure the violation and a compliance schedule for curing the violation. The Notice of Violation will be communicated to the customer in the form of a letter sent via postal carrier or another functionally equivalent method; as a courtesy and where feasible and appropriate, a door hanger tag may be left by the District as a preliminary notice to the occupant. The penalty amount will be added to the customer's bill on the next statement. For the second through the fourth violations, the Notice of Violation will clearly state that any further violations of a prohibited or restricted water use will be subject to greater penalties and the potential of the District installing a flow restrictor on the customer's service, or at the option of the District, disconnection (shut-off) of their service.

(c) Violation is a Misdemeanor.

Pursuant to California Water Code Section 71644, the use of water in violation of restrictions or prohibitions on water use, or the waste and unreasonable use of water in accordance with a District Ordinance is a misdemeanor.

(d) Multiple Violations.

Violations of more than one Water Use Limitation are separate violations each of which shall be subject to separate and independent enforcement in accordance with the provisions of this Ordinance.

SECTION 4. APPLICATION PROCEDURE FOR WAIVER OF VIOLATION.

The exclusive procedure for consideration of written applications for waivers of the violations of Water Use Limitations ("Waiver of Violation"), to avoid the enforcement actions described herein, will be as follows:

(a) A customer may submit a written application for a Waiver of Violation related to water use to the District's Drought Coordinator. The application must be on the District's form and must include the customer name, account number(s), a description of the water use for which the customer was cited, and a description of the reason(s) why a Waiver of Violation is requested and justification for the Waiver of Violation. If penalties and/or costs have been assessed, the application must be accompanied by a deposit in an amount specified in the enforcement action.

(b) The District Drought Coordinator will consider each application for a Waiver of Violation based on the customer's reason(s) for violating a Water Use Limitation and justification as presented. The Drought Coordinator may grant a one-time waiver of a particular violation if the customer's justification is deemed to be reasonable, and if the customer has mitigated

or agrees to immediately mitigate the cause of the violation. If a Waiver of Violation is granted the deposit furnished by the customer shall be refunded.

(c) A customer may appeal a denial of an application for a Waiver of Violation within ten (10) calendar days by submitting a written appeal to the Board of Directors on the District's form and specify the reasons why the customer disagrees with the denial.

(d) If a Waiver of Violation for a specific type of violation has been previously granted, a further waiver of that same type of violation is not permitted.

SECTION 5. ADMINISTRATIVE IMPLEMENTATION.

The General Manager is authorized and directed to establish appropriate administrative procedures, including guidelines to be used by the District's Drought Coordinator when considering applications for waivers, consistent with the provisions of this ordinance, and to take reasonable and appropriate action to fully implement the provisions of this ordinance.

SECTION 6. EXEMPTION FROM CEQA.

The District Board of Directors finds that the actions taken in this Ordinance are exempt from provisions of the California Environmental Quality Act of 1970 (CEQA) because they are immediate actions necessary to prevent or mitigate an emergency, as described in subdivision (b)(4) of Public Resources Code section 21080 and in section 15269(c) of the Guidelines promulgated under said Act and codified in Title 14 of the Code of California Regulations (CEQA Guidelines), and to assume the maintenance, restoration, or enhancement of a natural resource, as described in section 15307, of the CEQA Guidelines.

SECTION 7. SEVERABILITY.

If any provision of this Ordinance is held to be invalid or unenforceable, that holding will not affect the remainder of the Ordinance, which shall remain in full force and effect.

ADOPTED by the Board of Directors of Dublin San Ramon Services District, a public agency in the State of California, Counties of Alameda and Contra Costa, at its special meeting held on the 5th day of May 2014, by the following vote:

AYES: 5 - Directors Richard M. Halket, Dawn L. Benson, D.L. (Pat) Howard, Edward R. Duarte, Georgean M. Vonheeder-Leopold

NOES: 0

ABSENT: 0

Georgean M. Vonheeder-Leopold

Georgean M. Vonheeder-Leopold, President

ATTEST:

Nancy G. Hatfield

Nancy G. Hatfield, District Secretary

CERTIFIED AS A TRUE AND CORRECT COPY OF THE ORIGINAL ON FILE IN THE OFFICE OF DUBLIN SAN RAMON SERVICES DISTRICT
Secretary Nancy G. Hatfield

MAY 0 5 2014

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East Bay Municipal Utility District

East Bay Municipal Utility District. April 22, 2014. Declare a Need to Use the Freeport Project to Deliver Supplemental Supplies, Suspend Implementation of the Supplemental Supply Surcharge for Fiscal Year 2014, and Reaffirm the 2014 Preliminary Dry Year Response Plan.

_____. February 11, 2014. EBMUD Board of Directors asks customers to cut water use by 10 percent.

_____. February 11, 2014. Motion – 2014 Preliminary Dry Year Response Plan.

_____. May 13, 2014. Motion – Water Shortage Action Plan.

RESOLUTION NO. 33978-14

DECLARE A NEED TO USE THE FREEPORT PROJECT TO DELIVER SUPPLEMENTAL SUPPLIES, SUSPEND IMPLEMENTATION OF THE SUPPLEMENTAL SUPPLY SURCHARGE FOR FISCAL YEAR 2014, AND REAFFIRM THE 2014 PRELIMINARY DRY YEAR RESPONSE PLAN

Introduced by Director Coleman ; Seconded by Director Patterson

WHEREAS, California is experiencing one of the most severe droughts on record; and

WHEREAS, the 2014 water year has been one of the driest in decades and follows two consecutive dry years throughout the state; and

WHEREAS, even after the recent rain and snowfall, the state's major reservoirs remain well below average levels for the date and the statewide snowpack is less than a third of normal, with little time remaining to recover in 2014; and

WHEREAS, many areas of the state will face water shortages this year; and

WHEREAS, the East Bay Municipal Utility District (the "District") has undertaken substantial investments in aggressive water conservation programs, water recycling projects and dry year supplemental water supply projects to help reduce the severity of water rationing that may be required in droughts, and will continue doing so; and

WHEREAS, Governor Brown declared a drought state of emergency on January 17, 2014, and called on all Californians to do their part to reduce their water use; and

WHEREAS, on February 11, 2014, the District Board of Directors (the "Board") responded to the Governor's call by implementing a 2014 Preliminary Dry Year Response Plan which asked customers to voluntarily reduce water use by ten percent starting on February 11, 2014 and continuing until further notice along with a comprehensive water conservation and customer outreach program; and

WHEREAS, the 2014 Preliminary Dry Year Response Plan also prepared for the use of supplemental water supplies and provided ongoing monitoring of water supply and demand consistent with the District's Urban Water Management Plan 2010; and

WHEREAS, the Board approved a one-year water transfer agreement with Placer County Water Agency (PCWA) for additional supplemental water supplies; and

WHEREAS, the District has a long-term renewal contract with the United States Bureau of Reclamation (the "Bureau") for the Central Valley Project (the "CVP") supplemental water supply and during specified dry year conditions, may request delivery of the CVP water and convey it by using the Freeport Regional Water Facility (the 'Freeport Project'); and

WHEREAS, the District can take supplemental water supply from its CVP contract with the Bureau in Fiscal Year 2014 because the projected end of September total system storage is less than 450 thousand acre-feet and the District is entitled to take up to 66,500 acre-feet of CVP water during this federal water year which ends on February 28, 2015; and

WHEREAS, the District has scheduled to receive 6,900 acre-feet of water from its CVP contract to conduct a series of tests in April that are necessary to meet regulatory requirements and to confirm the system is prepared to deliver additional supplemental supply; and

WHEREAS, the District has reserved 16,000 acre-feet of supplemental supply water from its CVP contract for delivery to the District's service area in May and June 2014 for potable water service if the Board declares the need to use the Freeport Project to deliver these supplemental supplies to the District; and

WHEREAS, the Board accepted a Water Supply Availability and Deficiency Report from District staff at its April 22, 2014 meeting, advising the Board that the District's projected September 30 total system storage will fall below 450,000 acre-feet and declaring that the District's water supply is deficient for meeting normal customer demands in 2014; and

WHEREAS, the Water Supply Availability and Deficiency Report also advises the Board to continue the customer water use reduction program begun in February as part of the 2014 Preliminary Dry Year Response Plan and coupled with supplemental supplies from the Freeport Project in order to preserve supplies in case the dry conditions persist into the next water year; and

WHEREAS, the cost to purchase and deliver 16,000 acre-feet of CVP water to the District's service area is estimated to be eight million dollars; and

WHEREAS, Schedule A of the District's Schedule of Rates and Charges states that a Supplemental Supply Surcharge is effective after the Board declares a need to use the Freeport Project to deliver supplemental supplies from outside of the District's normal watershed, and the surcharge amount is 14% of the total charge for water delivered per billing period for all potable water customer accounts, continuing until the additional costs are recovered; and

WHEREAS, the revenue from the Supplemental Supply Surcharge covers the additional costs that are incurred when the Freeport Project facilities are operated, including purchases of water from the Bureau and other water agencies, and the costs for delivery and treatment, and the surcharge remains in effect until these additional costs are recovered; and

WHEREAS, customer communications about the water supply shortage, the need for voluntary conservation and the costs and benefits of using supplemental supplies began just two months ago and require additional time to adequately educate ratepayers; and

WHEREAS, due to the short time frame when the Freeport Project will be operated to deliver supplemental supplies to the District for potable water service in Fiscal Year 2014 and the availability of unbudgeted one-time revenue from the sale of the Redwood Filter Plant property, these costs can be funded in Fiscal Year 2014 without adversely affecting the District's finances and the Board has the legislative authority to suspend the implementation of the Supplemental Supply Surcharge for the delivery of the 16,000 acre-feet of CVP supplemental water supply for potable water service in May and June 2014; and

WHEREAS, suspending the implementation of the Supplemental Supply Surcharge in Fiscal Year 2014 does not prevent the Board from implementing the Supplemental Supply Surcharge in the future whenever it declares a need to operate the Freeport Project to deliver supplemental water supplies;

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of East Bay Municipal Utility District finds and determines and hereby declares the following:

Section 1. The Board hereby declares a need to use the Freeport Project to deliver 16,000 acre-feet of supplemental supply water from the District's CVP contract with the Bureau which is from outside of the District's normal watershed for delivery to the District's service area for potable water service in May and June 2014.

Section 2. The Board hereby suspends implementation of the Supplemental Supply Surcharge for the delivery of the 16,000 acre-feet of supplemental supply water to the District's service area in May and June 2014 for potable water service based on the Board's findings that due to the short time frame when the Freeport Project will be operated and the availability of unbudgeted one-time revenue from the sale of the Redwood Filter Plant property, the expenditures intended to be covered by the revenue from the Supplemental Supply Surcharge can be funded in Fiscal Year 2014 without adversely affecting the District's finances.

Section 3. The Board reserves the right to implement the Supplemental Supply Surcharge at any future subsequent date whenever it declares a need to operate the Freeport Project to deliver supplemental supplies from outside of the District's normal watershed.

Section 4. The Board hereby declares a need to continue requesting ten percent voluntary conservation by all customers to preserve up to 10,000 acre-feet of water supplies by reaffirming the 2014 Preliminary Dry Year Response Plan.

ADOPTED this 22nd day of April, 2014 by the following vote:

AYES: Directors Coleman, Foulkes, Linney, McIntosh, Mellon, Patterson, and President Katz.

NOES: None.

ABSENT: None.

ABSTAIN: None.

Andy Katz

President

ATTEST:

Rischa Cole for

Secretary

APPROVED AS TO FORM AND PROCEDURE:

Laura Collins

General Counsel

EBMUD Board of Directors asks customers to cut water use by 10 percent

Reductions needed to preserve dwindling supplies

OAKLAND, February 11, 2014 — Due to unusually dry conditions, decreasing reservoir levels and a potentially pessimistic forecast for the rest of the rainy season, the EBMUD Board of Directors today announced that to protect water supplies, voluntary cutbacks of 10 percent are needed from all customers effective immediately.

EBMUD relies on snowmelt and runoff for almost all of its supply. As of this weekend, the amount of snow and rain in the Mokelumne River watershed 90 miles from the East Bay is 49 percent of normal. EBMUD received more than seven inches from recent storms.

"This weekend's rain and snow were a relief. But we still have only about half of the average precipitation we count on," said Board President Andy Katz.

Many East Bay residents and businesses have made conservation a way of life. In fact, EBMUD customers use 17 percent less water today than they did five years ago. Some customers also have been using recycled water for irrigation or industrial process, further extending supplies.

"We are grateful to our customers who use water wisely every day. But we must ask for a ten percent voluntary cutback to make sure we have enough water stored in case this water shortage persists," said Katz.

Customers are asked to cut 10 percent to stretch supplies and to keep up those efforts until further notice. If dry conditions persist and rain and snowfall are not enough to sufficiently refill EBMUD reservoirs, it is possible that EBMUD will declare a water shortage emergency in April. At that time, EBMUD's Board of Directors will review the final precipitation totals and may take additional measures.

EBMUD will continue assisting its customers to save water through rebates and targeted information and assistance.

While customers cut back their water use, EBMUD is also preparing to obtain water from the Sacramento River via its Freeport Regional Water Facility, which EBMUD and its partner, Sacramento County Water Agency, completed in 2011. The facility has the capacity to move 100 million gallons per day to the East Bay during dry years. The water is available through a contract with the US Bureau of Reclamation. The Bureau is set to determine in late February how much water will be provided this year to its contractors, including EBMUD. EBMUD also is working with the Placer County Water Agency on a potential water transfer, which includes the benefit of water releases in the lower American River that provides a boost to migrating fish.

"EBMUD wants to thank customers who are already saving water. And if mandatory rationing becomes necessary, we guarantee that customer allocations would not be based on use during this voluntary cutback period," said Katz. "Now is a great time to fix leaks, manage irrigation and transform lawns to sustainable landscapes. We hope that these water savings can help us avoid more stringent measures later."

For the latest water supply update, information on rebates and watersmart tips, go to www.ebmud.com/watersmart.

Contact
Andrea Pook
Senior Public Information Representative
510-287-0145

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EBMUD

AGENDA NO. 9

MEETING DATE February 11, 2014

TITLE **2014 PRELIMINARY DRY YEAR RESPONSE PLAN**

☒ MOTION ☐ RESOLUTION ☐ ORDINANCE

RECOMMENDED ACTION

Authorize staff to request that all customers voluntarily reduce their water use by ten percent starting February 11, 2014 and continue until further notice to help keep water in storage during an unprecedented dry year.

SUMMARY

Regular updates to the Board of Directors have described how the lack of precipitation is affecting the District's water supplies. The supply levels were good in December and now are fair. Storage will fall to poor levels with continued dry conditions. EBMUD's Urban Water Management Plan 2010 (UWMP 2010) details the steps and thresholds for managing dry-year conditions. Historically, when the District has implemented a water shortage response plan that action has been taken in April because at that time the bulk of the rainy season is over and estimates of inflow into reservoirs can be more accurately projected. However, in consideration of historically dry conditions, staff proposes to implement a 2014 Preliminary Dry Year Response Plan (attached) effective immediately seeking a ten percent voluntary reduction by all customers. This preliminary plan will be updated as needed in the coming months. A final plan is anticipated for Board consideration in April, when the rainy season is drawing to a close.

DISCUSSION

As of January 30, 2014, if average precipitation ensues from this date forward carryover storage would be below 500,000 acre feet (carryover storage projections range from 300,000 to 630,000 acre feet). Forecasts make it increasingly unlikely that precipitation levels will exceed average. Pursuant to guidelines adopted by the Board as part of the UWMP 2010, the District implements a Drought Management Program if the projected total system storage falls below 500,000 acre feet. Based on the risk of extreme shortages and the likelihood of significant shortages, staff recommends that the Board implement a Preliminary Dry Year Response Plan that includes a ten percent voluntary Districtwide customer water use reduction.

Implementing water saving measures would enable the District to preserve supplies in case dry conditions persist. The voluntary ten percent reduction will be reassessed in the coming weeks and

Funds Available: FY14	Budget Code:	
DEPARTMENT SUBMITTING Water and Natural Resources	DEPARTMENT MANAGER or DIRECTOR Richard G. Sykes	APPROVED Alexander R. Coate

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changes may be recommended if water storage projections or demand experience warrants a change.

No later than April 22, 2014, staff will present the annual Water Supply Availability and Deficiency Report (WSADR) which will: 1) evaluate the availability of District water supplies including supplemental supplies from the Central Valley Project and water transfers, 2) project the total system storage at the end of September based on expected spring runoff, and 3) serve as the basis for the Board's determination of whether water supplies are adequate to meet customer demands for the coming year.

EBMUD has invested nearly a billion dollars in long-term water supply improvements to deliver supplemental supplies to the service area. If the District determines it needs supplemental supplies in 2014, the sources are likely to be the Central Valley Project contract with the Bureau of Reclamation and water transfers pursuant to an agreement with Placer County Water Agency (PCWA). Staff will be formally transmitting its request for up to 65,000 acre-feet of Central Valley Project water to the Bureau of Reclamation on March 1, 2014 as required under its contract. The Board will be asked to consider a one-year transfer agreement with PCWA on February 25 that will provide up to 20,000 acre-feet of water this spring and summer. The volumes and timing of supplemental supply water deliveries cannot be determined until later this spring.

FISCAL IMPACT

The costs of implementing a Preliminary Dry Year Response Plan and establishing a ten percent voluntary rationing program effective February 11, 2014 can be accommodated in the District's current operating budget for FY14. Estimates of dry-year costs will be prepared as part of future dry-year Board briefings and will be submitted with the final 2014 Dry Year Response Plan.

NEXT STEPS

Staff has developed a number of outreach and communication actions included in the 2014 Preliminary Dry Year Response Plan to alert customers to the voluntary Districtwide ten percent customer reduction request. Depending on circumstances, later this year staff may recommend adoption of a Drought Management Program and Dry Year Response Plan in accordance with the guidelines established in the Water Shortage Contingency Plan that was adopted by the Board as part of the UWMP 2010.

RGS:dec

Attachment

2014 PRELIMINARY DRY YEAR RESPONSE PLAN
February 11, 2014

PURPOSE

This plan outlines actions District staff will take over the next two months in response to the current dry year conditions. A final response plan is anticipated in April when projected water supply conditions are more certain.

BACKGROUND

On January 17, 2014, Governor Brown declared a Drought State of Emergency for California directing state officials to take all necessary actions to prepare for drought conditions and urged all Californians to take personal action to reduce their water usage by 20 percent. In the Bay Area, water agencies have enacted varying voluntary measures based on their storage status and supply sources. Currently, nearby agencies are asking their customers to reduce water use by the following levels:

Marin Municipal Water District	25%
Alameda County Water District	20%
Zone 7 Water Agency	20%
Santa Clara Valley Water District	10%
San Francisco Public Utilities Commission	10%
Contra Costa Water District	Use water wisely message

EBMUD has invested nearly a billion dollars in long term water supply improvements that has resulted in established contracts and available facilities to deliver supplemental supplies and water transfers, completed pilot studies and other progress on groundwater banking and desalination, and continued progress in building recycled water system expansions and supporting customer conservation. These investments offer more flexibility to protect against drought and our stored water levels are better than much of the rest of the state. However, the statewide outlook for 2014 hydrology continues to be very poor and staff projects that runoff for this year will not be sufficient to meet the District's minimum carryover storage requirement of 500,000 acre-feet into the next water year, beginning October 1st.

RESPONSE PLAN ACTIVITIES

This Preliminary Response Plan consists of:

- Initiation of a ten percent voluntary customer demand reduction goal
- Preparation for use of supplemental water supplies
- Ongoing monitoring of water supply and demand

These actions are consistent with the Urban Water Management Plan 2010.

Voluntary Water Use Reduction. All customers will be asked to voluntarily reduce water use ten percent starting February 11th and continuing until further notice. The water use reductions achieved through this voluntary program will advance or supplement the water savings anticipated through the District's long-term water conservation master plan. The outreach goals are to:

- Announce the ten percent reduction target and thank customers who routinely conserve for their continuing efforts.
- Explain that extra effort by customers in this unprecedented dry year will keep as much water in storage as possible, providing more options if the unprecedented dry conditions continue.
- Give specific information to each customer class about what they can do, and offer key audiences technical assistance to help them achieve voluntary conservation objectives.

The initial outreach to announce the District's call for voluntary cutbacks will include a press release, a letter from President Katz to cities, counties, civic groups and other key stakeholders and an e-mail to employees from the General Manager. Updated speaking points and water supply fact sheets will be provided to the Board members to assist directors in answering questions that may be received. Specific activities planned to support customer efforts to achieve the ten percent reduction are shown in the table below.

PRELIMINARY DRY YEAR OUTREACH ACTIVITIES

- Implement the leak alert hotline and create an online leak reporting option
- Run a top-of-bill voluntary cutback request for an eight-week billing cycle
- Update phone message to direct callers to the leak alert hotline
- Expand WaterSmart Business Certification Program outreach
- Update door hangers that provide conservation advice and distribute to field staff
- Offer free over-the-counter water saving devices
- Update web information describing EBMUD conservation services, rebates and tips, emphasizing information to help residential and small businesses customers choose easy ways to save water
- Encourage adoption of commercial and residential landscape water budgets
- Expand the single family residence home water report pilot project
- Encourage use of classroom materials supporting water conservation
- Inform customers about conservation services, rebates and tips through sponsored workshops, direct mail, updated handouts and District presentations
- Inform employees of EBMUD's customer goals and of operational changes to save water through email, staff meetings, *Splashes* updates and other resources
- Participate in EPA's national *Fix-a-Leak Week* outreach campaign (starts March 17)
- Coordinate with the statewide *Save our Water* outreach campaign on messaging

Supplemental Water Supplies. The District is taking actions to secure supplemental supplies if needed. These supplies would be delivered via the Freeport Regional Water Facility to replenish District total system storage in the event voluntary conservation measures are insufficient and/or the next year is also dry. The sources of this water include the District's existing Central Valley Project (CVP) Contract with the U.S. Bureau of Reclamation (Bureau), and transfers pursuant to our agreement with the Placer County Water Agency (PCWA). Staff will be providing a preliminary water request to the Bureau in March. These preliminary requests do not obligate us to take that full volume or commit us to payment. These preliminary requests are required to reserve a specific volume of water. Actual deliveries are finalized approximately two months in advance of delivery concurrent with payment. Staff has worked with PCWA staff to develop a one-year water transfer of up to 20,000 acre-feet. This agreement is scheduled for Board consideration on February 25th. A portion of the first 5,000 acre-feet of water under this contract could be used to perform a planned test of the Freeport fish screens. Additional water would only be used if needed as determined following adoption of the Water Supply Availability and Deficiency Report (WASDR) in April.

Development of the Final 2014 Dry Year Response Plan. This preliminary plan outlines staff actions at this time based on current conditions. Staff will provide regular water supply updates to the Board and continue to monitor and assess the situation. A detailed report will be provided in April at which time more information will be available to define the situation. The current recommended voluntary ten percent Districtwide customer demand reduction will be reassessed this spring as part of the WSADR.

Depending on circumstances, staff may recommend adoption of a Drought Management Program later this year in accordance with the guidelines established in the Water Shortage Contingency Plan that was adopted by the Board as part of the Urban Water Management Plan 2010. If a Drought Management Program is required, the recommendation would include a final Dry Year Response Plan to address potential rationing reductions by customer class and financial impacts associated with the reduced revenue, increased staffing, and acquisition of supplemental supply.

ARC:SAH:db

EBMUD

AGENDA NO. 16.1–16.3
MEETING DATE May 13, 2014

TITLE **WATER SHORTAGE ACTION PLAN**

☒ MOTION ☐ RESOLUTION ☐ ORDINANCE

RECOMMENDED ACTION

1. Approve the 2014 Water Shortage Action Plan in accordance with District Policy 9.03.
2. Report to the Department of Water Resources and the State Water Resources Control Board (Water Board) on the District's 2014 Water Shortage Action Plan and the effectiveness of the plan to reduce water use pursuant to California Water Code, Section 1058.5 per the Governor's executive order.
3. Continue the necessary actions to prepare for drought conditions if dry conditions worsen.

SUMMARY

At the April 22, 2014 Board meeting, the Water Supply Availability and Deficiency Report was filed and declared that the District's water supply is deficient for meeting customer demands in 2014. Staff projects that runoff for this year will leave the District with a projected September 2014 carryover storage ranging from 370,000 to 490,000 total acre feet. The reduced carryover storage triggers the need to continue water-shortage activities to preserve supplies in case the drought situation persists into a second or third year.

Under the District's adopted Urban Water Management Plan, the response to this level of projected storage is to encourage voluntary conservation while continuing to make preparations in case conditions worsen. The 2014 Water Shortage Action Plan (Attachment A) proposes to:

- Conduct public outreach that acknowledges the conservation ethic of customers and their ongoing efforts to manage their water use and sustain at minimum, a 10 percent water use reduction.
- Educate customers on the District's use of dry-year supplemental supplies and what it means to them.
- Demonstrate District stewardship in water conservation and target a 20 percent reduction at District facilities and identify and repair leaks.
- Prepare for the possibility of continued or worsening drought by monitoring water demand and supplies, developing additional tools to support communication and customer water use management, and prepare to take additional supplemental supplies in late 2014 and early 2015, if needed.

Funds Available: FY14-15		Budget Code: WC: WSO\314\1013818 & PIO: WSO\116\1013818
DEPARTMENT SUBMITTING Office of the GM-Communications	DEPARTMENT MANAGER or DIRECTOR Cheryl Farr	APPROVED General Manager

Contact the Office of the District Secretary with questions about completing or submitting this form.

DISCUSSION

The Preliminary Dry Year Response Plan approved by the Board on February 11, 2014, authorized a voluntary 10 percent water use reduction for all District customers. Ongoing customer and stakeholder outreach continues and customers have responded positively with overall water production levels down 7 percent in February, 11.1 percent in March, and 14 percent in April as compared to 2013. While the District has achieved its goal of a 10 percent reduction in the first few months of customer response, the overall call for customers to sustain a 10 percent reduction is necessary until water supply conditions improve. (The expansion of the District's Home Water Report Program will serve as a useful communication and educational tool for customers in meeting their reduction request.) If the voluntary 10 percent conservation savings goal is maintained between now and September 30, EBMUD customers will have saved approximately 10,000 acre-feet, which will provide a larger margin of safety against drought for the next water year beginning October 1.

On April 25, Governor Brown issued an executive order to strengthen the state's ability to manage water and habitat effectively in drought conditions and called on all Californians to redouble their efforts to conserve water (Attachment B). Specifically, the order calls on Californians and California businesses to take specific actions to avoid wasting water that include limiting lawn watering and car washing, recommends that schools, parks and golf courses limit the use of potable water for irrigation, and asks that hotels and restaurants give customers options to conserve water by only serving water upon request and taking other actions. The order also prevents homeowner associations from fining residents who limit their lawn watering and take other conservation measures. Pursuant to the Governor's executive order the District will be required to report to the State Water Resources Control Board on its drought response plan and the effectiveness of these efforts to reduce water usage.

The District's Regulations Governing Service (Section 29 - Prohibiting Wasteful Use of Water and Section 31 – Water Efficiency Requirements) restrict certain wasteful water uses under normal conditions and during voluntary dry-year reductions. They contain many of the restrictions listed in the Governor's executive order. Section 29 has been in effect since 1997 to encourage wise water use and Section 31 was added in 2007 to include water efficiency for new service connections. Water Service Regulation Section 28 – Water Use During Water Shortage Emergency Condition establishes water use prohibitions and is reserved for critical dry-year periods requiring mandatory customer water rationing.

Water Shortage Public Outreach

When customer conservation actions are voluntary, the District helps customers reduce their water use through a number of conservation services, including education on reducing wasteful water use practices such as fixing leaks and eliminating irrigation over-spray and runoff.

In 2014, ongoing conservation outreach and communication efforts also will focus on hard to reach customer sectors, such as renters in multi-family units where residents may or may not pay a water bill and receive EBMUD's bill insert communication. The District's approach to helping customers achieve their water use reduction goals will continue to stress the seriousness of threat to the water supply, to clearly inform customers about water use guidelines, and to be organized and equipped to help our

customers meet the challenges of coping with drought. Additionally, the District will continue to emphasize reducing outdoor water use by working proactively with irrigators, residential and institutional customers to reduce outdoor irrigation through the summer months.

The Water Shortage Action Plan (Attachment A) provides an overview of outreach goals, objectives and proposed actions. Because the current drought is significantly affecting all parts of California, media coverage has been sustained and intensive. At the present time, staff does not propose a paid advertising campaign and will continue to seek media coverage through drought-related outreach activities focused on now the District is supplementing customers' voluntary conservation with water supplies via the Freeport facility. Feature topics for customer communication will include seasonal watering tips, ways to find and repair leaks and recommendations for drought-tolerant plantings and landscape conversions.

Outreach to civic, community, non-governmental and business groups, schools and other local entities also will continue. During droughts, water supply presentations are welcomed by these groups and educating them on conservation strategies and seeking their assistance in communicating with customers and other community leaders has a multiplier effect for each contact made. Additionally, staff will partner with other community agencies to leverage opportunities to promote cost-effective conservation messaging.

Increased Conservation Incentives

It is anticipated that the expanded customer education and outreach and distribution of Home Water Reports will increase the demand for District conservation incentives. Staff estimates an increase in rebate activity of 10-15 percent, which will require expending an additional $150,000-$200,000 for indoor and outdoor incentives. Staff will respond to customer and regulatory demands and advance additional conservation services as needed to achieve the desired customer savings objectives.

Conservation at District Facilities and Leak Detection

The District has set a goal of cutting water use 20 percent at its facilities. To this end, water audits have been completed and the first round of regular follow-up is underway. EBMUD also is expanding its own leak detection as well as reminding the public about the importance of repairing leaks. Additional monitoring equipment has been ordered and will be installed later this summer to find leaks proactively.

Preparing for Continued Drought

Staff is currently developing actions necessary to ensure the District is prepared in the event that dry conditions persist in 2015. During FY15, the Board will review rate setting requirements and consider alternative approaches to establishing drought rates should the severity of the drought increase. The intention is to merge the drought rate setting process with the FY16-17 biennial budget and rate setting process normally undertaken in the second half of FY15. As necessary, drought and normal rates can concurrently be communicated with the public through the District's public workshop and Proposition 218 process.

Staff will continue to monitor water demand and supply conditions and provide updates to the Board on the status of projected water carryover storage and the demand reduction achieved by customers throughout the year.

FISCAL IMPACT

Staff will conduct the 2014 Water Shortage Action Plan by reallocating budget and staffing within the existing FY14-15 budget.

ALTERNATIVES

Conduct a paid advertising campaign to promote water savings. This alternative is not recommended because in the past effective paid advertising campaigns have required budgets of $1 million or more. Media coverage of the drought has been extensive and sustained, and the District has successfully earned media coverage of its leak repair message, its supplemental supply actions, and its request for voluntary cutbacks. Based on the fact that the District's customers are currently achieving the requested 10 percent voluntary cutback, investments in paid advertising are not warranted at this time.

Do not approve the Water Shortage Action Plan. This alternative is not recommended as adequate planning and appropriate outreach and communication are needed to sustain customer water conservation efforts.

Attachments: A. Water Shortage Action Plan
B. Governor's April 25, 2014 Emergency Order

I:\SEC\2014\051314 Board Agenda Items\CCS PIO - BD1 2014 Water Shortage Action Plan

2014 Water Shortage Action Plan

COMMUNICATION

Goals

- **Stress the need for customers to sustain their achievement of the 10 percent voluntary reduction target established by the Board.**
- **Promote awareness of the District's supplemental supply: what it means for customers, how it was achieved, what it costs to operate.**
- **Educate customers on how to save water indoors and outdoors and the many services and programs available from the District.**

Key Messages

1. Our community is in a severe water shortage emergency. Please voluntarily cut your water use by 10 percent compared to 2013.
    a. Finding and fixing leaks is an easy way for most customers to meet their 10 percent goal.
    b. Managing outdoor irrigation with extra care and making drought-tolerant plant choices are great ways to reduce water use.
    c. We promise water use reductions this year will not impact allocations if mandatory rationing is necessary in the future.
    d. You can help reduce unnecessary water use by recommending ways to save water in your community. Visit http://www.ebmud.com/water-and-wastewater/watersmart-center to learn more.
    e. Heat wave reminder (if needed): Most lawns and gardens will survive this short-term heat wave without additional watering. Be sure to check your soil and apply mulch in your garden.
    f. Visit our WaterSmart Center at http://www.ebmud.com/water-and-wastewater/watersmart-center to obtain free water saving devices and information to help you use water most efficiently. Thank you for your help.

2. EBMUD is not requiring the 20 percent cut requested by the governor for these reasons:
    a. Our customers are achieving our region's state mandated 20% by 2020 per capita water use reduction target, years ahead of schedule.
    b. Customer investments in supplemental supplies over the past decade allow EBMUD to keep cutback targets to 10 percent at this time.
    c. Ongoing customer water conservation savings have contributed toward more water supply storage in the EBMUD reservoirs.

Summary of Actions by Audience (*italics are completed events*)

Audience	Objective	Actions/Status
Media	• Share the District's key messages with the local news outlets to seek positive earned media, and coordinate activities with statewide and local earned media, including ACWA's "Save Our Water" campaign.	• *2/11 - Press release on 10 percent voluntary* • *3/14 - Media alert on fix a leak open house* • *4/22 - Freeport decision press release on Board action* • *4/30 - Freeport first use press conference* • *5/3 - Freeport op-ed published in CC Times* • TBD- News release on home water report • Staff continues to proactively seek earned media coverage of conservation messages and supplemental supply actions. To date more than 200 media interactions have led to 128 news mentions about District actions.
Bill payers	• Request 10 percent voluntary reduction from customers and provide helpful information in ***Pipeline*** to assist customers in meeting their cutback goal.	• *Feb –Apr - Top of bill 10 percent voluntary cutback alert* • *Jan-Feb Pipeline: Cut unnecessary water use* • *Mar-Apr Pipeline: Fix toilet leaks* • *May-June Pipeline: Fix outdoor leaks; convert your lawn* • July-August- Top of bill-summer watering tips • July-Aug Pipeline: Hot weather garden tips • Sept-October Top of bill-drought update • Sept-Oct Pipeline: Drought-tolerant planting tips; reduce outdoor watering • Nov-Dec Top of bill-indoor use tips • Nov-Dec Pipeline: Find your baseline water use; winterize your irrigation system

Audience	Objective	Actions/Status
Contact Center Callers	• Shortage alert/tips on toll free phone number.	• *2/1 – Tips line established*
	• Provide consistent information to employees with extensive customer interaction to help them answer common questions.	• *2/20 - Developed Frequently Asked Questions for employee use* • *2/20- Began tracking shortage-related inquiries* • *4/23 –Distributed updated FAQs; will continue updating as needed*
	• Established customer water waste hotline.	• *2/21 - Water waste hotline launched; responded to over 275 calls to date*
Web visitors	• Provide helpful informational resources online to make it easy for customers to understand the drought and receive water savings tips to cut back their water use.	• *Ongoing- Water supply updates provided at Board meetings posted online* • *2/11 – Shortage alert posted* • *3/14 - Leak information posted* • *3/14 - Shower stickers, tabletop tents, etc. available* • *4/14- Mulch coupons for 20 nurseries available* • TBD- Update information about drought tolerant plants • TBD- Develop videos on finding outdoor leaks • TBD- Develop photo gallery of drought tolerant landscapes • TBD- Expand information on converting to drought tolerant landscapes
	• Expand supplemental supply information.	• *TBD - Update Freeport information as needed*
Irrigators	• Provide helpful information to assist irrigators in meeting their cutback goal.	• *3/19+ Two workshops held during March* • *3/19 - Updated tip sheets for different business groups available* • TBD - Additional irrigation workshops to be scheduled as needed

Audience	Objective	Actions/Status
Renters and homeowners	• Provide 1-1 assistance via surveys, rebates and irrigation scheduling assistance on request, make presentations to homeowner associations and business property managers, and provide educational conservation savings information at local nurseries, irrigation equipment suppliers and retail appliance stores.	• *2/20 - Updated District water supply fact sheet* • *3/6 - Meeting with 20 nurseries held to discuss water shortage* • *3/19 - Updated water conservation tip sheets made available* • *4/28 – Updated District water supply fact sheet* • 6/xx - Second nursery meeting will be scheduled • Ongoing- make presentations at HOAs throughout the service area • Ongoing - Submit water conservation articles to HOA newsletters and property manager trade publications
	• Expand Single-Family Residential Home Water Report to promote savings.	• *2/25 - Approved by Board* • TBD - Home Water Report distribution begins (late summer)
	• Outreach to customers who do not pay a water bill and receive the bill insert, ***Pipeline***.	• Identify opportunities to reach out to HOAs and customers who don't pay a water bill to provide water reduction goals and tips
	• Conduct survey research on drought awareness and penetration of conservation messages.	• *3/25 - survey results reported to Board* • TBD - Consider focus groups for message refinement if needed
Commercial Industrial	• Provide helpful information to assist businesses in meeting their cutback goal. • Continue outreach and marketing of business WaterSmart Certification Program. • Coordinate conservation services with county Green Business programs.	• *Ongoing- Promoting WaterSmart Business Certification* • *3/3 Providing restaurant tents, hotel clings etc. via online store* • *3/19 - Updated tip sheets for different business groups available 4/1 CEP Newsletter: Water Saving Tips; Recycled Water Truck Program* • September - Recognize new WaterSmart Business Certification Awardees
Cities and civic groups, other public agencies	• Encourage stakeholder groups to assist with public knowledge of drought by providing information and resources to key organizations and individuals.	• *2/13 - BOD President letters on shortage; offer of presentations* • *4/23 – BOD President letter reporting Board's water shortage actions* • Ongoing- Track outreach conducted by District's Speaker's Bureau

Audience	Objective	Actions/Status
		• Ongoing- Expanded community fair and event participation • Ongoing- Partner with other agencies to promote conservation messages • Ongoing- Outreach to large employers for employee education on water saving tips (ongoing)
Schools	• Send a flyer offering free classroom materials Collaborate with Kid Scoop News periodical for 2nd thru 6th grades. • Provide classroom water supply and conservation presentations. • Work with universities and city colleges on campus conservation outreach efforts.	• *April – semi-annual flyer mailed to schools* • *Jan-Feb - Sponsored and developed two Kid Scoop news articles* • May-June- Sponsoring and developing additional Kid Scoop news articles • Ongoing- look for opportunities to work with universities and colleges on conservation outreach activities.
Billboards	• Oakport billboard: "Leak is a Four Letter Word" • Wastewater billboard: Save Our Water	• *3/14 – put in place* • *4/1-4/30 – completed* • Use additional Clear Channel credits for summer or fall messages
Employees	• Make it easy for EBMUD employees to stay up to date on the latest news about the water shortage	• *1/8 - Alert to employees re: drought in the news; water supply plans* • *2/11 General Manager's email to staff re: 10 percent voluntary* • *3/3 - Update to staff on Customer Service leak hotline message* • *3/11- GM email to staff re: water shortage update and Board action* • *3/13 - Drought overview for employees on local boards and commissions* • *4/4 - Splashes in-depth feature on Freeport startup* • *4/22 - GM announcement to staff regarding supply status* • *4/22 - Updated Water Conservation home page on intranet launch pad* • *Ongoing - regular updates in Splashes* • *Ongoing - intranet "drought central" tool for employee use*
District leaks search	• Help customers understand pipe flushing. • Continue/enhance distribution system pipeline leak identification and repairs. • Install data loggers at selected locations to monitor water use.	• *2/11 - Signage developed in last drought for field use back in use* • *4/8 - Agenda item recommending purchase of more data loggers approved* • Summer 2014 - Grant-funded Fixed Network Leak Detection Pilot Study Notice to Proceed to be issued and data collection to be initiated

Audience	Objective	Actions/Status
District rec areas/bldgs.	• Promote fix-a-leak weak campaign.	• *3/17 - Distributed handouts at Lafayette, San Pablo and Admin Building*
Car washes	• Promote use of car washes • Include in tips	• Ongoing- Encourage use of commercial car washes for water recycling
District Vehicles	• Promote leak repair	• May 2014 - Develop "LEAK is a 4-letter word" bumper sticker for fleet use

Executive Department

State of California

A PROCLAMATION OF A CONTINUED STATE OF EMERGENCY

WHEREAS on January 17, 2014, I proclaimed a State of Emergency to exist in the State of California due to severe drought conditions; and

WHEREAS state government has taken expedited actions as directed in that Proclamation to minimize harm from the drought; and

WHEREAS California's water supplies continue to be severely depleted despite a limited amount of rain and snowfall since January, with very limited snowpack in the Sierra Nevada mountains, decreased water levels in California's reservoirs, and reduced flows in the state's rivers; and

WHEREAS drought conditions have persisted for the last three years and the duration of this drought is unknown; and

WHEREAS the severe drought conditions continue to present urgent challenges: water shortages in communities across the state, greatly increased wildfire activity, diminished water for agricultural production, degraded habitat for many fish and wildlife species, threat of saltwater contamination of large fresh water supplies conveyed through the Sacramento-San Joaquin Bay Delta, and additional water scarcity if drought conditions continue into 2015; and

WHEREAS additional expedited actions are needed to reduce the harmful impacts from the drought as the state heads into several months of typically dry conditions; and

WHEREAS the magnitude of the severe drought conditions continues to present threats beyond the control of the services, personnel, equipment, and facilities of any single local government and require the combined forces of a mutual aid region or regions to combat; and

WHEREAS under the provisions of section 8558(b) of the Government Code, I find that conditions of extreme peril to the safety of persons and property continue to exist in California due to water shortage and drought conditions with which local authority is unable to cope; and

WHEREAS under the provisions of section 8571 of the Government Code, I find that strict compliance with the various statutes and regulations specified in this proclamation would prevent, hinder, or delay the mitigation of the effects of the drought.

NOW, THEREFORE, I, EDMUND G. BROWN JR., Governor of the State of California, in accordance with the authority vested in me by the Constitution and statutes of the State of California, including the Emergency Services Act and in particular Government Code section 8567, do hereby issue this Executive Order, effective immediately, to mitigate the effects of the drought conditions upon the people and property within the State of California.

IT IS HEREBY ORDERED THAT:

1. The orders and provisions contained in Proclamation No. 1-17-2014, dated January 17, 2014, remain in full force and effect except as modified herein.

2. The Department of Water Resources and the State Water Resources Control Board (Water Board) will immediately and expeditiously process requests to move water to areas of need, including requests involving voluntary water transfers, forbearance agreements, water exchanges, or other means. If necessary, the Department will request that the Water Board consider changes to water right permits to enable such voluntary movements of water.

3. Recognizing the tremendous importance of conserving water during this drought, all California residents should refrain from wasting water:

   a. Avoid using water to clean sidewalks, driveways, parking lots and other hardscapes.
   b. Turn off fountains and other decorative water features unless recycled or grey water is available.
   c. Limit vehicle washing at home by patronizing local carwashes that use recycled water.
   d. Limit outdoor watering of lawns and landscaping to no more than two times a week.

   Recreational facilities, such as city parks and golf courses, and large institutional complexes, such as schools, business parks and campuses, should immediately implement water reduction plans to reduce the use of potable water for outdoor irrigation.

   Commercial establishments such as hotel and restaurants should take steps to reduce water usage and increase public awareness of the drought through measures such as offering drinking water only upon request and providing customers with options to avoid daily washing of towels or sheets.

   Professional sports facilities, such as basketball arenas, football, soccer, and baseball stadiums, and hockey rinks should reduce water usage and increase public awareness of the drought by reducing the use of potable water for outdoor irrigation and encouraging conservation by spectators.

   The Water Board shall direct urban water suppliers that are not already implementing drought response plans to limit outdoor irrigation and other wasteful water practices such as those identified in this Executive Order. The Water Board will request by June 15 an update from urban water agencies on their actions to reduce water usage and the effectiveness of these efforts. The Water Board is directed to adopt emergency regulations as it deems necessary, pursuant to Water Code section 1058.5, to implement this directive.

   Californians can learn more about conserving water from the Save Our Water campaign (SaveOurH2O.org).

4. Homeowners Associations (commonly known as HOAs) have reportedly fined or threatened to fine homeowners who comply with water conservation measures adopted by a public agency or private water company. To prevent this practice, pursuant to Government Code section 8567, I order that any provision of the governing document, architectural or landscaping guidelines, or policies of a common interest development will be void and unenforceable to the extent it has the effect of prohibiting compliance with the water-saving measures contained in this directive, or any conservation measure adopted by a public agency or private water company, any provision of Division 4, Part 5 (commencing with section 4000) of the Civil Code notwithstanding.

5. All state agencies that distribute funding for projects that impact water resources, including groundwater resources, will require recipients of future financial assistance to have appropriate conservation and efficiency programs in place.

6. The Department of Fish and Wildlife will immediately implement monitoring of winter-run Chinook salmon in the Sacramento River and its tributaries, as well as several runs of salmon and species of smelt in the Delta as described in the April 8, 2014 Drought Operations Plan.

7. The Department of Fish and Wildlife will implement projects that respond to drought conditions through habitat restoration and through water infrastructure projects on property owned or managed by the Department of Fish and Wildlife or the

Department of Water Resources for the benefit of fish and wildlife impacted by the drought.

8. The Department of Fish and Wildlife will work with other state and federal agencies and with landowners in priority watersheds to protect threatened and endangered species and species of special concern and maximize the beneficial uses of scarce water supplies, including employment of voluntary agreements to secure instream flows, relocation of members of those species, or through other measures.

9. The Department of Water Resources will expedite the consideration and, where appropriate, the implementation, of pump-back delivery of water through the State Water Project on behalf of water districts.

10. The Water Board will adopt statewide general waste discharge requirements to facilitate the use of treated wastewater that meets standards set by the Department of Public Health, in order to reduce demand on potable water supplies.

11. The Department of Water Resources will conduct intensive outreach and provide technical assistance to local agencies in order to increase groundwater monitoring in areas where the drought has significant impacts, and develop updated contour maps where new data becomes available in order to more accurately capture changing groundwater levels. The Department will provide a public update by November 30 that identifies groundwater basins with water shortages, details remaining gaps in groundwater monitoring, and updates its monitoring of land subsidence and agricultural land fallowing.

12. The California Department of Public Health, the Office of Emergency Services, and the Office of Planning and Research will assist local agencies that the Department of Public Health has identified as vulnerable to acute drinking water shortages in implementing solutions to those water shortages.

13. The Department of Water Resources and the Water Board, in coordination with other state agencies, will provide appropriate assistance to public agencies or private water companies in establishing temporary water supply connections to mitigate effects of the drought.

14. For the protection of health, safety, and the environment, CAL FIRE, the Office of Emergency Services, the Department of Water Resources, and the Department of Public Health, where appropriate, may enter into contracts and arrangements for the procurement of materials, goods, and services necessary to quickly mitigate the effects of the drought.

15. Pursuant to the drought legislation I signed into law on March 1, 2014, by July 1, 2014, the California Department of Food and Agriculture, in consultation with the Department of Water Resources and Water Board, will establish and implement a program to provide financial incentives to agricultural operations to invest in water irrigation treatment and distribution systems that reduce water and energy use, augment supply, and increase water and energy efficiency in agricultural applications.

16. To assist landowners meet their responsibilities for removing dead, dying and diseased trees and to help landowners clear other trees and plants close to structures that increase fire danger, certain noticing requirements are suspended for these activities. Specifically, the requirement that any person who conducts timber operations pursuant to the exemptions in Title California Code of Regulations sections 1038 (b) and (c) submit notices to CAL FIRE under the provisions of Title 14, California Code of Regulations, section 1038.2 is hereby suspended. Timber operations pursuant to sections 1038(b) and (c) may immediately commence operations upon submission of the required notice to CAL FIRE and without a copy of the Director's notice of acceptance at the operating site. All other provisions of these regulations will remain in effect.

17. The Water Board will adopt and implement emergency regulations pursuant to Water Code section 1058.5, as it deems necessary to prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water, to promote water recycling or water conservation, and to require curtailment of diversions when water is not available under the diverter's priority of right.

18. In order to ensure that equipment and services necessary for drought response can be procured quickly, the provisions of the Government Code and the Public Contract Code applicable to state contracts, including, but not limited to, advertising and competitive bidding requirements, are hereby suspended for directives 7 and 14. Approval by the Department of Finance is required prior to the execution of any contract entered into pursuant to these directives.

19. For several actions called for in this proclamation, environmental review required by the California Environmental Quality Act is suspended to allow these actions to take place as quickly as possible. Specifically, for actions taken by state agencies pursuant to directives 2, 3, 6–10, 13, 15, and 17, for all actions taken pursuant to directive 12 when the Office of Planning and Research concurs that local action is required, and for all necessary permits needed to implement these respective actions, Division 13 (commencing with section 21000) of the Public Resources Code and regulations adopted pursuant to that Division are hereby suspended. The entities implementing these directives will maintain on their websites a list of the activities or approvals for which these provisions are suspended. This suspension and that provided in paragraph 9 of the January 17, 2014 Proclamation will expire on December 31, 2014, except that actions started prior to that date shall not be subject to Division 13 for the time required to complete them.

20. For several actions called for in this proclamation, certain regulatory requirements of the Water Code are suspended to allow these actions to take place as quickly as possible. Specifically, for actions taken pursuant to directive 2, section 13247 of the Water Code is suspended. The 30-day comment period provided in section 1726(f) of the Water Code is also suspended for actions taken pursuant to directive 2, but the Water Board will provide for a 15-day comment period. For actions taken by state agencies pursuant to directives 6 and 7, Chapter 3 of Part 3 (commencing with section 85225) of the Water Code is suspended. The entities implementing these directives will maintain on their websites a list of the activities or approvals for which these provisions are suspended.

I FURTHER DIRECT that as soon as hereafter possible, this Proclamation shall be filed in the Office of the Secretary of State and that widespread publicity and notice be given to this Proclamation.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 25th day of April, 2014

EDMUND G. BROWN JR.
Governor of California

ATTEST:

DEBRA BOWEN
Secretary of State

Marin Municipal Water District

Marin Municipal Water District. January 21, 2014. Resolution No. 8251 – A Resolution of the Board of Directors of the Marin Municipal Water District Calling for 25% Voluntary Water Usage Reduction and Activating Phase I of the District's Water Shortage Contingency Plan.

RESOLUTION NO. 8251

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE MARIN MUNICIPAL WATER DISTRICT CALLING FOR 25% VOLUNTARY WATER USAGE REDUCTION AND ACTIVATING PHASE I OF THE DISTRICT'S WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the State of California is experiencing record dry conditions, with 2013 being the driest year on record; and

WHEREAS, a high pressure ridge causing these extremely dry conditions has been stalled over the State of California for the last 13 months and is projected to persist for several weeks and could persist for much longer; and

WHEREAS, average rainfall in Marin County is approximately 52 inches; and

WHEREAS, calendar year rainfall in Marin County from January through December 13, 2013 at Lake Lagunitas was 10.68 inches, the driest in recorded history going back to 1879; and

WHEREAS, the District's Urban Water Management Plan (UWMP) contains water shortage contingency planning that is tied to Chapter 13.02 of the District's Code which was adopted in 1999 and contains trigger points for voluntary and mandatory water rationing based upon reservoir levels; and

WHEREAS, Chapter 13.02 calls for voluntary 10% water use reductions when District reservoir storage levels are below 50,000 acre feet (AF) on April 1; 25% mandatory water use reductions when District reservoir storage levels are below 40,000 AF on April 1 and 50% mandatory water usage reduction when reservoir storage levels on December 1 are projeeted to be in the vicinity or less than 30,000 AF; and

WHEREAS, the purpose of the contingency plan contained in Chapter 13.02, as described in the staff report that accompanied that item was designed to "...provide some guidance to decision makers, not to limit their options;" and

WHEREAS, as of January 16th, District reservoir storage is 43,600 AF, well below the District average of 62,300 AF and the 79,500 AF of storage in District reservoirs at this same time last year; and

WHEREAS, with reservoir levels below 50,000 AF, preservation of the District's water supply is essential to District customers and conservation actions taken now by District consumers can minimize the reduction in reservoir storage levels and conserve water for future use; and

WHEREAS, on January 17, 2014 Governor Jerry Brown proclaimed a state of emergency to exist in the State of California due to current drought conditions and has asked all Californians to reduce their water usage by 20 percent; and

WHEREAS, the Governor's Proclamation of a State of Emergency highlighted the fact that "...extremely dry conditions have persisted since 2012 and may continue beyond this year and more regularly into the future, based on scientific projections regarding the impact of climate change on California's snowpack;" and

WHEREAS, the Board has determined that given all of the above described considerations, extra vigilant measures are necessary by District customers until the current weather conditions have abated.

NOW, THEREFORE, THE BOARD OF DIRECTORS RESOLVES AS FOLLOWS:

1. In an effort to preserve the District's limited water supply and maximize the time frame for customers to do so, the Board is activating Phase 1, an early voluntary phase, of its water shortage contingency planning and is calling for District customers to voluntarily reduce their water usage by 25 percent.

2. The Board acknowledges the ongoing conservation efforts of customers currently using 6 CCFs per month (1 CCF equals 748 gallons) or less and appreciates their contributions to conserving and preserving our available water supplies. These customers with very low water usage are encouraged to continue their efforts and look for ways to lower usage.

3. The Board is asking all District customers to be judicious and prudent with every gallon of water used and to voluntarily turn off outdoor irrigation systems and minimize outdoor watering.

4. The Board and staff are committed to working with customers to lower water usage by 25 percent. The Board is calling all customers to exercise the top ten ways to save water by:

    a. Checking for leaks and repairing them immediately.
    b. Turning off automatic sprinkler systems and watering plants only as needed.
    c. Checking water pressure and installing pressure-compensating faucet aerators and showerheads.
    d. Checking water meters and learning to read it and spotting unusual usage and leaks.
    e. Participating in the District's free conservation programs; for example, calling and requesting a conservation assistance program audit of water usage in homes.
    f. Installing high-efficiency WaterSense-labeled toilets.
    g. Installing a high-efficiency clothes washer.
    h. Installing a WaterSense labeled smart irrigation controller.
    i. Adding compost and mulch to gardens.
    j. Making consumer gardens water-smart.

5. District Staff is directed to:

   a. Send a letter to all District customers advising them of the Board's call for the water usage reductions described above, asking for their cooperation and educating them on the top ten ways to save water.

   b. Provide customers with weekly updates on the drought conditions, District reservoir storage levels and any anticipated changes through local and social media and the District's website.

   c. Take a multi-faceted approach to resolving both short and long term water supply shortages by working with sister agencies for additional supply through interconnections, exploring any appropriate water transfers that may be available, closely monitoring the supply to determine if the reduction and or rationing triggers contained in Chapter 13.2 of the District Code need to be implemented and continue to the keep the Board updated on the status of staff's progress.

6. The Board recognizes that weather conditions could change and intends to be agile in its approach and response to dealing with the drought and any changes in weather conditions.

7. The Board thanks District customers for their anticipated cooperation and fully understands that it will take all of us, customers, staff and the Board to successfully navigate this situation.

PASSED AND ADOPTED this 21st day of January 2014 by the following vote of the Board.

AYES: Directors Crosse, Gibson, Koehler, Quintero and Russell

NOES: None

ABSENT: None

Armando Quintero
President, Board of Directors

ATTEST:

Secretary

San Francisco Public Utilities Commission

San Francisco Public Utilities Commission. January 31, 2014. San Francisco Public Utilities Commission Formally Requests Customers Voluntarily Curtail Water Use – Goal is to Reduce System-Wide Usage by 10%.

Ritchie, S. R., Assistant General Manager, Water, San Francisco Public Utilities Commission. May 7, 2014. Letter to SFPUC Wholesale Customers Re: Implementing Governor Brown's April 25 Proclamation on Drought.

Office of the Mayor, City and County of San Francisco. February 10, 2014. Executive Directive 14-01 – Water Conservation – City Departments.

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

525 Golden Gate Avenue, 12th Floor
San Francisco, CA 94102
T 415.554.3289
F 415.554.3161
TTY 415.554.3488

NEWS Release (Release No. 3-14)

Contact: Tyrone Jue
415-554-3247; 415-290-0163(cell)

FOR IMMEDIATE RELEASE
Friday, January 31, 2014

San Francisco Public Utilities Commission Formally Requests Customers Voluntarily Curtail Water Use

Goal is to Reduce System-Wide Usage by 10%

San Francisco, CA – Today, the San Francisco Public Utilities Commission (SFPUC) officially asked customers of the Hetch Hetchy Regional Water System to voluntarily curtail water consumption by at least 10%. With drought-like conditions being the worst in recorded California history, voluntary water conservation is the first step in stretching available water supplies. While the request is voluntary, it takes effect immediately and will apply to all residential, commercial, industrial, municipal and wholesale customers that receive water from the Hetch Hetchy Regional Water System.

"Over the past ten years we have strengthened our water system, upgraded critical facilities and diversified supplies in order to prepare for this very moment," said San Francisco Mayor Ed Lee. "Our users have been extremely prudent in their water use. Still, given the severity of the drought this year, we need every Hetch Hetchy customer to do a little more to conserve water."

Within the next two weeks, Mayor Lee will also be issuing an executive order to San Francisco city departments outlining strategies and requirements to further curtail municipal water use. Since the last request for 10% voluntary rationing in 2007, San Francisco city departments have successfully reduced consumption by 22% overall.

Precipitation in regional system watersheds to date is only 25% of normal, the worse that it's been in recorded history.

Drought or not, customers are always asked to conserve water. The SFPUC, in concert with the Bay Area Water Supply and Conservation Agency (BAWSCA), which represents the 26 wholesale customers of the Hetch Hetchy Regional Water System, will be working to develop a regional public education campaign to heighten awareness and encourage water conservation. To date, existing water conservation efforts throughout the system have been very successful in reducing water consumption despite a growing Bay Area population.

"BAWSCA supports the SFPUC's call for a voluntary 10% reduction. With long-range forecasts offering little respite from the dry weather, voluntary conservation efforts are the best way to reduce the likelihood of mandatory cutbacks and other water restrictions," said Nicole Sandkulla, Chief Executive Officer of BAWSCA. "Building upon our award-winning water conservation program, BAWSCA and the wholesale customers are committed to doing their part to respond to the SFPUC's request."

Edwin M. Lee
Mayor

Vince Courtney
President

Ann Moller Caen
Vice President

Francesca Vietor
Commissioner

Anson Moran
Commissioner

Art Torres
Commissioner

Harlan L. Kelly, Jr.
General Manager

Voluntary conservation does have the potential for unintended financial consequences. A 10% reduction in water usage will translate into a 10% decline in water revenue. Additionally, since sewer rates are directly tied to water usage, sewer revenue will also decline. Finally, with less water, the Hetch Hetchy hydroelectric powerhouses will produce and sell less power. At this time, the SFPUC is not planning to adjust current or future rates because of the drought. Rather, the SFPUC will implement fiscal austerity measures, much like what it did during the last dry spell.

San Francisco is already very water wise. Residents on average use 49 gallons per day, one of the lowest daily residential consumption figures in the state.

“Water supports life and our economy. Whether you are a homeowner, renter, business or government agency, every person needs to do their part to conserve today,” said Harlan Kelly, Jr., General Manager of the San Francisco Public Utilities Commission. “Every water drop saved today is truly a drop saved for the future. And there simply won’t be a future without water.”

Below are some water-saving tips that can be easily implemented today:

1. Turn off the faucet when you are brushing your teeth or doing the dishes - saves 2 gallons per minute.

2. Take shorter showers with high-efficiency showerheads. Each minute you cut saves 2.5 gallons.

3. Operate washers with full loads even if machines have varied settings.

4. Use a broom to clean sidewalks and pavement instead of a hose.

5. Reduce watering by planting species appropriate for the climate.

6. Water during the cool part of the day. Reduce evaporation by watering lawns and plants only at night or early morning before dawn.

7. Detect leaks. Do you hear the toilet running or your faucet dripping? Contact us or your local water agency for information on locating your water meter and detecting plumbing leaks using meter readings. Conduct a dye-test in toilet tanks to identify silent leaks.

8. Install aerators on bathroom/kitchen sinks to reduce water use by 4%.

9. Replace your old toilet, the largest water user inside your home. New high-efficiency toilet models flush at 1.3 gallons or less compared to older models, which use up to 7 gallons per flush. Bay Area water agencies offer rebates for the purchase of select high-efficiency toilets.

10. Replace your clothes washer, the second largest water user in your home. High-efficiency clothes washers can reduce water and energy use by 40%. Bay Area water agencies offer cash rebates.

All San Francisco residents can receive free, water-efficient kitchen sink aerators and showerheads just by walking into 525 Golden Gate Avenue with proof of address, Monday through Friday, 8:00 a.m. – 5:00 p.m. It’s that easy.

For water supply updates and additional specific information about water conservation rebates offered by the SFPUC and BAWSCA, please visit www.sfwater.org/supplyupdate and www.BAWSCA.org.

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San Francisco
Water Power Sewer
Operator of the Hetch Hetchy Regional Water System

525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102
T 415.554.3155
F 415.554.3161
TTY 415.554.3488

TO: SFPUC Wholesale Customers

FROM: Steven R. Ritchie, Assistant General Manager, Water

DATE: May 7, 2014

RE: Implementing Governor Brown's April 25 Proclamation on Drought

As we noted in our Water Supply Availability Update on April 15, SFPUC's request for voluntary 10 percent reduction continues to be in effect. We are in a drought of statewide significance and we need to preserve water supplies in storage in the event that subsequent years of drought conditions persist.

Underscoring the statewide importance of the drought, Governor Brown issued an Proclamation of a Continued State of Emergency on April 25, 2014 (see http://ca.gov/drought/topstory/top-story-6.html for full text). We encourage our customers to implement the measures recommended by the Governor, which include:

- Limiting lawn and outdoor plant watering to two days a week
- Not washing sidewalks and driveways with water
- Turning off fountains
- Washing cars only at car washes that use recycled water
- Implementing water use reduction plans at schools, parks and golf courses
- Asking restaurants, hotels and other businesses to build awareness of the drought and reduce water usage by measures such as only serving water upon request

Also note that the Governor prohibited Home Owner Associations from fining residents who conserve water by reducing lawn watering and pursuing other water conservation measures.

Though our customers have demonstrated a commitment to water conservation and adopting best practices for water use, our water delivery tracking indicates that we have yet to maintain our reduction target. Our deliveries tend to increase during the warm and dry weeks and drop during rain events. In fact, last week deliveries increased by more than 10% due to the warm weather. With the higher water demand season approaching, we expect to see some increase in demand, so we need our customers to be exceptionally water wise to meet the delivery reduction targets.

We will revisit our water use reduction request on June 15th to determine if the 10% voluntary reduction is sufficient. Thank you for your efforts to conserve water in this exceptionally dry year.

cc: Nicole Sandkulla, CEO/General Manager, BAWSCA

Edwin M. Lee
Mayor

Vince Courtney
President

Ann Moller Caen
Vice President

Francesca Vietor
Commissioner

Anson Moran
Commissioner

Art Torres
Commissioner

Harlan L. Kelly, Jr.
General Manager

Office of the Mayor
City & County of San Francisco

Edwin M. Lee

Executive Directive 14-01
Water Conservation – City Departments
February 10, 2014

San Francisco is a leader in using water wisely. Our citizens have some of the lowest water use in California, and the City has taken steps to help residents and businesses become even more efficient in their water use. In 2009, the City and County of San Francisco passed two water conservation ordinances for residential and commercial properties to install high-efficiency plumbing fixtures. The San Francisco Public Utilities Commission (SFPUC) offers financial incentives and technical assistance to replace inefficient plumbing fixtures for retail water customers. Additionally, San Francisco is diversifying our water supply by developing groundwater and recycled water.

Snowmelt from the Sierra Nevada is the primary drinking water source for 2.6 million people in the Bay Area. In 2013, California experienced one of the driest years on record, setting the stage for reduced water storage levels and possible first year drought conditions. These conditions have persisted in 2014, which could be the driest water year in the state's history. Precipitation has been less than 10 percent of normal so far for the year. After two years of below-average rainfall in California, Governor Jerry Brown declared a statewide drought in January 2014.

Given the current conditions in California, the City and County of San Francisco is requesting its water customers to reduce overall water consumption by 10 percent. Reducing water usage is essential to stretching our water supplies during this time of drought.

City agencies have made great strides to use less water. Since the last period of voluntary rationing in 2007, water use by City departments has declined by 22%. While many departments have implemented water conservation measures, there is still room to improve and save more water. Therefore, with this Executive Directive, I am outlining actions City departments should pursue to further reduce their consumption of water.

Further reduce consumption by 10 percent. All departments are directed to take steps immediately to reduce their water consumption with a goal of achieving a 10 percent reduction. Department heads are requested to report innovative conservation strategies to the SFPUC (contacts below) for the purpose of sharing best practices with other Departments. This reporting will be voluntary.

Develop a Water Conservation Plan. By August 1, 2014 all departments shall develop a Water Conservation Plan that includes:

- A departmental contact for water conservation efforts.
- An inventory of all departmental plumbing fixtures and their flow rates, including toilets, urinals, faucets, and showerheads.
- Timeline for retrofitting inefficient plumbing fixtures with high-efficiency models.
- A list of best management practices that departments will implement to achieve water-efficient operations and maintenance of parks, medians and other irrigated landscapes.

1 Dr. Carlton B. Goodlett Place, Room 200, San Francisco, California 94102-4641
(415) 554-6141

Educate staff and visitors on water conservation practices. Effective immediately, all departments shall educate employees and facility visitors about the efficient use of water at City facilities and the need to conserve.

Explore the use of non-potable water for street cleaning. City departments should explore the feasibility of replacing potable water with non-potable water sources for street cleaning.

Develop alternative sources of water supply. The SFPUC is directed to develop alternative sources of water supplies for both potable and non-potable uses. All departments shall cooperate with the SFPUC in developing these alternative water supplies. These alternatives shall include, but not be limited to: Cherry Lake; groundwater; recycled water; and foundation drainage.

The SFPUC can provide departments with assistance to comply with this Executive Directive. Please contact Steven Ritchie, Assistant General Manager, SFPUC (415-934-5736, sritchie@sfwater.org) or Paula Kehoe, Director of Water Resources, SFPUC (415-554-0792, pkehoe@sfwater.org).

This Executive Directive shall be effective immediately, and remain in place until rescinded or amended by future Directive.

Edwin M. Lee
Mayor, City & County of San Francisco

San Mateo County RCD

Cuesta La Honda Guild. March 7, 2014. Letter to Guild Members and Water Account Holders.

_____. April 16, 2014. Official Notice of the Cuesta La Honda Guild – April General Membership Meeting.

Fulwiler, J., Stetson Engineers Inc., Watermaster for San Gregorio Creek. March 13, 2014. Letter to Water User Re: San Gregorio Creek Water Availability – Request for Voluntary Reductions in Diversions.

_____. May 16, 2014. Letter to Water Users Re: San Gregorio Creek Water Availability – Notice to 2nd Priority Water Users to Reduce Diversions.

County of San Mateo Department of Public Works. January 31, 2014. Water Conservation Alert!!! Letter to CSA-7 Water System Customers Re: Water Conservation in CSA-7.

_____. June 6, 2014. Potential Water Shortage!!! Conservation Needed!!! Letter to CSA-7 Water System Customers Re: Water Conservation in CSA-7.

March 7, 2014

Dear Guild Members and Water Account Holders,

As the third year of record-low rainfall begins, the Guild is taking several steps to manage our water supply until the next rainy season and beyond.

Members of the Water Resources Committee have made a model of water diversion, storage and use to assess if we are in immediate danger of running critically low on water, and, if current weather patterns continue, how long supplies might last. The two creeks from which we divert our raw water, Mindego and Woodhams, have had low but steady flows since last spring. At these flows, Cuesta would be able to meet typical water use year-round, although the reserves in our reservoirs would be lower than normal. However, we do not know if those flows will indeed continue or if they may drop if rainfall remains low. If supply in these creeks drops, conservation efforts will be required to avoid a critical shortage. For example, if creek flow drops 50% over the next year, and if we continue to use water at current rates, we project a shortage by the fall of 2015. However, under the same scenario, a 20% reduction in water use would assure supply through 2015 until the next wet season. If we are lucky, next year will bring more rain – but we may not be lucky.

This colorful sign, painted by LH resident at the request of the CLHG Board, may be repainted and moved occasionally.

The good news: Many La Honda residents already have begun to conserve water aggressively. Voluntary conservation in late January and early February has reduced average use by about 25-30%. Please keep up the good work!

7655 Redwood Blvd., #100, Novato, CA 94945 • P: 866-473-2573 • F: 415-367-9045 • service@realmanage.com

To maintain a sufficient supply, we need to keep conserving water by at least 20% throughout the year. That is why, on February 19, the Board adopted an emergency water rationing measure to halve the current allotment per account (the amount included in your monthly Guild payment) to 600 cubic feet / month (from 1200 cubic feet / month), and to charge for any amounts above the basic allocation according to a new tiered-pricing plan. The plan will go into effect after **a 15-day comment period. It will remain in effect for up to 120 days, although the Board will be continually reevaluating and might adjust the policy.**

Recent rain has lifted our total rainfall during July-February from 20% to 30% of the 20-year median – still well below normal. Many La Honda residents have expressed their deep concern for stretching our water supply through the year. Thank you -- and keep using water carefully!

Sincerely,
The Cuesta La Honda Guild Board of Directors

MOTION ADOPTED BY CUESTA LA HONDA GUILD BOARD OF DIRECTORS FEBRUARY 19, 2014

To adopt a water-rationing program per the provisions of Civil Code 4360, Section d, and the rule change will suspend the existing monthly allotment and water over-usage fees of Operating Procedure 304.4, to be replaced by a new allotment and fee schedule to be determined by the Board. The rationing program will start April 1, after meter readings are accomplished, and will remain in place for 120 days, although throughout that period the term and rates will be subject to Board review and possible adjustment.
For each service connection, charges will be as follows

Water use per month (cubic feet)	Water use per month (gallons)	Charge per cubic foot	Total additional fee at this rate of water use
up to 600 cubic feet	4,488 gallons, or almost 150 gallons/day in a 30-day month	$0 (this amount comes with your monthly dues)	0
601-800 cubic feet	an additional 1,489 gallons, or about 50 gallons/day in a 30-day month	$0.12	$24
801-1000 cubic feet	an additional 1,489 gallons, or about 50 gallons/day in a 30-day month	$0.25	$74
1001-1200 cubic feet	an additional 1,489 gallons, or about 50 gallons/day in a 30-day month	$0.35	$144
Greater than 1,200 cubic feet		$0.50	$0.50 per additional cubic foot

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Q&A ABOUT WATER ISSUES, SPRING 2014

How do I submit a comment during the 15-day comment period?

- Email the Guild's RealManage Manager, Vicki Lynch service@ciramail.com
- Drop a letter in the door slot of the Guild office. Carroll Kelly is in the Guild Office Thursday and Friday, 12-4 PM
- Email or call a member of the Board.

If I have a problem with my bill, what do I do?

- Email the Guild's RealManage Manager, Vicki Lynch service@ciramail.com Call RealManage at 1-888-473-2573 and ask to be referred to Vicki Lynch

How many people are affected by the tiered pricing plan?

Only people who have Guild water accounts. The Guild has almost 300 accounts. They include Apple Jack's, the Fire Brigade and La Honda Elementary. LHE will be subject to water use specifications that are geared to the school's needs and the technical requirements of serving the location. Judging from the Guild's experience with the same tiered-pricing plan during the dry fall of 2008, most La Honda residents should be able easily to adjust to using up to or less than the 600-cubic-foot / account / month (4,488 gallons / account / month) allotment.

Is the Guild fixing its own leaks?

Yes! We are always looking out for leaks. If you see one, please call Peter Lyon, the Guild's Public Works Manager, at 650-773-9097.

If I see a couple of workers flushing water from a hydrant, what is going on?

Hydrants are flushed on a regular basis in order to eliminate build-ups of harmful chemicals, which are produced when chlorinated water stagnates. Even in a drought, flushing must continue to maintain safe levels of disinfection chemicals in the water.

WHAT CAN I DO TO CONSERVE WATER?

Indoors

- **Never put water down the drain** when there may be another use for it, such as for cleaning, or for watering a potted plant or plants in your garden.
- **Repair dripping faucets** by replacing washers. If your faucet is dripping at the rate of one drop per second, the accumulated waste will be 2,700 gallons per year.
- Take **shorter showers.** Replace your showerhead with a low-flow version.

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- **Don't let water run** while shaving or washing your face or brushing your teeth. If you need hot water, heat it up on the stove first, or save in a pan or in the basin the cold water that first comes out of the tap.
- **Operate dishwashers and clothes washers only when they are fully loaded,** or properly set the water level for the size of load you are using.
- **When washing dishes by hand,** fill one sink or basin with soapy water. Quickly rinse under a slowly moving stream from the faucet.
- **Store drinking water in the refrigerator** rather than letting the tap run every time you want a cool glass of water.
- **Kitchen sink disposals require lots of water** to operate properly. Instead of using a garbage disposal, start a compost pile as an alternate method of disposing of food waste.

PLEASE FIX LEAKS PROMPTLY

- A **slow drip** that produces 1 gallon per hour produces 720 gallons per month.

- **Leaking toilets** can use several hundreds of gallons a month. To test your toilet: Put a few drops of food coloring in your tank. If the color appears in the bowl, there's a leak. Replace flapper and other parts until leak stops.

- **Please look around your house for damp spots on the ground where a pipe might be leaking.** If you spot a damp spot in the roadways or on the ground up to and including your meter box, call Peter Lyon at 773-9097. If you spot a damp spot after the meter box or in your yard, most likely it is your own service line and you may need a plumber. If you are not sure where the water is leaking from, call Peter. The Public Works team will be happy to assist in the determination of the source of the leak.

Consider turning off home reserve osmosis filters until the drought ends: Reserve osmosis filters produce only 1 gallon of clean water for every 10 gallons processed. That means 9 gallons go to your septic tank. Please consider turning off a reserve osmosis filter – or using it sparingly – until the drought ends.

Outdoors

- **Don't overwater your lawn.** As a general rule, lawns only need watering every 5-7 days in summer and every 10-14 days in winter. A hearty rain eliminates the need for watering for as long as 2 weeks. Water lawns during the early morning hours when temperatures and wind speed are the lowest. This reduces losses from evaporation.
- **Raise the lawn mower blade to at least 3 inches.** A lawn cut higher encourages grass roots to grow deeper, shades the root system and holds soil moisture better than a closely clipped lawn.
- **Mulch to retain moisture** in the soil. Mulching also helps to control weeds that compete with plants for water.

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- **Do not hose down your driveway or sidewalk.** Use a broom to clean off leaves and other debris.
- **Do not leave sprinklers or hoses unattended.** Your garden hoses can pour out 600 gallons or more in only a few hours, so don't leave the sprinkler running all day. Use a kitchen timer to remind yourself to turn it off.
- **Consider using a commercial car wash** that recycles water. If you wash your own car, park on the grass to do so.
- **Avoid the installation of ornamental water features** (such as fountains) **unless the water is recycled.**
- If you have a swimming pool, **consider a new water-waving pool filter.** A single back-flushing with a traditional filter uses from 180 to 250 gallons or more of water.
- **Use plants in your yard that require little water.** For a list of native plants suitable for growing in La Honda, consult:
    - Master Gardeners of San Mateo and San Francisco Counties (http://smsf-mastergardeners.ucanr.org/)
    - California Native Plant Society (http://www.cnps.org)
    - San Mateo County Resource Conservation District (http://sanmateorcd.org/)
    - local nurseries.
- Other useful websites include:
    - The EPA's Watersense site: http://www.epa.gov/watersense/

HOW MUCH WATER DO I USE?

- Email a request for your water meter readings to the Guild's RealManage Manager, Vicki Lynch service@ciramail.com or call 1-866-473-2573.
- Check your own water meter!

How to check your own water meter:

- There are nine different kinds of meters used in La Honda. The photo shows one type. They all read in cubic feet and all read with one revolution of the "seconds" hand (like an analog clock) equaling one cubic foot or 7.48 gallons

- When no water-using appliances are operating, find your water meter box, open the lid, and look at the meter. It has 6 digits.

- Write down the number on the meter. Look again in a day or week. The difference between the first and second number is your water use over that period of time.

- 1 digit = 1 cubic foot of water = 7.48 gallons

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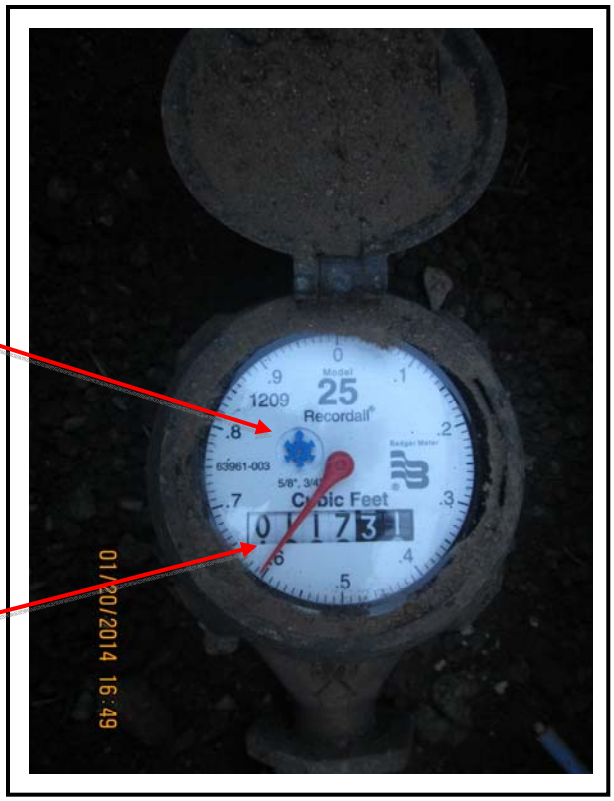
- To reduce water use by 20% or more, keep checking your meter.

  To calculate your use / day: Subtract second reading from the first reading and divide by the number of days

E.g. 011231 - 011216 =

15 cubic feet of water * 7.48 gallons = 112.2 gallons



- Some water meters have ***a leak indicator***: a small red triangle, blue flower or other indicator.
  - If the triangle moves, a water-using appliance is on – or you have a leak!
  - If your meter only has a ***sweep hand,*** make sure your faucets are off, check the sweep hand's position and wait 1/2 hour. The sweep hand should not have moved. If it has moved from perhaps .6 to .7, you have a leak of about 0.1 cubic feet or 1.5 gallons per hour -- a steady drip.
  - If you need assistance reading or finding your meter, please call Garrett Morris at 773-8782 or Will Long at 773-8202.

How much water does the average person use at home per day?

http://water.usgs.gov/edu/qa-home-percapita.html

Bath	A full tub is about 36 gallons.
Shower	2 gallons per minute. Old showerheads use as much as 5 gallons per minute.
Teeth brushing	<1 gallon, especially if water is turned off while brushing. Newer bath faucets use about 1 gallon per minute, whereas older models use over 2 gallons.
Hands/face washing	1 gallon
Face/leg shaving	1 gallon
Dishwasher	4 to 10 gallons/load, depending of efficiency of dishwasher
Dishwashing by hand	20 gallons. Newer kitchen faucets use about 2.2 gallons per minutes, whereas older faucets use more.
Clothes washer	25 gallons/load for newer washers. Older models use about 40 gallons per load.
Toilet flush	3 gallons. Almost all new toilets use 1.6 gallons per flush, but many older toilets used about 4 gallons.
Glasses of water drunk	8 oz. per glass (Did you remember to drink your 8 glasses of water today?)
Outdoor watering	5 to 10 gallons per minute

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APPENDIX: TECHNICAL DETAILS OF MODEL USED FOR CUESTA LA HONDA GUILD WATER SYSTEM

I. Assessment and prediction.

Mike Williams and David Ehrhardt built a model of water diversion, storage and use to assess how the current drought may affect Cuesta's water supply over the next 2 years. The model took into consideration different scenarios for water availability at our three diversion points. It also took into account historic and current patterns of water demand, loss of water by evaporation in storage reservoirs, and limitations of water diversion to direct use and to storage by our riparian rights, license and permits.

i. **Availability.** The major unknown, of course, is water availability in Mindego and Woodhams streams. Until the most recent storms, flow at the Upper Woodhams diversion point had been about 10 gallons per minute since late summer, according to estimates from Public Works staff. In early January, water was diverted from Lower Woodhams at about 11 gallons per minute. Water was not previously diverted from Lower Woodhams because Lower Reservoir is the only receptacle for water from Lower Woodhams, and for many months Lower Reservoir was in the process of being cleaned. Since October 1st, the earliest date when we can begin diverting water from Mindego creek, flow in Mindego and San Gregorio creeks has been below the bypass levels allowed by our permits, but it has been adequate for diversion by our license, which has no bypass requirement. (A "bypass" level is the amount of water that must be allowed to pass by the pump and remain in the waterway.) Thus, diversion has been reported at the full pump rate of approximately 45 GPM.

As a conservative scenario, we ran models that assumed that the drought continues through next year (2015). Since flow in both Woodhams and Mindego is reported to have been relatively steady since October, we are assuming that both systems are likely fed by a number of springs and seeps. We do not know how sustained drought will affect these reserves, but we do not assume that the current flows, while having been relatively steady so far, will go on indefinitely. Thus we assessed scenarios where flow in both systems falls about 50% over the course of each year of sustained drought.

ii. **Demand**. Demand is the second big unknown. As a baseline, we calculated the average water production at the filter treatment plant for each month for 2003-2011. Water production is approximately the same as demand. Although these historic numbers are not perfect, this is our best estimate of anticipated demand in a normal year. However, water use this early winter was significantly higher than it has been in past years. We assume that most of this difference is due to increased water demand because of landscaping use, which is not required in normal, wetter winters. To try and take into account this extra demand for water in a drought year, we built a water demand schedule as follows. We assumed that demand at the height of summer, in August, would be close to the historic rate. To estimate the "extra" demand for landscaping each month

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between January and August, we fit a model where landscape demand goes up linearly with temperature, with August representing peak demand. We call this this estimated schedule "2014 estimated demand without conservation".

iii. Modeling alternative scenarios

(1) **No Conservation.** This scenario, our most pessimistic, used the 2014 estimated demand schedule without conservation and estimates for what could happen if drought continues and no special conservation measures are taken. This scenario resulted in a go-dry date in the summer of 2015. (A "go-dry" date is when the Guild would have to begin purchasing water from an outside supplier.)

(2) **20% reduction of estimated 2014 demand.** In this scenario, the estimated 2014 demand schedule was reduced 20% each month, modeling the effect of conservation measures with a goal of 20% less water use in the community as a whole. This scenario allowed the Guild to avoid importing water in 2015 and to maintain adequate supply into the winter of 2016, which would be the next opportunity for refilling the reservoirs if 2015 is another dry year.

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Cuesta La Honda Guild
Common Interest Development

Professionally managed by RealManage

Official Notice of the Cuesta La Honda Guild April General Membership Meeting

Wednesday, April 16, 2014 – 7:00 PM
The Guild Clubhouse

You are invited to attend the April Membership Meeting of the Cuesta La Honda Guild, a California non-profit Corporation, being held on **Wednesday, April 16, 2014 at 7:00 PM.**

AGENDA

- Confirmation of Quorum of Members
- Call to Order and Welcoming Remarks
- Review of Informational Minutes of the November 2013 General Membership Meeting
- Fall General Membership Meeting Date: Wednesday, November 19, 2014
- Homeowners' Forum
- Financial Report
  - 2014 Budget
  - Current 2014 Balance Sheet
  - CPA 2013 Year End Review
- Recreation Committee Projects
- Pool Season - Pool Opens Saturday, May 24, 2014
- Public Works Projects - Public Works Manager, Peter Lyon
- Water Committee – Drought issues/Water conservation – David Ehrhardt
- Adjourn (Estimate at 8 p.m.)

The Board appreciates your cooperation and involvement and looks forward to seeing you at the **General Membership Meeting, Wednesday, April 16, 2014.** A brief Board Meeting will be held prior to the General Membership Meeting at 6:30 PM, and the Board Meeting will resume after if time allows.

Thank you, Cuesta La Honda Guild Board of Directors

Strong voluntary water conservation allows water rationing to be rescinded.

At the February Board of Directors meeting, the BOD passed a motion to initiate an emergency water-rationing plan for Cuesta La Honda. As explained in a previous mailing, the record drought, combined with unusually high water use in the fall and early part of January, prompted concern that if the drought continues through next year, water demand at these high rates of use would outstrip supply. This concern was supported by modeling water supply over the next two years. The BOD responded by informing the community of the problem, encouraging water conservation, and adopting the rationing plan.

The rationing plan was adopted with the goal of encouraging a reduction in water use by at least 20%. This level of reduction was predicted in the water model to significantly extend the Guild's water supply in the event of sustained drought, getting the system through 2015 to the winter of 2016, provided that stream flow slows but does not stop. The adoption of the conservation plan was also meant to indicate clearly the seriousness of the situation to the community. Fortunately, since public education efforts began, Guild water use has dropped about 30%, exceeding the goal of a 20% reduction. This reduction has been sustained, so at the March meeting, the BOD rescinded the rationing plan for the time being. Good job Cuesta!

It is important that the community understand that this does not mean we are out of the woods. Conservation needs to be continued and increased as warm weather approaches. The Guild is closely monitoring water use, trends in stream flow, and reservoir levels. Changes in water supply or demand may prompt the need for new conservation goals. The BOD would much rather see conservation goals met by voluntary efforts rather than the "big stick" of a rationing plan with a lower base allotment and overuse fees, but it is prepared to implement a rationing plan if voluntary efforts fail to meet those conservation goals.

After the motion passed in February to adopt a rationing plan, the BOD received a number of letters and comments from Guild members. This feedback is valuable for decision makers and we thank the community for their engagement. We would like to take this opportunity to respond to a few of the many good questions that were asked and issues that were raised.

Why was the base allotment in the rationing plan set at 50% of the normal allotment, when the goal is a 20% reduction in use? Designing and implementing a rationing plan is not an exact science. A cutoff level for the base allotment needs to be established and a fee structure designed. The goal is to achieve a certain level of reduced water use, not to achieve a revenue stream. Some customers already use an

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absolute minimum of water, and would have a hard time reducing their use further, while others use more than the base allotment. At the last meter reading, where overall water use was higher than normal, about 80% of Guild water accounts had used 50% or less of the base allotment This was the basis for the 50% percent reduction in the base allotment in the rationing plan.

The USGS estimates that the average water use per person is 80-100 gallons per day. The Guild's proposed base allotment (600 cubic feet per month) would have been less than half of that for a family of four. This would have been be difficult and/or near impossible for a family of 4, and rather impossible for a larger family. The proposed allotment reduction was indeed a tight squeeze for a family of four. It is hard to find a one-size-fits-all solution, which is why, in the event of adopting a mandatory rationing plan, the Board plans to offer a case-by-case appeal process. The USGS data indicated how much water was used per capita, not what a reasonable minimum amount of treated water should be per person. The USGS data for a family of 4 is above the normal allotment in Cuesta. The last time water meters were read, in January, only nine accounts were over the normal allotment. The nine accounts included the Guild's account because of a leak in the pool (which has since been stopped). The point of a rationing plan is to motivate strong water conservation practices, not to impose undue hardship.

It is speculation that next year may be as dry as this year. This is true, but it is also speculation that the weather will return to normal. This drought is unusual in recent history, and there is no way to know if next year will be a return to "normal" or not. Preparing for the possibility of a second dry year is easier if we build raw water reserves now at modest levels of conservation, rather than having to protect those reserves with much deeper cuts in use later.

The proposed conservation plan expires in three months and, if needed, cannot be re-implemented as an emergency measure. While the law allows the BOD to implement a change in fee structure on an emergency basis for three months, it does not permit extending such a change by the same mechanism. That would require a change to the Guild's bylaws. Therefore, the BOD is drafting an amendment to the Guild's bylaws, as part of our Drought Contingency Plan, which would allow for more flexible implementation of a water-rationing plan, should it be need in the future. This amendment will of course be subject to comment and approval by the membership.

Sincerely,

Cuesta La Honda Guild Board of Directors

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STETSON
ENGINEERS INC.

2171 E. Francisco Blvd., Suite K • San Rafael, California 94901
Phone: (415) 457-0701 • FAX: (415) 457-1638 • Web site: www.stetsonengineers.com

Northern California • Southern California • New Mexico • Arizona • Nevada • Colorado

March 13, 2014

Re: San Gregorio Creek Water Availability – Request for Voluntary Reductions in Diversions

Dear Water User:

As you are aware, water flowing in the San Gregorio Creek Stream System is currently well below normal due to limited rainfall received so far this season. This letter is written to request **all water users in the San Gregorio Creek Stream System take immediate actions to increase water conservation efforts** to help maintain flows in the stream system for the benefit of all water right holders, fish, wildlife, and other instream uses.

The 1993 Decree specifies priorities of rights wherein no water user is entitled to divert any water until the allotments to all higher priorities have been satisfied and further requires all water users with the same priority to share equitably in any supply shortage. **Our current water supply projections and past experience indicate that the cessation of diversions under lower priority allocations (4th and 3rd priorities) and severe reductions in diversions under 2nd priority allocations will be necessary this summer season.** In the upcoming weeks and months, subsequent notices will be distributed requesting mandatory restrictions in diversions in accordance with the requirements of the 1993 Decree. Unless the current water supply outlook changes, no-pump day notices will likely be issued to 2nd priority water users much earlier in the irrigation season than in the past.

Your cooperation and assistance, now and in the upcoming dry season, are greatly appreciated. Please contact me if you have any questions or require additional information.

Sincerely,

Julian Fulwiler, P.E.
Stetson Engineers Inc.
Watermaster for San Gregorio Creek

cc: (representative letter)
Honorable George A. Miram

STETSON
ENGINEERS INC.

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Phone: (415) 457-0701 • FAX: (415) 457-1638 • Web site: www.stetsonengineers.com

Northern California • Southern California • New Mexico • Arizona • Nevada • Colorado

May 16, 2014

Re: San Gregorio Creek Water Availability – Notice to 2nd Priority Water Users to Reduce Diversions

Dear Water User:

As you are aware, water flowing in the San Gregorio Creek Stream System continues to be significantly below normal due to limited rainfall received this past winter. **Our projections indicate that the available water supply has become insufficient to meet all 2nd priority water right allocations (irrigation, outside domestic and commercial stock watering uses).**

The 1993 Decree specifies priorities of rights wherein no water user is entitled to divert any water until the allotments to all higher priorities have been satisfied and further requires all water users with the same priority to share equitably in any supply shortage. We have notified or are completing the process of notifying all 4th and 3rd priority water users to cease diverting so that the 2nd priority allotments may be satisfied.

This letter is written to respectfully request that you, as having a 2nd priority water right, stop diverting water for <u>two</u> days of each week (until further notice), beginning May 19, 2014, according to your Point of Diversion (POD) Number as set forth in the schedule below:

Point of Diversion Numbers	No Diversions During Day of Week*
POD #1 through #35	Sundays and Tuesdays
POD #36 through #70	Mondays and Wednesdays
POD #71 through #105	Tuesdays and Thursdays
POD #106 through #140	Wednesdays and Fridays
POD #141 through #175	Thursdays and Saturdays
POD #176 through #210	Fridays and Sundays
POD #211 through #245	Saturdays and Mondays
POD#1000 through #1002	Saturdays and Mondays

* *Note: Four of the largest irrigators in the lower portion of the watershed will be on a specific rotation schedule, different than above, which also includes two days each of no diversions.*

Your Point of Diversion Number(s) with 2nd Priority uses are shown on the attachment to this letter. Please use your Point of Diversion Number(s) from the attachment and the above schedule to determine which days of the week you should not divert any water.

Beginning May 19, 2014 (and until further notice) you are also requested to not divert water at a rate that is greater than your Decreed allocation, taken continuously over a 24-hour period. By way of example, if your total daily allocation is 5,000 gallons per day, then your maximum allowable diversion rate, beginning May 19, would be calculated as follows:

$$\frac{5{,}000}{24 \times 60} = 3.5 \text{ gallons per minute} \quad \text{(EXAMPLE)}$$

In the upcoming weeks and months, subsequent notices for further reductions in diversions will be necessary. Please be advised that based on a comparison with historical droughts, lower San Gregorio Creek may go dry this summer. Please contact me if you have any questions or require additional information.

Sincerely,

Julian Fulwiler, P.E.
Stetson Engineers Inc.
Watermaster for San Gregorio Creek

cc: (representative letter)
Honorable George A. Miram

COUNTY OF SAN MATEO

BOARD OF SUPERVISORS
DAVE PINE
CAROLE GROOM
DON HORSLEY
WARREN SLOCUM
ADRIENNE J. TISSIER

Department of Public Works

JAMES C. PORTER
DIRECTOR

555 COUNTY CENTER, 5TH FLOOR • REDWOOD CITY • CALIFORNIA 94063-1665 • PHONE (650) 363-4100 • FAX (650) 361-8220

WATER CONSERVATION ALERT!!!

January 31, 2014

Re: Water Conservation in CSA-7

Dear CSA-7 Water System Customers:

On January 17, 2014 Governor Edmund G. Brown, Jr. declared a drought state of emergency and encouraged all Californians to conserve water in every way possible. As you are aware, Alpine Creek is CSA-7's only source of water approved by the California Department of Public Health. Although CSA-7 has not yet received a notice from the Watermaster requiring mandatory reductions in water diversion from Alpine Creek, it is unpredictable how long the drought will continue and its prolonged effect on CSA-7's water supply.

Conserving water can be as simple as turning off water when not in use, fixing leaks, washing full loads of laundry, etc. More information on water conservation can be found at:

http://www.wateraware.org/

We appreciate your efforts in conserving water. If you have any questions please call (650) 363-4100.

Very truly yours,

Mark Chow, P.E.
Principal Civil Engineer
Utilities-Flood Control-Watershed Protection

mc
G:\users\utility\water_CSA-7\CUSTOMER\CSA7 Conservation Letter 2014.doc

cc: Supervisor Horsley, District 3, County of San Mateo
James C. Porter, P.E., Director of Public Works
Ann M. Stillman, P.E., Deputy Director of Public Works

Save Water Right at Home

In California, water is a limited resource. Add to this a growing population and it's clear we need to work together to stretch our existing water supplies. You can help by conserving water inside and outside your home. And, don't forget, saving water saves energy and money and it's easy to do!

Indoor water saving tips

- Only run full loads in the washing machine and if you are purchasing a new washer sometime soon, purchase a water and energy saving model.
- Don't let the water run while you're washing dishes or brushing your teeth.
- Use water-saving showerheads and take shorter showers.
- Only run full loads in the dishwasher.
- Fix leaky faucets and toilets – if the toilet flapper valve leaks, it's an easy problem to fix and stops enormous waste of water.

This article, in English and four other languages, can be submitted to local newspapers, magazines or used in newsletters to encourage water conservation. It is available for free from www.wateraware.org

Outdoor water saving tips

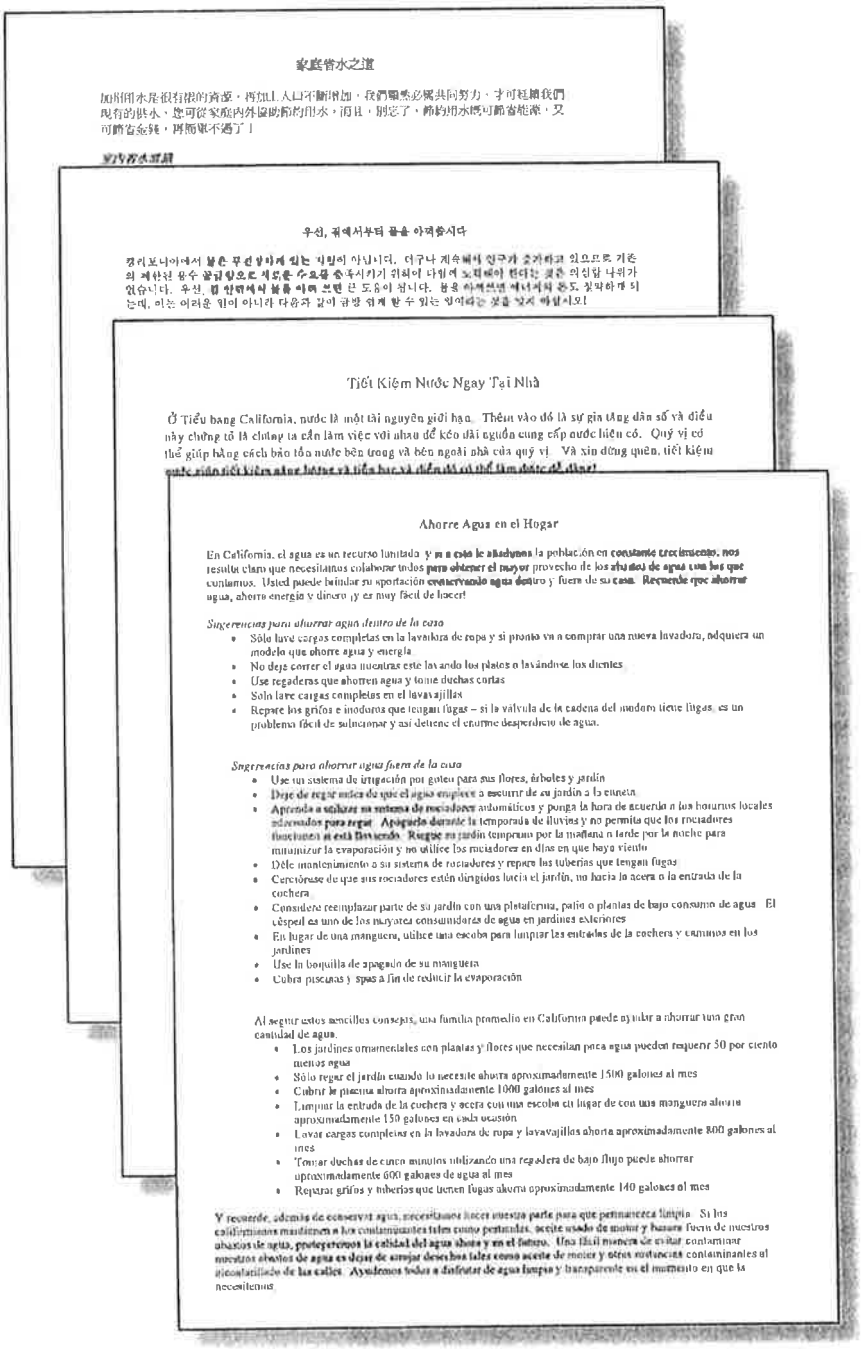
- Use drip irrigation for your flowers, trees and garden.
- Stop watering before water starts to flow from your yard to the gutter.
- Know how to use your automatic sprinkler system, and set your time to local watering hours. Turn it off during rainy seasons and don't let sprinklers run if it's raining. Water your yard in the early morning or late evening to minimize evaporation and don't use the sprinklers on windy days.
- Maintain your sprinkler systems and fix leaking pipes.
- Make sure your sprinklers are directed toward watering the yard, not the sidewalk or driveway.
- Consider replacing part of your lawn with a deck, patio or low water-use plants. Grass is one of the highest users of water in outdoor landscaping.
- Instead of a hose, use a broom to clean driveways and walkways.
- Use a shutoff nozzle on your hose.
- Cover pools and spas to reduce evaporation.

By following these easy tips, an average California family can help save this much water:

- Landscaping with plants and flowers that need a little water can use 50 percent less water
- Only watering the lawn when it needs it saves about 1500 gallons a month
- Covering the pool saves about 1000 gallons a month
- Cleaning the driveway and sidewalk with a broom instead of a hose saves about 150 gallons each time
- Running full loads in the washing machine and dishwasher saves about 800 gallons a month
- Taking five minute showers while using a low-flow showerhead can save about 600 gallons of water a month
- Fixing leaky faucets and pipes saves about 140 gallons a month

And don't forget, in addition to conserving water, we need to do our part to keep it clean. If Californians keep pollutants like pesticides, used motor oil and litter out of our water supplies, we'll protect the quality of our water into the future. One easy way to avoid polluting our water supplies is to stop pouring waste such as motor oil and other polluting substances down street drains. Let's all help to enjoy clean, clear water when we need it.

For more information on California's water and water conservation, visit the California Water Awareness Campaign Web site at www.wateraware.org or call 916-325-2596.



家庭省水之道

加州用水是很有限的資源，再加上人口不斷增加，我們顯然必需共同努力，才可延續我們現有的供水，您可從家庭內外協助節約用水，而且，別忘了，節約用水將可節省能源，又可節省金錢，再簡單不過了！

우선, 집에서부터 물을 아끼십시다

캘리포니아에서 물은 무진장하게 있는 자원이 아닙니다. 더구나 계속해서 인구가 증가하고 있으므로 기존의 제한된 용수 공급량으로 새로운 수요를 충족시키기 위해서 다함께 노력해야 한다는 것은 의심할 나위가 없습니다. 우선, 집 안팎에서 물을 아끼 쓰면 큰 도움이 됩니다. 물을 아끼쓰면 에너지와 돈도 절약하게 되는데, 이는 어려운 일이 아니라 다음과 같이 금방 쉽게 할 수 있는 일이라는 것을 알지 아십시오!

Tiết Kiệm Nước Ngay Tại Nhà

Ở Tiểu bang California, nước là một tài nguyên giới hạn. Thêm vào đó là sự gia tăng dân số và điều này chứng tỏ là chúng ta cần làm việc với nhau để kéo dài nguồn cung cấp nước hiện có. Quý vị có thể giúp bằng cách bảo tồn nước bên trong và bên ngoài nhà của quý vị. Và xin đừng quên, tiết kiệm nước giúp tiết kiệm năng lượng và tiền bạc và điều đó có thể làm được dễ dàng!

Ahorre Agua en el Hogar

En California, el agua es un recurso limitado y si a esto le añadimos la población en constante crecimiento, nos resulta claro que necesitamos colaborar todos para obtener el mayor provecho de los abastos de agua con los que contamos. Usted puede brindar su aportación conservando agua dentro y fuera de su casa. Recuerde que ahorrar agua, ahorra energía y dinero ¡y es muy fácil de hacer!

Sugerencias para ahorrar agua dentro de la casa

- Sólo lave cargas completas en la lavadora de ropa y si pronto va a comprar una nueva lavadora, adquiera un modelo que ahorre agua y energía
- No deje correr el agua mientras esté lavando los platos o lavándose los dientes
- Use regaderas que ahorren agua y tome duchas cortas
- Sólo lave cargas completas en el lavavajillas
- Repare los grifos e inodoros que tengan fugas – si la válvula de la cadena del inodoro tiene fugas, es un problema fácil de solucionar y así detiene el enorme desperdicio de agua.

Sugerencias para ahorrar agua fuera de la casa

- Use un sistema de irrigación por goteo para sus flores, árboles y jardín
- Deje de regar antes de que el agua empiece a escurrir de su jardín a la cuneta
- Aprenda a utilizar su sistema de rociadores automáticos y ponga la hora de acuerdo a los horarios locales adecuados para regar. Apáguelo durante la temporada de lluvias y no permita que los rociadores funcionen si está lloviendo. Riegue su jardín temprano por la mañana o tarde por la noche para minimizar la evaporación y no utilice los rociadores en días en que haya viento
- Dele mantenimiento a su sistema de rociadores y repare las tuberías que tengan fugas
- Cerciórese de que sus rociadores estén dirigidos hacia el jardín, no hacia la acera o la entrada de la cochera
- Considere reemplazar parte de su jardín con una plataforma, patio o plantas de bajo consumo de agua. El césped es uno de los mayores consumidores de agua en jardines exteriores
- En lugar de una manguera, utilice una escoba para limpiar las entradas de la cochera y caminos en los jardines
- Use la boquilla de apagado de su manguera
- Cubra piscinas y spas a fin de reducir la evaporación

Al seguir estos sencillos consejos, una familia promedio en California puede ayudar a ahorrar una gran cantidad de agua.

- Los jardines ornamentales con plantas y flores que necesitan poca agua pueden requerir 50 por ciento menos agua
- Sólo regar el jardín cuando lo necesite ahorra aproximadamente 1500 galones al mes
- Cubrir la piscina ahorra aproximadamente 1000 galones al mes
- Limpiar la entrada de la cochera y acera con una escoba en lugar de con una manguera ahorra aproximadamente 150 galones en cada ocasión
- Lavar cargas completas en la lavadora de ropa y lavavajillas ahorra aproximadamente 800 galones al mes
- Tomar duchas de cinco minutos utilizando una regadera de bajo flujo puede ahorrar aproximadamente 600 galones de agua al mes
- Reparar grifos y tuberías que tienen fugas ahorra aproximadamente 140 galones al mes

Y recuerde, además de conservar agua, necesitamos hacer nuestra parte para que permanezca limpia. Si los californianos mantienen a los contaminantes tales como pesticidas, aceite usado de motor y basura fuera de nuestros abastos de agua, protegeremos la calidad del agua ahora y en el futuro. Una fácil manera de evitar contaminar nuestros abastos de agua es dejar de arrojar desechos tales como aceite de motor y otras sustancias contaminantes al alcantarillado de las calles. Ayudemos todos a disfrutar de agua limpia y transparente en el momento en que la necesitemos.

COUNTY OF SAN MATEO
DEPARTMENT OF PUBLIC WORKS

James C. Porter
Director

County Government Center
555 County Center, 5th Floor
650-363-4100 T
650-361-8220 F
www.smcgov.org

POTENTIAL WATER SHORTAGE!!! CONSERVATION NEEDED!!!

June 6, 2014

Re: Water Conservation in CSA-7

Dear CSA-7 Water System Customers:

On January 31, 2014 we asked that you conserve water in every way possible due to the drought conditions. We thank you for your efforts to date.

As you are aware, Alpine Creek (Creek) is CSA-7's only source of water approved by the California Department of Public Health. CSA-7 has been monitoring the depth of the Creek flow at the system intake for the last few months. Based on our recent monitoring, it appears that the Creek may become dry over the summer months. Should the Creek reach a critical depth above the system intake, CSA-7 will not be able to draw water from the Creek.

CSA-7 has informed the State and County Offices of Emergency Services, the County's Environmental Health Division, and the State Department of Public Health of its current situation and the potential need to acquire water from other sources. To prepare for this potential emergency, staff is working with these agencies and other water providers in the County to formulate a contingency plan should CSA-7 not be able to pump water from the Creek.

Conserving water can be as simple as turning off water when not in use, fixing leaks, washing full loads of laundry, etc. More information on water conservation can be found at:

http://www.wateraware.org/

We appreciate your ongoing efforts in conserving water and will inform you if there are changes to the current situation. If you have any questions please call (650) 363-4100.

Very truly yours,

Mark Chow, P.E.
Principal Civil Engineer
Utilities-Flood Control-Watershed Protection

mc
G:\Users\utility\water_CSA-7\CUSTOMER\CSA7 Conservation Letter_Jun 2014.doc

cc: Supervisor Horsley, District 3, County of San Mateo
James C. Porter, P.E., Director of Public Works
Ann M. Stillman, P.E., Deputy Director of Public Works

Santa Clara Valley Water District

Santa Clara Valley Water District. February 25, 2014. Resolution No. 14-11 – Calling for 20 Percent Water Use Reduction through December 31, 2014.

RESOLUTION NO. 14- 11

CALLING FOR 20 PERCENT WATER USE REDUCTION
THROUGH DECEMBER 31, 2014

WHEREAS, in California, water is a precious and limited resource that must be used wisely; and

WHEREAS, 2013 was the driest year on record and 2014 is projected to be critically dry as well; and

WHEREAS, on January 17, 2014, Governor Brown proclaimed a State of Emergency calling on all Californians to reduce their water usage by 20 percent, and calling on local urban water suppliers and municipalities to implement their local water shortage contingency plans immediately; and

WHEREAS, Santa Clara County relies on water supply imported by the State Water Project and Central Valley Project to provide treated drinking water, replenish the local groundwater basin and prevent the return of historic overdraft and land surface subsidence that could damage Bay-front levees and other critical infrastructure in northern Santa Clara County; and

WHEREAS, in 2014, State Water Project allocations have been reduced to zero percent of contract quantity, Central Valley Project water allocations for agricultural use are also expected to be zero percent, and Central Valley Project water allocations for municipal and industrial uses are expected to be no greater than 50 percent, or as needed to support public health and safety; and

WHEREAS, deliveries of imported water to the Santa Clara Valley Water District's (District's) drinking water treatment plants are being affected by poor water quality conditions in the Sacramento-San Joaquin Delta that have developed from lack of precipitation and depleted storage in State and federal reservoirs, and deliveries may be further limited or interrupted this summer due to degraded Delta water quality and low storage levels in San Luis Reservoir; and

WHEREAS, local watershed runoff has been extremely low this winter, and the District's ability to augment reservoir storage with imported water is limited because of California Department of Water Resources Division of Dam Safety requirements; and

WHEREAS, through careful water management, Santa Clara County groundwater reserves at the start of 2014 were well within the normal range, but these reserves are projected to drop significantly by the end of 2014; and

WHEREAS, the District must maintain sufficient local surface and groundwater reserve supplies to cope with supply interruptions from natural disasters and catastrophic events such as earthquake; and

WHEREAS, the District's Urban Water Management Plan, Water Shortage Contingency Plan guides the District's water supply management actions for supply augmentation, increased water use reduction measures, and the use of local reserve supplies; and

WHEREAS, the District through coordination with retail water agencies, local municipalities and the County of Santa Clara is increasing public outreach and education to create greater awareness of countywide water supply challenges and need for efficient water use; and

WHEREAS, the District must rely on the actions of the retail water agencies, local municipalities and the County of Santa Clara to enact and implement local ordinances and water use reduction measures; and

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Santa Clara Valley Water District that a water use reduction target equal to 20 percent of 2013 water use is called for through December 31, 2014, and it is further recommended that retail water agencies, local municipalities and the County of Santa Clara implement mandatory measures as needed to achieve the 20 percent water use reduction target.

PASSED AND ADOPTED by the Board of Directors of Santa Clara Valley Water District by the following vote on February 25, 2014:

AYES:	Directors	B. Kennedy, R. Santos, N. Hsueh, B. Keegan, B. Schmidt, L. LeZotte, T. Estremera
NOES:	Directors	None
ABSENT:	Directors	None
ABSTAIN:	Directors	None

SANTA CLARA VALLEY WATER DISTRICT

By: Tony Estremera
TONY ESTREMERA
Chair/Board of Directors

ATTEST: MICHELE L. KING, CMC

Michele L. King
Clerk/Board of Directors

Sonoma County Water Agency

Sonoma County Water Agency. No Date. Drought Declarations.

_____. February 2, 2014. Voluntary 20 Percent Water Conservation Request Issued to North Bay Water Utilities.

County of Sonoma. February 25, 2014. Agenda Item Summary Report – Informational report on impacts of drought and take recommendation actions.

Drought
Declarations

County of Sonoma

- Resolution Number 14-0067: Resolution of The Board Of Supervisors Of The County of Sonoma, Proclaiming a Local Emergency Due to Drought Conditions in the County of Sonoma and Requesting Immediate State and Federal Assistance, 2/26/14

- Resolution Number 14-0068: Concurrent Resolution of the Board of Supervisors of The Sonoma County Water Agency and the County of Sonoma Board of Supervisors Supporting Governor Brown's Emergency Drought Declaration and Directing other Actions in Response to the Drought Conditions, 2/26/14

- Resolution Number 14-0069: Resolution of The Board of Supervisors Of The County Of Sonoma, State of California, Requesting the California Office of Emergency Services Concurrence in Local Emergency, 2/26/14

- Resolution Number 14-0070: Resolution of The Board of Supervisors Of The County Of Sonoma, State of California, Requesting that the Governor of the State of California Request a Presidential Declaration of Emergency, 2/26/14

County of Mendocino

- Resolution Number 14: Resolution of the Mendocino County Board of Supervisors Declaring Local Emergency and Imminent Threat of Disaster in Mendocino County Due to Drought Conditions, 1/7/8/14

County of Sonoma
State of California

THE WITHIN INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE

ATTEST: FEB 26 2014

VERONICA A. FERGUSON, Clerk/Secretary
BY C Woodson
DEPUTY CLERK/ASST SECRETARY

Date: February 25, 2014

Item Number: 34
Resolution Number: 14-0067

☐ 4/5 Vote Required

Resolution Of The Board Of Supervisors Of The County Of Sonoma, State Of California, Proclaiming a Local Emergency Due to Drought Conditions in the County of Sonoma and Requesting Immediate State and Federal Assistance

WHEREAS, the State of California is experiencing one of the driest winters in recorded history; and

WHEREAS, on January 17, 2014, the Governor of the State of California proclaimed a State of Emergency for the State of California due to drought conditions; and

WHEREAS, on January 22, 2014, the City of Cloverdale adopted a Resolution declaring a Water Shortage Emergency Condition; and

WHEREAS, on January 24, 2014, the United States Department of Agriculture designated the County of Sonoma, along with many other California counties, a natural disaster area due to drought; and

WHEREAS, on February 14, 2014, the City of Healdsburg adopted a Resolution proclaiming a drought emergency; and

WHEREAS, the adverse environmental, economic, health, welfare and social impacts of the drought pose an imminent threat of disaster and threaten to cause widespread potential harm to people, businesses, agriculture, property, communities, wildlife and recreation in the County of Sonoma.

CF/60-0-11 Drought (ID 4971)

c Jasperse, Sherwood, refile, J

NOW, THEREFORE, IT IS HEREBY RESOLVED by Board of Supervisors of the County of Sonoma, State of California, as follows:

IT IS PROCLAIMED AND ORDERED, pursuant to Government Code section 8558 and Chapter 10 of the Sonoma County Code, that a local emergency has existed throughout the County of Sonoma because of drought conditions since January 17, 2014; and

IT IS FURTHER PROCLAIMED AND ORDERED that during the existence of this local emergency, the powers, functions and duties of the County Administrator, Director of Emergency Services and the emergency management organization of the Sonoma County Operational Area shall be those prescribed by Federal law; State law; by ordinances, resolutions and the Code of the County of Sonoma; and by the Sonoma County/Operational Area Emergency Operations Plan approved the Board of Supervisors; and

IT IS REQUESTED that the Governor of the State of California waive regulations that may hinder response and recovery efforts, make available California Disaster Assistance Act funding for the State of Emergency proclaimed on January 17, 2014, and seek all available forms of Federal disaster assistance and relief programs, to include a Presidential Declaration of Emergency; and

IT IS FURTHER PROCLAIMED AND ORDERED, pursuant to Government Code section 8630, the Board of Supervisors shall review the need for continuing this local emergency at least once every thirty days until the Board of Supervisors terminates the local emergency: and

IT IS FURTHER PROCLAIMED AND ORDERED that a copy of this proclamation be forwarded to the State Director of the Office of Emergency Services and all State and Federal legislators representing the County of Sonoma.

Supervisors:

Gorin: Aye Zane: Aye McGuire: Aye Carrillo: Aye Rabbitt: Aye

Ayes: 5 Noes: 0 Absent: 0 Abstain: 0

So Ordered.

County of Sonoma
State of California

THE WITHIN INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE

ATTEST: FEB 26 2014

VERONICA A. FERGUSON, Clerk/Secretary
BY C Woodson
DEPUTY CLERK/ASST SECRETARY

Date: February 25, 2014

Item Number: 34
Resolution Number: 14-0068

☐ 4/5 Vote Required

Concurrent Resolution of the Board of Directors of the Sonoma County Water Agency and the County of Sonoma Board of Supervisors Supporting Governor Brown's Emergency Drought Declaration and Directing other Actions in Response to the Drought Conditions

WHEREAS, calendar year 2013 was the lowest rainfall year on record in 120 years; and

WHEREAS, the historical dry conditions have resulted in severely low storage levels in Lake Mendocino (41% of capacity as of February 19, 2014) requiring a Temporary Urgency Change Order to be issued by the State Water Resources Control Board enabling lower in stream releases to the Russian River and preserving lake storage; and

WHEREAS, on January 17, 2014 Governor Brown declared a statewide drought in California and called for a 20% voluntary reduction in water use; and

WHEREAS, on January 24, 2014, the United States Department of Agricultural designated Sonoma County a natural disaster area due to drought. The USDA's designation provides access to a variety of emergency financial assistance programs to ranchers and farmers and agriculture-related businesses; and

WHEREAS, the agricultural community has been negatively impacted by the drought conditions; and

WHEREAS, the Sonoma County Board of Supervisors proclaimed a local emergency due to drought conditions on February 25, 2014; and

WHEREAS, in September 2010, following 16 months of community outreach and involvement, the Sonoma County Water Agency Board of Directors approved nine Water Supply Strategies developed to increase water supply system reliability, resiliency and efficiency in the face of limited resources,

c Jasperse, Sherwood, refile, J

CF/60-0-11 Drought (ID 4971)

regulatory constraints and climate change uncertainties. The Water Supply Strategies Action plan was last updated in 2013; and

WHEREAS, Water Agency staff has been coordinating with affected stakeholders in Sonoma and Mendocino counties and resource agencies, including the State Water Resources Control Board, the California Department of Fish and Wildlife, the United States Army Corps of Engineers, and the National Marine Fisheries Service, on drought issues; and

WHEREAS, Sonoma County Water Agency, along with the Cities of Cotati, Petaluma, Rohnert Park, Santa Rosa and Sonoma, the North Marin, Marin Municipal and Valley of the Moon Water Districts and the Town of Windsor, are members of the Sonoma-Marin Saving Water Partnership (Partnership), through which these members have joined together to provide a regional approach to water use efficiency; and

WHEREAS, these Partnership members recognize that establishing common water conservation projects on a regional basis and applicable across the political and jurisdictional boundaries of each member may be a means of cost effectively conserving more water than would be otherwise be conserved on an individual member-by-member basis; and

WHEREAS, the Partnership, through its many water efficiency programs, educational seminars and outreach campaigns, is working to educate our communities about the importance of conserving water resources and curbing water-wasting behaviors; and

WHEREAS, in summer 2013 the "20-Gallon Challenge" was embraced by community members who pledged to reduce water use by 20 gallons per person per day. The 20-Gallon Challenge was promoted throughout the Russian River Watershed expanding the Partnership reach into Mendocino County. Working together in Sonoma, Marin and Mendocino counties, the "20-Gallon Challenge" resulted in a positive response to the 2013 dry spring conditions; and

WHEREAS, the Partnership members have embarked on a regional water use efficiency media campaign titled: "There's a Drought on. Turn the Water Off" designed to increase awareness and reduce water use; and

WHEREAS, on February 3, 2014, the Water Advisory Committee to the Sonoma County Water Agency adopted a resolution pledging support of the Partnership efforts, encouraging residents to increase water use efficiency by fixing leaks and eliminating unnecessary outdoor irrigation to help

protect and preserve reliable drinking water supplies stored in Lake Mendocino and Lake Sonoma; and urging water customers to heed the Governor's declaration to reduce water use by 20 percent:

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Sonoma County Water Agency and the Sonoma County Board of Supervisors hereby:

1. Pledges to support the Partnership efforts; and

2. Encourages the community to increase water use efficiency by fixing leaks and eliminating unnecessary outdoor irrigation to help protect and preserve reliable drinking water supplies stored in Lake Mendocino and Lake Sonoma; and

3. Urges the community to heed the Governors declaration to reduce water use by at least 20%, regardless of water source, to avoid potential future mandatory water use restrictions; and

4. Directs Water Agency and County staff to explore ways to further reduce water use at Water Agency and County facilities; and

5. Authorizes the Agricultural Commissioner to continue to assist the agricultural community by implementing water hauling/trucking programs, as needed; and

6. Directs Water Agency and County staff to continue engaging stakeholders in Sonoma and Mendocino counties to coordinate on drought-related issues, including through the Russian River Compact; and

7. Supports the Water Agency convening drought town hall meetings in each Supervisorial district that would include local governmental and non-governmental partners; and

8. Directs Water Agency and County staff to continue to monitor and collaborate with state and federal legislative drought relief efforts; and

9. Directs Water Agency and County staff to continue to collaborate on countywide groundwater management issues, including exploring opportunities for groundwater recharge and aquifer storage and recovery to provide for resiliency now and in the future.

10. Directs Water Agency staff to continue to build drought resiliency through improving scientific understanding of weather and climate variability in then relate to how water is used; using forecasts in coordinated reservoir operations; pursuing integrated water resource management; and overcoming fragmentation of water management by strengthening partnerships.

Supervisors:

Gorin: Aye	Zane: Aye	McGuire: Aye	Carrillo: Aye	Rabbitt: Aye
Ayes: 5	Noes: 0	Absent: 0	Abstain: 0	

Directors:

Gorin: Aye	Zane: Aye	McGuire: Aye	Carrillo: Aye	Rabbitt: Aye

So Ordered.

County of Sonoma
State of California

THE WITHIN INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE

ATTEST: FEB 26 2014

VERONICA A. FERGUSON, Clerk/Secretary
BY C Woodson
DEPUTY CLERK/ASST SECRETARY

Date: February 25, 2014

Item Number: 34
Resolution Number: 14-0069

☐ 4/5 Vote Required

Resolution Of The Board Of Supervisors Of The County Of Sonoma, State Of California, Requesting the California Office of Emergency Services Concurrence in Local Emergency

WHEREAS, on January 17, 2014, the Governor of the State of California proclaimed a State of emergency for the State of California due to drought conditions, but did not authorize California Disaster Assistance Act (CDAA) funding to counties and local government entities; and

WHEREAS, on February 25, 2014, in accordance with State law, the Board of Supervisors of the County of Sonoma proclaimed a local emergency has existed throughout the County of Sonoma due to drought conditions since January 17, 2014; and

WHEREAS, the adverse environmental, economic, health, welfare and social impacts of the drought pose an imminent threat of disaster and threaten to cause widespread potential harm to people, businesses, agriculture, property, communities, wildlife and recreation in the County of Sonoma.

NOW, THEREFORE, IT IS HEREBY RESOLVED, DECLARED AND ORDERED that a copy of this Resolution be forwarded to the Director of the California Office of Emergency Services (Cal OES) with a request that he find it acceptable in accordance with the provisions of the California Disaster Assistance Act (CDAA) in order to make available CDAA funding for the State of Emergency proclaimed by the Governor on January 17, 2014; and

CF/60-0-11 Drought (ID 4971)

C Jasperse, Sherwood, resfile, J

IT IS FURTHER RESOLVED that the Sonoma County Auditor Controller Treasurer Tax Collector is hereby designated as the authorized representative of the County of Sonoma for the purpose of receipt, processing, and coordination of all inquiries and requirements necessary to obtain available State assistance; and

IT IS FURTHER RESOLVED that the Sonoma County Auditor Controller Treasurer Tax Collector is hereby designated as the authorized representative of the County of Sonoma for the purpose of receipt, processing, and coordination of all inquiries and requirements necessary to obtain available State and Federal assistance for the private sector.

Supervisors:

Gorin: Aye Zane: Aye McGuire: Aye Carrillo: Aye Rabbitt: Aye

Ayes: 5 Noes: 0 Absent: 0 Abstain: 0

So Ordered.

County of Sonoma
State of California

THE WITHIN INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE

ATTEST: FEB 26 2014

VERONICA A. FERGUSON, Clerk/Secretary
BY C Woodson
DEPUTY CLERK/ASST SECRETARY

Item Number: 34
Date: February 25, 2014 Resolution Number: 14-0070

☐ 4/5 Vote Required

Resolution Of The Board Of Supervisors Of The County Of Sonoma, State Of California, Requesting that the Governor of the State of California Request a Presidential Declaration of Emergency

WHEREAS, on January 17, 2014, the Governor of the State of California proclaimed a State of Emergency for the State of California due to drought conditions; and

WHEREAS, on January 24, 2014, the United State Department of Agriculture designated the County of Sonoma, along with many other California counties, a natural disaster area due to drought; and

WHEREAS, on February 25, 2014, in accordance with State law, the Board of Supervisors of the County of Sonoma proclaimed a local emergency has existed throughout the County of Sonoma due to drought conditions since January 17, 2014; and

WHEREAS, local resources are likely unable to cope with the adverse environmental, economic, health, welfare and social impacts of the drought which pose an imminent threat of disaster and threaten to cause widespread potential harm to people, businesses, agriculture, property, communities, wildlife and recreation in the County of Sonoma.

NOW, THEREFORE, IT IS HEREBY RESOLVED, DECLARED AND ORDERED that a copy of this Resolution be forwarded through the Director of the California Office of Emergency Services (Cal OES) to the Governor of the State of California with a request that the Governor request a Presidential Declaration of Emergency; and

CF/60-0-11 Drought (ID 4971)

c Jospeose, Sherwood, mfile, g

IT IS FURTHER RESOLVED that the Sonoma County Auditor Controller Treasurer Tax Collector is hereby designated as the authorized representative of the County of Sonoma for the purpose of receipt, processing, and coordination of all inquiries and requirements necessary to obtain available State and Federal assistance for the public sector; and

IT IS FURTHER RESOLVED that the Sonoma County Auditor Controller Treasurer Tax Collector is hereby designated as the authorized representative of the County of Sonoma for the purpose of receipt, processing, and coordination of all inquiries and requirements necessary to obtain available State and Federal assistance for the private sector.

Supervisors:

Gorin: Aye Zane: Aye McGuire: Aye Carrillo: Aye Rabbitt: Aye

Ayes: 5 Noes: 0 Absent: 0 Abstain: 0

So Ordered.

RESOLUTION NO. 14-

RESOLUTION OF THE MENDOCINO COUNTY BOARD OF SUPERVISORS DECLARING LOCAL EMERGENCY AND IMMINENT THREAT OF DISASTER IN MENDOCINO COUNTY DUE TO DROUGHT CONDITIONS

WHEREAS, Mendocino County is now entering its second year of significant reduction of rain fall; and

WHEREAS, drought conditions and water delivery limitations have become worse in this second year of less than average rain fall, creating emergency conditions in Mendocino County; and

WHEREAS, Lake Mendocino storage remains at unprecedentedly low levels; and

WHEREAS, recently the City of Willits informally sought advice from the County Office of Emergency Services on whether or not to declare an emergency due to extremely low water availability to its municipal customers, and is poised to enact water rationing provisions on its January 8, 2014 City Council meeting to maintain what little water it has left; and

WHEREAS, on December 31, 2013, the State Water Resources Control Board agreed to change the ways it measures the hydrological index for the Russian River Watershed, meaning it ceases to use cumulative inflows to Lake Pillsbury which currently reflects only a "Dry" index and has now instead opted to use a realistic method of measurement to reflect "Critically Low" conditions in Lake Mendocino; and

WHEREAS, Ukiah Valley vintners and farmers depend on water from one and only one source of water, Lake Mendocino, for frost protection and watering of livestock. This supply is critically short, thus placing the local economy in a state of dire emergency if water runs out; and

WHEREAS, the entire Mendocino County economy is placed in great jeopardy because of the current water shortage due to its dependence on Lake Mendocino and Russian River water allocations, and must act proactively to prevent an imminent disaster; and

WHEREAS, due to drought conditions and the aforementioned regulatory constraints, it is unlikely that water currently in Lake Mendocino, the principal source of water for much of Mendocino County and the sole source of water for Redwood Valley, will be adequate to meet the essential water supply needs of the County's residents this summer and fall; and

WHEREAS, the adverse environmental, economic, and social impacts of the drought pose an imminent threat of disaster and threaten to cause widespread harm to people, businesses, property, communities, wildlife and recreation in Mendocino County.

NOW, THEREFORE, BE IT RESOLVED that the Mendocino County Board of Supervisors declares that a local emergency and imminent threat of disaster exists in Mendocino County due to drought conditions.

The foregoing Resolution introduced by Supervisor _____, seconded by Supervisor _____, and carried this _____ day of _____, 2014, by the following vote:

AYES:
NOES:
ABSENT:
WHEREUPON, the Chair declared said Resolution adopted and SO ORDERED.

ATTEST: CARMEL J. ANGELO
Clerk of the Board

_____
Deputy

APPROVED AS TO FORM:
THOMAS R. PARKER, County Counsel

_____

_____
JOHN PINCHES, Chair
Mendocino County Board of Supervisors

I hereby certify that according to the provisions of Government Code Section 25103, delivery of this document has been made.

BY: CARMEL J. ANGELO
Clerk of the Board

_____
Deputy

Securing our Future by Investing in our Water Resources, Environment & Community

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Voluntary 20 Percent Water Conservation Request Issued to North Bay Water Utilities

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2014-02-03

For Immediate Release
February 3, 2014

CONTACT:
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707.322.8192 (cell)
sherwood@scwa.ca.gov

(Santa Rosa, CA) Sonoma County Water Agency (Water Agency) General Manager Grant Davis today will call on residents of the cities and water district it serves to reduce their water use by 20 percent. View a video statement from General Manager Grant Davis. The Water Agency provides wholesale drinking water to the cities of Santa Rosa, Petaluma, Rohnert Park, Sonoma, Cotati, the Town of Windsor, and the Valley of the Moon, North Marin and Marin Municipal water districts – otherwise known as the Sonoma-Marin Saving Water Partnership. The Water Agency's request responds to Governor Brown's emergency drought declaration that included a request for 20 percent voluntary conservation.

Grant Davis, General Manager of the Water Agency said, "The Water Agency supports the governor's emergency drought declaration, and that's why I am asking everyone who receives water from our Russian River water supply system to immediately reduce their water use by 20 percent. A voluntary 20 percent reduction will save 3 billion gallons of water this year. I have also directed my finance team to develop next year's budget assuming this 20 percent reduction. Proactive financing will help prepare for declining water sales due to the drought and resulting necessary conservation."

Water Agency Director Efren Carrillo stated, "Our two water supply reservoirs, Lake Sonoma and Lake Mendocino, remain historically low. Conditions today are worse than during the 1977 drought; we need at least 13 inches of rain to even get up to 1977 conditions. We didn't have Lake Sonoma in 197 and are lucky it's there. Although Lake Sonoma's water supply storage is 66 percent of capacity, we must conserve that supply in case dry conditions continue into next year."

Water Agency Director Susan Gorin added, "We will get through this drought by pulling together as a community. Taking simple steps to save water such as turning off outdoor irrigation can help our community reach a 20 percent conservation goal. Resources are available to help our community during these dry times. I encourage everyone to visit www.wateroff.org to learn more about the drought and how to save water."

Current Russian River water supply conditions:
Lake Mendocino: 36% of water supply capacity
Lake Sonoma: 65% of water supply capacity

The Water Agency will continue to monitor daily water use, reservoir storage levels and weather conditions. Updated drought information can be found o the Water Agency's website at www.sonomacountywater.org.

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The Sonoma County Water Agency is working to secure our future by investing in our water resources, community and environment. The Water Agency provides water supply, flood protection and sanitation services for portions of Sonoma and Marin counties. Visit us on the Web at www.sonomacountywater.org

<< back to All Press Releases

County of Sonoma Agenda Item Summary Report

Clerk of the Board
575 Administration Drive
Santa Rosa, CA 95403

Agenda Item Number: 34
(This Section for use by Clerk of the Board Only.)

To: Sonoma County Board of Supervisors; Water Agency Board of Directors

Board Agenda Date: February 25, 2014

Vote Requirement: Majority

Department or Agency Name(s): County Administrator; Water Agency

Staff Name and Phone Number:
Veronica Ferguson; Grant Davis

Supervisorial District(s):
All

Title: Informational report on impacts of drought and take recommendation actions

Recommended Actions:

Receive an update on drought conditions facing the region, adopt a Resolution of the Board of Supervisors proclaiming a drought emergency in Sonoma County, and adopt a Concurrent Resolution of the Board of Supervisors and the Board of Directors of the Sonoma County Water Agency urging a 20% voluntary reduction in water use and other specific actions in response to drought conditions.

Executive Summary:

Several consecutive dry years, followed by the driest calendar year on record in 2013, have culminated in a statewide drought, including Sonoma County. Due to the lack of rain, water storage levels are at historic lows in both of our region's two water supply reservoirs, Lake Sonoma and Lake Mendocino. Most critical is Lake Mendocino currently at 41 percent of water supply storage capacity with no carry over supply for next year. Lake Sonoma's water supply capacity is currently 68 percent with a year or more of supply remaining.

Drought in Sonoma County has broad impacts and considerations that extend beyond drinking water and conservation efforts. The local agricultural system, the County's wholesale and retail water responsibilities, general county operational practices, tourism, fire services and prevention, conservation messaging and practices within the community at large, and consideration of the public's health are all important aspects of the County's drought response. In some instances, such as local agriculture, the drought has created a critical emergency with significant crop loss and costs to local producers.

Several jurisdictions within the County have already proclaimed states of emergency or similar responses to the drought. The city of Cloverdale has proclaimed a Stage 2 Water Shortage Emergency, which requires customers to reduce water consumption by 25%, permitting of hydrant use, and water service only by request at restaurants; the City of Healdsburg has proclaimed a Water Shortage Emergency and implemented Stage 2 mandatory water conservation measures; the City of Santa Rosa has approved voluntary 20% reduction in water use and funding for outreach materials; the City of Sonoma has approved voluntary 15% reduction in water use; and the City of Rohnert Park has approved voluntary 20% reduction in water use. In addition, the County of Mendocino has proclaimed a drought emergency, which supported the Town of Willits in receiving outside funding, and provided

for a heightened level of coordination on County wide response.

This report provides an overview of the current status of the drought in Sonoma County, specific actions underway or planned by the Water Agency and various Departments, requests your Board's proclamation of a state of emergency related to the drought, and requests your Board's adoption of voluntary conservation measures.

Water Agency Drought-Related Actions

The Water Agency, in December 2013, requested and received a Temporary Urgency Change Order from the State Water Resources Control Board allowing the Water Agency to preserve Lake Mendocino water storage levels by reducing releases into the Russian River. The Russian River water supply system is now in a critical condition per the Water Agency's water rights. This means minimum flows have been dropped to 25 cubic-feet-per-second (cfs) in the Russian River north of Healdsburg; 75 cfs in Dry Creek; and 35 cfs in the Lower Russian River. To date, over 3,000 acre-feet of water has been preserved due this change.

On February 3, 2014, the Water Advisory Committee adopted a resolution pledging support for a 20% voluntary reduction. The Water Agency's proposed FY 14/15 budget is based upon reduced water sales and uses reserve funds to reduce water rate increases that would otherwise have occurred due to the lower water sales estimate.

The Water Agency and the Water Contractors, participating in the Sonoma-Marin Saving Water Partnership, have implemented an aggressive public outreach effort – *there's a drought on; turn the water off* – to increase drought and water conservation awareness. Because the impacts of the drought vary geographically, Water Agency staff is also developing drought town hall meetings in each supervisorial district for March and April, along with a public outreach event called the drought drive-thru to distribute free water use efficiency equipment to help save water along with water conservation tips and resources. In addition to these outreach efforts, the Board has approved several efforts for the Water Agency to staff to increase water supply system reliability, resiliency and efficiency in the face of limited resources, regulatory constraints and climate change uncertainties.

Water Agency staff is working with the National Oceanic and Atmospheric Administration to improve our ability to capture and manage water from atmospheric rivers. In addition, Agency staff is meeting monthly with water managers in the upper Russian River (including Mendocino County) and coordinating regularly with State Water Resources Control Board staff and meeting every other week with applicable resource agencies including the U.S. Army Corps of Engineers, National Marine Fisheries Service, and California Department of Fish and Wildlife regarding drought, water supply, and fisheries issues. In addition, the Water Agency is implementing long term projects that will provide secure and reliable water supplies for the future, including programs for the sustainable management of groundwater resources in the Alexander Valley, Santa Rosa Plain and Sonoma Valley as well as implementation of water reuse programs throughout our service area.

Agricultural Commissioner and UC Cooperative Extension

The Agricultural Commissioner has surveyed local producers to determine the economic impact. Through these efforts, as of January 31, 2014, it is estimated that Sonoma County rangeland is at 94% loss, pasture at 93% loss, and Oat Hay and Volunteer Hay both at 100% loss, among other significant impacts. While the economic impact continues to grow, it was assessed at approximately $6.2 million as of January 31st. The Agricultural Commissioner, in collaboration with the University of California Cooperative Extension, is working to assist the agricultural community respond to the drought, as well as providing technical and other support necessary to support financial assistance applications.

In partnership with several agricultural organizations and the UC Cooperative Extension, the Agricultural

Commissioner hosted a workshop to identify the impacts of the drought on the local agricultural community as well as options for addressing those impacts, including available funding. The results of the workshop will be consolidated and presented to the Board as appropriate. In addition, the Agricultural Commissioner has taken the lead to investigate and is prepared to implement a water hauling/trucking program to aid ranchers and farmers who are in dire need of water for livestock and feed.

Transportation and Public Works

The County operates several small water districts. Water district customers have been advised to immediately implement voluntary water conservation measures and planning for emergency water provisions is underway. Russian River Utilities is securing water delivery service from a private hauler who has delivery trucks that meet the California Department of Public Health (CDPH) standards for potable water. In addition, staff and the water district's maintenance contractor, Russian River Utilities (RRU), are preparing for drought related impacts to surface and ground water sources that provide water to the Freestone, Jenner and Salmon Creek water systems.

Transportation and Public Works is modifying its operations in other areas to conserve water. For example, Road Maintenance has not washed vehicles at Santa Rosa yard for over 2 years. Parking areas in the road yards are swept, not washed, due to storm water regulations. All culvert and storm drain cleaning is done with a Vactor truck and use at least 50% less water through their pressure nozzles. Similarly, Sonoma Compost Company, the largest water user at the Central Landfill, is pursuing measures to use other water sources, such as reclaimed brewery water, rather than well water to add required moisture to incoming materials during the dry season.

Regional Parks

Regional Parks is striving to set an example of water conservation in the management of parks, open space, and landscaping. Over the past decade, Regional Parks has implemented a variety of strategies to conserve water resources including restroom fixture conversions for low flow/auto shut valves, irrigation schedules and the conversion of water intensive landscape to native drought-tolerant plantings. In addition, the Department has implemented new procedures in response to the drought conditions whereby water will be used minimally for sanitation of restrooms, equipment cleaning, and irrigation of landscaped areas while increasing efforts to monitor park infrastructure for leaks. Regional Parks will be providing information to campers and park members regarding the drought and working closely with the Water Agency to distribute information to park visitors throughout the County.

Permit and Resource Management Department

PRMD supports a number of water conservation programs to help citizens adapt to changes the drought brings to Sonoma County. The Water Efficient Landscape Ordinance, required for qualifying projects, details water budgets and landscape and irrigation design. Homeowners and businesses can install graywater systems to divert wastewater from washing machines, sinks, bathtubs and showers to irrigate landscaping. Some systems require no permit; others only need a plumbing permit. Residents can also capture rainwater for irrigation using a range of systems. Storage tanks sized 5,000 gallons or less and requiring 50 cubic yards of grading or less do not require permits. Bigger tanks or other storage systems require County and/or State permits.

General Services

Since 2008 the Department has reduced water consumption by 48 percent in buildings in the County Administration Center, Heavy Equipment Shop, Animal Shelter, La Plaza, Los Guilucos and other General Funded Buildings. The reductions have been accomplished though the use of electronic controls, low gallon toilets,

reduced landscape areas and other measures. Approximately 30,645,197 gallons of water are saved annually as a result of these efforts. The Department will continue to work with all county departments and facilities under its responsibility to identify additional opportunities to conserve, including landscaping and facilities operations. Efforts will include disseminating water use reduction information to employees, information that employees can follow in the workplace and at home. General Services Real Estate will engage the multiple landlords that provide lease space for County programs and reiterate the importance of meeting water reduction targets. Information and technical assistance relative to water use reduction strategies and measures will be shared with landlords.

Health Services

The Department of Health Services is providing support to several departments, including the Water Agency and Agricultural Commissioner, as well as monitoring and assessing any potential public health issues arising from the drought. Central to the Department's efforts is public messaging to ensure vulnerable populations drink enough clean water, sanitation for medical facilities and restaurants is maintained, and sewage systems avoid failures all while conserving water.

Fire and Emergency Services

The County's Fire and Emergency Services Department has maintained close contact with Cal Fire, the California Office of Emergency Services, regional emergency coordinators. In addition, because the drought has increased the risk of fire, particularly in undeveloped parts of the county, the Department is exploring what additional preventative measures, such as increased vegetation management programs, it can undertake. Also related to fire services, the Department is working collaboratively with fire districts in the county to modify training practices as necessary and appropriate to avoid using significant amounts of potable water.

State and Federal Legislative Efforts; Emergency Drought Declarations

The Board of Supervisors along with Water Agency and County staff have worked aggressively with the County's State and Federal delegation to seek support for addressing local drought impacts.

On January 17, 2014, Governor Jerry Brown issued a statewide emergency proclamation based on drought conditions in which he called for every Californian to voluntarily reduce water use by 20 percent. The complete text of Governor Brown's proclamation is available here: http://gov.ca.gov/news.php?id=18368

State Senator Darrell Steinberg is proposing a bill that includes appropriation of funds from existing bonds (Prop 50, Prop 84 and Prop 1E), the General Fund, and the Greenhouse Gas Reduction Fund to expedite drought relief projects across the state. Specifically, the bill would fund projects for local drought preparedness and supply reliability including conservation and recycling, emergency drinking water for affected communities, multi-benefit flood projects designed to improve water supply, sustainable groundwater management, and emergency actions to protect fish and wildlife.

On January 24, 2014, the United States Department of Agricultural designated Sonoma County (along with many other counties) a natural disaster area due to drought. The USDA's designation provides access to a variety of emergency financial assistance programs to ranchers and farmers and agriculture-related businesses.

U.S. Senate leaders from California and Oregon have introduced emergency drought legislation to provide funding and tools to communities suffering from severe drought impacts. The legislation was introduced by Senators Diane Feinstein and Barbara Boxer (D-California) as well as Ron Wyden and Jeff Merkley (D-Oregon). The California Emergency Drought Relief Act of 2014 would allocate $300 million of federal funding for drought-relief

projects and institute provisions to improve agency flexibility for water delivery, without limiting state and federal environmental laws. California Natural Resources Agency Secretary John Laird offered comments in support of the newly introduced bill.

County Emergency Drought Proclamation

The attached Resolution proclaiming a local emergency due to drought conditions covers the entire Sonoma County Operational Area, including all nine cities and special districts. Based on the County's Operational Area Agreement, the county will be the lead agency for mutual aid and coordination with these jurisdictions and the State through the California Office of Emergency Services. With this proclamation, additional coordination at the operational area will occur to help identify what actions are needed to address broad community impacts, particularly to local agriculture.

The proclamation creates a greater suite of opportunities to support our region's local agriculture and economy. For example, additional funding requests for drought related response activities and public outreach may become available that can assist the agricultural community, mitigate the increased fire risk, and streamline mitigation projects to protect and preserve drinking and agricultural water supplies. Although not currently available through the Gubernatorial Proclamation, future reimbursement for emergency response and coordination activities may later become available through the California Disaster Assistance Act (CDAA). The CDAA would allow for reimbursement up to 75% of costs incurred under a locally proclaimed emergency. Several other counties have included a request for expanded State and Federal assistance in their proclamations of local emergency. The attached Resolution requests the Governor immediately authorize CDAA reimbursement and also requests the Governor seek all available Federal disaster assistance, to include a Presidential Declaration of Emergency.

Prior Board Actions:

Strategic Plan Alignment	Goal 2: Economic and Environmental Stewardship

The recommended actions support the conservation of vital resources necessary for the health and continued economy of the county and citizens.

Fiscal Summary - FY 13-14

Expenditures		**Funding Source(s)**	
Budgeted Amount	$		$
Add Appropriations Reqd.	$	State/Federal	$
	$	Fees/Other	$
	$	Use of Fund Balance	$
	$	Contingencies	$
	$		$
Total Expenditure	**$**	**Total Sources**	**$**

Narrative Explanation of Fiscal Impacts (If Required):			
No specific budget action is requested through this item. However, the CAO will begin to coordinate cost tracking associated with emergency response planning and activity, including costs associated with staffing the Emergency Operations Center, requesting mutual aide, and other necessary measures.			
Staffing Impacts			
Position Title (Payroll Classification)	**Monthly Salary Range** (A – I Step)	**Additions** (Number)	**Deletions** (Number)
Narrative Explanation of Staffing Impacts (If Required):			
Attachments:			
Water Agency Resolution County of Sonoma Resolution Resolution for State Assistance Resolution for Federal Assistance			
Related Items "On File" with the Clerk of the Board:			

County of Sonoma
State of California

Item Number: _____

Date: February 25, 2014 Resolution Number: _____

☐ 4/5 Vote Required

Resolution Of The Board Of Supervisors Of The County Of Sonoma, State Of California, Proclaiming a Local Emergency Due to Drought Conditions in the County of Sonoma and Requesting Immediate State and Federal Assistance

WHEREAS, the State of California is experiencing one of the driest winters in recorded history; and

WHEREAS, on January 17, 2014, the Governor of the State of California proclaimed a State of Emergency for the State of California due to drought conditions; and

WHEREAS, on January 22, 2014, the City of Cloverdale adopted a Resolution declaring a Water Shortage Emergency Condition; and

WHEREAS, on January 24, 2014, the United States Department of Agriculture designated the County of Sonoma, along with many other California counties, a natural disaster area due to drought; and

WHEREAS, on February 14, 2014, the City of Healdsburg adopted a Resolution proclaiming a drought emergency; and

WHEREAS, the adverse environmental, economic, health, welfare and social impacts of the drought pose an imminent threat of disaster and threaten to cause widespread potential harm to people, businesses, agriculture, property, communities, wildlife and recreation in the County of Sonoma.

NOW, THEREFORE, IT IS HEREBY RESOLVED by Board of Supervisors of the County of Sonoma, State of California, as follows:

IT IS PROCLAIMED AND ORDERED, pursuant to Government Code section 8558 and Chapter 10 of the Sonoma County Code, that a local emergency has existed throughout the County of Sonoma because of drought conditions since January 17, 2014; and

IT IS FURTHER PROCLAIMED AND ORDERED, that during the existence of this local emergency, the powers, functions and duties of the County Administrator, Director of Emergency Services and the emergency management organization of the Sonoma County Operational Area shall be those prescribed by Federal law; State law; by ordinances, resolutions and the Code of the County of Sonoma; and by the Sonoma County/Operational Area Emergency Operations Plan approved the Board of Supervisors; and

IT IS REQUESTED that the Governor of the State of California waive regulations that may hinder response and recovery efforts, make available California Disaster Assistance Act funding for the State of Emergency proclaimed on January 17, 2014, and seek all available forms of Federal disaster assistance and relief programs, to include a Presidential Declaration of Emergency; and

IT IS FURTHER PROCLAIMED AND ORDERED, pursuant to Government Code section 8630, the Board of Supervisors shall review the need for continuing this local emergency at least once every thirty days until the Board of Supervisors terminates the local emergency: and

IT IS FURTHER PROCLAIMED AND ORDERED that a copy of this proclamation be forwarded to the State Director of the Office of Emergency Services and all State and Federal legislators representing the County of Sonoma.

Supervisors:

Gorin: Zane: McGuire: Carrillo: Rabbitt:

Ayes: Noes: Absent: Abstain:

So Ordered.

County of Sonoma
State of California

Item Number: _____

Date: February 25, 2014 Resolution Number: _____

☐ 4/5 Vote Required

Concurrent Resolution of the Board of Directors of the Sonoma County Water Agency and the County of Sonoma Board of Supervisors Supporting Governor Brown's Emergency Drought Declaration and Directing other Actions in Response to the Drought Conditions

WHEREAS, calendar year 2013 was the lowest rainfall year on record in 120 years; and

WHEREAS, the historical dry conditions have resulted in severely low storage levels in Lake Mendocino (41% of capacity as of February 19, 2014) requiring a Temporary Urgency Change Order to be issued by the State Water Resources Control Board enabling lower in stream releases to the Russian River and preserving lake storage; and

WHEREAS, on January 17, 2014 Governor Brown declared a statewide drought in California and called for a 20% voluntary reduction in water use; and

WHEREAS, on January 24, 2014, the United States Department of Agricultural designated Sonoma County a natural disaster area due to drought. The USDA's designation provides access to a variety of emergency financial assistance programs to ranchers and farmers and agriculture-related businesses; and

WHEREAS, the agricultural community has been negatively impacted by the drought conditions; and

WHEREAS, the Sonoma County Board of Supervisors proclaimed a local emergency due to drought conditions on February 25, 2014; and

WHEREAS, in September 2010, following 16 months of community outreach and involvement, the Sonoma County Water Agency Board of Directors approved nine Water Supply Strategies developed to increase water supply system reliability, resiliency and efficiency in the face of limited resources,

regulatory constraints and climate change uncertainties. The Water Supply Strategies Action plan was last updated in 2013;

WHEREAS, Water Agency staff has been coordinating with affected stakeholders in Sonoma and Mendocino counties and resource agencies, including the State Water Resources Control Board, the California Department of Fish and Wildlife, the United States Army Corps of Engineers, and the National Marine Fisheries Service, on drought issues;

WHEREAS, Sonoma County Water Agency, along with the Cities of Cotati, Petaluma, Rohnert Park, Santa Rosa and Sonoma, the North Marin, Marin Municipal and Valley of the Moon Water Districts and the Town of Windsor, are members of the Sonoma-Marin Saving Water Partnership (Partnership), through which these members have joined together to provide a regional approach to water use efficiency; and

WHEREAS, these Partnership members recognize that establishing common water conservation projects on a regional basis and applicable across the political and jurisdictional boundaries of each member may be a means of cost effectively conserving more water than would be otherwise be conserved on an individual member-by-member basis; and

WHEREAS, the Partnership, through its many water efficiency programs, educational seminars and outreach campaigns, is working to educate our communities about the importance of conserving water resources and curbing water-wasting behaviors; and

WHEREAS, in summer 2013 the “20-Gallon Challenge” was embraced by community members who pledged to reduce water use by 20 gallons per person per day. The 20-Gallon Challenge was promoted throughout the Russian River Watershed expanding the Partnership reach into Mendocino County. Working together in Sonoma, Marin and Mendocino counties, the “20-Gallon Challenge” resulted in a positive response to the 2013 dry spring conditions; and

WHEREAS, the Partnership members have embarked on a regional water use efficiency media campaign titled: “There’s a Drought on. Turn the Water Off” designed to increase awareness and reduce water use; and

WHEREAS, on February 3, 2014, the Water Advisory Committee to the Sonoma County Water Agency adopted a resolution pledging support of the Partnership efforts, encouraging residents to increase water use efficiency by fixing leaks and eliminating unnecessary outdoor irrigation to help

protect and preserve reliable drinking water supplies stored in Lake Mendocino and Lake Sonoma; and urging water customers to heed the Governor's declaration to reduce water use by 20 percent:

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the Sonoma County Water Agency and the Sonoma County Board of Supervisors hereby:

1. Pledges to support the Partnership efforts; and

2. Encourages the community to increase water use efficiency by fixing leaks and eliminating unnecessary outdoor irrigation to help protect and preserve reliable drinking water supplies stored in Lake Mendocino and Lake Sonoma; and

3. Urges the community to heed the Governors declaration to reduce water use by at least 20%, regardless of water source, to avoid potential future mandatory water use restrictions; and

4. Directs Water Agency and County staff to explore ways to further reduce water use at Water Agency and County facilities; and

5. Authorizes the Agricultural Commissioner to continue to assist the agricultural community by implementing water hauling/trucking programs, as needed; and

6. Directs Water Agency and County staff to continue engaging stakeholders in Sonoma and Mendocino counties to coordinate on drought-related issues, including through the Russian River Compact; and

7. Supports the Water Agency convening drought town hall meetings in each Supervisorial district that would include local governmental and non-governmental partners; and

8. Directs Water Agency and County staff to continue to monitor and collaborate with state and federal legislative drought relief efforts; and

9. Directs Water Agency and County staff to continue to collaborate on countywide groundwater management issues, including exploring opportunities for groundwater recharge and aquifer storage and recovery to provide for resiliency now and in the future.

10. Directs Water Agency staff to continue to build drought resiliency through improving scientific understanding of weather and climate variability in then relate to how water is used; using forecasts in coordinated reservoir operations; pursuing integrated water resource management; and overcoming fragmentation of water management by strengthening partnerships.

Supervisors:

Gorin:	Zane:	McGuire:	Carrillo:	Rabbitt:
Ayes:	Noes:	Absent:	Abstain:	

So Ordered.

Directors:

Gorin:	Zane:	McGuire:	Carrillo:	Rabbitt:

County of Sonoma
State of California

Item Number: _____

Date: February 25, 2014 Resolution Number: _____

☐ 4/5 Vote Required

Resolution Of The Board Of Supervisors Of The County Of Sonoma, State Of California, Requesting the California Office of Emergency Services Concurrence in Local Emergency

WHEREAS, on January 17, 2014, the Governor of the State of California proclaimed a State of emergency for the State of California due to drought conditions, but did not authorize California Disaster Assistance Act (CDAA) funding to counties and local government entities; and

WHEREAS, on February 25, 2014, in accordance with State law, the Board of Supervisors of the County of Sonoma proclaimed a local emergency has existed throughout the County of Sonoma due to drought conditions since January 17, 2014; and

WHEREAS, the adverse environmental, economic, health, welfare and social impacts of the drought pose an imminent threat of disaster and threaten to cause widespread potential harm to people, businesses, agriculture, property, communities, wildlife and recreation in the County of Sonoma.

NOW, THEREFORE, IT IS HEREBY RESOLVED, DECLARED AND ORDERED that a copy of this Resolution be forwarded to the Director of the California Office of Emergency Services (Cal OES) with a request that he find it acceptable in accordance with the provisions of the California Disaster Assistance Act (CDAA) in order to make available CDAA funding for the State of Emergency proclaimed by the Governor on January 17, 2014; and

IT IS FURTHER RESOLVED that the Sonoma County Auditor Controller Treasurer Tax Collector is hereby designated as the authorized representative of the County of Sonoma for the purpose of receipt, processing, and coordination of all inquiries and requirements necessary to obtain available State assistance; and

IT IS FURTHER RESOLVED that the Sonoma County Auditor Controller Treasurer Tax Collector is hereby designated as the authorized representative of the County of Sonoma for the purpose of receipt, processing, and coordination of all inquiries and requirements necessary to obtain available State and Federal assistance for the private sector.

Supervisors:

Gorin: Zane: McGuire: Carrillo: Rabbitt:

Ayes: Noes: Absent: Abstain:

So Ordered.

County of Sonoma
State of California

Item Number: _____

Date: February 25, 2014 Resolution Number: _____

☐ 4/5 Vote Required

Resolution Of The Board Of Supervisors Of The County Of Sonoma, State Of California, Requesting that the Governor of the State of California Request a Presidential Declaration of Emergency

WHEREAS, on January 17, 2014, the Governor of the State of California proclaimed a State of Emergency for the State of California due to drought conditions; and

WHEREAS, on January 24, 2014, the United State Department of Agriculture designated the County of Sonoma, along with many other California counties, a natural disaster area due to drought; and

WHEREAS, on February 25, 2014, in accordance with State law, the Board of Supervisors of the County of Sonoma proclaimed a local emergency has existed throughout the County of Sonoma due to drought conditions since January 17, 2014; and

WHEREAS, local resources are likely unable to cope with the adverse environmental, economic, health, welfare and social impacts of the drought which pose an imminent threat of disaster and threaten to cause widespread potential harm to people, businesses, agriculture, property, communities, wildlife and recreation in the County of Sonoma.

NOW, THEREFORE, IT IS HEREBY RESOLVED, DECLARED AND ORDERED that a copy of this Resolution be forwarded through the Director of the California Office of Emergency Services (Cal OES) to the Governor of the State of California with a request that the Governor request a Presidential Declaration of Emergency; and

IT IS FURTHER RESOLVED that the Sonoma County Auditor Controller Treasurer Tax Collector is hereby designated as the authorized representative of the County of Sonoma for the purpose of receipt, processing, and coordination of all inquiries and requirements necessary to obtain available State and Federal assistance for the public sector; and

IT IS FURTHER RESOLVED that the Sonoma County Auditor Controller Treasurer Tax Collector is hereby designated as the authorized representative of the County of Sonoma for the purpose of receipt, processing, and coordination of all inquiries and requirements necessary to obtain available State and Federal assistance for the private sector.

Supervisors:

Gorin: Zane: McGuire: Carrillo: Rabbitt:

Ayes: Noes: Absent: Abstain:

So Ordered.

Stinson Beach County Water District

Stinson Beach County Water District. January 2014. Drought Alert – Water Rationing in Effect February 2014.

_____. February 2014. Drought Alert – Water Rationing in Effect February 2014.

_____. March 2014. Revised Drought Rationing Allocation – Water Rationing Enforcement in Effect April 1, 2014.

_____. April 2, 2014. Drought Status.

DROUGHT ALERT

WATER RATIONING IN EFFECT FEBRUARY 2014

Stinson Beach County Water District

January 2014

A WATER SHORTAGE EMERGENCY CONDITION PREVAILS

Effective February 2014, water use will be restricted to 110 gallons per day (which represents a 27% reduction from average use) per residence until further notice. A Draft Water Rationing Ordinance containing enforcement provisions will be presented at a Public Hearing at the Saturday, February 15, 2014, Board meeting. Although commercial users are exempt from rationing, they are expected to be aggressive in their conservation of water.

The District's Water Conservation Stage II Alert went into effect in April 2013. Water usage has actually gone up due to warm weather, lack of rainfall and more visitors than usual for this time of year. Creek flows are barely measurable and our well capacity has decreased.

Enforcement – If you use more than 110 gallons per day, you will receive a warning notice (notice #1. If you fail in the next billing cycle, you will be fined $100 (notice #2). If you fail again, the fine will be $200 (notice #3). The 4th failure will result in a cease and desist order and water will be turned off, whether or not the over usage is for consecutive months.

This is only a first step. In the future, it may be necessary to have additional reductions.

What you can do:

Turn off your water when you are absent from the residence: Turn off water to your irrigation system and to the house (the valve located between the meter and the house, at the meter) if you plan to be off-site for an extended period of time ***unless the residence is equipped with a fire sprinkler system.*** Customers are responsible for wasted water due to a leak whether or not they are occupying the residence.

Irrigation systems and in-house plumbing should be monitored. Anything but a 1.6 gallon flush toilet should be replaced.

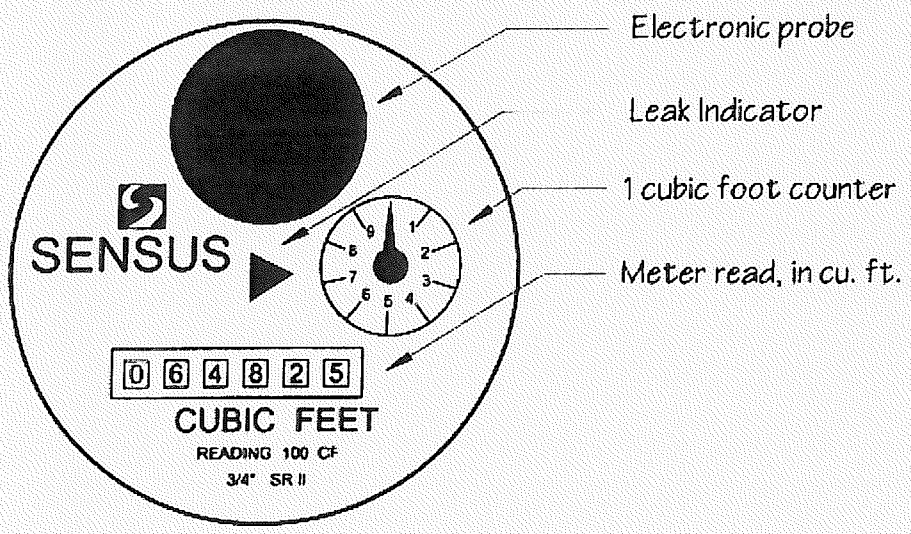
If you have any questions or concerns, please don't hesitate to call the District for assistance at: 868-1333. Log in to http://www.epa.gov/watersense/ for tips to save water each day.

Typical water use at home

Bath	A full tub is about 36 gallons.
Shower	2 gallons per minute. Old shower heads use as much as 5 gallons per minute.
Teeth brushing	<1 gallon, especially if water is turned off while brushing. Newer bath faucets use about 1 gallon per minute, whereas older models use over 2 gallons.
Hands/face/washing	1 gallon

Shaving	1 gallon
Dishwasher	4 to 10 gallons/load, depending of efficiency of dishwasher
Dishwashing by hand	20 gallons. Newer kitchen faucets use about 2.2 gallons per minutes, whereas older faucets use more.
Clothes washer	25 gallons/load for newer washers. Older models use about 40 gallons per load.
Toilet flush	3 gallons. Most all new toilets use 1.6 gallons per flush, but many older toilets used about 4 gallons.

READING YOUR WATER METER



1. Meters are read monthly, reflecting a billing period of approximately 30 days.
2. The leak indicator will rotate clockwise, visually alerting you that water is traveling through the water meter.
3. One revolution of the cubic foot counter equals 1 cubic foot of water usage. 1 Cubic Foot = 7.48 gallons.
4. The electronic probe is attached to the lid of your meter box. Care should be used in removing and replacing the lid to avoid damaging attached wires.
5. Review your water bill to determine your monthly usage. For example, 400 cubic feet used would equate to 2,992 gallons (400 x 7.48). Dividing 2,992 gallons by 30 days = 100 gallon usage per day.

w/bills 2-5-14 1

DROUGHT ALERT

WATER RATIONING IN EFFECT FEBRUARY 2014

Stinson Beach County Water District

February 2014

A WATER SHORTAGE EMERGENCY CONDITION PREVAILS

Effective February 2014, water use will be restricted to 110 gallons per day (which represents a 27% reduction from average use) per residence until further notice. A Draft Water Rationing Ordinance containing enforcement provisions will be presented at a Public Hearing at the Saturday, February 15, 2014, Board meeting. Although commercial users are exempt from rationing, they are expected to be aggressive in their conservation of water.

The District's Water Conservation Stage II Alert went into effect in April 2013. Water usage has actually gone up due to warm weather, lack of rainfall and more visitors than usual for this time of year. Creek flows are barely measurable and our well capacity has decreased.

Enforcement – If you use more than 110 gallons per day, you will receive a warning notice (notice #1). If you fail in the next billing cycle, you will be fined $100 (notice #2). If you fail again, the fine will be $200 (notice #3). The 4th failure will result in a cease and desist order and water will be turned off, whether or not the over usage is for consecutive months.

This is only a first step. In the future, it may be necessary to have additional reductions.

What you can do:

Turn off your water when you are absent from the residence: Turn off water to your irrigation system and to the house (the valve located between the meter and the house, at the meter) if you plan to be off-site for an extended period of time ***unless the residence is equipped with a fire sprinkler system.*** Customers are responsible for wasted water due to a leak whether or not they are occupying the residence.

Irrigation systems and in-house plumbing should be monitored. Anything but a 1.6 gallon flush toilet should be replaced.

If you have any questions or concerns, please don't hesitate to call the District for assistance at: 868-1333. Log in to http://www.epa.gov/watersense/ for tips to save water each day.

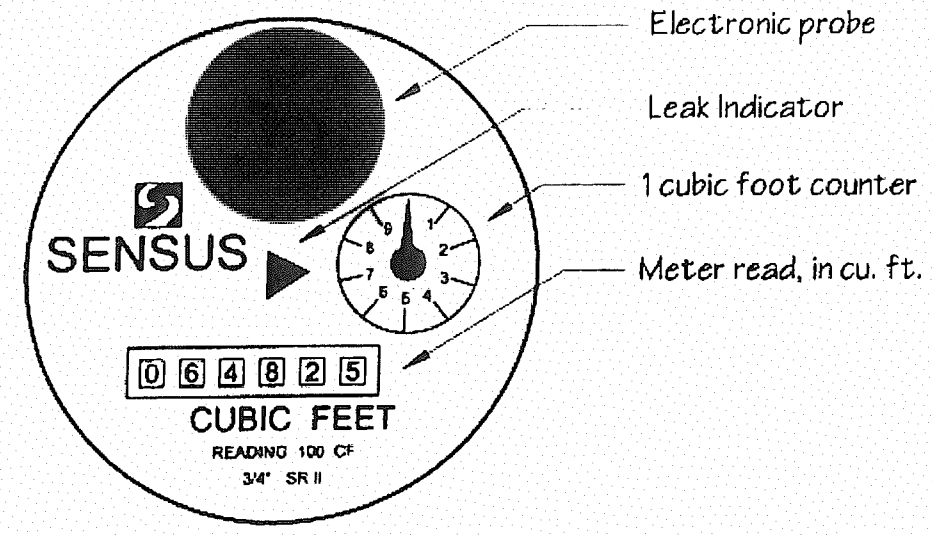
Typical water use at home

Bath	A full tub is about 36 gallons.
Shower	2 gallons per minute. Old shower heads use as much as 5 gallons per minute.
Teeth brushing	<1 gallon, especially if water is turned off while brushing. Newer bath faucets use about 1 gallon per minute, whereas older models use over 2 gallons.
Hands/face/washing	1 gallon

Shaving	1 gallon
Dishwasher	4 to 10 gallons/load, depending of efficiency of dishwasher
Dishwashing by hand	20 gallons. Newer kitchen faucets use about 2.2 gallons per minutes, whereas older faucets use more.
Clothes washer	25 gallons/load for newer washers. Older models use about 40 gallons per load.
Toilet flush	3 gallons. Most all new toilets use 1.6 gallons per flush, but many older toilets used about 4 gallons.

READING YOUR WATER METER & HOW TO CALCULATE YOUR AVERAGE DAILY USE.

The following is a representation of the typical ¾" water meter in Stinson Beach. There are several generations and sizes of the same type of meters within the District. Some registers will look a little different, but they all operate in the same general manner. All of the meters have a leak indicator and read in cubic feet.



1. Meters are read monthly by District staff, reflecting a billing period of approximately 30 days. You may want to monitor your water usage by reading your meter daily or weekly.

2. The leak indicator will rotate clockwise, visually alerting you that water is traveling through the water meter.

3. For most meters, one revolution of the cubic foot counter equals 1 cubic foot of water usage. 1 Cubic Foot = 7.48 gallons.

4. The electronic probe is attached to the lid of your meter box. Care should be used in removing and replacing the lid to avoid damaging attached wires.

5. Review your water bill to determine your monthly usage. For example, 400 cubic feet used would equate to 2,992 gallons (400 x 7.48). Dividing 2,992 gallons by 30 days = 100 gallon usage per day. Most meters round down to the nearest 100 cubic foot. All meters can be manually read to the tenth of a cubic foot.

March 2014

REVISED DROUGHT RATIONING ALLOCATION

WATER RATIONING ENFORCEMENT IN EFFECT APRIL 1, 2014
Stinson Beach County Water District

A WATER SHORTAGE EMERGENCY CONDITION PREVAILS.

Effective April 1, 2014, water use will be restricted to 125 gallons per day per residence until further notice. A Water Rationing Ordinance was presented and approved at a Public Hearing at the Saturday, February 15, 2014, Board meeting. Modifications to the Ordinance were made by the Board of Directors at a Public Hearing at the February 24, 2014 Special Board meeting. Commercial users are requested to reduce their water consumption by 20%.

Enforcement in effect on April 1st, regardless of whether the excess water usage occurs in consecutive billing cycles:

a. Notice #1 (a warning notice) will be sent with the May bill to reduce water usage if the customer's monthly usage for April exceeds 125 gallons per residence per day (500 cubic feet per month), requesting them to reduce their maximum usage to 125 gallons per residence per day in subsequent billing cycles.

b. If a subsequent over usage occurs, Notice #2 (a violation notice) will be sent no earlier than June and a fine of $400 will be charged.

c. If another subsequent over usage (violation) occurs, Notice #3 will be sent no earlier than July and cease and desist order will be issued, and water will be turned off and water service will be terminated.

d. Termination of Water Service: Water waste consisting of continued water consumption in violation of the provisions of the ordinance will serve as prima facie evidence that the water use is excessive and will result in the termination of water service. A charge shall be paid prior to reactivating a service that has been terminated. The charge shall be specified from time to time by resolution of the Stinson Beach County Water District.

An appeal process for additional water allocation for special needs, restoration of water service in event of shutoff, and other implementing regulations are being developed by the Board.

Another public Special Board meeting will be held on Wednesday, March 12, 2014, at 8:30 a.m. at the Stinson Beach Chapel, 32 Belvedere Avenue. The public is invited to attend and provide input on the implementing regulations the Board will be considering.

April 2, 2014

DROUGHT STATUS

DUE TO RECENT RAINFALL, THE DISTRICT BOARD OF DIRECTORS OF THE STINSON BEACH COUNTY WATER DISTRICT HAS POSTPONED THE FIRST MONTH OF WATER RATIONING TO THE MAY WATER BILL, WHICH IS MAILED OUT THE FIRST WEEK OF JUNE.

If you use more than 125 gallons per day during the month of May, you will receive a warning notice in that invoice, which is mailed out the first week of June.

Since the District Board of Directors is still working on the implementing rules and regulations and because of 2" of rainfall within the last 48 hours, the Board may decide to further postpone rationing. We have now received about 80% of our annual rainfall. Watch the District website, http//Stinson-Beach-cwd.dst.ca.us, for up-to-date details.

Water Rationing Plans will be discussed at all Board meetings in the immediate future. They are held at the District Office at 9:30 a.m., the third Saturday of every month.

The District Board has spent many hours developing a water rationing plan that meets the specific needs of the Stinson Beach Community. THE BOARD WANTS TO THANK ALL OF THE PEOPLE WHO HAVE HELPED THE DISTRICT THROUGH THIS EXTENSIVE PROCESS. Many water agencies just raise their rates in response to the drought. Your Board is not doing that. They are developing a program that provides additional water to larger families, multiple units on one meter, and for the special medical needs of our customers.

During the last 15 months, the Board has developed a program for Graywater Systems. That plan has been approved by the Board and will be implemented as soon as the Regional Water Quality Control Board approves it. Please see the District website for details.

Other actions have been taken by the District to <u>conserve water</u> and they include:

- We revised our meter reading from every two months to every month in an effort to repair leaks faster and provide monthly water demand information to customers.
- Implemented Stage I Water Conservation Alert about 18 months ago.
- Implemented Stage II Water Conservation Alert about 12 months ago.
- Implementing Stage III (rationing) since February 2014.
- Had our entire water system "leak detected" by a professional team.
- Developed a Capital Improvement Program (about $500K/yr.) to reduce the amount of water that is leaking through the District's infrastructure.
- Applying for grants from several layers of state and Federal Government for adding additional water supply and storage.
- Hired a local consultant (Richard Reasoner) to provide landscape irrigation assistance to the District's highest water users.
- Planted a display garden of low water using plants at the District Office at 3785 Shoreline Highway.
- Accelerated a water line replacement program for the Calles and Patios from 2 years to 5 months.
- Hired an additional field employee to work exclusively on repairing District water line leaks and new line installation.
- Replaced the Black Rock tanks which were both leaking.
- Drilled another well, at the Steep Ravine Tank site.
- Reviewing the location and status of privately owned wells that might be used by the District in an emergency.
- Developing a new mapping system for all water lines in the District.
- Purchase leak detection equipment.
- Wrote an "Urban Water Management Plan" and a "Water Supply and Demand Management Option Report."
- Developed a Master List of Water Conservation Ideas and Technologies. (Check it out on the website.)
- Implemented a tiered water rate that encourages conservation.
- Sponsored a Water Irrigation class for landscape professionals.
- Convinced the GGNRA to shut off most of the water used at the Park.
- Developed a creek flow monitoring program.

Zone 7 Water Agency

Zone 7 Alameda County Flood Control and Water Conservation District Board of Directors. January 29, 2014. Resolution No. 14-4339 – Proclamation of State of Local Drought Emergency.

_____. April 16, 2014. Resolution No. 14-4361 – Declaring May as Water Awareness Month.

_____. 2014. Drought Prompts Cuts in Water Deliveries.

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
BOARD OF DIRECTORS

RESOLUTION NO 14-4339

INTRODUCED BY DIRECTOR QUIGLEY
SECONDED BY DIRECTOR PALMER

Proclamation of State of Local Drought Emergency

WHEREAS, Zone 7 of the Alameda County Flood Control and Water Conservation District is responsible for providing a reliable supply of high quality water to the Livermore-Amador Valley; and

WHEREAS, Zone 7 is responsible for managing the local groundwater basin in a sustainable fashion to provide annual and drought year water supplies; and

WHEREAS, California Governor Jerry Brown has officially declared a drought emergency for the State of California; and

WHEREAS, the federal government has declared Alameda County as a federal natural disaster county; and

WHEREAS, the Department of Water Resources has informed Zone 7 that the current dry conditions far exceed any previously recorded and that methods for determining safe allocations for State Water Project deliveries South of the Delta are nearly impossible; and

WHEREAS, DWR announced last week that if dry conditions continue, it will likely reduce the allocation of water supply from 5% to zero, which could also prevent any water from being moved through the South Delta Pumping Plant to contractors South of the Delta, including Zone 7; and

WHEREAS, the National Weather Service announced that the 90-day forecast is for continuing dry weather; and

WHEREAS, if no water is conveyed through the Delta, access to Zone 7's remotely-stored water may be minimal (i.e., water stored outside the local groundwater basin or Lake Del Valle in Semitropic, Cawelo or San Luis Reservoir).

WHEREAS, potential environmental impacts of some projects have already been reviewed as part of either Zone 7's Well Master Plan EIR or the Mitigated Negative Declaration for the Vulcan discharge pipeline, which were both adopted in accordance with California Environmental Quality Act (CEQA) guidelines.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District does hereby declare a state of drought emergency within its service area (the Livermore-Amador Valley); and

BE IT FURTHER RESOLVED that the Zone 7 Board of Directors hereby accepts and approves the Drought Emergency Response Plan; and

BE IT FURTHER RESOLVED that the General Manager is hereby authorized and directed to establish appropriate levels of conservation that are consistent with the California State of Drought Emergency and local water supply conditions; and

BE IT FURTHER RESOLVED that the General Manager is hereby authorized and directed to identify and pursue emergency projects that will minimize impacts on water deliveries in the Livermore-Amador Valley.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS FIGUERS, GRECI, MACHAEVICH, PALMER, QUIGLEY, RAMIREZ HOLMES, STEVENS

NOES: NONE

ABSENT: NONE

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a Resolution adopted by the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District on January 29, 2014.

By W. R. Stevens
President, Board of Directors

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
BOARD OF DIRECTORS

RESOLUTION NO 14-4361

INTRODUCED BY DIRECTOR FIGUERS
SECONDED BY DIRECTOR PALMER

Declaring May as Water Awareness Month

WHEREAS, on January 17, 2014, Governor Jerry Brown declared a State of Emergency due to the current drought conditions and asked everyone to reduce water use by 20%; and

WHEREAS, on January 29, 2014 at a Special Meeting of the Zone 7 Board, a local Drought Emergency was declared and a Drought Emergency Response Plan was accepted; and

WHEREAS, on January 29, 2014 the General Manager was authorized to establish an appropriate level of conservation, consistent with the governor's proclamation of a drought emergency as a Stage 2 Action under the 2010 Urban Water Management Plan; and

WHEREAS, on January 31, 2014, the California Department of Water Resources (DWR) announced they were reducing State Water Project allocations from to zero per cent for the first time in history; and

WHEREAS, Zone 7 usually declares May as Water Awareness Month and water awareness is even more important during the Drought Emergency.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District supports and declares May as Water Awareness Month and directs staff to provide direction to the water retailers for achieving needed conservation consistent with the Stage 2 Action Plan described in this Staff Report.

BE IT FURTHER RESOLVED that the Board directs staff to coordinate closely with the water retailers on conservation messaging, and staff are authorized to pool budgeted financial resources dedicated for conservation outreach in order to achieve this consolidated messaging.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS FIGUERS, GRECI, PALMER, RAMIREZ HOLMES, STEVENS

NOES: NONE

ABSENT: DIRECTORS MACHAEVICH, QUIGLEY

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a Resolution adopted by the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District on April 16, 2014.

By _____
President, Board of Directors

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, ZONE 7
100 NORTH CANYONS PARKWAY • LIVERMORE, CA 94551 • PHONE (925) 454-5000 • FAX (925) 454-5727

ORIGINATING SECTION: Integrated Planning
CONTACT: Robyn Navarra/Carol Mahoney

AGENDA DATE: April 16, 2014 ITEM NO. **8**

SUBJECT: Declaring May as Water Awareness Month

SUMMARY:

- Water Awareness month has traditionally provided an opportunity to heighten public awareness about conservation, supply, quality and distribution of water.
- With the Drought Emergency and the need to reduce demands a key part of this year's Sustainability Report (later in this evening's agenda), water awareness and providing conservation direction to the retailers is a critical Stage 2 Action, pursuant to Zone 7's 2010 Urban Water Management Plan (UWMP).
- Zone 7 is a member of "Save Our Water," a statewide program aimed at helping Californians to reduce their everyday indoor and outdoor water use. Save Our Water is a partnership between the Association of California Water Agencies (ACWA) and the California Department of Water Resources (DWR). With the establishment of the Drought Portal, this year's program focus is on drought emergency response.
- Zone 7 has developed some simple guidelines to achieve the necessary conservation, with a focus on significantly reducing outdoor water use this summer.
- The Water Awareness Campaign kick-off occurs in May every year with a proclamation from the Governor and the observance of Water Awareness Month. It is unclear what the State plans to do to fold in the Governor's previous statewide proclamation of a drought emergency. However, Zone 7 recognizes the particular importance of Water Awareness Month this year and recommends not only the more routine annual board resolution and various activities that recognize the vital role water plays in our lives but a more aggressive approach to achieve the required demand reductions.
- Staff recommends that the Board adopt the attached resolution, declaring the month of May 2014 as Water Awareness Month.

FUNDING:
Not applicable.

RECOMMENDED ACTION:
Adopt attached resolution declaring May as Water Awareness Month and directing staff to implement the Stage 2 Action Plan outlined in the attached memo.

ATTACHMENTS:
Memo providing additional background and discussion on agenda item
Resolution

Interoffice Memo

Date: April 16, 2014
To: Jill Duerig, General Manager
From: Robyn Navarra, Water Conservation Coordinator
Subject: Declaring May as Water Awareness Month

BACKGROUND:

May has historically been designated as Water Awareness Month to highlight the importance of California's water resources to the human health, economic vitality and environmental quality of our state. Water conservation is especially important in this drought emergency, with California's fluctuating water conditions and increasing water supply needs statewide. In years past, Zone 7 sponsored the California Water Awareness Campaign's mission to increase public awareness about the need for all Californians to use water wisely.

In 2013, the campaign dissolved and the California Department of Water Resources (DWR) and the Association of California Water Agencies (ACWA) developed the "Save Our Water Program," which is regarded as the leader to continue to promote water efficiency practices for both indoor and outdoor conservation. The program provides ideas for creating beautiful landscapes, tools for calculating water use, and fun ways for kids to save. Zone 7 is a program partner, along with various local water agencies and other community-based organizations throughout the state. This year, the Program has a focus on demand reduction for the drought. More information can be found on the Program's "Drought Portal," at http://www.saveourh2o.org/content/Drought2014WhatYouNeedtoKnow.

In addition, Article 10 of the California State Constitution states:

> *It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare.*

In most cases, use of potable (tap or drinking) water for outdoor irrigation when recycled water providers are willing and able to provide recycled water for that purpose is considered a waste of water under the California State Constitution.

DISCUSSION:

For this year, the April Sustainability Report (to be discussed later in this agenda) will clarify that Stage 2 Actions (under Zone 7's 2010 Urban Water Management Plan) are required and proceed to set demand reduction measures required for use of potable water this year. Zone 7's initial focus will be on assuring implementation of the Stage 2 Action Plan and the Zone 7 website will be adjusted to reflect these directions.

The Stage 2 Action Plan consists of:

- Reduce indoor water use by 5%
    - Water service in restaurants to be provided only when requested.
    - Check your home's water meter to see if you have a leak (directions are posted at http://h2ouse.org/action/details/action_element_contents.cfm?actionID=F56F50F2-34E3-4095-9A919C304D945B5F&elementID=FCC1BED3-B2D1-4253-A3D07864BBA98629&parentPage=Take%20Action|/action/index.cfm).
    - Leaks are prohibited. If you find a leak (even a small one), arrange for it to be repaired as quickly as possible.
    - Rebate programs for water –efficient appliances, low-flow toilets (replacing older, high-flow toilets) and waterless urinals will remain available while funds last (first come, first served)
- Reduce outdoor water use by 50-60% (these limitations apply to outdoor use of tap water, only; they do not apply to applications or use of recycled water)
    - The following practices are **prohibited** during the Drought Emergency
        - Watering while it's raining or less than three days after a rain event
        - Any irrigation that results in ponding, flooding, excessive runoff or marshy conditions
        - Watering during daylight hours, due to the higher evaporation rates
        - Filling a new swimming pool or draining and subsequent complete refilling of existing swimming pools (in some extremely limited situations related to health and safety needs and localized groundwater conditions, waivers may be considered)
        - Refilling (topping off) swimming pools that are uncovered when not in use
        - Use of non-recycling decorative water fountains
        - Using hoses without quick-acting positive shutoff nozzles
        - Hosing off sidewalks, driveways, building exteriors, etc.
        - Any use of potable water related to street sweeping, sewer maintenance, gutter flushing, etc.
    - Lawn and Landscape Irrigation Limitations
        - April – May: Water no more than once per week
        - June – September: Water no more than twice per week
        - October – November: Water no more than once per week
        - December – March: Do not water (landscape can be dormant)

- Outdoor Landscaping Improvements

    - Zone 7 will continue to offer outdoor rebate programs - lawn replacement rebates will be broken into up-front funding for lawn removals and replacement with sheet-mulching - plantings shall be deferred until the Fall rains begin (since new drought-tolerant plants require water during the period of establishment) and the remainder of the rebate will only be available after such Fall plantings have been completed. Single-family residential WBIC rebates are being discontinued during the drought due to irrigation limitations outlined above.

    - Zone 7 has developed a new menu of incentive programs for untreated water users. The programs will vary based on the specific site profile and will offer incentives for irrigation hardware upgrades and site monitoring.

As with potable water customers, agricultural (untreated water) customers will be provided no more than 75% of their projected demands (i.e., untreated water customers must also reduce their demands by at least 25%).

Staff is also finalizing plans for various more routine Water Awareness Month activities, including enhanced conservation messaging in the classrooms, water-conservation and stormwater-pollution awareness booths at farmers markets in each of the three cities, and participation in a water conservation workshop being held as part of Dublin Pride Week. In addition, winners of Zone 7's special awards for water-related projects at the Alameda County Science & Engineering Fair will be invited to make presentations at the May board meeting.

There will be conservation workshops for professional landscapers and landscape contract managers and water conservation handouts during the East Bay garden tours:

Tours:

May 4th Bringing Back the Natives Garden Tour. Note that while lawn removals are encouraged at any time, new landscaping is prohibited until Zone 7 lifts restrictions (anticipated in the Fall or Winter after the rainy season begins). So, please attend and get some ideas for replacing dead lawns later in the year (rebates available for lawn removals)!

Training:

This is the third year Zone 7 is offering the Qualified Water Efficient Landscaper (QWEL) training to landscape professional, designers, and homeowners. The program presents an affordable proactive local approach to reducing landscape water demand. QWEL provided graduates with knowledge in water efficient and sustainable landscape practices including water management and preservation of other valuable resources.

Workshops and Talks, Livermore:
"Mow No More"- Sheet-Mulching Workshop in Livermore with Bringing Back the Natives May 24, 2014. Bringing Back the Natives Garden Workshop encourages

individuals to change their own landscapes by replacing lawn with a nature scape while helping to educate the public on the importance of preserving the natural habitat at home and in our communities. This year's program will focus on removing lawns before summer and deferring planting until Zone 7 gives the signal that adequate natural rain has occurred to help establish the plants (most likely in the Fall or Winter). Rebates will be split accordingly.

"Viticulture Workshop" - On April 14, 2014, Coastal Viticulture Consultants (CVC) gave a presentation to the winegrowers at Zone 7 Offices. This consultant provides tools and techniques on water use efficiency to produce quality grapes. The focus is not only on technology. The program relies on water use-based weather factors, soil moisture content and plant growth. Some of Zone 7's untreated water customers are already clients of CVC but this is a good opportunity to get more of them involved, provide some resources and raise awareness. Staff is working with CVC and have developed a menu of incentive programs to assist the untreated customers with improved irrigation hardware and controller that can reduced water consumption and be more efficient.

As a kickoff to Water Awareness Month, staff recommends that the Board declare support for the Save our Water Program. Staff will also continue their efforts to promote the water efficiency program to businesses and schools for enhanced regional conservation. And, as a Stage 2 UWMP Action, Zone 7 will continue to provide direction to the retailers and coordinate outreach messaging to achieve necessary demand reduction in the Livermore-Amador Valley.

RECOMMENDATION:

Adopt attached resolution declaring May as Water Awareness Month and directing staff to implement the Stage 2 Action Plan outlined above.

search...

HOME

ABOUT US PUBLICATIONS & REPORTS NEWS CONSERVATION & REBATES WORKING HERE BUSINESS EVENTS & RESOURCES

Drought update

DROUGHT PROMPTS CUTS IN WATER DELIVERIES

Zone 7 and its retail water suppliers serving Pleasanton, Livermore, Dublin and Dougherty Valley are requiring all customers to conserve during the drought. Find more specific information at: www.trivalleydrought.org.

Continuing extreme drought conditions have prompted Zone 7's Board of Directors to set forth water demand reduction measures needed to achieve an overall 25% cutback in treated and untreated water deliveries for 2014.

Zone 7's 2014 Annual Review of Sustainable Water Supply was presented to the board of April 16, 2014. Among other things, it clarified the need for water retailers serving Pleasanton, Livermore, Dublin and Dougherty Valley to achieve conservation consistent with "Stage 2 Actions" under Zone 7's Urban Water Management Plan. To view a new brochure that outlines many of the conservation actions from the plan, click here.

Because the majority of water used for non-public health and safety is used outdoors, attaining a 25% reduction over the course of the entire year will require a much larger cutback in outdoor water use this summer.

The Stage 2 Action Plan consists of:

1) Reduce Indoor water use by 5%

- Water service in restaurants to be provided only when requested.
- Check your home's water meter to see if you have a leak (directions are posted at www.h2ouse.org or by clicking here.
- Leaks are prohibited. If you find a leak (even a small one), arrange for it to be repaired as quickly as possible.
- Rebate programs for water-efficient appliances, low-flow toilets (replacing older, high-flow toilets) and waterless urinals will remain available while funds last (first-come, first-served).

2) Reduce outdoor water use by 50-60% (***these limitations apply only to outdoor use of tap water; they do not apply to applications or use of recycled water***).

The following practices are **prohibited** during the Drought Emergency:

Quick Links

- Our Service Area
- Construction/Business Opportunities
- Job Opportunities
- Permits & Fees
- Board of Directors Meetings
- E-news & Signup
- Reports & Planning Documents
- Water Conservation
- Conservation Rebates
- Water-Wise Garden Website

- Watering while it's raining or less than three days after a rain event.
- Any irrigation that results in ponding, flooding, excessive runoff or marshy conditions.
- Watering during daylight hours, due to the higher evaporation rates.
- Filling a new swimming pool or draining and subsequent complete refilling of existing swimming pools (in some extremely limited situations related to health and safety needs and localized groundwater conditions, waivers may be considered).
- Refilling (topping off) swimming pools that are uncovered when not in use.
- Use of non-recycling decorative water fountains.
- Using hoses without quick-acting positive shutoff nozzles.
- Hosing off sidewalks, driveways, building exteriors, etc.
- Any use of potable water related to street sweeping, sewer maintenance, gutter flushing, etc.

Lawn and Landscape Irrigation Limitations

- **June - September:** Water no more than twice per week
- **October - November:** Water no more than once per week
- **December - March:** Do not water (landscape can be dormant).

As with potable water customers, agricultural (untreated water) customers will be provided no more than 75% of their projected demands (i.e., untreated water customers must also reduce their demands by at least 25%).

- For information on available indoor and outdoor rebate programs, click here.
- For additional water conservation tips and resources, click here.
- To view a flier with additional information on how local businesses can conserve, click here.

Drought's effect on water hardness

In addition to the need for businesses and residents to reduce water use, another impact of the drought has to do with changes in water quality as the Valley relies more heavily on the water stored in its groundwater basin. Because imported State Water Project supplies normally conveyed through the Delta have been reduced this year from the average of 60% to a mere 5% of Zone 7's contract amount, Zone 7 will be withdrawing from the water stored as groundwater during previous wet years to meet local demands. Using water from groundwater storage allows Zone 7 to deliver 75% of local demands instead of the 5% that would otherwise be available without this wonderful, invisible storage facility.

This use of groundwater means many more customers will be receiving well water than during a normal year. Even for those customers who routinely receive groundwater, there might be increased hardness due to reduced use of the demineralization facility (which reduces hardness but does so by "wasting" about 15% of the groundwater pumped).

As a result, some residents in the valley might notice that the water coming from their taps is "hard." Hard water contains a higher amount of naturally-occurring minerals, particularly calcium and magnesium, than soft water. While hard water can create water spots and scale buildup on plumbing fixtures, it is safe for drinking, cooking and other household uses (in fact, calcium carbonate is the same mineral found in calcium vitamin supplements). Your water continues to meet all state and federal drinking water standards by a comfortable margin.

100 North Canyons Parkway, Livermore, CA 94551

925-454-5000

Other Agencies (e.g., Wholesale Customers)

City of American Canyon. February 4, 2014. Resolution #2014-14; A Resolution of the City Council of the City of American Canyon, Declaring a Water Conservation Stage 1 Water Shortage and Calling for a 20% Voluntary Reduction of Water Use by All Residential and Commercial Customers.

City of St. Helena. January 28, 2014. Resolution No. 2014-3A; Establishing a Water Shortage Emergency Condition Requiring the Implementation of Phase II Water Regulations.

_____. April 22, 2014. Resolution No. 2014-22; Terminating Phase II Water Emergency.

Town of Yountville. February 4, 2014. Resolution Number 3151-14; Implement Phase 1 Water Emergency Regulations and Approve Water Use Efficiency Plan.

RESOLUTION #2014-14

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF AMERICAN CANYON, DECLARING A WATER CONSERVATION STAGE 1 WATER SHORTAGE AND CALLING FOR A 20% VOLUNTARY REDUCTION OF WATER USE BY ALL RESIDENTIAL AND COMMERCIAL CUSTOMERS

WHEREAS, the City Council of the City of American Canyon, on February 17, 2009, adopted Ordinance 2009-03 establishing a Water Conservation Plan; and

WHEREAS, on January 17, 2014, Governor Jerry Brown proclaimed a State of Emergency due to the drought and requested that all urban water users immediately increase their water conservation activities in an effort to reduce their individual water use by 20%; and

WHEREAS, on November 19, 2013, the Department of Water Resources notified State Water Project contractors that the 2014 State Water Project allocation will be 5%; and

WHEREAS, when dry conditions prevail, the general welfare requires that the City's available water resources be put to the maximum beneficial use to every extent possible;

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of American Canyon hereby declares a Water Conservation Stage 1 water shortage and calls for all water customers to voluntarily reduce their water consumption by 20%.

BE IT FURTHER RESOLVED that the City Manager shall order that the appropriate Stage 1 measures of the City of American Canyon's Water Conservation Plan be implemented in accordance with the applicable provisions of Ordinance 2009-03.

PASSED, APPROVED AND ADOPTED at a regular meeting of the City Council on the 4th day of February, 2014, by the following vote:

MAYOR GARCIA: yes
VICE MAYOR RAMOS BENNET: yes
COUNCIL MEMBER BENNETT: yes
COUNCIL MEMBER JOSEPH: yes
COUNCIL MEMBER LEARY: yes

Leon Garcia

Leon Garcia, Mayor

ATTEST:

Rebekah Barr, MMC, City Clerk

APPROVED AS TO FORM:

William D. Ross, City Attorney

CITY OF ST. HELENA

RESOLUTION NO. 2014 - 3 A

ESTABLISHING A WATER SHORTAGE EMERGENCY CONDITION REQUIRING THE IMPLEMENTATION OF PHASE II WATER REGULATIONS

RECITALS

A. St. Helena Municipal Code Section 13.04.220 establishes that at any time that the City Council finds and determines a water shortage emergency condition exists within the criteria of Sections 13.04.230 through 13.04.250, and that it is necessary to limit usage by the customers of the municipal water department, the City Council shall adopt a resolution setting forth the applicable phase; and

B. St. Helena Municipal Code Section 13.04.240 A.1 provides for implementation of a Phase II Water Emergency when the volume of water anticipated to be available prior to the next November 1st from all potable water sources is not sufficient to meet the projected demands through November 1st without demand reduction measures beyond the Phase I reductions being implemented;

C. A Phase II Water Emergency can be declared prior to the trigger dates in the trigger system identified in St. Helena Municipal Code Section 13.04.240 A.3 and the City Council has been advised that the currently anticipated water shortage is of such a magnitude that the City will be in a Phase II emergency at the next trigger date (April 15);

D. The City Council finds that the perquisites for declaring a Phase II Water Shortage Emergency are met.

RESOLUTION

NOW, THEREFORE, the City Council of St. Helena resolves as follows:

1. To establish Phase II Water Emergency Regulations;

2. That the City Clerk shall cause to be published at least once, in a newspaper of general circulation published and circulated in the City, a notice declaring the establishment of such regulatory phase. Such notice shall set forth the limitations of water use applicable to the particular phase being established and shall further declare the violations of such limitations are punishable in accordance with the provisions of Sections 13.04.290 and 13.04.310 of the St. Helena Municipal Code. The establishment of a particular phase be completed and effective at midnight of the day on which the newspaper containing such notice is distributed.

Approved at a Regular Meeting of the St. Helena City Council on January 28, 2014 by the following vote:

AYES: Councilmembers White, Sculatti, Crull, Pitts, Mayor Nevero
NOES: None
ABSENT: None

APPROVED:

Ann Nevero
Mayor

ATTEST:

Delia Guijosa
City Clerk

CITY OF ST. HELENA

RESOLUTION NO. 2014-22

TERMINATING PHASE II WATER EMERGENCY

RECITALS

A. With Resolution 2014-3, the City Council established Phase I Water Shortage Emergency based on an analysis that the City was facing potential Phase II triggers in April and the establishment of a Phase II water emergency appeared imminent; and

B. With Resolution 2014-3A, the City Council established Phase II Water Shortage Emergency based on an analysis that the volume of water anticipated to be available prior to the next November 1st from all potable water sources was not sufficient to meet the projected demands through November 1st without demand reduction measures beyond the Phase I reduction implementation; and

C. This season's late precipitation added volume to Bell Canyon Reservoir to bring it to a 95.1 percent full as of April 14, 2014; and

D. Based on an analysis that the volume of water anticipated to be available prior to the next November 1st from all potable water sources will most likely be sufficient to meet the projected demands through November 1st, the City Council has made the determination that it is no longer necessary to continue the mandatory restrictions under Phase II water regulations; and

E. On January 17, 2014, the Governor declared a State of Emergency to exist in the State of California due to drought conditions. The declaration calls for, among other things, a statewide water conservation campaign and a voluntary 20% reduction in water use across the state. Based on the lack of statewide rainfall and minimal mountain snowpack this season, the majority of the state including Napa County continues to remain in an Extreme Drought status per the United States Drought Mitigation Center as of April 15, 2014. The State of California continues to call for a 20% reduction in water use; and

F. Following the lead of the State of California, the City Council desires to continue with Phase I Water Shortage Emergency, including a voluntary 20% reduction in use from the 2013 year's use by all water customers.

RESOLUTION

NOW, THEREFORE, the City Council of the City of St. Helena resolves as follows:

1. To terminate Phase II Water Shortage Emergency and continue the Phase I Water Shortage Emergency with a voluntary 20% reduction in water use from 2013 by all water customers.

Approved at a Regular Meeting of the St. Helena City Council on April 22, 2014, by the following vote:

Ayes:	Councilmembers Pitts, Sculatti, Crull and Mayor Nevero
Noes:	None
Absent:	Councilmember White
Abstain:	None

APPROVED:

Ann Nevero, Mayor

ATTEST:

Cindy Black, Interim City Clerk

Town of Yountville
Resolution Number 3151-14

Implement Phase 1 Water Emergency Regulations and Approve Water Use Efficiency Plan

---

Recitals

A. The Governor of California declared a Drought State of Emergency on January 17, 2014 and it is necessary to limit usage by the water customers.

B. The Governor has ordered that local urban water suppliers and municipalities are called upon to implement their local water shortage contingency plans immediately in order to avoid or forestall outright restrictions necessary later in the drought season.

C. Yountville Municipal Code Chapter 13.24 addresses water shortage emergencies.

D. Based on the Declaration, staff is recommending that the Town Council implement Phase 1 water shortage emergency regulations.

E. Water use efficiency results in benefits to water supply and water quality through technological and behavioral improvements that decrease indoor and outdoor residential, commercial, industrial, and institutional water use.

F. Town staff is requesting the Town Council approve of the Water Use Efficiency Plan, which presents water conservation information.

Now therefore, the Town Council of the Town of Yountville does resolve as follows:

1. Town shall immediately implement Phase 1 water shortage emergency regulations.

2. The Town Clerk shall file a notice declaring the establishment of Phase 1 water shortage emergency regulations.

3. The Water Use Efficiency Plan is approved.

4. This Resolution is hereby adopted and becomes effective and in full force immediately upon adoption.

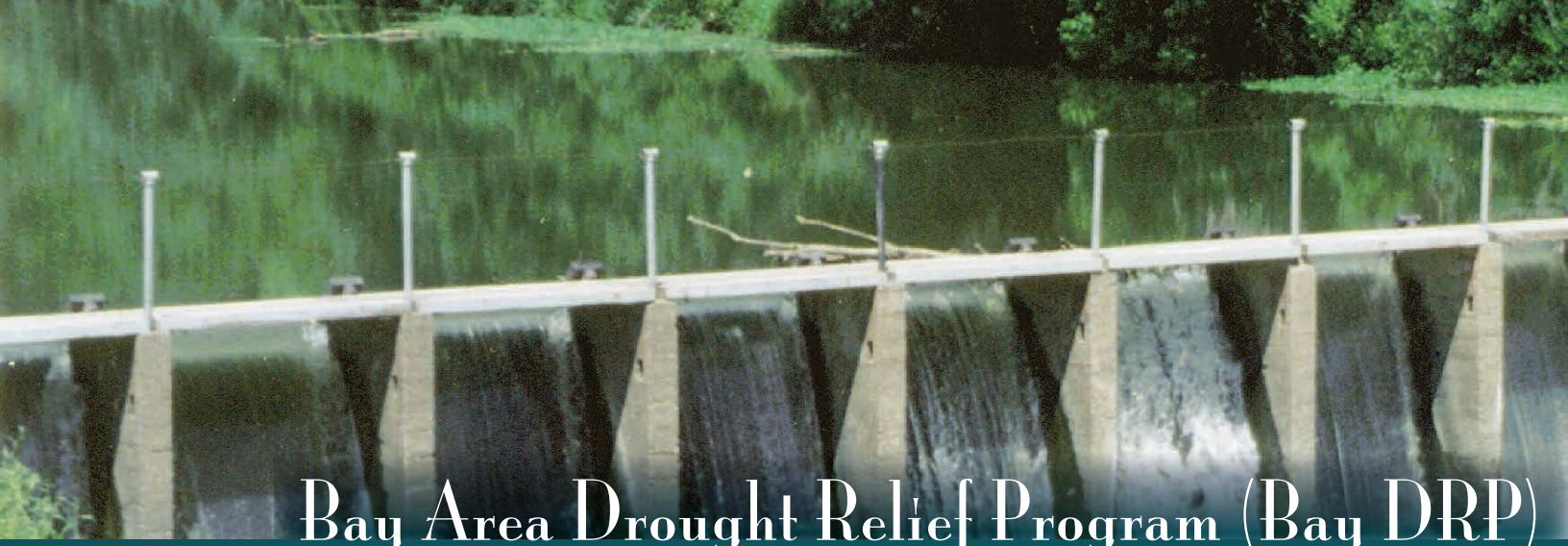
PASSED AND ADOPTED at a regular meeting of the Town Council of the Town of Yountville, State of California, held on this 4th day of February, 2014 by the following vote:

AYES: Dorenbecher, Hall, Mohler, Chilton and Dunbar
NOES: None
ABSENT: None
ABSTAIN: None

John F. Dunbar, Mayor

ATTEST:

Michelle Dahme, Town Clerk



Bay Area Drought Relief Program (Bay DRP)

Attachment 3

Project Justification

Association of Bay Area Governments

Proposition 84

Integrated Regional Water Management

2014 Drought Grant Application

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List of Acronyms and Abbreviations

ABAG	Association of Bay Area Governments
ACWD	Alameda County Water District
AF	acre-feet
AFD	acre-feet per day
AFY	acre-feet per year
AMI	advanced metering infrastructure
AMR	automatic meter reading
BAIR	Bypass Alternatives Investigation Report
BAWSCA	Bay Area Water Supply and Conservation Authority
Bay DRP	Bay Area Drought Relief Program
BOD	biochemical oxygen demand
BOD_5	biochemical oxygen demand consumed over 5 days
CalWater	California Water Service Company
CBOD	carbonaceous biochemical oxygen demand
CCWD	Contra Costa Water District
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
cfs	cubic feet per second

CIP	Capital Improvement Program
CLP	Cope Lake to Lake I Pipeline
COG	Council of Governments
COL-5	Chain of Lakes Well No.5
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CWD	County Water District
cy	cubic yards
DAF	dissolved air flotation
Delta	Sacramento-San Joaquin River Delta
DERWA	Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) Recycled Water Authority
DSRSD	Dublin-San Ramon Services District
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
FEMA	Federal Emergency Management Agency
ft.	feet
FY	fiscal year
gpcd	gallons per capita per day
gpm	gallons per minute
GWh	gigawatt-hours
HDPE	high-density polyethylene
hp	horsepower
I-	Interstate
in.	inches
IRWM	Integrated Regional Water Management
kg/yr	kilograms per year
kWh	kilowatt-hours
LAVWMA	Livermore-Amador Valley Water Management Agency
LCA	Lower Cherry Aqueduct
LCWD	Los Carneros Water District
LF	linear feet
MCL	maximum contaminant level
MG	million gallons
MGD	million gallons per day
mg/L	milligrams per liter
MMWD	Marin Municipal Water District
MND	Mitigated Negative Declaration
MST	Milliken-Sarco-Tulocay
MWh	megawatt-hours
NBWRA	North Bay Water Reuse Authority
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NSD	Napa Sanitation District
PAC	Powdered Activated Carbon
Plan	Stinson Beach Water Supply & Drought Preparedness Plan
Prop 84	Proposition 84
Proposal	the proposal being submitted in response to the 2014 IRWM
PSP	Proposal Solicitation Package
RCD	resource conservation district

RWQCB	Regional Water Quality Control Board
RWTP	Rinconada Water Treatment Plant
San Mateo County RCD	San Mateo County Resource Conservation District
SBA	South Bay Aqueduct
SCVWD	Santa Clara Valley Water District
SFEP	San Francisco Estuary Partnership
SFPUC	San Francisco Public Utilities Commission
SRVRWP	San Ramon Valley Recycled Water Program
StopWaste	Alameda County StopWaste.org
SWP	State Water Project
TDS	total dissolved solids
THMs	trihalomethanes
TN	total nitrogen
TOC	total organic carbon
TSS	total suspended solids
TTHM	total trihalomethane
UFW	unaccounted-for water
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan
WPCP	Sunnyvale Water Pollution Control Plant
WSIMP	SCVWD's 2012 Water Supply and Infrastructure Master Plan
WWTP	wastewater treatment plant
Zone 7	Zone 7 Water Agency
µg/L	micrograms per liter

Introduction

The Bay Area Drought Relief Program (Bay DRP) and its eleven high-priority projects comprise a geographically diverse and well-integrated implementation program with multiple water supply, recycled water, and drought preparedness benefits to the Bay Area's diverse population. This attachment demonstrates that this Proposal contains significant, dedicated, and well-defined projects that meet multiple Program Preferences of the California Department of Water Resources (DWR) Proposition 84 (Prop 84) Integrated Regional Water Management (IRWM) Guidelines. This attachment describes how the Bay DRP meets the needs created by the drought, estimates the physical benefits associated with each project, justifies how the project is technically feasible, describes how the project can achieve the claimed level of benefits, and explains whether the benefits will be attained through the least cost alternative. A brief description of grant administration tasks is provided as Project 12.

The Bay DRP geographically spans the entire Bay Area region and addresses four primary benefits:

- Water Supply Enhancement
- Recycled Water
- Human Right to Water
- Drought Preparedness

To facilitate review, the projects are grouped by primary benefit type, as listed in **Table 3-1**, below. **Table 3-2** provides an abstract for each project. A **Regional Map** showing the locations of these projects in relation to the San Francisco Bay IRWM Regions is included as **Figure 3-1**. It is important to note that while the project groupings shown in **Table 3-1** are intended to facilitate review, many of the 11 high-priority projects provide multiple benefits (such as Water Supply Enhancement and Drought Preparedness). Details and justifications for each of the 11 high-priority projects are provided in this attachment following the summary tables.

Table 3-1. Bay DRP Project Identification Numbers and Organization

Primary Project Benefit	Project ID#	Project Proponent	Project Title
Water Supply Enhancement	1	San Francisco Public Utilities Commission (SFPUC)	Lower Cherry Aqueduct Emergency Rehabilitation Project
	2	Santa Clara Valley Water District (SCVWD)	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment
	3	Zone 7 Water Agency (Zone 7)	Zone 7 Water Supply Drought Preparedness Project
Recycled Water	4	Napa Sanitation District	Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines
	5	SCVWD and City of Sunnyvale	Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline
	6	DERWA[1]	DERWA Phase 3 Recycled Water Expansion Project
	7	City of Calistoga	Calistoga Recycled Water Storage Facility
Human Right to Water	8	San Mateo County Resource Conservation District (San Mateo County RCD)	Drought Relief for South Coast San Mateo County
	9	Stinson Beach County Water District (CWD)	Stinson Beach Water Supply & Drought Preparedness Plan

Primary Project Benefit	Project ID#	Project Proponent	Project Title
Drought Preparedness	10	StopWaste[2]	Bay Area Regional Drought Relief Conservation Program
	11	Marin Municipal Water District (MMWD)	WaterSMART Irrigation with AMI/AMR[3]
Administration	12	Association of Bay Area Governments (ABAG)/San Francisco Estuary Partnership (SFEP)	Grant Administration

1. *DERWA: Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) Recycled Water Authority*
2. *This Project will be implemented by a group of 12 project proponents led by Alameda County StopWaste.org (StopWaste). Participating agencies and organizations include: Alameda County Water District, Bay Area Water Supply and Conservation Authority, City of Napa, Contra Costa Water District, EBMUD, MMWD, SFPUC, SCVWD, Solano County Water Agency, Sonoma County Water Agency, StopWaste, and Zone 7.*
3. *AMI/AMR: advanced metering infrastructure/automatic meter reading*

Table 3-2. Bay DRP – 2014 IRWM Drought Grant Application Project List

Project ID #	Project Name	Project Proponent	Project Abstract
1	Lower Cherry Aqueduct Emergency Rehabilitation Project	SFPUC	The project provides access to 150,000+ acre-feet (AF) of immediate, cost-effective, potable water for drought preparedness for 2.6 million Bay Area residents.
2	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment	SCVWD	This project adds PAC treatment to SCVWD's Rinconada Water Treatment Plant to deliver 36,233 AF of water that meets drinking water standards.
3	Zone 7 Water Supply Drought Preparedness Project	Zone 7	The project constructs a new well and short pipeline to increase water supply in the Livermore-Amador Valley during severe drought conditions.
4	Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Distribution Pipelines	Napa Sanitation District (NSD)	The projects extend recycled water distribution infrastructure, which will offset groundwater and surface water use in the Napa Valley.
5	Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	SCVWD and City of Sunnyvale	The project consists of plant improvements and construction of a recycled water pipeline to offset 1,680 acre-feet per year (AFY) of potable water demand.
6	DERWA Phase 3 Recycled Water Expansion Project	DERWA	The project includes construction of 9 miles of recycled water pipelines (867 AFY), which will replace potable demand with recycled water.
7	Calistoga Recycled Water Storage Facility	City of Calistoga	The project enhances recycled water production and storage to provide increased water supply for urban and agricultural use.

Project ID #	Project Name	Project Proponent	Project Abstract
8	Drought Relief for South Coast San Mateo County	San Mateo County RCD	The project enhances water supply and management to improve drought preparedness and drinking water supply reliability.
9	Stinson Beach Water Supply & Drought Preparedness Plan	Stinson Beach CWD	The plan mitigates water supply shortages and increases water conservation efforts in response to current and future droughts.
10	Bay Area Regional Drought Relief Conservation Program	StopWaste	The project expands indoor and outdoor water use efficiency efforts to support the statewide 20% drought demand reduction goal.
11	WaterSMART Irrigation with AMI/AMR	MMWD	The project provides immediate drought preparedness by improving landscape irrigation efficiency and achieving long-term water use reductions.
12	Grant Administration	ABAG/SFEP	The grant administration task ensures that IRWM grant funds for the 11 projects are properly managed, projects completed, and schedules met within budget.

Notes:

AF = acre-feet

AFY = acre-feet per year

AMI = advanced metering infrastructure

AMR = automatic meter reading

DSRSD = Dublin-San Ramon Services District

EBMUD = East Bay Municipal Utility District

StopWaste = Alameda County StopWaste.org (StopWaste), Alameda County Water District, Bay Area Water Supply and Conservation Authority, City of Napa, Contra Costa Water District, East Bay Municipal Utility District, Marin Municipal Water District San Francisco Public Utilities Commission, Santa Clara Valley Water District, Solano County Water Agency, Sonoma County Water Agency, and Zone 7 Water Agency

Regional Map

Figure 3-1

Bay Area Drought Relief Program (Bay DRP)
2014 IRWM Drought Grant Application
Proposed Project Locations

Project Summary Table

PSP Table 4 lists the projects by identification number and identifies which aspects of the Drought Project Element and IRWM Project Element are met by the 11 drought preparedness projects. The IRWM Drought Project Eligibility and IRWM Project Elements presented in the table are as follows:

IRWM Drought Project Eligibility:

D.1: Provide immediate regional drought preparedness

D.2: Increase local water supply reliability and the delivery of safe drinking water

D.3: Assist water suppliers and regions to implement conservation programs and measures that are not locally cost effective

D.4: Reduce water quality conflicts or ecosystem conflicts created by the drought

IRWM Project Elements:

IR.1: Water supply reliability, water conservation, and water use efficiency

IR.2: Stormwater capture, storage, cleanup, treatment, and management

IR.3: Removal of invasive non-native species; the creation and enhancement of wetlands; and the acquisition, protection, and restoration of open space and watershed lands

IR.4: Non-point source pollution reduction, management, and monitoring

IR.5: Groundwater recharge and management projects

IR.6: Contaminant and salt removal through reclamation, desalting, and other treatment technologies and conveyance of reclaimed water for distribution to users

IR.7: Water banking, exchange, reclamation, and improvement of water quality

IR.8: Planning and implementation of multipurpose flood management programs

IR.9: Watershed protection and management

IR.10: Drinking water treatment and distribution

IR.11: Ecosystem and fisheries restoration and protection

PSP Table 4. 2014 IRWM Drought Solicitation Project Summary Table											
	1	2	3	4	5	6	7	8	9	10	11
Project ID and Title	Lower Cherry Aqueduct Emergency Rehabilitation Project	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment	Zone 7 Water Supply Drought Preparedness Project	Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines	Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	DERWA Phase 3 Recycled Water Expansion Project	Calistoga Recycled Water Storage Facility	Drought Relief for South Coast San Mateo County	Stinson Beach Water Supply & Drought Preparedness Plan	Bay Area Regional Drought Relief and Conservation Program	WaterSMART Irrigation with AMI/AMR
IRWM Drought Project Element											
D.1	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
D.2	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
D.3											
D.4	♦	♦			♦	♦	♦	♦		♦	♦
IRWM Project Element											
IR.1	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦
IR.2											
IR.3											
IR.4						♦				♦	
IR.5			♦	♦		♦	♦	♦	♦		
IR.6					♦	♦	♦				
IR.7	♦		♦		♦		♦				
IR.8											
IR.9							♦	♦			
IR.10		♦						♦	♦		
IR.11					♦	♦	♦	♦	♦	♦	♦

The subsequent sections of Attachment 3 are organized by project benefit type and include the following information for each project:

1. Project description;
2. Project map;
3. Annual project physical benefits (primary, secondary, as well as tertiary and quaternary, if applicable) (PSP Table 5);
4. Technical analysis of physical benefits claimed; and
5. Cost effectiveness analysis (PSP Table 6).

References to support the project physical benefits described for each project are listed at the end of each project section. Copies of all references cited are provided in **Files 2 and 3 of Attachment 3**. Attachment 3, File 2 includes references for Projects 1 through 5 and File 3 includes references for Projects 6 through 11. References are truncated to provide just the document cover and relevant pages.

Project Justification – Water Supply Enhancement Projects

Project descriptions, estimated physical benefits of the projects, justification of each project's technical feasibility, and a cost-effectiveness analysis are presented in this section for the projects listed below. These projects span two sub-regions in the San Francisco Bay IRWM Region as well as Tuolumne County. The projects included in this section have benefits related to potable water supply enhancement, groundwater management, water quality treatment, and water supply reliability.

Project ID#	Project Proponent	Project Title
1	SFPUC	Lower Cherry Aqueduct Emergency Rehabilitation Project
2	SCVWD	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment
3	Zone 7	Zone 7 Water Supply Drought Preparedness Project

Project 1 – Lower Cherry Aqueduct Emergency Rehabilitation Project

Project Description

Project Goals: The Lower Cherry Aqueduct (LCA) Emergency Rehabilitation Project (Project) will allow the San Francisco Public Utilities Commission (SFPUC) to access up to 150,000 AF of potable supply from Cherry Reservoir and Lake Eleanor in the Upper Tuolumne River watershed. The Project will provide immediate, cost-effective, regional drought relief for 2.6 million residents of the Bay Area during a severe drought, safeguarding the region against possible extension of the drought and future droughts. It will also enable flexibility of long-term water operations and adaptive management of water supplies under changing climate conditions.

Project Description: The Project is located in Tuolumne County on Cherry Creek, a tributary to the Tuolumne River. The LCA system connects water supply from Cherry Creek, Cherry Reservoir, and Lake Eleanor to the Hetch Hetchy Regional Water System, which transmits 85% of SFPUC's water supply to the Bay Area. The LCA system diverts water at the Lower Cherry Diversion Dam from Cherry Creek, and a 3-mile-long system of tunnels and open canals ultimately discharges into the Hetch Hetchy system. The LCA system was last used to convey stored water to the Bay Area during drought years in 1988. Due to aging infrastructure (built in 1917) and the damage caused by the Rim Fire, the LCA system is unable to reliably convey stored water to SFPUC's water delivery system. Project components include:

Pipe Installation & Replacement: About 5,600 ft. of open aqueduct will be converted to enclosed 84-in.-diameter pipeline, about 400 ft. of existing pipe will be replaced with new piping, and 1,000 ft. of the existing pipe will be rehabilitated to prevent erosion and corrosion; 500 cy of accumulated debris in the aqueduct will also be removed.

Tunnel Repair: Select sections of the LCA system's 9,500 ft. of tunnel will be repaired, including rock bolting, grouting, and reinforced concrete placement. Due to the Rim Fire, about 750 cy of rocks, muck, and sand from erosion will be removed from the tunnel.

Cherry Creek Diversion Dam Facility Repairs: Reconstruction of the gate house and control room; trail and bridge rehabilitation; geotechnical hazard repair (e.g., rock scaling, rock retaining walls, replacement of safety cables); replacement of head gates; concrete structural inspections and repair work; and replacement of the existing tunnel inlet structure, including a temporary coffer dam, demolishing the existing structure, and removing 20 cy of debris.

Forebay Trash Rack: SFPUC will clean an existing 20-ft.-diameter reinforced concrete structure, remove a non-functioning trash rack, seal the existing slide gate, and construct a new cover.

Geotechnical Hazard Mitigation: Engineering studies to evaluate conditions of slopes and potential rockfall hazards as a result of the 2013 Rim Fire are being conducted. Hazard mitigation work may include selective rock scaling, erosion control measures, and/or rockwall screens and fencing.

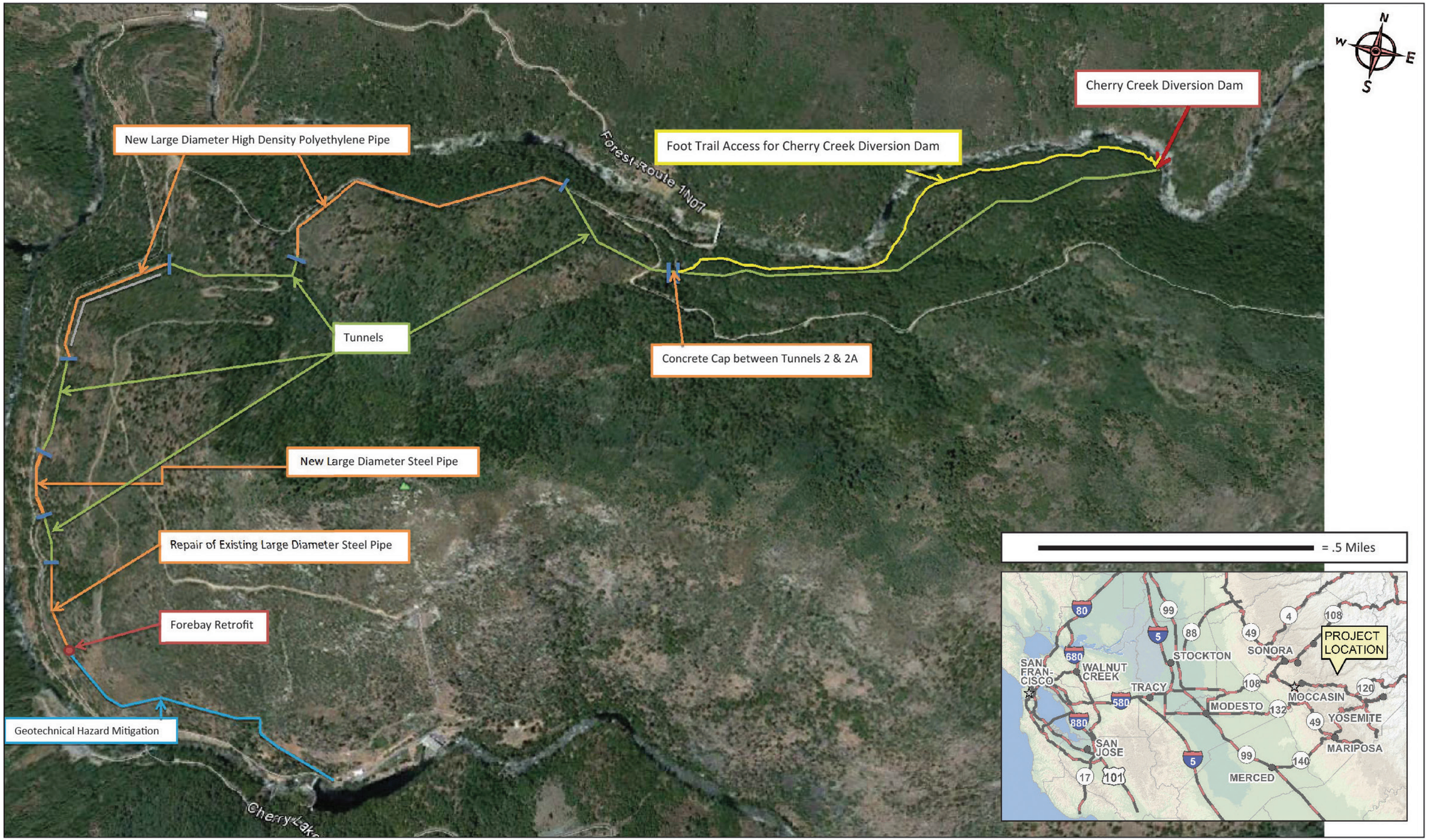
Implementation Status: The project is being implemented in two phases. Phase One will clear the aqueduct and do minimal repairs to enable the use of the asset by December 2014. Construction is estimated to commence in August 2014, and SFPUC is aiming to complete Phase One work by December 2014. Phase Two will consist of the more substantial work described above, including pipe installation and more permanent tunnel repairs. Phase Two construction will begin in April 2015 and be completed by August 2015. Project design for both phases is approximately 90% complete, environmental documentation is 35% complete and project permitting is 80% complete.

Funding Needs: The LCA system infrastructure was damaged in the 2013 Rim Fire and funding for the project was not included in SFPUC's FY 2013/14 budget. Although SFPUC has applied for FEMA funds, these sources cover only a small portion of the necessary rehabilitation, and it is unclear how much money will be made available. Considering the drought, the Project was initiated in 2014 by diverting funds from other capital infrastructure improvements, which will result in delays of these improvements into future fiscal years and increased customer rates over the long term.

Drought Eligibility: Immediate regional drought preparedness. Phase One is projected to be complete in December 2014. Once complete, the LCA will allow immediate access to 150,000 AF of supply stored in Cherry Reservoir and Lake Eleanor.

Increase local water supply reliability and safe drinking water. Upon project completion, 150,000 AF of safe drinking water will be available for consumption as soon as December 2014 to alleviate water supply demands in the Bay Area. This Project will provide connections to reliable sources of supply and ensure the SFPUC can continue making full deliveries to customers hardest hit by droughts, and to guard against the need for further rationing if dry conditions persist.

Project Map


N
W
E
S
Cherry Creek Diversion Dam
New Large Diameter High Density Polyethylene Pipe
Foot Trail Access for Cherry Creek Diversion Dam
Forest Route 1N07
Tunnels
Concrete Cap between Tunnels 2 & 2A
New Large Diameter Steel Pipe
Repair of Existing Large Diameter Steel Pipe
Forebay Retrofit
Geotechnical Hazard Mitigation
Cherry Lake
= .5 Miles
PROJECT LOCATION
SAN FRAN-CISCO
WALNUT CREEK
TRACY
STOCKTON
SONORA
MODESTO
MOCCASIN
YOSEMITE
MARIPOSA
SAN JOSE
MERCED
80
680
580
880
5
99
88
49
4
108
120
132
140
17
101

Project Physical Benefits

Primary and secondary project physical benefits are summarized in **PSP Tables 5a and 5b**, respectively, below.

PSP Table 5a. Primary Annual Project Physical Benefits			
Project Name: Lower Cherry Aqueduct Emergency Rehabilitation Project **Primary Benefit Claimed:** Water Supply **Units of the Benefit Claimed:** Acre-feet (AF) **Additional Information About This Benefit:** Access to an additional 150,000 AF of water supply delivered through the Hetch Hetchy Regional Water System			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2015*	0	150,000 AF	150,000 AF of additional accessible potable water supply
2016*	0	150,000 AF	150,000 AF of additional accessible potable water supply
Last Year of Project Life (approximately 2040)	0	150,000 AF	150,000 AF of additional accessible potable water supply
Comments: **The Lower Cherry Aqueduct will not likely be used in normal hydrologic years. It will allow access to 150,000 AF of potable supply in dry years. If 2015 and 2016 are normal hydrologic years, it is unlikely SFPUC will need to utilize the asset.*			

Technical Analysis of Primary Physical Benefits Claimed

Technical basis of the Project: During dry years, it has historically been possible to divert water from Cherry Reservoir and Lake Eleanor through the LCA to supplement supplies to the Bay Area when Hetch Hetchy Reservoir storage is low. The primary purpose of the LCA system since the 1950s has been to convey water supply from Cherry Creek that can supplement the primary Hetch Hetchy Reservoir supply during a drought year. The last time SFPUC used the LCA system to supplement Hetch Hetchy supply was in 1988. Due to aging infrastructure, the damage caused by the 2013 Rim Fire, and current drought conditions, the LCA system is currently unable to reliably convey the supplemental water supply from Cherry Creek to SFPUC's primary water delivery system. Therefore, SFPUC is expediting the repair of the aqueduct and adding improvements to enable access to the water supply in Cherry and Eleanor Reservoirs. Given the drought, SFPUC is expediting construction of the Project to provide water supply in the event of continuing dry conditions (SFPUC, 2014).

Recent and historical conditions: SFPUC is currently requesting 10% voluntary conservation from all of its Retail and Wholesale customers. The Project is needed to repair the Lower Cherry Aqueduct because of damage caused in the 2013 Rim Fire (Black and Veatch, 2013).

Estimates of without-project conditions: If the drought continues into the winter of 2014/15 and beyond, SFPUC will need to maintain or increase rationing and potentially move to mandatory cutbacks. This could result in rationing of some individual Wholesale Customers up to 40%. With Project implementation, SFPUC will be able to defer the need for extreme rationing by an additional year.

Methods used to estimate physical benefits: Reservoir storage levels presented on SFPUC's website were used to estimate physical benefits (SFPUC, 2014).

New facilities, policies, and actions required to obtain the physical benefits: The proposed repairs and improvements to the LCA system are needed to realize the physical benefits of the Project. No additional policies are needed to ensure project implementation.

Potential adverse effects: The Project will result in adverse effects to the historically significant features of the LCA system, which has been determined to be a historic property eligible for listing on the National Register of Historic Places. The Project will also displace Townsend's big-eared bats, a USFWS-listed sensitive species and a CDFW-listed Candidate species, from three existing tunnel segments. SFPUC will implement impact avoidance, minimization, and mitigation measures to reduce significant impacts resulting from the Project.

PSP Table 5b. Secondary Annual Project Physical Benefits

Project Name: Lower Cherry Aqueduct Emergency Rehabilitation Project
Secondary Benefit Claimed: Water Supply – Groundwater Storage
Units of the Benefit Claimed: Acre-feet (AF)
Additional Information About This Benefit: 5,500 AF of unused groundwater in the Santa Clara basin

Year	Physical Benefits		
	Without Project	**With Project**	**Change Resulting from Project**
2014	SFPUC supplies 49,500 AF to Santa Clara Groundwater Basin (Santa Clara County).	SFPUC supplies 49,500 AF to Santa Clara Groundwater Basin (Santa Clara County).	No net result.
2015	Assuming continued drought conditions, SFPUC imposes additional rationing and supplies 44,000 AF to Santa Clara County, resulting in 199,880 AF of groundwater stored in the Santa Clara Basin (loss of 5,500 AF recharge).	With supply from the LCA, SFPUC supplies 49,500 AF to Santa Clara County, resulting in 205,380 AF of groundwater stored in the Santa Clara Basin.	5,500 additional AF in the Santa Clara Groundwater Basin. This represents the difference between "Severe" and "Critical" levels of SCVWD's Water Supply Contingency Plan due to common customers relying more on SFPUC supply.
2016	Assuming continued drought conditions, SFPUC imposes additional rationing and supplies 44,000 AF to Santa Clara County, resulting in 199,880 AF of groundwater stored in the Santa Clara Basin (loss of 5,500 AF recharge).	With supply from LCA, SFPUC supplies 49,500 AF to Santa Clara County, resulting in 205,380 AF of groundwater stored in the Santa Clara Basin.	5,500 additional AF in the Santa Clara Groundwater Basin. This represents the difference between "Severe" and "Critical" levels of SCVWD's Water Supply Contingency Plan due to common customers relying more on SFPUC supply.
2017	Further benefits will depend on whether dry conditions persist.	Further benefits will depend on whether dry conditions persist.	Further benefits will depend on whether dry conditions persist.
Ongoing	SFPUC supplies 49,500 AF to Santa Clara Groundwater Basin (Santa Clara County).	SFPUC supplies 49,500 AF to Santa Clara Groundwater Basin (Santa Clara County).	No net result.

Source: *SCVWD, 2014.*

Technical Analysis of Secondary Physical Benefits Claimed

Technical basis of the Project: Given the drought, SFPUC is expediting construction of the Project to provide water supply in the event of continuing dry conditions. The water provided to customers that also receive water from the SCVWD will relieve pressure on the Santa Clara Groundwater Basin, resulting in 5,500 AF of additional water stored in the basin (SCVWD, 2014: pp. 1 and 3, Table 1).

Recent and historical conditions: SFPUC is currently requesting 10% voluntary conservation from all of its Retail and Wholesale customers. The SCVWD, which manages the Santa Clara Groundwater Basin, is requesting 20% rationing from its customers (SCVWD, 2014).

Estimates of without-project conditions: Supply through the LCA will delay the time at which SFPUC will need to resort to 20% mandatory rationing. Failure to implement the Project will result in 5,500 fewer AF of water recharge to the Santa Clara Groundwater Basin, among other impacts (SCVWD, 2014: pp. 1 and 3, Table 1).

Methods used to estimate physical benefits: Reservoir storage data, demand projections, and SCVWD groundwater basin estimates were reviewed to determine groundwater recharge benefit estimates (SCVWD, 2014: pp. 1 and 3, Table 1).

New facilities, policies, and actions required to obtain the physical benefits: The proposed repairs and improvements to the LCA system are needed to realize the physical benefits of the Project. No additional policies are needed to ensure project implementation.

Potential adverse effects: None known.

Cost-Effectiveness Analysis

PSP Table 6 evaluates whether the physical benefits provided by the Project are provided at the least possible costs.

PSP Table 6. Cost-Effectiveness Analysis	
Project name: Lower Cherry Aqueduct Emergency Rehabilitation Project	
Question 1	***Types of benefits provided as shown in Tables 5a and 5b:*** Water Supply**:** Project will directly and immediately increase water supply for the region by over 150,000 AF and will provide ongoing access to storage for potable water. Rehabilitation of the Lower Cherry Aqueduct (LCA) will provide reliable access to the entire Tuolumne River system water supply for the 2.6 million residents served by SFPUC before the end of calendar year 2014, providing immediate drought relief. Groundwater Recharge**:** The Project will reduce pressure on groundwater pumping in Santa Clara County to offset reduced SFPUC water deliveries due to drought. Energy Saved**:** As a third benefit, the Project will increase the quantity of water delivered by gravity to the San Francisco Bay Area, which will result in lower energy costs and less energy consumption for water delivery.
Question 2	***Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?*** No. Other alternatives examined were cost-prohibitive or technically infeasible. It would be difficult to find another water supply source enabling access to 150,000 AF of potable water to the Bay Area in a dry year. For example, short- and long-term water transfers and expansion of water conservation projects would both be costly and technically infeasible to meet immediate drought relief needs. Equivalent amounts of water rationing would be economically damaging to the Bay Area region (SFPUC, 2014).
Question 3	***If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.*** See above answer to Question 2.

References Cited:

Black and Veatch, 2013. SFPUC HHWP Rim Fire Asset Recovery Plan, November 15.

San Francisco Public Utilities Commission (SFPUC), 2014. We Deliver website, Graphs 1 and 2. Available at: www.sfwater.org/wedeliver.

Santa Clara Valley Water District (SCVWD), 2014. March Water Supply Outlook.

Project 2 – Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment

Project Description

Project Goals: The Rinconada Water Treatment Plant (RWTP) Powdered Activated Carbon (PAC) Treatment Project (Project) will ensure reliable treatment and distribution of 40,000 AF of safe drinking water from a variety of sources, including sources directly affected by the drought. As alternate water supply sources are utilized as a result of the 2014 and future droughts, this Project will enable the RWTP to reliably treat water of poorer quality, such as from reservoirs that are not at full capacity (e.g., Anderson Reservoir).

Project Description: The Santa Clara Valley Water District (SCVWD)'s RWTP is located in Los Gatos and serves the following water retailers: Cities of Sunnyvale, Santa Clara, and Mountain View; San Jose Water Company; and California Water Service Company. The RWTP is over 40 years old and is SCVWD's only plant that treats the widest variety of sources in the County (Central Valley Project [CVP], South Bay Aqueduct [SBA], and local sources). Alternating between these sources is challenging, requiring the plant to adjust treatment processes quickly to adapt to source water quality. Currently, the RWTP has limited ability to adapt to such variations, which constrains the reliability of drinking water standard compliance.

Source water quality for imported supplies has deteriorated since the drought declaration in January 2014. The plant has experienced increases in total dissolved solids (TDS), bromides, total organic carbon (TOC), and organic compounds that affect taste and odor. Of particular concern are the increasing levels of TOC and bromide, which contribute to formation of carcinogenic trihalomethanes (THMs), and are expected to worsen as drought conditions continue. Due to the RWTP's age and drought conditions, compliance with current disinfection by-product regulations is threatened by the high TOC and bromide levels in local water supply sources. Thus, to ensure compliance with drinking water standards, the RWTP has employed the addition of PAC, which is typically used in summer months to remove taste and odor compounds but has been not needed for THM treatment.

Grant funding is requested to cover the costs of purchasing PAC and adding it to the RWTP treatment process continually throughout 2014. Approximately 40,000 pounds of PAC per month is needed, which costs about $24,000 per month, a costly treatment method. SCVWD plans to upgrade the RWTP to add ozone treatment and reduce the need for PAC treatment, but these upgrades will not be online until 2019. In the meantime, PAC is the only method to ensure reliable potable water delivery to west Santa Clara County during the 2014 drought and future drought years. Use of PAC will ensure all water treated at the RWTP will meet federal and State treatment standards.

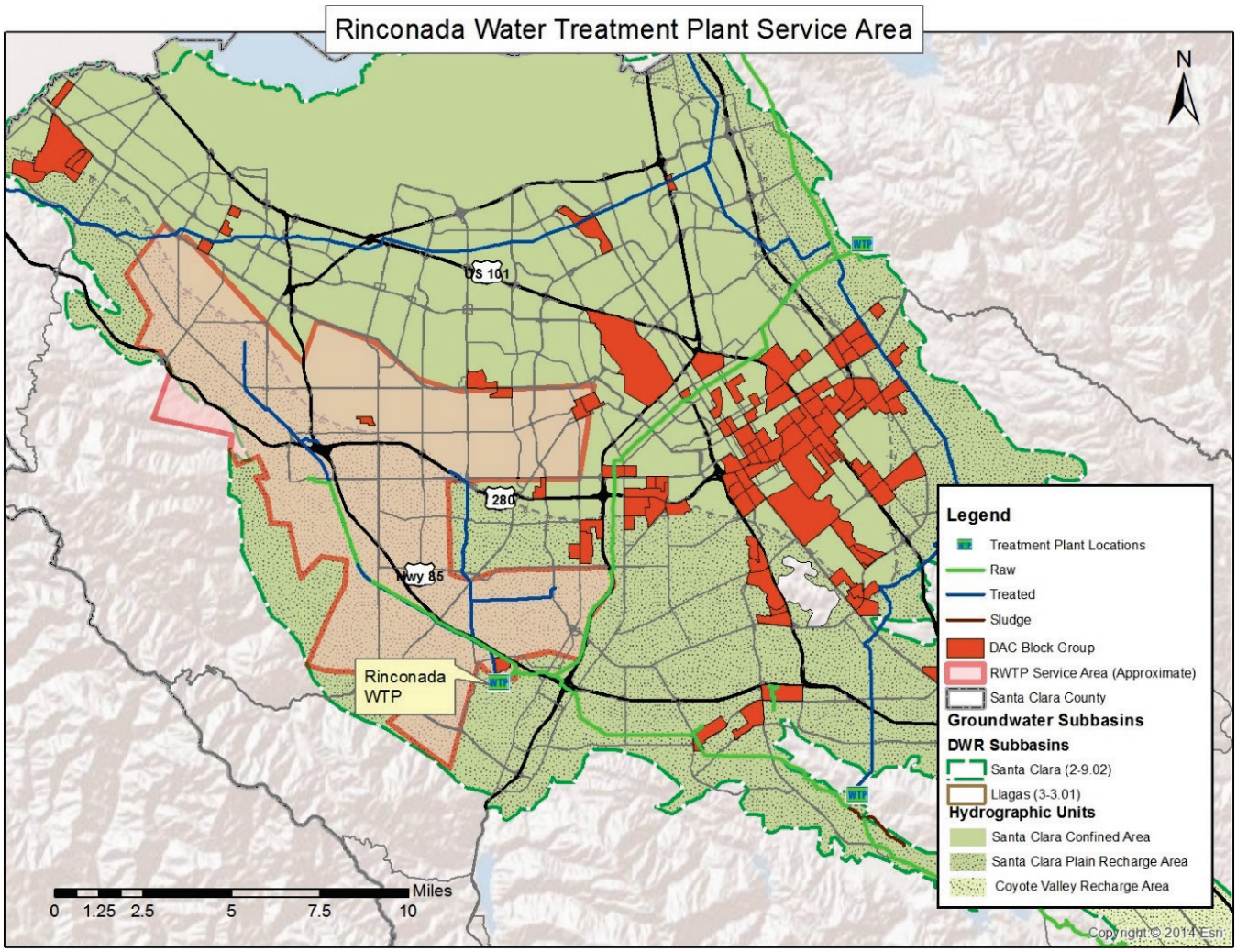
Implementation Status: SCVWD is currently purchasing PAC on a monthly basis since the drought declaration in January 2014. Purchase of PAC will continue through December 2014, and funding is requested to recover these unplanned PAC purchases. With PAC purchases through May 2014, the project is more than 40% complete.

Funding Needs: PAC treatment is the least cost alternative to meet drinking water standards at the RWTP. Purchase of PAC throughout 2014 is an unbudgeted drought response cost for SCVWD. Without funding support, purchase of PAC for the RWTP will reduce funding for other ongoing water supply operations and maintenance needs throughout Santa Clara County.

Drought Eligibility: *Increase local water supply reliability and the delivery of safe drinking water* – The ability for SCVWD water retailers to switch to other drinking water sources, especially in high demand periods, is limited; the RWTP is the only plant on the west side of SCVWD's treated water system. This Project will ensure compliance with drinking water standards for local supply sources and reliable delivery of safe drinking water to SCVWD's users.

Reduce water quality conflicts – Source water quality for imported supplies treated at the RWTP has deteriorated since the drought declaration in January 2014. Increased TDS, bromides, TOC, and taste and odor compounds threaten formation of THMs and exceedance of drinking water standards; treatment challenges are expected to worsen as drought conditions continue. PAC has proved to be effective in reducing these threats and is the most cost-effective alternative.

Project Map


Rinconada Water Treatment Plant Service Area
N
US 101
280
Hwy 85
Rinconada WTP
WTP
Legend
Treatment Plant Locations
Raw
Treated
Sludge
DAC Block Group
RWTP Service Area (Approximate)
Santa Clara County
Groundwater Subbasins
DWR Subbasins
Santa Clara (2-9.02)
Llagas (3-3.01)
Hydrographic Units
Santa Clara Confined Area
Santa Clara Plain Recharge Area
Coyote Valley Recharge Area
Miles
0 1.25 2.5 5 7.5 10
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Project Physical Benefits

Primary and secondary project physical benefits are summarized in **PSP Tables 5a and 5b**, below.

PSP Table 5a. Primary Annual Project Physical Benefits			
Project Name: Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment **Primary Benefit Claimed:** Amount of Water Quality Improvement **Units of the Benefit Claimed:** micrograms per liter (µg/L) **Additional Information About This Benefit:** This is the estimated reduction in total THM concentrations at Rinconada Water Treatment Plant in 2014 as a result of PAC treatment.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2014 Last Year of Project Life (1 year only)	67	39	28
Comments: *See e-mail communication with T. Hemmeter, 2014a for total trihalomethane (TTHM) reduction. The average TTHM concentration without treatment was about 67 µg/L. The TTHM concentration with a 20-mg/L PAC dose on 4/28/14 was about 39 µg/L. This estimate of physical benefits assumes a 20-mg/L PAC dose. It also assumes water quality entering RWTP remains about the same or declines through the summer. SCVWD anticipates that any potential improvement in source water quality from using water stored in local reservoirs will be offset by declining water quality of imported water sources necessary to supplement locally stored supplies.*			

Technical Analysis of Primary Physical Benefits Claimed

Technical basis of the Project: SCVWD experts have determined that PAC is necessary in 2014 to meet drinking water standards for THMs in the SCVWD-delivered water and/or SCVWD retailers' distribution systems. The drinking water standard for TTHMs is 80 µg/L, with compliance determined based on a locational running annual average. Laboratory testing shows PAC removes up to 41% of THMs from the treated water (Hemmeter, 2014a and 2014b).

Recent and historical conditions: Concentrations of TTHMs greater than the drinking water standard of 80 µg/L were detected in the retailers' distribution systems in early 2014 as a result of deteriorating source water quality due to the drought and longer residence times in distribution systems resulting from low winter demands. PAC treatment has been effective at reducing concentrations of THMs leaving RWTP at levels that keep concentrations in the retailers' systems below 80 µg/L (SCVWD, 2014b).

Estimates of without-project conditions: TTHM concentrations without PAC treatment averaged about 67 µg/L in April 2014 (Hemmeter, 2014a).

Methods used to estimate physical benefits: A 20-mg/L PAC dose reduced TTHM concentrations by 41%, or about 28 µg/L (Hemmeter, 2014a).

New facilities, policies, and actions required to obtain the physical benefits: None have been identified.

Potential adverse effects: None have been identified.

PSP Table 5b. Secondary Annual Project Physical Benefits			
Project Name: Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment **Secondary Benefit Claimed:** Amount of Water Treated/Improved **Units of the Benefit Claimed:** Acre-feet (AF) **Additional Information About This Benefit:** This is the amount of water that will be treated with PAC at RWTP			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2014 Last Year of Project Life (1 year only)	13,808	39,953	26,145
Source: *SCVWD, 2014a. The "Without Project" value represents the total supply for July through September 2014, a period when PAC is typically used to treat for taste and odor and would be used in the summer regardless of THM removal needs. In other words, SCVWD would treat about 13,808 AF of water at RWTP with PAC during the summer months under the "without project" condition. The "with project" value represents total 2014 deliveries with PAC treatment. PAC treatment may also be needed in 2015 depending on water quality conditions, but only the benefits for 2014 are calculated.*			

Technical Analysis of Secondary Physical Benefits Claimed

Technical basis of the Project: SCVWD has determined that PAC is necessary in 2014 to meet drinking water standards for THMs in the SCVWD-delivered water and/or SCVWD retailers' distribution systems. The drinking water standard for TTHMs is 80 µg/L, with compliance determined based on a locational running annual average. Laboratory testing shows PAC removes up to 41% of THMs from the treated water (Hemmeter, 2014a and 2014b).

Recent and historical conditions: Concentrations of TTHMs greater than the drinking water standard of 80 µg/L were detected in the retailers' distribution systems in early 2014 as a result of deteriorating source water quality due to the drought and longer residence times in distribution systems resulting from low winter demands. PAC treatment has been effective at reducing concentrations of THMs leaving RWTP to levels that keep concentrations in the retailers' systems below 80 µg/L (SCVWD, 2014a).

Estimates of without-project conditions: PAC would likely be used at RWTP during the summer months (July through September) to address taste and odor issues, regardless of the drought and THM issues. The without-project condition was estimated by summing the projected treated water deliveries for July through September (SCVWD, 2014a).

Methods used to estimate physical benefits: The amount of water treated/improved is equivalent to the estimated treated water deliveries for 2014. Treated water deliveries are based on actual deliveries and contract amounts (SCVWD, 2014a).

New facilities, policies, and actions required to obtain the physical benefits: None have been identified.

Potential adverse effects: None have been identified.

Cost-Effectiveness Analysis

PSP Table 6 evaluates whether the physical benefits provided by the Project are provided at the least possible costs.

PSP Table 6. Cost-Effectiveness Analysis	
Project name: Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment	
Question 1	***Types of benefits provided as shown in PSP Tables 5a and 5b:*** Production of Treated Water that Meets Drinking Water Standards: PAC addition at RWTP ensures that drinking water quality in the SCVWD and retailers' systems meets drinking water standards. THM concentrations in the water would be reduced by approximately 28 µg/L. Water Supply: This project ensures an additional 26,145 AF of water that is compliant with drinking water standards. Without the Project, the Rinconada Water Treatment Plant would only be able to provide 13,808 AF of safe drinking water to water retailers. Without the project, water retailers would be unable to meet drinking water demands with supplies that meet drinking water standards. Although retailers have some capacity to switch to other sources, such as groundwater, this capacity is limited in peak demand periods such as those experienced during summer months (June to September).
Question 2	***Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?*** Yes.
	If yes, list the methods (including the proposed project) and estimated costs. SCVWD has completed a Planning Study Report documenting alternatives for achieving better THM reduction at RWTP, as well as other objectives (SCVWD, 2012). The Planning Study Report identifies a preferred alternative (raw water ozonation), which would be effective at addressing source water quality concerns including those that SCVWD is currently experiencing throughout this drought. The report indicates that ozone addition is effective at reducing TOC, a THM precursor (SCVWD, 2012: p. 26). The estimated capital cost of the ozone component is $7,489,000 (SCVWD, 2012: p. 32). Adding PAC at the beginning of the treatment plant process (the Project) is an alternative to improving drinking water treatment processes via ozonation. The estimated annual cost for PAC treatment in 2014 is $1,091,088. SCVWD has not been able to identify other alternatives for achieving the Project benefits associated with treatment processes due to the plant's old age. Costs associated with raw water ozonation improvements at the plant are higher than PAC treatment for 2014. In addition, construction of the improvements in 2014 is infeasible because this alternative would still need to undergo design and construction. As described in the Project Description above, SCVWD plans to upgrade the plant to include ozonation, but such improvements would not be online until 2019. Another alternative to reducing THM concentrations is blending the source water with higher quality local surface water sources. This alternative is used when possible as it is essentially a no-cost alternative. However, this alternative is infeasible because local surface water supplies are minimal due to the drought.
Question 3	If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods. As described above in response to Question 2, the least cost alternative includes blending with local surface water supplies. However, blending with surface water is not a feasible option due to drought conditions and limited local surface water supplies (SCVWD, 2012 and 2014c). In comparison to the raw water ozonation improvements to the plant, PAC addition is the least cost alternative to meet current water supply needs in the western area of Santa Clara County, allowing treatment and distribution of safe drinking water from a variety of sources.
Comments: *None.*	

References Cited:

Hemmeter, T., 2014a. E-mail communication with SCVWD staff re: RWTP PAC efficacy. June 11.

Hemmeter, T., 2014b. E-mail communication with SCVWD staff re: PAC necessity. June 11.

Santa Clara Valley Water District (SCVWD), 2012. Rinconada Water Treatment Plant Reliability Improvement Project Planning Study Report, prepared by CDM-Smith. May.

_____, 2014a. SCVWD FY 2014 Treated Water Deliveries, RWTP 2014 TW Deliveries tab.

_____, 2014b. Monthly Water Quality Reports. May.

_____, 2014c. Supplemental Board Agenda Memorandum: Update on 2014 Water Supply and Drought Response, March 25.

Project 3 – Zone 7 Water Supply Drought Preparedness Project

Project Description

Project Goals: The goal of Zone 7 Water Agency's Zone 7 Water Supply Drought Preparedness Project (Project) is to increase potable water supply and groundwater recharge for residents of the Livermore-Amador Valley through construction of a production well and pipeline. The new production well, Chain of Lakes Well No. 5 (COL-5), is projected to produce up to 2 million gallons per day (MGD) (6.1 acre-feet per day [AFD] or 2,240 AFY) and will improve management of the groundwater basin by pumping from a different area of the basin to minimize effects on existing, localized, low water levels. The Cope Lake to Lake I Pipeline (CLP) will transfer water between an impervious pond to a pervious pond to recharge up to 15 MGD (46 AFD).

Project Description: The Project includes two components: the COL-5 and CLP, located in the Livermore Valley between the cities of Pleasanton and Livermore, described below.

COL-5 Project: The COL-5 project will provide better access to stored supplies in the Main Groundwater Basin. The well is being constructed on vacant land north of Lake H and near Zone 7's existing Chain of Lakes Well Nos. 1 and 2. The well will be 700 feet deep with an 18-inch mild steel/stainless steel casing. A vertical turbine pump will be installed approximately 360 feet (ft.) below the ground surface, and powered by a 350-horsepower (-hp) motor. A masonry block well building with a paved access road and fencing will be constructed to protect the well and pump. The well is projected to produce up to 2 MGD. The well discharge outlet will be connected to an existing 14-inch (-in.) pipeline located about 50 ft. away, which was installed as part of a previous project. A chemical treatment facility co-located with Well No. 1 has sufficient capacity to treat water from the new well.

CLP Project: Groundwater stored in the Main Groundwater Basin is a critical source of water supply during droughts. Historically, gravel mining companies have pumped groundwater from their active mining pits and discharged this groundwater into the creeks that flow out of the Livermore-Amador Valley, resulting in a permanent loss of water. In December 2013, a project was completed to allow Vulcan Materials Company to capture water pumped from its quarries and transfer it into Cope Lake, which has a clay lining that prevents percolation and recharge of the groundwater basin. The CLP project, already under construction, will transfer water from Cope Lake to Lake I via a 620-ft.-long high-density polyethylene (HDPE) pipeline. With the CLP, water can be recharged and stored in the groundwater basin, thereby improving conjunctive use of imported water supplies. Up to 15 MGD of groundwater recharge will result from this project when Lake I water elevations are at their highest level. In the future, the pipeline will enable Cope Lake to function as a detention basin during flood events to reduce peak storm flows. A slide-gate structure will be installed to control flow through the pipeline, and the Cope Lake inlet includes a trash rack to prevent obstructions from passing into the pipe. The Lake I outlet includes a concrete and rip-rap outfall structure to protect the lake slope. Once constructed, the pipe will remain open to carry all inflow from the mining company discharges into Cope Lake and into Lake I.

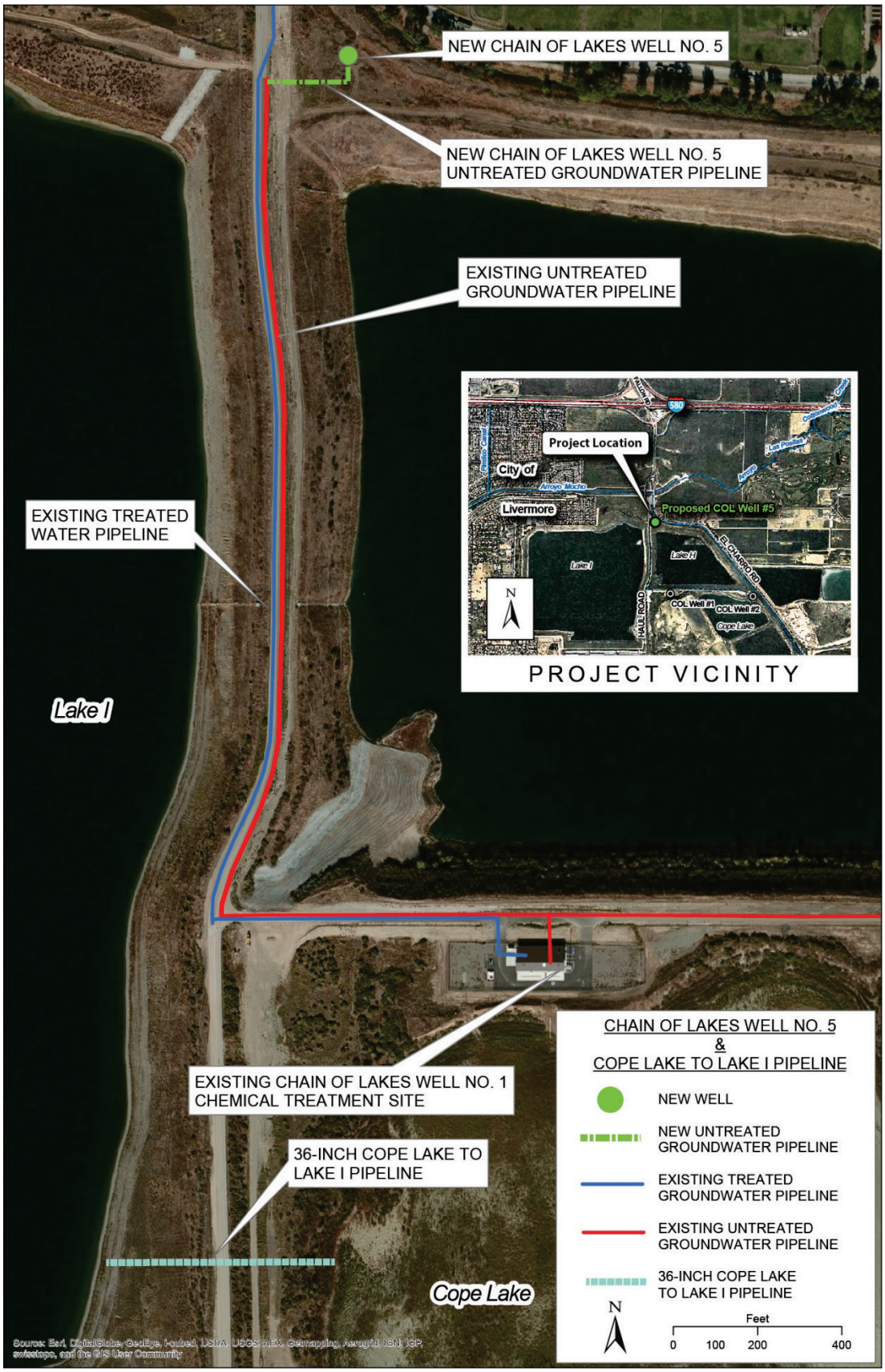
Implementation Status: Construction of the COL-5 project was initiated in February 2014 and will be complete in October 2014. The CLP project was installed in May 2014. Construction reporting and project monitoring remain to be completed.

Funding Needs: The COL-5 well was listed in the Capital Improvement Program (CIP) but was not scheduled to be constructed until fiscal year (FY) 2016-17. Because the CLP was not included in Zone 7's CIP, project funding was not budgeted in the current fiscal year. Both projects were prioritized as a result of the drought declaration. To initiate earlier than scheduled construction of these projects, other CIP projects had to be deferred or canceled. Drought grant funding is requested to recover costs of fast-tracking the COL-5 and CLP projects.

Drought Eligibility: *Immediate regional drought preparedness* – Currently, there are not enough supply wells to meet the demands in the Livermore-Amador Valley, nor does the local groundwater basin have a sustainable supply to keep up with area demands. The COL-5 and CLP projects are currently being constructed to address the current and future drought shortages.

Increase local water supply reliability and safe drinking water – The projects will provide up to 17 MGD (19,043 AFY) of water supply for drought and emergency situations, ensuring delivery of safe drinking water to residents of the Livermore-Amador Valley.

Project Map


NEW CHAIN OF LAKES WELL NO. 5
NEW CHAIN OF LAKES WELL NO. 5 UNTREATED GROUNDWATER PIPELINE
EXISTING UNTREATED GROUNDWATER PIPELINE
EXISTING TREATED WATER PIPELINE
Project Location
City of
Livermore
Proposed COL Well #5
Lake I
Lake H
COL Well #1
COL Well #2
Cope Lake
PROJECT VICINITY
Lake I
EXISTING CHAIN OF LAKES WELL NO. 1 CHEMICAL TREATMENT SITE
36-INCH COPE LAKE TO LAKE I PIPELINE
Cope Lake
CHAIN OF LAKES WELL NO. 5
&
COPE LAKE TO LAKE I PIPELINE
NEW WELL
NEW UNTREATED GROUNDWATER PIPELINE
EXISTING TREATED GROUNDWATER PIPELINE
EXISTING UNTREATED GROUNDWATER PIPELINE
36-INCH COPE LAKE TO LAKE I PIPELINE
N
Feet
0 100 200 400

Project Physical Benefits

Primary and secondary project physical benefits are summarized in **PSP Tables 5a and 5b**, below.

PSP Table 5a. Primary Annual Project Physical Benefits			
Project Name: Zone 7 Water Supply Drought Preparedness Project **Primary Benefit Claimed:** Water Supply Production **Units of the Benefit Claimed:** MGD Additional Information About This Benefit: Potable supply production			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2014	No new groundwater production	Up to 2 MGD of groundwater produced	Up to 2 MGD groundwater supply produced.
2015-2089 (75 years)	No new groundwater production	Up to 2 MGD of groundwater produced	Up to 2 MGD groundwater supply produced.
Comments: *None*			

Technical Analysis of Primary Physical Benefits Claimed

Technical basis of the Project: To develop a more reliable water supply, Zone 7 needs to develop alternative ways to deliver potable water to its customers. There may be instances where a treatment plant is out of service or at a reduced rate, one or more wells are out of service, or there are issues on the South Bay Aqueduct (SBA) that reduce the total volume of water available to Zone 7 for distribution. Additional well capacity allows Zone 7 to be more flexible and better able to adapt to various situations, such as the current low deliveries on the SBA. Additional wells in the Chain of Lakes area were identified in the Well Master Plan (CH2MHill, 2003).

Recent and historical conditions: The Livermore-Amador Valley is experiencing water shortages, loss of habitat or ecosystem function, and water quality issues. These are being caused by:

- Urbanization that has degraded water quality in the Bay Area,
- The recent drought (declared by the Governor in January 2014),
- Drastically reduced deliveries through the State Water Project (SWP), and
- The unavailability of "banked" water from south/central California water banks.

Estimates of without-project conditions: As evaluated in the No Project Alternative in Zone 7's Well Master Plan EIR, Zone 7 would not implement construction of new facilities under the Well Master Plan, and would continue withdrawing groundwater to meet reliability and emergency demands using Zone 7's existing facilities. Zone 7's current drought well capacity of 25 MGD would remain unchanged. However, as growth occurs within its service area, peak demands and drought-year demands would continue to increase. Implementation of the No Project Alternative within this context would have several potential consequences with respect to provision of reliable water supplies within the Livermore Valley. These would include inability to meet Zone 7's Reliability Goals; a potential shift in the ratio of surface water and groundwater supplies provided by Zone 7, with subsequent reduction of salt management benefits; and the likely need to acquire additional dry-year supplies. These supplies, which would likely be surface water supplies, or surface water supplies in lieu of groundwater stored outside of the Zone 7 service area, would be subject to hydrologic conditions in a given dry year, and would not provide the in-service-area storage reliability provided by use of the groundwater basin for storage and conjunctive use. As treated water demands increase over time within the Zone 7 service area, Zone 7's

existing well capacity of 25 MGD would not be adequate to recover the stored groundwater necessary to provide water supply to its Retail Agencies in a manner consistent with Goal 1 of Zone 7's Reliability Policy, "provision of 100% reliability during average, single drought year, and multiple drought years" (Zone 7, 2005).

Methods used to estimate physical benefits: The estimate of up to 2 MGD of well capacity was based upon the completion logs of the COL-1 and COL-2 wells and their current production, along with the adjacent monitoring well log lithology. The final capacity of the well will ultimately determine the extent of the Project's physical benefit (DWR, 2014).

New facilities, policies, and actions required to obtain the physical benefits: The Project will require the construction of a new supply well, piping to connect well discharge to existing pipeline, well house, and associated equipment to run the well.

Potential adverse effects: Potential issues associated with Project construction pertain to land subsidence. The Project could also result in short-term water quality impacts to Lake I (e.g., potential high turbidity) which receives well to waste discharges, while the well is ramping up for production (Zone 7, 2012).

PSP Table 5b. Secondary Annual Project Physical Benefits

Project Name: Zone 7 Water Supply Drought Preparedness Project

Primary Benefit Claimed: Water Supply Savings – Groundwater Recharge

Units of the Benefit Claimed: Million gallons per day (MGD)

Additional Information About This Benefit: The secondary benefit of this Project is conjunctive use of the Main Groundwater Basin. The pipeline portion of the Project will result in discharge water from mining operations to be transferred from Cope Lake to Lake I. Unlike Cope Lake, which has an almost completely impermeable clay-lined bottom, Lake I will permit the percolation of the water to recharge the basin that is used as a water supply. Otherwise, the water, when reaching a certain level in Cope Lake, would have been discharged into the Arroyo Mocho and found its way to San Francisco Bay. It is anticipated that even with evaporation in the lakes, groundwater recharge will be as much as 15 MGD when Lake I reaches its highest level at 340 feet (the level where the recharge capacity is the highest).

Year	Physical Benefits		
	Without Project	**With Project**	**Change Resulting from Project**
2014	No recharge water	15 MGD of recharge water	An additional 15 MGD of recharge water.
Last Year of Project Life (2089)	No recharge water	15 MGD of recharge water	An additional 15 MGD of recharge water.

Comments: *None.*

Technical Analysis of Secondary Physical Benefits Claimed

Technical basis of the Project: The CLP project, which would result in conjunctive use, the secondary benefit of the overall Project, will move water from one former gravel pit (Cope Lake) to another, Lake I. At Lake I, the water will recharge the groundwater basin from which potable supplies are pumped. Lake I is pervious and receives discharged water through Cope Lake from mining operations. Prior to this project, these mining discharges would eventually flow to the Bay (Stetson Engineers, 2004).

Recent and historical conditions: Over the years, water used in sand and gravel mining operations has been discharged into Cope Lake (a former quarry), which has developed a clay lining that prevents groundwater recharge. When the mining company discharges into the creek rather than Cope Lake, these flows exit the Valley via the Arroyo Mocho to San Francisco Bay (Zone 7, 2010).

Estimates of without-project conditions: Without the pipeline, there will be no additional recharge of the Main Groundwater Basin through Lake I and the mining company discharges will be lost (Zone 7, 2012).

Methods used to estimate physical benefits: Stetson Engineers prepared the Management Plan for Lakes H and I and Cope Lake in June 2004. In this report, Stetson Engineers calculated the estimated recharge rates in Lake I using water budget analysis, current groundwater conditions, and calibrated aquifer hydraulic conductivity (Stetson Engineers, 2004).

New facilities, policies, and actions required to obtain the physical benefits: The facility needed to obtain the conjunctive use physical benefit of the Project is the pipeline between Cope Lake and Lake I. The pipeline is included in Zone 7's CIP, but construction was accelerated because of the drought and the need to further recharge the Main Ground Basin from where Zone 7 and other agencies pump a portion of the area's potable water supplies.

Potential adverse effects: The pipeline project would not result in any potential adverse effects (Zone 7, 2012).

Cost-Effectiveness Analysis

PSP Table 6 evaluates whether the physical benefits provided by the Project are provided at the least possible costs.

PSP Table 6. Cost-Effectiveness Analysis	
Project name: Zone 7 Water Supply Drought Preparedness Project	
Question 1	***Types of benefits provided as shown in Tables 5a and 5b:*** This Project (the well and pipeline) may result in up to an additional 15 MGD of groundwater recharge and an additional 2 MGD of potable water production available to residents of the Livermore-Amador Valley . The recharged groundwater storage would offset the need to use surface water supplies from the State Water Project. While there could be some other incidental benefits (e.g., flood control), this is principally a drought preparedness water supply project intended to address the current, and assuredly future (because of climate change), drought conditions.
Question 2	***Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?*** No alternative methods have been considered for the COL-5 Project; however, two alternative methods were evaluated for the CLP Project. See below.
	If no, why? *COL-5 Project*: Due to limited water resources in the Livermore-Amador Valley (the majority of potable supply is imported from the Delta), the most feasible and immediately accessible water supply source is groundwater. Installation of the COL-5 well was determined to be the only and least expensive alternative to provide immediate water supply for the region. Zone 7 is approaching its mandatory 25% water conservation goal but that does not obviate the need for the COL-5 well and pipeline.
	If yes, list the methods (including the proposed project) and estimated costs. *CLP Project*: Two alternative methods were explored. First, Zone 7 investigated the use of a siphon to transfer water from Cope Lake to Lake I, using an existing tunnel that connected the two lakes. This option was rejected due to the elevation difference between the existing tunnel and the maximum water surface of Cope Lake – a siphon would not be able to lift water the required elevation. Because the siphon would have been infeasible there is no cost estimate. Secondly, Zone 7 investigated the possibility of pumping the water from Cope Lake to Lake I. The pipeline cost would be a little less at about $1 million. The pump cost would have been about $500,000. The annual operations and maintenance, including power, would have been about 10% of the initial capital cost. Additionally, the pump alternative would only have delivered half the water per day to Lake I, thus reducing to 7.5 MGD the potential recharge amount. The option selected is, over the long run, by far the least expensive.

Question 3	***If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.*** The Project is the least cost alternative. For CLP, Zone 7 investigated transferring water by siphon, but the physical characteristics of the site made that option unworkable. Zone 7 also investigated a pump system to move water from one lake to the other; this option had a lower construction cost, but the energy costs associated with this project made it more expensive after a few years. The gravity system proposed for the CLP is more reliable and eliminates the need for electricity and on-going power costs from pumping. The COL-5 well was planned to be constructed at a future date and has been accelerated due to the drought. When the COL-1 well was constructed in 2009, the chemical facilities were sized and a connector pipeline was constructed to accommodate a future COL-5. Construction of this well is the least cost alternative because the infrastructure necessary to distribute supply pumped from the well is already in place. Placement of the well at another location would not be cost effective and may not achieve the desired groundwater management goals.
Comments: *None.*	

References Cited:

CH2MHill, 2003. Draft Report Well Master Plan, prepared for Zone 7 Water Agency, October. Page ES-5, ES.3.3, last paragraph; and page 1-6, 1.4, first paragraph

California Department of Water Resources (DWR), 2014. Well Completion Report No. e0206419.

Stetson Engineers, 2004. Management Plan for Lakes H & I and Cope Lake, June. Pages 4-13 and 4-14.

Zone 7 Water Agency (Zone 7), 2005. Zone 7 Water Agency Well Master Plan Final EIR Responses to Comments, SCH: 2002032163, July. Page 2-1.

_____, 2010. 2010 Urban Water Management Plan, December 15.

_____, 2012. Cope Lake Improvements & Maintenance Final Environmental Initial Study/Draft Mitigated Negative Declaration, January 26.

Project Justification – Recycled Water Projects

Project descriptions, estimated physical benefits of the projects, justification of each project's technical feasibility, and a cost-effectiveness analysis are presented in this section for the projects listed below. These projects span three sub-regions in the San Francisco Bay IRWM Region. The projects included in this section have benefits related to recycled water production and distribution, potable water supply demand offset, water quality improvements (pollutant reductions in the Bay), and reduced demand on Delta water supplies.

Project ID#	Project Proponent	Project Title
4	Napa Sanitation District	Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines
5	SCVWD and City of Sunnyvale	Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline
6	DERWA	DERWA Phase 3 Recycled Water Expansion Project
7	City of Calistoga	Calistoga Recycled Water Storage Facility

Project 4 - Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines Project

Project Description

Project Goals: The goal of the Los Carneros Water District (LCWD) and Milliken-Sarco-Tulocay (MST) Recycled Water Pipelines Project (Project) is to extend the Napa Sanitation District (NSD)'s recycled water distribution system in Napa Valley by 15 miles west into the Los Carneros area and northeast into the MST area. The LCWD is an agricultural area directly west of Napa. The MST area is a rural residential and agricultural area directly east of Napa. Both are in unincorporated areas, with no connections to a municipal water supply system. As a separate project, the NSD is expanding the Soscol Water Recycling Facility to increase production of tertiary treated recycled water, which will be completed in fall 2014. The MST recycled water pipeline will supply 700 AFY for agricultural and landscape irrigation purposes, offsetting groundwater use. The LCWD recycled water pipeline will provide up to 1,250 AFY to supplement surface water demands and offset agricultural demands.

Project Description: The NSD provides wastewater treatment services for the City of Napa and a small unincorporated area around the city. NSD treats an average 7.8 MGD (8,700 AFY) of wastewater, of which 2,000 AFY is treated to a tertiary level. Of this, 1,400 AFY is provided to the community as "Title 22 Unrestricted" recycled water.

> *LCWD Project:* NSD will construct 9 miles of recycled water pipeline (6-in. to 20-in. diameter) for agricultural and landscape irrigation in the Los Carneros region of Napa Valley, which will connect to existing pipelines. Pipelines will mostly be constructed within public road right-of-way; NSD will acquire an easement for a short portion of the alignment in July 2014. Major pipeline segments will be constructed along Ranch, Stanly Cross, Cuttings Warf, Milton, Las Amigas, Duhig, Withers, and Neuenschwander roads, and Sough and Los Carneros avenues. The pipeline will serve approximately 106 parcels or 3,800 acres of irrigable land within the Los Carneros region with 1,250 AFY of recycled water. Recycled water users within the Carneros region will connect their own facilities to distribute the water to their private land and will apply water at agronomic rates to avoid runoff and/or saturation to protect surface water and groundwater quality.
>
> *MST Project:* NSD will construct 5 miles of recycled water pipeline (8-in. to 24-in. diameter) in the MST groundwater basin area to provide agricultural and landscape irrigation supply. The proposed pipeline network will be constructed within public road right-of-way. Major pipeline segments will be installed along Imola, 2nd, 3rd, 4th, and North avenues and Coombsville Road. To provide adequate flow and line pressure, a booster pump station will be constructed on an existing easement. The Project will serve approximately 34 parcels (360 acres) of irrigable land with approximately 700 AFY of recycled water supply. Recycled water users will connect their own facilities to distribute recycled water to their private land.

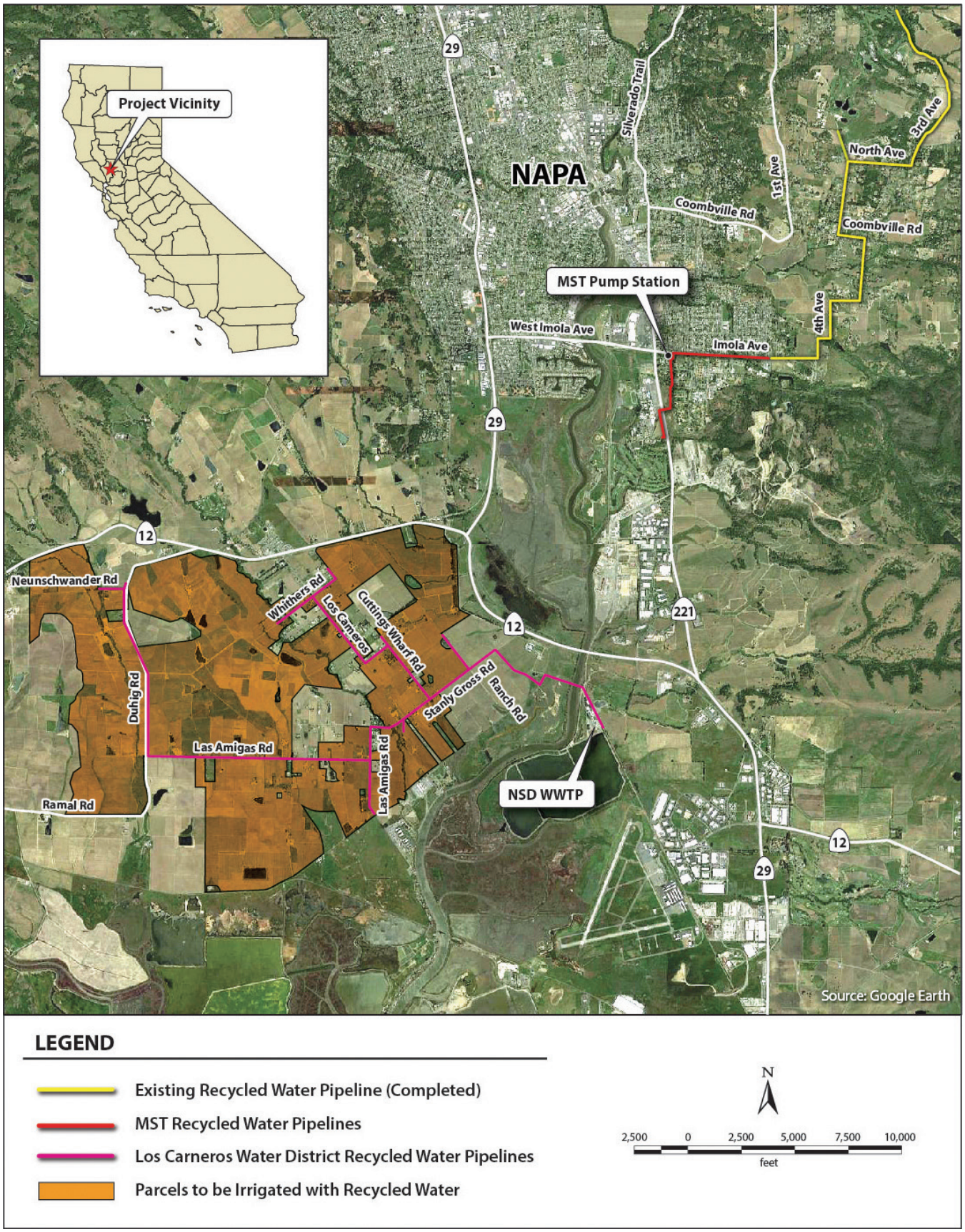
Implementation Status/Funding Needs: Construction of the MST project begins in summer 2014; the LCWD project is scheduled to begin early 2015. Both projects are relying on local assessment districts to pay for the majority of costs. (The MST assessment district and associated special tax has been approved, and the vote for the LCWD assessment is scheduled for July 2, 2014). Expedited funding will align with the construction schedule for these projects.

Drought Eligibility: *Immediate regional drought preparedness* – Napa County is currently in "Extreme Drought" conditions, as designated by the U.S. Drought Monitor. Surface water in the LCWD area is fully appropriated. Most private surface water storage reservoirs in this area are at half capacity or less. Several landowners are trucking water to their crops. As agricultural users turn to groundwater, residential users may bear the consequences. The only source of water in the MST area is the groundwater basin, estimated to be overdraft by 2,000 AFY. The LCWD and MST projects are anticipated to be complete fall 2015 and will immediately begin delivering recycled water; maximum deliveries will be realized in 2017.

Increase local water supply reliability and safe drinking water – Potable water supply in the Project area is under severe threat. The MST pipeline will supply 700 AFY of recycled water to offset potable groundwater demands, which provides additional safe drinking water for consumption.

Reduce water quality/ecosystem conflicts – Napa River is on the U.S. Environmental Protection Agency's (U.S. EPA's) 303(d) list of impaired water bodies due to excessive concentrations of nutrients and algae growth. The project will reduce treated wastewater effluent discharged to the Napa River and the Bay, reducing nutrient loading of Biological Oxygen Demand (BOD), nitrogen, and Total Suspended Solids (TSS).

Project Map


Project Vicinity
NAPA
Silverado Trail
Coombville Rd
1st Ave
North Ave
3rd Ave
Coombville Rd
MST Pump Station
West Imola Ave
Imola Ave
4th Ave
29
12
221
Neunschwander Rd
Whithers Rd
Los Carneros
Cuttings Wharf Rd
Stanly Gross Rd
Ranch Rd
Duhig Rd
Las Amigas Rd
Las Amigas Rd
Ramal Rd
NSD WWTP
Source: Google Earth
LEGEND
Existing Recycled Water Pipeline (Completed)
MST Recycled Water Pipelines
Los Carneros Water District Recycled Water Pipelines
Parcels to be Irrigated with Recycled Water
N
2,500 0 2,500 5,000 7,500 10,000
feet

Project Physical Benefits

Primary and secondary project physical benefits are summarized in **PSP Tables 5a and 5b**, below.

PSP Table 5a: Primary Annual Project Physical Benefits			
Project Name: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines **Primary Benefit Claimed:** Water Supply – Recycled Water Use **Units of the Benefit Claimed:** Acre-feet per year (AFY) **Additional Information About this Benefit:** Total amount of recycled water distributed and used in the LCWD and MST areas. Water delivery is expected to expand annually through 2017 based on increased voluntary connections and conversions of private distribution systems.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2015	0	150 (100 for LCWD and 50 for MST)	150 AFY of recycled water use
2016	0	1,600 (1,250 for LCWD and 350 for MST)	1,600 AFY of recycled water use
2017	0	1,950 (1,250 for LCWD and 700 for MST)	1,950 AFY of recycled water use
2018-Last Year of Project Life (2065)	0	1,950 (1,250 for LCWD and 700 for MST)	1,950 AFY of recycled water use
Comments: *None.*			

Technical Analysis of Primary Physical Benefits Claimed

Technical basis of the Project:

MST Project: NSD studied the MST recycled water pipeline project as part of the North Bay Water Recycling Program. The study included an environmental analysis of the recycled water pipeline project to deliver recycled water to the MST area. The study included several alternatives, including "No Project," "No Action Alternative," "Basic System," "Partially Connected System," and "Fully Connected System." The "Basic System" was found to be the least cost alternative with the least negative environmental impacts that still met project goals of reducing groundwater overdraft in the MST area. The Project included and described in this grant application is the first phase of the "Basic System" alternative, which builds the main trunk system for recycled water delivery (North Bay Water Reuse Authority, 2009).

LCWD Project: The LCWD Project is described in environmental documents (SBM Environmental, 2013). Section 1.2 identifies surface water availability issues during the irrigation season and states that groundwater in some localities have marginal quality and highly unreliable quantity from year to year. Supply of recycled water to the Carneros region will partially or completely mitigate these issues. Section 2.1 states that the project will supply recycled water to approximately 106 parcels, 3,800 acres of irrigable land, and supply approximately 1,300 AFY.

Table 7.2 of Carollo Engineers' memorandum (last two pages) lists that the LCWD pipeline could deliver 1,783 AFY to the Carneros region (Carollo Engineers, 2012).

NSD Recycled Water Policy establishes priories for use of recycled water produced at the Soscol Recycled Water Facility. This policy establishes an allocation of recycled water to the MST area (700 AFY during the summer months) and the LCWD (450 AFY in the summer months and 800 AFY in the winter months). The policy also establishes LCWD priority for future recycled water that may become available.

Recent and historical conditions:

MST Groundwater Conditions: Napa County commissioned a study in 2003 to evaluate the conditions of the MST groundwater aquifer. The study used data from 4,800 private wells in the MST area from 1975 to 2002 to evaluate the amount of annual groundwater pumping in 2000 (5,350 AF) and calculate the increased groundwater usage since 1975 (80% increase). The study determined that between 1975 and 2001, the groundwater levels declined 25 to 125 feet in the central and eastern parts of the aquifer, with the declines resulting from increases in groundwater pumpage and possibly changes in infiltration capacity caused by changes in land use (Farrar and Metzger, 2003). From the data in this study, and the information in the Napa County Baseline Data Report (2005), the County determined that the MST groundwater basis was being overdraft by approximately 2,000 acre-feet per year. This became the basis of the County's declaration of the MST as a "Groundwater Deficient Area" and the establishment of guidelines for groundwater permits. These guidelines, adopted in July 2005 and updated in 2012, establish the "no net increase" policy for water consumption that the County enforces in this area (NSD, 2012a).

LCWD Area Conditions: Section 1.2 of the LCWD Initial Study/Mitigated Negative Declaration/Environmental Assessment/Finding of No Significant Impact (SBM Environmental, 2013) identified the recent and historical conditions in the LCWD area regarding available water:

- The agricultural economy, which is dominated by high-value vineyard culture, requires a highly reliable water supply to maintain and to expand its crop base
- Surface water supplies are already diverted by multiple users, have low flows in the summer (which coincides with the irrigation season), and can have low flows in dry years
- Groundwater supplies are typically heavily used and in some localities have marginal quality and highly unreliable quantity from year to year
- Groundwater availability is irregular. In some areas, especially during the dry months, pumping of the scattered groundwater aquifer often causes some residential users' well production to markedly diminish and in some cases stop altogether. As a result, those homeowners must truck in water.
- Rising sea levels, combined with groundwater and surface water extraction, have increased the risk of saltwater intrusion from San Pablo Bay in many parts of the area.

Estimates of without-project conditions:

MST Area: The MST groundwater basin is being overdraft by approximately 2,000 acre-feet per year. This overdraft of will continue without the project, which will decrease the overdraft by 700 AFY (35%).

LCWD Area: Recycled water will not be delivered to the area without the project (SBM Environmental, 2013). The conditions described above under "Recent and Historical Conditions" will continue without abatement.

Methods used to estimate physical benefits: Estimates of recycled water usage are based on current usage of groundwater from agricultural and irrigation purposes on properties that will be served by recycled water pipeline projects.

New facilities, policies, and actions required to obtain the physical benefits: NSD is constructing additional filter capacity at the Soscol Recycled Water Facility, which will be completed in 2014. The MST and LCWD recycled water pipelines (as described in the Project Description) are necessary to distribute recycled water. Onsite irrigation systems and meters installed at all user connections are necessary for users to receive water and comply with regulations regarding recycled water use. These onsite improvements are being constructed by most landowners concurrent with the construction of the MST and LCWD recycled water pipelines.

Potential adverse effects: Temporary impacts during project construction will be reduced to less-than-significant levels (SBM Environmental, 2013).

PSP Table 5b: Secondary Annual Project Physical Benefits			
Project Name: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines **Secondary Benefit Claimed:** Groundwater Demand Offset **Units of the Benefit Claimed :** Acre-feet per year (AFY) groundwater demand offset to the MST aquifer due to offset recycled water use **Additional Information About this Benefit:** Recycled water delivery in the MST area is expected to be 350 AFY by 2016, expanded to 700 AF as early as 2017, based on increased voluntary connections and conversions of private distribution systems.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2015	0	50 AFY in MST groundwater aquifer	50 AFY in MST groundwater aquifer
2016	0	350 AFY in MST groundwater aquifer	350 AFY in MST groundwater aquifer
2017	0	700 AFY in MST groundwater aquifer	700 AFY in MST groundwater aquifer
2018-Last Year of Project Life (2065)	0	700 AFY in MST groundwater aquifer	700 AFY in MST groundwater aquifer
Comments: *None.*			

Technical Analysis of Secondary Physical Benefits Claimed

Technical basis of the Project: See discussion under the heading "Primary Physical Benefits Claimed," above.

Recent and historical conditions: See discussion under the heading "Primary Physical Benefits Claimed," above.

Estimates of without-project conditions: See discussion under the heading "Primary Physical Benefits Claimed," above.

Methods used to estimate physical benefits: Estimates of recycled water usage are based on current usage of groundwater from agricultural and irrigation purposes on properties that will be served by recycled water pipeline projects.

New facilities, policies, and actions required to obtain the physical benefits: NSD is constructing additional filter capacity at the Soscol Recycled Water Facility, which will be completed in 2014. MST and LCWD recycled water pipelines (as described in this application) are necessary to distribute water. Onsite irrigation systems and meters installed at all user connections are necessary for users to obtain water and comply with regulations on the use of recycled water. These onsite improvements are being constructed by most landowners concurrent with the construction of the MST and LCWD recycled water pipelines. Increased use of recycled water as a result of Project implementation will reduce demands for groundwater in the MST groundwater basin area.

Potential adverse effects: Temporary impacts during project construction would be reduced to less-than-significant levels (SBM Environmental, 2013).

PSP Table 5c: Tertiary Annual Project Physical Benefits			
Project Name: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines **Tertiary Benefit Claimed:** Ecosystem improvement – pollution reduction **Units of the Benefit Claimed :** Kilograms per year (kg/year) **Additional Information About this Benefit:** The Napa River is on the U.S. EPA's 303(d) list of impaired water bodies due to excessive concentrations of nutrients and algal growth. Kilograms per year of nitrogen, biological oxygen demand consumed over 5 days (BOD_5) and total suspended solids (TSS) per year removed is based on NSD's average monthly discharge concentrations of these constituents to the Napa River in calendar year 2013.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2015	0	Reduction from discharge into Napa River/Bay: Nitrogen: 255 BOD_5: 981 TSS: 1,402	Nitrogen: 255 BOD_5: 981 TSS: 1,402
2016	0	Reduction from discharge into Napa River/Bay: Nitrogen: 2,716 BOD_5: 10,460 TSS: 14,989	Nitrogen: 2,716 BOD_5: 10,460 TSS: 14,989
2017	0	Reduction from discharge into Napa River/Bay: Nitrogen: 3,310 BOD_5: 12,748 TSS: 18,268	Nitrogen: 3,310 BOD_5: 12,748 TSS: 18,268
Last Year of Project Life (2065)	0	Reduction from discharge into Napa River/Bay: Nitrogen: 3,310 BOD_5: 12,748 TSS: 18,268	Nitrogen: 3,310 BOD_5: 12,748 TSS: 18,268
Comments: *Kilograms per year of nitrogen, BOD_5, and TSS removed are based on Napa Sanitation District average monthly discharge concentrations of these constituents to the Napa River in calendar year 2013.*			

Technical Analysis of Tertiary Physical Benefits Claimed

Technical basis of the project: See discussion under the heading "Primary Physical Benefits Claimed," above.

Recent and historical conditions: In 2013 and in accordance with NSD's National Pollutant Discharge Elimination System (NPDES) permit, the NSD discharged treated wastewater effluent to the Napa River during January, February, March, April, November, and December. The BOD_5 monthly average in the effluent during these months ranged from 3.73 milligrams per liter (mg/L) to 8.57 mg/L, with an annual average of 5.30 mg/L. The TSS monthly average ranged from 4.59 mg/L to 10.53 mg/L, with an annual average of 7.595 mg/L. The nitrogen monthly average ranged from non-detect to 4.547 mg/L, with an annual average of 1.376 mg/L.

Estimates of without-project conditions: 150 AF of effluent diverted from river discharge equates to the following pollution reduction:

BOD_5 = 981 kg/year
TSS = 1,402 kg/year
Nitrogen = 255 kg/year

1,600 AF of effluent diverted from river discharge equates to the following pollution reduction:

BOD_5 = 10,460 kg/year
TSS = 14,989 kg/year
Nitrogen = 2,716 kg/year

1,950 AF of effluent diverted from river discharge equates to the following pollution reduction:

BOD_5 = 12,748 kg/year
TSS = 18,268 kg/year
Nitrogen = 3,310 kg/year

Methods used to estimate physical benefits: Continuous testing and reporting of nitrogen, BOD_5, and TSS in wastewater were used to estimate pollution reduction benefits. Data from 2013 was used to calculate pollution diversion based on estimated delivery of recycled water (Napa Sanitation District, 2013b).

New facilities, policies, and actions required to obtain the physical benefits: See discussion above for primary and secondary benefits claimed.

Potential adverse effects: Temporary impacts during project construction would be reduced to less-than-significant levels (SBM Environmental, 2013).

Cost-Effectiveness Analysis

PSP Table 6 evaluates whether the physical benefits provided by the project are provided at the least possible costs.

PSP Table 6. Cost-Effectiveness Analysis	
Project name: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines Project	
Question 1	***Types of benefits provided as shown in Table 5:*** The LCWD and MST projects would provide water supply benefits by expanding distribution and recycled water use opportunities in NSD's recycled water service area. The projects are anticipated to be complete in late 2015 and will immediately begin delivering water. In 2015, usage could approach 150 AFY. In 2016, delivery is expected to approach 1,600 AFY, while 2017 and beyond usage is anticipated to be 1,950. The projects would also provide ecosystem improvement/environmental benefits, as they would collectively reduce discharge of wastewater effluent to the Bay by 1.74 MGD.
Question 2	***Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?*** Yes. The LCWD Engineering Feasibility Study evaluated alternative alignments. The proposed project can provide recycled water to all interested recycled water users. The MST project was initially envisioned as a much more extensive and expensive project. The EIR/EIS was based upon this larger project. Unfortunately, sufficient funding could not be identified. The currently proposed project constitutes the "backbone" of the larger system and has been optimized to serve the largest users identified; thus the proposed project provides the lowest cost per AF.
Question 3	***If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.*** The LCWD Engineering Feasibility Study evaluated all possible supply alternatives. Recycled water was the only viable option, so yes, it is the least cost alternative. The MST project was initially envisioned as a much more extensive and expensive project. The EIR/EIS was based upon this larger project. Unfortunately, sufficient funding could not be identified.

	The currently proposed project constitutes the "backbone" of the larger system and has been optimized to serve the largest users identified; thus the proposed project provides the lowest cost per AF.
Comments: *None.*	

References Cited:

Carollo Engineers, 2012. Project Memorandum: Analysis of New Alternatives for the LCWD Recycled Water Distribution System.

Farrar and Metzger, 2003. Ground-Water Resources in the Lower Milliken–Sarco–Tulocay Creeks Area, Southeastern Napa County, California, 2000–2002. USGS Water-Resources Investigations Report 03-4229.

Napa County, 2005. Napa County Baseline Data Report, Chapter 16 – Groundwater Hydrology, November.

Napa Sanitation District (NSD), 2011. Resolution 11-004 – Summer Water Allocation.

_____, 2012a. General Information Regarding Groundwater Permits for Projects Within the MST Groundwater Deficient Area. July 2005 (Updated 2012).

_____, 2012b. NSD Minute Resolution MR 12-072 – Establish 800 AFY winter water allocation to LCWD, and 150 AFY of summer water.

_____, 2013a. NSD Minute Resolution MR 13-019 – Allocates an additional 300AFY of summer water to LCWD.

_____, 2013b. 2013 Annual Self-Monitoring Report for Napa Sanitation District (inclusive of data submitted directly to CIWQS).

North Bay Water Reuse Authority (NBWRA), 2009. North San Pablo Bay Restoration and Reuse Project (North Bay Water Recycling Program) EIR/EIS, November.

San Francisco Bay Regional Water Quality Control Board (RWQCB), NPDES Permit No. CA0037575.

SBM Environmental, 2013. Los Carneros Water District Recycled Water Pipeline Project, Initial Study/MND/EA, October.

Project 5 – Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline Project

Project Description

Project Goals: The purpose of the Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline Project (Project) is to increase recycled water production and distribution capacity in order to provide 1,680 acre-feet per year (AFY) of additional recycled water to alleviate immediate and future drought impacts. The potable water offset of 1,680 AFY will help maintain groundwater levels and contribute to the ongoing conjunctive management in the Santa Clara sub-basin. In addition, the Project will reduce nutrient loading to San Francisco Bay. Lastly, the Project will set the stage for a future potable reuse project to adapt to climate change and alleviate future drought impacts.

Project Description: Current recycled water demands in Santa Clara County are increasing as a result of the drought, construction of the new Apple 2 Campus in the City of Cupertino, and other development. To meet these demands, the SCVWD and City of Sunnyvale (Project co-sponsors) Project will increase recycled water production and use in Santa Clara County through two methods: (1) increasing the recycled water production capacity at the Sunnyvale Water Pollution Control Plant (WPCP) and (2) adding distribution system capacity (Wolfe Road Pipeline). The WPCP is owned by the City of Sunnyvale and is located at 1444 Borregas Avenue in Sunnyvale. Plant configuration limitations require recycled water production to be a batch operation that alternates between recycled water production and San Francisco Bay effluent discharge. Infrastructure age and control system limitations, together with compliance challenges, have necessitated complex flow management that has ruled out batch production. As a result, during the last two years, all of the recycled water demand of 1.0 million gallons per day (MGD) (1,120 AF) has been met with potable water supplies (City of Sunnyvale, 2013a and 2014a). This Project includes improvements to the WPCP's recycled water production process so that recycled water can be produced on a continuous basis and potable water will no longer need to be diverted into the recycled water distribution system to meet current and future recycled water demands. The plant improvements consist of air flotation tank influent and effluent piping and flow diversion valving, new flow metering for process control, filter influent channel modifications including a new separator wall and isolation gate, filtered water pump discharge pipe modifications and new discharge isolation valves, chlorine contact tank modifications including a new separator wall and isolation gate. These improvements will allow for the production of an additional 1,120 AFY of supply by 2016. The additional recycled water production will reduce effluent discharges to San Francisco Bay and, as a result, reduce nutrient loading to the bay.

SCVWD will also construct a booster pump station and 13,000 linear feet of 24-inch recycled water pipeline along Wolfe Road to serve new projected demands in the cities of Sunnyvale and Cupertino. The pipeline will extend along Wolfe Road from the City of Sunnyvale's San Lucar pump station at Kifer Road to the new Apple 2 Campus at Wolfe Road and East Homestead Road in Cupertino. This will extend the recycled water system into the City of Cupertino and California Water Service Company (CalWater)'s service area. The Wolfe Road Pipeline will deliver 560 AFY of supply starting in 2016. This Project sets the stage for a future potable reuse project involving groundwater recharge with 11,200 AFY of advanced treated recycled water produced at the WPCP. Water would be delivered through an extension of the Wolfe Road recycled water pipeline from the Apple 2 Campus to SCVWD recharge ponds, approximately 17 miles long.

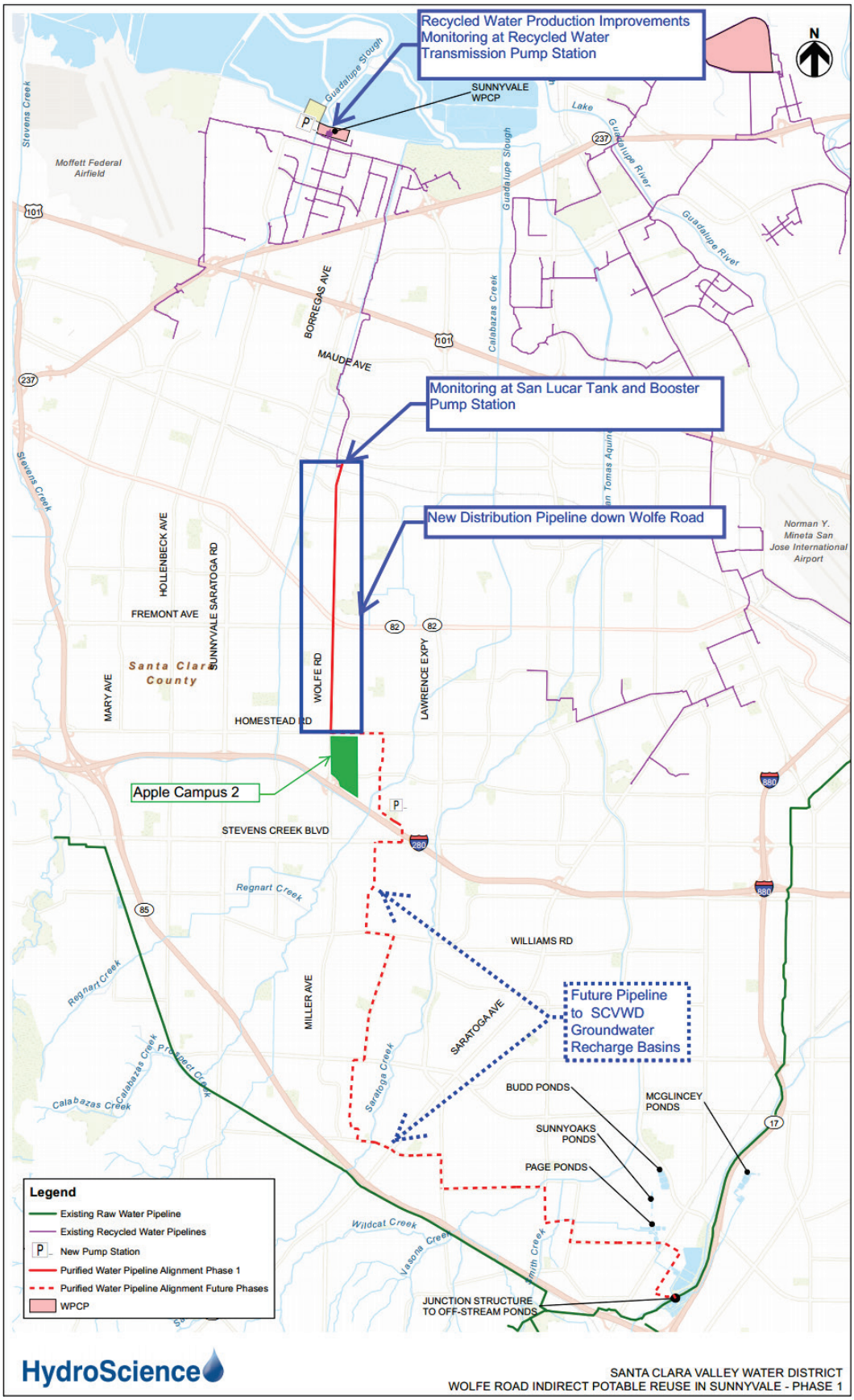
Implementation Status: Proposed WPCP facilities are currently at 10% complete (conceptual) design level. Project construction will begin in April 2015 (HDR, 2013). The Wolfe Road Pipeline Project is at 30% complete design and construction is scheduled to start in June 2015.

Funding Needs: Expedited funding is needed to accelerate recycled water production and distribution improvements to reliably meet existing demands and accelerate subsequent, planned recycled water distribution expansion to provide drought-proof recycled water supply and permanent potable water demand reduction.

Drought Eligibility: *Immediate regional drought preparedness* — The Project will produce 1,680 AFY of additional recycled water by 2016. This local source of drought-proof supply will help Santa Clara County respond to droughts and adapt to climate change.

Increase local water supply reliability and safe drinking water — Currently, about 55% of Santa Clara County's water supply is imported and about 5% is recycled water. This Project will increase recycled water use to 10% of the total water use in the County by 2025. This Project will increase local water supply reliability by increasing recycled water production and distribution capacity, while reducing demands for potable water and facilitating increased access to safe drinking water

Project Map


Recycled Water Production Improvements
Monitoring at Recycled Water
Transmission Pump Station
SUNNYVALE WPCP
Monitoring at San Lucar Tank and Booster Pump Station
New Distribution Pipeline down Wolfe Road
Apple Campus 2
Future Pipeline to SCVWD Groundwater Recharge Basins
BUDD PONDS
MCGLINCEY PONDS
SUNNYOAKS PONDS
PAGE PONDS
JUNCTION STRUCTURE TO OFF-STREAM PONDS
Moffett Federal Airfield
Norman Y. Mineta San Jose International Airport
Santa Clara County
BORREGAS AVE
MAUDE AVE
HOLLENBECK AVE
SUNNYVALE SARATOGA RD
FREMONT AVE
MARY AVE
WOLFE RD
HOMESTEAD RD
LAWRENCE EXPY
STEVENS CREEK BLVD
WILLIAMS RD
MILLER AVE
SARATOGA AVE
Legend
Existing Raw Water Pipeline
Existing Recycled Water Pipelines
New Pump Station
Purified Water Pipeline Alignment Phase 1
Purified Water Pipeline Alignment Future Phases
WPCP
HydroScience
SANTA CLARA VALLEY WATER DISTRICT
WOLFE ROAD INDIRECT POTABLE REUSE IN SUNNYVALE - PHASE 1

Project Physical Benefits

Primary and secondary Project physical benefits are summarized in **PSP Tables 5a, 5b, and 5c,** below.

PSP Table 5a. Primary Annual Project Physical Benefits			
Project Name: SCVWD-Sunnyvale Recycled Water Expansion Project **Primary Benefit Claimed:** Water Supply – Recycled Water Production **Units of the Benefit Claimed :** Acre-feet/year (AFY) **Additional Information About This Benefit:** Drought-proof permanent potable water demand reduction by replacement with recycled water			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2016-2066	0	1,680	1,680
Last Year of Project Life (50 years)	0	1,680	1,680
Source: HydroScience, 2013: p. ES-2 and Table 11-1.			

Technical Analysis of Primary Physical Benefits Claimed

Technical basis of the Project: The Project consists of the following:

- Recycled Water Production Improvements (HDR, 2013): structural, mechanical, and pipeline improvements to dissolved air flotation (DAF), dual media filters and chlorine contact tanks that will produce, at a minimum, 1,680 AFY: 1,120 AFY for existing demand (HydroScience, 2013: p. ES-2) plus 560 AFY (HydroScience, 2013: Table 11-1) for the Wolfe Road Pipeline.
- New Distribution Pipeline down Wolfe Road: 13,000 linear feet (LF) of 24-inch pipeline and booster pump station which will deliver 560 AFY (HydroScience, 2013: Table 11-1; number reported is 495 AFY but subsequent discussions with prospective users increased the value to 560 AFY).

The Project will achieve the following drought-proof permanent potable water demand reduction:

- From 2016 to 2066: 1,680 AFY recycled water produced and distributed

Recent and historical conditions: SCVWD is in Stage 3 (Severe) of its Water Shortage Contingency Plan (SCVWD, 2010: Table 6-1). The Board of Directors adopted Resolution 14-11 calling for 20% water use reduction in Santa Clara County through 12/31/14. SCVWD has also reduced treated water contract deliveries by 20% through 12/31/14 and is planning to discontinue raw surface water deliveries to its customers. If dry conditions continue into 2015, SCVWD falls to Stage 5 Emergency of its Water Shortage Contingency Plan, which could require water use reductions of up to 50%.

Plant configuration limitations require recycled water production to be a batch operation that alternates between recycled water production and San Francisco Bay effluent discharge. Infrastructure age and control system limitations together with compliance challenges have necessitated complex flow management that has ruled out batch production. As a result, during the last two years, all of the recycled water demand of 1.0 MGD (1,120 AF) has been met with potable water (City of Sunnyvale, 2013a: Attachment B, p. 23; and City of Sunnyvale, 2014a: Attachment B, p. 27).

Estimates of without-project conditions: Plant configuration limitations require recycled water production to be a batch operation that alternates between recycled water production and San Francisco Bay effluent discharge. Infrastructure age and control system limitations together with compliance challenges have necessitated complex flow management that has ruled out batch production. As a result, during the last two years, all of the recycled water

demand of 1.0 MGD (1,120 AF) has been met with potable water (City of Sunnyvale, 2013a, Attachment B, p 23; and City of Sunnyvale, 2014b, Attachment B, p. 27).

Therefore, 0 AFY of drought-proof permanent potable water demand reduction is achieved without the Project, given the Plant's inability to produce recycled water on a continuous basis.

Methods used to estimate physical benefits: According to Brown and Caldwell's 2009 technical memorandum (p. ES-2), the typical total annual recycled water demand is approximately 1,120 AFY or 1 MGD. The Phase 1 Wolf Road pipeline will serve a demand new demand for 560 AFY (number reported is 495 AFY but subsequent discussions with prospective users increased the value to 560 AFY) (HydroScience, 2013).

New facilities, policies, and actions required to obtain the physical benefits: Recycled Water Production Improvements (HDR, 2013) and 13,000 LF of new distribution pipeline down Wolfe Road (HydroScience, 2013: p. ES-6 and Table ES1-2) are required to achieve the benefits.

Potential adverse effects: Production improvements are likely exempt from the California Environmental Quality Act (CEQA) under Guideline Section 15301(d) (rehabilitation of deteriorated structures, facilities, or mechanical equipment to meet current standards of public health and safety entailing negligible or no expansion of an existing use).

A Mitigated Negative Declaration (MND) was prepared for the Wolfe Road Pipeline Project, which concluded that mitigation measures would need to be implemented to reduce potential adverse effects on nesting birds and effects related to potential exposure to hazardous materials (e.g., contaminated soil or groundwater) that could be encountered during pipeline construction. The City of Sunnyvale adopted the MND for the new Distribution Pipeline (Wolfe Road Pipeline Project) on September 24, 2013 (City of Sunnyvale, 2013b).

Table 5b. Secondary Annual Project Physical Benefits

Project Name: SCVWD-Sunnyvale Recycled Water Expansion Project
Secondary Benefit Claimed: In-lieu Groundwater Recharge
Units of the Benefit Claimed: Acre-feet per year (AFY)
Additional Information About This Benefit: Amount of in-lieu groundwater recharge provided by the Project.

Year	Physical Benefits		
	Without Project	With Project	Change Resulting from Project
2016-2066	0	1,680	1,680
Last Year of Project Life	0	1,680	1,680

Source: HydroScience, 2013: p. ES-2 and Table 11-1.

Technical Analysis of Secondary Physical Benefits Claimed

Technical basis of the Project: See technical basis discussion under the heading "Technical Analysis of Primary Physical Benefits Claimed," above. The Project will increase recycled water use by 1,680 AFY from 2016 through 2066. This additional recycled water use is a drought-proof supply that provides in-lieu groundwater recharge (SCVWD, 2012a: p. 2-6). In-lieu recharge help keeps groundwater supplies from diminishing and the land from subsiding by reducing demands on the groundwater sub-basins.

Recent and historical conditions: Northern Santa Clara County has a history of groundwater overdraft and land subsidence Nearly half the water used in Santa Clara county is pumped from groundwater. Natural groundwater recharge needs to be augmented by managed and in-lieu recharge in order to avoid resumption of groundwater overdraft and land subsidence. The use of recycled water is in-lieu groundwater recharge (SCVWD, 2012a: pp. 2-2 and 2-6, Figure 2-4 on p. 2-7).

Because of the lack of local rainfall and cut backs in water imported from state and federal water projects, SCVWD has had to reduce management groundwater recharge operations in ponds and creeks to conserve drinking water supplies

for use this summer (SCVWD, 2014a). Consequently, groundwater levels in the Project area (Santa Clara Plain portion of the Santa Clara subbasin) are 22 feet lower than last year and are 21 feet below the five-year average (SCVWD, 2014b). In addition, SCVWD is in Stage 3 (Severe) of its Water Shortage Contingency Plan (SCVWD, 2014c: p. 14) and is calling for a 20% reduction in water use in 2014.

Estimates of without-project conditions: Current Plant configuration limitations require recycled water production to be a batch operation that alternates between recycled water production and San Francisco Bay effluent discharge. Infrastructure age and control system limitations together with compliance challenges have necessitated complex flow management that has ruled out batch production. As a result, during the last two years, all of the existing recycled water demand of 1.0 MGD (1,120 AF) has been met with potable water (City of Sunnyvale, 2013a: Attachment B, p. 23; and City of Sunnyvale, 2014: Attachment B, p. 27). Without the Project, potable water will continue to be used to meet existing recycled water demands. In addition, without the Project, 560 AFY of new demand from the Apple 2 Campus development and other projects will be unmet (HydroScience, 2013: Table 11-1; number reported is 495 AFY but subsequent discussions with perspective users increased the value to 560 AFY).

Therefore, 0 AFY of in-lieu groundwater recharge would be achieved without the Project given plant treatment limitations and the lack of distribution infrastructure.

Methods used to estimate physical benefits: As described on page ES-2 of the City of Sunnyvale's Feasibility Study for Recycled Water Expansion Report (HydroScience, 2013: Table 11-1), the typical existing annual recycled water demand is approximately 1,120 AFY or 1 MGD. The total recycled water use of 1,680 AFY provides an equivalent amount of in-lieu groundwater recharge.

New facilities polices, and actions required to obtain the physical benefits: Recycled Water Production Improvements (HDR, 2013) and 13,000 LF of new Distribution Pipeline down Wolfe Road (HydroScience, 2013: p. ES-6, Table ES1-2) are required to achieve the benefits.

Potential adverse effects: See discussion above under the heading "Technical Analysis of Primary Benefits Claimed," above.

PSP Table 5c. Tertiary Annual Project Physical Benefits

Project Name: SCVWD-Sunnyvale Recycled Water Expansion Project

Tertiary Benefit Claimed: Water Quality Improvement – Pollutant Reduction to San Francisco Bay

Units of the Benefit Claimed: kilograms per year (kg/year)

Additional Information About this Benefit: Reduced total nitrogen (TN), carbonaceous biochemical oxygen demand (measure of organics loading) (CBOD), and total suspended solids (TSS) Pollutants Loadings to the San Francisco Bay

Year	Physical Benefits		
	Without Project	**With Project**	**Change Resulting from Project**
2016-2066	TN, BOD, and TSS: 0	Pollutant reductions to Bay: TN: 48,000 BOD: 10,900 TSS: 20,400	TN: 48,000 BOD: 10,900 TSS: 20,400
Last Year of Project Life	TN, BOD, and TSS: 0	Pollutant reductions to Bay: TN: 48,000 BOD: 10,900 TSS: 20,400	TN: 48,000 BOD: 10,900 TSS: 20,400

Source: City of Sunnyvale, 2014b and 2014c.

Technical Analysis of Tertiary Physical Benefits Claimed

Technical basis of the Project: Recycled water production in lieu of effluent discharge will reduce pollutant loadings to the San Francisco Bay. The following pollutants loadings will be reduced: TN; CBOD (a measure of the oxygen demand exerted by the oxidizable organic carbon in the sample); and TSS.

The Project will achieve the following reduction in pollutants loads to the Bay from 2016-2066:

- TN reduction: 48,000 kg/yr
- CBOD reduction: 10,900 kg/yr
- TSS reduction: 20,400 kg/yr

Values were calculated based on recycled water produced (1,680 AFY) multiplied by pollutant concentrations (TN: City of Sunnyvale 2014c; CBOD, and TSS: City of Sunnyvale, 2014b).

Recent and historical conditions: In 2014, San Francisco Bay dischargers including Sunnyvale received a Nutrients Watershed Permit (San Francisco Bay RWQCB, 2014) which requires evaluation of methods to reduce nutrient discharges to the San Francisco Bay. One of the primary nutrients of concern is Nitrogen. The proposed project supports the Regional Board's goal of reducing nutrient discharge to the Bay.

Estimates of without-project conditions: 0 kg/yr of TN, CBOD, and TSS diverted from Bay discharge.

Methods used to estimate physical benefits: Values were calculated based on recycled water produced (1,680 AFY) multiplied by pollutant concentrations (TN: City of Sunnyvale 2014c; CBOD and TSS: City of Sunnyvale 2014b).

The 1,680 AFY is determined as follows:

- 1,120 AFY for existing users (City of Sunnyvale 2014b: p. ES-2)
- 560 AFY for the Wolfe Road Pipeline service area (HydoScience 2013: Table 11-1)

New facilities polices, and actions required to obtain the physical benefits: Recycled Water Production Improvements (HDR 2013) and 13,000 LF of new Distribution Pipeline down Wolfe Road (HydroScience 2013: p. ES-6, Table ES1-2) are required to achieve the benefits.

Potential adverse effects: See discussion above under the heading "Technical Analysis of Primary Benefits Claimed."

Cost-Effectiveness Analysis

PSP Table 6 evaluates whether the physical benefits provided by the project are provided at the least possible costs.

PSP Table 6. Cost-Effectiveness Analysis	
Project name: SCVWD-Sunnyvale Recycled Water Expansion Project	
Question 1	***Types of benefits provided as shown in Tables 5a, 5b, and 5c:*** The Project's primary benefit is that it will produce 1,680 AFY of drought-proof permanent potable water demand reduction. The project consists of the following: • Recycled Water Production Improvements: - Structural, mechanical, and pipeline improvements to DAF, dual media filters and chlorine contact tanks that will provide a continuous and reliable recycled water source - At a minimum, production of 1,680 AFY (1,120 AFY for existing demand plus 560 AFY for Wolfe Road service area) (Hydroscience, 2013: p. ES-2 and Table 11-1) • New Distribution Pipeline down Wolfe Road: - 13,000 LF of 24-inch pipeline and booster pump station - Delivery of 560 AFY to its service area As a result of the Project, potable water demand would be reduced 1,680 AFY from 2016 to 2066. Cost per AF for the Project was calculated based on the following: • 5.7% discount factor (per direction of the Association of Bay Area Governments [ABAG]) • 50-year lifetime for the Recycled Water Production Improvements • 50-year lifetime for the New Distribution Pipeline down Wolfe Road • Recycled water produced/supplied: 1,680 AFY Total project annualized cost per acre foot is $752/AF. In addition to drought-proof permanent potable water demand reduction, the Project will reduce pollutant loadings to the San Francisco Bay through recycling water in lieu of discharging to the Bay. Pollutant loading reduction from 2016 to 2066 are as follows: • TN reduction: 48,000 kg/year (City of Sunnyvale, 2014c) • CBOD reduction: 10,900 kg/year (City of Sunnyvale, 2014b) • TSS reduction: 20,400 kg/year (City of Sunnyvale, 2014b)
Question 2	***Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?*** Yes.
	If yes, list the methods (including the proposed project) and estimated costs. SCVWD's 2012 Water Supply and Infrastructure Master Plan (WSIMP) evaluated the costs, benefits, and risks of various options for providing a reliable supply of water for Santa Clara County now and in the future, including additional conservation, additional water recycling, indirect potable reuse, additional groundwater recharge, additional imported water agreement, regional desalination, additional conveyance, and additional storage (SCVWD, 2012b: Attachment 2, pp. 11-18, and SCVWD, 2011). The options were combined into three different strategies – Local Supply Development (indirect potable reuse; $600 to $700 million), System Flexibility (reservoir expansion and conveyance; $400 to $600 million) and Minimize Costs (dry year imported water options; $100 million) – and evaluated for how well they met planning objectives (SCVWD, 2012b: Attachment 2, pp. 19-25, and SCVWD, 2011). All of the options included achieving baseline non-potable recycled water use of 30,000 AFY by 2035.

Question 3	***If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.*** Three alternatives were screened for improvements to the production facilities: 1. Modifications to Existing Facilities: Structural and mechanical modifications to the existing tertiary treatment facilities at an estimated cost of $3,280,000 (HDR, 2013)[a] 2. New Cloth Disk Filters dedicated for recycled water production at an estimated cost of $3,590,000 (Brown & Caldwell, 2009)[b] 3. New Granular Media Filters dedicated for recycled water production at an estimated cost of $5,900,000 (Brown & Caldwell, 2009)[b] Modification to existing facilities, the Project, is the least cost alternative. To expand recycled water use, two pipeline alternatives were screened in the City of Sunnyvale's 2013 Feasibility Study for Recycled Water Expansion (Hydroscience, 2013). They include: • Wolfe Road Main (similar to proposed Project): Prior to selecting the preferred pipeline alignment, the City considered construction of 13,000LF of 12" to 24" pipeline. This alternative would cost $7.2 million. • Wolfe Road Pipeline (proposed Project): The Project as proposed includes 13,000 LF of 24" pipeline and provides regional interconnection. The Project also includes pump station upgrades, which will deliver 560 AFY, future potential for IPR demand. The Project's estimated cost is $17.5M. • Main Loop: This alternative includes 24,800 LF of 16"-24" pipeline and would meet a potential demand 345 AFY. However, no regional interconnectivity would be provided. Costs associated with this alternative are $15.9M. The Wolfe Road Pipeline as described in the Project Description, includes the least length of additional pipeline with a higher potential rate of recycled water demand per year. The water supply strategy adopted by the SCVWD Board of Directors builds on the Local Supply Development/Indirect Potable Reuse strategy discussed in Question 2 above. The strategy is to secure existing supplies and infrastructure, optimize the use of existing supplies and infrastructure, and develop additional recycled water and conservation to meet future increases in demands (SCVWD, 2012b: pp. iii and 17, and SCVWD, 2011). Securing existing supplies includes increasing non-potable reuse from about 15,000 AFY in 2010 to 30,000 AFY in 2035 (SCVWD, 2012b: p. 17, and SCVWD, 2011). Developing additional recycled water includes developing 20,000 AFY of indirect potable reuse (SCVWD, 2012b: p. 19, and SCVWD, 2011). Indirect potable reuse is not the least cost alternative, but it best addresses risks such as climate change and imported water reductions. In addition, the strategy best achieves non-cost planning objectives (SCVWD, 2012b: Attachment 2, p. 25, and SCVWD, 2011) and received almost unanimous support from stakeholders (SCVWD, 2012b: p. 35, and SCVWD, 2011). In the SCVWD 2012 Potable Reuse Study and follow-on Technical Memorandums, the Los Gatos Groundwater Recharge System Indirect Potable Reuse (IPR) Project presents the most cost-effective among all alternatives analyzed (See note b, below). In addition to the non-potable re-use benefit of the project, the Wolfe Road Water Pipeline alignment is the first step toward a 10 MGD Indirect Potable Reuse project in the SCVWD's Los Gatos recharge system. Improvements to the production facilities at the Sunnyvale treatment plant combined with the construction of the Wolfe Road pipeline aligns the City of Sunnyvale's 2013 Feasibility Study for Recycled Water Expansion with the SCVWD 2012 Potable Reuse Study. The Local Supply Development/Indirect Potable Reuse strategy has the following accomplishments that are different from the alternative strategies (SCVWD, 2012b: p. 22, and SCVWD, 2011): • Provides a local supply of drought-proof water (the other strategies are dependent on hydrologic condition), • Maintains local reservoir supplies that are used to meet flow and temperature requirements for fish (by using advanced treated recycled water for recharge instead of local reservoir supplies), and • Improving groundwater quality (because the advanced treated recycled water quality is of higher quality than the local and imported supplies currently used for groundwater recharge).

	The Wolfe Road pipeline alignment supports both the local and regional planning efforts to increase use of recycled water and provide future potential opportunities for indirect potable reuse within the Santa Clara County.

Source: *Brown & Caldwell, 2009; City of Sunnyvale, 2014c; HDR, 2013; HydroScience, 2013; SCVWD, 2012b, and SCVWD, 2011.*

Notes:

a. *The 2013 HDR memorandum reports construction cost including 30% contingency. Sunnyvale added a 40% markup to account for engineering and construction support to report a project cost.*

b. *Alternatives 2 and 3 construction cost data shown in the 2009 Brown & Caldwell memorandum were converted to project costs as follows: construction cost data were adjusted using ENR data from October 2009 to July 2013. These alternatives costs were also adjusted to include contingency (30%), yard piping ($100,000), and other project costs (40%) multiplier.*

References Cited:

Brown & Caldwell, 2009. Technical Memorandum - Recycled Water Treatment Alternatives, City of Sunnyvale WPCP Strategic Infrastructure Plan, October 10.

City of Sunnyvale, 2013a. 2012 Recycled Water Annual Report, March 15.

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HDR, 2013. Technical Memorandum - Simultaneous Production of Recycled Water, City of Sunnyvale Water Pollution Control Plant, Sodium Hypochlorite Disinfection Project, July 19.

HydroScience, 2013. City of Sunnyvale Feasibility Study for Recycled Water Expansion Report, June.

San Francisco Bay Regional Water Quality Control Board (RWQCB), 2014. Order No. R2-2014-0014, Nutrients from Municipal Wastewater Discharges to San Francisco Bay, NPDES Permit No. CA003887.

Santa Clara Valley Water District (SCVWD), 2010. Urban Water Management Plan.

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_____, 2014a. Neighborhood Update – May 2014, Reservoir and local stream conditions.

_____, 2014b. May 2014 Water Tracker.

_____, 2014c. Supplemental Board Agenda Memorandum, Update on 2014 Water Supply and Drought Response, meeting date March 25, 2014.

SCVWD and City of Sunnyvale. 2014a. Primary Benefit Calculations: Cost per Acre Foot.

_____, 2014b. Tertiary Benefit Calculations: Effluent CBOD and TSS.

_____, 2014c. Tertiary Benefit Calculations: Total Nitrogen.

Project 6 – DERWA Phase 3 Recycled Water Expansion Project

Project Description

Project Goals: The DSRSD-EBMUD Recycled Water Authority's (DERWA's) Phase 3 Recycled Water Expansion Project (Project) will construct permanent distribution system infrastructure, providing immediate drought relief by permanently meeting some current potable water demand with recycled water for non-potable uses. The Project will offset the use of limited potable water supplies and preserve it for drinking water for residents in Alameda and Contra Costa counties. This Project contributes to DERWA's long-term recycling goal, which will reduce the need for severe rationing during prolonged droughts. With Project implementation, anticipated recycled water deliveries are 390 acre-feet per year (AFY) from DERWA to DSRSD and 477 AFY from DERWA to EBMUD.

Project Description: The Project consists of three pipeline components, described below. Together, these components will add nearly 9 miles of recycled water distribution pipelines that will deliver up to 867 AFY.

Central Dublin Pipeline: This pipeline will add 1.5 miles of 4-inch (in.) to 10-in.-diameter recycled water pipe to deliver an annual average of 230 AFY of recycled water to six existing federal and county facilities in Dublin for landscape irrigation purposes. This pipeline will primarily run along 8th Street and Broder Boulevard and will connect to DSRSD's existing recycled water system at three locations: Dougherty Road/8th Street, Broder Boulevard/Arnold Road, and Madigan Road/Gleason Road.

West Dublin Pipeline: This pipeline consists of 3.6 miles of 4-in. to 8-in.-diameter recycled water pipe. It will serve an annual average of 160 AFY to 34 existing water customers located west of Interstate (I-) 680 along Amador Valley Boulevard in western Dublin. The recycled water will be used for landscape irrigation of City-owned streetscapes and parks, business parks, a fire station, and two schools. The pipeline will connect to DSRSD's existing recycled water pipeline and pass under I-680 along Amador Valley Boulevard, extending under the highway overpass to San Ramon Road.

San Ramon Valley Phase 2: This pipeline consists of 3.6 miles of recycled water distribution pipe ranging in diameter from 6 in. to 16 in. It will provide an average of 477 AFY to 39 customer sites, including the Bishop Ranch Business Park, the City of San Ramon, the Town of Danville, and a golf course. Recycled water will be used for landscape irrigation and a decorative pond feature. The alignment will run along Camino Ramon, Crow Canyon Road, Alcosta Boulevard, Sunset Drive, Bishop Drive, Executive Parkway, Norris Canyon Road, and other small side streets. The pipeline will connect to EBMUD's existing recycled water system at two locations: Bollinger Canyon Road/Sunset Drive and Alcosta Boulevard near Iron Horse Middle School.

Implementation Status: The Central Dublin Pipeline will be constructed between January and April 2015. The West Dublin Pipeline will be constructed between May 2015 and January 2016. The San Ramon Valley Phase 2 Pipeline will be constructed between July 2015 and June 2016.

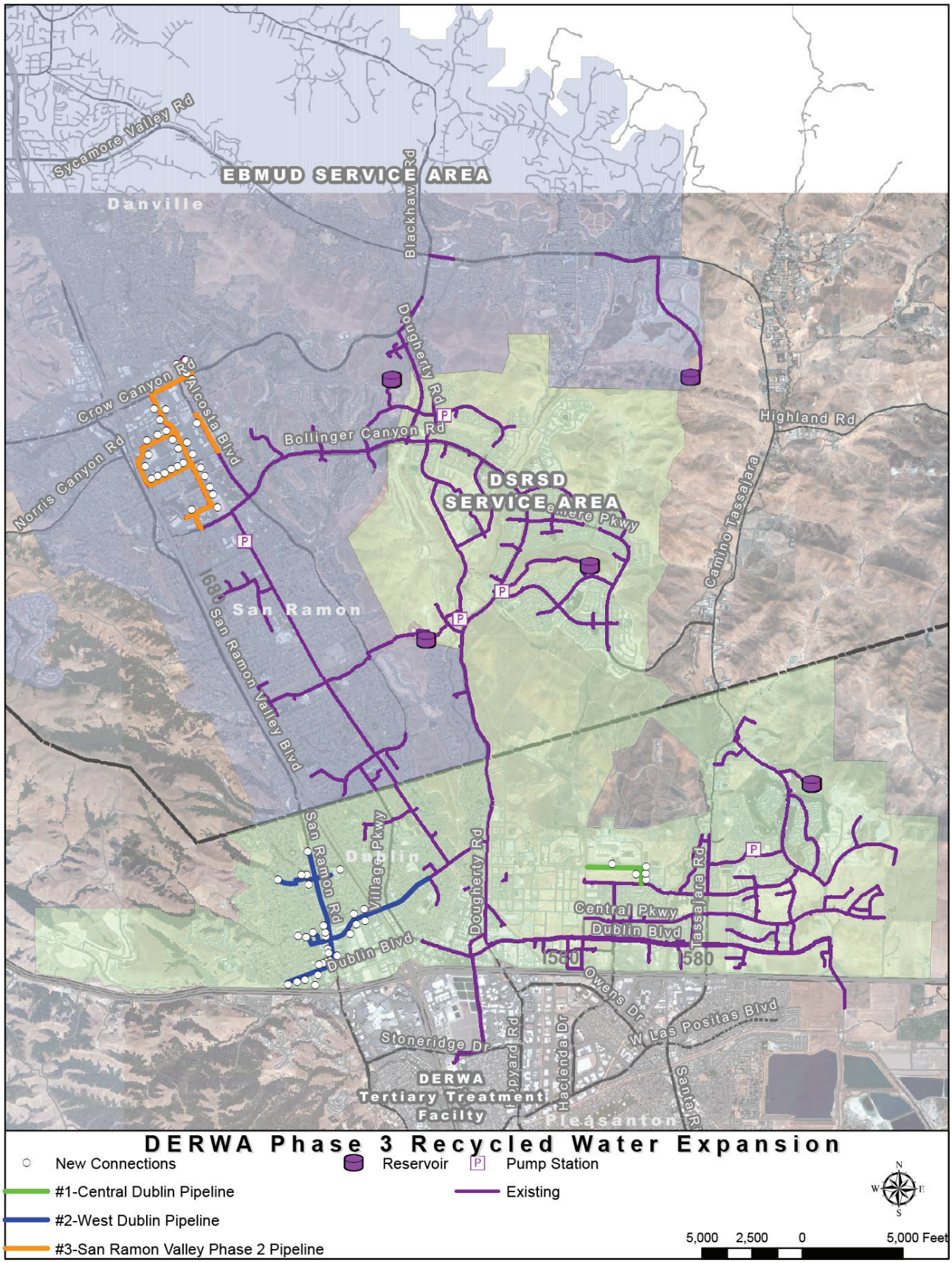
Funding Needs: DERWA projects are funded by DSRSD and EBMUD. Expedited funds are needed to facilitate Project construction beginning this year and to achieve potable water demand savings within the next 10 months. Without expedited funding, construction of the West Dublin and San Ramon Phase 2 pipelines may not begin for another 2-3 years. Construction of the Central Dublin Pipeline will begin this year to ensure potable demand savings by early next year. State funding will free up some of the financial resources of each agency so that those resources can be applied to implementation of other conservation and recycled water projects.

Drought Eligibility: *Immediate regional drought preparedness* – The Project will provide 230 AFY to DSRSD's water service area by 2015 and 867 AFY (390 AFY to DSRSD water service area, 477 AFY to EBMUD water service area) by 2016.

Increase local water supply reliability and safe drinking water – This Project provides a new reliable water supply that will offset existing potable water demands in Alameda and Contra Costa counties. The recycled water supply provided by this Project will conserve high-quality drinking water supplies and increase overall potable water supplies for water customers within the DSRSD and EBMUD service areas.

Reduce water quality/ecosystem conflicts – The Project will result in reduced discharge of point-source pollutants (e.g., nutrients and suspended solids) from treated wastewater effluent, which will contribute to overall improvement of the San Francisco Bay ecosystem.

Project Map


EBMUD SERVICE AREA
Danville
Sycamore Valley Rd
Blackhawk Rd
Dougherty Rd
Crow Canyon Rd
Alcosta Blvd
Norris Canyon Rd
Bollinger Canyon Rd
DSRSD
SERVICE AREA
Highland Rd
Camino Tassajara
San Ramon
San Ramon Valley Blvd
San Ramon Rd
Village Pkwy
Dublin
Dublin Blvd
Central Pkwy
Tassajara Rd
Owens Dr
W Las Positas Blvd
Stoneridge Dr
Hacienda Dr
DERWA
Tertiary Treatment
Facility
Pleasanton
DERWA Phase 3 Recycled Water Expansion
New Connections
Reservoir
Pump Station
#1-Central Dublin Pipeline
Existing
#2-West Dublin Pipeline
#3-San Ramon Valley Phase 2 Pipeline
5,000 2,500 0 5,000 Feet

Project Physical Benefits

Primary, secondary, tertiary, and quaternary Project physical benefits are summarized in PSP **Tables 5a through 5d,** below.

PSP Table 5a. Primary Annual Project Physical Benefits			
Project Name: DERWA Phase 3 Recycled Water Expansion Project **Primary Benefit Claimed:** Water Supply – Recycled Water **Units of the Benefit Claimed:** Acre-feet (AF) **Additional Information About this Benefit:** This new recycled water supply will result in a permanent potable water demand reduction and reduce demands on the Delta.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2014	0	0	0
2015	0	230	230 AF of recycled water
2016 - 2064	0	867	867 AF of recycled water
Last Year of Project Life (2065)	0	867	867 AF of recycled water
Comments: *None.*			

Technical Analysis of Primary Physical Benefits Claimed

Technical basis of the Project: The DERWA 1996 Facilities Plan for the San Ramon Valley Recycled Water Program (SRVRWP) (DERWA, 1996a) identifies the Project area and facilities for implementation of the multi-phased SRVRWP. The Facilities Plan identifies potential customers within the San Ramon Valley (including the cities of San Ramon, Pleasanton, and Dublin, the Town of Danville, and portions of Alameda and Contra Costa counties), treatment facilities, and distribution facilities consisting of transmission pipelines, distribution pipelines, storage reservoirs, and pump stations. The Facilities Plan incorporates the recycled water planning work completed separately by DSRSD and EBMUD for their respective service areas.

DSRSD's 1995 master planning work was incorporated into the 1996 DERWA Facilities Plan. The DSRSD SRVRWP Master Plan (DERWA, 1996a) included the proposed Central and West Dublin Project components that were refined in subsequent master planning updates and most recently in the *Dublin Recycled Water Expansion Recycled Water Treatment and Distribution System Analysis* (Carollo Engineers, 2013). The Distribution System Analysis identifies three alternative alignments for the West Dublin Pipeline. Since completion of the analysis, District staff has selected to move forward with Alternative #2 as described above under "Project Description"; this is the lowest cost alternative.

Customers of the proposed Central and West Dublin pipelines were identified in DSRSD's "Dublin Recycled Water Expansion Market Survey" (WBA, 2013). Since completion of these two studies, DSRSD staff has eliminated one of the Central Dublin customers (Camp Parks) from the Market Survey list because the customer's planned land uses may change, and staff has updated the anticipated recycled water use at the Alameda County Sheriff's office.

EBMUD's Project customers and preliminary pipe alignment were identified in the EBMUD New Customer Base Hydraulic Modeling Memo (CDM, 2003). EBMUD has recently updated the estimated recycled water use for the San Ramon Valley Phase 2 Project (Project component #3) based on potable water use metered over a three-year period from 2010 to 2012.

Recent and historical conditions: DSRSD's water supply deliveries from Zone 7 are not sufficient to meet demand during this drought period (DSRSD and Zone 7, 1994). DSRSD declared a Community Drought Emergency and Stage 3 Water Supply; customers have been mandated to reduce water use by 25% (5% indoors, 50-60% outdoors) below 2013 use. DSRSD has passed Ordinance No. 301 to restrict water use applications and to impose penalties and enforcement.

EBMUD's current available water supply is less than what is required to meet demands during this drought period. EBMUD has requested a 10% voluntary water use reduction of its customers and is using supplemental supplies from the Sacramento River diverted through the Freeport Project to meet demand. Additionally, EBMUD (and all water rights holders within the Sacramento–San Joaquin River watershed) was recently issued a curtailment order to stop diverting water from the Sacramento and San Joaquin river watershed. This has resulted in a loss of 4,000 AF of water supply within the EBMUD service area in addition to the existing below-normal supply. (DSRSD, 2014a-d; EBMUD, 2014a; SWRCB, 2014)

Estimates of without-project conditions: Without the Project, DERWA will not be able to offset 867 AFY of potable water use. The No Project Alternative is described in the SRVRWP EIR (DERWA, 1996b).

Methods used to estimate physical benefits: The DERWA Facilities Plan (DERWA, 1996a) includes an initial market survey of potential recycled water customers to be served by the DERWA system. Customers are initially identified based on high water use for non-potable demands and proximity to potential pipeline alignments. The initial market assessments are refined at the time of Project implementation. DSRSD and EBMUD have each conducted their own updated recycled water market surveys and estimated the amount of recycled water to be used by Project customers (WBA, 2013 and EBMUD, 2014b). Recycled water demand estimates are based on water use over the last three years and current landscaping at a site.

New facilities, policies, and actions required to obtain the physical benefits: Both DSRSD and EBMUD have recycled water use ordinances (DSRSD, 2004 and EBMUD, 2013) to facilitate customer connection to the recycled water system. Upon completion of the Project pipelines, retrofit of customer sites will begin. Recycled water deliveries will commence upon completion of site retrofits. Recycled water use will be metered.

Potential adverse effects: There are no potential adverse effects that have been identified for this Project. Mitigation measures will be in place during construction. This Project is included in the SRVRWP EIR; a Notice of Determination was filed in December 1996 (DERWA, 1996c).

PSP Table 5b. Secondary Annual Project Physical Benefits			
Project Name: DERWA Phase 3 Recycled Water Expansion Project **Secondary Benefit Claimed:** Potable Supply Offset/Reduced Demands on the Delta **Units of the Benefit Claimed:** Acre-feet (AF) **Additional Information About this Benefit:** The Project will permanently reduce potable water demand on the Delta.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2014	0	0	0
2015	0	230	230 AF of reduced demand on the Delta
2016 - 2064	0	867	867 AF of reduced demand on the Delta
Last Year of Project Life (2065)	0	867	867 AF of reduced demand on the Delta
Comments: *Both DSRSD and EBMUD water supplies impact the Delta. DSRSD's water supply comes from the State Water Project, which is closely interconnected with the Delta. EBMUD's water comes from the Mokelumne River, a tributary to the Delta. Recycled water supply provided by this Project will offset potable water demands on the limited Delta water supply.*			

Technical Analysis of Secondary Physical Benefits Claimed

Technical basis of the Project: See discussion above under the heading "Technical Analysis of Primary Physical Benefits Claimed."

Recent and historical conditions: DSRSD's Urban Water Management Plan (UWMP) (DSRSD, 2012) discusses its typical and historical water supply and demand. DSRSD's water supply is not sufficient to meet demand. DSRSD declared a Community Drought Emergency and Stage 3 Water Supply; customers have been mandated to reduce water use by 25% (5% indoors, 50-60% outdoors) below 2013 use. DSRSD has passed ordinances to restrict water use applications and to impose penalties and enforcement. (DSRSD, 2014a-d; EBMUD, 2014a; SWRCB, 2014)

EBMUD's UWMP (EBMUD, 2010) discusses its typical and historical water supply and demand. EBMUD's current available water supply is less than what is required to meet demands. EBMUD has requested a 10% voluntary water use reduction of its customers and is using supplemental supplies from the Sacramento River diverted through the Freeport Project to meet demand. Additionally, EBMUD (and all water rights holders within the Sacramento–San Joaquin River watershed) was recently issued a curtailment order to stop diverting water from the Sacramento–San Joaquin River watershed. This has resulted in a loss of 4,000 AF of water supply within the EBMUD service area in addition to the existing below-normal supply. EBMUD's UWMP discusses its typical and historical water supply and demand (EBMUD, 2010).

Estimates of without-project conditions: See estimates of without-project conditions above under the heading "Technical Analysis of Primary Project Benefit."

Methods used to estimate physical benefits: See methods discussion above under the heading "Technical Analysis of Primary Project Benefit."

New facilities, policies, and actions required to obtain the physical benefits: See new facilities discussion above under the heading "Technical Analysis of Primary Project Benefit."

Potential adverse effects: See discussion above under the heading "Technical Analysis of Primary Project Benefit."

PSP Table 5c. Tertiary Annual Project Physical Benefits			
Project Name: DERWA Phase 3 Recycled Water Expansion Project **Tertiary Benefit Claimed:** Ecosystem improvement – pollution reduction **Units of the Benefit Claimed:** Kilograms per year (kg/yr) **Additional Information About this Benefit:** The Project will reduce pollutant discharge to San Francisco Bay.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2014	0	0	0
2015	0	Pollution reduction: Nitrogen: 10,200 C-BOD: 1,100 TSS: 1,900	Pollution reduction: Nitrogen: 10,200 C-BOD: 1,100 TSS: 1,900
2016 - 2064	0	Pollution reduction: Nitrogen: 38,500 C-BOD: 4,100 TSS: 7,100	Pollution reduction: Nitrogen: 38,500 C-BOD: 4,100 TSS: 7,100
Last Year of Project Life (2065)	0	Pollution reduction: Nitrogen: 38,500 C-BOD: 4,100 TSS: 7,100	Pollution reduction: Nitrogen: 38,500 C-BOD: 4,100 TSS: 7,100
Comments: *Pollution reduction estimated is based on the average monthly concentrations of pollutant constituents from DSRSD's 2013 wastewater effluent data (DSRSD, 2013).*			

Technical Analysis of Tertiary Physical Benefits Claimed

Technical basis of the Project: Recycled water is produced from treated wastewater effluent that would otherwise be discharged to the San Francisco Bay. Any reduction in discharge to the Bay results in reduced pollutant loadings to the Bay. The following pollutant loading reductions have been identified for this Project: total nitrogen (TN), carbonaceous biochemical oxygen demand (CBOD); and total suspended solids (TSS).

Pollutant load reductions identified in PSP Table 5c, above, were calculated based on average pollutant concentrations multiplied by recycled water production of 230 AF in 2015 and 867 AFY from 2016 through 2065. Average pollutant concentrations are the monthly average concentrations measured at the DSRSD Wastewater Treatment Plant (WWTP) in 2013.

Recent and historical conditions: In 2014, San Francisco Bay dischargers, including DSRSD, received a Nutrients Watershed Permit (San Francisco Bay Regional Water Quality Control Board [RWQCB], 2014), which requires evaluation of methods to reduce nutrient discharges to the San Francisco Bay. One of the primary nutrients of concern is nitrogen. The Project supports the RWQCB's goal of reducing nutrient discharge to the Bay.

Estimates of without-project conditions: 0 kg/yr of TN, CBOD, and TSS diverted from Bay discharge.

Methods used to estimate physical benefits: Pollutant load reductions identified in PSP Table 5c were calculated based on average pollutant concentrations multiplied by recycled water production of 230 AF in 2015 and 867 AFY from 2016 through 2065. Average pollutant concentrations are the monthly average concentrations measured at the DSRSD WWTP in 2013.

New facilities, policies, and actions required to obtain the physical benefits: The Project pipelines must be constructed to achieve the benefits and customers must be connected. Recycled water use policies are in place to facilitate customer connection and use of recycled water.

Potential adverse effects: There are no potential adverse effects that have been identified for this Project. Mitigation measures will be in place during construction. This Project is included in the SRVRWP EIR; a Notice of Determination was filed in December 1996 (DERWA, 1996c).

PSP Table 5d. Quaternary Annual Project Physical Benefits			
Project Name: DERWA Phase 3 Recycled Water Expansion Project **Quaternary Benefit Claimed:** Reduced Energy Consumption **Units of the Benefit Claimed:** Kilowatt-hours (kWh) **Additional Information About this Benefit:** The Project will reduce DSRSD's energy consumption.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2014	0	0	0
2015	0	279,220	279,220 kWh reduced energy consumption
2016 - 2064	0	444,360	444,360 kWh reduced energy consumption
Last Year of Project Life (2065)	0	444,360	444,360 kWh reduced energy consumption
Comments: *Recycled water will be produced at the DSRSD WWTP using treated wastewater that would otherwise be discharged to San Francisco Bay. Approximately 690 kWh per AF of water is consumed to pump treated wastewater for discharge out of the Tri-Valley (DSRSD, 2014e). Additionally, DSRSD's potable water supply from Zone 7 consumes on average 1,165 kWh per AF of energy for pumping water into the Tri-Valley Region (DERWA, 2014) and 110 kWh of energy used to treat DSRSD's potable water (DERWA, 2014). The total energy used to provide potable water to the DSRSD service area (pumping and treatment) is 1,965 kWh. The energy required to produce recycled water is 751 kWh (DERWA, 2013). This Project will result in overall reduced energy consumption of 1,214 kWh in the DSRSD service area. Since this Project will reduce EBMUD's potable water demand, EBMUD's water treatment energy use will decrease and the EBMUD service area will also realize reduced energy use with implementation of this Project.*			

Technical Analysis of Quaternary Physical Benefits Claimed

Technical basis of the Project and recent and historical conditions: Recycled water will be produced at the DSRSD WWTP using treated wastewater that would otherwise be discharged to San Francisco Bay. Recycled water is produced on average of 751 kWh per AF (DERWA, 2014). If not recycled, 690 kWh per AF of water is consumed to pump treated wastewater for discharge out of the Tri-Valley. Additionally, DSRSD's potable water supply from Zone 7 consumes on average 1,165 kWh per AF of energy for pumping water into the Tri-Valley Region and an additional 110 kWh per AF of energy is used to treat potable water. This Project will result in avoided energy consumption of 1,214 kWh per AF.

Estimates of without-project conditions: Continued net energy consumption would be 444,360 kWh for pumping water into the Tri-Valley, treatment of DSRSD potable water, and pumping treated wastewater out of the Tri-Valley.

Methods used to estimate physical benefits: The energy consumption for pumping water into the Tri-Valley is based on Zone 7's annual operating cost to pump water from its two pumping plants. Reduction of energy consumption for pumping water into the Tri-Valley and potable water treatment cost applies only to DSRSD's supply; EBMUD's water supply comes from the Mokelumne River and is delivered by gravity flow. The value used to calculate the energy consumption of DSRSD's imported water supply is 1,165 kWh per AF (DERWA 2014). This rate was multiplied by the AF of recycled water to be provided by DSRSD.

DSRSD contracts with the Livermore-Amador Valley Water Management Agency (LAVWMA) for discharge to the LAVWMA pipeline that pumps water out of the Tri-Valley and to the San Francisco Bay. The energy consumption rate for pumping water out of the Tri-Valley is based on LAVWMA's fiscal year (FY) 2013-14 data collected from LAVWMA expenditure reports. The average energy consumption rate used to calculate energy required to pump water out of the

Tri-Valley is 690 kWh per AF. This rate was multiplied by the total recycled water supply (from both DSRSD and EBMUD) to be provided by this Project.

DSRSD purchases treated potable water from Zone 7. Zone 7's average energy consumption rate used to calculate energy required to treat DSRSD's potable water is 110 kWh. This rate was multiplied by DSRSD's anticipated recycled water supply to be provided by this Project.

DSRSD's energy use to produce recycled water is on average 751 kWh. This rate is a 12-month average ending May 2014. This rate was multiplied by the total recycled water volume to be supplied by this Project.

Net energy savings to be realized in the DSRSD service area is the total energy used for pumping potable water into the Tri-Valley, pumping treated wastewater out of the Tri-Valley, plus the energy required to treat DSRSD's potable water, less the energy use required to produce recycled water.

New facilities, policies, and actions required to obtain the physical benefits: The Project pipelines must be constructed to achieve the benefits and customers must be connected. Recycled water use policies are in place to facilitate customer connection and use of recycled water.

Potential adverse effects: There are no potential adverse effects that have been identified for this Project. Mitigation measures will be in place during construction. This Project is included in the SRVRWP EIR; a Notice of Determination was filed in December 1996 (DERWA, 1996c).

Cost-Effectiveness Analysis

PSP Table 6 evaluates whether the physical benefits provided by the Project are provided at the least possible costs.

PSP Table 6. Cost-Effectiveness Analysis	
Project name: DERWA Phase 3 Recycled Water Expansion Project	
Question 1	***Types of benefits provided as shown in Tables 5a through 5d:*** This Project provides a reliable drought-resistant, non-potable water supply and reduces demand on Delta water supplies. The Project includes installation of 9 miles of recycled water pipelines with a useful life of at least 50 years. This Project provides many long-term benefits to the region: • Saves limited potable supply for drinking and other domestic uses, permanently reducing potable demands by 867 AFY • Protects San Francisco Bay by reducing pollutant mass loading to the Bay • Provides a sustainable resource • Avoids energy pumping costs; Recycled water is produced using DSRSD's treated wastewater that would otherwise be pumped through a regional pipeline for discharge to the Bay • Leaves more water in-stream, enhancing fish and wildlife resources in the Delta and more available water supply for users downstream of the Delta • Provides a reliable, drought-proof non-potable water supply for landscaping • Supports sustainable development in the region • Supports a healthy environment that contributes to a high quality of life

Question 2	***Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?*** Yes. DSRSD alternatives for the Central and West Dublin pipeline alignments were evaluated in the Recycled Water Treatment and Distribution System Analysis (Carollo Engineers, 2013). There were no other alternatives considered for the Central Dublin pipeline. It is the only feasible alignment that can be constructed within existing rights-of-way to serve the prospective customers. Three alternative alignments were presented for the West Dublin pipeline. All three alternatives would serve the same customer base, but would follow a slightly different route that would either avoid construction in high traffic areas, jack and bore construction, or construction along a roadway that would have higher construction cost due to thick concrete along the route. The costs for each alternative were: Alternative A, $7,020,000; Alternative B, $6,420,000; and Alternative C, $7,120,000. DSRSD is moving forward with construction of Alternative B, the least cost alignment alternative. EBMUD considered alternative alignments for its proposed pipeline in the technical memo "Modeling Results for DERWA Task 7A - New EBMUD Customer Base Hydraulic Modeling" (CDM, 2003). The final alignment was determined based on hydraulics, customer concerns, and maintenance concerns. Because much of the alignment is located within a large business park, traffic concerns were considered, as well as ease of access for maintenance.
Question 3	***If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.*** This Project is the only viable water supply alternative for both DSRSD and EBMUD that will provide additional, reliable, long-term water supply. The Project is the only water supply alternative available to DSRSD. The District's water supply agreement with Zone 7 prohibits the purchase of water supply outside of Zone 7. DSRSD's only other supply alternative to this Project is to do nothing. The "do nothing" alternative would result in DSRSD not having sufficient supply to meet demands in future droughts, and increases the risk of the District being in a Stage 3 or Stage 4 water shortage emergency during future droughts. EBMUD has evaluated other water supply alternatives that could be more cost-effective, including the Freeport diversion at the Sacramento River or through increased conservation. However, these alternatives are in fact being implemented to their maximum feasible extent. Recycled water supplied through the Project is a permanent, reliable, year-round, locally controlled supply in response to this drought and future droughts. This project prepares EBMUD and DSRSD to respond to climate change and extreme conditions. It is the preferred alternative because it is the only alternative that provides a reliable, drought-proof, long-term water supply and a permanent reduction on demands from the Delta. Because DSRSD does not have any other water supply alternatives and because EBMUD's supplemental drought year CVP supply is unreliable (described above) the Project is the preferred alternative and will provide a permanent, reliable, year-round, locally controlled water supply.
Comments: *None.*	

References Cited:

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_____, 2014a. Resolution No. 26-14. Community Drought Emergency and Mandatory Rationing, adopted May 5, 2014.

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_____, 2014d. Enforcement and Penalties (Ordinance No. 334)

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East Bay Municipal Utility District (EBMUD), 2010. Urban Water Management Plan.

_____, 2013. Non-Potable Water Policy 9.05, effective March 26.

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San Francisco Bay RWQCB, 2014. Order No. R2-2014-0014, Nutrients from Municipal Wastewater Discharges to San Francisco Bay, NPDES Permit No. CA003887.

State Water Resources Control Board (SWRCB), 2014. Notice of Unavailability of Water and Immediate Curtailment for Those Diverting Water in the Sacramento and San Joaquin River Watersheds with a Post-1914 Appropriative Right.

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Project 7 – Calistoga Recycled Water Storage Facility

Project Description

Project Goals: The Calistoga Recycled Water Storage Facility Project (Project) will enhance recycled water production and storage to provide increased water supply for urban and agricultural use. The City of Calistoga has a critical need for funding to advance water recycling within its community and region. Recycled water provides a sustainable local water supply source that reduces reliance on imported and local water supplies (Delta, surface water, and groundwater) and improves water quality in the Napa River and ultimately the San Francisco Bay. The goal of the Project is to provide an additional 25 acre-feet per year (AFY) of recycled water to Calistoga by extending the City's ability to generate recycled water year-round and provide new customers with recycled water to offset their potable water and groundwater use.

Project Description: The City's existing reclaimed water system produces an average of 180 AFY of recycled water and distributes recycled water to a large portion of the City's service area. However, recycled water storage capacity is lacking and constrains year-round recycled water production and distribution capabilities. The Project would construct a new 20-million gallon (MG) effluent storage pond (approximately 725 feet x 385 feet x 14 feet) on two City-owned parcels totaling about 10 acres, adjacent to the City's existing 10-MG effluent storage pond and distribution infrastructure. The pond will not be lined or covered. Other Project components include construction of a 200-foot-long pipeline, a pre-fabricated rail car bridge that will provide convenient access to the pond, and a maintenance road around the perimeter of the pond. Construction of the Project will require approximately 100,000 cy of excavation and embankment work. Excavated soil will be re-used on-site.

Implementation Status: The City has retained URS Corporation for Project design and environmental compliance. Biological, cultural resources, and hydrologic studies were completed in May 2014. A CEQA Notice of Exemption was filed in June 2014 (City of Calistoga, 2014c). Project permits and/or exemptions to permits are being pursued with resource agencies; agency authorizations are anticipated to be secured by fall 2014. The 90% complete Project design will be completed by mid-June 2014 and final construction documents are anticipated to be complete by August 2014. The Project will go out to competitive bid and is anticipated to be awarded by late fall 2014. Construction will begin in early spring 2015 and be completed approximately 4 months later. Delivery of additional recycled water supply may begin by July 2015.

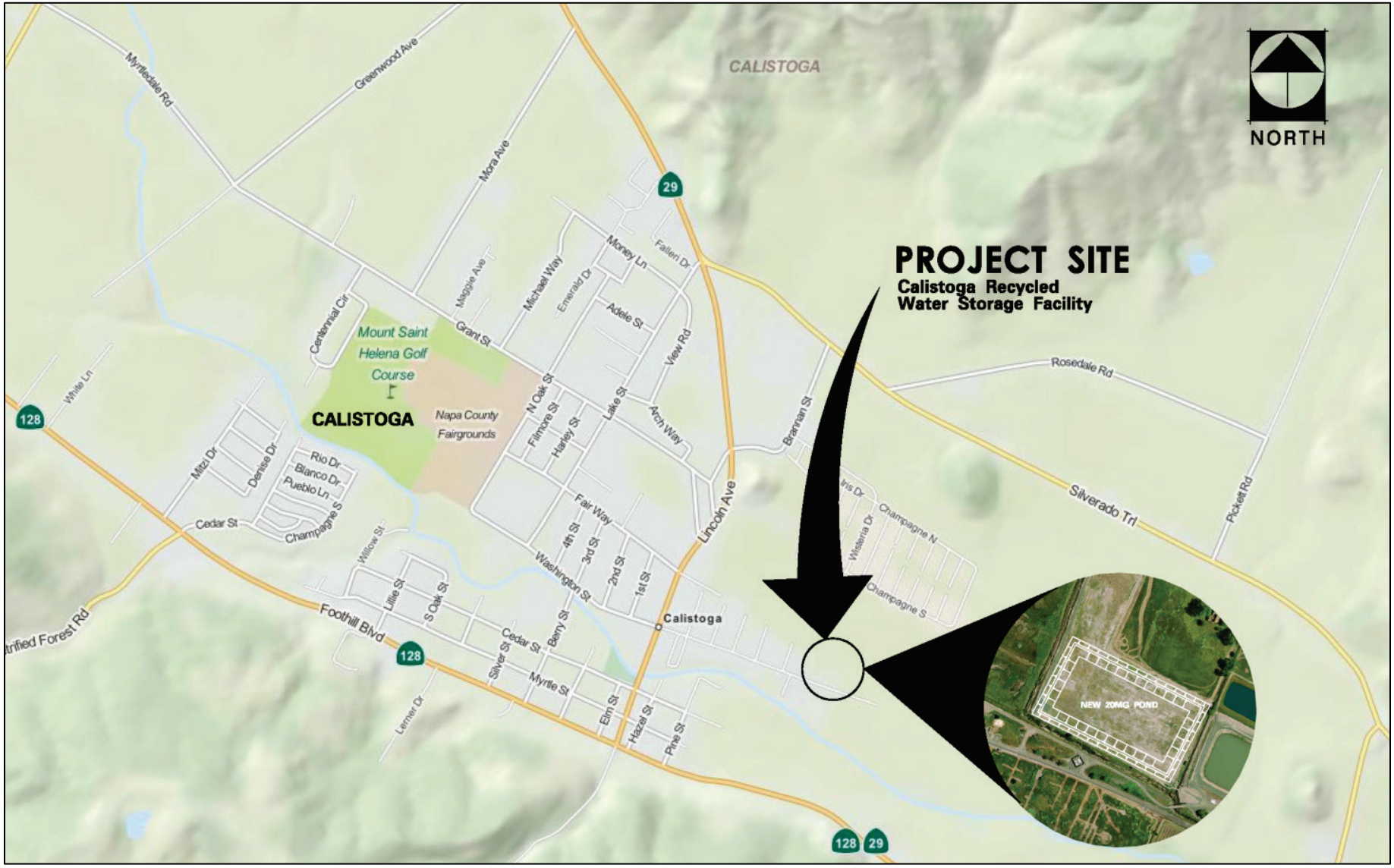
Funding Needs: This Project is critical in the City's efforts to improve water reliability, offset potable water and groundwater use, and improve the water quality of the Napa River. The Project will be ready to start construction within 6 months of grant award (construction to begin in February 2015). Considering these facts, the City is eligible and in need of expedited funding to build the Project. The City has funds in place to provide a 25% match for the Project cost ($1 million). Without expedited funding support, the City will have to secure funding elsewhere, with its rate payers likely being asked to pay for this Project.

Drought Eligibility: *Immediate regional drought preparedness* – Napa County is currently in "Extreme Drought" conditions, as designated by the U.S. Drought Monitor. The Project will provide an additional 25 AFY of recycled water to Calistoga beginning in 2015. A direct result of the additional recycled water production is an estimated 15 AFY of direct potable water demand reduction (8 AFY direct reduction of Delta/State Water Project supply) and an additional 10 AFY reduction in private groundwater use. The Project will immediately assist some new residential customers in complying with the required 20%, Stage II Emergency Water mandate by providing recycled water for landscape irrigation.

Increase local water supply reliability and safe drinking water – Recycled water can be utilized as a continuous, sustainable source to offset potable water and groundwater use for irrigation purposes. Increasing the use of recycled water reduces potable water and groundwater demand, which provides additional safe drinking water for consumption. Reduced discharge of treated water effluent to the Napa River improves overall water quality in the watershed, thereby protecting downstream drinking water supplies.

Reduce water quality/ecosystem conflicts – The Project would reduce treated water effluent discharge to the Napa River/San Francisco Bay by 61 AFY. This will reduce nutrient loading to the Napa River/San Francisco Bay, including Biological Oxygen Demand, Total Suspended Solids, and Total Nitrogen. The new storage facility will allow the City to store water rather than discharge it to the Napa River during low flow/drought conditions when dilution ratios cannot be met, thereby protecting riparian habitat that may be sensitive to effluent constituents at higher concentrations.

Project Map


NORTH
PROJECT SITE
Calistoga Recycled
Water Storage Facility
CALISTOGA
Mount Saint
Helena Golf
Course
Napa County
Fairgrounds
Calistoga
NEW 20MG POND
Myrtledale Rd
Greenwood Ave
Mora Ave
Maggie Ave
Michael Way
Emerald Dr
Money Ln
Fallon Dr
Adele St
View Rd
Grant St
Centennial Cir
White Ln
N Oak St
Filmore St
Harley St
Lake St
Arch Way
Brannan St
Rosedale Rd
Silverado Trl
Pickett Rd
Lincoln Ave
Fair Way
4th St
3rd St
2nd St
1st St
Washington St
Iris Dr
Wisteria Dr
Champagne N
Champagne S
Mitzi Dr
Denise Dr
Rio Dr
Blanco Dr
Pueblo Ln
Cedar St
Willow St
Lillie St
S Oak St
Foothill Blvd
Cedar St
Berry St
Silver St
Myrtle St
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128
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Physical Benefits

Primary and secondary Project physical benefits are summarized in **PSP Tables 5a, 5b, and 5c,** below.

PSP Table 5a. Primary Annual Project Physical Benefits			
Project Name: Calistoga Recycled Water Storage Facility **Primary Benefit Claimed:** Increased Recycled Water Production / Use **Units of the Benefit Claimed:** Acre-feet/year (AFY) **Additional Information About this Benefit:** City of Calistoga will be able to provide recycled water 365 days per year from 240 days per year.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2015	200	225	25 AFY of additional recycled water produced
2016	205	230	25 AFY of additional recycled water produced
2017	210	235	25 AFY of additional recycled water produced
Etc.	225	250	25 AFY of additional recycled water produced
Last Year of Project Life (75 years)	225	250	25 AFY of additional recycled water produced
Comments: *City of Calistoga, 2014a.*			

Technical Analysis of Primary Physical Benefits Claimed

Technical basis of the Project:

Calistoga is in a Stage II Water Emergency – Mandatory 20% Conservation Requirements (City of Calistoga, 2014b).

With the Project, the City will now be able to operate the recycled water system 365 days per year rather than averaging only about 240 days per year. There is also a small amount assumed due to increased demand of recycled water due to the drought continuing (about 2 AFY). These are new customers that have asked the City for new uses (dog park and Grant Street resident).

In June 2013, the City conducted a Bypass Alternatives Investigation Report (BAIR). This investigation was conducted by Larry Walker Associates, which produced a report consisting of eight alternatives (Larry Walker Associates, 2013). It was determined that Alternative #8 (Increase Permanent Storage) was the highest priority, and therefore the preferred alternative for immediate implementation. The City owns two parcels consisting of 10 acres close to existing recycled water infrastructure.

Recent and historical conditions:

Calistoga is in a Stage II Water Emergency due to the existing drought conditions (City of Calistoga, 2014b).

The new pond (proposed location shown in photo, above left) will allow the City to run the recycled water system year-round. Currently, the City does not have enough storage to operate the system year-round and must shut off the recycling system for 4-5 months each year.

Estimates without project conditions: If the Project is not completed, the following are the consequences:

- With the City's mandatory 20% conservation goal, a reduced demand for approximately 2 AFY will remain in effect.
- Year-Round Recycled Water Use – The City will not be able to provide year-round recycled water supply. The recycled water system will be shut off 4-5 months of the year because the City lacks adequate recycled water storage capacity. Approximately 13 AFY of recycled water will be lost and customers will use additional domestic water, half of which comes from the SWP/Delta.

Methods used to estimate physical benefits: The following is a summary of how the estimates of physical benefits of 25 AFY of additional needed recycled water were determined:

1. The City has two recent inquiries from customers that want to utilize recycled water for irrigation purposes. Based on area of turf, volumes of new recycled use have been calculated by the City's Senior Civil Engineer. This amount was determined to be 2 AFY.
2. Year Round Recycled Water Use – An average annual recycled water volume was used to estimate average monthly use. The average annual use is around 180 AFY, which (divided by 12 months) equals an average of 15 AF/month. Assuming that recycled water supply will be higher during the four higher precipitation months in a year (i.e., in late fall, winter, and early spring), the average monthly use (15 AF) was reduced by 78% to about 3.25 AF per month. A total of 13 AFY of increase in recycled water use is anticipated (i.e., 4 months multiplied by 3.25 AF = 13 AFY).

New facilities, policies, and actions required to obtain the physical benefits:

- Design of 20-MG recycled water storage pond is almost complete – City Council has authorized award of design to URS to complete this phase of work.
- Project will be placed out for bids.
- Bidder must be approved by City Council and a contract formally awarded through Council action.
- Construct the recycled water storage pond and related appurtenances.
- Begin filling the recycled water storage pond and distributing recycled water to customers.

Potential adverse effects: None anticipated (A categorical exemption under CEQA has been submitted to the State Clearinghouse).

PSP Table 5b. Secondary Annual Project Physical Benefits			
Project Name: Calistoga Recycled Water Storage Facility **Secondary Benefit Claimed:** Permanent Potable / Groundwater Demand Reduction **Units of the Benefit Claimed:** Acre-feet per year (AFY) **Additional Information About this Benefit:** Groundwater recharge			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2014	Delta/SWP Reduction = 0 Kimball Surface Water Reduction = 0 Reduction of Private Groundwater Use = 0	Delta/SWP Reduction = 8 Kimball Surface Water Reduction = 7 Reduction of Private Groundwater Use = 10	Delta/SWP Reduction = 8 Kimball Surface Water Reduction = 7 Reduction of Private Groundwater Use = 10
Comments: *None.*			

Technical Analysis of Secondary Physical Benefits Claimed

Technical basis of the Project: See discussion above under the heading "Technical Analysis of Primary Physical Benefits Claimed."

Recent and historical conditions:

- Calistoga is in a Stage II Water Emergency due to the existing drought conditions (City of Calistoga, 2014b).
- Delta/SWP Water Reduction: 50% of City water supply comes from the SWP, which pulls water from the Delta at Barkers Slough. Of the 15 AFY of offset to potable water use, 8 AFY of this is assumed to be SWP/Delta water that will not be needed.
- Kimball Surface Water Reduction: The other 50% of City water supply comes from the Kimball surface water. Of this potable water source, 7 AFY will not be needed.
- Reduction of Private Groundwater Use: Calistoga has a local resort that is tripling in size and wants to become a new recycled water customer. The resort currently irrigates with well water and, if it is unable to replace the well water with recycled water, will continue to use this source. The applicant's landscape architect submitted irrigation demands for the new landscaping and the annual use was calculated based on irrigating throughout the year. A total demand of 10 AFY is anticipated to meet the resort's irrigation needs. Note that the reduction of 10 AFY of groundwater use is not contingent upon implementation of subsequent projects; the groundwater reduction benefits would be realized through an existing recycled water use request.

Estimates without project conditions: If the Project is not completed, the following results would take place:

- Delta/SWP Water Reduction: 8 AFY of SWP supply will continue to be needed from the Delta
- Kimball Surface Water Reduction: 7 AFY of surface water supply will continue to be needed from this City water source.
- Reduction of Private Groundwater Use: 10 AFY will be pulled from local groundwater sources.

Methods used to estimate physical benefits: The following is a summary of how the estimates of physical benefits were made:

- Potable Water Reduction: 15 AFY of potable water offset is based on the following:
  - Water offset = New customers due to drought + 365-day operation of recycled water system (15 AFY = 2 AFY + 13 AFY).
  - Because the City's water use is about 50% from Kimball and 50% from the Delta/SWP, Calistoga uses 7.5 AFY from SWP supply and 7.5 AFY from the Kimball supply.
- Reduction of Private Groundwater Use: New resort project wants to use recycled water for irrigation that will offset existing groundwater supply of about 10 AFY.

New facilities, policies and actions required to obtain the physical benefits:

- Design of 20-MG recycled water storage pond is almost complete – City Council has authorized award of design to URS to complete this phase of work.
- Project will be advertised for competitive bids.
- Bidder must be approved by City Council and a contract formally awarded through Council action.
- Construct the recycled water storage pond and related appurtenances.
- Begin filling the recycled water storage pond and distributing recycled water to customers.

Potential adverse effects: See discussion for "Primary Project Benefits Claimed," above.

PSP Table 5c. Tertiary Annual Project Physical Benefits			
Project Name: Calistoga Recycled Water Storage Facility **Tertiary Benefit Claimed:** Water Quality Improvement - Pollution Reduction to San Francisco Bay **Units of the Benefit Claimed:** Kilograms per year (kg/yr), acre-feet per year (AFY) **Additional Information About this Benefit:** The benefits provided are presented in nutrient reductions and total treated effluent discharge volumes in Napa River/San Francisco Bay.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2015	Nutrient reduction: BOD = 0 TSS = 0= Nitrogen = 0 340 AFY of Napa River/Bay discharge	Nutrient reduction: BOD = 379 TSS = 341 Nitrogen = 1,514 279 AFY of Napa River/Bay discharge	Nutrient reduction: BOD = 379 TSS = 341 Total Nitrogen = 1,514 Reduction of 61 AFY of Napa River/Bay discharge
2016-Last Year of Project Life (75 years)	Same as for year 2015.	Same as for year 2015.	Same as for year 2015.
Source: *Raynor, Derek, 2014*			

Technical Analysis of Tertiary Physical Benefits Claimed

Technical basis of the Project: The Project will eliminate discharge of 61 AFY of treated effluent to the Napa River/Bay. Calistoga is estimating that Napa River/Bay discharge will be reduced by 20 MG (the size of the new storage pond), equivalent to 61 AFY. Tertiary project benefits include reductions in volume and nutrients to the Napa River/San Francisco Bay as follows:

BOD = 379 kg/yr

TSS = 341 kg/yr

Total Nitrogen = 1,514 kg/yr

Volume Reduction to Napa River/Bay = 61 AFY

As recycled water replaces the need for diverting and importing surface water, more water remains in streams for fish and wildlife in local areas of the region, as well as the Delta.

Recent and historical conditions:

- Calistoga is in a Stage II Water Emergency due to the existing drought conditions (City of Calistoga, 2014b).
- Nutrient/Volume reduction: With the onset of the current drought (beginning in the fall of 2011), localized conditions resulted in lower-than-normal water flows in the Napa River. This has resulted in the City's storage facilities operating above capacity, requiring the City to request bypass directly to the Napa River/San Francisco Bay from the Regional Water Quality Control Board (RWQCB).
    - As a result of the drought and low flows in the Napa River, the City has requested permission from RWQCB to over-irrigate the irrigation fields with tertiary-treated, disinfected, and de-chlorinated wastewater. Subsequently, this treated wastewater bypasses the permitted discharge point and is discharged to the river at much lower dilution ratios.
    - RWQCB required the City to investigate all feasible bypass alternatives, including increased storage capacity, and submit a report.
    - Uncontrolled discharge to the Napa River could result in loss of or harm to habitat in the river.

Estimates without project conditions: If the Project is not completed, the following results would take place:

- Volume reduction: The volume reduction would be zero (0). 61 AFY of treated effluent would be discharged to the Napa River/San Francisco Bay.
- Nutrient Reductions:
  a. BOD = Zero (0) instead of 379 kg/yr
  b. TSS = Zero (0) instead of 341 kg/yr
  c. Total Nitrogen = Zero (0) instead of 1,514 kg/yr

Methods used to estimate physical benefits: The following is a summary of how the estimates of physical benefits were made:

- Nutrient/Volume reduction: The new pond will provide approximately 20 MG (or 61 AFY) of storage. Calistoga expects that new recycled water users will use the 25 AFY of recycled water. Between the new recycled water users and the ability to store more recycled water, the City expects to reduce the volume of discharge to the Napa River/Bay by at least 61 AFY (25 AFY plus additional storage capacity of about 36 AFY). As the storage pond will be topped off continuously through the summer and fall months, the volume reduction will most likely be greater than 61 AFY. The nutrient loading is based on this conservative volume and the concentration of average wastewater discharged by the WWTP.

New facilities, policies and actions required to obtain the physical benefits:

- Design of 20-MG recycled water storage pond is almost complete – City Council has authorized award of design to URS to complete this phase of work.
- Project will be advertised for competitive bids.
- Bidder must be approved by City Council and a contract formally awarded through Council action.
- Construct the recycled water storage pond and related appurtenances.
- Begin filling the recycled water storage pond and distributing recycled water to customers.

Potential adverse effects: See discussion for "Primary Project Benefits Claimed," above.

Cost-Effectiveness Analysis

PSP Table 6 evaluates whether the physical benefits provided by the Project are provided at the least possible costs.

PSP Table 6. Cost-Effectiveness Analysis	
Project Name: Calistoga Recycled Water Storage Facility	
Question 1	***Types of benefits provided as shown in PSP Tables 5a, 5b, and 5c:*** The Project would provide water supply and water quality benefits. As California is currently facing severe drought, recycled water production is an added benefit to offset the use of potable water and groundwater supplies. In addition, recycled water benefits the environment by reducing nitrogen/ nutrient loading to the Napa River and San Francisco Bay through reduced discharges. The Project has the potential to reduce bypass discharges during low flow conditions, thereby protecting water quality and riparian ecosystems that may be impacted by effluent constituents in higher concentrations due to lack of dilution. The Project will eliminate 61 AFY of treated effluent discharged to the Napa River/ San Francisco Bay. Recycled water replaces the need for diverting and importing surface water, more water remains in streams for fish and wildlife in local areas in the region, as well as the Delta. This water also reduces the amount of private groundwater well use that will be replaced with recycled water. The Calistoga Recycled Water Storage Facility will yield 25 AFY of water. The following water supply benefit yields are anticipated: • Water Supply - Replaces Potable Water Demand = 15 AFY (8 AFY of Delta/SWP Supply)

	• Water Supply - Replaces Private Groundwater Use = 10 AFY • Water Quality - Reduction in Discharge to Napa River/Bay = 61 AFY • Water Quality - Reduction in Nutrients: BOD = 379 kg/yr, TSS = 341 kg/yr, Total Nitrogen = 1,514 kg/yr Benefits will accrue in and around the City of Calistoga and downstream along the Napa River, which is a tributary to San Pablo Bay/San Francisco Bay.
Question 2	***Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?***
	If yes, list the methods (including the proposed project) and estimated costs. A preliminary draft technical memorandum (Larry Walker Associates, 2008) evaluated the costs for various recycled water storage and distribution alternatives for the City. The two most promising alternatives for increasing recycled water availability and reducing discharge to the Napa River/San Francisco Bay are additional recycled water storage and additional treatment process to remove boron from wastewater for use on local vineyards. Boron treatment is estimated to cost $3-4 million dollars to treat Calistoga's average dry-weather flow (0.84 MGD). The 20-MG storage facility is estimated to cost about $1.1 million and will reduce discharge by about 0.06 MGD. Even though the boron treatment yields a greater potential to reduce discharge, the City still needs to generate and store recycled water to meet demands from local vineyards and, more importantly, to build the additional storage pond so this boron-treated water can be stored prior to bulk delivery. The storage pond is the first step enabling the City to substantially increase its recycled water yield and must be constructed prior to implementation of boron treatment. Other alternative methods were initially considered to achieve similar types and amounts of physical benefits. The BAIR (Larry Walker Associates, 2013) initially looked at eight alternatives to reduce Napa River/San Francisco Bay discharge and increase recycled water use. The BAIR states clearly that impediments for agricultural use must be further evaluated prior to being able to deliver recycled water to the local vineyard community (Larry Walker Associates, 2013: p. 6). Alternatives 1 and 7 provide increases in seasonal discharge start/stop dates or discharge higher flows when river volumes are higher, resulting in a net reduction in recycled water availability and proportional increases in nutrient loading to the Napa River. Alternative 2 (Private Storage) has been pursued with three different property owners, who have rejected the City's offers. Alternatives 3 through 6 are underway, and the City has identified funding to move these projects forward. Alternative 8 (Increase Permanent Storage) is the only real project that can be implemented immediately that will provide increased water supply, improve ecosystem habitat, and provide significant reduction in river discharge (and associated reduction in nutrient loadings). The Calistoga Recycled Water Storage Facility, estimated to cost $1.1 million, will be built on City-owned property, significantly reducing the cost of the Project. Using property currently owned by the City avoids additional land purchase cost, estimated to be $3 million (or more if the City were to pursue acquisition of private property for the pond). Other City-owned properties are farther away from existing recycled water infrastructure; if used, such infrastructure would need to be extended, thereby increasing the cost. Other properties cannot have a pond built on them because they are in the 100-year floodplain and a recycled water storage facility would not be permitted by regulatory agencies.
Question 3	***If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.*** As described in response to Question 2 above, the proposed project is the least cost alternative because this parcel is also the closest to the existing recycled water infrastructure. The Calistoga Recycled Water Storage Facility is the least cost alternative when compared to: (a) WWTP plant upgrades for boron removal; (b) construction of a similar pond on other City-owned property combined with construction of the necessary piping infrastructure; or (c) construction of the storage pond on private property acquired as part of the Project. For these reasons, it is the preferred alternative; in addition, it provides the necessary "backbone" infrastructure before boron removal can be implemented efficiently and effectively.
Sources: *Kirn, M., 2013; Larry Walker Associates, 2008, 2013.*	

References cited:

City of Calistoga, 2014a. Calculations and Estimates of Primary and Secondary Benefits completed by Senior Civil Engineer.

_____, 2014b. Stage II Water Emergency declaration – Resolution 2014-052.

_____, 2014c. Notice of Exemption for Calistoga Recycled Water Storage Pond Expansion Project. June 14.

_____, Municipal Code Section 3.32.

Kirn, M., 2013. Letter from City of Calistoga to San Francisco Bay Regional Water Quality Control Board, dated December 10, 2013.

Larry Walker Associates, 2008. Recycled Water Strategic Plan Technical Memorandum No. 3: Recycled Water Disposal/Storage Scenarios to Meet Buildout Conditions, pp. 8-12. May 2008.

_____, 2013. Bypass Alternatives Investigation Report. Prepared for City of Calistoga.

Rayner, Derek, 2014. E-mail communication.

Project Justification – Human Right to Water Projects

Project descriptions, estimated physical benefits of the projects, justification of each project's technical feasibility, and a cost-effectiveness analysis are presented in this section for the projects listed below. These projects span two sub-regions in the San Francisco Bay IRWM Region. The projects included in this section have benefits related to increased reliability of water supplies and delivery of safe drinking water, and water supply savings.

Project ID#	Project Proponent	Project Title
8	San Mateo County RCD	Drought Relief for South Coast San Mateo County
9	Stinson Beach County Water District	Stinson Beach Water Supply & Drought Preparedness Plan

Project 8 – Drought Relief for South Coast San Mateo County

Project Description

Project Goals & Description: The San Mateo County Resource Conservation District (RCD) and its partners (American Rivers, Trout Unlimited, and the Natural Resources Conservation Service [NRCS]) work to reduce water supply conflicts in rural communities of the Central California coast. The goals of the Drought Relief for South Coast San Mateo County Project (Project) are to improve water supply and drought resiliency for domestic and agricultural water users in the two largest coastal watersheds in the county (Pescadero-Butano and San Gregorio watersheds). A suite of site-specific water use, infrastructure, and water management improvements will result in 20.1 AFY (6.55 MGY) of additional water storage capacity and 157 AFY (51 MGY) of reduced water demand. The RCD's water management coordination efforts will be implemented in the Pescadero-Butano and San Gregorio watersheds to address domestic and agricultural water use efficiency, water supply storage, and regional water management during drought and dry years.

Water Use Efficiency Element A.1–Domestic: Repair four significant water main pipe leaks/breakages and inspect primary community drinking water supply lines to identify and address other inefficiencies, resulting in water savings of 14 AFY.

Water Use Efficiency Element A.2–Agricultural: Conduct assessments of water use and management at 13 sites and implement on-farm infrastructure upgrades and water management modifications based on assessment results. These actions are anticipated to result in water savings of approximately 143 AFY.

Water Supply Storage Element B.1–Domestic: Improve and expand domestic water supply infrastructure at San Mateo County's Memorial Park Reservoir and Cuesta La Honda Guild's Granny Flat Reservoir. The Memorial Park Reservoir provides potable water to a regional park and campground that serves approximately 9,000 visitors annually and the Redwood Glen community, which supports 10 residents and 10,000-12,000 visitors annually. The existing 250,000-gallon reservoir will be replaced with a 2-MG concrete reservoir (final reservoir sizing may be adjusted). Potable water supply for the community of La Honda will be improved by dredging (to remove accumulated sediment) and lining the ±12.5-AF Granny Flat Reservoir. This upgrade will increase storage capacity by 2.5 AF, reduce seepage losses by 3 AFY, and address past water quality issues associated with high total organic carbon (TOC) levels. Both projects will enable water to be stored in the wet season and reduce water diversions when stream flow is low.

Water Supply Storage Element B.2–Agricultural: Construct storage facilities and identify storage improvements across four agricultural sites, allowing agricultural water diverters to dramatically reduce or eliminate stream pumping rates during low flow periods, and ensure that domestic and environmental water use needs are met during times of water scarcity. This element will create 11.5 AF of drought preparedness storage for some of the largest water diverters in the area.

Regional Drought Water Management Element C: Develop and implement a regional strategy to coordinate timing and rate of water diversions which, when paired with water use efficiency and storage improvements (Elements A and B), will dramatically reduce water conflicts/competition between domestic, agricultural, and environmental demands and improve resiliency of local water supplies during drought and dry years.

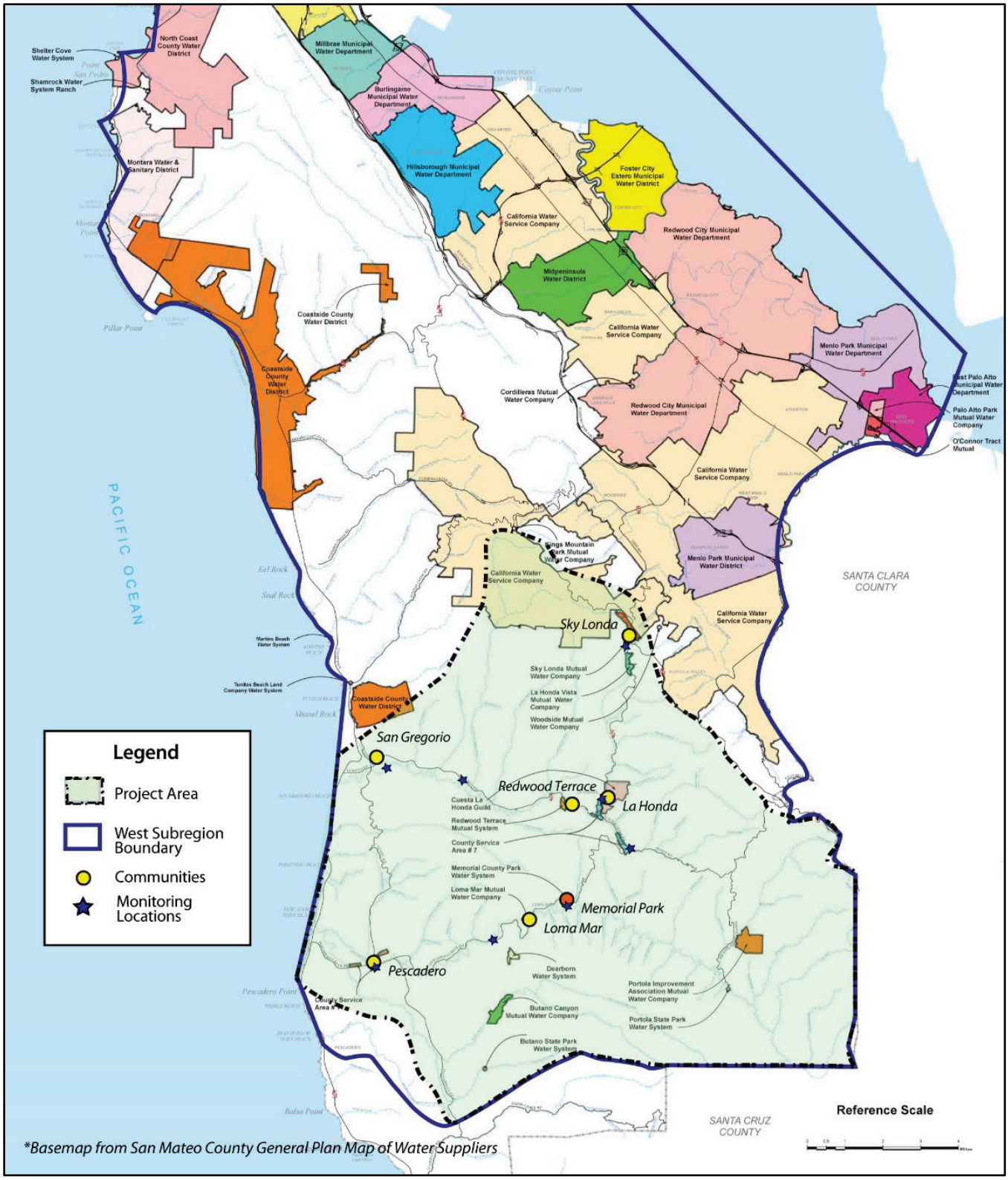
Implementation Status: Element A.1: One pipe replacement has been completed; two others will be completed by end of 2014. Element B.1: Environmental compliance and permit applications are underway for domestic water supply storage projects to be completed by summer 2015; construction is scheduled for fall 2015. Elements A.2 and B.2: Sites are at various stages of assessment and evaluation, design, and construction. Element C will be initiated in fall 2014.

Funding Needs: This Project is critical to the region's ability to improve local water supply reliability and deliver safe drinking water. Community water suppliers do not have the user fee base needed to finance these Projects, and the agricultural community consists of family farms that cannot afford to develop these Projects without emergency drought relief funding. To date planning, design and implementation efforts have been largely funded by grants or San Mateo County.

Drought Eligibility: *Immediate regional drought preparedness* – The Project will result in 20.1 AFY (6.55 MGY) of additional water supply storage and 157 AFY (51 MGY) of water use efficiency improvements; benefits will begin to be realized by fall 2014. Additional water storage at three sites (Element B.1) will increase the water storage totals to about 43 AFY (14 MGY). Repair of known leaks and pipe breaks (Element A.1) will save approximately 6 AFY (2 MGY) of water in 2014; irrigation efficiency projects (Element A.2) will save about 105 AFY by fall 2014.

Increase local water supply reliability and safe drinking water – Repair of leaks and pipe breaks on community water supply systems and water storage upgrades will improve the reliability and safety of local water supplies by ensuring water users in coastal San Mateo County are working together as efficiently as possible.

Project Map


Shelter Cove Water System
Shamrock Water System Ranch
North Coast County Water District
Millbrae Municipal Water Department
Burlingame Municipal Water Department
Hillsborough Municipal Water Department
Foster City Estero Municipal Water District
California Water Service Company
Redwood City Municipal Water Department
Midpeninsula Water District
Montara Water & Sanitary District
Coastside County Water District
Menlo Park Municipal Water Department
East Palo Alto Municipal Water Department
Palo Alto Park Mutual Water Company
O'Connor Tract Mutual
Cordilleras Mutual Water Company
Kings Mountain Park Mutual Water Company
Menlo Park Municipal Water District
PACIFIC OCEAN
SANTA CLARA COUNTY
SANTA CRUZ COUNTY
Sky Londa
Sky Londa Mutual Water Company
La Honda Vista Mutual Water Company
Woodside Mutual Water Company
San Gregorio
Redwood Terrace
La Honda
Cuesta La Honda Guild
Redwood Terrace Mutual System
County Service Area # 7
Memorial County Park Water System
Loma Mar Mutual Water Company
Memorial Park
Loma Mar
Pescadero
Dearborn Water System
Portola Improvement Association Mutual Water Company
Butano Canyon Mutual Water Company
Portola State Park Water System
Butano State Park Water System
Martins Beach Water System
Tunitas Beach Land Company Water System
Legend
Project Area
West Subregion Boundary
Communities
Monitoring Locations
Reference Scale
*Basemap from San Mateo County General Plan Map of Water Suppliers

Project Physical Benefits

Primary and secondary Project physical benefits are summarized in **PSP Tables 5a and 5b**, below.

PSP Table 5a. Primary Annual Project Physical Benefits			
Project Name: Drought Relief for South Coast San Mateo County **Primary Benefit Claimed:** Increased Water Supply Reliability **Units of the Benefit Claimed:** Acre-feet per year (AFY) **Additional Information About this Benefit:** The Project will result in an increase of 21.5 AFY (14 MGY) in additional water storage capacity and 157 AFY (51 MGY) of reduced water need due to efficiency improvements. Increased water supply is roughly equivalent to 3% of domestic water allocations in the area, and water savings are roughly equivalent to 17% of domestic water allocations in the area.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2014	Water savings: 0 Water storage capacity: 46	Water savings: 112 Water storage capacity: 47.1	Water savings: 112 Additional water storage capacity: 1.1
2015	Water savings: 0 Water storage capacity: 46	Water savings: 157 Water storage capacity: 66.1	Water savings: 157 Additional water storage capacity: 20.1
2016	Water savings: 0 Water storage capacity: 46	Water savings: 157 Water storage capacity: 66.1	Water savings:157 Additional water storage capacity: 20.1
2017 – 2047 (30-year period)	Water savings: 0 Water storage capacity: 46	Water savings: 157 Water storage capacity: 66.1	Water savings: 157 Additional water storage capacity: 20.1
Comments: *Existing water storage capacity includes existing storage for the two domestic water supply Project sites at La Honda and Memorial Park (Element B.1). Between 2017 and 2047, up to 4,705 AF would be saved.*			

Technical Analysis of Primary Physical Benefits Claimed

Technical basis of the Project: Water supply reliability will increase as a result of the Project's additional water storage, which will provide supplies during late summer months and prolonged drought periods when surface water is unable to meet water demands. Water supply reliability will also be improved by reducing summer water demands and water use conflicts through water efficiency projects and coordinating water diversion and management activities (Alford, 2010: pp. 67-69).

Recent and historical conditions: In an effort to address the lack of water availability during drought conditions, the San Gregorio Creek Watermaster has instituted water rationing in the area through no-pump days, and community water suppliers have coordinated conservation efforts the past three water years. Community water supply infrastructure was primarily constructed between 1930 and 1960; some of the main water distribution lines and other infrastructure are approximately 50-80 years old and at risk of breaks or failures.

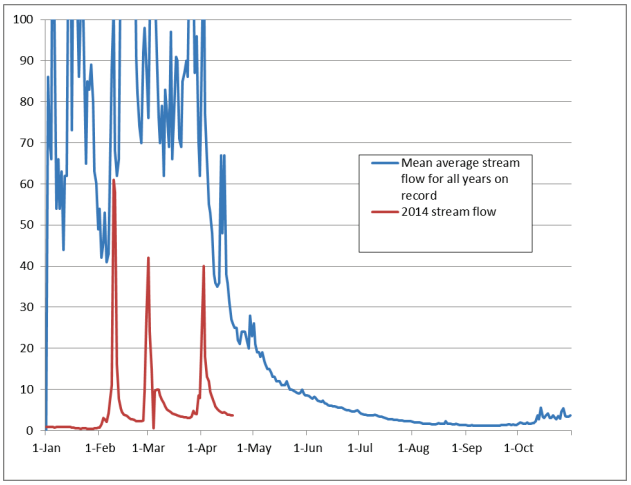
Water rights allocated in the region exceed actual surface water supply during late summer months in dry water years (Alford, 2010: p. 56).

Estimates of without-project conditions: Without the development of additional water storage and substantial reductions in agricultural water demand, the ability to meet immediate and long-term human and environmental needs in the region during drought and dry summer conditions is at significant risk (Alford, 2010: p. 56)

Methods used to estimate physical benefits: Estimated physical benefits were developed based on volume of additional storage that could feasibly be developed as well as calculations of water saved by efficiency improvements. Water savings calculations were based on water audits conducted by NRCS and reduction of water loss associated with known pipe breaks and leaks.

New facilities, policies, and actions required to obtain the physical benefits: New actions and facilities associated with this Project that will be required to obtain the primary physical benefits of the Project include water management coordination, increased water supply efficiency, and increased water storage capacity.

Potential adverse effects: Construction of water storage facilities could result in temporary construction-related impacts, including noise, traffic, and air quality, but such effects are expected to be mitigated to less-than-significant levels. All Projects will improve water supply and reliability in the long term. Infrastructure elements consist of modifications to existing structures or development of storage facilities on lands that are already developed.



Mean daily average stream flow recorded at the USGS San Gregorio Creek Stream Gage (11162570) for all available records between 1969 and 2013 compared to mean daily average recorded so far in the year 2014.

PSP Table 5b. Secondary Annual Project Physical Benefits

Project Name: Drought Relief for South Coast San Mateo County

Primary Benefit Claimed: Protection of core habitat for steelhead and coho salmon due to reduced water diversion amounts and reduced pumping rates during summer months and low flow periods (late August to early October).

Units of the Benefit Claimed: Number of summer rearing habitat areas protected from dewatering and/or significant fluctuations in channel flows.

Additional Information About this Benefit: The Project will result in an increase in local streamflow by approximately 0.5 cfs per agricultural water diversion site and 0.1 cfs per domestic water diversion site. The agricultural water diversion sites are located along the main channels of San Gregorio and Pescadero creeks, where stream flows average 1-2.5 cfs during average years in September; domestic water supply sites are located on tributary streams where flows of less than 0.5 cfs are common during summer months. Each Project, once implemented, will result in a 20-50% reduction in local summer streamflow impacts due to reduced summer water diversion pumping. This will improve summer rearing habitat for steelhead and coho salmon located adjacent and downstream of the Project sites, as well as helping to ensure adequate stream connectivity for migrating juveniles along 6 miles of blue-line streams.

Year	Physical Benefits		
	Without Project	With Project	Change Resulting from Project
2014	0	2	2
2015	0	6	6
2016	0	7	7

Comments: *Water savings and storage noted in PSP Table 5a, above, also apply to the benefits described in this table.*

San Gregorio Creek and Pescadero Creek watersheds are noted as core recovery areas for central coast coho in the Central Coast Coho Recovery Plan (NOAA, 2012: p. 261). Low streamflows are noted in the San Gregorio Creek Watershed Management Plan as a primary limiting factor for steelhead and coho salmon (NHI, 2010: pp. 100, 114) and for steelhead in both the San Gregorio and Pescadero watersheds in the Southern Steelhead Resources Evaluation (Becker et al., 2010: pp. 17-25).

Technical Analysis of Secondary Physical Benefits Claimed

Technical basis of the Project: Low streamflows, in part due to water diversions, are noted in the San Gregorio Creek Watershed Management Plan as a primary limiting factor for steelhead and coho salmon (NHI, 2010: pp. 100, 114) and for steelhead in both the San Gregorio and Pescadero watersheds in the Southern Steelhead Resources Evaluation (Becker et al., 2010: pp. 17-25). The U.S. Geological Survey (USGS) stream gages maintained in each watershed show that streamflows drop dramatically during summer months, to the point that larger water diversions can dramatically drop the streamflow in a short period of time. An assessment that evaluated the impacts of changing from a 250-gallon-per-minute (-gpm) pumping rate (common for most agricultural water users in the area) down to a 90-gpm pumping rate showed that these modifications can dramatically reduce streamflow fluctuations and impacts to salmonid habitat (American Rivers, 2013).

Recent and historical conditions: The San Gregorio and Pescadero Creek watersheds historically supported a population of approximately 2,000-2,500 steelhead and have been listed by the California Department of Fish and Wildlife (CDFW) as high-priority streams (Becker et al., 2010: pp. 17-25). These streams are also listed by the National Marine Fisheries Service (NMFS) as core recovery areas for Central California Coast Coho (NOAAA, 2012: p. 261).

Estimates of without-project conditions: Water diversions will continue to have dramatic impacts on the hydrograph and may dewater critical instream summer rearing habitat, particularly during drought periods. Salmonid population viability is at risk if these conditions continue. CDFW has conducted enforcement sweeps and has imposed regulatory instream flow requirements in these watersheds to protect fish and wildlife resources. If these CDFW actions occur, they will have a benefit to salmonids but will have a significant adverse impact on water users that rely on surface waters for drinking and/or agricultural water supplies.

Methods used to estimate physical benefits: Physical benefits correspond with the number of sites identified for Project implementation that are located within primary stream habitat areas and currently have diversion pumping rates equal to or greater than 50% of the local streamflow during low flow periods (flows equal to or less than average flows recorded for the month of September) (Alford, 2010: p. 56; ESA, 2004: p. 8-2; USGS, 2014a and 2014b).

New facilities, policies, and actions required to obtain the physical benefits: This Project will develop off-stream storage and/or improve operation of existing water storage infrastructure. These efforts are necessary to allow for reduced instantaneous pumping rates and to eliminate direct stream diversions during low flow periods. These facilities and actions will ensure protection of core habitat for steelhead and coho salmon.

Potential adverse effects: Reducing the water diversion amounts and pumping rates during summer months and low flow periods is not expected to result in any adverse effects (American Rivers, 2010: pp. 1-4). See discussion under the heading "Technical Analysis for Primary Physical Benefits Claimed" above for temporary effects associated with construction of water storage facilities.

Cost-Effectiveness Analysis

PSP Table 6 evaluates whether the physical benefits provided by the Project are provided at the least possible costs.

PSP Table 6. Cost-Effectiveness Analysis	
Project name: Drought Relief for South Coast San Mateo County	
Question 1	***Types of benefits provided as shown in PSP Tables 5a and 5b:*** By increasing the water storage capacity at Memorial Park from 250,000 gallons to 2 MG (which constitutes about one-third to one-half of the park's annual use), the park will be able to fill its storage in the wet season when stream flow is high and eliminate its diversions from the creek during the summer when stream flow is lowest. San Mateo County estimates a loss of $350,000 this year from having to close Memorial Park campgrounds for the 2014 summer season due to lack of water supply. By lining the Granny Flats Reservoir in the Cuesta La Honda Guild water supply system, the TOC and disinfection byproducts associated with the Cuesta La Honda Guild drinking water supply system will be reduced and will allow the use of approximately 5 AF of stored water during late summer months

	that has historically become unusable due to high TOC. This could potentially extend water availability for the community by approximately 3 weeks. Altering the timing of water diversions at seven large water diversion sites in the Project area will protect critical salmonid rearing habitat along 6 miles of streams in the San Gregorio and Pescadero creek watersheds, which are listed by NMFS as core recovery streams for coho (NOAA, 2012: p. 261). The Project will protect stream regions downstream of these diversion sites from being dewatered and will improve stream flows in the immediate areas by approximately 0.5 cfs (equivalent to approximately 20-50% of the average stream flow in September during an average water year) at these locations. Addressing the protection and recovery of listed species habitat in a voluntary and collaborative manner will result in a significant reduction in regulatory enforcement costs incurred by the state and federal agencies.
Question 2	***Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?*** Yes. The only other alternative to the Project includes development of an intertie with municipal water supplies on the other side of the Coast Range. This alternative is infeasible due to the long distance between water suppliers and the steep and landslide-prone terrain. In addition to high construction costs, ongoing electrical costs associated with pumping and would be costly to maintain. Trucking water in from outside the area is not a sustainable solution as it is cost prohibitive and resource intensive. Based on a report from a community member that is already trucking water, the cost to truck water into the area is approximately $1,300 per month for a single household. Furthermore, bottled water also must be purchased for drinking and cooking since it is not possible for residents to verify that the trucked-in water is potable.
Question 3	***If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.*** The Project as proposed is the least cost alternative. Interties with urban water agency infrastructure are cost prohibitive due to distance, so increasing available local drinking water supply by purchasing it from other areas is infeasible and not considered a realistic alternative. The Project will reduce long-term water treatment costs associated with one of the largest domestic water supply reservoirs in the region. It addresses infrastructure needs, resulting in both immediate and long-term benefits that outweigh the alternative option of incurring significant cumulative costs associated with needs to import water from other regions during drought periods, periods when aging water supply lines break, and/or when reservoir water quality renders stored water unusable.
Comments: *None.*	

References Cited:

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USGS, 2014b. USGS Pescadero Creek Gage. Available at: waterdata.usgs.gov/usa/nwis/uv?site_no=11162500.

Project 9 – Stinson Beach Water Supply & Drought Preparedness Plan

Project Description

Project Goals: The Stinson Beach County Water District's (District's) critical water needs relate to the isolated location of the District's service area with no existing or feasible possibilities for inter-tie connections or water transfers with other water agencies, and limited local water supplies. The Stinson Beach Water Supply & Drought Preparedness Plan (Plan) includes four projects (Projects) that would reduce water system losses; improve the District's ability to identify, locate, and repair leaks in pipelines; improve drinking water supply and reliability; and benefit fish and wildlife.

Project Description: The District provides drinking water to the isolated Town of Stinson Beach (<1,500 residents) in coastal Marin County. The District's water resources are limited and highly vulnerable to climatic conditions and seasonal water demands from large numbers of summer visitors to Stinson Beach and adjacent areas. On average, the District produces 55 million gallons per year (MGY). Implementation of the Plan is estimated to generate about 15 MGY of reliable water supply for drought and emergency periods: 5 MGY by 2015 and an additional 10 MGY by 2016.

Project A. 2014 Calles Pipeline Replacement Project: This Project involves replacing four priority water pipelines (1,300 feet total) in the Calles area of Stinson Beach (serving approximately 40 residents) and would recover 1 MGY of water. The existing pipelines in the Calles area are old and undersized, were installed at very shallow depths, and develop leaks regularly.

Project B. Patios Pipelines Replacement Project: This Project involves replacing five pipelines (1,000 feet total) in the Patios area of Stinson Bach (serving approximately 40 residents) and would recover 1 MGY of water. Similar to those in the Calles area, these pipelines are old, undersized, shallow, and leak-prone.

Project C. Supplemental Groundwater Supplies: This Project includes construction of a new 20-gallons-per-minute (GPM) groundwater well that can produce up to 10 MGY. The new well would be used in drought years and includes connecting up to three privately-owned wells to the District's water distribution system to supplement water supply during periods of drought or emergencies. Potential additional supply from private wells is currently under investigation.

Project D. Water Meter Replacements and In-Line Meters: The District will replace approximately 700 old water meters and install up to five new in-line water meters in strategic locations throughout its system. New water meters will have remote reading capabilities. This Project will allow the District to perform mass-balance water calculations on isolated sections of its water system to determine when and where losses are occurring and promptly stop the leaks, resulting in water savings. Combined with completion of Projects A and B, approximately 5 MGY is expected to be recovered.

Implementation Status: All Projects are underway: (1) Project A construction should be completed by October 2014, (2) Project B construction should be completed by July 2015, (3) Project C should be completed by July 2016, and (4) Project D should be completed by July 2016.

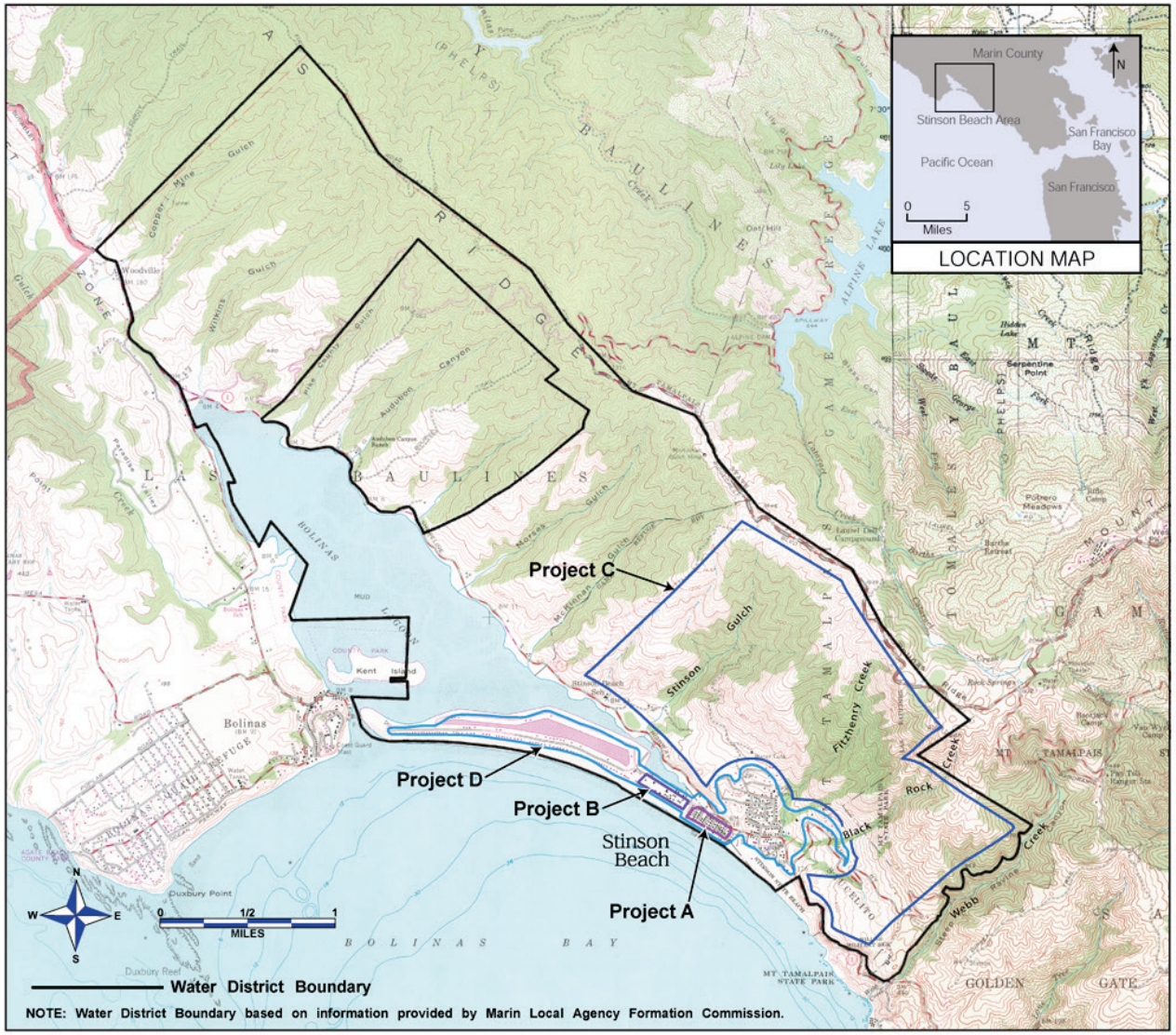
Funding Needs: The District's total annual budget is less than $2 million, and about $500,000 of the total annual budget is allocated for wastewater oversight and administration of issues related to all residential on-site wastewater systems in Stinson Beach. Grant funding is needed to help implement the District's Plan to expedite mitigation measures for the current drought situation and provide additional protections (and water savings) in future drought conditions.

Drought Eligibility: *Immediate regional drought preparedness* – The pipeline replacement Projects and water metering replacements will alleviate approximately 5 MGY of lost supply due to leaks, and the groundwater well Project will provide 10 MGY of drought and emergency supplemental groundwater supply. Project benefits will be realized as early as December 2014.

Increase local water supply reliability and safe drinking water – The groundwater Project will increase local water supply reliability and safe drinking water during drought and emergency periods, supplementing the District's supply by an additional 10 MGY (about 18% of the total amount of water produced by the District).

Reduce water quality/ecosystem conflicts – The Plan will provide direct environmental benefits due to more efficient use and distribution of water supply and reduced need to extract surface water supplies during drought and emergency periods. The Projects will allow up to 15 MGY of increased in-stream creek flows for fish and wildlife (SBCWD, 2010).

Project Map



Sub-Project Areas

- **Project A -** 2014 Calles Pipelines Replacement Project
- **Project B -** Patios Pipelines Replacement Project
- **Project C -** Supplemental Groundwater Supplies
- **Project D -** Water Meter Replacements and In-Line Meters

Stinson Beach Water Supply & Drought Preparedness
for 2014 IRWMP Grant Program
Stinson Beach County Water District

Project Physical Benefits

Primary and secondary Project physical benefits are summarized in **PSP Tables 5a and 5b**, below.

PSP Table 5a. Primary Annual Project Physical Benefits			
Project Name: Stinson Beach Water Supply & Drought Preparedness Plan **Primary Benefit Claimed:** Additional Water Supply **Units of the Benefit Claimed:** Million gallons per year (MGY) **Additional Information About this Benefit:** Water supply reliability would increase with supplemental groundwater supplies and surface water use would be offset by use of groundwater wells when surface water availability is limited. Supplemental groundwater supplies (Project C) are estimated to be 10 MGY or approximately 18% of the District's total average annual water production.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2016	0	10 MGY with Project C completed.	10 MGY increase in water supply
2017 - 2065 (Estimate 50-Year Project Life)	0	10 MGY every year thereafter throughout the life of the project.	10 MGY increase in water supply
Comments: *The supply enhancement realized from Project C is 10 MGY. This is based on the following assumptions:* - *The goal of Project C is to construct a 20-GPM well.* - *A 20-GPM well run continuously for 1 year is 10.5 MGY. Because the well will not be operated 100% of the time, the estimate was reduced to 10 MGY.*			

Technical Analysis of Primary Physical Benefits Claimed

Technical basis of the Project: Although it is well below the State's Urban Water Management Plan (UWMP) criteria for the number of customers served and the amount of water delivered, the Stinson Beach County Water District prepared a 2005 UWMP that included an assessment of the District's existing water supply reliability and water demands. Based on the results of the water supply reliability assessment, the UWMP recommended that the District "conduct a groundwater investigation to determine the extent of the District's available groundwater resources" and the UWMP noted that "To prepare for the multiple consecutive dry-year scenario, more secure sources of supply (groundwater) and storage options should be considered."

Recent and historical conditions: Historically, the District relied on more surface water (2/3 of total water production) than groundwater (1/3 of total water production). In recent years, the trend has changed and the District currently utilizes surface water and groundwater in approximately the same annual proportions (DWR, 2012a).

Estimates of without-project conditions: The supplemental groundwater supply Project is estimated to produce an additional 10 MGY, which will not be available without the Project.

Methods used to estimate physical benefits: The physical benefits are increased water availability and increased water supply reliability. The estimated benefits (target capacity of new well) are based on the capacities of the District's existing wells, limited information regarding the capacity of existing privately-owned wells in the Stinson Beach area, and a cursory understanding of groundwater potential in the geologic formations surrounding the Stinson Beach area.

New facilities, policies, and actions required to obtain the physical benefits: Test drilling to help determine the extent of the local groundwater supply, construction of a new groundwater well, and agreements and easements with private well owners for emergency use and tie-ins to existing private wells will be required to implement the Plan and Projects.

Potential adverse effects: Potential adverse impacts of a new groundwater well will need to be evaluated. However, environmental impacts would likely be temporary, construction related, and less than significant. Effects of increased pumping during drought and emergency conditions on the affected groundwater basins are currently being investigated. Well sites will not be selected if significant adverse effects on groundwater basins will result.

PSP Table 5b. Secondary Annual Project Physical Benefits

Project Name: Stinson Beach Water Supply & Drought Preparedness Plan

Primary Benefit Claimed: Water Supply Savings (Drought Preparedness)

Units of the Benefit Claimed: Million gallons per year (MGY)

Additional Information About this Benefit: Water savings will be realized from the repair of leaking pipelines, and other (potential future) leaks in the distribution system will be identified for prompt repair with the installation of new water meters that have improved technology for remote reading and an aggressive leak detection program utilizing the new meters. A total of 5 MGY will be gained from Projects A, B, and D combined, or approximately 9% of the District's total average annual water production.

Year	Physical Benefits		
	Without Project	**With Project**	**Change Resulting from Project**
2014	0 MGY savings	1 MGY – with completed Project A	1 MGY potable water savings
2015	0 MGY savings	2 MGY – with completed Project A and Project B	2 MGY potable water savings
2016	0 MGY savings	5 MGY total – with completed Projects A, B, and D online	5 MGY potable water savings
2017 – 2065 (Estimate 50-Year Project Life)	0 MGY savings	5 MGY total every year thereafter throughout the life of the project.	5 MGY potable water savings

Comments: *The total savings for Projects A, B, and D is 5 MGY is based on the following assumptions:*

- *Total 2012 Water Produced = 55.8 MGY*
- *Total 2012 Water Delivered = 45.8 MGY*
- *Total 2012 Water Loss = 55.8-45.8 MG = 10.0 MGY (18% water loss)*

The District's goal is to recover 9% of unaccounted-for water (UFW), or one-half of the existing losses (5 MGY).

Conservation savings resulting from pipeline replacements and meter replacements and improved leak detection capability resulting from the new meter installations are estimated. However, the estimates are realistic and the water savings are realistically attainable considering existing water system losses, the District's ongoing experiences repairing existing pipelines, and the potential for increased losses over time without the Projects.

Project A (Calles) is assumed to recover 1 MGY after construction; Project B (Patios) is anticipated to recover 1 MGY after construction, and Project D (meters) is anticipated to recover 3 MGY after all meters are installed and leak detection and repair actions are in place.

The potential reduction in water system losses resulting from implementation of Projects A, B, and D (5 MGY) is equivalent to total water recovery corresponding to a single leak with an average (continuous) leak rate of about 9.5 gpm. Based on the beach areas that are targeted for prioritized pipeline replacement and leak identification, water recovery resulting from small leaks of 1-2 gpm per 1,000 feet of pipe are potential and anticipated.

Technical Analysis of Secondary Physical Benefits Claimed

Technical basis of the Project: In spite of ongoing efforts to locate and reduce water losses in its water system, the Stinson Beach County Water District is losing about 10 MGY of water, which corresponds to approximately 18% of UAF water losses. A large portion of the District's water pipelines are installed in well-drained beach sand, which makes water leaks difficult to find; the Calles and Patios pipelines are just such pipelines that were installed in the beach sand many years ago and are some of the oldest pipelines in the water system. The District has narrowed its focus to these areas of its water system as having a high potential for undetected water leaks.

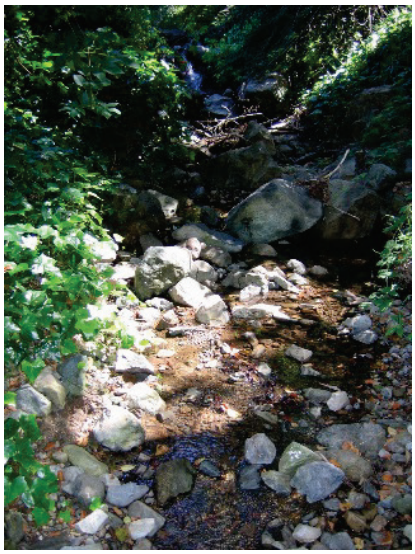
Recent and historical conditions: The District's average annual water system losses have been approximately 10 MGY for several years. Typical water losses in California municipal systems range from 5% to 30% and average 10%. The District's goal is to cut its UAF water in half (from 18% to 9%), and the pipeline replacement Projects and metering Project for which it seeks grant funding will provide the basis for significantly reducing water losses (DWR, 2012b).

Estimates of without-project conditions: Without the proposed projects, UAF water losses will likely continue, and are likely to increase over time because water leaks increase as water pipelines age.

Methods used to estimate physical benefits: Methods used include calculation of UAF water and reasonable, professional judgment that UAF water can be reduced in the District's water system to the California statewide average of 10% or lower.

New facilities, policies, and actions required to obtain the physical benefits: Other than the water pipeline replacements and new meter installations, no new facilities, policies, or actions will be required to obtain the estimated benefits.

Potential adverse effects: Temporary impacts from pipeline installation, primarily related to traffic and other construction-related effects, would occur during the construction period. Pipelines would be installed beneath existing roads and would not significantly impact special-status species or cultural resources. Water meter replacements would not create significant environmental impacts.



Cost-Effectiveness Analysis

PSP Table 6 evaluates whether the physical benefits provided by the Project are provided at the least possible costs.

PSP Table 6 – Cost-Effectiveness Analysis	
Project name: Stinson Beach Water Supply & Drought Preparedness Plan	
Question 1	***Types of benefits provided as shown in Tables 5a and 5b:*** *Projects A and B (2014 Calles Pipeline Replacement Project & Patios Pipelines Replacement Project)*: These pipeline Projects will directly address drought preparedness in the form of water savings that will be realized from eliminating ongoing leaks and potentially finding and eliminating leaks that have not yet been discovered. *Project C (Supplemental Groundwater Supplies)*: As previously described, the primary benefit of the Project is increased water supply availability and reliability during dry and drought periods. Use of supplemental groundwater supplies will alleviate potable water demand on surface water supply, thereby providing incidental benefits to fish and wildlife. The new groundwater well and private well connections will supplement the limited surface water and groundwater supplies in the District's service area, thereby increasing water availability and reliability. *Project D (Water Meter Replacements and In-Line Meters)*: The Project will directly address drought preparedness in the form of water savings that will be realized from replacement of customer water meter. The new meters will have improved technology and remote reading capability such that the District may be able to identify and repair leaks promptly. The new customer meters, in conjunction with new in-line water meters, will greatly increase the District's ability to identify when and where water losses are occurring within its overall water distribution system. With strategically placed in-line water meters and new customer water meters, the District can perform accurate mass-balance accounting of water losses within isolated sections of its overall water system to determine when and where the losses are occurring and promptly repair or replace leaking pipes.
Question 2	***Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?***
	If no, why? *Projects A and B*: No. The pipelines along the four Calles and five Patios need to be replaced. There are no alternatives to supplying water to the residents that live in the Calles and Patios areas without delivering water to them in a pipeline, in the alignment of the existing pipelines. The existing pipelines simply must be replaced with new pipelines. Constraints on local water supply sources and property in this small coastal community restrict other options to provide water supply reliably.
	If yes, list the methods (including the proposed project) and estimated costs. *Project C*: Yes. In 2006, the District prepared a reconnaissance-level investigation of a comprehensive set of Water Supply Options to supplement the District's existing sources of supply (Stetson Engineers, Inc., 2006). Several categories of Water Supply Options were evaluated, including supplemental surface water supplies, supplemental groundwater supplies, storage options, inter-tie connections, and various other water supply alternatives. In total, 24 water supply options were evaluated in the 2006 Stetson Engineers report for cost, yield, and cost-effectiveness. *Project D*: Yes. Alternatives for identifying where and when leaks are occurring within a water system are limited. The District has had leak detection surveys conducted on its system in the past; however, due to the small size of most of the pipelines in the District's water system and the sandy soil conditions in which the pipes were originally installed, leak detection audits have been relatively unsuccessful. An accurate accounting of water system input and customer water usage (based on new, accurate water meters) provides a strong basis for determining where UAF water is leaking.

Question 3	***If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.*** *Projects A and B*: The pipeline replacement Projects are the only and least cost alternatives. Different methods of installing the pipe were evaluated (trenching vs. trenchless) and the method of installation by trenching was determined by the District's engineering consultant to be the least-cost alternative, or comparable with the cost for the trenchless installation. *Project C*: The Groundwater Supply Options, as identified in the tables from the 2006 Draft Report (Stetson Engineers, Inc., 2006), were generally identified as the least cost alternatives and the most cost-effective alternatives when compared to all other water supply options. *Project D*: The Project is the least cost alternative, second only perhaps to a leak detection water audit, and past leak detection audits have met limited success.
Source: *Stetson Engineers, Inc., 2006*	

References Cited:

California Department of Water Resources (DWR), 2012a. Public Water System Statistics Report for Stinson Beach CWD, Calendar Year 2012.

California Department of Water Resources (DWR), 2012b. Leak Detection website. Available at: www.water.ca.gov/wateruseefficiency/leak/.

Stinson Beach County Water District (SBCWD), 2006. 2005 Urban Water Management Plan Stinson County Water District, p. 59. Prepared by Stetson Engineers, September.

SBCWD, 2010. Stinson Beach County Water District, Water Supply Accomplishments and Challenges.

Stetson Engineers, Inc., 2006. Draft Water Supply and Demand Management Options Stinson Beach County Water District. Reconnaissance Report. July.

Project Justification – Drought Preparedness Projects

Project descriptions, estimated physical benefits of the projects, justification of each project's technical feasibility, and a cost-effectiveness analysis are presented in this section for the projects listed below. These projects span all four sub-regions in the San Francisco Bay IRWM Region. The projects included in this section have several benefits related to potable water supply savings, energy savings, and greenhouse gas emission reduction.

Project ID#	Project Proponent	Project Title
10	StopWaste	Bay Area Regional Drought Relief Conservation Program
11	MMWD	WaterSMART Irrigation with AMI/AMR

Project 10 – Bay Area Regional Drought Relief Conservation Program

Project Description

Project Goals: The Bay Area Regional Drought Relief Conservation Program (Project) offers drought relief and long-term water savings in the form of water conservation projects that will improve water use efficiency throughout the Bay Area. This Project will help meet the statewide 20% drought demand reduction goal and reduce strains on local water supplies.

Project Description: The Project will be implemented by 12 Bay Area agencies and will leverage and expand existing incentive projects to meet the reduction goals for the current drought and ensure long-term savings, thus improving water supply reliability. A suite of Project elements will promote high-efficiency technologies and water conservation practices that improve indoor and outdoor water use efficiency. The Project will save approximately 1,200 AFY (or 24,000 AF over 20 years).

Element 1: Lawn to Landscape Conversions: Rebate incentives for customers to replace water-thirsty lawns with water-wise landscaping and replace inefficient spray irrigation with efficient drip irrigation. Replacement of about 2.28 million sq. ft. of lawn with water-efficient landscaping will save 250 AFY (or more than 5,000 AF over 20 years).

Element 2: High-Efficiency Toilet Rebates: Rebate incentive for customers to replace older, high-volume toilets with new WaterSense-certified, high-efficiency toilets that use only 1.28 gallons per flush. This will result in the installation of approximately 9,300 high-efficiency toilets and will save 250 AFY (or more than 5,000 AF over 20 years).

Element 3: High-Efficiency Toilet and Urinal Direct Installation: Install about 6,670 high-efficiency toilets that use 1.28 gallons per flush and urinals that use 0.125 gallon per flush, primarily in multi-family residential units and commercial properties. This element will save 150 AFY (or more than 3,000 AF over 20 years).

Element 4: High-Efficiency Washer Rebates: Rebate incentives for customers to purchase new high-efficiency clothes washers, which use less than half of the water compared to older machines. This will result in the installation of approximately 25,546 high-efficiency clothes washers, saving 550 AFY (or more than 11,000 AF over 20 years).

Element 5: Drought-Resistant Soil and Garden Marketplace Project: Provides lawn-to-garden rebates and promotes sheet mulching lawns in place to improve the drought resiliency of landscapes. This element will provide education and sheet mulch materials through regional professional and retail partnerships. Components include: Retail soil supply and nursery partnerships, sheet mulch stakeholder meetings, landscape professional events, and website tools. Results: Convert a minimum of 100 lawns and reach 8,000 consumers over an 18-month period for a projected water savings of 5 AF.

Implementation Status: Project planning will begin in October 2014 or as soon as DWR announces grant award, and implementation will start in April 2015 and continue through June 2018 (3 years).

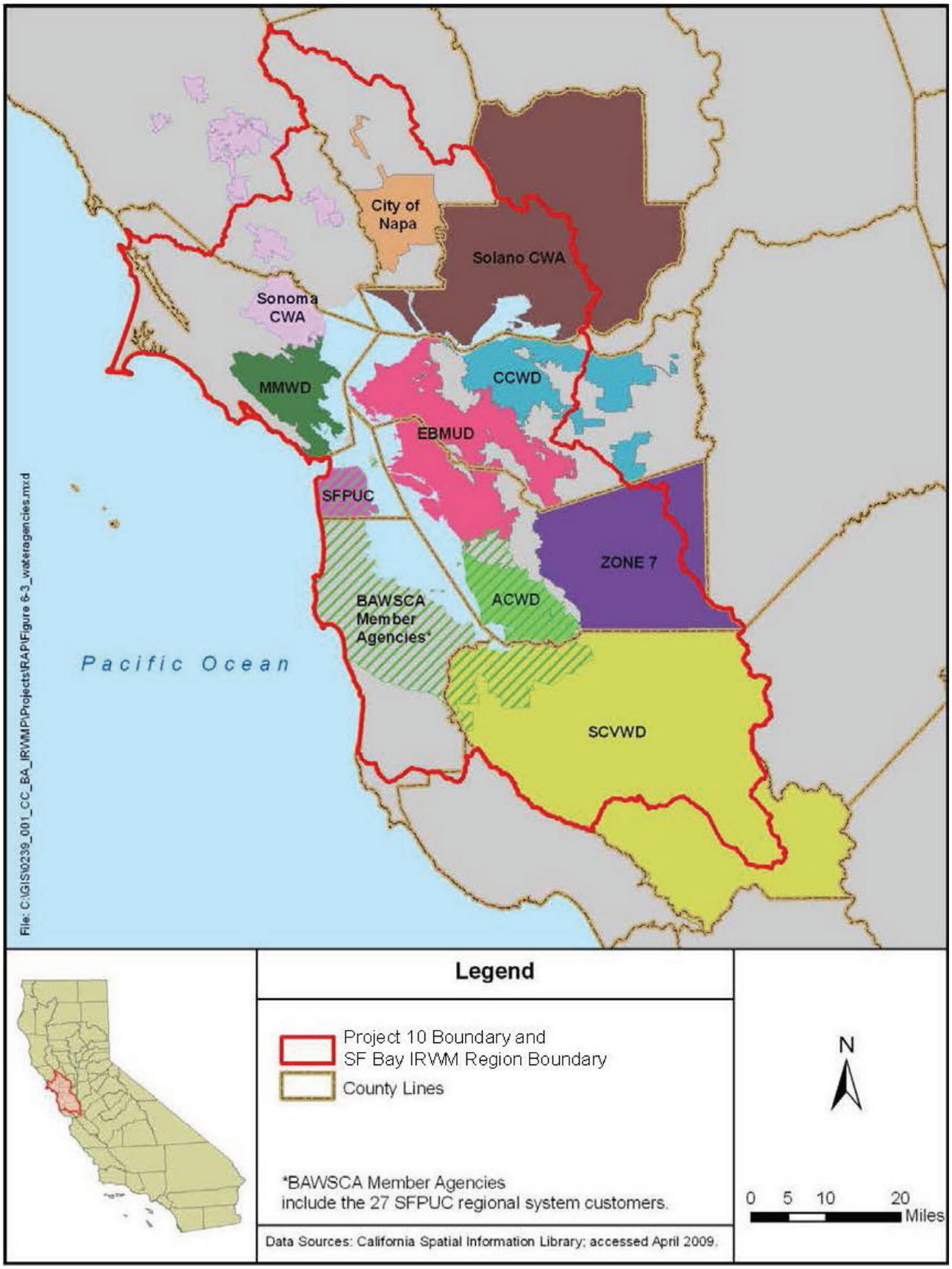
Funding Needs: Drought-related cost impacts on water agencies have resulted in increased expenditures and reduced revenue due to declining water sales throughout the Bay Area, leading to an immediate need for funding support. Water agencies need assistance to fund increased conservation activities that provide immediate savings as well as long-term drought resiliency. Operating revenue losses have also occurred due to reduced water sales following statewide drought declarations coupled with mandatory and voluntary water use restrictions. Expedited funding will allow participating agencies to increase Project activities that target immediate and long-term reduction in potable water demand.

Drought Eligibility: *Immediate regional drought preparedness* – Immediate and long-term reductions in potable water demand of approximately 1,200 AFY will be achieved as a result of this Project. The Project will assist customers in meeting water reductions goals throughout the region and will maximize available water supplies at the lowest cost.

Increase local water supply reliability and safe drinking water – The Project will increase local water supply reliability and quality as follows: Conservation elements provide immediate water supply benefits; conservation elements focus on the largest water-using fixtures; and less demand provides improved water quality benefits in the Delta. The Project will also relieve demand for potable water and facilitate increased access to safe drinking water supplies.

Reduce water quality/ecosystem conflicts – The Lawn to Landscape element of the Project will reduce runoff from urban landscapes that contain fertilizers, pesticides, and herbicides. This will have an immediate positive impact on local streams, thus reducing ecosystem conflicts and improving water quality.

Project Map


City of Napa
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BAWSCA Member Agencies*
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Legend
Project 10 Boundary and SF Bay IRWM Region Boundary
County Lines
*BAWSCA Member Agencies include the 27 SFPUC regional system customers.
Data Sources: California Spatial Information Library; accessed April 2009.
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Project Physical Benefits

Primary and secondary Project physical benefits are summarized in **PSP Tables 5a and 5b**, below.

PSP Table 5a. Primary Annual Project Physical Benefits			
Project Name: Bay Area Regional Drought Relief Conservation Program **Primary Benefit Claimed:** Potable water savings **Units of the Benefit Claimed:** Acre-feet per year (AFY) **Additional Information About this Benefit:** None.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2015 – 2035	0	1,200 AFY	1,200 AFY potable water saved in the first year, with total savings of nearly 24,000 AF.
Comments: *Over 20 years, a total of 24,000 AF of potable water will be saved.*			

Technical Analysis of Primary Physical Benefits Claimed

Technical basis of the Project: Potable water savings will result from retrofit of poorly performing toilets, urinals, clothes washers, landscape irrigation equipment, and high-water-use turf grass with high-efficiency fixtures and climate adapted drought-tolerant landscapes. Additional water savings and reductions in non-point-source urban runoff pollution will result from the distribution of educational materials and training on methods to sheet-mulch turf grass and install and maintain drought-tolerant landscapes.

The calculation of a 20-year improvement life for all Project elements is a nominal period and is based on the reasonable assumption that the majority of plumbing fixture and landscape efficiency upgrades made possible with this project are unlikely to revert to a less water-efficient condition in the future. This assumption is reinforced by the fact that legislative mandates and conservation code requirements are now, or will soon be, in place statewide and at all participating project agencies that require manufacturers and customers to increase levels of water efficiency. The purpose of the Project is to provide customer incentives that will accelerate the conversion to high-efficiency technology, yielding greater water and energy savings earlier to respond to the pervasive drought conditions.

Without the Project, customers will likely not have sufficient financial resources or incentive to upgrade outdated equipment or convert high-water-using landscapes, resulting in delay and reduction in water and energy savings. The cost-effectiveness of this Project is calculated by comparing the total project costs to the total water saving benefit, and neither the costs nor the benefits have been discounted. A detailed economic valuation (per DWR's Economic Analysis Guidebook) is not explicitly included, but can be performed if required (DWR 2008).

General References:

High-Efficiency Toilets and Urinals:

- Seattle home water conservation study of the impacts of high-efficiency plumbing fixture retrofits in single-family homes (California Urban Water Conservation Council [CUWCC], 2000)
- Alliance for Water Efficiency Savings Model – Default specifications, Active library, AWE tool/guidebook
- Veritec/Canadian Mortgage and Housing Corporation (CUWCC, 2002) Dual-flush Toilet Project
- Evaluation of Potential Best Management Practices, High Efficiency Plumbing Fixtures, Koeller & Co (2005)

Lawn-to-Landscape Conversions:

- California Single-Family Water Use Efficiency Study, Aquacraft Consulting - Outdoor Model (EBMUD, 2011a: p. 220)
- Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act (EPA, 2009: pp. 8-9)

High-Efficiency Clothes Washers:

- Residential BMP Coverage Requirements (CUWCC, 2014)
- California Single-Family Water Use Efficiency Study, Conclusions (EBMUD, 2011b: pp. 272-282)
- Household water use and conservation models using Monte Carlo Techniques (Hydrology and Earth Sciences, 2013: Abstract, p. 1).

Recent and historical conditions: California experienced the lowest levels of precipitation in recorded history in 2013, and climate change may cause long-term drought and threaten the stability of potable water supplies statewide (DWR, 2014b).

Estimates of without-project conditions: Without substantial reductions in potable water demand, the ability of water agencies in the Bay Area to continue meeting immediate and long-term human and environmental needs is at significant risk (California Natural Resources Agency, 2009).

Methods used to estimate physical benefits: Potable water savings will result from retrofitting or replacement of poorly performing toilets, urinals, clothes washers, landscape irrigation equipment, and high-water-use turf grass with high-efficiency fixtures and climate-adapted drought-tolerant landscapes. Additional water savings and reductions in non-point-source urban runoff pollution will result from the distribution of educational materials and training on methods to sheet-mulch turf grass and install and maintain drought-tolerant landscapes. See references cited for "Technical Basis of the Project," above.

Water savings were estimated based on the number of rebates anticipated to be issued over the life of the program. Detail for these estimates is provided in the table below. First year water savings is 1,189 AF (rounded to 1,200 AF) and 23,775 AF of water savings (rounded to 24,000 AF) is estimated after 20 years. Estimated length of water savings: high-efficiency toilet rebate and direct installs = 20 years, lawn-to-landscape conversion = 13 years, high-efficiency washer savings = 13 years.

Summary of Program Rebates and Water Savings Estimates					
Rebate Type	**Total Number of Rebates**	**Unit Description**	**Total Annual Water Savings (AF/yr)**	**Life of Savings (yrs)**	**Total Life Savings (AF)**
Landscape Rebates	2,281,000	Per Square Foot	236	20	4,716
Toilet/Urinal Rebates	9,364	Per Toilet or Urinal	165	20	3,307
Toilet/Urinal Direct Installation	6,670	Per Toilet or Urinal	162	20	3,243
Washer Rebates	25,546	Per Washer	625	20	12,509
Total Water Savings from the Regional Conservation Rebate Program			**1,189**	**20**	**23,775**

New facilities, policies, and actions required to obtain the physical benefits: No new facilities or policies are required. Additional actions taken as a result of implementing the proposed project will result in obtaining the physical benefits.

Potential adverse effects: No adverse effects are associated with this Project, as it has been determined to be categorically exempt under CEQA.

PSP Table 5b. Secondary Annual Project Physical Benefits			
Project Name: Bay Area Regional Drought Relief Conservation Program **Primary Benefit Claimed:** Energy Savings and Greenhouse Gas Reduction **Units of the Benefit Claimed:** Megawatt-hours (MWh) of Electrical Energy and Million Pounds per Year of CO_2 **Additional Information About this Benefit:** None.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
20% Savings per Year for 20 years	Electrical Energy: 0 CO_2: 0	Electrical Energy Saved: 3,812 MWh CO_2 Reduced: 1.7 million pounds	Electrical Energy: 3,812 MWh reduced CO_2: 1.7 million pounds reduced
**PG&E System wide average at 445 pounds CO_2/MWh in 2012 (The Climate Registry, 2012).* ***9,750 KWh/Million Gallons or 9.75 MWh/Million Gallons (U.S. Department of Energy, 2006).*			

Technical Analysis of Secondary Physical Benefits Claimed

Technical basis of the Project: Due to the large amounts of energy required to transport and treat water, reductions in water demand also directly reduce energy demand and the associated greenhouse gas emissions (DWR, 2012). The Bay Area Regional Drought Relief Conservation Program would reduce an estimated 1,200 AFY and 24,000 AF after 20 years.

Recent and historical conditions: Since the beginning of the Industrial Revolution, burning of fossil fuels, deforestation, expanding agriculture, and other human activities have contributed to rapid increases in CO2 and methane concentrations. For example, as the largest producer and supplier of water in the Bay Area, EBMUD is typical of all the water agencies participating in the Project (at a smaller scale). EBMUD

> "delivers drinking water to more than 1.3 million people in 20 cities and 16 unincorporated communities in parts of Alameda and Contra Costa counties in the eastern part of the San Francisco Bay Area. The average water consumption in this service area is 220 million gallons per day (mgd) and consumption peaks at 341 mgd. EBMUD operates six water treatment plants, nearly 4,000 miles of water mains, and 135 pumping stations. Two EBMUD hydroelectric plants generate 185 gigawatt-hours (GWh) of electricity in a median year. The electricity generated is sold into the wholesale market. Delivering water on this scale requires enormous amounts of energy, mostly in the form of electricity. In 2004 EBMUD spent about $12 million purchasing electricity; approximately two-thirds, or $8 million, of that amount was required for pumping water through the distribution system. The consumption of electricity represents the single largest, non-labor expense in EBMUD's operations and maintenance department." (Water Research Foundation, 2005)

Estimates of without-project conditions: Additional electrical generation of 3,812 MWh will be required and 1.7 million pounds of CO_2 will be released to the atmosphere annually (The Climate Registry, 2012; U.S. Department of Energy, 2006).

Methods used to estimate physical benefits: The calculations of secondary benefits in PSP Table 5b, for energy and CO_2 savings, are based on the average amount of electrical energy (MWh/Million Gallons) used by all water agencies in California for potable water conveyance, treatment and distribution (U.S. Department of Energy, 2006) and the PG&E system average amount of CO_2 emissions in 2012, 445 lbs CO2/MWh (The Climate Registry, 2012). The total water savings after 20 years of Program implementation were evaluated against these average estimates to calculate the total electrical energy and emission reductions resulting from the Program.

New facilities, policies, and actions required to obtain the physical benefits: No new facilities or policies are required. Additional actions taken as a result of implementing the proposed project will result in obtaining the physical benefits.

Potential adverse effects: No adverse effects are associated with this Project, and all Project elements are categorically exempt under CEQA.

Cost Effective Analysis

PSP Table 6 evaluates whether the physical benefits provided by the Project are provided at the least possible costs.

PSP Table 6. Cost Effective Analysis	
Project name: Bay Area Regional Drought Relief and Conservation Project	
Question 1	***Types of benefits provided as shown in PSP Tables 5a and 5b:*** *Water Supply:* Benefits will include avoided water supply purchase costs, including those for environmental purposes; avoided costs of water supply projects, avoided water shortage costs, avoided operations and maintenance costs, or water revenue from water sales to another purveyor or third party. Immediate and long-term drought relief will be achieved by reducing demand on limited water supplies by approximately 1,200 AFY for a 20-year Project total of approximately 24,000 AF, resolving water-related conflicts by improving landscape irrigation efficiency. *Ecosystem Improvement/Environmental Benefits:* The proposed project will immediately and permanently reduce dependence on Delta water supplies as a result of reduction in urban water demand. The Bay Area is highly dependent upon the Delta and its tributaries for surface water supplies. About 70% of the region's urban water supply is derived from these Delta and major tributary (Tuolumne and Mokelumne river) sources. About half of that surface water is withdrawn from the statutory delta (State Water Project, Federal Central Valley Project, and other U.S. Bureau of Reclamation facilities), with the balance coming from upstream of the Delta from the Tuolumne River (SFPUC and its contractors) and the Mokelumne River (EBMUD). Additionally, replacing wasteful lawn sprinklers with high-efficiency drip irrigation will protect riparian habitat by significantly reducing non-point-source pollution from urban runoff. *Energy Produced or Saved:* The proposed project will reduce the energy demands caused by pumping and treating water, lessening energy demands by approximately 3,812 MWh and reducing greenhouse gas emissions by 1.7 million pounds of CO_2 annually for 20-year Project totals of approximately 76,240 MWh and 34 million pounds of CO_2, respectively*.
Question 2	***Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?***
	Yes; simply allowing natural rates of replacement to occur alone, via state and local plumbing codes requirements to increased fixture efficiencies, has been considered, but this method would require a longer time period and achieve fewer savings than will occur in conjunction with this project.
Question 3	***If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.*** Yes; conservation projects are the least costly water supply alternatives. At a total Project cost of $10,892,986 to reduce consumption by 24,000 AF over the 20-year nominal Project period, the simple average cost per AF saved is $454 ($10,892,986/24,000).** The project generated energy savings, greenhouse gas reductions, and avoided impacts of non-point source pollution reduction are value-added but beyond the scope of this benefit/cost analysis. Normal upkeep and replacement of the hardware and landscape elements incentivized by this project will be required over the 20-year nominal time period; however, all maintenance and replacement expenses during and after this Project period will be paid by the agency customers who receive incentives with this Project. The cost effectiveness of this Project has been calculated by comparing the initial Project costs to the total projected water saving benefit, and neither the costs nor the benefits have been discounted. A detailed economic valuation (DWR, 2008) has not been performed, but can be completed if required.
Comments: **PG&E System wide average @ 393 pounds CO_2/MWh (The Climate Registry, 2012).* ***Water savings are as follows: First year 1,189 AF (rounded to 1,200 AF). Estimated length of water savings: lawn-to-landscape conversion = 13 years, high-efficiency toilet rebate and direct installs = 20 years, high-efficiency washer savings = 13 years. Also see the detailed table provided with the Budget Summary in Attachment 5.*	

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Project 11 – WaterSMART Irrigation with AMI/AMR

Project Description

Project Goals: The Marin Municipal Water District's (MMWD's) WaterSMART Irrigation with AMI/AMR Project (Project) will alleviate drought impacts in MMWD's service area by permanently reducing commercial landscape sector potable water demand. The Project goal is to achieve a 25% reduction in average landscaping water use through the installation of SMART irrigation equipment and AMI/AMR technology.

Project Description: The Project will be implemented at 800 sites throughout MMWD's service area in Marin County and includes installation of SMART irrigation equipment retrofits at landscaped sites. Conversion to an Advanced Metering Infrastructure/Advanced Meter Reading (AMI/AMR) system will allow consumers to track water usage and allow MMWD to track conservation efforts, be more proactive in monitoring, finding and responding to leaks, and reduce vehicle emissions associated with meter reading and service calls. The Project includes acquisition and installation of electronic radio transmitters and data loggers (AMR devices) at 800 dedicated irrigation water meters. This Project involves several major elements that when implemented together will significantly improve water management and efficiency in the service area:

- Conversion of existing manual-read landscape irrigation water meters to AMI/AMR reading system, including installation of data storage and radio transmission devices, installation of all ancillary communications infrastructure, software and delivery of meter reading data and analysis functionality, and creation of a new internet data portal that will allow staff and customers to manage irrigation water use with online accounts.
- Retrofitting with SMART irrigation equipment at project sites receiving AMI/AMR technology. This includes launching and administering an Irrigation Equipment Rebate Program for project irrigation account customers. This SMART irrigation equipment will include a combination of high-efficiency sprinkler nozzles, low-volume drip irrigation, and SMART controllers.
- Analysis of irrigation water requirements at project sites and development and establishment of new Water Budgets associated with each site. The new water budgets will reflect higher efficiencies and demand reductions made possible by the SMART irrigation equipment element of the project.
- Outreach with project irrigation account customers regarding project parameters, to ensure transition to water efficient irrigation equipment, to educate about using the new technology to monitor and track water use, and for collaboration in establishing new water budgets.

With implementation of this project, MMWD will have a complete "tool kit" for landscape water management that will facilitate an average reduction in annual water used for dedicated irrigation meters of 25% (300 AFY). Upon Project completion, MMWD staff will conduct all routine maintenance and incorporate the advanced technology this Project brings, into daily operations to foster water use savings.

Implementation Status: MMWD is ready to proceed with the Project as soon as an agreement is finalized. Implementation will be completed within approximately 18 months from the agreed upon start date.

Funding Needs: MMWD has no capacity to fund the Project with its current budget.

Drought Eligibility: *Immediate regional drought preparedness* – This Project will immediately improve landscape irrigation efficiency and achieve a long term reduction of water use, facilitating an average reduction in annual water used for dedicated irrigation meters of approximately 25% (300AFY). The Project will establish high-efficiency consumption baselines and create an enforceable tracking system to quickly detect leaks and eliminate excessive use. The Project will require commercial irrigation customers to adhere to strict efficiency standards.

Increase local water supply reliability and safe drinking water – Implementation of the Project will reduce potable water consumption by 300 AF during the first irrigation season and every year thereafter, enabling safe drinking water to be available for other uses. After 15 years of implementation, an estimated 4,500 AF will be conserved as a direct result of this Project.

Reduce water quality/ecosystem conflicts – The Project will reduce potable water consumption by 300 AFY during the driest season, thereby freeing up this supply for other uses. Under a 1995 SWRCB Order, the District must release water from Kent Lake to support endangered aquatic species in Lagunitas Creek. In early 2014, MMWD was preparing to launch mandatory rationing and a request to the SWRCB for an emergency reduction in amount of required stream releases. The Project could reduce the need for future emergency reductions of stream releases for environmental uses.

Project Map

San Pablo Bay
Pacific Ocean
San Francisco Bay
POINT REYES STATION
OLEMA
NICASIO
IGNACIO
MARINWOOD
FOREST KNOLLS
LAGUNITAS
SAN GERONIMO
WOODACRE
TERRA LINDA
SANTA VENETIA
FAIRFAX
SAN ANSELMO
SAN RAFAEL
ROSS
KENTFIELD
GREENBRAE
LARKSPUR
CORTE MADERA
MILL VALLEY
STRAWBERRY POINT
ALMONTE
BOLINAS
STINSON BEACH
MARIN CITY
SAUSALITO
BELVEDERE
TIBURON
NORTH RICHMOND
Richmon
MARIN MUNICIPAL WATER DISTRICT
N
S
E
W
Source: MMWD GIS, ESRI.com
March 2012
Service Area Boundary

Project Physical Benefits

Primary and secondary Project physical benefits are summarized in **PSP Tables 5a and 5b***,* below.

PSP Table 5a - Primary Annual Project Physical Benefits			
Project Name: WaterSMART Irrigation with AMI/AMR **Primary Benefit Claimed:** Water Supply Savings **Units of the Benefit Claimed:** Acre-feet per year (AFY) **Additional Information About this Benefit:** None.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2015 – 2030 (15-year horizon)	0 AFY potable water saved	300 AFY	300 AFY of potable water saved
Comments: *Over the next 15 years, 4,500 AF of potable water will be saved cumulatively.*			

Technical Analysis of Primary Physical Benefits Claimed

Technical basis of the Project: Potable water savings will result from the retrofit of existing manual read water meters, poorly performing landscape irrigation equipment, and the issuance of scientific water budgets based on seasonal plant demand at all sites with dedicated landscape irrigation meters. Automatically-read meters (AMI/AMR) will record water consumption data on an hourly basis that will be entered into MMWD's SAP computer system, allowing staff to monitor, analyze, report, and enforce water use patterns at each site with a high level of accuracy and data resolution. Upgrading landscape equipment to a high efficiency standard provides the necessary tools to sustain landscape plants in a healthy condition with the minimum amount of supplemental water. Additional reductions in non-point urban runoff pollution will result by reducing the volume of water containing nutrients and sediment that flows off the landscape into adjacent water bodies.

Implementation of this Project is anticipated to facilitate an average reduction in annual irrigation water use by 25% or 300 AFY. This estimate is based on a projected 20% water savings from commercial landscape irrigation (dedicated irrigation meters) and 5% water savings from residential/commercial landscape (mixed indoor/outdoor irrigation meters). The water savings estimates are based on the average of actual water used by MMWD's 117 dedicated commercial irrigation landscape water meters and 2,294 mixed indoor/outdoor residential landscape water meters. The 20% water savings estimate is based on a comparison of 2008-2010 water use versus 2011-2013 water use (MMWD unpublished data). The 5% water savings estimate is based on published, peer-reviewed evaluation of residential irrigation water use (Deoreo and Mayer, 2010).

Quantifiable water savings will be verified by comparing actual water meter consumption data from each dedicated irrigation meter before and after the proposed project is implemented. MMWD has historic consumption records for all irrigation meters in the SAP enterprise system dating back more than 20 years. Historic consumption data will be normalized by calculating the past 5-years average use. Average use will be compared to consumption data collected after all efficiency equipment retrofits, site audits, and water budgets have been completed and implemented. MMWD intends to collect and analyzed water use data using standard comparative descriptive statistical analysis methods, and include the results in semi-annual performance reports distributed to irrigation customers.

Recent and historical conditions: The current drought in Marin began in early 2013. Precipitation in 2013 was the lowest ever recorded in Marin, and rainfall in 2014 is also well below average with current year-to-date rainfall at only 65 percent of normal. In January 2014 the MMWD Board of Directors activated Phase 1 of the district's Water Shortage Contingency Plan and requested customers to voluntarily reduce their water usage by 25 percent. Rainfall received in February 2014 improved the water supply situation somewhat, however, local surface water storage remains below normal and MMWD intends to continue to request voluntary water use reductions at least through the end of 2014.

Estimates of without-project conditions: Without this project, excessive potable water will continue to be used to irrigate landscapes due to inefficient equipment, and MMWD will continue to experience an inability to monitor and

enforce drought restrictions in a timely and effective manner. Pollutants from excess and non-point source pollution runoff will continue to impact waterways, and additional energy and greenhouse gas emissions associated with potable water treatment and distribution will occur.

Without this project, irrigation customers will likely not have sufficient financial resources or incentive to upgrade outdated equipment and will not be provided with weekly irrigation schedule updates by MMWD in the foreseeable future. A detailed economic valuation (per DWR's Economic Analysis Guidebook) is explicitly not included, but can be performed if required.

Methods used to estimate physical benefits: The project is anticipated to result in water savings over a 15-year period. Normal upkeep and replacement of hardware and software components will be required over this time period, however, given the fact that the efficiency of these technologies is continuously improving, and that any replacement of initially installed equipment over the 15 year nominal project life will be made using materials of equal or greater efficiency, it is assumed that the improvements made possible with this project will be permanent. Future capital expenses for AMI/AMR hardware and software replacements and upgrades will come from MMWD's capital improvement budget, and irrigation customers will be responsible for the costs of maintaining and replacing irrigation equipment at their sites as required.

The estimated 15-year project savings is projected to be 4,500 AF. This is calculated from the estimated 25% water savings from the Project, as explained above, and applying the historical average actual water use from MMWD irrigation accounts (1,200 AFY). When projected over 15 years, 25% reduction in the average 1,200 AFY water use equates to a total water savings of 4,500 AF, and an annual water savings of 300 AF.

New facilities, policies, and actions required to obtain the physical benefits: None.

Potential adverse effects: The Project would not result in any potential adverse effects.

PSP Table 5b - Secondary Annual Project Physical Benefits			
Project Name: WaterSMART Irrigation with AMI/AMR **Primary Benefit Claimed:** Energy Savings and Greenhouse Gas Reduction **Units of the Benefit Claimed:** MWh Electrical Energy saved, and Pounds CO_2 per year reduced **Additional Information About this Benefit:** None.			
Year	**Physical Benefits**		
	Without Project	**With Project**	**Change Resulting from Project**
2015 – 2030	Energy: 0 CO_2: 0	Energy saved: 225 MWh (300 AF @.75 MWh/AF)* CO_2: 85,500 lbs/year (380 lbs CO_2 /MWh)**	Energy: 225 MWh saved per year* CO_2: 85,500 pounds reduced per year
Comments: * 750 kWh/AF (.75 MWh/AF) is the 12-year average electrical use by MMWD to produce an average of 29,000 AFY: per internal engineering records and calculations by MMWD staff. ** 380 lbs CO_2/MWh (Marin Clean Energy, 2012)			

Technical Analysis of Secondary Physical Benefits Claimed

Technical basis of the Project: Reduced demand for potable water will result in reduced electrical energy used by MMWD to produce and distribute water supplies. Reduced electricity generation will subsequently result in reduced greenhouse gas emissions.

Recent and historical conditions: MMWD is the largest energy consumer in the County of Marin, due to the high amounts of electricity required to produce and deliver drinking water in the service area. Seventy-five percent of MMWD's water supply comes from local rainfall on Mt. Tamalpais and in West Marin, which is captured in MMWD's seven reservoirs. The remaining approximately twenty-five percent of supply is purchased from Sonoma County Water Agency and is piped to MMWD's service area from Sonoma County. Raw water from Kent Lake or Nicasio Reservoir is treated at San Geronimo Treatment Plant and must then be pumped up and over steep hills in order to reach most of the service area. It takes a great deal of energy (750 kWh/AF) just to pump the potable water up and over the hill to make it available for distribution to most of the service area. Because so many of Marin County's residential areas are located in and around a multitude of hills and valleys, potable water coming into the area must be pumped from the main supply lines to smaller storage tanks. Ninety individual pump/lift stations pump the water up to 125 individual storage tanks located at high elevations, from which the water then flows by gravity down into residential neighborhoods. Additionally, MMWD operates a recycled water treatment and distribution system, which includes another five pump stations and three storage tanks. The great amount of energy needed to treat and pump potable and recycled water to all these local tank sites is a primary reason that MMWD uses so much energy. Reductions in amount of water used by consumers directly equates to reduced energy consumption by MMWD, as less water would be treated, pumped, and delivered.

Estimates of without-project conditions: Without the project, an additional 225 MWh of electricity per year will be generated from the water transmission system to meet irrigation demands. This would result in 85,500 pounds of CO_2 released to the atmosphere annually. Without the Project, a cumulative total of 3,375 MWh and 1,282,500 pounds of CO_2 would be emitted over the 15-year nominal Project lifetime.

Methods used to estimate physical benefits:_The calculations of the Project energy and CO_2 savings, are based on the average amount of electrical energy (MWh) used by MMWD to pump one acre-foot of water and the average amount of greenhouse gases (CO_2) produced by the local electric utility in Marin County (Marin Clean Energy, a public agency that provides 50% renewable electricity to Marin County and the City of Richmond) to generate the electrical energy used by MMWD. The data used in this calculation was derived from production water meter readings, and the 2012 emissions report published by Marin Clean Energy (Marin Clean Energy, 2012).

Per internal engineering records and calculations by MMWD staff, 750 kWh/AF (.75 MWh/AF) is the 12-year average electrical use by MMWD to produce an average of 29,000 AFY (agency average water production). The estimated annual water savings from the AMI/AMR Project (300 AFY) was multiplied by .75 MWh/AF to arrive at the energy savings estimate of 225 MWh per year.

The Project is estimated to reduce greenhouse gas emissions by 85,500 lbs per year. This is based on the Marin County Clean Energy's GHG emission estimates from 2012: 380 lbs of CO_2 emissions generated per MWh (Marin Clean Energy, 2012). This estimate assumes electricity used by the water transmission system originates from 50% renewable energy content (Light Green power supply sources). In 2012, the Light Green electricity volume used in Marin County was 559,836 MWh, which equates to 380 lbs of CO_2 emissions/MWh. The Project will save an estimated 225 MWh per year. This equates to a savings of 85,500 lbs of CO_2 emissions per year.

New facilities, policies, and actions required to obtain the physical benefits: None.

Potential adverse effects: None.

Cost Effective Analysis

PSP Table 6 evaluates whether the physical benefits provided by the Project are provided at the least possible costs.

PSP Table 6 - Cost Effective Analysis	
Project name: WaterSMART Irrigation with AMI/AMR	
Question 1	***Types of benefits provided as shown in Table 5:*** Direct water supply savings resulting from the Project: • Average reduction in annual water used for dedicated irrigation meters of 25% (300 AFY). • 4,500 AF of supply reduction over 15 years • Savings will offset locally and imported water supplies
Question 2	***Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?*** Yes. MMWD is continuously evaluating methods to reduce demand and increase efficiency, and is continuously implementing new strategies as possible. This project represents a big step towards fully adopting AMI/AMR in the service area. MMWD conducted an extensive cost/benefit analysis of leak detection and landscape incentive programs in 2009. The present value cost of these programs ranged from $654 to $1,745 /AF saved, depending on the amount of the incentive offered and staff time required to operate the programs (Maddaus Water Management, 2009)
Question 3	***If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.*** The Project is the least cost alternative. During the first 15 years of operation, the Project will save an estimated 4,500 AF of water at an average cost of $250-$500 per AF saved, which compares to approximately $250/AF for water produced locally and over $1,200 /AF for the next incremental supply of imported water.
Comments: Savings and supply costs in Question 3 are not discounted.	

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Project Justification – Grant Administration

The grant administration description is provided in this section. Discussion of physical benefits and cost effectiveness of grant administration is not applicable.

Project ID#	Project Proponent	Project Title
12	ABAG/SFEP	Grant Administration

Project 12 – Grant Administration

Project Description

This grant administration effort will ensure that Bay Area Integrated Regional Water Management (IRWM) grant funds are properly managed and administered in accordance with California Department of Water Resources (DWR) guidelines and requirements. The Bay Area Drought Relief Program consists of 11 projects addressing immediate regional drought relief efforts for increased local water supply, delivery of safe drinking water, implementation of conservation programs, and reduced water supply and quality conflicts.

Grant Administrator and Grant Recipient: The Association of Bay Area Governments (ABAG) is the official Council of Governments (COG) representing the San Francisco Bay Area's nine counties and 101 cities and towns. ABAG holds the distinction of being the first COG in California and is the Bay Area's official regional planning agency. Its mission is to strengthen cooperation and coordination among local governments and address social, environmental, and economic issues that transcend local borders. The San Francisco Estuary Partnership (SFEP), administered by ABAG, is one of 28 national programs under the U.S. Environmental Protection Agency's (U.S. EPA's) National Estuary Program. SFEP's mission is to protect and restore the natural resources of the San Francisco Bay Estuary. SFEP staff members are ABAG employees. ABAG/SFEP has participated in the regional IRWM planning effort since its inception.

Oversight and Coordination Committee: ABAG is a voluntary membership and advisory organization with limited statutory authority. The agency is governed by a General Assembly and Executive Board with standing and interagency committees all comprised of local elected officials. The Bay Area Local Project Sponsors and ABAG will form a Local Project Sponsor Oversight & Coordination Committee that will meet in person or by conference call, as needed, to review progress/quarterly reports, resolve grant reimbursement or invoicing issues, and resolve outstanding matters. In addition, the ABAG/SFEP Grant Manager will provide grant oversight and coordination with all Local Project Sponsors, ensuring completeness of reporting and invoicing and ensuring that project progress is being made according to schedule and concomitant with progress reports and field visits.

Local Project Sponsor Agreements: The Local Project Sponsor Agreements between ABAG and each Local Project Sponsor will ensure that matching funds are committed and grant requirements are satisfied, which will reduce risk exposure to ABAG in executing a grant agreement with the State on behalf of the Local Project Sponsors. All agreements will have similar general conditions, but each agreement will also be tailored to the specific funding and grant requirements applicable to that project. Generally, Local Project Sponsor Agreements will address issues affecting a specific project. Issues affecting more than one project will be addressed by the Local Project Sponsor Oversight & Coordination Committee. Agreements with Local Project Sponsors will be established by ABAG staff as described below:

- Negotiate and finalize Local Project Sponsor Agreements with each Local Project Sponsor that will receive IRWM Drought grant funding, and obtain approval from the ABAG Executive Board and the governing body of each Local Project Sponsor. Each Local Project Sponsor will be expected to execute such an agreement before reimbursement is requested or distributed.
- Each Local Project Sponsor Agreement will include standard formats for reporting project progress and making reimbursement requests, dispute resolution, and other conditions as specified in the Grant Agreement between ABAG and DWR.

A discussion of project physical benefits and cost-effectiveness analysis has not been provided as these components are not applicable to the grant administration task.

File 2 of 3: Project Benefits Documentation

Documents referenced in the project benefits discussions are provided in this section. Documentation is organized by project number as listed below. As requested, only pertinent pages referenced are provided.

Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project

Project 2: Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment

Project 3: Zone 7 Water Supply Drought Preparedness Project

Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines

Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline

Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project

1. Black and Veatch, 2013. SFPUC HHWP Rim Fire Asset Recovery Plan, November 15.
2. San Francisco Public Utilities Commission (SFPUC), 2014. We Deliver website, Graphs 1 and 2.
3. Santa Clara Valley Water District (SCVWD), 2014. March Water Supply Outlook.

Reference 1

PROJECT DESCRIPTION	**FINANCE REFERENCE: CUH905-11-01**
Asset Name: Lower Cherry Aqueduct System	
Maximo Asset No.: CCDDM	**Asset Priority No.:** Critical
Physical Location: The Lower Cherry Aqueduct System is comprised of the Cherry Diversion Dam, Lower Cherry Aqueduct (LCA) with spillway gates, and the forebay. Cherry Diversion Dam: Access is from North Mountain Trail, trailhead located near Cherry Lake Road MP 11. Lat: 37.89918 N, Long: 119.93490 W. LCA: First open canal segment is located near Lat: 37.89248 N, Long: 119.94969 W and the final open canal segment ends at the entrance to Tunnel No. 5 near Lat: 37.88149 N, Long: 119.96814 W. Forebay: Located on hillside above Cottage 13 Compound, near Lat: 37.87784 N, Long: 119.96612 W.	
Asset Classification: Water	**Category of Work:** A, D
Type of Work: Emergency, Permanent	**Map Book No.:** 28, 29, 30, 37

ASSET DESCRIPTION
The Lower Cherry Aqueduct System is comprised of the Cherry Diversion Dam, Lower Cherry Aqueduct (LCA) with headgates, and the LCA Forebay. The Diversion Dam is a concrete dam that houses two sluice gates (~2 ft x 4 ft). The LCA is comprised of approximately 3 miles of pipes, tunnels, and concrete lined canals. The LCA Forebay includes a non-operational trash-rack, a sluice gate covering an abandoned penstock, and a 12-inch gate valve for the drain assembly.

ASSET FUNCTION FOR WATER & POWER DELIVERY
The Lower Cherry Aqueduct System is a critical asset, as it is the only link between the Cherry Lake and Lake Eleanor watersheds and the municipal supply. It is one of SFPUC's emergency water supplies for their 2.6 million customers. When needed to supplement supply from Hetch Hetchy Reservoir, the system delivers water from the Cherry Lake and Lake Eleanor watersheds to the Early Intake Reservoir upstream of the Early Intake Dam.

Legend

Overall Condition Rating: (1) Routine Maintenance; (2) Minor Repairs; (3) Major Maintenance or Replacement; (4) Overhaul Required for Majority of the System; (5) Complete replacement

FEMA Type of Work: Emergency Work or Permanent Work

FEMA Categories of Work: A – Debris Removal; B – Emergency Protective Measures; C – Roads and Bridges; D – Water Control Facilities; E – Buildings and Equipment; F – Utilities; G – Parks, Recreational Facilities, and Other items

Privileged and Confidential Attorney Client Communication

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ASSET ASSESSMENT & DAMAGE DESCRIPTION	OVERALL CONDITION RATING: 3

A field assessment of the Lower Cherry Aqueduct System was performed over two days by Black & Veatch on October 1, 2013, and October 2, 2013. A functional assessment was performed by Black & Veatch and HHWP to further inspect the headgates and attempt operation. A summary of observed fire damage for each system component is provided below. Complete results from the field assessment are provided in a field observation report (Reference 1).

Cherry Diversion Dam:

- Trail to the diversion dam has experienced fire damage, including a burned pedestrian bridge, damage to safety cables, eroded slopes, and trail blockage from fallen debris.
- The reliability of the trail access has become compromised due to the reduction in trail width that was caused by the fire-related slope unraveling and erosion.
- The gate house and controls structure was damaged beyond repair by the fire and is out of service.
- Headgate locks were ruined by the fire; thus the gates are locked in the closed position. During the functional assessment, gates were able to be operated.
- Headgates appear to be near end of their useful life. One gate showed signs of fire damage to the seat.
- Hydraulic system for dam sluice gates is damaged beyond repair by the fire, rendering the sluice gates inoperable.

LCA Spillway Gates:

- The wooden operator access stairs and platform for Spillway Gate E were severely burned in the fire, impairing safe access to the gate controls.

LCA Forebay:

- Wood platform for penstock gate operator was severely burned, impairing safe access to the gate operator.
- Wood cover to the drainage gate valve is burned, impairing access to the controls.
- A burned tree with soil erosion at root structure is directly up slope of the forebay which poses a safety hazard to the facility/operators.

LCA: The following fire damage to the LCA impairs the ability to convey supplemental water supply to the Mountain Tunnel.

- Fire has exposed potentially hazardous conditions, such as fallen trees and rocks.
- Damage to concrete liner as a result of rock or tree falls caused by the fire.
- Separation of concrete liner from embankment; debris from fire has wedged in the gap, increasing the damage.
- Canal is littered with debris, rocks, and tree trunks and limbs. Accumulation can lead to plugging of the spillway gates and/or the tunnel entrances and exits.
- Catchment chute along portion of LCA is burned and filled with rocks and debris.
- Large boulder likely set loose by the fire has dented a piece of the exposed pipe portion of the LCA.
- Entrance to Tunnel No. 5 is plugged with debris from the abandoned turbidity monitoring shed destroyed by the fire.

Figure 1. Lower Cherry Aqueduct (LCA) System Map

Figure 2. Dam Sluice Gate Operator Damage

Figure 3. Cherry Diversion Dam Fire Damage

Figure 4. Cherry Diversion Dam Access Trail Bridge Damage

Figure 5. Dam Headgates

Figure 6. Gate House and Controls Structure Prior to Fire

Figure 7. Burned Stairway and Platform at Spillway Gate

Figure 8. Burned Forebay Platform

Figure 9. Typical LCA Debris

Figure 10. LCA Concrete Damage Due to Tree/ Rock Fall

Figure 11. LCA Concrete Damage Worsened by the Rim Fire

Figure 12. Potential Rock Fall Hazard

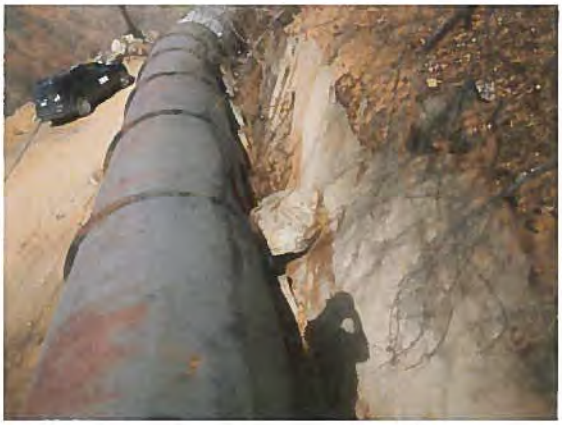


Figure 13. Damaged LCA Pipe

Figure 14. Plugged LCA No. 5 Entrance

Figure 15. Typical Damaged and Debris Filled Catchment Chute

Figure 16. Cherry Diversion Dam Access Trail Safety Cables

Figure 17. Cherry Diversion Dam Access Trail Debris

Figure 18. Forebay Drain Valve Vault Cover

SCOPE OF PROJECT

A. Alternatives Evaluation

The scope of work for the Lower Cherry Aqueduct System recovery project is to return the asset to its pre-fire condition, and given the criticality of emergency water supply quality, consideration of the following alternatives should be immediately considered:

1. Lower Cherry Aqueduct: The fire caused significant damage to the slopes along a 1-mile length adjacent to the LCA; the following alternatives were evaluated.
Option 1: HHWP to accept the post-fire condition of slopes and will perform regular maintenance of the aqueduct by clearing debris.
Option 2: HHWP will replace open canal and exposed conduit portions of LCA with a new 84-inch diameter water conveyance pipeline. This alternative project would eliminate the hazards associated with rockfalls and debris.
Option 3: HHWP will install a rock fence along the toe of slope along open canal sections of LCA. This alternative project would eliminate the hazards associated with rockfalls and debris by intercepting them uphill of the canal.

2. Lower Cherry Aqueduct: The fire caused some damage to the concrete liner; the following alternatives were evaluated.
Option 1: Repair fire-damaged concrete liner.
Option 2: Forego concrete liner repair and use the funds for an alternate project as determined by HHWP.

B. Scope of Work

The Project Scope of Work includes one or more of the following (check if "Yes"):

- ☒ Work Related to Fire Damage.
- ☒ Hazard Mitigation Project Work.
- ☒ Special Considerations Issues Included.
- ☐ Other Work Not-Related to Fire Damage
- ☒ Scope of Work Changes Pre-Disaster Conditions at Site.

The project scope of work is as follows:

1) <u>Work Related to Fire Damage</u>

The scope of the repair work for the Lower Cherry Aqueduct System includes debris removal, restoring access to the Cherry Diversion Dam, making repairs at the Cherry Diversion Dam, and maintenance and repair to the LCA and LCA Forebay. The project will include the following work items:

a) Cherry Diversion Dam
   1. Debris Removal (Category A). Remove and dispose of all burned debris from destroyed gate house and controls structure at the Cherry Diversion Dam (approx. 600 square feet) (Figure 3).
   2. Restore Trail Access to Cherry Diversion Dam (Category A and D).
      i. Remove large boulders, rocks, and vegetation blocking access trail (approx. 100 feet). (Figure 17). (Category A).

ii. Remove burned pedestrian bridge. Replace destroyed pedestrian bridge in kind. (Figure 4). (Category D).
iii. Replace damaged safety cables along trail (approx. 1,000 ft). (Figure 16). (Category D).
iv. Construct a new rock retaining walls (hand work only, due to access) – approximately 1,000 ft.
v. Construct Erosion Control Measures (hand work only – e.g. wattles, fabric, etc...) – approximately 1,000 ft.

3. Cherry Diversion Dam Repairs (Category D)
   i. Perform functional testing of Cherry Diversion Dam headgate operators.
   ii. Replace hydraulic system for operating dam sluice gates. Hydraulic system is a small, hand-powered (Figure 2).
   iii. Construct new gate house and controls structure to enable safe operation of headgates and sluice gates (Figure 6).

b) LCA Spillway Gates
   1. Replace wooden stairway and access platform in kind at Spillway Gate E (Category D). (Figure 7).

c) LCA Forebay
   1. Forebay Maintenance and Repair (Category D)
      i. Replace burned wooden platform at forebay (Figure 8).
      ii. Replace burned wood boards covering drain valve vault (Figure 18).
      iii. Remove large tree leaning toward forebay on upslope.

d) LCA
   1. LCA Maintenance and Repair (Category A and D)
      i. Remove destroyed turbidity shed and debris from Tunnel No. 5 entrance (Figure 14) (Category A).
      ii. Clear debris and rocks from LCA (approximately one mile) (Figure 9) (Category A).
      iii. Repair damaged 72-inch diameter steel pipe (Figure 13) (Category D).

2) <u>Hazard Mitigation Project Work</u>

To mitigate the significant damage caused by the fire to the slopes along a 1-mile length adjacent to the LCA, and given the criticality of emergency water supply quality, HHWP elected to implement Option 2 which is described as follows:

a) LCA Pipeline Hazard Mitigation Project. Replace open canal and exposed conduit portions of LCA with 5,500 foot long, 84-inch diameter water conveyance pipe. Lay pipe within existing open canal. Backfill open canal with sloped grade to minimize runoff infiltration. Drill holes in bottom of concrete canal at 100-foot intervals to allow drainage and prevent pipe uplift. Install K-rail with fencing along replaced canal sections to protect roadway and prohibit vehicles from driving over covered pipe. Provide 10 culverts along replaced canal section to prevent debris and runoff from damaged roadway.

3) <u>Special Considerations</u>

a) <u>Insured Asset</u>
   i) The Lower Cherry Aqueduct System asset falls within the HHWP insured facility area.

b) <u>Historic Preservation</u>
   N/A

c) Environmental Compliance
   i) Cleanup of debris within a certain timeframe, perhaps requiring installation of containment measures until such time that debris can be removed.
   ii) Treating this project as a standalone project for permitting purposes because of the nature of the restoration work involved.
   iii) Bed, Bank and Channel. Project work performed within the "bed, bank or channel" could involve requirements established under US Army Corps of Engineers permits; California State Water Resources Control Board (SWRCB) 401 certifications; or US Fish & Wildlife (USFWS) or California Department of Fish & Game (CDFG) permits.
   iv) Compliance with Stormwater Pollution Prevention Plan (SWPPP) requirements for areas larger than 1 acre or lengths exceeding 1 mile.
   v) Avoidance of historical or cultural sites.
   vi) Consideration of sensitive plants and animals.

4) Other Work Not Related to Fire Damage
   N/A

5) Summary of Changes to Pre-Fire Conditions
   a) Lower Cherry Aqueduct. In lieu of repairing the fire-damaged LCA concrete liner, HHWP proposes to implement an alternate project (a permanent restoration project located within the declared disaster area). The definition of the alternate project is under review by HHWP.
   b) As noted above, the proposed LCA Pipeline Hazard Mitigation Project represents a change to the original site conditions.

C. Recovery Project Completion Timelines

	Completion of Eligible Work			
Work Element	0 -2 Months	0-3 Months	3-6 Months	6-18 Months
Debris Removal	☐	☒	☐	☐
Restore Trail Access to Cherry Diversion Dam	☐	☐	☒	☐
Cherry Diversion Dam Repairs	☐	☐	☐	☒
LCA and LCA Forebay Repairs	☐	☐	☐	☒
LCA Pipeline Hazard Mitigation Project	☐	☐	☐	☒

ESTIMATE OF RESOURCES

The estimated resources required for the project are summarized below.

1. Materials and carpentry crew to rebuild gate house and controls structure, pedestrian bridge, stairway, and access platforms.
2. Crews to clear debris and make repairs to access trail, hand-construct rock retaining walls, and apply erosion control measures.
3. Crews to clear debris at the LCA.
4. Helicopter services are expected to be needed to clear debris from the Cherry Diversion Dam and access trail, and bring in materials for permanent work.
5. Design and construction resources for LCA Pipeline Hazard Mitigation Project.

ESTIMATED COST AND SCHEDULE

The estimated cost and schedule for each phase of the recovery project is provided below:

Project Phase		Fire Damage Estimated Cost	Hazard Mitigation Estimated Cost[1]	Other Work Estimated Cost	Planned Start	Planned Completion
Assessment		$20,000	-	-	Sept. 2013	Oct. 2013
Design		$64,000	$278,000	-	January 2014	May 2014
Construction		$827,000	$3,602,000	-	See Below	See Below
Construction Management		$125,000	$541,000	-	-	-
Project Closeout		$60,000	$81,000	-	Nov. 2014	January 2015
City Admin	(10%)	$110,000	$451,000	-		
Project Contingency	(10%)	$121,000	$496,000	-		
Subtotal of Estimated Costs		$1,327,000	$5,449,000	-		
Total Project Estimated Cost:		**$6,776,000**				

Planned Construction Schedule:

Construction Activity	Planned Start	Planned Completion
Debris Removal	11/18/2013	12/17/2013
Restore Access to Diversion Dam	March 2014	May 2014
Cherry Diversion Dam Repairs	May 2014	November 2014
LCA Maintenance and Repair	May 2014	November 2014
LCA Pipeline Hazard Mitigation Project	May 2014	November 2014
LCA Forebay Maintenance	May 2014	November 2014

[1]LCA Pipeline Hazard Mitigation Project

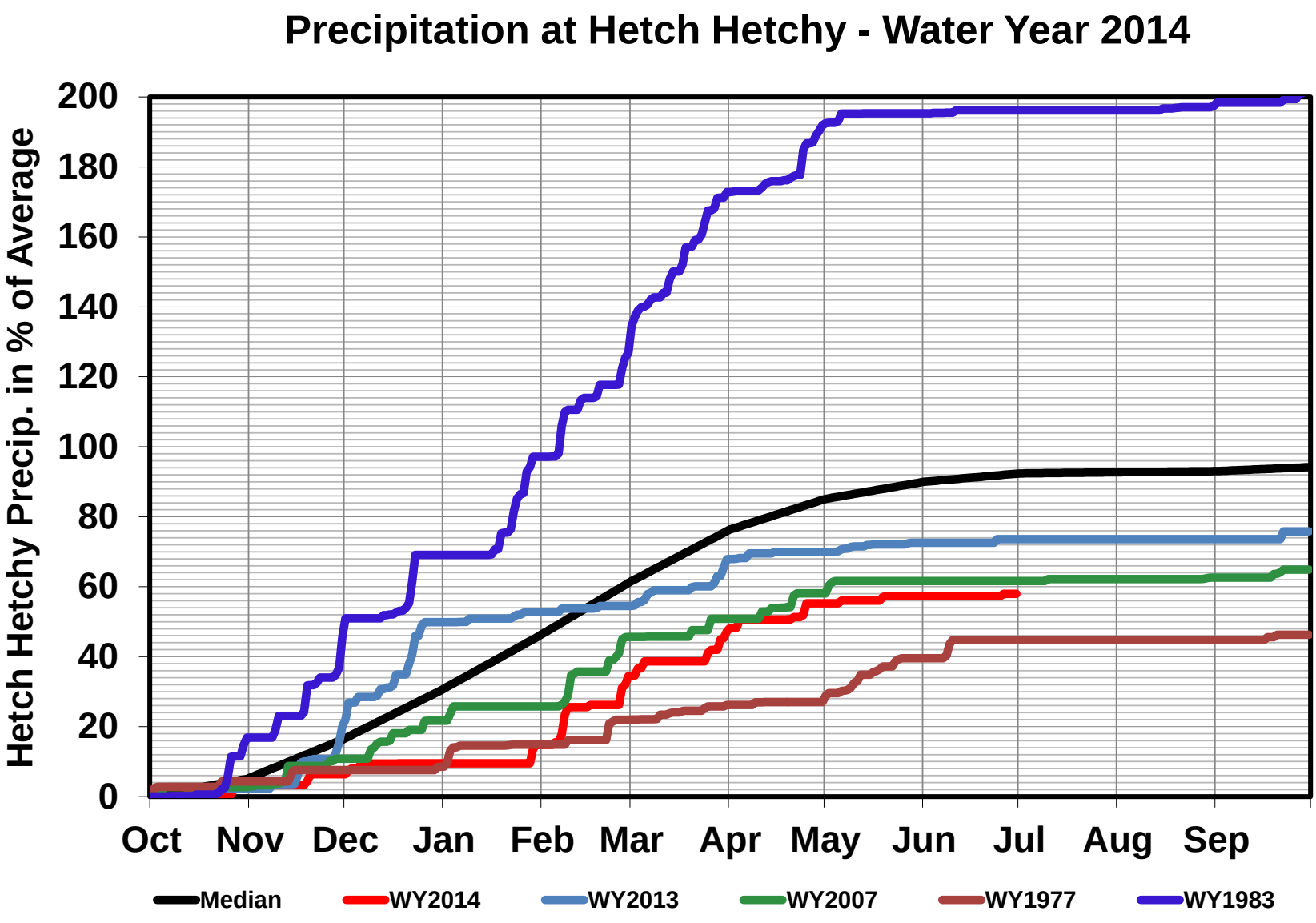
PROJECT COST BY FEMA CATEGORY

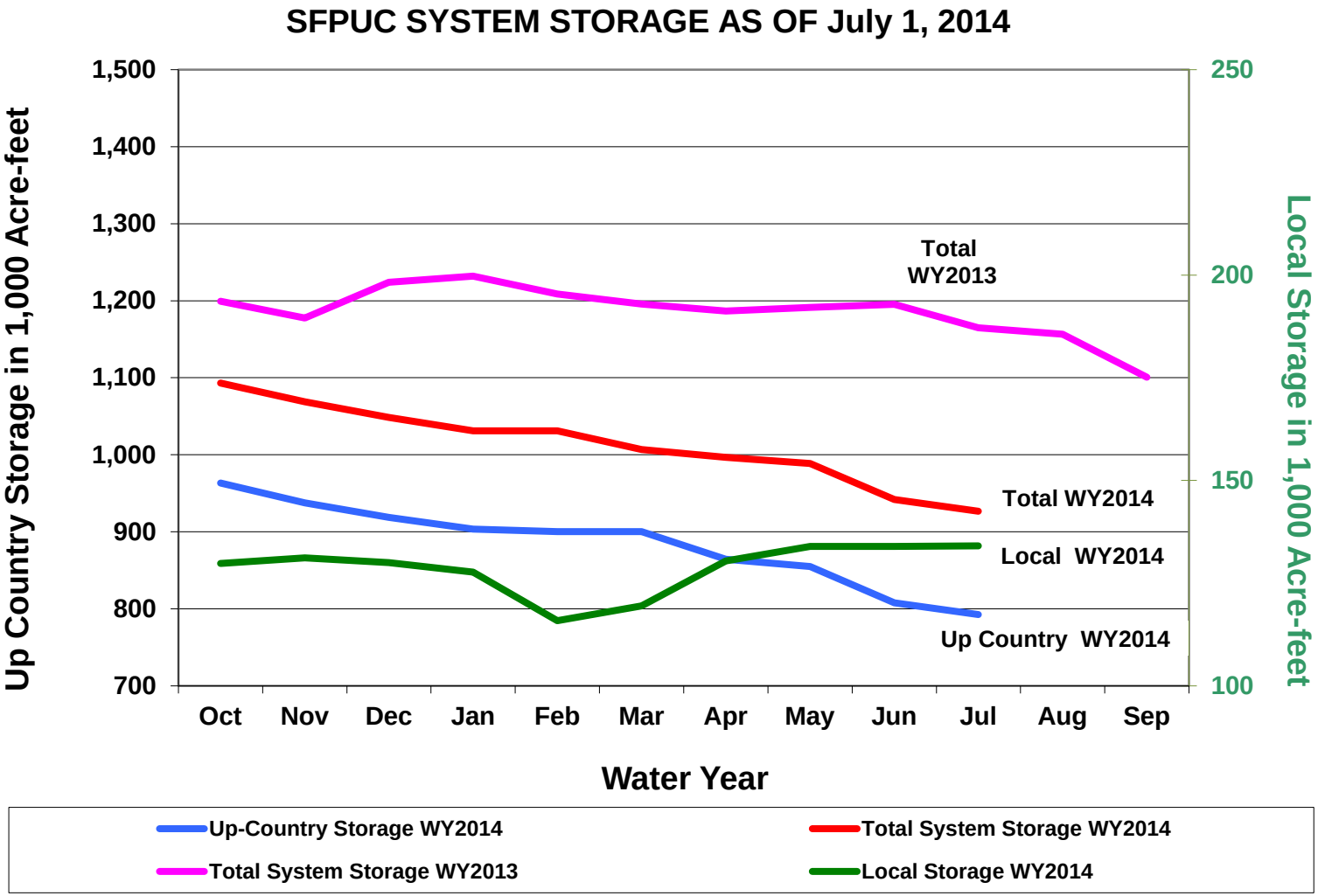
Category	% of Project	Estimated Cost
A – Debris Removal	2%	$140,000
B – Emergency Protective Measures	-	-
C – Roads and Bridges	-	-
D – Water Control Facilities	98%	$6,636,000
E – Buildings and Equipment	-	-
F – Utilities	-	-
G – Parks	-	-

REFERENCES

1. CS-340E, Task Order No. 11, Lower Cherry System Assessment; Report – Lower Cherry System Assessment; Black & Veatch Corporation, October 2013.

Reference 2


Precipitation at Hetch Hetchy - Water Year 2014
Hetch Hetchy Precip. in % of Average
200
180
160
140
120
100
80
60
40
20
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Median
WY2014
WY2013
WY2007
WY1977
WY1983


SFPUC SYSTEM STORAGE AS OF July 1, 2014
Up Country Storage in 1,000 Acre-feet
Local Storage in 1,000 Acre-feet
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
250
200
150
100
Total WY2013
Total WY2014
Local WY2014
Up Country WY2014
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Water Year
Up-Country Storage WY2014
Total System Storage WY2014
Total System Storage WY2013
Local Storage WY2014

Reference 3

Santa Clara Valley Water District

FC 1703 (08-17-11)

Meeting Date:	3/25/14
Agenda Item No.:	4.1
Manager:	J. Maher
Extension:	2073
Director:	All

SUPPLEMENTAL BOARD AGENDA MEMORANDUM

SUBJECT: Update on 2014 Water Supply and Drought Response

REASON FOR SUPPLEMENTAL MEMORANDUM:

To allow for inclusion of the most current water supply information.

RECOMMENDATION:

Receive, review, and discuss updated information on 2014 water supply and drought response.

SUMMARY:

Severe drought continues to impact both statewide and local water supply conditions. On February 25, the Board approved a resolution setting a county-wide water use reduction target equal to 20 percent of 2013 water use, or approximately 72,000 acre-feet, and recommending that retail water agencies, municipalities and the county implement mandatory measures as needed to accomplish the target. This action was based on the District's Water Shortage Contingency Plan[1] and estimated 2014 water supply conditions that showed groundwater reserves could reach the Stage 3 ("Severe") level by the end of the year if water use reduction measures are not implemented. Updated information on 2014 water supply and operations is presented, along with an update on the District's drought response strategies.

A. Update on 2014 Water Supply and Operations

Despite some precipitation since the last update on February 25, water supply conditions statewide and locally have not measurably improved. Table 1 shows updated estimates of 2014 water supply and use in Santa Clara County. End-of-year groundwater storage is still projected to drop to the Stage 3 "Severe" range (200,000 to 250,000 acre-feet) if the 20 percent water use reduction target is not achieved.

1. Imported Water Supply

In this update, District imported water supplies have been reduced by 5,420 acre-feet to reflect more conservative estimates of 2013 State Water Project (SWP) carryover deliveries and supplemental water. The Bureau of Reclamation's (Reclamation's) February announcement of 2014 Central Valley Project (CVP) allocations provided 50% of "historic use" for municipal and industrial water service, confirmed by letter to equal 65,000 acre-feet for the District. However, the unprecedented allocations of only 40% to senior water rights holders and wildlife refuges, along with the State Water Resources Control Board's

[1] Santa Clara Valley Water District's 2010 Urban Water Management Plan, http://www.valleywater.org/Services/WaterSupplyPlanning.aspx

(SWRCB's) restriction of Delta pumping to "public health and safety," have raised more questions and uncertainty over how much water will really be available for CVP and SWP contractors this year, and how the extremely limited supplies will be allocated.

In late February, the Department of Water Resources (DWR) informed SWP contractors that only 45% of 2013 carryover water could be delivered in 2014 due to restricted export conditions. For the District, this meant that its 27,478 acre-feet of carryover water was reduced to 12,365 acre-feet. In the weeks that followed, several smaller storms allowed the State and federal projects to export slightly more than the minimum "public health and safety" levels allowed by the SWRCB, and this increased 2013 SWP carryover estimates from 45% to 86%, restoring the District's carryover to 23,631 acre-feet. To support the DWR's ability to pump 2013 SWP carryover water, and to support Reclamation's ability to pump 2014 CVP municipal and industrial water, the District and other contractors were requested to prepare and submit public health and safety justifications.

With critically dry conditions and limited storage available in Sacramento valley reservoirs, fresh water flows through the Delta are not sufficient to maintain water quality, which can effectively limit or eliminate imported water as a source of supply for the treatment plants. Modeling work completed by DWR showed that, absent preventive measures, salinity in parts of the Delta later this summer could increase up to 20 times the level of current standards. DWR and Reclamation are working with State and federal fishery agencies, Delta interests, and the SWRCB to expedite the installation of temporary barriers in May to protect water quality in the central and south Delta. The proposed barriers would be installed at the entrance to three Delta channels: Sutter Slough, Steamboat Slough and False River. As fishery conditions allow, opening the Delta Cross Channel gates to allow more Sacramento River water to flow into the interior Delta could also help maintain water quality.

Santa Clara County relies on water imported from the Sacramento-San Joaquin River watershed for 55 percent of its supply, on average. The District’s State Water Project (SWP) and Central Valley Project (CVP) contracts are the primary sources of supply for its three drinking water treatment plants. Some cities are also served imported water directly by the San Francisco Public Utilities Commission’s (SFPUC's) Hetch-Hetchy Project.

The SFPUC has called for 10% voluntary water use reduction by Hetch-Hetchy customers, and suspended "take or pay" provisions of contracts to encourage reduced use. The 10% target is applied to projected 2014 demands. For this update, the 10% target has been applied more conservatively to actual 2013 Hetch-Hetchy water use in Santa Clara County (approximately 55,000 acre-feet), resulting in estimated 2014 Hetch-Hetchy supplies of 49,500 acre-feet. A final determination will be made by the SFPUC in April whether to maintain the current program, or impose more restricted contract allocations.

Table 1. Estimated 2014 Water Supply and Use

Estimated Supplies (AF)	Jan. 28, 2014 Initial Outlook Dry Conditions (90% exceedence)	Feb. 25, 2014 Update Critically Dry Conditions (99% exceedence)	Mar. 25, 2014 Update Critically Dry Conditions (99% exceedence)
Local surface water	34,000	26,300	26,300
Natural groundwater recharge	47,100	38,600	38,600
Imported – District	149,000	106,200	100,780
Imported – Hetch Hetchy	57,000	44,000	49,500
Recycled water	23,000	23,000	23,000
Total	**310,100**	**238,100**	**238,180**
Estimated Use (AF)			
Groundwater pumping	173,200	201,200	206,300
Treated water deliveries--District	121,000	107,300	95,000
Surface water, SJWC treated water	5,000	300	2,000
Imported—Hetch Hetchy	57,000	44,000	49,500
Recycled water	23,000	23,000	23,000
Total	**379,200**	**375,800**	**375,800**
Net from Groundwater Reserves (AF)	**69,100**	**137,700**	**137,620**
Estimated End-of-Year Groundwater Storage (AF)	**273,900**	**205,300**	**205,380**

2. Local Reservoirs and Groundwater Recharge

Local rainfall and runoff through March has continued to track critically dry hydrology. At present, total reservoir storage is about 54 percent of restricted capacity, and 55 percent of 20-year average total storage for March. Approximately 85% of the increase in storage since February 25 is imported water pumped into Anderson Reservoir. Local inflow continues to track critically dry year hydrology. Although some rainfall could still occur in April and May, it is anticipated that little runoff would occur due to dry watershed conditions. Storage levels in Stevens Creek (13%), Guadalupe (15%), Almaden (24%), Chesbro (15%), and Uvas (13%) remain below their 20-year averages.

As the primary strategy to ensure adequate supply for the District's three drinking water treatment plants this summer, imported water is currently being pumped into Anderson Reservoir with the goal of filling it to the maximum level permitted by current seismic restrictions (61,000 acre-feet). Also, releases from Coyote Reservoir have been stopped to maximize water available to the treatment plants from the Anderson-Coyote system.

In order to conserve the limited supplies of imported water for the treatment plants, nearly all releases of imported water to creeks and ponds for groundwater recharge were discontinued at the end of January, with the exception of releases to Madrone Channel and upper Coyote Creek. Staff has been coordinating with the regulatory agencies and other stakeholders regarding the District's raw water operations. A March 2014 version of the Reservoir and Creek Dry Back Conditions Neighborhood Update (Attachment 2) has been prepared, posted at many of the recharge facilities, distributed to the public and placed on the District's Drought 2014 website (http://www.valleywater.org/drought2014/).

3. Untreated Surface Water Deliveries

In addition to eliminating nearly all groundwater recharge to conserve limited surface water supplies for drinking water, the District's operations plans include curtailment of untreated surface water deliveries. Over the years, a limited number of permits have been issued by the District to allow untreated surface water to be diverted from District facilities and creeks to irrigate landscape, agriculture, golf courses and other non-potable uses. Water delivered under current permits (99 total) is approximately 3,500 acre-feet annually, and represents approximately 1 percent of county's municipal and industrial water use, and 5 percent of the county's agricultural water use. Since February 25, staff has initiated communication with these surface water customers to let them know that alternate sources of supply will need to be used in 2014, and that alternate sources will need to be developed if not readily available.

On March 13, a meeting was held with surface water permittees that receive deliveries from District pipelines to discuss the curtailment of surface water. After receiving feedback from the surface water permittees, a letter was prepared and sent to all (72) pipeline surface water users on March 21, 2014. The letter notifies them that releases of District surface water will cease on May 1, 2014, but provides for extensions of time to develop alternate sources of supply. Extensions of time will be considered for agricultural and commercial users that need to refurbish a well or undertake other work to access groundwater or another source of supply. Staff is prepared to assist surface water permittees with pursuit of grants or other drought relief funding, expedited well permitting, and other actions.

The District currently has 27 permittees that divert surface water from creeks. Given reduced releases from District reservoirs, elimination of imported water releases and lack of rainfall, the ability to divert from creeks has already been severely limited for some time. Staff has been in communication with creek diverters and will be following up with a formal letter shortly notifying them of the unavailability of District supply.

4. Treated Water Operations

With limited surface water supplies, the District expects to be able to meet only 80% of treated water contract demands from March through December 2014. Staff has been proactively working with the treated water retailers, meeting individually with each retailer and scheduling joint retailer subcommittee meetings, to inform them of the need to cut back treated water deliveries by 20%. On March 20, a formal letter and water delivery schedule reflecting 20% reductions from March through December were sent to each retailer requesting concurrence with the reduced schedule.

A primary objective of the District is continued delivery of safe, clean drinking water from its treatment plants. Source water quality continues in March to be affected by the drought. Treatment plant operations are impacted by elevated bromide and total organic carbon levels from the South Bay Aqueduct and taste and odor compounds from the San Luis Reservoir. Staff is vigilant and has increased water quality monitoring while adjusting treatment strategies to meet various water quality objectives. Treatment costs are on the rise and are closely monitored.

The Campbell Well Field, which has been under development for a number of years, is near completion with operational testing of the well field anticipated in April. The well field has a capacity of three million gallons per day. Although that is less than one-tenth of the average flow on the West Pipeline, every bit of drinking water is precious this year and the District expects to be operating the well field as needed this summer to help meet treated water demands.

B. Drought Response

1. Water Use Reduction Target

Achieving a 20 percent water use reduction in 2014 will require close coordination with retail water agencies, local municipalities and the County of Santa Clara to coordinate public outreach and implementation of conservation programs, and to put in place and enforce appropriate ordinances.

Staff has been meeting regularly with the water retailers through the recently formed Ad Hoc Drought Preparedness Committee. In addition, the Water Retailers' Water Conservation Subcommittee and the Communications Subcommittee have been coordinating efforts to meet the target. Attachment 3 summarizes drought response actions to date by the water retailers and county. Once city/county ordinances are adopted staff will develop a matrix summarizing the various restrictions in place. The District worked with retail water agencies and stakeholders in past years to develop a model drought ordinance, which is similar to the one adopted by the City of Morgan Hill in 2009 (Attachment 4). Progress on the adoption and implementation of ordinances will be included in a monthly report that summarizes actions to date as well as water savings achieved, both county-wide and by water retailer.

2. Drought Communication and Outreach Efforts

Communication and outreach efforts have increased significantly since late January to increase awareness of the drought situation due to the deteriorating water supply outlook, the Governor's January 17 Declaration of Drought Emergency, increasing media attention and the District's call for a 20 percent water use reduction.

A detailed summary of current activities to support media relations, Board and key stakeholder outreach, development of drought program materials and marketing campaigns, and public education and customer service is provided in Attachment 5.

Key initiatives being implemented include:

- ✓ An advertising program to promote reduced water use and the District's conservation program will take place from late March through May, using $350,000 of the outreach funds approved by the Board in January. A cost-effective and broad advertising program has been planned that includes print, radio, cable TV, online and ethnic media outlets to run ads in Spanish, Vietnamese and Chinese.
- ✓ The Board's newly established Water Conservation Ad Hoc Committee will provide a forum for engaging stakeholders and the public in discussion of prospective new drought response measures and conservation program initiatives.
- ✓ Presentations to the District's Management Leadership Team and all-user email messages from the CEO are keeping employees abreast of water supply conditions, board actions and informational resources.
- ✓ For all residents, District staff created a new one-stop resource: www.valleywater.org/Drought 2014 web site that contains a comprehensive and continuously updated collection of materials related to water supply conditions, impacts and drought response resources. In addition, the save20gallons.org long-term conservation campaign site has been updated with current drought information.
- ✓ A new Drought Hotline (408-630-2000) has been created as well as a 2014 Drought topic button on Access Valley Water, both in order to facilitate the logging, tracking and fulfilling of customer requests for information.

Building on what has already been put in place, staff is currently developing a number of ideas for expansion of marketing and community outreach efforts in addition to activities that are underway or in planning for the summer and fall. These include:

- The District's annual countywide mailer is scheduled to be completed and mailed in May; in addition to significant messaging about the new SVAWPC, it will equally emphasize water use reduction messages;
- Staff is establishing an electronic drop-box feature in order to share electronic advertising, messaging and multimedia tools with retailers and partners;
- In order to ensure logging in, tracking and responding effectively to the large volume of inquiries being received, additional staff resources are being secured to serve as a full-time drought customer service coordinator;
- Internal staff resources are also being secured to help with scheduling of speaker's bureau presentations and staffing numerous community event invitations;
- Having dedicated customer service staff in place for drought response will help gather information from the various units in the organization receiving inquiries, identify trends in the nature of the inquiries, identify opportunities for development of materials and a frequently-asked-questions document, and enable reporting on the District's responsiveness to the Board and community on drought issues;
- Staff is exploring new concepts for regional advertising with Bay Area agencies, as well as a potential focused summer campaign based on seasonal needs as discussed at the Board Water Conservation Ad Hoc meeting;
- Staff is researching promotional items that can supplement the usual inventory of conservation items for use at summer community events.

To reach the 20 percent water use reduction target, additional resources will be required, including a budget for a more extensive summer ad campaign. In 2008, BBC Research &

Consulting prepared a Conservation Marketing Plan (Plan) for the District that recommended a reserve of $700,000 (in any given year) for emergency conservation and marketing campaigns to support drought management. The plan further recommended long-term growth in the District's general conservation marketing budget, with a funding level of $1,500,000 recommended in FY2013. A recommended budget adjustment for FY2013 will be included in the next update on 2014 water supply and drought response.

3. Conservation Program

Due to the increased media attention, there has been a significant increase in inquiries from the public and participation in District long-term conservation programs. The number of calls to the water conservation hotline has doubled and interest in the Landscape Rebate Program has quadrupled (both compared to the same time last year).

The Board Ad Hoc Water Conservation Committee will be examining the District's long-term conservation programs and discussing which ones might benefit from an increased rebate. Staff will return at a future Board meeting with details of an augmented program and a recommended budget adjustment. Also, to help facilitate new ideas for saving water, staff will be expediting the next round of funding for the Safe, Clean Water Conservation Research Grant program. Staff also plans to increase the amount of funding available and open it up to individuals and for-profit companies (these were not eligible for the first cycle).

4. Recycled Water Program

Non-potable recycled water production in January and February was 2,545 acre-feet, tracking 172% of the five year average for the same period. For calendar year 2014, recycled water use is projected to total 23,000 acre-feet, compared estimated actual recycled water use of 20,516 acre-feet in 2013.

The drought has raised greater interest in expansion of recycled water, both non-potable water from existing systems as well as accelerated development of potable reuse. In accordance with Board policy, the District plans to expand recycled water use to meet at least 10 percent of County demand by 2025 (a total of 40,000 to 45,000 acre-feet). To help meet this target, the District is currently constructing the Silicon Valley Advanced Water Purification Center which is expected to be completed by summer 2014. In addition the District is designing several major recycled water pipelines in Sunnyvale and Gilroy area, and planning and pursuing funding for short-term as well long-term reuse projects in the county.

5. State and Federal Drought Relief and Funding

Staff is tracking a number of State and federal legislative initiatives aimed at providing drought relief and funding to offset costs of drought response and accelerate water supply and water use efficiency projects.

The California Emergency Drought Relief Act of 2014 (S 2016) was introduced by Senator Feinstein in early February. A summary of S2016 was attached to the February 25th Board agenda memo, including provisions for increased federal disaster assistance, including

funding authorizations for WaterSMART grants, and reauthorization of the CALFED Bay Delta program through 2018. At present, a hearing on S2016 has not been scheduled.

On February 28, Congressman Costa introduced a package of legislation (HR4125, HR4126, and HR4127) to advance the construction of storage projects in California, including: 1) the expansion of Shasta Dam, 2) the expansion of San Luis Reservoir; and 3) the Upper San Joaquin River Storage. A summary of this federal legislation is provided in Attachment 6. Increased storage is part of a comprehensive solution to address water reliability, along with water conservation, recycling, groundwater storage, water transfers, and other water management tools needed to ensure water supply reliability. Additional surface storage provides flexibility to California's constrained water management system. Surface storage is useful in providing drought protection, releasing water at specific times for water quality and environmental benefits, contributing to flood management, mitigating for lost snowpack due to climate change, and in responding to other unforeseen circumstances.

Staff is also evaluating opportunities related to State legislation introduced in February to provide drought relief for communities and funding to increase local water supplies. Much of the $647 million in proposed funding under is accelerated expenditure of voter-approved Proposition 84 and Proposition 1E bonds (a total of $549 million) for infrastructure grants to support enhanced water conservation, recycled water, groundwater management, and development of local supplies. A complete summary will be provided with the April udpate of 2014 water supply and drought response.

6. District Asset Management Opportunities

Staff continues to assess opportunities to inspect and rehabilitate facilities that are otherwise not accessible, including dams, reservoirs and groundwater recharge facilities. Some groundwater recharge ponds have been not been out of service for years, or in some cases, decades. Staff initiated projects to clean the Los Capitancillos, Guadalupe, Alamitos, and Main Ponds this spring. A plan is being developed to clean other recharge ponds later in the year.

Staff is also developing a plan to replace/upgrade hydraulic lines at Stevens Creek, Guadalupe, Almaden, Chesbro and Uvas Dams, and is investigating replacement of downstream valves at Uvas and Chesbro Dams, as well as replacing cables and inspecting Coyote Percolation Dam. As these projects are better defined, staff will return to the Board with recommendations for any needed budget adjustments.

FINANCIAL IMPACT CHANGE:

Implementing measures to achieve a 20 percent water use reduction target in 2014 could reduce Water Utility revenues by $30 million to $40 million, depending on whether reductions occur in treated water or groundwater deliveries, and depending on the distribution of reductions between the District's north county and south county groundwater charge zones. Staff is currently evaluating the impact of this water use reduction target on FY15 Water Utility financial planning. In addition, increased costs are being incurred for conveyance pumping, treatment plant operations, conservation programs and public outreach, and other drought response measures. To accommodate reduced revenues and increased costs, it is anticipated that

adjustments will be needed to reduce other operating costs and delay projects in the Water Utility Capital Improvement Program.

CEQA:

The recommended action does not constitute a project under CEQA because it does not have a potential for resulting in direct or reasonably foreseeable indirect change in the physical environment.

ATTACHMENTS:

Attachment 1, Staff Presentation
Attachment 2, Neighborhood Update, March 2014: Reservoir and creek dry back conditions
Attachment 3, Santa Clara County Retailer Drought Response Actions 2014
Attachment 4, City of Morgan Hill Drought Ordinance
Attachment 5, Santa Clara Valley Water District, Summary of Drought Communication and Outreach Efforts
Attachment 6, Summary of Federal Legislation for California Storage Projects (Costa)

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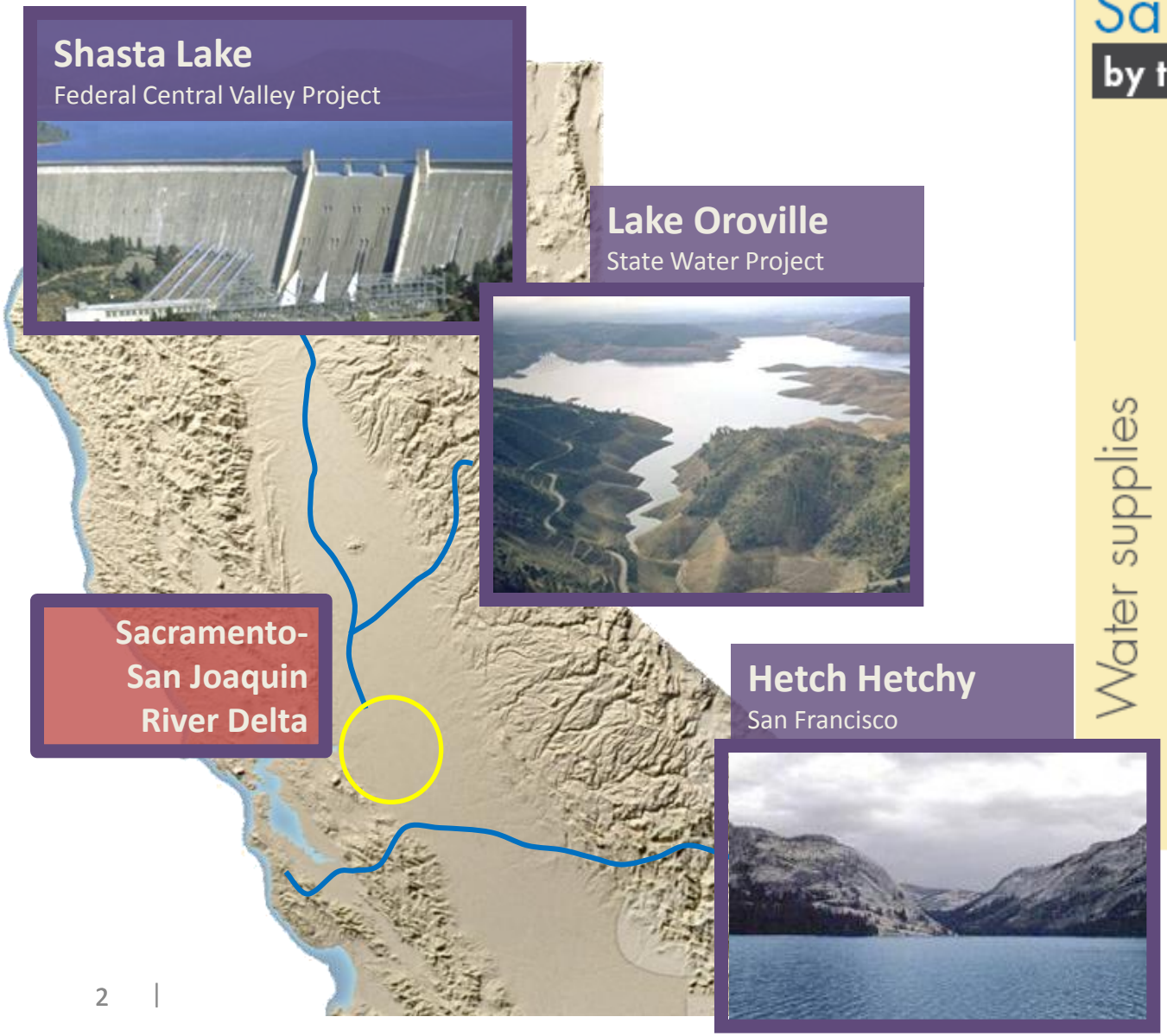
Update on 2014 Water Supply Outlook

February 25, 2014

Santa Clara Valley Water District

Sources of Supply for Santa Clara County



Santa Clara County

by the numbers

Water supplies

30% local water
- 15% natural groundwater
- 10% from reservoirs to groundwater
- 5% from reservoirs to drinking water treatment plants

55% imported water
- 15% thru Delta to replenish groundwater
- 25% thru Delta to drinking water treatment plants
- 15% from Hetch Hetchy system

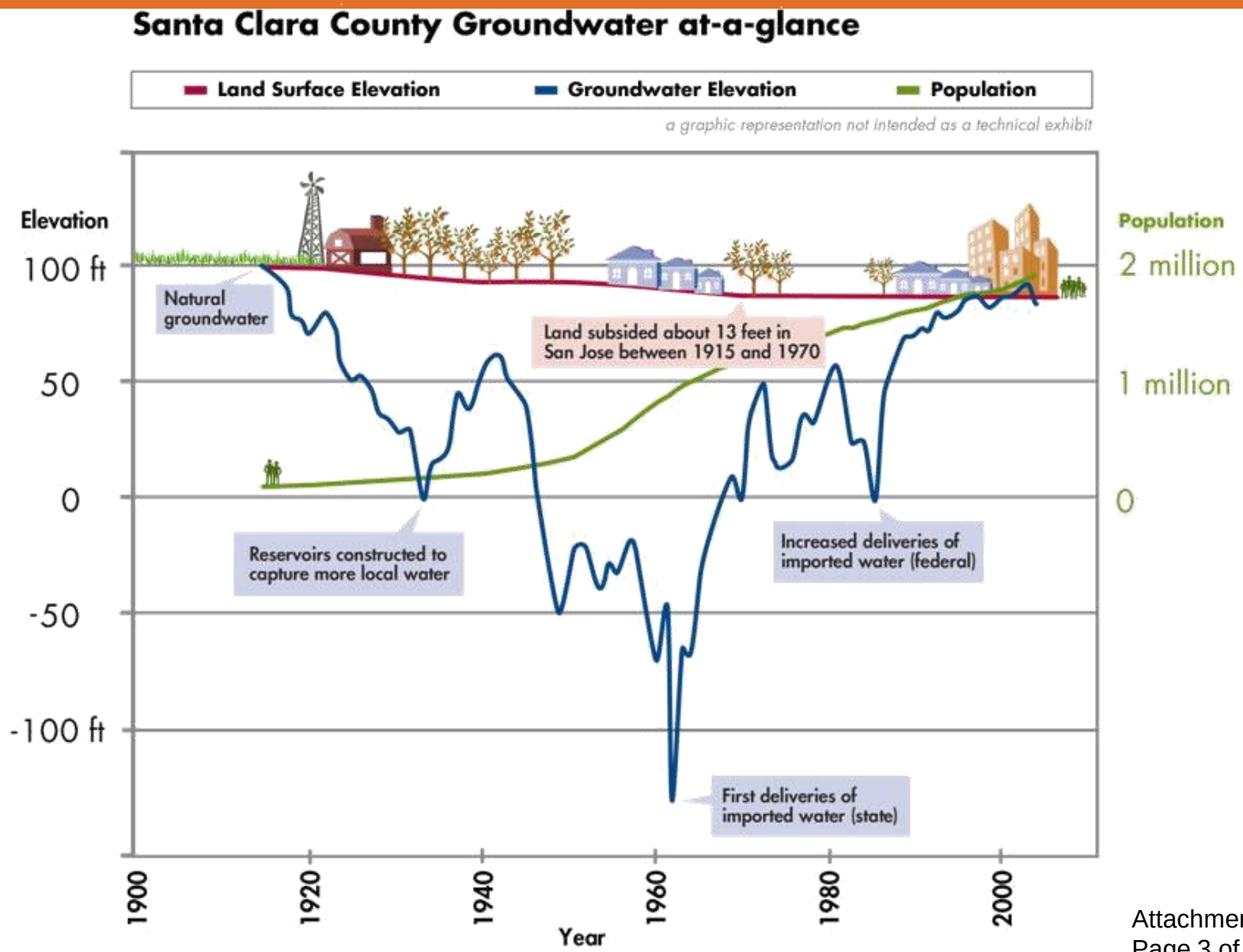
5% recycled water

90%

10% Water Conservation

100%

Local and Imported Water are Needed to Maintain Groundwater and Prevent Land Subsidence



Water Shortage Contingency Plan

From District's 2010 Urban Water Management Plan

Stage	Title	Projected End-of-Year Groundwater Storage (AF)	Suggested Short-Term Reduction in Water Use
1	Normal	Above 300,000 AF	None
2	Alert	250,000 AF to 300,000 AF	0 – 10%
3	Severe	200,000 AF to 250,000 AF	10 – 20%
4	Critical	150,000 AF to 200,000 AF	20 – 40%
5	Emergency	Less than 150,000 AF	Up to 50%

Board Adopted Resolution on February 25

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Santa Clara Valley Water District that **a water use reduction target equal to 20 percent of 2013 water use is called for through December 31, 2014**, and it is further recommended that **retail water agencies, local municipalities and the County of Santa Clara implement mandatory measures as needed** to achieve the 20 percent water use reduction target.

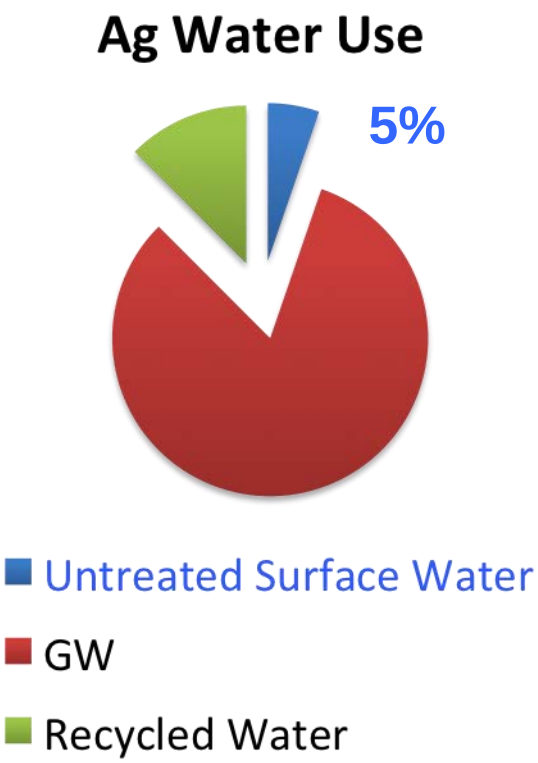
Update on 2014 Water Supply

Estimated Supplies (AF)	Jan. 28, 2014 Initial Outlook	Feb. 25, 2014 Update	Mar. 25, 2014 Update
Local surface water	34,000	26,300	26,300
Natural groundwater recharge	47,100	38,600	38,600
Imported – District	149,000	106,200	100,780
Imported – Hetch Hetchy	57,000	44,000	49,500
Recycled water	23,000	23,000	23,000
Total	**310,100**	**238,100**	**238,180**
Estimated Use (AF)			
Groundwater pumping	173,200	201,200	206,300
Treated water deliveries--District	121,000	107,300	95,000
Surface water, SJWC treated water	5,000	300	2,000
Imported—Hetch Hetchy	57,000	44,000	49,500
Recycled water	23,000	23,000	23,000
Total	**379,200**	**375,800**	**375,800**
Net from Groundwater Reserves (AF)	**69,100**	**137,700**	**137,620**
Est. End-of-Year Groundwater Storage (AF)	**273,900**	**205,300**	**205,380**

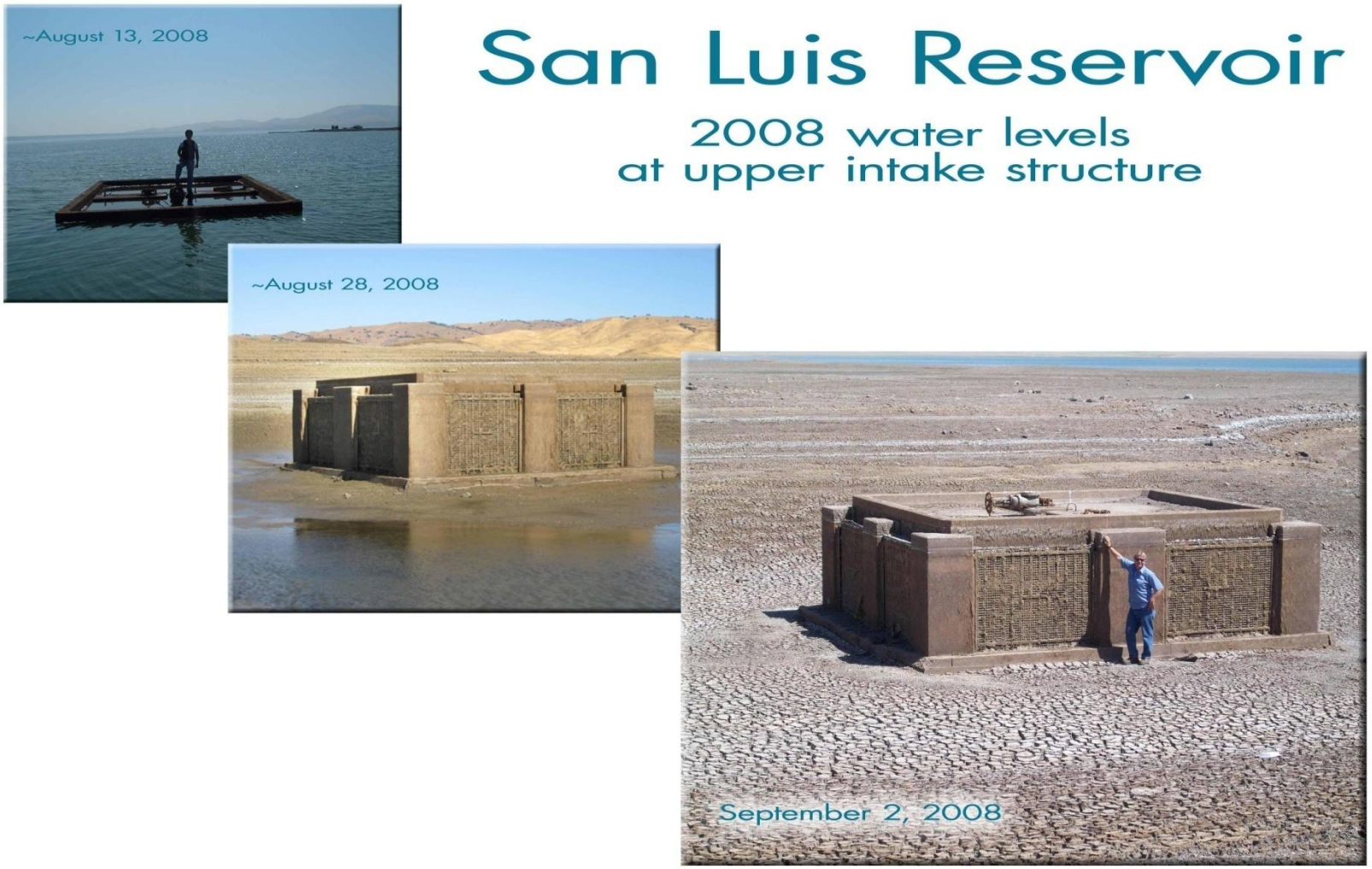
2014 Operational Challenges

- Limited treatment plant supplies
- Delta water quality
- San Luis Reservoir “low point”
- Untreated surface water deliveries
- Dry reservoirs, creeks and recharge ponds

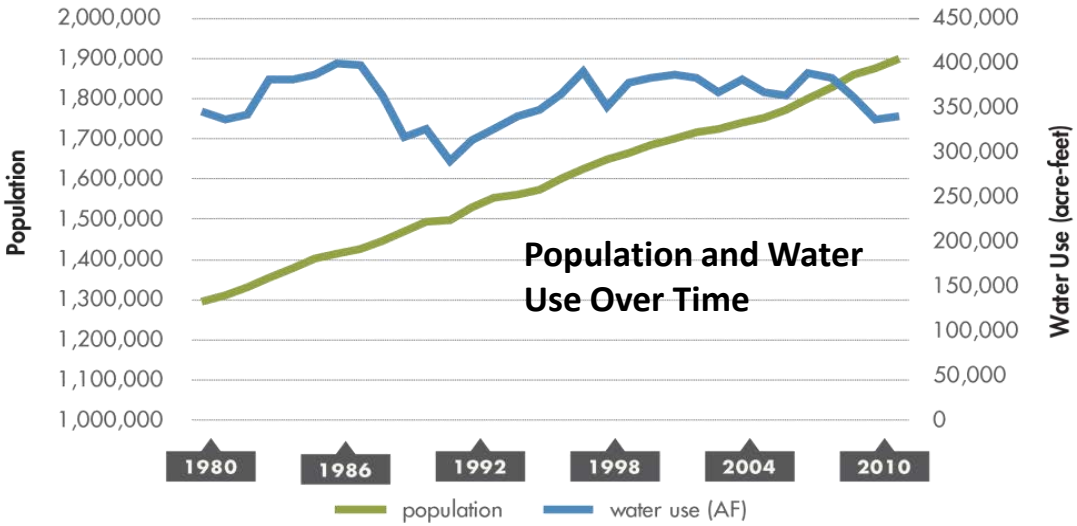
Untreated Surface Water

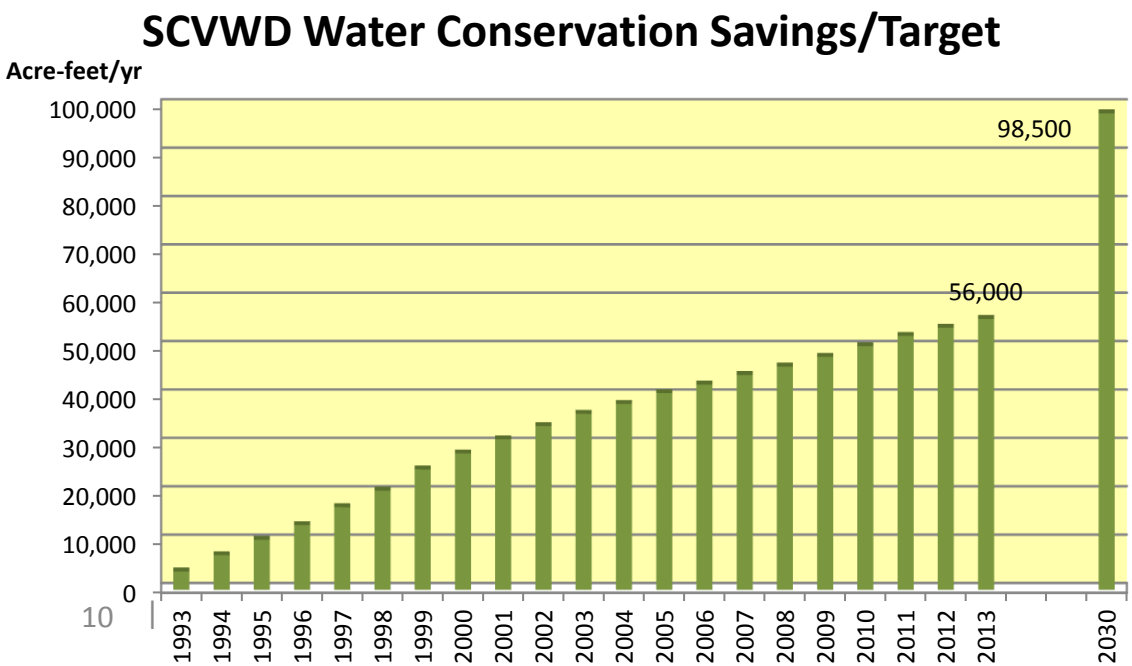


2014 Operational Challenges



Water Conservation Program = Long-Term Savings





Drought Communications and Outreach

- To achieve call for 20% water use reduction

Media relations

Ethnic media tour of SVAWPC

Board and key stakeholder outreach

- Board Water Conservation Ad Hoc
- Retailer Communications and Conservation committees
- Message distribution to key stakeholders
- Coordination with state and regional water agencies
- Government relations outreach to advocacy stakeholders, the State Legislature, and Congress

ACWA Campaign

Public education and customer service

- Speakers bureau presentations and other requests
- Informed employees
- valleywater.org/Drought2014
- Save20gallons.org
- Drought hotline: 408-630-2000
- Access Valley Water - drought
- E-Newsletter and social media

Program materials and marketing

Fact Sheet
Water Conservation Program Updates

Santa Clara Valley Water District

Updates and New Programs

- **New rebate amounts for High-Efficiency Toilet Rebate program.** Replace your inefficient toilets and you may be eligible to receive up to $125 per PREMIUM model Hig Efficiency Toilet and up to $50 per Non-PRE High-Efficiency Toilet, no pre-inspection requ For more information or to receive a High Efficiency Toilet Rebate Program Application please call the District's contractor, ConserVi

FREQUENTLY ASKED
FAQ
QUESTIONS

Santa Clara Valley Water District

Indoor Tips for Residents

No cost, easy to do

- Take shorter showers—2.5 gallons/minute*

Graywater

What is graywater?

Graywater is water from showers, bath tubs, washing machines, and bathroom sinks. It is water that contains some soap and detergents but is clean enough to water plants. Water from toilets or wash water from diapers is never considered graywater. Kitchen sink water is not considered graywater in California.

Why use graywater?

Graywater helps conserve our drinking water supply, decreases water and wastewater utility bills, decreases input to septic systems, and reduces burden on wastewater treatment facilities. Another benefit of using graywater is that it connects us to our water supply, helping us understand where our water comes from and where it goes. Becoming conscious of our

Planned and prospective activities

- Countywide mailer to all residences in SCC
- Sharing information with retailers and partners
- Drought customer service coordinator
- Possible regional advertising campaign
- Summer season advertising
- Expanded community visibility
- New promotional giveaway items

Questions?

Valleywater.org
Save20gallons.org

Santa Clara Valley Water District

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Neighborhood Update - March 2014

Reservoir and creek dry back conditions

Santa Clara Valley Water District

Los Capitancillos groundwater recharge pond in South San Jose is at its lowest level in years.

Lack of rainfall continues to impact creeks and reservoirs

To conserve water in the midst of one of the driest seasons on record, the Santa Clara Valley Water District is modifying its operations. These changes will impact creek flows and groundwater recharge pond water levels in your neighborhood and throughout the valley.

Despite last year's dry conditions, the water district carefully managed its operations so that our county was able to start 2014, after two dry years, with normal groundwater levels. But continuing dry weather, minimal runoff in local reservoirs and unprecedented low allocations of state and federal imported water mean that surface water supplies are very limited this year.

In this drought, the water district is having to make some tough decisions. Because of the lack of local and imported water, nearly all of our groundwater replenishment operations have been cut back to conserve supplies for use this summer.

A priority of the district is continued delivery of safe, clean water from its drinking water treatment plants to local water providers and municipalities. Imported water typically provides more than 85 percent of the supply for the water district's three drinking water treatment plants. In dry and critically dry years, when local water is limited, up to 99 percent of treated drinking water is from imported water sources.

Planned operation conditions in your area

Cupertino/Saratoga area:

- Releases of local water from Stevens Creek Reservoir will continue to provide limited flows in Stevens Creek, but expect progressively drying creek conditions as reservoir water levels fall below intake structures later in the year.
- Pipeline releases of imported water to local creeks and McClellan ponds for groundwater recharge are being suspended.
- Expect dry creek conditions for the rest of the year on Rodeo, Regnart, Calabazas and Saratoga creeks.

Los Gatos Creek area:

- Expect to see flows to Los Gatos Creek reduced as water levels in Lexington and Vasona reservoirs fall.
- All diversion of flow to groundwater recharge ponds has been suspended so expect to see dry ponds throughout the area. Page, Sunnyoaks, Budd, McGlincy, Oka and Camden ponds are, or will be, going dry during the spring, summer and fall.

continued on back »

Guadalupe Creek during the week of March 17, 2014.

To ensure safe, clean drinking water through the summer, imported and local water supplies are being stored in Anderson, Coyote and Calero reservoirs. With little local rainfall and runoff, however, all other district reservoirs are continuing to drop to minimum storage, and releases to creek and ponds are being curtailed.

South San Jose/Almaden area:

- Almaden and Calero reservoir outlets have been closed altogether due to drought conditions. Expect creeks below these dams to dry back.
- Almaden Lake Park is expected to lose all inflows to the lake as temperatures increase and creeks dry up. Expect lake elevation to fall over the summer months and remaining water quality to decline in the lake.
- Releases of water to Los Capitancillos Ponds are currently suspended for stream gauge work and will not be put back into operation until water supply conditions improve. If drought conditions continue in 2014, the water district may use this opportunity to undertake needed maintenance of this pond system.
- Groundwater recharge operations at Alamitos and Guadalupe ponds have been suspended. Expect these ponds to slowly dry up through the summer. The water district may perform maintenance and pond cleaning operations when the ponds go dry.
- All imported water releases to creeks in this area have been suspended until water supply improves.

East San Jose area:

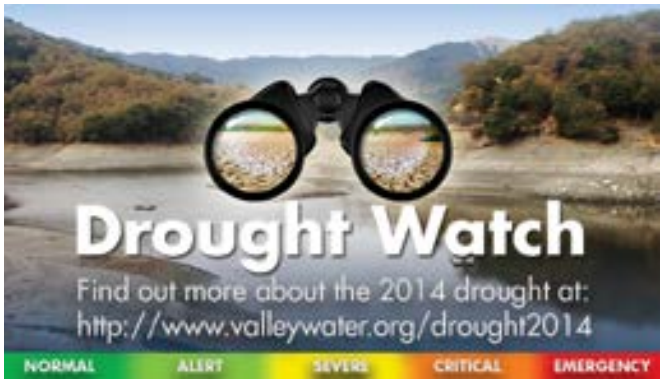
- Releases of imported water to Upper Penitencia Creek and most adjacent recharge ponds are being suspended.
- Expect gradual reduction in water levels, resulting in the drying up of the Piedmont, Capitol and Helmsley ponds. In addition, ponds will be drying at Penitencia Creek Park (City of San José), Penitencia Creek County Park (County of Santa Clara) and Overfelt Garden Park (City of San José).

Morgan Hill/South San Jose area:

- Releases of imported water to Coyote Creek have been reduced and may be further reduced depending on water supply conditions.

Gilroy/Morgan Hill area:

- Releases of local water from Uvas and Chesbro dams will continue to provide limited flows in Uvas and Llagas creeks, but expect drying creeks and falling reservoir elevations until the water in the reservoir is exhausted and natural flows stop this summer.
- Releases of imported water to Madrone Channel and Main Avenue ponds may be suspended or reduced. Expect ponds potentially to dry up over the next few months and some work to be done to restore these ponds to improve capacity for future groundwater recharge.



CONTACT US

For more information, contact the **Drought Hotline** at **(408) 630-2000**, or visit our website at valleywater.org and use our **Access Valley Water** customer request and information system. With three easy steps, you can use this service to find out the latest information on district projects or to submit questions, complaints or compliments directly to a district staff person.

Follow us on: /scvwd /valleywater /valleywater

To get eNews, email info@valleywater.org

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Santa Clara County Water Retailer Drought Response Actions 2014

March 25, 2014

Retailer	Council Date	Action	Outreach	Restrictions	Allocation or Rationing Program	Drought Rates
California Water Service Company	N/A	Working with CPUC to activiate Rule 14.1 (water restrictions)	Plan to increase outreach/education efforts	Staff working with CPUC to update Rule 14.1 restrictions	Not at this time	Not at this time
Mountain View	4/1/2014	Public hearing for water shortage ordinance and resolution declaring a Stage 1 shortage (10%) to be consistent with SFPUC call. Second reading is scheduled for 4/8/14	Looking to increase outreach/education efforts	Permanent water waste measures only.	Not at this time	Not at this time
Palo Alto	3/3/2014 - information session only, no formal action was taken	City calling for voluntary 10% to be consistent with SFPUC call.	Plan to increase outreach/education efforts	Permanent water waste measures only.	Not at this time	Not at this time
Purrissima Hills Water Districct		Supporting SFPUC's call for voluntary 10%	Have increased outreach efforts with drought specific information	Permanent water waste measures only.	Not at this time, will reconsider if SFPUC calls for mandatory rationing	Not at this time, will reconsider if SFPUC calls for mandatory rationing
Santa Clara	None scheduled	Still discussing internally. Staff recommendation will likely depend on SFPUC April update and March water use.	Plan to increase outreach/education efforts	Permanent water waste measures only.	Not at this time	Not at this time
Stanford University	N/A	Calling for voluntary 10% based on SFPUC's call	increasing outreach/education, fact sheets, emails, etc. Working with groups on campus, all irrigation off right now.	N/A	Not at this time	Not at this time
Sunnyvale	Sometime in April	Still discussing internally, reduction target will likely depend on SFPUC update in April	Plan to increase outreach/education efforts	Discussing internally	Not at this time	May consider increasing rates or adding a tier
Great Oaks Water Company	N/A	Activated Rule 14.1 conservation measures on February 28, 2014	Wesite notification (3/6/14); bill inserts (3/11/14)	Tarriff Rule 14.1 Restrictions Activated	Not at this time	Not at this time. May consider a drought related rate change in the future, will require an additional filing with CPUC
San Jose Muni Water	None scheduled	Still discussing internally. Staff recommendation will likely depend on SFPUC April update and March water use.	Plan to increase outreach/education efforts	Permanent water waste measures only.	Not at this time	Not at this time
San Jose Water Company	N/A	Filed with CPUC in late February to start process, activate Rule 14.1 (water restrictions)	Plan to increase outreach/education efforts	All field personnel will be trained about Rule 14.1 and will engage with customers as appropriate when violations are observed. Will use door hangers to notify residents of violations when contact cannot be made in person	Not at this time	Not at this time. May consider a drought related rate change in the future, will require an additional filing with CPUC
Milpitas	NO RESPONSE					
Morgan Hill	4/2/2014	Staff recommending Stage 1 (20%)	Looking to increase outreach/education efforts. City staff recommending they start sending out home water use reports	Permanent water waste measures in place. Declaration of Stage 1 includes additional restrictions (e.g. limiting the number of days per week for irrigation).	Not at this time	Not at this time
Gilroy	5/7/2014	Staff updating drought contingency plan to be consistent with others. Plan to recommend a call for 20%	Plan to increase outreach/education efforts	Updating restrictions to be consistent with Morgan Hill Stage 1	Not at this time	Considering increasing tiered rates (except base tier)
Santa Clara County	3/20/2014 (Committee meeting)	Housing, Land Use, Environment and Transportation (HLUET) Committee has been discussing potential County drought response actions	Plan to increase outreach/education efforts	One potential action HLUET is considering is a drought ordinance based on the model used by others in the county.	N/A	N/A

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ORDINANCE NO. 1932, NEW SERIES

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF MORGAN HILL AMENDING SECTIONS 13.04.010 (Definitions), 13.04.330 (Wasting of Water), 13.04.390 (Enforcement), AND 13.04.400 (Violation-Penalty) OF CHAPTER 13.04 (Water System) OF TITLE 13 (Public Services), ESTABLISHING REGULATIONS PROHIBITING NONESSENTIAL USE OF POTABLE WATER AND ADOPTING PENALTIES AND FINES FOR VIOLATIONS.

WHEREAS, the City of Morgan Hill recognizes that there is a limited supply of water available to serve the residents and businesses of Morgan Hill; and,

WHEREAS, the City of Morgan Hill wishes to encourage the efficient use of water in order to optimize the use of the limited supply

WHEREAS, a Water Supply Shortage Program is essential to ensure a reliable and sustainable minimum supply of water for the public health, safety and welfare.

WHEREAS, the City Council wishes to amend the municipal code to ensure a reliable and sustainable minimum supply of water through its water conservation program.

NOW THEREFORE, IN CONSIDERATION OF THE FOREGOING, THE CITY COUNCIL OF THE CITY OF MORGAN HILL DOES HEREBY ORDAIN AND ENACT AS FOLLOWS:

Section 1. Findings.

a. A reliable minimum supply of potable water is essential to the public health, safety and welfare of the people and economy of City of Morgan Hill.

b. The City of Morgan Hill is located in a semi-arid region and is dependent upon local surface water, groundwater, and imported water supplies. A growing population, climate change, environmental concerns, and other factors in other parts of the State and western United States, make the region highly susceptible to water supply reliability issues.

c. There is a need for water conservation program and regulations because there is a limited supply of water available to serve the residents and businesses of Morgan Hill and demand for water has, at times, exceeded supply, threatening a water shortage.

d. Careful water management that includes active water conservation measures not only in times of drought, but at all times, is essential to ensure a reliable minimum supply of water to meet current and future water supply needs.

e. Article X, Section 2 of the California Constitution declares that the general welfare requires that water resources be put to beneficial use, waste or unreasonable use or unreasonable method of use of water be prevented, and conservation of water be fully exercised with a view to the reasonable and beneficial use thereof.

f. Article XI, Section 7 of the California Constitution declares that a city or county may make and enforce within its limits all local, police, sanitary and other ordinances and regulations not in conflict with general laws.

g. California Water Code Section 375 authorizes water suppliers to adopt and enforce a comprehensive water conservation program to reduce water consumption and conserve supplies.

h. The Governor of California has proclaimed a statewide drought and issued an Executive Order, which takes immediate action to address a dire situation where numerous California communities are being forced to mandate water conservation or rationing. The lack of water has created other problems, such as extreme fire danger due to dry conditions, economic harm to urban and rural communities, loss of crops and the potential to degrade water quality in some regions. As well, the Santa Clara Valley Water District Board of Directors has called for an immediate 15 percent reduction in water use to assure we have enough water to endure the current drought.

g. The adoption and enforcement of a water conservation and supply shortage program is necessary to manage the City of Morgan Hill's potable water supply in the short and long-term and to avoid or minimize the effects of drought and shortage within the City of Morgan Hill. Such program is essential to ensure a reliable and sustainable minimum supply of water for the public health, safety and welfare.

Section 2. Declaration of Purpose and Intent.

a. The purpose of this Ordinance is to establish a water conservation and supply shortage program that will reduce water consumption within the City of Morgan Hill through conservation, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the City of Morgan Hill to avoid and minimize the effect and hardship of water shortage to the greatest extent possible.

b. This Ordinance establishes permanent water conservation standards intended to alter behavior related to water use efficiency at all times and further establishes three levels of water supply shortage response actions to be implemented during times of declared water shortage or declared water shortage emergency, with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies.

Section 3. CEQA Exemption

Therefore, the city finds that this Ordinance and actions taken hereafter pursuant to this Ordinance are exempt from the California Environmental Quality Act as specific actions necessary to prevent or mitigate an emergency pursuant to Public Resources Code Section 21080(b)(4) and the California Environmental Quality Act Guidelines Section 15269(c). The

City Clerk is hereby authorized and directed to file a Notice of Exemption as soon as possible following adoption of this Ordinance.

Section 4. Section 13.04.010 (Definitions) of Chapter 13.04 (Water System) of Title 13 (Public Services) is hereby amended in its entirety as follows:

"Section 13.04.010 Definitions.

For the purposes of this Chapter, unless otherwise apparent from the context, certain words and phrases used in this chapter are defined as follows:

A. "Person" means any natural person or persons, corporation, public or private entity, governmental agency or institution, or any other user of water provided by the city.

B. "Landscape irrigation system" means an irrigation system with pipes, hoses, spray heads, or sprinkling devices that are operated by hand or through an automated system.

C. "Single pass cooling systems" means equipment where water is circulated only once to cool equipment before being disposed.

D. "Potable water" means water which is suitable for drinking.

E. "Recycled water" means the reclamation and reuse of non-potable water for beneficial use as defined in Title 22 of the California Code of Regulations.

F. "Station" means an area of irrigated landscape controlled by a single irrigation valve.

G. "Superintendent" means the superintendent of water of the city, and any act in this chapter required or authorized to be done by the superintendent, may be done on behalf of the superintendent by an authorized officer or employee of the water department."

Section 5. Section 13.04.330 (Wasting of Water) of Chapter 13.04 (Water System) of Title 13 (Public Services) is hereby amended in its entirety to read as follows:

"13.04.330 Wasting of water and drought emergencies

A. Applicability
1. The provisions of this chapter apply to any person in the use of any potable water provided by the city.
2. The provisions of this chapter do not apply to uses of water necessary to protect public health and safety or for essential government services, such as police, fire and other similar emergency services.

3. The provisions of this chapter do not apply to the use of recycled water, with the exception of subsection B (1) of this section.
4. The provisions of this chapter do not apply to the use of water by commercial nurseries and commercial growers to sustain plants, trees, shrubs, crops or other vegetation intended for commercial sale.
5. This chapter is intended solely to further the conservation of water. It is not intended to implement any provision of federal, State, or local statutes, ordinances, or regulations relating to protection of water quality or control of drainage or runoff.

B. Prohibition Against Waste: The following water conservation requirements are effective at all times and are permanent. Violations of this section will be considered waste and an unreasonable use of water.
1. Limits on Watering Hours: Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 9:00 a.m. and 5:00 p.m. Pacific Standard/Daylight Savings Time on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
2. Limit on Watering Duration: Watering or irrigating of lawn, landscape or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than fifteen (15) minutes watering per day per station. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a 70% efficiency standard.
3. No Excessive Water Flow or Runoff: Watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch is prohibited.
4. No Washing Down Hard or Paved Surfaces: Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.
5. Obligation to Fix Leaks, Breaks or Malfunctions: Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more than ten (10) days of receiving written notice from the city, is prohibited.
6. Recirculating Water Required for Water Fountains and Decorative Water Features: Operating a water fountain or other decorative water feature that does not use recirculated water is prohibited.
7. Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not is prohibited, except by use of a hand-held bucket or similar container or

a hand-held hose equipped with a positive self-closing water shut-off nozzle or device. This subsection does not apply to any commercial car washing facility.

8. Drinking Water Served Upon Request Only: Eating or drinking establishments, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

9. Commercial Lodging Establishments Must Provide Guests Option to Decline Daily Linen Services: Hotels, motels and other commercial lodging establishments must provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments must prominently display notice of this option in each bathroom using clear and easily understood language.

10. No Installation of Single Pass Cooling Systems: Installation of single pass cooling systems is prohibited in buildings requesting new water service.

11. No Installation of Non-re-circulating in Commercial Car Wash and Laundry Systems: Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems.

12. Restaurants Required to Use Water Conserving Dish Wash Spray Valves: Food preparation establishments, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.

13. Commercial Car Wash Systems: Within one year of passage of this ordinance, all commercial conveyor car wash systems must have installed operational re-circulating water systems, or must have secured a waiver of this requirement from the city.

C. Level 1 Water Supply Shortage (11% - 20% reduction): A Level 1 Water Supply Shortage exists when the city council determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a 11% - 20% consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the city of a Level 1 Water Supply Shortage condition, the following mandatory water conservation requirements, in addition to the prohibited uses of water set forth in subsection B of this section, shall apply during such time that the Level 1 Water Supply Shortage is in effect.

1. Limits on Watering Days. Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to three to five days per week (as necessary to achieve reductions as determined in the discretion of the superintendent) on a schedule established and posted by the city. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the city. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. Obligation to Fix Leaks, Breaks or Malfunctions. All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within

seventy-two (72) hours of notification by the city unless other arrangements are made with the city.
3. No Washing Down Hard or Paved Surfaces. Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.

D. Level 2 Water Supply Shortage (21% - 35% reduction).
A Level 2 Water Supply Shortage exists when the city council declares, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a 21% - 35% consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration of a Level 2 Water Supply Shortage condition, the following mandatory water conservation requirements, in addition to the prohibited uses of water set forth in subsections B and C of this section, shall apply during such time that the Level 1 Water Supply Shortage is in effect.
1. Watering Days. Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to two days per week (as necessary to achieve reductions as determined in the discretion of the superintendent) on a schedule established and posted by the city. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the city. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
2. Obligation to Fix Leaks, Breaks or Malfunctions. All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the city unless other arrangements are made with the city.
3. Limits on Filling Ornamental Lakes or Ponds. Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this section.
4. Limits on Washing Vehicles. Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, is prohibited except at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.
5. Limits on Filling Residential Swimming Pools & Spas. Re-filling of more than one foot and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.

E. Level 3 Water Supply Shortage – Emergency Condition (Greater than 35% reduction). A Level 3 Water Supply Shortage shall be referred to as a Water Shortage Emergency. A Level 3 condition exists when the city council declares, in its sole discretion, a water shortage emergency and notifies its residents and businesses that a greater than 35% reduction in consumer demand is necessary to maintain sufficient water supplies for public health and safety, pursuant to Water Code Section 350 et seq. Upon the declaration of a Level 3 Water Supply Shortage condition, the following mandatory water conservation requirements, in addition to the prohibited uses of water set forth in subsections B, C and D of this section, shall apply during such time that the Level 3 Water Supply Shortage is in effect

1. No Watering or Irrigating. Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited. This restriction does not apply to the following categories of use, unless the city has determined that recycled water is available and may be applied to the use:

a. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self–closing water shut-off nozzle or device;

b. Maintenance of existing landscape necessary for fire protection;

c. Maintenance of existing landscape for soil erosion control;

d. Maintenance of plant materials identified to be rare or essential to the well-being of protected species;

e. Maintenance of landscape within active public parks and playing fields, day care centers, golf course greens, and school grounds, provided that such irrigation does not exceed two (2) days per week for no more than fifteen (15) minutes watering per day per station and is prohibited between the hours of 9:00 a.m. and 5:00 p.m. Pacific Standard/Daylight Savings Time, according to the schedule established in subsection D(1) or this section.

f. Actively irrigated environmental mitigation projects.

2. Obligation to Fix Leaks, Breaks or Malfunctions. All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty four (24) hours of notification by the city unless other arrangements are made with the city.

3. Limits on New Potable Water Service: Upon declaration of a Level 3 Water Shortage Emergency condition, the city may limit the issuance of new potable water services, temporary meters and/or statements of immediate ability to serve or provide potable water service (such as, will-serve letters, certificates, or letters of availability), except under the following circumstances:

a. A valid, unexpired building permit has been issued for the project; or

b. The project is necessary to protect the public health, safety, and welfare; or

c. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the city.

d. This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one year or less.

4. Limits on Building Permits. Upon declaration of a Level 3 Water Supply Shortage Emergency condition, the city manager is authorized to implement a program in his or her discretion to limit or withhold the issuance of building permits which require new or expanded water service, except to protect the public health, safety and welfare, or in cases which meet the city's adopted conservation offset requirements.
5. Discontinue Service. The city, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this section.
6. No New Annexations. Upon the declaration of a Level 3 Water Supply Shortage condition, the city may suspend consideration of annexations to its service area. This subsection does not apply to boundary corrections and annexations that will not result in any immediate increased use of water.

F. Procedures for Determination/Notification of Water Supply Shortage
The existence of Level 1, Level 2 or Level 3 Water Supply Shortage conditions may be declared by resolution of the city council adopted at a regular or special public meeting held in accordance with state law. The mandatory conservation requirements applicable to Level 1, Level 2 or Level 3 conditions will take effect on the tenth day after the date the shortage level is declared. Within five (5) days following the declaration of the shortage level, the city must publish a copy of the resolution in a newspaper used for publication of official notices.

G. Hardship Waiver. If, due to unique circumstances, a specific requirement of this chapter would result in undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water users, then the person may apply for a waiver to the requirement as provided in this Section.
1. Application: Application for a waiver must be on a form prescribed by the superintendent and accompanied by a nonrefundable processing fee in an amount set by city council resolution.
2. Supporting Documentation: The application must be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant.
3. Required Findings for Waiver: The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water use due to specific and unique circumstances of the user or the user's property. An application for a waiver will be denied unless the superintendent finds, based on the information provided in the application, supporting documents, or such additional information as may be requested, and on water use information for the property as shown by the records of the city or its agent, all of the following:
a. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other residents and businesses;
b. That because of special circumstances applicable to the property or its use, the strict application of this chapter would have a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally;

c. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the city to effectuate the purpose of this chapter and will not be detrimental to the public interest; and
d. That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.
4. Approval Authority: The superintendent must act upon any completed application no later than ten (10) days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply to the subject property during the period of the mandatory water supply shortage condition. The decision of the superintendent shall be final."

Section 6. Chapter 13.04.390 (Enforcement) of Chapter 13.04 (Water System) of Title 13 (Public Services) is hereby amended as follows (additions shown in *italics*):

"Section 13.04.390 Enforcement

It shall be the duty of the employees of the police, fire, *community development* and ~~street~~ *public works* departments to give vigilant aid to the superintendent in the enforcement of the provisions of this chapter, and to this end they shall report all violations thereof which shall come to their knowledge, to the office of the superintendent and it shall be the duty of the chief of the fire department to report immediately to the superintendent in case of fire in premises, having metered service for fire protection purposes that fire has occurred there."

Section 7. Chapter 13.04.400 (Violation - Penalty) of Chapter 13.04 (Water System) of Title 13 (Public Services) is hereby amended in its entirety to read as follows:

"**13.04.400 Violation-Penalty.**

A. Penalty. Any person violating or causing or permitting to be violated, any of the provisions of this chapter, is deemed guilty of a misdemeanor. Upon conviction thereof, such person shall be punished by a fine not exceeding one thousand dollars ($1,000), or by imprisonment in the county jail for not more than 30 days. Every such person shall be deemed to be guilty of a separate offense for every day during any portion of which any violation of any provision of this chapter is committed, continued or permitted by such person, and shall be punishable therefor as provided in this section.

B. Notwithstanding any other provision of this code, whenever a violation of any section contained in this chapter is punishable as a misdemeanor, the city attorney may specify that the offense is an infraction, and proceed with prosecution as an infraction, unless the defendant objects to the offense being made an infraction, in which event the court may elect to have the complaint amended to charge as a misdemeanor, and the case shall proceed on a misdemeanor charge.

C. Violation of Section 13.04.330. In addition to all other available remedies, including penalties available pursuant to subsection A or B of this section, any person violating or

causing or permitting to be violated any provision of Section 13.04.330 shall be subject to the following penalties and fines pursuant to the authorities and procedures set forth in Chapter 1.19:

1. First Violation: The City of Morgan Hill will issue a written warning and deliver a copy of this ordinance by mail.

2. Second Violation: A second violation within any consecutive twelve (12) months period is punishable by a fine not to exceed one hundred dollars ($100).

3. Third Violation: A third violation within any consecutive twelve (12) months period is punishable by a fine not to exceed two hundred dollars ($200).

4. Subsequent Violations: Any subsequent violations within any consecutive twelve (12) months period are punishable by a fine not to exceed five hundred ($500) and subject to installation of a water flow restrictor device of approximately one gallon per minute capacity for services up to one and one-half inch size and comparatively sized restrictors for larger services after written notice of intent to install a flow restrictor for a minimum of forty eight (48) hours.

a. In addition to any other fines or penalties, a person who violates provisions of Section 13.04.330 is responsible for payment of the City of Morgan Hill's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the city's schedule of charges then in effect. The charge for installing and/or removing any flow restricting device must be paid to the city before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

b. The first installation of a flow-restricting device shall remain in place for a minimum of three days and shall be removed by the city not more than ten days after installation. The second installation of a flow-restricting device, for continued violation of this chapter, shall remain in place for a minimum period of ten days before being removed by the city no later than thirty days thereafter. Normal water service shall not be restored until all installation and removal costs of flow-restricting devices have been paid.

6. Separate Offenses: Each day that a person violated provisions of Section 13.04.330 shall constitute a separate violation or offense.

C. All remedies provided for herein shall be cumulative and not exclusive.

Section 8. Severability

If any section, subsection, sentence, clause or phrase in this Ordinance is for any reason held invalid, the validity of the remainder of the Ordinance will not be affected. The city council hereby declares it would have passed this Ordinance and each section, subsection, sentence, clause or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases or is declared invalid.

Section 9. Effective Date; Posting. Pursuant to California Water Code Section 376, this Ordinance shall constitute a water conservation program and shall be effective upon adoption. Within ten (10) days of its adoption, this ordinance shall be published in full once in a newspaper of general circulation which is printed, published, and circulated in the City of Morgan Hill.

This ordinance was introduced at a meeting of the City Council held on the 6th day of May, 2009, and adopted at a meeting held on the 27th day of May, 2009, and said ordinance was duly passed and adopted in accordance with law by the following vote:

AYES:	**COUNCIL MEMBERS:**	**Larry Carr, Marby Lee, Greg Sellers, Steve Tate**
NOES:	**COUNCIL MEMBERS:**	**None**
ABSTAIN:	**COUNCIL MEMBERS:**	**None**
ABSENT:	**COUNCIL MEMBERS:**	**Marilyn Librers**

ATTEST: **APPROVED:**

_____ _____

IRMA TORREZ, City Clerk **STEVE TATE, Mayor**

ꕥ CERTIFICATE OF THE CITY CLERK ꕥ

I, IRMA TORREZ, CITY CLERK OF THE CITY OF MORGAN HILL, CALIFORNIA, do hereby certify that the foregoing is a true and correct copy of Ordinance No. 1932, New Series, adopted by the City Council of the City of Morgan Hill, California at their regular meeting held on the 27th day of May, 2009.

WITNESS MY HAND AND THE SEAL OF THE CITY OF MORGAN HILL.

DATE: _____ _____

IRMA TORREZ, City Clerk

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Santa Clara Valley Water District
Summary of Drought Communications and Outreach Activities
March 25, 2014

Media relations

District staff and board members have responded to a high number of daily news media inquiries about water supply and, increasingly, drought response actions. District staff have also circulated and posted statements following key board decisions.

Members of the ethnic and other media have been provided with onsite interviews and more tours of water supply facilities are in planning to further their understanding of drought conditions.

Board and key stakeholder outreach

Effective implementation of the drought contingency measures and management of drought response requires extensive coordination with a number of key stakeholders.

The board's Water Conservation Ad Hoc Committee is newly established and will provide the forum for tracking of these efforts and discussing prospective new drought response initiatives.

Guest columns on the board's official actions have been developed and submitted to local newspapers.

Staff have been in active coordination, from both an operational and communications standpoint, with retailer Communications and Water Conservation Subcommittees.

Key messages about evolving dry year conditions, impacts and drought response efforts have been shared with a group of key stakeholders including retailers, public information officers for all local municipalities, city managers, advisory committee members, and other organizations representing business, labor, agriculture and environmental interests. Four key message updates have been distributed which have then been shared within these organizations to forward to their constituencies.

There has also been increasing coordination amongst state and regional water agencies on drought communications.

The District's Office of Government Relations is actively working with advocacy stakeholders, the State Legislature, and Congress to pursue funding opportunities related to recovery of expenses for drought related activities, recycled water expansion, and infrastructure development to address the drought. The Office of Government Relations is additionally looking at opportunities to move public policy efforts toward supporting the District's interest that include direct/indirect potable recycled water among other policy opportunities. Staff continue to communicate updated drought-related information to key stakeholders so they can, in turn, disseminate current information to their constituencies.

Public education and customer service

As awareness increased in January and February about drought conditions, the District began to see an increase in requests for speakers to civic groups, inquiries submitted regarding rebate programs, and an increase in the number of recipients who receive the District's monthly e-newsletter as well as the rate at which they open the email.

As conditions necessitated the call for mandatory water use reductions, that general awareness and interest has been heightened with confusion about potential restrictions and enforcement at the local level. This has dramatically increased the number of inquiries.

Correspondingly, the number of direct constituent inquiries to board members and staff has gone up considerably, requiring individual and collective responses, including a public meeting.

The District's employees are another key stakeholder group requiring information about water supply conditions and drought response in order to both personally achieve water use reduction targets and better convey accurate information to their families, friends and neighbors. Presentations to the Management Leadership Team and all-user email messages from the CEO to employees have kept them abreast of conditions, board actions and informational resources.

For all residents, District staff created a new one-stop resource: www.valleywater.org/Drought 2014 web site that contains a comprehensive and continuously updated collection of materials related to water supply conditions, impacts and drought response resources. In addition, the save20gallons.org long-term conservation campaign site has been updated with current drought information.

The District's monthly eNewsletter has consistently included updated drought and conservation program information; we have launched a new social media drought tips feature called "Tuesday Tips" on Facebook and Twitter. The District's public access television show has also been focused on water supply and drought response topics and has been shared via Youtube. Staff are producing additional water conservation program videos for CreaTV and YouTube.

The eNewsletter and multiple social media vehicles have served as mechanisms for further dissemination of drought information through forwarding, "liking", and sharing amongst recipient networks of friends and colleagues.

Finally, a new Drought Hotline (408-630-2000) has been created as well as a 2014 Drought topic button on Access Valley Water, both in order to facilitate the logging, tracking and fulfilling of customer requests for information.

Drought program materials and marketing campaign

One of the most important functions the District can play is to encourage and incentivize water use reducing behaviors through promotions and advertisings.

Coinciding with the declaration of a drought, staff replaced previously reserved ad placements from existing (flood protection) messaging with new drought ads running in the San Jose Mercury News, Pandora Radio, Online and on Outdoor billboards or posters.

A number of materials have been updated or developed including a new water conservation rebate program fact sheet, artificial turf fact sheet, graywater program FAQ and other updated program materials required for distribution at events or via mail.

With $350,000 of the outreach funds approved by the Board in January, planning has been done to identify the most cost-effective and broad advertising program possible. This spring drought advertising campaign will take place from late March through May in print, radio, cable TV, Online and in ethnic media outlets to run ads in Spanish, Vietnamese and Chinese.

Due to the increased media attention and expanded marketing efforts, the water district has seen a significant increase in inquiries from the public and participation in our long-term conservation programs. For instance, the number of calls to the water conservation hotline has increased by approximately 175 percent and interest in our Landscape Rebate Program has increased by nearly 300 percent (both compared to the same time last year).

Planned activities

Building on what has already been put in place, staff is currently developing a number of ideas for expansion of marketing and community outreach efforts in addition to activities that are underway or in planning for the summer and fall. These include:

- The District's annual countywide mailer is scheduled to be completed and mailed in May; in addition to significant messaging about the new SVAWPC, it will equally emphasize water use reduction messages;
- Staff is establishing an electronic drop-box feature in order to share electronic advertising, messaging and multimedia tools with retailers and partners;
- In order to ensure logging in, tracking and responding effectively to the large volume of inquiries being received, additional staff resources are being secured to serve as a full-time drought customer service coordinator;
- Internal staff resources are also being secured to help with scheduling of speaker's bureau presentations and staffing numerous community event invitations;
- Having dedicated customer service staff in place for drought response will help gather information from the various units in the organization receiving inquiries, identify trends in the nature of the inquiries, identify opportunities for development of materials and a frequently-asked-questions document, and enable reporting on the District's responsiveness to the Board and community on drought issues;
- Staff is exploring new concepts for regional advertising with Bay Area agencies, as well as a potential focused summer campaign based on seasonal needs as discussed at the Board Water Conservation Ad Hoc meeting;
- Staff is researching promotional items that can supplement the usual inventory of conservation items for use at summer community events.

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Summary of Federal Legislation for California Storage Projects (Costa)

HR 4125 (Costa) - Shasta Dam Expansion Act of 2014;
HR 4126 (Costa) - San Luis Reservoir Expansion Act of 2014;
HR 4127 (Costa) - Upper San Joaquin River Storage Act of 2014

These bills would authorize construction of: 1) the expansion of Shasta Dam, 2) the expansion of San Luis Reservoir; and 3) the Upper San Joaquin River Storage.

Representative Jim Costa introduced this package of legislation on February 28, 2014, to provide immediate relief in 2014 by focusing on measures that can provide a noticeable water conservation and supply effect in the short-term. The current drought has highlighted the need for long-term water solutions, especially increasing the state's storage capacity.

These bills, if passed, would amend the Calfed Bay-Delta Authorization Act in order to invest in California's water infrastructure and expedite construction on existing storage projects to improve water reliability across the state.

The three bills would:

- Expand San Luis Reservoir to increase storage capacity by 130,000 acre feet of storage with an approximate annual yield of 40,000 acre feet. The total cost of the project would be an estimated $360 million with approximately $240 million of that already being invested for seismic improvements.
- Raise Shasta Dam to add an additional 634,000 acre feet of storage to the dam and increase annual yield by 76,000 acre feet and add 76,000-133,000 acre feet to the system during dry years. Estimated for the total cost of the project is $1.1 billion.
- Construct Temperance Flat (Upper San Joaquin River Storage) to create 1.3 million acre feet of storage with an annual yield of 60,000-75,000 acre feet and in dry years an additional 103,000-254,400 acre feet would be added to the system at a cost of around $2.5 billion.

Current Status of Legislation:

As of 3/13/2014:

Feb. 28, 2014 — All three bills were read twice and referred to: House Natural Resources Committee.

Project 2: Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment

1. Hemmeter, T., 2014a. E-mail communication with SCVWD staff re: RWTP PAC efficacy. June 11.
2. Hemmeter, T., 2014b. E-mail communication with SCVWD staff re: PAC necessity. June 11.
3. Santa Clara Valley Water District (SCVWD), 2012. Rinconada Water Treatment Plant Reliability Improvement Project Planning Study Report, prepared by CDM-Smith. May.
4. Santa Clara Valley Water District, 2014a. SCVWD FY 2014 Treated Water Deliveries, RWTP 2014 TW Deliveries tab.
5. Santa Clara Valley Water District, 2014b. Monthly Water Quality Reports. May.
6. Santa Clara Valley Water District, 2014c. Supplemental Board Agenda Memorandum: Update on 2014 Water Supply and Drought Response, March 25.

Reference 1

From: Tracy Hemmeter
To: Tracy Hemmeter
Subject: RWTP PAC Efficacy
Date: Wednesday, June 11, 2014 9:37:40 AM
Attachments: image001.png

From: Laura Young
Sent: Tuesday, June 10, 2014 2:35 PM
To: Tracy Hemmeter
Cc: Angela Cheung; Peter Zhou; Laura Young; Johanna Castro
Subject: FW: RWTP PAC Drought Grant Application

Hi Tracy,
See the RWTP THM reduction data from PAC use below,
Thanks
Laura

LAURA YOUNG
SENIOR WATER QUALITY SPECIALIST
Water Quality Unit
Water Utility Enterprise
Santa Clara Valley Water District
(408) 630-2461
lyoung@valleywater.org

From: Peter Zhou
Sent: Tuesday, June 10, 2014 2:29 PM
To: Laura Young
Cc: Johanna Castro
Subject: RE: RWTP PAC Drought Grant Application

See below.

RWTP PAC Impact on TTHM Reduction

						Source Blend Ratio		
	PAC (mg/L)	TTHM (ppb)	TTHM reduction	Br- (mg/L)	TOC (mg/L)	SL	Delta	Dyer
04/21/14	0.00	65.8	0%	0.32	4.58	66%	27%	7%
04/23/14	?	69.7	0%	0.26	4.01	55%	36%	9%
04/25/14	10.00	49.7	24%	N/T	N/T	61%	16%	23%
04/28/14	20.00	38.7	41%	0.29	4.01	64%	29%	7%

From: Laura Young
Sent: Tuesday, June 10, 2014 9:24 AM
To: Johanna Castro; Peter Zhou
Cc: Laura Young
Subject: FW: RWTP PAC Drought Grant Application

Hi Johanna and Peter,
Can you pull together the THM reduction data from PAC use for Angela and Tracy Hammeter, some time today.

Thanks
Laura

LAURA YOUNG
SENIOR WATER QUALITY SPECIALIST
Water Quality Unit
Water Utility Enterprise
Santa Clara Valley Water District
(408) 630-2461
lyoung@valleywater.org

From: Angela Cheung
Sent: Tuesday, June 10, 2014 8:42 AM
To: Tracy Hemmeter; Crystal Yezman; Laura Young
Subject: RE: RWTP PAC Drought Grant Application

Crystal,
Please get the first two items from Tracy's Sunday email to her by tomorrow.

Laura,
Please have someone in water quality pull the THM reduction data from PAC use.

Thanks.

From: Tracy Hemmeter
Sent: Tuesday, June 10, 2014 8:33 AM
To: Angela Cheung; Crystal Yezman
Subject: RE: RWTP PAC Drought Grant Application

In addition to the items below, I need a copy of the lab report(s) documenting the 20 ug/L reduction in THMs with a 20 mg/L PAC dose. And, I need this information by tomorrow.

From: Tracy Hemmeter
Sent: Sunday, June 08, 2014 11:56 AM
To: Angela Cheung; Crystal Yezman
Subject: RWTP PAC Drought Grant Application

To complete the application materials, I need:

1) A copy of the PO for PAC (or whatever we have to document costs per lb).
2) An estimate of labor costs associated with use of PAC and a breakdown by task (if we think we can document specific labor costs as a line item on time cards). The grant requires a 25% local match of costs. We can use labor costs as the match to increase the amount of

reimbursement we get. I'm going to include some labor costs for preparing the invoice(s) and associated progress report(s), but that is a minimal amount. I suspect the labor costs of adding PAC are minimal, but the costs of monitoring source and treated water quality might be worth including. I guess this might a question for Jim Scott or Greg.

TRACY HEMMETER
SENIOR PROJECT MANAGER
Imported Water Unit
Water Utility Enterprise
Santa Clara Valley Water District
(408) 630-2647
themmeter@valleywater.org

Reference 2

From: Tracy Hemmeter
To: Tracy Hemmeter
Subject: PAC Necessity
Date: Wednesday, June 11, 2014 9:42:59 AM

From: Angela Cheung
Sent: Thursday, May 08, 2014 5:34 PM
To: Tracy Hemmeter; Crystal Yezman; Bruce Cabral
Subject: RE: Bay Area IRWMP Drought Solicitation - Response Required

PAC is needed this year to remove TOC in the source water which is one of two significant precursors of THM formation. With reduced flows in the system and at times high TOC and high bromide in the source water, we have found it to be challenging to maintain THMs at below 80 ppb, especially in our retailers' systems. As it stands, there are areas in our retailers' systems that have exceeded 80 ppb in the last couple of quarters. Exceeding regulatory standards is something that we want to avoid even though PAC feed comes at a high cost.

From: Tracy Hemmeter
Sent: Thursday, May 08, 2014 2:47 PM
To: Crystal Yezman; Bruce Cabral
Cc: Angela Cheung
Subject: FW: Bay Area IRWMP Drought Solicitation - Response Required
Importance: High

I need to provide the Bay Area IRWM group with more information on our PAC project proposal and how it is responsive to the drought. My understanding is that THM formation in the distribution system is/could be an issue due to reduced flows. Is it reasonable to say that PAC treatment helps reduce THM formation in the distribution system, which is a water quality concern exacerbated by the drought and the 20% reduction in treated water deliveries?

From: Matt Gerhart [mailto:mgerhart@scc.ca.gov]
Sent: Wednesday, May 07, 2014 9:33 PM
To: projects@bairwmp.org
Subject: Bay Area IRWMP Drought Solicitation - Response Required
Importance: High

Dear BAIRWM Proponent:

Thank you for your recent concept submission to the Bay Area IRWMP. The IRWM Project Screening Committee (PSC) has been evaluating regional and subregional concept submittals for applicability/priority under DWR's recently released and expedited Drought Solicitation. It has preliminarily determined that your project addresses the drought solicitation's priorities and requests additional information.

The drought proposal will be significantly streamlined but is on a very short timeline (tentatively due

July 31st). If you would like to be further considered for inclusion in the drought round, please submit to projects@bairwmp.org a response of *500 words or less* specifying how your project meets the drought solicitation's key requirements below by **5:00 p.m., Monday May 12th**. Please include/highlight metrics of drought-specific benefits to areas of high need using acre-feet of water. If you would like to respond but cannot by that time, please let us know before then to be retained for consideration.

Please ensure your response addresses the following questions:

1. How is your project alleviating drought in an area of highest need (geographically and topically)? What is your agency or area's current status regarding declarations of drought, voluntary/mandatory restrictions, measures of drought severity?
2. What is the story of your agency/area's water situation moving forward? Are you at risk of not meeting drinking water demands this year or next? What additional measures are being considered/taken for 2014? Should the drought continue through 2015, what will be your situation and what additional measures will be taken then?
3. When will the benefits of your project be realized? Please be specific as to what amounts will be available in what years.
4. Is your project the least-cost alternative? If not, please explain why not.
5. Can your project start construction by April 2015?
6. Does your project specifically address the Human Right to Water Policy (AB 685 / CWC 106.3)? If so, how?

If you have addressed some or all of these comments in your submittal, please copy and paste your responses to these questions. We are not looking for new information if this was included in your submittal but require answers to each of these questions to determine whether or not projects meet the DWR guidance for the drought funding. You may note in your response if your submittal contains more detail.

Feel free to contact me with any questions. Additional updates will be made available at bairwmp.org.

Sincerely,
Matt Gerhart
Chair, IRWM Project Screening Committee

Deputy Program Manager, San Francisco Bay Area
State Coastal Conservancy

Reference 3

PLANNING STUDY REPORT

Rinconada Water Treatment Plant
Reliability Improvement Project

May 2012

Santa Clara Valley Water District

CDM Smith

The RWTP is situated on approximately 40 acres within a residential area in the town of Los Gatos (Figure 2). The current major facilities at the RWTP are the following:

- Operations and administration building
- Four upflow clarifiers
- Six dual media filters
- Residuals management facilities including washwater recovery basins, sludge drying basins, and dewatering facilities
- Two 1 MG clearwells and one 15-MG treated water reservoir (Rinconada Reservoir)

Figure 2
Site map for RWTP

Commissioned in 1968, the RWTP has numerous plant components that are nearing the end of their useful lives. This fact, coupled with increasingly more stringent water quality and code requirements, requires that the plant be upgraded to ensure the reliability of its operation and that of the water supply to the western service area.

This planning effort culminates years of careful study and analysis by the District of how to provide a reliable, high quality water supply. While major improvements have been implemented at the District's other two treatment plants, the District has deferred major improvements at the RWTP due to the need to address other pressing issues and greater regulatory flexibility in the upgrade schedule.

2.2 Objectives

In 2007[3], the District outlined five planning objectives for the RWTP improvements effort:

1. *Maintain aging infrastructure to reduce the risk of system interruptions/failures*
2. *Improve reliability to address plant redundancy, seismic reliability, and business continuity issues*
3. *Contribute to energy self sufficiency and minimize the carbon footprint*
4. *Evaluate and implement cost-effective treatment technologies to meet current drinking water regulations, taste and odor control, and forecasted new contaminants to result in a robust plant design to take the Rinconada plant into the future*
5. *Improve operability of the plant*

[3] Rinconada Water Treatment Plant Improvement Program: Needs Assessment and Conceptual Strategies Development Report.

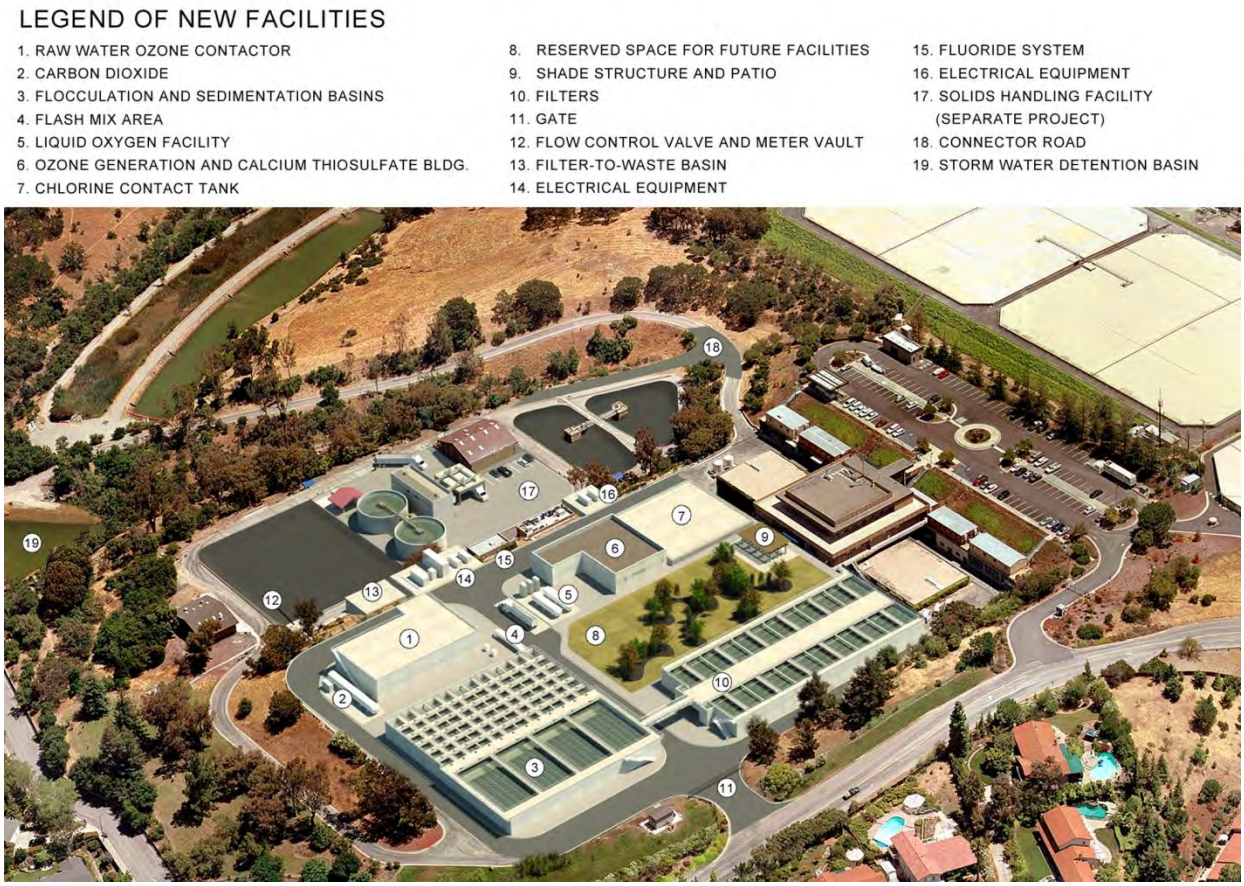

Figure 10
Upgraded Facility Layout with Major Processes

5.1.1 Raw Water Ozone

The recommended project utilizes raw water ozonation for both oxidation and disinfection. An ozone contactor structure with two parallel basins will be provided to meet primary disinfection requirements for *Giardia* and viruses as specified by the Surface Water Treatment Rule (SWTR). Ozone will provide additional water quality benefits beyond disinfection, including:

- Improve aesthetics by reducing color and oxidizing algal metabolites (such as geosmin and MIB) and other organic taste and odor compounds.
- Enhance filtered water quality and production as measured by lower turbidity and particle counts, as well as reduced filter headloss accumulation rates.
- Oxidize metals, such as iron and manganese, to their insoluble forms for removal in the flocculation/sedimentation basins and the filters.
- Oxidize and promote biodegradation of trace synthetic organic compounds such as pesticides, hydrocarbons, and other potential contaminants.

Due to fluctuations in the pH of the raw water source, carbon dioxide (CO_2) is added to stabilize the pH entering the ozone contactor. This provides for a more stable ozone operation and reliable disinfection credit. Chlorine and ammonia are also added, when needed, upstream of the ozone contactor to control bromate formation.

Reference 4

Santa Clara Valley Water District (SCVWD), 2014a. SCVWD FY 2014 Treated Water Deliveries, RWTP 2014

Month	Cal Water (AF)	Mountain View (AF)	San Jose Water Company (AF)	Santa Clara (AF)	Sunnyvale (AF)	All RWTP Retailers	Peak Demand (Summer Peak Month Demand less May Demand of 3,804 AF)
January	451	68	2,148	321	732	**3,720**	
February	158	53	764	262	623	**1,860**	
March	230	60	860	285	656	**2,091**	
April	411	83	1,418	336	576	**2,825**	
May	699	106	1,959	344	696	**3,804**	
June	971	118	2,330	352	820	**4,592**	787
July	986	133	2,482	352	820	**4,772**	968
August	986	122	2,436	352	820	**4,715**	911
September	971	115	2,070	344	820	**4,321**	517
October	563	94	1,545	352	648	**3,203**	
November	218	64	1,047	240	608	**2,177**	
December	181	50	866	248	528	**1,873**	
Totals (AF)	**6,825**	**1,066**	**19,926**	**3,788**	**8,348**	**39,953**	**3,183**

Notes:

San Jose Water Company is the total for Cupertino and SJWC. SJWC operates the Cupertino System

January through March amounts are actual deliveries

April through December amounts are the adjusted treated water schedules for the remainder of 2014; which are original schedules reduced by 20%

Summer months are June through September

Reference 5

LABORATORY SERVICES
1026 Blossom Hill Road
San Jose, CA 95123-1103

Santa Clara Valley Water District

Santa Clara Valley Water District System # 4310027

Report for: Penitencia, Rinconada, Santa Teresa Water Treatment Plants

Start: 05/01/2014 End: 05/31/2014

Primary Standards - Mandatory Health-Related Standards

	Units	MCL	DLR	PWTP Influent	PWTP Treated	RWTP Influent	RWTP Treated	STWTP Influent	STWTP Treated
Chlorine (Total) by DPD	mg/L	NS	NS	NT	2.2	NT	1.6	NT	2.3
Aluminum (Al)	mg/L	1	0.05	0.07	ND	0.10	ND	0.10	ND
Antimony (Sb)	mg/L	0.006	0.006	ND	ND	ND	ND	ND	ND
Arsenic (As)	mg/L	0.01	0.002	0.003	ND	0.003	ND	0.002	ND
Barium (Ba)	mg/L	1	0.1	ND	ND	ND	ND	ND	ND
Beryllium (Be)	mg/L	0.004	0.001	ND	ND	ND	ND	ND	ND
Bromate (BrO3)	mg/L	0.01	0.001	NT	0.002	NT	NT	NT	0.005
Cadmium (Cd)	mg/L	0.005	0.001	ND	ND	ND	ND	ND	ND
Chromium, Total (Cr)	mg/L	0.05	0.01	ND	ND	ND	ND	ND	ND
Fluoride (F)	mg/L	2	0.1	0.1	ND	0.1	ND	0.1	0.1
Mercury (Hg)	mg/L	0.002	0.001	ND	ND	ND	ND	ND	ND
Nickel (Ni)	mg/L	0.1	0.01	ND	ND	ND	ND	ND	ND
Nitrate (as NO3)	mg/L	45	2	2	2	3	3	3	3
Nitrite (as N)	mg/L	1	0.4	ND	ND	ND	ND	ND	ND
Selenium (Se)	mg/L	0.05	0.005	ND	ND	ND	ND	ND	ND
Thallium (Tl)	mg/L	0.002	0.001	ND	ND	ND	ND	ND	ND
Dibromoacetic Acid (HAA-DBAA)	ug/L	NS	1.0	NT	6.3	NT	9.3	NT	4.2
Dichloroacetic Acid (HAA-DCAA)	ug/L	NS	1.0	NT	4.5	NT	3.8	NT	1.8
Monobromoacetic Acid (HAA-MBAA)	ug/L	NS	1.0	NT	ND	NT	1.1	NT	ND
Monochloroacetic Acid (HAA-MCAA)	ug/L	NS	2.0	NT	ND	NT	ND	NT	ND
Trichloroacetic Acid (HAA-TCAA)	ug/L	NS	1.0	NT	1.2	NT	1.8	NT	ND
Total Haloacetic Acids (HAA5)	ug/L	60	NS	NT	12	NT	16	NT	6
Bromodichloromethane (THM)	ug/L	NS	1.0	NT	9.5	NT	14.0	NT	5.1
Bromoform (THM)	ug/L	NS	1.0	NT	6.8	NT	10.5	NT	9.4
Chloroform (THM)	ug/L	NS	1.0	NT	7.2	NT	4.5	NT	2.0
Dibromochloromethane (THM)	ug/L	NS	1.0	NT	14.8	NT	23.8	NT	9.3
Total Trihalomethanes (THM)	ug/L	80	NS	NT	38	NT	53	NT	26
Heterotrophic Plate Count	CFU/ml	NS	NS	16242	1	9138	53	3148	1

Secondary Standards - Aesthetic Standards

	Units	MCL	DLR	PWTP Influent	PWTP Treated	RWTP Influent	RWTP Treated	STWTP Influent	STWTP Treated
Apparent Color	Color Units	15	NS	47	<2.5	35	<2.5	34	<2.5
Chloride (Cl)	mg/L	250	NS	74	77	101	98	111	115
Copper (Cu)	mg/L	1	0.05	ND	ND	ND	ND	ND	ND
Iron (Fe)	mg/L	0.3	0.1	ND	ND	0.1	ND	ND	ND
Manganese (Mn)	mg/L	0.05	0.02	ND	ND	ND	ND	ND	ND
pH	pH units	NS	NS	8.2	7.8	8.0	7.8	7.9	7.7
Silver (Ag)	mg/L	0.1	0.01	ND	ND	ND	ND	ND	ND
Specific Conductance (E.C.)	umhos/cm	2200	NS	501	548	597	648	652	690
Sulfate (as SO4)	mg/L	600	0.5	40.0	60.8	49.7	76.6	56.2	69.5
Total Dissolved Solids	mg/L	500	NS	290	284	324	360	372	384
Turbidity	NTU	5	NS	2.67	0.07	2.20	0.07	2.71	0.06

LABORATORY SERVICES
1026 Blossom Hill Road
San Jose, CA 95123-1103

Santa Clara Valley Water District

Santa Clara Valley Water District System # 4310027

Report for: Penitencia, Rinconada, Santa Teresa Water Treatment Plants

Start: 05/01/2014 End: 05/31/2014

Zinc (Zn)	mg/L	5	0.05	ND	ND	ND	ND	ND	ND

Additional Constituents Analyzed

	Units	MCL	DLR	PWTP Influent	PWTP Treated	RWTP Influent	RWTP Treated	STWTP Influent	STWTP Treated
Percent Monochloramines	%	NS	NS	NT	83	NT	90	NT	75
Total Chloramines	mg/L	NS	NS	NT	1.78	NT	1.48	NT	1.66
Ammonia, Free (NH3-N)	mg/L	NS	NS	<0.05	<0.05	<0.05	<0.05	<0.05	0.07
Ammonia, Total (as NH3-N)	mg/L	NS	NS	NT	0.42	NT	0.23	NT	0.39
Boron (B)	mg/L	NS	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Bromide (Br)	mg/L	NS	NS	0.19	0.08	0.28	0.09	0.33	0.18
Calcium (Ca)	mg/L	NS	NS	21	21	23	23	24	24
Chlorate (ClO3)	mg/L	NS	0.02	NT	0.11	NT	0.19	NT	0.16
Hardness (as CaCO3)	mg/L	NS	NS	122	122	128	130	134	133
Lead (Pb)	mg/L	0.015	0.005	ND	ND	ND	ND	ND	ND
Magnesium (Mg)	mg/L	NS	NS	14	14	15	15	16	16
Phosphate (PO4)	mg/L	NS	NS	0.28	1.07	0.33	1.07	0.30	1.05
Potassium (K)	mg/L	NS	NS	2.9	3.0	3.3	3.2	3.6	3.6
Sodium (Na)	mg/L	NS	NS	45	58	63	70	74	82
Temperature	Deg. C	NS	NS	19	19	20	19	18	20
Total Alkalinity (as CaCO3)	mg/L	NS	NS	91	88	89	85	88	84
Total Organic Carbon	mg/L	NS	0.30	5.41	3.16	4.51	2.00	3.59	2.23
Vanadium (V)	mg/L	NS	0.003	0.004	ND	0.004	ND	0.003	ND

MCL = Maximum Contaminant Level
DLR = Detection Limit for Reporting
PWTP = Penitencia Water Treatment Plant
RWTP = Rinconada Water Treatment Plant
STWTP = Santa Teresa Water Treatment Plant

mg/L = milligrams per liter
ug/L = micrograms per liter
Deg. C = Degree Celsius
CFU/ml = colony forming units per milliliter
umhos/cm = micromhos per centimeter
NTU = nephelometric turbidity units

ND = Not Detected
NT = Not Tested
NS = No Standard
NR = Not Reporte

For questions about this report, or for additional water quality information, call (408) 630-3228.

Jim Scott
Laboratory Manager
Laboratory Services Unit

State of California Health and Welfare Agency | Department of Health Services

MONTHLY SUMMARY OF DISTRIBUTION SYSTEM COLIFORM MONITORING

System Name:	System Number:
Santa Clara Valley Water District	**4310027**
Sampling Period: **May** Month:	**2014** Year:

	Minimum Number Required	Number Collected	Number Total Coliform Positives	Number Total Fecal/E.Coli Positives
1. ROUTINE SAMPLES (see note 1) :	340	397	0	0
2. REPEAT SAMPLES FOLLOWING ROUTINE SAMPLES THAT ARE TOTAL COLIFORM POSITIVE AND FECAL/E. COLI NEGATIVE (see notes 5 and 6)		0	0	
3. REPEAT SAMPLES FOLLOWING ROUTINE SAMPLES THAT ARE TOTAL COLIFORM POSITIVE AND FECAL/E. COLI POSITIVE (see notes 5 and 6) :		0	0	0

4. MCL COMPUTATION FOR TOTAL COLIFORM POSITIVE SAMPLES :

a. Totals (sum of columns) : 397 | 0

b. If 40 or more samples are collected in the month, determine percent of samples that are T. Coli positive ([total number positive/total number collected] X 100) : **0.00 %**

c. Is system in compliance... ...with Fecal/E. Coli MCL (see notes 2 and 3) [X] Yes [ ] No

...with monthly MCL (see note 4)? [X] Yes [ ] No

5. INVALIDATED SAMPLES (note what samples, if any, were invalidated; why they were invalidated; who authorized the invalidation; and when replacement samples were collected. Attach additional sheets, if necessary.

6. SUMMARY COMPLETED BY:

Signature:	Title:	Date:
	James N. Scott Laboratory Manager	**6/16/2014**

NOTES AND INSTRUCTIONS:

1. Routine samples include:
   a) Samples required per 22 CCR, Section 64423;
   b) Extra samples required for systems collecting less than 5 routine samples per month that had one or more Total Coliform positives in previous month;
   c) Extra samples for systems with high source water turbidities that are using surface water or groundwater under the direct influence of surface water and do not practice filtration in compliance with the regulations.
2. Note: For a repeat sample following a Total Coliform positive sample, any Fecal/E.Coli positive repeat (boxed entry) **constitutes an MCL violation and requires immediate notification to the Department** (22 CCR, Section 64426.1).
3. Note: For a repeat sample following a Fecal/E. Coli positive sample, any Total Coliform positive repeat (boxed entry) **constitutes an MCL violation and requires immediate notification to the Department** (22 CCR, Section 64426.1).
4. Total Coliform MCL **(Notify Department within 24 hours of MCL violation).**
5. Positive results and their associated repeat samples must be tracked on the worksheet on the other side.
6. For systems collecting more than one routine sample per month, three repeat samples must be collected for each Total Coliform positive sample. For systems collecting one or less routine samples per month, four repeat samples must be collected for each Total Coliform positive sample. Repeat samples must be collected within 24 hours of being notified of the positive result.

State of California Health and Welfare Agency | Department of Health Services

MONTHLY SUMMARY OF DISTRIBUTION SYSTEM
DISINFECTION PROCESS DATA

System Name:	System Number:
Santa Clara Valley Water District	**4310027**
Sampling Period: **May** Month:	**2014** Year:

	East Line	West Line	Snell Line	Total
Number of Distribution Samples Collected:	112	195	90	**397**
Number of Distribution Samples With HPC Only:	0	0	0	0
Total Number of Residual and/or HPC Samples Collected:	112	195	90	**397**
Number of Samples With No Detectable Residual and HPC is Not Measured:	0	0	0	0
Number of Samples With No Residual and HPC > 500 CFU/ml:	0	0	0	0
Number of Samples for HPC Only and HPC > 500 CFU/ml:	0	0	0	0
Total Number of Samples With No Residual and/or HPC > 500 CFU/ml:	0	0	0	0
Compute V: $V = \left[1 - \frac{\text{Total Number of Samples With No Residual and/or HPC > 500 CFU/ml}}{\text{Total Number of Residual and/or HPC Samples Collected}}\right] \times 100$	100	100	100	100

Meets Standard (V $\geq$ 95%) **?** **Yes** [X] **No** [ ]

SUMMARY COMPLETED BY:

Signature:	Title:	Date:
	James N. Scott Laboratory Manager	**6/16/2014**

Reference 6

Santa Clara Valley Water District

FC 1703 (08-17-11)

Meeting Date:	3/25/14
Agenda Item No.:	4.1
Manager:	J. Maher
Extension:	2073
Director:	All

SUPPLEMENTAL BOARD AGENDA MEMORANDUM

SUBJECT: Update on 2014 Water Supply and Drought Response

REASON FOR SUPPLEMENTAL MEMORANDUM:

To allow for inclusion of the most current water supply information.

RECOMMENDATION:

Receive, review, and discuss updated information on 2014 water supply and drought response.

SUMMARY:

Severe drought continues to impact both statewide and local water supply conditions. On February 25, the Board approved a resolution setting a county-wide water use reduction target equal to 20 percent of 2013 water use, or approximately 72,000 acre-feet, and recommending that retail water agencies, municipalities and the county implement mandatory measures as needed to accomplish the target. This action was based on the District's Water Shortage Contingency Plan[1] and estimated 2014 water supply conditions that showed groundwater reserves could reach the Stage 3 ("Severe") level by the end of the year if water use reduction measures are not implemented. Updated information on 2014 water supply and operations is presented, along with an update on the District's drought response strategies.

A. Update on 2014 Water Supply and Operations

Despite some precipitation since the last update on February 25, water supply conditions statewide and locally have not measurably improved. Table 1 shows updated estimates of 2014 water supply and use in Santa Clara County. End-of-year groundwater storage is still projected to drop to the Stage 3 "Severe" range (200,000 to 250,000 acre-feet) if the 20 percent water use reduction target is not achieved.

1. Imported Water Supply

In this update, District imported water supplies have been reduced by 5,420 acre-feet to reflect more conservative estimates of 2013 State Water Project (SWP) carryover deliveries and supplemental water. The Bureau of Reclamation's (Reclamation's) February announcement of 2014 Central Valley Project (CVP) allocations provided 50% of "historic use" for municipal and industrial water service, confirmed by letter to equal 65,000 acre-feet for the District. However, the unprecedented allocations of only 40% to senior water rights holders and wildlife refuges, along with the State Water Resources Control Board's

[1] Santa Clara Valley Water District's 2010 Urban Water Management Plan, http://www.valleywater.org/Services/WaterSupplyPlanning.aspx

(SWRCB's) restriction of Delta pumping to "public health and safety," have raised more questions and uncertainty over how much water will really be available for CVP and SWP contractors this year, and how the extremely limited supplies will be allocated.

In late February, the Department of Water Resources (DWR) informed SWP contractors that only 45% of 2013 carryover water could be delivered in 2014 due to restricted export conditions. For the District, this meant that its 27,478 acre-feet of carryover water was reduced to 12,365 acre-feet. In the weeks that followed, several smaller storms allowed the State and federal projects to export slightly more than the minimum "public health and safety" levels allowed by the SWRCB, and this increased 2013 SWP carryover estimates from 45% to 86%, restoring the District's carryover to 23,631 acre-feet. To support the DWR's ability to pump 2013 SWP carryover water, and to support Reclamation's ability to pump 2014 CVP municipal and industrial water, the District and other contractors were requested to prepare and submit public health and safety justifications.

With critically dry conditions and limited storage available in Sacramento valley reservoirs, fresh water flows through the Delta are not sufficient to maintain water quality, which can effectively limit or eliminate imported water as a source of supply for the treatment plants. Modeling work completed by DWR showed that, absent preventive measures, salinity in parts of the Delta later this summer could increase up to 20 times the level of current standards. DWR and Reclamation are working with State and federal fishery agencies, Delta interests, and the SWRCB to expedite the installation of temporary barriers in May to protect water quality in the central and south Delta. The proposed barriers would be installed at the entrance to three Delta channels: Sutter Slough, Steamboat Slough and False River. As fishery conditions allow, opening the Delta Cross Channel gates to allow more Sacramento River water to flow into the interior Delta could also help maintain water quality.

Santa Clara County relies on water imported from the Sacramento-San Joaquin River watershed for 55 percent of its supply, on average. The District’s State Water Project (SWP) and Central Valley Project (CVP) contracts are the primary sources of supply for its three drinking water treatment plants. Some cities are also served imported water directly by the San Francisco Public Utilities Commission’s (SFPUC's) Hetch-Hetchy Project.

The SFPUC has called for 10% voluntary water use reduction by Hetch-Hetchy customers, and suspended "take or pay" provisions of contracts to encourage reduced use. The 10% target is applied to projected 2014 demands. For this update, the 10% target has been applied more conservatively to actual 2013 Hetch-Hetchy water use in Santa Clara County (approximately 55,000 acre-feet), resulting in estimated 2014 Hetch-Hetchy supplies of 49,500 acre-feet. A final determination will be made by the SFPUC in April whether to maintain the current program, or impose more restricted contract allocations.

Table 1. Estimated 2014 Water Supply and Use

Estimated Supplies (AF)	Jan. 28, 2014 Initial Outlook Dry Conditions (90% exceedence)	Feb. 25, 2014 Update Critically Dry Conditions (99% exceedence)	Mar. 25, 2014 Update Critically Dry Conditions (99% exceedence)
Local surface water	34,000	26,300	26,300
Natural groundwater recharge	47,100	38,600	38,600
Imported – District	149,000	106,200	100,780
Imported – Hetch Hetchy	57,000	44,000	49,500
Recycled water	23,000	23,000	23,000
Total	**310,100**	**238,100**	**238,180**
Estimated Use (AF)			
Groundwater pumping	173,200	201,200	206,300
Treated water deliveries--District	121,000	107,300	95,000
Surface water, SJWC treated water	5,000	300	2,000
Imported—Hetch Hetchy	57,000	44,000	49,500
Recycled water	23,000	23,000	23,000
Total	**379,200**	**375,800**	**375,800**
Net from Groundwater Reserves (AF)	**69,100**	**137,700**	**137,620**
Estimated End-of-Year Groundwater Storage (AF)	**273,900**	**205,300**	**205,380**

2. Local Reservoirs and Groundwater Recharge

Local rainfall and runoff through March has continued to track critically dry hydrology. At present, total reservoir storage is about 54 percent of restricted capacity, and 55 percent of 20-year average total storage for March. Approximately 85% of the increase in storage since February 25 is imported water pumped into Anderson Reservoir. Local inflow continues to track critically dry year hydrology. Although some rainfall could still occur in April and May, it is anticipated that little runoff would occur due to dry watershed conditions. Storage levels in Stevens Creek (13%), Guadalupe (15%), Almaden (24%), Chesbro (15%), and Uvas (13%) remain below their 20-year averages.

As the primary strategy to ensure adequate supply for the District's three drinking water treatment plants this summer, imported water is currently being pumped into Anderson Reservoir with the goal of filling it to the maximum level permitted by current seismic restrictions (61,000 acre-feet). Also, releases from Coyote Reservoir have been stopped to maximize water available to the treatment plants from the Anderson-Coyote system.

In order to conserve the limited supplies of imported water for the treatment plants, nearly all releases of imported water to creeks and ponds for groundwater recharge were discontinued at the end of January, with the exception of releases to Madrone Channel and upper Coyote Creek. Staff has been coordinating with the regulatory agencies and other stakeholders regarding the District's raw water operations. A March 2014 version of the Reservoir and Creek Dry Back Conditions Neighborhood Update (Attachment 2) has been prepared, posted at many of the recharge facilities, distributed to the public and placed on the District's Drought 2014 website (http://www.valleywater.org/drought2014/).

3. Untreated Surface Water Deliveries

In addition to eliminating nearly all groundwater recharge to conserve limited surface water supplies for drinking water, the District's operations plans include curtailment of untreated surface water deliveries. Over the years, a limited number of permits have been issued by the District to allow untreated surface water to be diverted from District facilities and creeks to irrigate landscape, agriculture, golf courses and other non-potable uses. Water delivered under current permits (99 total) is approximately 3,500 acre-feet annually, and represents approximately 1 percent of county's municipal and industrial water use, and 5 percent of the county's agricultural water use. Since February 25, staff has initiated communication with these surface water customers to let them know that alternate sources of supply will need to be used in 2014, and that alternate sources will need to be developed if not readily available.

On March 13, a meeting was held with surface water permittees that receive deliveries from District pipelines to discuss the curtailment of surface water. After receiving feedback from the surface water permittees, a letter was prepared and sent to all (72) pipeline surface water users on March 21, 2014. The letter notifies them that releases of District surface water will cease on May 1, 2014, but provides for extensions of time to develop alternate sources of supply. Extensions of time will be considered for agricultural and commercial users that need to refurbish a well or undertake other work to access groundwater or another source of supply. Staff is prepared to assist surface water permittees with pursuit of grants or other drought relief funding, expedited well permitting, and other actions.

The District currently has 27 permittees that divert surface water from creeks. Given reduced releases from District reservoirs, elimination of imported water releases and lack of rainfall, the ability to divert from creeks has already been severely limited for some time. Staff has been in communication with creek diverters and will be following up with a formal letter shortly notifying them of the unavailability of District supply.

4. Treated Water Operations

With limited surface water supplies, the District expects to be able to meet only 80% of treated water contract demands from March through December 2014. Staff has been proactively working with the treated water retailers, meeting individually with each retailer and scheduling joint retailer subcommittee meetings, to inform them of the need to cut back treated water deliveries by 20%. On March 20, a formal letter and water delivery schedule reflecting 20% reductions from March through December were sent to each retailer requesting concurrence with the reduced schedule.

A primary objective of the District is continued delivery of safe, clean drinking water from its treatment plants. Source water quality continues in March to be affected by the drought. Treatment plant operations are impacted by elevated bromide and total organic carbon levels from the South Bay Aqueduct and taste and odor compounds from the San Luis Reservoir. Staff is vigilant and has increased water quality monitoring while adjusting treatment strategies to meet various water quality objectives. Treatment costs are on the rise and are closely monitored.

The Campbell Well Field, which has been under development for a number of years, is near completion with operational testing of the well field anticipated in April. The well field has a capacity of three million gallons per day. Although that is less than one-tenth of the average flow on the West Pipeline, every bit of drinking water is precious this year and the District expects to be operating the well field as needed this summer to help meet treated water demands.

B. Drought Response

1. Water Use Reduction Target

Achieving a 20 percent water use reduction in 2014 will require close coordination with retail water agencies, local municipalities and the County of Santa Clara to coordinate public outreach and implementation of conservation programs, and to put in place and enforce appropriate ordinances.

Staff has been meeting regularly with the water retailers through the recently formed Ad Hoc Drought Preparedness Committee. In addition, the Water Retailers' Water Conservation Subcommittee and the Communications Subcommittee have been coordinating efforts to meet the target. Attachment 3 summarizes drought response actions to date by the water retailers and county. Once city/county ordinances are adopted staff will develop a matrix summarizing the various restrictions in place. The District worked with retail water agencies and stakeholders in past years to develop a model drought ordinance, which is similar to the one adopted by the City of Morgan Hill in 2009 (Attachment 4). Progress on the adoption and implementation of ordinances will be included in a monthly report that summarizes actions to date as well as water savings achieved, both county-wide and by water retailer.

2. Drought Communication and Outreach Efforts

Communication and outreach efforts have increased significantly since late January to increase awareness of the drought situation due to the deteriorating water supply outlook, the Governor's January 17 Declaration of Drought Emergency, increasing media attention and the District's call for a 20 percent water use reduction.

A detailed summary of current activities to support media relations, Board and key stakeholder outreach, development of drought program materials and marketing campaigns, and public education and customer service is provided in Attachment 5.

Key initiatives being implemented include:

- ✓ An advertising program to promote reduced water use and the District's conservation program will take place from late March through May, using $350,000 of the outreach funds approved by the Board in January. A cost-effective and broad advertising program has been planned that includes print, radio, cable TV, online and ethnic media outlets to run ads in Spanish, Vietnamese and Chinese.
- ✓ The Board's newly established Water Conservation Ad Hoc Committee will provide a forum for engaging stakeholders and the public in discussion of prospective new drought response measures and conservation program initiatives.
- ✓ Presentations to the District's Management Leadership Team and all-user email messages from the CEO are keeping employees abreast of water supply conditions, board actions and informational resources.
- ✓ For all residents, District staff created a new one-stop resource: www.valleywater.org/Drought 2014 web site that contains a comprehensive and continuously updated collection of materials related to water supply conditions, impacts and drought response resources. In addition, the save20gallons.org long-term conservation campaign site has been updated with current drought information.
- ✓ A new Drought Hotline (408-630-2000) has been created as well as a 2014 Drought topic button on Access Valley Water, both in order to facilitate the logging, tracking and fulfilling of customer requests for information.

Building on what has already been put in place, staff is currently developing a number of ideas for expansion of marketing and community outreach efforts in addition to activities that are underway or in planning for the summer and fall. These include:

- The District's annual countywide mailer is scheduled to be completed and mailed in May; in addition to significant messaging about the new SVAWPC, it will equally emphasize water use reduction messages;
- Staff is establishing an electronic drop-box feature in order to share electronic advertising, messaging and multimedia tools with retailers and partners;
- In order to ensure logging in, tracking and responding effectively to the large volume of inquiries being received, additional staff resources are being secured to serve as a full-time drought customer service coordinator;
- Internal staff resources are also being secured to help with scheduling of speaker's bureau presentations and staffing numerous community event invitations;
- Having dedicated customer service staff in place for drought response will help gather information from the various units in the organization receiving inquiries, identify trends in the nature of the inquiries, identify opportunities for development of materials and a frequently-asked-questions document, and enable reporting on the District's responsiveness to the Board and community on drought issues;
- Staff is exploring new concepts for regional advertising with Bay Area agencies, as well as a potential focused summer campaign based on seasonal needs as discussed at the Board Water Conservation Ad Hoc meeting;
- Staff is researching promotional items that can supplement the usual inventory of conservation items for use at summer community events.

To reach the 20 percent water use reduction target, additional resources will be required, including a budget for a more extensive summer ad campaign. In 2008, BBC Research &

Consulting prepared a Conservation Marketing Plan (Plan) for the District that recommended a reserve of $700,000 (in any given year) for emergency conservation and marketing campaigns to support drought management. The plan further recommended long-term growth in the District's general conservation marketing budget, with a funding level of $1,500,000 recommended in FY2013. A recommended budget adjustment for FY2013 will be included in the next update on 2014 water supply and drought response.

3. Conservation Program

Due to the increased media attention, there has been a significant increase in inquiries from the public and participation in District long-term conservation programs. The number of calls to the water conservation hotline has doubled and interest in the Landscape Rebate Program has quadrupled (both compared to the same time last year).

The Board Ad Hoc Water Conservation Committee will be examining the District's long-term conservation programs and discussing which ones might benefit from an increased rebate. Staff will return at a future Board meeting with details of an augmented program and a recommended budget adjustment. Also, to help facilitate new ideas for saving water, staff will be expediting the next round of funding for the Safe, Clean Water Conservation Research Grant program. Staff also plans to increase the amount of funding available and open it up to individuals and for-profit companies (these were not eligible for the first cycle).

4. Recycled Water Program

Non-potable recycled water production in January and February was 2,545 acre-feet, tracking 172% of the five year average for the same period. For calendar year 2014, recycled water use is projected to total 23,000 acre-feet, compared estimated actual recycled water use of 20,516 acre-feet in 2013.

The drought has raised greater interest in expansion of recycled water, both non-potable water from existing systems as well as accelerated development of potable reuse. In accordance with Board policy, the District plans to expand recycled water use to meet at least 10 percent of County demand by 2025 (a total of 40,000 to 45,000 acre-feet). To help meet this target, the District is currently constructing the Silicon Valley Advanced Water Purification Center which is expected to be completed by summer 2014. In addition the District is designing several major recycled water pipelines in Sunnyvale and Gilroy area, and planning and pursuing funding for short-term as well long-term reuse projects in the county.

5. State and Federal Drought Relief and Funding

Staff is tracking a number of State and federal legislative initiatives aimed at providing drought relief and funding to offset costs of drought response and accelerate water supply and water use efficiency projects.

The California Emergency Drought Relief Act of 2014 (S 2016) was introduced by Senator Feinstein in early February. A summary of S2016 was attached to the February 25th Board agenda memo, including provisions for increased federal disaster assistance, including

funding authorizations for WaterSMART grants, and reauthorization of the CALFED Bay Delta program through 2018. At present, a hearing on S2016 has not been scheduled.

On February 28, Congressman Costa introduced a package of legislation (HR4125, HR4126, and HR4127) to advance the construction of storage projects in California, including: 1) the expansion of Shasta Dam, 2) the expansion of San Luis Reservoir; and 3) the Upper San Joaquin River Storage. A summary of this federal legislation is provided in Attachment 6. Increased storage is part of a comprehensive solution to address water reliability, along with water conservation, recycling, groundwater storage, water transfers, and other water management tools needed to ensure water supply reliability. Additional surface storage provides flexibility to California's constrained water management system. Surface storage is useful in providing drought protection, releasing water at specific times for water quality and environmental benefits, contributing to flood management, mitigating for lost snowpack due to climate change, and in responding to other unforeseen circumstances.

Staff is also evaluating opportunities related to State legislation introduced in February to provide drought relief for communities and funding to increase local water supplies. Much of the $647 million in proposed funding under is accelerated expenditure of voter-approved Proposition 84 and Proposition 1E bonds (a total of $549 million) for infrastructure grants to support enhanced water conservation, recycled water, groundwater management, and development of local supplies. A complete summary will be provided with the April udpate of 2014 water supply and drought response.

6. District Asset Management Opportunities

Staff continues to assess opportunities to inspect and rehabilitate facilities that are otherwise not accessible, including dams, reservoirs and groundwater recharge facilities. Some groundwater recharge ponds have been not been out of service for years, or in some cases, decades. Staff initiated projects to clean the Los Capitancillos, Guadalupe, Alamitos, and Main Ponds this spring. A plan is being developed to clean other recharge ponds later in the year.

Staff is also developing a plan to replace/upgrade hydraulic lines at Stevens Creek, Guadalupe, Almaden, Chesbro and Uvas Dams, and is investigating replacement of downstream valves at Uvas and Chesbro Dams, as well as replacing cables and inspecting Coyote Percolation Dam. As these projects are better defined, staff will return to the Board with recommendations for any needed budget adjustments.

FINANCIAL IMPACT CHANGE:

Implementing measures to achieve a 20 percent water use reduction target in 2014 could reduce Water Utility revenues by $30 million to $40 million, depending on whether reductions occur in treated water or groundwater deliveries, and depending on the distribution of reductions between the District's north county and south county groundwater charge zones. Staff is currently evaluating the impact of this water use reduction target on FY15 Water Utility financial planning. In addition, increased costs are being incurred for conveyance pumping, treatment plant operations, conservation programs and public outreach, and other drought response measures. To accommodate reduced revenues and increased costs, it is anticipated that

adjustments will be needed to reduce other operating costs and delay projects in the Water Utility Capital Improvement Program.

CEQA:

The recommended action does not constitute a project under CEQA because it does not have a potential for resulting in direct or reasonably foreseeable indirect change in the physical environment.

ATTACHMENTS:

Attachment 1, Staff Presentation
Attachment 2, Neighborhood Update, March 2014: Reservoir and creek dry back conditions
Attachment 3, Santa Clara County Retailer Drought Response Actions 2014
Attachment 4, City of Morgan Hill Drought Ordinance
Attachment 5, Santa Clara Valley Water District, Summary of Drought Communication and Outreach Efforts
Attachment 6, Summary of Federal Legislation for California Storage Projects (Costa)

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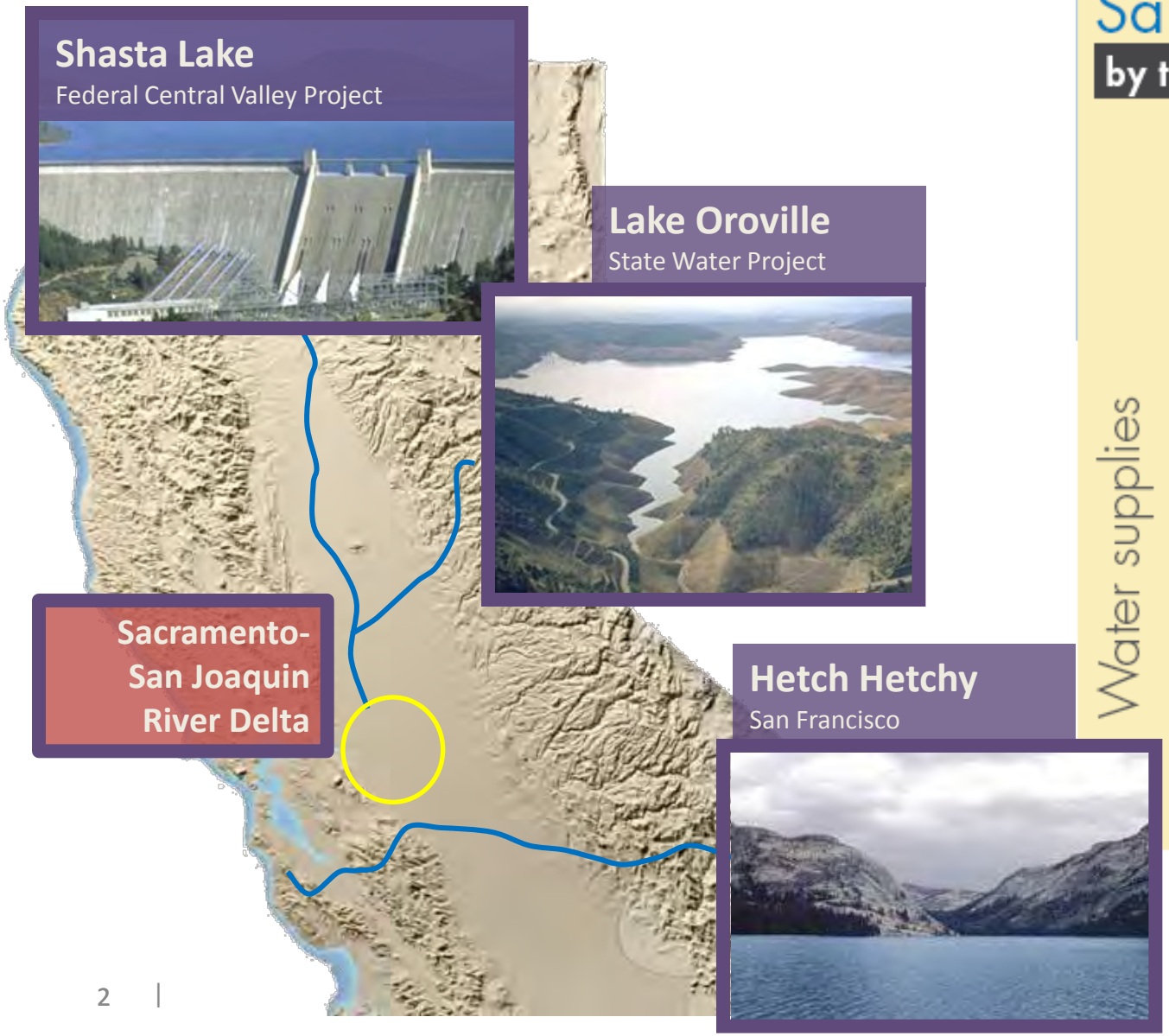
Update on 2014 Water Supply Outlook

February 25, 2014

Santa Clara Valley Water District

Sources of Supply for Santa Clara County



Santa Clara County

by the numbers

Water supplies

30% local water
- 15% natural groundwater
- 10% from reservoirs to groundwater
- 5% from reservoirs to drinking water treatment plants

55% imported water
- 15% thru Delta to replenish groundwater
- 25% thru Delta to drinking water treatment plants
- 15% from Hetch Hetchy system

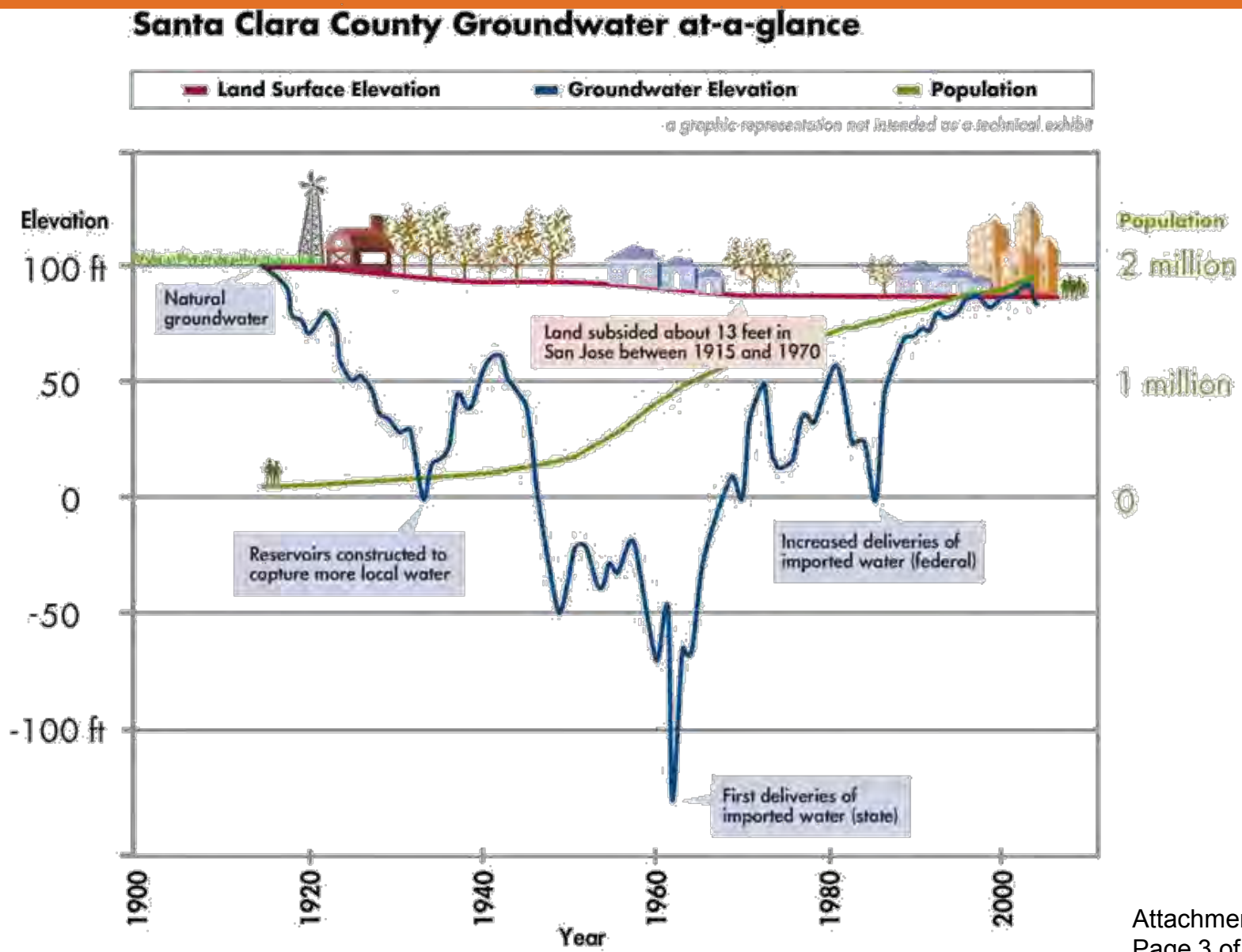
5% recycled water

90%

10% Water Conservation

100%

Local and Imported Water are Needed to Maintain Groundwater and Prevent Land Subsidence



Water Shortage Contingency Plan

From District's 2010 Urban Water Management Plan

Stage	Title	Projected End-of-Year Groundwater Storage (AF)	Suggested Short-Term Reduction in Water Use
1	Normal	Above 300,000 AF	None
2	Alert	250,000 AF to 300,000 AF	0 – 10%
3	Severe	200,000 AF to 250,000 AF	10 – 20%
4	Critical	150,000 AF to 200,000 AF	20 – 40%
5	Emergency	Less than 150,000 AF	Up to 50%

Board Adopted Resolution on February 25

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Santa Clara Valley Water District that **a water use reduction target equal to 20 percent of 2013 water use is called for through December 31, 2014**, and it is further recommended that **retail water agencies, local municipalities and the County of Santa Clara implement mandatory measures as needed** to achieve the 20 percent water use reduction target.

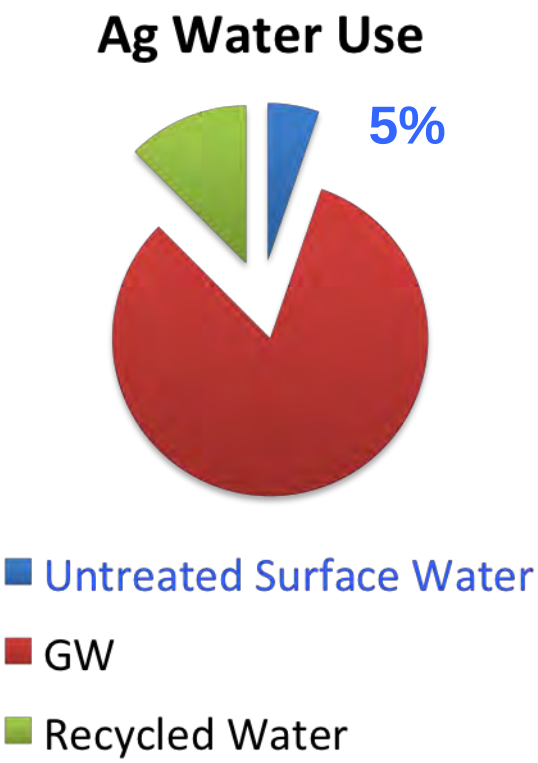
Update on 2014 Water Supply

Estimated Supplies (AF)	Jan. 28, 2014 Initial Outlook	Feb. 25, 2014 Update	Mar. 25, 2014 Update
Local surface water	34,000	26,300	26,300
Natural groundwater recharge	47,100	38,600	38,600
Imported – District	149,000	106,200	100,780
Imported – Hetch Hetchy	57,000	44,000	49,500
Recycled water	23,000	23,000	23,000
Total	**310,100**	**238,100**	**238,180**
Estimated Use (AF)			
Groundwater pumping	173,200	201,200	206,300
Treated water deliveries--District	121,000	107,300	95,000
Surface water, SJWC treated water	5,000	300	2,000
Imported—Hetch Hetchy	57,000	44,000	49,500
Recycled water	23,000	23,000	23,000
Total	**379,200**	**375,800**	**375,800**
Net from Groundwater Reserves (AF)	**69,100**	**137,700**	**137,620**
Est. End-of-Year Groundwater Storage (AF)	**273,900**	**205,300**	**205,380**

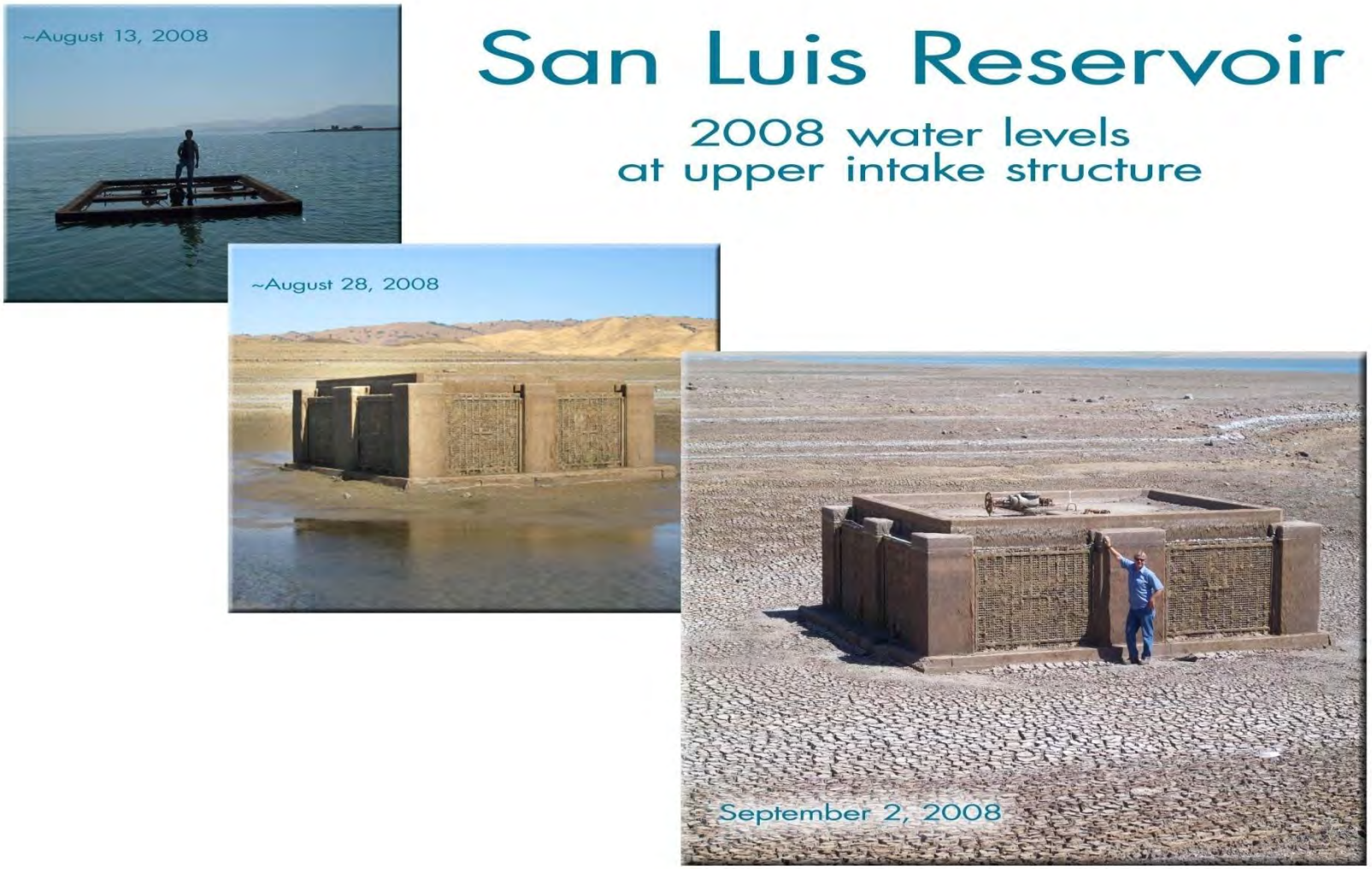
2014 Operational Challenges

- Limited treatment plant supplies
- Delta water quality
- San Luis Reservoir “low point”
- Untreated surface water deliveries
- Dry reservoirs, creeks and recharge ponds

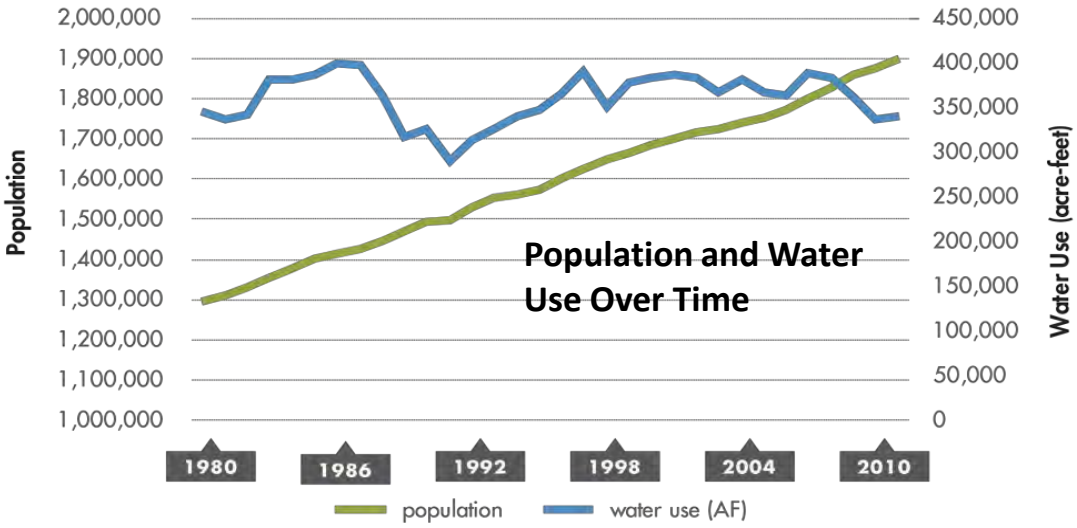
Untreated Surface Water

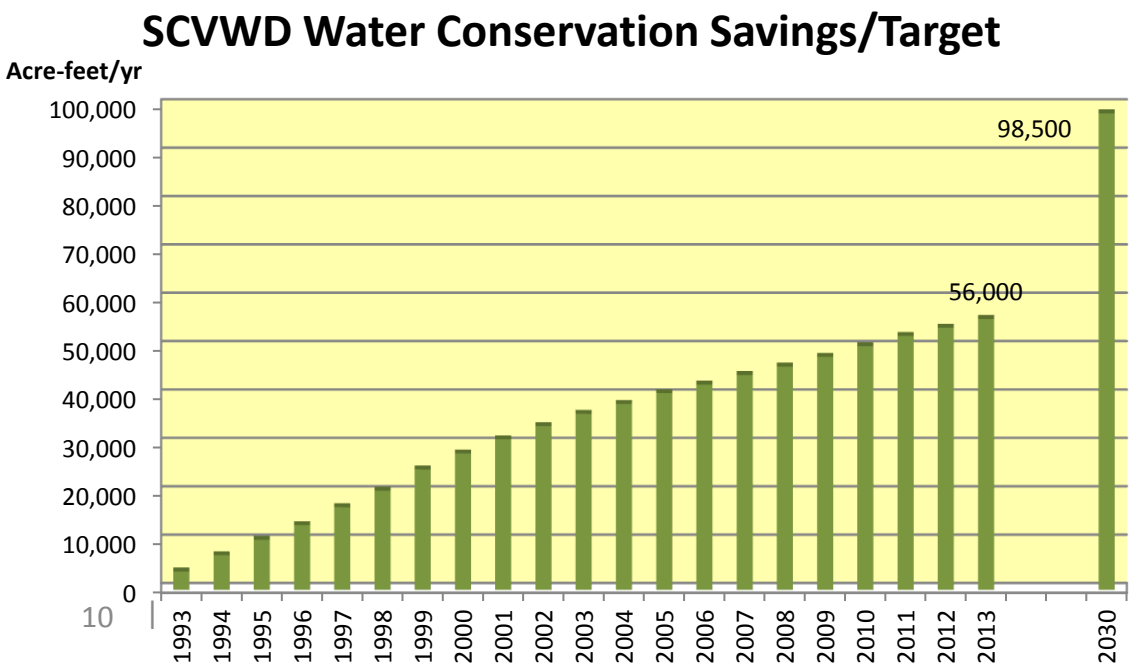


2014 Operational Challenges



Water Conservation Program = Long-Term Savings





Drought Communications and Outreach

- To achieve call for 20% water use reduction

Media relations

Ethnic media tour of SVAWPC

Board and key stakeholder outreach

- Board Water Conservation Ad Hoc
- Retailer Communications and Conservation committees
- Message distribution to key stakeholders
- Coordination with state and regional water agencies
- Government relations outreach to advocacy stakeholders, the State Legislature, and Congress

ACWA Campaign

Public education and customer service

- Speakers bureau presentations and other requests
- Informed employees
- valleywater.org/Drought2014
- Save20gallons.org
- Drought hotline: 408-630-2000
- Access Valley Water - drought
- E-Newsletter and social media

Program materials and marketing

Fact Sheet
Water Conservation Program Updates

Santa Clara Valley Water District

Updates and New Programs

- **New rebate amounts for High-Efficiency Toilet Rebate program.** Replace your inefficient toilets and you may be eligible to receive up to $125 per PREMIUM model Hig Efficiency Toilet and up to $50 per Non-PRE High-Efficiency Toilet, no pre-inspection requ For more information or to receive a High Efficiency Toilet Rebate Program Application please call the District's contractor, ConserVi

FREQUENTLY ASKED
FAQ
QUESTIONS

Santa Clara Valley Water District

Indoor Tips for Residents

No cost, easy to do

- Take shorter showers—2.5 gallons/minute*

Graywater

What is graywater?

Graywater is water from showers, bath tubs, washing machines, and bathroom sinks. It is water that contains some soap and detergents but is clean enough to water plants. Water from toilets or wash water from diapers is never considered graywater. Kitchen sink water is not considered graywater in California.

Why use graywater?

Graywater helps conserve our drinking water supply, decreases water and wastewater utility bills, decreases input to septic systems, and reduces burden on wastewater treatment facilities. Another benefit of using graywater is that it connects us to our water supply, helping us understand where our water comes from and where it goes. Becoming conscious of our

Planned and prospective activities

- Countywide mailer to all residences in SCC
- Sharing information with retailers and partners
- Drought customer service coordinator
- Possible regional advertising campaign
- Summer season advertising
- Expanded community visibility
- New promotional giveaway items

Questions?

Valleywater.org
Save20gallons.org

Santa Clara Valley Water District

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Neighborhood Update - March 2014

Reservoir and creek dry back conditions

Santa Clara Valley Water District

Los Capitancillos groundwater recharge pond in South San Jose is at its lowest level in years.

Lack of rainfall continues to impact creeks and reservoirs

To conserve water in the midst of one of the driest seasons on record, the Santa Clara Valley Water District is modifying its operations. These changes will impact creek flows and groundwater recharge pond water levels in your neighborhood and throughout the valley.

Despite last year's dry conditions, the water district carefully managed its operations so that our county was able to start 2014, after two dry years, with normal groundwater levels. But continuing dry weather, minimal runoff in local reservoirs and unprecedented low allocations of state and federal imported water mean that surface water supplies are very limited this year.

In this drought, the water district is having to make some tough decisions. Because of the lack of local and imported water, nearly all of our groundwater replenishment operations have been cut back to conserve supplies for use this summer.

A priority of the district is continued delivery of safe, clean water from its drinking water treatment plants to local water providers and municipalities. Imported water typically provides more than 85 percent of the supply for the water district's three drinking water treatment plants. In dry and critically dry years, when local water is limited, up to 99 percent of treated drinking water is from imported water sources.

Planned operation conditions in your area

Cupertino/Saratoga area:

- Releases of local water from Stevens Creek Reservoir will continue to provide limited flows in Stevens Creek, but expect progressively drying creek conditions as reservoir water levels fall below intake structures later in the year.
- Pipeline releases of imported water to local creeks and McClellan ponds for groundwater recharge are being suspended.
- Expect dry creek conditions for the rest of the year on Rodeo, Regnart, Calabazas and Saratoga creeks.

Los Gatos Creek area:

- Expect to see flows to Los Gatos Creek reduced as water levels in Lexington and Vasona reservoirs fall.
- All diversion of flow to groundwater recharge ponds has been suspended so expect to see dry ponds throughout the area. Page, Sunnyoaks, Budd, McGlincy, Oka and Camden ponds are, or will be, going dry during the spring, summer and fall.

continued on back »

Guadalupe Creek during the week of March 17, 2014.

To ensure safe, clean drinking water through the summer, imported and local water supplies are being stored in Anderson, Coyote and Calero reservoirs. With little local rainfall and runoff, however, all other district reservoirs are continuing to drop to minimum storage, and releases to creek and ponds are being curtailed.

South San Jose/Almaden area:

- Almaden and Calero reservoir outlets have been closed altogether due to drought conditions. Expect creeks below these dams to dry back.
- Almaden Lake Park is expected to lose all inflows to the lake as temperatures increase and creeks dry up. Expect lake elevation to fall over the summer months and remaining water quality to decline in the lake.
- Releases of water to Los Capitancillos Ponds are currently suspended for stream gauge work and will not be put back into operation until water supply conditions improve. If drought conditions continue in 2014, the water district may use this opportunity to undertake needed maintenance of this pond system.
- Groundwater recharge operations at Alamitos and Guadalupe ponds have been suspended. Expect these ponds to slowly dry up through the summer. The water district may perform maintenance and pond cleaning operations when the ponds go dry.
- All imported water releases to creeks in this area have been suspended until water supply improves.

East San Jose area:

- Releases of imported water to Upper Penitencia Creek and most adjacent recharge ponds are being suspended.
- Expect gradual reduction in water levels, resulting in the drying up of the Piedmont, Capitol and Helmsley ponds. In addition, ponds will be drying at Penitencia Creek Park (City of San José), Penitencia Creek County Park (County of Santa Clara) and Overfelt Garden Park (City of San José).

Morgan Hill/South San Jose area:

- Releases of imported water to Coyote Creek have been reduced and may be further reduced depending on water supply conditions.

Gilroy/Morgan Hill area:

- Releases of local water from Uvas and Chesbro dams will continue to provide limited flows in Uvas and Llagas creeks, but expect drying creeks and falling reservoir elevations until the water in the reservoir is exhausted and natural flows stop this summer.
- Releases of imported water to Madrone Channel and Main Avenue ponds may be suspended or reduced. Expect ponds potentially to dry up over the next few months and some work to be done to restore these ponds to improve capacity for future groundwater recharge.

CONTACT US

For more information, contact the **Drought Hotline** at **(408) 630-2000**, or visit our website at valleywater.org and use our **Access Valley Water** customer request and information system. With three easy steps, you can use this service to find out the latest information on district projects or to submit questions, complaints or compliments directly to a district staff person.

Follow us on: /scvwd /valleywater /valleywater

To get eNews, email info@valleywater.org

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Santa Clara County Water Retailer Drought Response Actions 2014

March 25, 2014

Retailer	Council Date	Action	Outreach	Restrictions	Allocation or Rationing Program	Drought Rates
California Water Service Company	N/A	Working with CPUC to activiate Rule 14.1 (water restrictions)	Plan to increase outreach/education efforts	Staff working with CPUC to update Rule 14.1 restrictions	Not at this time	Not at this time
Mountain View	4/1/2014	Public hearing for water shortage ordinance and resolution declaring a Stage 1 shortage (10%) to be consistent with SFPUC call. Second reading is scheduled for 4/8/14	Looking to increase outreach/education efforts	Permanent water waste measures only.	Not at this time	Not at this time
Palo Alto	3/3/2014 - information session only, no formal action was taken	City calling for voluntary 10% to be consistent with SFPUC call.	Plan to increase outreach/education efforts	Permanent water waste measures only.	Not at this time	Not at this time
Purrissima Hills Water Districct		Supporting SFPUC's call for voluntary 10%	Have increased outreach efforts with drought specific information	Permanent water waste measures only.	Not at this time, will reconsider if SFPUC calls for mandatory rationing	Not at this time, will reconsider if SFPUC calls for mandatory rationing
Santa Clara	None scheduled	Still discussing internally. Staff recommendation will likely depend on SFPUC April update and March water use.	Plan to increase outreach/education efforts	Permanent water waste measures only.	Not at this time	Not at this time
Stanford University	N/A	Calling for voluntary 10% based on SFPUC's call	increasing outreach/education, fact sheets, emails, etc. Working with groups on campus, all irrigation off right now.	N/A	Not at this time	Not at this time
Sunnyvale	Sometime in April	Still discussing internally, reduction target will likely depend on SFPUC update in April	Plan to increase outreach/education efforts	Discussing internally	Not at this time	May consider increasing rates or adding a tier
Great Oaks Water Company	N/A	Activated Rule 14.1 conservation measures on February 28, 2014	Wesite notification (3/6/14); bill inserts (3/11/14)	Tarriff Rule 14.1 Restrictions Activated	Not at this time	Not at this time. May consider a drought related rate change in the future, will require an additional filing with CPUC
San Jose Muni Water	None scheduled	Still discussing internally. Staff recommendation will likely depend on SFPUC April update and March water use.	Plan to increase outreach/education efforts	Permanent water waste measures only.	Not at this time	Not at this time
San Jose Water Company	N/A	Filed with CPUC in late February to start process, activate Rule 14.1 (water restrictions)	Plan to increase outreach/education efforts	All field personnel will be trained about Rule 14.1 and will engage with customers as appropriate when violations are observed. Will use door hangers to notify residents of violations when contact cannot be made in person	Not at this time	Not at this time. May consider a drought related rate change in the future, will require an additional filing with CPUC
Milpitas	NO RESPONSE					
Morgan Hill	4/2/2014	Staff recommending Stage 1 (20%)	Looking to increase outreach/education efforts. City staff recommending they start sending out home water use reports	Permanent water waste measures in place. Declaration of Stage 1 includes additional restrictions (e.g. limiting the number of days per week for irrigation).	Not at this time	Not at this time
Gilroy	5/7/2014	Staff updating drought contingency plan to be consistent with others. Plan to recommend a call for 20%	Plan to increase outreach/education efforts	Updating restrictions to be consistent with Morgan Hill Stage 1	Not at this time	Considering increasing tiered rates (except base tier)
Santa Clara County	3/20/2014 (Committee meeting)	Housing, Land Use, Environment and Transportation (HLUET) Committee has been discussing potential County drought response actions	Plan to increase outreach/education efforts	One potential action HLUET is considering is a drought ordinance based on the model used by others in the county.	N/A	N/A

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ORDINANCE NO. 1932, NEW SERIES

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF MORGAN HILL AMENDING SECTIONS 13.04.010 (Definitions), 13.04.330 (Wasting of Water), 13.04.390 (Enforcement), AND 13.04.400 (Violation-Penalty) OF CHAPTER 13.04 (Water System) OF TITLE 13 (Public Services), ESTABLISHING REGULATIONS PROHIBITING NONESSENTIAL USE OF POTABLE WATER AND ADOPTING PENALTIES AND FINES FOR VIOLATIONS.

WHEREAS, the City of Morgan Hill recognizes that there is a limited supply of water available to serve the residents and businesses of Morgan Hill; and,

WHEREAS, the City of Morgan Hill wishes to encourage the efficient use of water in order to optimize the use of the limited supply

WHEREAS, a Water Supply Shortage Program is essential to ensure a reliable and sustainable minimum supply of water for the public health, safety and welfare.

WHEREAS, the City Council wishes to amend the municipal code to ensure a reliable and sustainable minimum supply of water through its water conservation program.

NOW THEREFORE, IN CONSIDERATION OF THE FOREGOING, THE CITY COUNCIL OF THE CITY OF MORGAN HILL DOES HEREBY ORDAIN AND ENACT AS FOLLOWS:

Section 1. Findings.

a. A reliable minimum supply of potable water is essential to the public health, safety and welfare of the people and economy of City of Morgan Hill.

b. The City of Morgan Hill is located in a semi-arid region and is dependent upon local surface water, groundwater, and imported water supplies. A growing population, climate change, environmental concerns, and other factors in other parts of the State and western United States, make the region highly susceptible to water supply reliability issues.

c. There is a need for water conservation program and regulations because there is a limited supply of water available to serve the residents and businesses of Morgan Hill and demand for water has, at times, exceeded supply, threatening a water shortage.

d. Careful water management that includes active water conservation measures not only in times of drought, but at all times, is essential to ensure a reliable minimum supply of water to meet current and future water supply needs.

e. Article X, Section 2 of the California Constitution declares that the general welfare requires that water resources be put to beneficial use, waste or unreasonable use or unreasonable method of use of water be prevented, and conservation of water be fully exercised with a view to the reasonable and beneficial use thereof.

f. Article XI, Section 7 of the California Constitution declares that a city or county may make and enforce within its limits all local, police, sanitary and other ordinances and regulations not in conflict with general laws.

g. California Water Code Section 375 authorizes water suppliers to adopt and enforce a comprehensive water conservation program to reduce water consumption and conserve supplies.

h. The Governor of California has proclaimed a statewide drought and issued an Executive Order, which takes immediate action to address a dire situation where numerous California communities are being forced to mandate water conservation or rationing. The lack of water has created other problems, such as extreme fire danger due to dry conditions, economic harm to urban and rural communities, loss of crops and the potential to degrade water quality in some regions. As well, the Santa Clara Valley Water District Board of Directors has called for an immediate 15 percent reduction in water use to assure we have enough water to endure the current drought.

g. The adoption and enforcement of a water conservation and supply shortage program is necessary to manage the City of Morgan Hill's potable water supply in the short and long-term and to avoid or minimize the effects of drought and shortage within the City of Morgan Hill. Such program is essential to ensure a reliable and sustainable minimum supply of water for the public health, safety and welfare.

Section 2. Declaration of Purpose and Intent.

a. The purpose of this Ordinance is to establish a water conservation and supply shortage program that will reduce water consumption within the City of Morgan Hill through conservation, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the City of Morgan Hill to avoid and minimize the effect and hardship of water shortage to the greatest extent possible.

b. This Ordinance establishes permanent water conservation standards intended to alter behavior related to water use efficiency at all times and further establishes three levels of water supply shortage response actions to be implemented during times of declared water shortage or declared water shortage emergency, with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies.

Section 3. CEQA Exemption

Therefore, the city finds that this Ordinance and actions taken hereafter pursuant to this Ordinance are exempt from the California Environmental Quality Act as specific actions necessary to prevent or mitigate an emergency pursuant to Public Resources Code Section 21080(b)(4) and the California Environmental Quality Act Guidelines Section 15269(c). The

City Clerk is hereby authorized and directed to file a Notice of Exemption as soon as possible following adoption of this Ordinance.

Section 4. Section 13.04.010 (Definitions) of Chapter 13.04 (Water System) of Title 13 (Public Services) is hereby amended in its entirety as follows:

"Section 13.04.010 Definitions.

For the purposes of this Chapter, unless otherwise apparent from the context, certain words and phrases used in this chapter are defined as follows:

A. "Person" means any natural person or persons, corporation, public or private entity, governmental agency or institution, or any other user of water provided by the city.

B. "Landscape irrigation system" means an irrigation system with pipes, hoses, spray heads, or sprinkling devices that are operated by hand or through an automated system.

C. "Single pass cooling systems" means equipment where water is circulated only once to cool equipment before being disposed.

D. "Potable water" means water which is suitable for drinking.

E. "Recycled water" means the reclamation and reuse of non-potable water for beneficial use as defined in Title 22 of the California Code of Regulations.

F. "Station" means an area of irrigated landscape controlled by a single irrigation valve.

G. "Superintendent" means the superintendent of water of the city, and any act in this chapter required or authorized to be done by the superintendent, may be done on behalf of the superintendent by an authorized officer or employee of the water department."

Section 5. Section 13.04.330 (Wasting of Water) of Chapter 13.04 (Water System) of Title 13 (Public Services) is hereby amended in its entirety to read as follows:

"13.04.330 Wasting of water and drought emergencies

A. Applicability
1. The provisions of this chapter apply to any person in the use of any potable water provided by the city.
2. The provisions of this chapter do not apply to uses of water necessary to protect public health and safety or for essential government services, such as police, fire and other similar emergency services.

3. The provisions of this chapter do not apply to the use of recycled water, with the exception of subsection B (1) of this section.
4. The provisions of this chapter do not apply to the use of water by commercial nurseries and commercial growers to sustain plants, trees, shrubs, crops or other vegetation intended for commercial sale.
5. This chapter is intended solely to further the conservation of water. It is not intended to implement any provision of federal, State, or local statutes, ordinances, or regulations relating to protection of water quality or control of drainage or runoff.

B. Prohibition Against Waste: The following water conservation requirements are effective at all times and are permanent. Violations of this section will be considered waste and an unreasonable use of water.
1. Limits on Watering Hours: Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 9:00 a.m. and 5:00 p.m. Pacific Standard/Daylight Savings Time on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
2. Limit on Watering Duration: Watering or irrigating of lawn, landscape or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than fifteen (15) minutes watering per day per station. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a 70% efficiency standard.
3. No Excessive Water Flow or Runoff: Watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch is prohibited.
4. No Washing Down Hard or Paved Surfaces: Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.
5. Obligation to Fix Leaks, Breaks or Malfunctions: Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more than ten (10) days of receiving written notice from the city, is prohibited.
6. Recirculating Water Required for Water Fountains and Decorative Water Features: Operating a water fountain or other decorative water feature that does not use recirculated water is prohibited.
7. Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not is prohibited, except by use of a hand-held bucket or similar container or

a hand-held hose equipped with a positive self-closing water shut-off nozzle or device. This subsection does not apply to any commercial car washing facility.

8. Drinking Water Served Upon Request Only: Eating or drinking establishments, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

9. Commercial Lodging Establishments Must Provide Guests Option to Decline Daily Linen Services: Hotels, motels and other commercial lodging establishments must provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments must prominently display notice of this option in each bathroom using clear and easily understood language.

10. No Installation of Single Pass Cooling Systems: Installation of single pass cooling systems is prohibited in buildings requesting new water service.

11. No Installation of Non-re-circulating in Commercial Car Wash and Laundry Systems: Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems.

12. Restaurants Required to Use Water Conserving Dish Wash Spray Valves: Food preparation establishments, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.

13. Commercial Car Wash Systems: Within one year of passage of this ordinance, all commercial conveyor car wash systems must have installed operational re-circulating water systems, or must have secured a waiver of this requirement from the city.

C. Level 1 Water Supply Shortage (11% - 20% reduction): A Level 1 Water Supply Shortage exists when the city council determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a 11% - 20% consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the city of a Level 1 Water Supply Shortage condition, the following mandatory water conservation requirements, in addition to the prohibited uses of water set forth in subsection B of this section, shall apply during such time that the Level 1 Water Supply Shortage is in effect.

1. Limits on Watering Days. Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to three to five days per week (as necessary to achieve reductions as determined in the discretion of the superintendent) on a schedule established and posted by the city. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the city. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. Obligation to Fix Leaks, Breaks or Malfunctions. All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within

seventy-two (72) hours of notification by the city unless other arrangements are made with the city.
3. No Washing Down Hard or Paved Surfaces. Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.

D. Level 2 Water Supply Shortage (21% - 35% reduction).
A Level 2 Water Supply Shortage exists when the city council declares, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a 21% - 35% consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration of a Level 2 Water Supply Shortage condition, the following mandatory water conservation requirements, in addition to the prohibited uses of water set forth in subsections B and C of this section, shall apply during such time that the Level 1 Water Supply Shortage is in effect.
1. Watering Days. Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to two days per week (as necessary to achieve reductions as determined in the discretion of the superintendent) on a schedule established and posted by the city. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the city. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
2. Obligation to Fix Leaks, Breaks or Malfunctions. All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the city unless other arrangements are made with the city.
3. Limits on Filling Ornamental Lakes or Ponds. Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this section.
4. Limits on Washing Vehicles. Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, is prohibited except at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.
5. Limits on Filling Residential Swimming Pools & Spas. Re-filling of more than one foot and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.

E. Level 3 Water Supply Shortage – Emergency Condition (Greater than 35% reduction). A Level 3 Water Supply Shortage shall be referred to as a Water Shortage Emergency. A Level 3 condition exists when the city council declares, in its sole discretion, a water shortage emergency and notifies its residents and businesses that a greater than 35% reduction in consumer demand is necessary to maintain sufficient water supplies for public health and safety, pursuant to Water Code Section 350 et seq. Upon the declaration of a Level 3 Water Supply Shortage condition, the following mandatory water conservation requirements, in addition to the prohibited uses of water set forth in subsections B, C and D of this section, shall apply during such time that the Level 3 Water Supply Shortage is in effect

1. No Watering or Irrigating. Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited. This restriction does not apply to the following categories of use, unless the city has determined that recycled water is available and may be applied to the use:

a. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self–closing water shut-off nozzle or device;

b. Maintenance of existing landscape necessary for fire protection;

c. Maintenance of existing landscape for soil erosion control;

d. Maintenance of plant materials identified to be rare or essential to the well-being of protected species;

e. Maintenance of landscape within active public parks and playing fields, day care centers, golf course greens, and school grounds, provided that such irrigation does not exceed two (2) days per week for no more than fifteen (15) minutes watering per day per station and is prohibited between the hours of 9:00 a.m. and 5:00 p.m. Pacific Standard/Daylight Savings Time, according to the schedule established in subsection D(1) or this section.

f. Actively irrigated environmental mitigation projects.

2. Obligation to Fix Leaks, Breaks or Malfunctions. All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty four (24) hours of notification by the city unless other arrangements are made with the city.

3. Limits on New Potable Water Service: Upon declaration of a Level 3 Water Shortage Emergency condition, the city may limit the issuance of new potable water services, temporary meters and/or statements of immediate ability to serve or provide potable water service (such as, will-serve letters, certificates, or letters of availability), except under the following circumstances:

a. A valid, unexpired building permit has been issued for the project; or

b. The project is necessary to protect the public health, safety, and welfare; or

c. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the city.

d. This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one year or less.

4. Limits on Building Permits. Upon declaration of a Level 3 Water Supply Shortage Emergency condition, the city manager is authorized to implement a program in his or her discretion to limit or withhold the issuance of building permits which require new or expanded water service, except to protect the public health, safety and welfare, or in cases which meet the city's adopted conservation offset requirements.
5. Discontinue Service. The city, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this section.
6. No New Annexations. Upon the declaration of a Level 3 Water Supply Shortage condition, the city may suspend consideration of annexations to its service area. This subsection does not apply to boundary corrections and annexations that will not result in any immediate increased use of water.

F. Procedures for Determination/Notification of Water Supply Shortage
The existence of Level 1, Level 2 or Level 3 Water Supply Shortage conditions may be declared by resolution of the city council adopted at a regular or special public meeting held in accordance with state law. The mandatory conservation requirements applicable to Level 1, Level 2 or Level 3 conditions will take effect on the tenth day after the date the shortage level is declared. Within five (5) days following the declaration of the shortage level, the city must publish a copy of the resolution in a newspaper used for publication of official notices.

G. Hardship Waiver. If, due to unique circumstances, a specific requirement of this chapter would result in undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water users, then the person may apply for a waiver to the requirement as provided in this Section.
1. Application: Application for a waiver must be on a form prescribed by the superintendent and accompanied by a nonrefundable processing fee in an amount set by city council resolution.
2. Supporting Documentation: The application must be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant.
3. Required Findings for Waiver: The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water use due to specific and unique circumstances of the user or the user's property. An application for a waiver will be denied unless the superintendent finds, based on the information provided in the application, supporting documents, or such additional information as may be requested, and on water use information for the property as shown by the records of the city or its agent, all of the following:
a. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other residents and businesses;
b. That because of special circumstances applicable to the property or its use, the strict application of this chapter would have a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally;

c. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the city to effectuate the purpose of this chapter and will not be detrimental to the public interest; and
d. That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.
4. Approval Authority: The superintendent must act upon any completed application no later than ten (10) days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply to the subject property during the period of the mandatory water supply shortage condition. The decision of the superintendent shall be final."

Section 6. Chapter 13.04.390 (Enforcement) of Chapter 13.04 (Water System) of Title 13 (Public Services) is hereby amended as follows (additions shown in *italics*):

"Section 13.04.390 Enforcement

It shall be the duty of the employees of the police, fire, *community development* and ~~street~~ *public works* departments to give vigilant aid to the superintendent in the enforcement of the provisions of this chapter, and to this end they shall report all violations thereof which shall come to their knowledge, to the office of the superintendent and it shall be the duty of the chief of the fire department to report immediately to the superintendent in case of fire in premises, having metered service for fire protection purposes that fire has occurred there."

Section 7. Chapter 13.04.400 (Violation - Penalty) of Chapter 13.04 (Water System) of Title 13 (Public Services) is hereby amended in its entirety to read as follows:

"**13.04.400 Violation-Penalty.**

A. Penalty. Any person violating or causing or permitting to be violated, any of the provisions of this chapter, is deemed guilty of a misdemeanor. Upon conviction thereof, such person shall be punished by a fine not exceeding one thousand dollars ($1,000), or by imprisonment in the county jail for not more than 30 days. Every such person shall be deemed to be guilty of a separate offense for every day during any portion of which any violation of any provision of this chapter is committed, continued or permitted by such person, and shall be punishable therefor as provided in this section.

B. Notwithstanding any other provision of this code, whenever a violation of any section contained in this chapter is punishable as a misdemeanor, the city attorney may specify that the offense is an infraction, and proceed with prosecution as an infraction, unless the defendant objects to the offense being made an infraction, in which event the court may elect to have the complaint amended to charge as a misdemeanor, and the case shall proceed on a misdemeanor charge.

C. Violation of Section 13.04.330. In addition to all other available remedies, including penalties available pursuant to subsection A or B of this section, any person violating or

causing or permitting to be violated any provision of Section 13.04.330 shall be subject to the following penalties and fines pursuant to the authorities and procedures set forth in Chapter 1.19:

1. First Violation: The City of Morgan Hill will issue a written warning and deliver a copy of this ordinance by mail.

2. Second Violation: A second violation within any consecutive twelve (12) months period is punishable by a fine not to exceed one hundred dollars ($100).

3. Third Violation: A third violation within any consecutive twelve (12) months period is punishable by a fine not to exceed two hundred dollars ($200).

4. Subsequent Violations: Any subsequent violations within any consecutive twelve (12) months period are punishable by a fine not to exceed five hundred ($500) and subject to installation of a water flow restrictor device of approximately one gallon per minute capacity for services up to one and one-half inch size and comparatively sized restrictors for larger services after written notice of intent to install a flow restrictor for a minimum of forty eight (48) hours.

a. In addition to any other fines or penalties, a person who violates provisions of Section 13.04.330 is responsible for payment of the City of Morgan Hill's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the city's schedule of charges then in effect. The charge for installing and/or removing any flow restricting device must be paid to the city before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

b. The first installation of a flow-restricting device shall remain in place for a minimum of three days and shall be removed by the city not more than ten days after installation. The second installation of a flow-restricting device, for continued violation of this chapter, shall remain in place for a minimum period of ten days before being removed by the city no later than thirty days thereafter. Normal water service shall not be restored until all installation and removal costs of flow-restricting devices have been paid.

6. Separate Offenses: Each day that a person violated provisions of Section 13.04.330 shall constitute a separate violation or offense.

C. All remedies provided for herein shall be cumulative and not exclusive.

Section 8. Severability

If any section, subsection, sentence, clause or phrase in this Ordinance is for any reason held invalid, the validity of the remainder of the Ordinance will not be affected. The city council hereby declares it would have passed this Ordinance and each section, subsection, sentence, clause or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases or is declared invalid.

Section 9. Effective Date; Posting. Pursuant to California Water Code Section 376, this Ordinance shall constitute a water conservation program and shall be effective upon adoption. Within ten (10) days of its adoption, this ordinance shall be published in full once in a newspaper of general circulation which is printed, published, and circulated in the City of Morgan Hill.

This ordinance was introduced at a meeting of the City Council held on the 6th day of May, 2009, and adopted at a meeting held on the 27th day of May, 2009, and said ordinance was duly passed and adopted in accordance with law by the following vote:

AYES:	**COUNCIL MEMBERS:**	**Larry Carr, Marby Lee, Greg Sellers, Steve Tate**
NOES:	**COUNCIL MEMBERS:**	**None**
ABSTAIN:	**COUNCIL MEMBERS:**	**None**
ABSENT:	**COUNCIL MEMBERS:**	**Marilyn Librers**

ATTEST: **APPROVED:**

_____ _____

IRMA TORREZ, City Clerk **STEVE TATE, Mayor**

☙ CERTIFICATE OF THE CITY CLERK ❧

I, IRMA TORREZ, CITY CLERK OF THE CITY OF MORGAN HILL, CALIFORNIA, do hereby certify that the foregoing is a true and correct copy of Ordinance No. 1932, New Series, adopted by the City Council of the City of Morgan Hill, California at their regular meeting held on the 27th day of May, 2009.

WITNESS MY HAND AND THE SEAL OF THE CITY OF MORGAN HILL.

DATE: _____ _____

IRMA TORREZ, City Clerk

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Santa Clara Valley Water District
Summary of Drought Communications and Outreach Activities
March 25, 2014

Media relations

District staff and board members have responded to a high number of daily news media inquiries about water supply and, increasingly, drought response actions. District staff have also circulated and posted statements following key board decisions.

Members of the ethnic and other media have been provided with onsite interviews and more tours of water supply facilities are in planning to further their understanding of drought conditions.

Board and key stakeholder outreach

Effective implementation of the drought contingency measures and management of drought response requires extensive coordination with a number of key stakeholders.

The board's Water Conservation Ad Hoc Committee is newly established and will provide the forum for tracking of these efforts and discussing prospective new drought response initiatives.

Guest columns on the board's official actions have been developed and submitted to local newspapers.

Staff have been in active coordination, from both an operational and communications standpoint, with retailer Communications and Water Conservation Subcommittees.

Key messages about evolving dry year conditions, impacts and drought response efforts have been shared with a group of key stakeholders including retailers, public information officers for all local municipalities, city managers, advisory committee members, and other organizations representing business, labor, agriculture and environmental interests. Four key message updates have been distributed which have then been shared within these organizations to forward to their constituencies.

There has also been increasing coordination amongst state and regional water agencies on drought communications.

The District's Office of Government Relations is actively working with advocacy stakeholders, the State Legislature, and Congress to pursue funding opportunities related to recovery of expenses for drought related activities, recycled water expansion, and infrastructure development to address the drought. The Office of Government Relations is additionally looking at opportunities to move public policy efforts toward supporting the District's interest that include direct/indirect potable recycled water among other policy opportunities. Staff continue to communicate updated drought-related information to key stakeholders so they can, in turn, disseminate current information to their constituencies.

Public education and customer service

As awareness increased in January and February about drought conditions, the District began to see an increase in requests for speakers to civic groups, inquiries submitted regarding rebate programs, and an increase in the number of recipients who receive the District's monthly e-newsletter as well as the rate at which they open the email.

As conditions necessitated the call for mandatory water use reductions, that general awareness and interest has been heightened with confusion about potential restrictions and enforcement at the local level. This has dramatically increased the number of inquiries.

Correspondingly, the number of direct constituent inquiries to board members and staff has gone up considerably, requiring individual and collective responses, including a public meeting.

The District's employees are another key stakeholder group requiring information about water supply conditions and drought response in order to both personally achieve water use reduction targets and better convey accurate information to their families, friends and neighbors. Presentations to the Management Leadership Team and all-user email messages from the CEO to employees have kept them abreast of conditions, board actions and informational resources.

For all residents, District staff created a new one-stop resource: www.valleywater.org/Drought 2014 web site that contains a comprehensive and continuously updated collection of materials related to water supply conditions, impacts and drought response resources. In addition, the save20gallons.org long-term conservation campaign site has been updated with current drought information.

The District's monthly eNewsletter has consistently included updated drought and conservation program information; we have launched a new social media drought tips feature called "Tuesday Tips" on Facebook and Twitter. The District's public access television show has also been focused on water supply and drought response topics and has been shared via Youtube. Staff are producing additional water conservation program videos for CreaTV and YouTube.

The eNewsletter and multiple social media vehicles have served as mechanisms for further dissemination of drought information through forwarding, "liking", and sharing amongst recipient networks of friends and colleagues.

Finally, a new Drought Hotline (408-630-2000) has been created as well as a 2014 Drought topic button on Access Valley Water, both in order to facilitate the logging, tracking and fulfilling of customer requests for information.

Drought program materials and marketing campaign

One of the most important functions the District can play is to encourage and incentivize water use reducing behaviors through promotions and advertisings.

Coinciding with the declaration of a drought, staff replaced previously reserved ad placements from existing (flood protection) messaging with new drought ads running in the San Jose Mercury News, Pandora Radio, Online and on Outdoor billboards or posters.

A number of materials have been updated or developed including a new water conservation rebate program fact sheet, artificial turf fact sheet, graywater program FAQ and other updated program materials required for distribution at events or via mail.

With $350,000 of the outreach funds approved by the Board in January, planning has been done to identify the most cost-effective and broad advertising program possible. This spring drought advertising campaign will take place from late March through May in print, radio, cable TV, Online and in ethnic media outlets to run ads in Spanish, Vietnamese and Chinese.

Due to the increased media attention and expanded marketing efforts, the water district has seen a significant increase in inquiries from the public and participation in our long-term conservation programs. For instance, the number of calls to the water conservation hotline has increased by approximately 175 percent and interest in our Landscape Rebate Program has increased by nearly 300 percent (both compared to the same time last year).

Planned activities

Building on what has already been put in place, staff is currently developing a number of ideas for expansion of marketing and community outreach efforts in addition to activities that are underway or in planning for the summer and fall. These include:

- The District's annual countywide mailer is scheduled to be completed and mailed in May; in addition to significant messaging about the new SVAWPC, it will equally emphasize water use reduction messages;
- Staff is establishing an electronic drop-box feature in order to share electronic advertising, messaging and multimedia tools with retailers and partners;
- In order to ensure logging in, tracking and responding effectively to the large volume of inquiries being received, additional staff resources are being secured to serve as a full-time drought customer service coordinator;
- Internal staff resources are also being secured to help with scheduling of speaker's bureau presentations and staffing numerous community event invitations;
- Having dedicated customer service staff in place for drought response will help gather information from the various units in the organization receiving inquiries, identify trends in the nature of the inquiries, identify opportunities for development of materials and a frequently-asked-questions document, and enable reporting on the District's responsiveness to the Board and community on drought issues;
- Staff is exploring new concepts for regional advertising with Bay Area agencies, as well as a potential focused summer campaign based on seasonal needs as discussed at the Board Water Conservation Ad Hoc meeting;
- Staff is researching promotional items that can supplement the usual inventory of conservation items for use at summer community events.

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Summary of Federal Legislation for California Storage Projects (Costa)

HR 4125 (Costa) - Shasta Dam Expansion Act of 2014;
HR 4126 (Costa) - San Luis Reservoir Expansion Act of 2014;
HR 4127 (Costa) - Upper San Joaquin River Storage Act of 2014

These bills would authorize construction of: 1) the expansion of Shasta Dam, 2) the expansion of San Luis Reservoir; and 3) the Upper San Joaquin River Storage.

Representative Jim Costa introduced this package of legislation on February 28, 2014, to provide immediate relief in 2014 by focusing on measures that can provide a noticeable water conservation and supply effect in the short-term. The current drought has highlighted the need for long-term water solutions, especially increasing the state's storage capacity.

These bills, if passed, would amend the Calfed Bay-Delta Authorization Act in order to invest in California's water infrastructure and expedite construction on existing storage projects to improve water reliability across the state.

The three bills would:

- Expand San Luis Reservoir to increase storage capacity by 130,000 acre feet of storage with an approximate annual yield of 40,000 acre feet. The total cost of the project would be an estimated $360 million with approximately $240 million of that already being invested for seismic improvements.
- Raise Shasta Dam to add an additional 634,000 acre feet of storage to the dam and increase annual yield by 76,000 acre feet and add 76,000-133,000 acre feet to the system during dry years. Estimated for the total cost of the project is $1.1 billion.
- Construct Temperance Flat (Upper San Joaquin River Storage) to create 1.3 million acre feet of storage with an annual yield of 60,000-75,000 acre feet and in dry years an additional 103,000-254,400 acre feet would be added to the system at a cost of around $2.5 billion.

Current Status of Legislation:

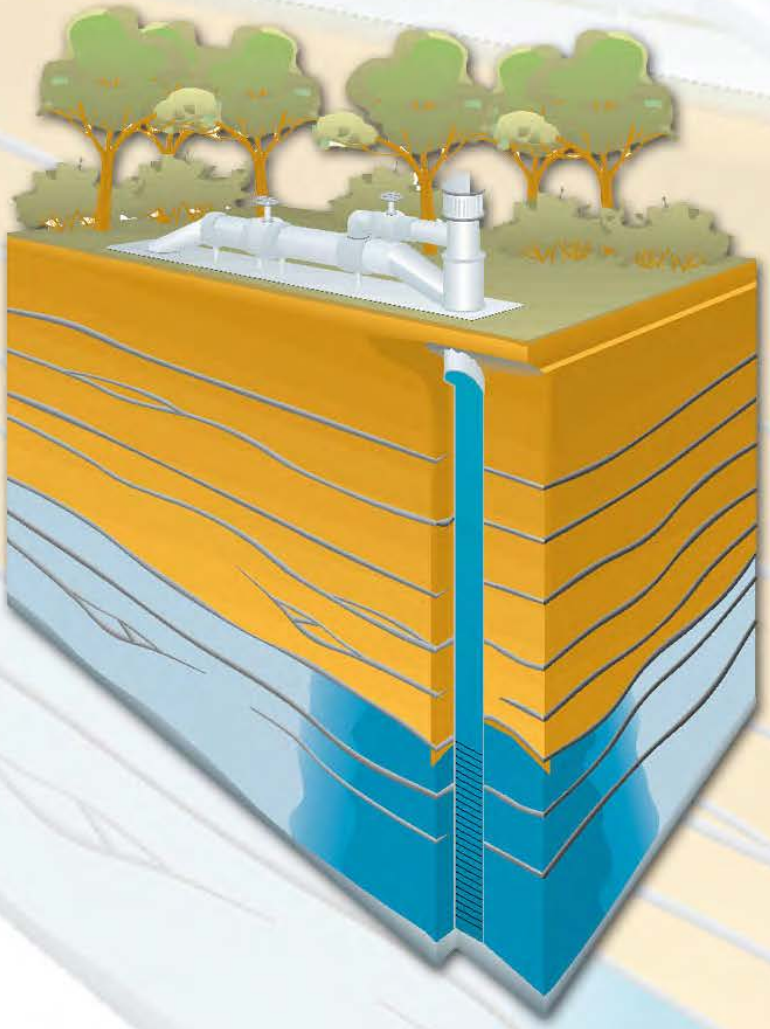
As of 3/13/2014:

Feb. 28, 2014 — All three bills were read twice and referred to: House Natural Resources Committee.

Project 3: Zone 7 Water Supply Drought Preparedness Project

1. CH2MHill, 2003. Draft Report Well Master Plan, prepared for Zone 7 Water Agency, October. Page ES-5, ES.3.3, last paragraph; and page 1-6, 1.4, first paragraph.
2. California Department of Water Resources (DWR), 2014. Well Completion Report No. e0206419.
3. Stetson Engineers, 2004. Management Plan for Lakes H & I and Cope Lake, June. Pages 4-13 and 4-14.
4. Zone 7 Water Agency (Zone 7), 2005. Zone 7 Water Agency Well Master Plan Final EIR Responses to Comments, SCH: 2002032163, July. Page 2-1.
5. Zone 7, 2010. 2010 Urban Water Management Plan, December 15.
6. Zone 7, 2012. Cope Lake Improvements & Maintenance Final Environmental Initial Study/Draft Mitigated Negative Declaration, January 26.Santa Clara Valley Water District, 2014b. Monthly Water Quality Reports. May.

Reference 1



Draft Report
Well Master Plan

Prepared for

ZONE 7 WATER RESOURCES MANAGEMENT

Prepared by

CH2MHILL

October 2003

properly implemented monitoring program can be used to adjust pumping rates to mitigate subsidence.

ES.3.3 Wellfield Alternatives

Wellfields were screened and ranked based upon results of Well Master Plan work and other studies (Table ES.3-1). As shown in this matrix, four of the wellfields have significant limitations for new wells due to limited available drawdown above historic lows. The remaining Wellfields have similar ranking scores, with the Chain of Lakes and Gravel Pit Wellfields ranking highest overall. Test wells are recommended in all previously untested areas to confirm potential well yields, aquifer transmissivity, and water quality. These aspects of the Busch-Valley Wellfield have been adequately delineated by previous test drilling.

Zone 7 needs to increase its well production capacity to meet customer demands during drought periods when State Water Project allocations are reduced. Based on recent State Water Project allocation figures, Zone 7 projects it will need a total of about 45 mgd of groundwater production capacity to meet projected worst-case 1-year and 6-year drought demands. Results of groundwater modeling conducted as part of this study indicate that Zone 7 can produce 45 mgd of groundwater from the basin during drought with only minimal exceedance of historical low water levels under a number of wellfield alternative.

Modeled alternatives require construction of about seven to 15 new wells in "outer" wellfields to pump about 27 mgd of groundwater, with the remainder (18 mgd) coming from existing Zone 7 wells. Existing wells cannot be relied upon to produce more that 18 mgd of groundwater when new adjacent wellfields are operating without risk of potentially significant declines of water levels below historical lows. Fewer wells are required (possibly as few as seven) if the Chain of Lakes and Gravel Pit Wellfields are preferentially developed and prove productive. This alternative, "Scenario 2d," is herein referred to as the "preferred alternative" (Figure ES.3-6). More wells will be required (possibly as many as 15) if marginal wellfields are developed (such as Stanley Avenue and Isabel Wellfields), or the Chain of Lakes and Gravel Pit Wellfields prove less productive than currently thought. Figures ES.3-6 and ES.3-7 show the relationship of water levels to historical lows at the height of 1-year and 6-year droughts, respectively, under the preferred alternative. Positive numbers indicate modeled water levels are above historical lows, negative numbers below.

Under the preferred alternative, Zone 7's total instantaneous well capacity will be approximately 52 mgd—25 mgd from existing Zone 7 wells and 27 mgd from new wells. Modeling indicates that 52 mgd of groundwater production from these wells can be sustained for at least 4 days with water levels remaining above historical lows, but that after 30 days of continuous pumping, water levels fall significantly below historical lows in northern portion of the basin.

If maximum day demands of 70 mgd are to met for extended periods of time (30 days or more), then additional wells will need to be constructed in the eastern portions of the basin. The Chain of Lakes and Gravel Pit Wellfields are favorable in this respect. Expanded use of these wellfields under the preferred alternative could allow Zone 7 to pump about 70 mgd from the basin for extended periods of time (about 60 days) without water level declines

below historical lows. This would require installation of a total of about three to eight more new wells than those required for drought protection.

Further modeling would likely be successful in optimizing Scenario 2d well locations and pumpage distributions to reduce all exceedances to less than historical maximums. However, this implies a level of accuracy relative to actual future response of the system that is unreasonable, given the assumptions made during modeling. In addition, simply keeping water levels above observed historical lows will not necessarily prevent subsidence. Therefore, results of this evaluation need to be viewed as a general guide as to how much groundwater might be produced from the basin not an absolute answer. As new wells and wellfields are installed, they will need to be tested and their effects monitored to assess actual impacts. Wellfield construction activities and well operations can then be adjusted as needed. The implementation plan lends itself to this systematic approach.

ES.4 Well Facility Design

Current and planned future land uses in the area indicate that most of the new wells will be located in an urban environment. Potential facility impacts to the surrounding environment include aesthetic, noise, traffic, and risk. Some of these potential impacts, such as aesthetics and noise, can be significantly reduced through design considerations. Potential impacts from other sources, such as equipment and chemical deliveries, can be partially reduced through design. Well facility design options specific to each of these areas were developed as part of the Well Master Plan. A conceptual design for a well in an urban setting is provided as Figure ES.4-1.

Pumping rates for new wells are expected to be in the range of 2,000 gallons per minute (gpm) to 4,000 gpm. The type of pumps used for the new wells may be either vertical turbine or submersible. Vertical turbine pumps are generally preferable because of ease of access to the electrical motor, generally higher pump efficiencies, and lower overall cost. To reduce noise levels, vertical turbines may require noise-insulated buildings. For areas where noise becomes an overriding consideration, the use of submersible pumps should be considered.

Groundwater pumped from wells will require disinfection prior to entering the distribution system. Disinfection at Zone 7's existing wells consists of using chlorine and ammonia to form a chloramine residual. It is assumed that the new wells will undergo similar treatment. Future treatment may include addition of fluoride. Disinfection at the new wells may take place using one of two methods: on-site, salt-based chlorine generation, or bulk deliveries of liquid sodium hypochlorite. On-site chlorine generation is more desirable from a safety viewpoint because it avoids frequent truck deliveries, and large tanks of concentrated solution are not stored on site. However, on-site generation is more expensive and may not be appropriate for wells that will be used infrequently.

Based on site-specific considerations, treatment may occur in an adjacent building contiguous with the well or in a separate building. Within a given wellfield, each well may be manifold to a common treatment system or be outfitted with its own treatment system. Conveyance facilities will need to be constructed to connect new wells to the existing distribution system. New pipes will range in size from 10 to 36 inches in diameter,

1.3.2 Preliminary Wellfield Designs

The Mocho Wellfield provides an example of the approach used to provide preliminary well designs for this report. The historical low water level in this area is about 200 feet above mean sea level (msl). The bottom of the B-zone is at elevation 90 ft msl. These data indicate that the B-zone has a saturated thickness of about 110 feet in this area during low water level conditions. This is adequate to support well screen in the lower portions of the B-zone. Therefore, it appears reasonable to place well screens in this zone. A well completed in the B, C, and D zones in this area (similar to Mocho-1 and Mocho–2) may have an average transmissivity of about 275,000 gpd/ft, which translates to a specific capacity of 138 gpm/ft (Table 1.3-1; Driscoll, 1986). For purposes of this report, it was assumed that wells should have mutual interference of about 25 feet or less.

Analytical curves of distance-drawdown were then reviewed to estimate distance from the well to a point of about 25 feet drawdown using a range of pumping rates (Figures 1.3-2 through 1.3-5 and Table 1.3-2). It was assumed that wells would be spaced 1,000 feet or less from one another. At the Mocho Wellfield, a pumping rate of 4,000 gpm in an aquifer with a transmissivity of about 275,000 gpd/ft (the average transmissivity) exhibits a drawdown of about 25 feet at a distance less than about 200 feet (Figure 1.3-5). Because drawdown is less than 25 feet within 1,000 feet of the well at a pumping rate of 4,000 gpm, the maximum recommended pumping rate is 4,000 gpm, and the recommended well spacing is about 500 feet (rounded up from 200 feet).

The above data were superposed on the historical low water level data to determine the recommended level of uppermost well screen and pump setting. In the above example, if it is assumed that the well is 100-percent efficient (worst case with respect to drawdown in the aquifer), then the B-zone will retain 81 feet of residual saturation when the basin is at historical low water levels and the well is pumping at 4,000 gpm. This level of saturation should be adequate to maintain production rates and, therefore, the overall preliminary design appears reasonable. Summary data of this sort for the other wellfields are provided in Table 1.3-3 along with estimated average TDS concentrations for wells in the area.

1.4 Summary

The Mocho Wellfield is located in the most productive proven portion of the Livermore Valley Groundwater Basin (LVGB) but is already fully developed, as are the Hopyard and Stoneridge wellfields. The Chain of Lakes, Gravel Pit, and Busch-Valley Wellfield areas also appear to have locally favorable aquifer properties. The Valley Avenue Wellfield offers a potentially large area of highly productive aquifer, but test wells are needed to confirm these properties and assess local groundwater quality. In general, significant portions of aquifer underlying each of these areas appears well suited for construction of multiple high-capacity municipal water supply production wells.

Well yields in significant portions of the Bernal Wellfield may vary from marginal (1,000 gpm or less) to very good (2,000 gpm or more), depending upon location. Some of the wells in this area may need to be operated at lower rates and/or spaced father apart. It is recommended that aquifer tests be conducted in existing deep wells in all the above areas

Reference 2

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0206419

Page 1 of 2

Owner's Well Number 3S/IE-10B14

Date Work Began 02/19/2014 Date Work Ended 2/26/2014

Local Permit Agency Zone 7 Water Agency

Permit Number 2014024 Permit Date 2/13/14

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N Latitude W Longitude

APN/TRS/Other

Geologic Log

Orientation ⦿ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Mud Rotary Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0	5	Clay, brown with large gravels & cobbles
5	10	Clay, dark brown, stiff
10	18	Clay, silty brown
18	38	Clay, brown, sticky
38	88	Gravels, brown, small with course sand
88	95	Clay, brown, silty soft
95	123	Gravels, brown, medium size with coarse sand
123	150	Clay, brown ,sticky
150	157	Clay, brown, soft with some gravels
157	177	Clay, brown, sticky
177	210	Gravels, brown, medium size with coarse sand
210	215	Clay, brown, soft with some gravels
215	228	Gravels, medium with coarse sand
228	235	Clay, brown, sticky
235	260	Gravels, medium with coarse sand
260	270	Clay, brown, sticky
270	290	Gravels, small with coarse sand
290	350	Clay, brown sticky
350	364	Gravels, medium with coarse sand
364	373	Clay, brown, sticky
373	375	Gravels, medium size with coarse sand
375	390	Clay, brown, sticky
390	411	Gravels, pea with coarse sand
411	430	Gravels, small with clay, brown
430	478	Clay, brown, sticky
478	483	Gravels, medium with coarse sand
483	508	Clay, brown, sticky
508	556	Gravels, small with coarse sand
556	586	Clay, brown sticky
586	600	Gravels, small with coarse sand

Total Depth of Boring 711 Feet

Total Depth of Completed Well 690 Feet

Well Owner

Name Zone 7 Water Agency

Mailing Address 100 North Canyons Parkway

City Livermore State CA Zip 94551

Well Location

Address Chain of Lakes 5 MW@ NW Corner of Lake H

City Livermore County Alameda

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ___ Dec. Lat. ___ Dec. Long. ___

APN Book ___ Page ___ Parcel ___

Township ___ Range ___ Section ___

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. **Please be accurate and complete.**

Activity

⦿ New Well
○ Modification/Repair
○ Deepen
○ Other
○ Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
⦿ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water 95 (Feet below surface)

Depth to Static Water Level ___ (Feet) Date Measured ___

Estimated Yield * ___ (GPM) Test Type ___

Test Length ___ (Hours) Total Drawdown ___ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	210	8	Blank	PVC	Sch 40	2		
210	390	8	Blank	PVC	Sch 80	2		
390	430	8	Screen	PVC	Sch 80	2	Slot	0.020
430	510	8	Blank	PVC	Sch 80	2		
510	550	8	Screen	PVC	Sch 80	2	Slot	0.020
550	650	8	Blank	PVC	Sch 80	2		

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	3	Cement	
3	360	Bentonite	Grout
360	370	Bentonite	Chips
370	711	Sand	#3

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☑ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site Map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Cascade Drilling, L.P.
Person, Firm or Corporation

3000 Duluth Street (Address) West Sacramento (City) CA (State) 95691 (Zip)

Signed ___ (C-57 Licensed Water Well Contractor) Date Signed ___ 938110 (C-57 License Number)

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0206420

Page 2 of 2

Owner's Well Number 3S/IE-10B14

Date Work Began 02/19/2014 Date Work Ended 2/26/2014

Local Permit Agency Zone 7 Water Agency

Permit Number 2014024 Permit Date 2/13/14

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ⦿ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Mud Rotary Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
600	640	Clay, gray, soft
640	697	Gravels, small with coarse sand
697	711	Clay, gravel, sticky

Total Depth of Boring 711 Feet

Total Depth of Completed Well 690 Feet

Well Owner

Name Zone 7 Water Agency

Mailing Address 100 North Canyons Parkway

City Livermore State CA Zip 94551

Well Location

Address Chain of Lakes 5 MW@ NW Corner of Lake H

City Livermore County Alameda

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ___ Dec. Lat. ___ Dec. Long. ___

APN Book ___ Page ___ Parcel ___

Township ___ Range ___ Section ___

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. **Please be accurate and complete.**

Activity

⦿ New Well

○ Modification/Repair

○ Deepen

○ Other ___

○ Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply

☐ Domestic ☐ Public

☐ Irrigation ☐ Industrial

○ Cathodic Protection

○ Dewatering

○ Heat Exchange

○ Injection

○ Monitoring

○ Remediation

○ Sparging

⦿ Test Well

○ Vapor Extraction

○ Other ___

Water Level and Yield of Completed Well

Depth to first water 95 (Feet below surface)

Depth to Static Water Level ___ (Feet) Date Measured ___

Estimated Yield * ___ (GPM) Test Type ___

Test Length ___ (Hours) Total Drawdown ___ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
650	690	8	Screen	PVC	Sch 80	2	Slot	0.020
0	106	12		Conductor Casing	.188	8		

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	106	Cement	Portland

Attachments

☐ Geologic Log

☐ Well Construction Diagram

☑ Geophysical Log(s)

☐ Soil/Water Chemical Analyses

☑ Other Site Map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Cascade Drilling, L.P. (Person, Firm or Corporation)

3000 Duluth Street (Address) West Sacramento (City) CA (State) 95691 (Zip)

Signed ___ (C-57 Licensed Water Well Contractor) Date Signed ___ 938110 C-57 License Number

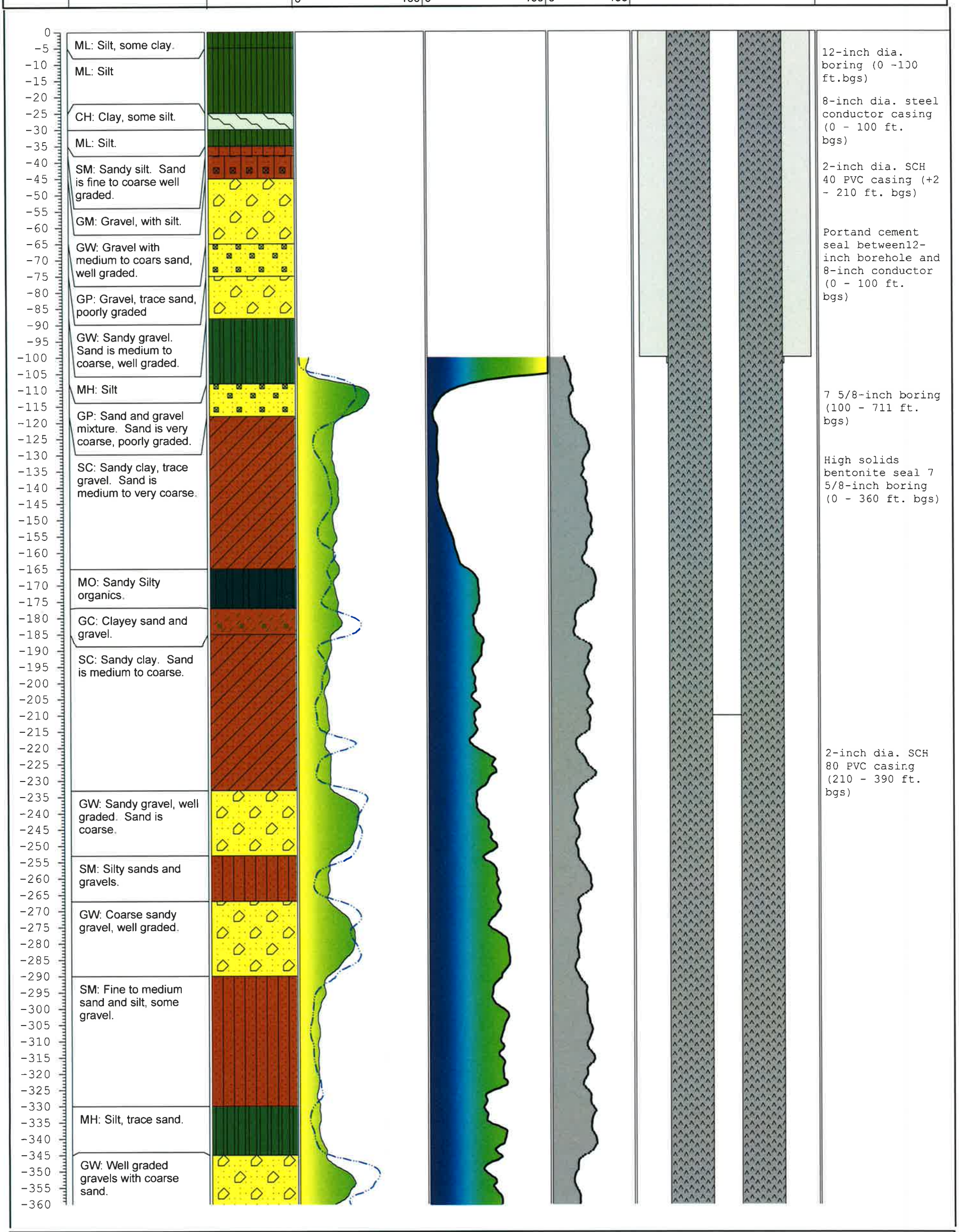
Stantec
1340 Treat Boulevard, Suite 300
Walnut Creek, California 94597
Phone: (925) 941-1400 Fax: (925) 941-1401

Field Borehole Log: COL5 Test Well

DRILLING CO: Cascade
LOGGED BY: Thomas Butler and James Witty
TOTAL BOREHOLE DEPTH (FT, BGS): 711 ft.
WELL DEPTH (FT, BGS): 690 ft.

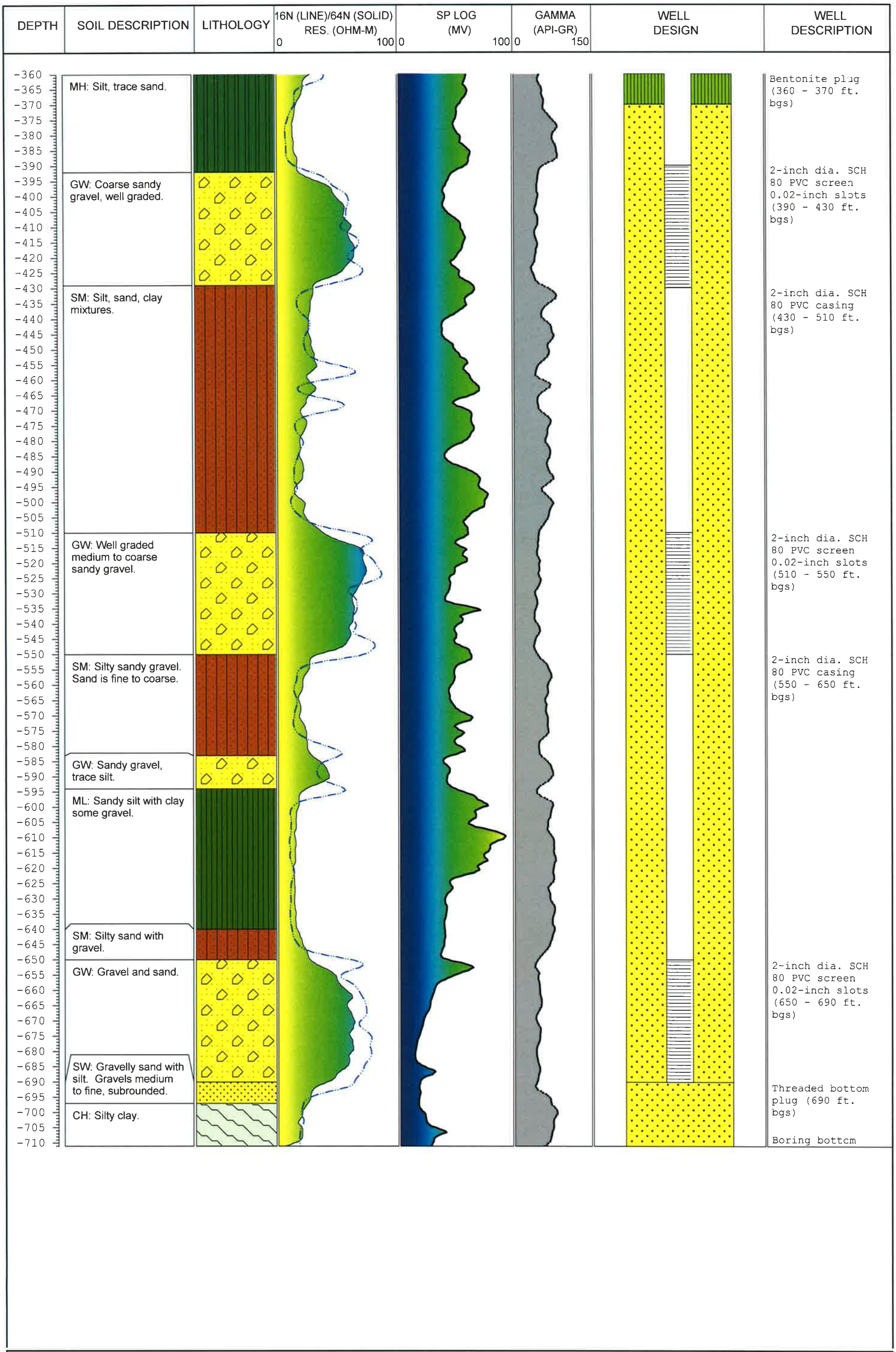
Shallow Aquifer Water Level | Deep Aquifer Water Level | (G,S,M,C) = Gravel, Sand, Silt, Clay)

DEPTH	SOIL DESCRIPTION	LITHOLOGY	16N (LINE)/64N (SOLID) RES. (OHM-M) 0 100	SP LOG (MV) 0 100	GAMMA (API-GR) 0 150	WELL DESIGN	WELL DESCRIPTION



CLIENT:
NOTES: Owners Well Number 3S/1E-10B14

DATE COMPLETED 2/26/2014



STANTEC CONSULTING
1340 Treat Boulevard, Suite 300Phone: (925) 941-1400
Walnut Creek, California 94597Fax: (925) 941-1401

COL5 Test Well

FC - MP-7

Reference 3

MANAGEMENT PLAN

FOR
LAKES H, I, AND COPE LAKE

JUNE 2004

STETSON ENGINEERS INC.

STETSON ENGINEERS INC.
San Rafael and West Covina, California
Mesa, Arizona

Recharge Capacity of Lakes H and I

Most recharge to the aquifer in Lakes H and I occurs through the sidewalls. In general, the rate of recharge is a function of the lake water level and the surrounding groundwater levels. A higher lake level and lower surrounding groundwater levels will induce more recharge due to the greater wetted area of the recharge surface and greater driving head. Conversely, a lower lake level and higher surrounding groundwater levels will reduce recharge. When surrounding groundwater levels are higher than lake levels (*e.g.*, following lake dewatering or prolonged pauses in lake filling) groundwater discharge into the lakes will occur (*i.e.*, "reverse recharge") causing lake levels to rise.

It is Zone 7's intention, through its artificial recharge operations, not to cause groundwater levels to rise above elevation 330 ft, which is historical high for the Lakes H and I area. Elevation 330 ft represents the maximum operating water level in Lakes H and I that would ensure that surrounding groundwater levels do not exceed this historical high. In actual practice, the lakes may be operated higher provided groundwater levels do not exceed elevation 330 ft. For purposes of this report, the operating water levels in Lakes H and I were assumed to be restricted to a maximum elevation 330 ft; hereinafter referred to as the historical high standard, or HHS.

Groundwater analysis was performed to estimate the rate of recharge to the aquifer from Lakes H and I that would occur for a range of anticipated lake levels and groundwater levels (Appendix 4-A). The analysis was based on measured regional groundwater levels and estimated localized groundwater levels during fall 2002, and measurements of seepage flows, evaporation, and lake levels made during summer 2002. Recharge was found to occur in both lakes. In Lake H, recharge is suspected to occur primarily through the north face. In Lake I, recharge is suspected to occur primarily through the west face, but some recharge is also suspected along portions of the north and south faces that were not completely backfilled with fine sediment.

The analysis found that recharge occurs in Lake H at a rate of about 9.4 ac-ft/d when the lake level is above elevation 301.5 ft. This finding only considers effects in recharge resulting from change in lake level, and does not consider effects resulting from change in the surrounding groundwater level which is assumed constant. When the lake level is below elevation 301.5 ft, recharge is about 1 ac-ft/d. In Lake I, groundwater discharge into the lake occurs when the lake level is below elevation 260 ft. When the lake level is at or above

elevation 260 ft, recharge occurs reaching a maximum rate of 41 ac-ft/d, or 1,220 ac-ft/mo, when the lake level is at elevation 330 ft, the HHS (Table 4-2).

TABLE 4-2 LAKE I RECHARGE FOR A RANGE OF LAKE LEVELS

Lake Level	West Side Recharge (ac-ft/mo)	North Side Recharge (ac-ft/mo)	South Side Recharge (ac-ft/mo)	Total (Net) Recharge (ac-ft/mo)
240	0	-243	-44	**-287**
250	131	-182	-33	**-84**
260	175	-137	-25	**13**
270	219	-91	-23	**105**
280	262	-71	-22	**169**
290	383	-58	-20	**305**
300	525	-51	0	**474**
310	689	0	25	**714**
320	875	47	57	**979**
330	1,034	99	89	**1,222**
340	1,148	148	119	**1,416**
350	1,263	198	148	**1,610**
360	1,378	247	178	**1,804**

Notes:
1) Negative value indicates flow from the aquifer into Lake I.
2) The shaded row was used for calibration of hydraulic conductivity.
3) The calibrated hydraulic conductivity of the aquifer is 198.5 ft/d, or 5,955 ac-ft/mo.
4) Based on fall 2002 groundwater levels.
5) Refer to App. 4-A for details on the groundwater recharge analysis, and refer to Table 4A-4 for recharge in units of cfs and ac-ft/d.

4.2 PLANNED OPERATION OF THE WATER DELIVERY AND RECHARGE SYSTEM

4.2.1 Operational Policy

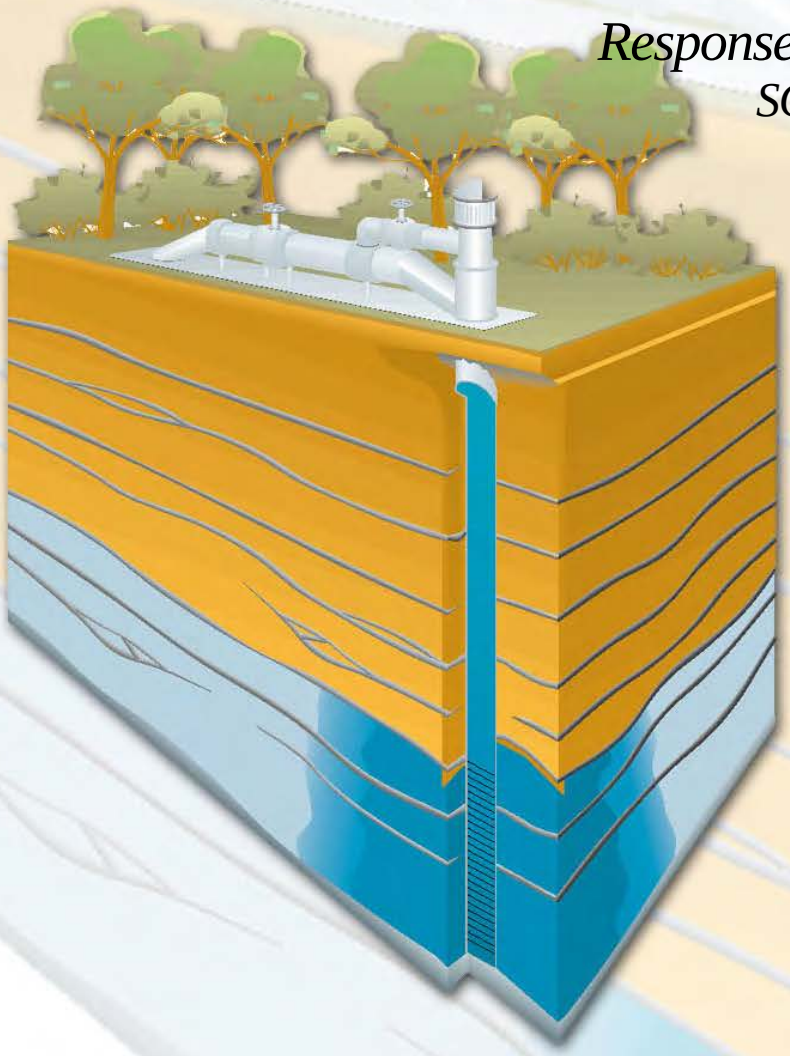
Zone 7's operating policy will be to order SBA releases as set forth in the Annual Water Operations Plans to the extent that (1) SWP supplies and SBA capacity allow and (2) the released water can be stored or recharged in Lakes H and I without exceeding maximum permissible levels. Operations will follow the approved Arroyo Mocho Diversion Facility Operating Procedures, which establishes limits on SBA releases and diversion dam operations in accordance with the MND.

Reference 4

ZONE 7 WATER AGENCY WELL MASTER PLAN

Final EIR
Responses to Comments
SCH: 2002032163

July 2005



ESA Environmental Science Associates

CHAPTER 2.0

MASTER RESPONSES

There are topics that received multiple comments each. In order to provide thorough responses on these topics master responses have been prepared that present a broad and comprehensive discussion of the key items of interest to the commentors. Each individual comment is responded to in Chapter 3.0. If and when one of these major topics is raised in an individual comment, where appropriate, a brief response is provided and the commentor is referred to one of these master responses for a complete discussion.

2.1 PROJECT OBJECTIVES

INTRODUCTION

Comments regarding Project Objectives are addressed here and in the responses to individual comments presented in Chapter 3.0. Relevant comments received on this topic include: B.1, B.12, C.1, C.2, C.4, F.5.

DISCUSSION

It is important to note that the goals and objectives of the Well Master Plan are to provide adequate capacity for Zone 7 to recover stored groundwater supplies to meet its adopted Reliability Policy. This policy has been established in consultation with the Retailer Agencies, and provides for 100% reliability under all hydrologic conditions, including credible worst-case drought years and 75% maximum day demand (MDD) during emergency outages. Given the reliability of the State Water Project, Zone 7 must rely on its groundwater basin to meet demands during drought year and emergency scenarios to meet this policy. The objectives of the Proposed Project are stated on DEIR Page 2-9 as follows:

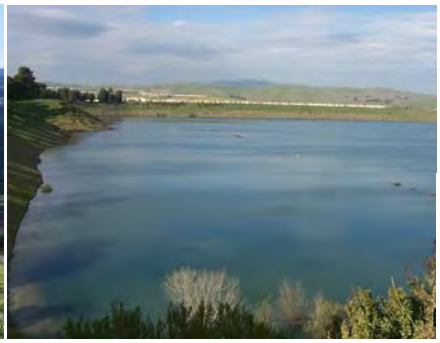
The main objective of this project is to increase reliability and redundancy of the water system such that treated water is available to Zone 7 customers when SWP water allocation is low during a drought year or in the event of an emergency. The specific project objectives are as follows:

- Provide facilities to recover stored groundwater supplies from the Main Basin at a sufficient rate to meet Zone 7's reliability goals, as established in Resolution 02-2382. These goals are consistent with those used for the Zone 7 Water Supply Planning Program, and include:
  - **Goal 1:** Meet 100% of treated water customers water supply needs in accordance with Zone 7's most current contracts for M&I Water Supply, including existing and projected demands for the next 20 years as specified in Zone 7's Urban Water Management Plan (UWMP), which will be coordinated with Zone 7's M&I Contractors. Zone 7 will

Reference 5

2010 URBAN WATER MANAGEMENT PLAN

December 15, 2010



Zone 7 Water Agency
Livermore, CA

2010 URBAN WATER MANAGEMENT PLAN

Prepared by:

Zone 7 Water Agency

100 North Canyons Parkway

Livermore, CA 94551

(925) 454-5000

Version: December 15, 2010

ZONE 7 WATER AGENCY

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Sal Segura, P.E. – Associate Engineer
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or

Brad Ledesma, (925) 454-5038, bledesma@zone7water.com

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Enclosure

CD containing the 2005 Groundwater Management Plan and the 2009 Update

ACRONYMS AND DEFINITIONS

The following terms and acronyms have been used throughout this UWMP to improve document clarity and readability.

ACWD	Alameda County Water District
ADWF	Average Dry Weather Flow
AF	Acre-feet
AFA	Acre-feet annually
Basin	Livermore-Amador Valley Groundwater Basin
BBID	Byron-Bethany Irrigation District
BMP	Best Management Practices
Cal Water	California Water Service Company
CCWD	Contra Costa Water District
CII	Commercial, Industrial, & Institutional
CIMIS	California Irrigation Management Information System
CoVWR	Committee of Valley Water Retailers
CUWCC	California Urban Water Conservation Council
DERWA	DSRSD-EBMUD Recycled Water Authority
District	Alameda County Flood Control and Water Conservation District
District Act	Act 205 of the California Uncodified Water Code
DMM	Demand Management Measures
DSRSD	Dublin San Ramon Services District
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
EOC	Emergency Operations Center
ETo	Evapotranspiration rate based on standard grass as reference
GMP	Groundwater Management Plan
HET	High-Efficiency Toilet
LAVWMA	Livermore-Amador Valley Water Management Agency
Livermore	City of Livermore
M&I	Municipal and Industrial
Main Basin	The portion of the Livermore-Amador Valley Groundwater Basin that contains high-yielding aquifers and good quality groundwater.
mgd	Million gallons per day
MOU	Memorandum of Understanding Regarding Urban Water Conservation in California
Msl	Mean sea level
Pleasanton	City of Pleasanton
Retailers	Cal Water, DSRSD, Livermore, and Pleasanton
RWQCB	Regional Water Quality Control Board
SB 7	Senate Bill X7-7 related to 20% water conservation by 2020
SBA	South Bay Aqueduct
SCVWD	Santa Clara Valley Water District
SFPUC	San Francisco Public Utilities Commission
SMP	Salt Management Plan

SRVRWP	San Ramon Valley Recycled Water Program
State	State of California
SWP	State Water Project
TDS	Total Dissolved Solids
TWRG	Tri-Valley Water Retailers Group
UWMP	Urban Water Management Plan
UWMP Act	California Urban Water Management Planning Act
Yuba Accord	Lower Yuba River Accord
Zone 7	Zone 7 of the Alameda County Flood Control and Water Conservation District (also referred to as Zone 7 Water Agency)
Zone 7 Board	Zone 7 Water Agency Board of Directors

1. INTRODUCTION

This 2010 Urban Water Management Plan (UWMP) has been prepared in response to the California Urban Water Management Planning Act (UWMP Act), Water Code Division 6, Part 2.6, Sections 10610 through 10650. The UWMP Act requires every urban water supplier that provides water for municipal purposes either directly or indirectly to more than 3,000 customers, or supplies more than 3,000 acre-feet of water annually (AFA), to prepare and adopt an UWMP.

The urban water supplier must then update and adopt the UWMP every five years on or before December 31, in years ending in zero or five. An urban water supplier that does not prepare, adopt, and submit an UWMP to the California Department of Water Resources (DWR) is ineligible to receive drought assistance from the State of California (State). For 2010, the State has extended the submission deadline to July 1, 2011 in order to give water suppliers sufficient time to meet the new requirements under Senate Bill SBX7-7 (SB 7). SB 7 is intended to reduce per capita water consumption in California by 20 percent by the year 2020.

The purpose of this chapter is to give an overview of the UWMP process and the contents of this UWMP.

1.1 PREVIOUS URBAN WATER MANAGEMENT PLANS

In 2009, Zone 7 of the Alameda County Flood Control and Water Conservation District, also known as the Zone 7 Water Agency (Zone 7), supplied over 40,000 acre-feet (AF) of municipal and industrial water; therefore, Zone 7 is subject to the requirements of the UWMP Act. Zone 7 adopted its first UWMP in 1985, and then prepared an updated UWMP in 1991, in cooperation with three of the retailers supplied by Zone 7 [City of Livermore (Livermore), City of Pleasanton (Pleasanton), and Dublin San Ramon Services District (DSRSD)]. Zone 7 prepared and adopted a Water Shortage Contingency Plan in January 1992, and then updated and adopted a UWMP, which included a Water Shortage Contingency Plan, in 1995, 2000, and 2005. The 2005 UWMP was approved (i.e., “verified for completeness”) by DWR in early 2006.

1.2 THE PURPOSE OF THE 2010 UWMP

This 2010 UWMP updates and supersedes all previous UWMPs prepared by Zone 7. Zone 7 is almost exclusively a water wholesaler that provides water for municipal and industrial purposes indirectly through four retail urban water suppliers (Retailers) in the Livermore-Amador Valley; consequently, this UWMP addresses global water demand, water supply, and water resource management for this region. Additional details are included in the UWMPs prepared by the Retailers: DSRSD, Livermore, Pleasanton, and California Water Service Company (Cal Water). Zone 7 directly serves six retail customers, which is significantly fewer than 3,000 customers; at a 5-year average demand of 300 acre-feet, this demand represents less than 1% of the total demand in the service area. Retail customers include commercial and institutional water users as described in more detail in Section 9.3.2. Zone 7 also serves untreated water to agricultural customers as described in Section 2.3.

As a wholesaler, Zone 7 coordinates its water conservation efforts with its Retailers; therefore, this UWMP focuses on Zone 7's water conservation activities, and will not include a detailed description of the individual conservation programs implemented by the Retailers.

The California Environmental Quality Act (CEQA) does not apply to the preparation and adoption of a UWMP.[1]

1.3 PLAN CONTENTS AND ORGANIZATION

Assembly Bill 797 established the UWMP Act in 1983. The latest version of the UWMP Act, which contains the current requirements for the UWMP, is provided in Appendix A. This UWMP was prepared in accordance with those requirements. Table 1-1 provides a roadmap of where each of those requirements is addressed in this UWMP (in order of the referenced water code section). As noted in Table 1-1, this UWMP also includes a Water Shortage Contingency Plan (Chapter 13) as required under Section 10632 of the Water Code.

1.4 CHANGES FROM THE 2005 UWMP

This UWMP addresses all new relevant legislation enacted between 2005 and 2010, most notably SB 7, as described above, and Senate Bill 1087, related to the provision of water supply to lower income households. The implementation of SB 7 primarily rests with the Retailers; however, Zone 7 is incorporating the demand reductions expected from the Retailers in its planning, and water supply and demand analysis.

In late 2009, Zone 7 began its efforts to update its Water System Master Plan. This update involves a significant departure from the previous planning methodology used by Zone 7, which assumed a repetition of historical patterns. To make its planning more robust, Zone 7 developed a new risk model to develop probability curves for hydrologic conditions, incorporating potential variations from the historical hydrologic sequence. The dynamic model also allows for a more rigorous year-by-year analysis of water system operations in response to hydrologic conditions. Data from the Department of Water Resources' (DWR's) 2009 State Water Project Reliability Report[2] (Reliability Report) were incorporated into the model; unlike the 2005 version, this Reliability Report accounts for potential climate change impacts. The updated data from DWR also reflect recent Biological Opinions related to fish impacts of the State Water Project (SWP) and the associated operational restrictions and estimated supply reductions as of late 2009.

To be more consistent with DWR guidelines, median values were used instead of average values for the water supply quantities (e.g., SWP and Arroyo del Valle) during normal water years.

Finally, the Demand Management Measures discussion (Chapter 10) was reformatted to be consistent with the new guidelines from the California Urban Water Conservation Council, with reference to the relevant Water Code Section 10631(f) designation.

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[1] See Water Code Section 10652.
[2] DWR, 2010. 2009 State Water Project Reliability Report.

Table 1-1. Roadmap of Water Code Requirements and Corresponding UWMP Sections

Water Code Section	UWMP Chapter	UWMP Section	Content Description
10620(d)	3	3.1	Agency Coordination
10620 (f)	3	3.2	Resource Maximization / Import Minimization Plan
10621 (a)	1	1.1-1.4	Updated Plan in Years Ending in Five and Zero
10621 (b)	4	4.1	City and County Notification and Participation
10631(a)	2	2.1-2.4	Service Area Information
10631(b)	5	5.1-5.5	Water Sources
10631(b) (1)-(4)	6		Water Sources - Groundwater
10631(c) (1-3)	7	7.1-7.6	Reliability of Supply Sources
10631(d)	8	8.1-8.3	Transfer & Exchange Opportunities
10631(e) (1) (2) (3)	9	9.1-9.3	Water Use By Customer Type
10631(f)(1) (2) (3) (4) and 10631(g) and 10631(j)	10	10.1-10.2	Demand Management Measures (DMMs)
10631 (h)	11	11.1-11.3	Planned Water Supply Projects & Programs
10631(i)	12	12.1-12.3	Opportunities for Development of Desalinated Water
10631.5	10	10.1-10.2	Determination of DMM Implementation
10632(a)	13	13.1-13.6	Water Shortage Contingency Plan
10632(b)	13	13.2	Three-Year Minimum Water Supply
10632(c)	13	13.3	Preparation for Catastrophic Water Supply Interruption
10632(d)	13	13.4	Prohibitions against specific water use practices during water shortages
10632 (e)	13	13.6	Consumption Reduction Methods
10632 (f)	13	13.6	Excessive use penalties or charges for excessive use
10632(g)	13	13.5	Revenue and Expenditure Impacts
10632(i)	13	13.6	Reduction Measuring Mechanism
10633	14	14.3	Recycled Water Agency Plan
10633 (a)	14	14.2	Description of Wastewater System
10633	14	14.1	Recycled Water Plan Coordination
10633(a-d)	14	14.2	Wastewater Disposal and Current Use
10633(e)	14	14.3	Projected Uses of Recycled Water
10633 (f)	14	14.3	Plan to Optimize Use of Recycled Water
10634	15	15.1-15.4	Water Quality Impacts on Availability of Supply
10635(a)	16	Tables 16-3(a) to (c)	Water Service Reliability – Normal, Dry, and Multiple Dry Years
10635 (b)	17	17.0	Provision of Water Service Reliability Section to Cities/ Counties Within Service Area

Water Code Section	UWMP Chapter	UWMP Section	Content Description
10642	4, 17	4.1, 17.0	Public Participation
10643	10	10.1-10.2	Review of Implementation of 2000 UWMP
10644 (a)	4	4.1	Provision of 2005 UWMP to Local Governments
10645	4	4.1	Places Where UWMP is Available For Public Review
10656, 10657	17	17.0	UWMP Adoption & Implementation

2. GENERAL SERVICE AREA

Water Code Section 10631(a)

2.1 BACKGROUND

Zone 7 of Alameda County Flood Control and Water Conservation District (Zone 7) is one of ten active zones of the Alameda County Flood Control and Water Conservation District (District).

2.1.1 Alameda County Flood Control and Water Conservation District

The District was created in 1949 by the California State Legislature through passage of Act 205 of the California Uncodified Water Code (District Act) to provide control of flood and storm waters and to conserve water for beneficial uses. The District is also vested with the power to store water in surface or underground reservoirs within or outside of the District for the common benefit of the District; conserve and reclaim water for present and future use within the District; appropriate and acquire water and water rights; and import water into the District.

The District is further authorized by the District Act to prevent interference with or diminution of, or to declare rights in the natural flow of any stream or surface or subterranean supply of waters used or useful for any purpose of the District and to prevent contamination, pollution or otherwise rendering unfit for beneficial use the surface or subsurface water used or useful in the District.

The District is also authorized to levy replenishment assessments upon the production of groundwater from all water-producing facilities, whether public or private, within the District.

2.1.2 Zone 7 Water Agency

The history of Zone 7 as a water resource management agency can be traced to the mid-1950s, when the Livermore-Amador Valley was primarily rural in character, with a population of approximately 30,000 people. The area faced a number of problems, including groundwater overdraft, poor drainage and flood hazards, and an uncertainty over the status of future water supplies. It was against this backdrop that the residents of the Livermore-Amador Valley voted, in 1957, to create Zone 7 Water Agency or Zone 7.

Zone 7 is governed by a seven-member board of directors (Zone 7 Board). Each director is elected at-large by residents within Zone 7's service area to a four-year term. The Zone 7 Board sets policy and provides direction to agency management and staff.

In 2003, the legislature passed Assembly Bill 1125 and gave the Zone 7 Board full authority and autonomy to govern matters solely affecting Zone 7 independently of the Alameda County Board of Supervisors. The Alameda County Board of Supervisors, acting as the District Board of Supervisors, solely governs the other nine zones of the District.

2.1.2.1 Zone 7 – A Wholesale Water Agency

Zone 7 is the water wholesaler for the Livermore-Amador Valley, also known as the Tri-Valley Area[3], in addition to serving as the area's flood control agency. Zone 7 supplies untreated water for agriculture, and treated drinking water to four retail water supply agencies (Retailers):

- California Water Service Company (Cal Water),
- Dublin San Ramon Services District (DSRSD),
- City of Livermore (Livermore), and
- City of Pleasanton (Pleasanton).

These Retailers deliver water for municipal and industrial (M&I) purposes within their individual service areas.

Over 2002 and 2003, the Retailers signed the "Tri-Valley Water Retailers Cooperation Agreement" (Agreement), which provides a framework for cooperation amongst the Retailers to enhance their abilities to serve their customers. The Committee of Valley Water Retailers (CoVWR), consisting of two governing body or senior management staff representatives from each retailer, was formed as part of the Agreement. The Tri-Valley Water Retailers Group (TWRG), consisting of staff from each retailer, was also formed to administer the actions called for under the Agreement, to develop consensus on issues of mutual concern, and to prepare an Annual Report for approval by the CoVWR[4]. The CoVWR and the TWRG serve as forums for the Retailers to discuss issues of common interest and to communicate the Retailers' position on such issues to Zone 7.

2.1.2.2 Key Management and Administrative Activities

Zone 7's key management responsibilities include:

- providing a wholesale treated drinking water supply;
- monitoring and protecting water quality;
- operating and maintaining a water treatment system; and
- managing regional flood and storm water for public safety and protection of property.

Under Zone 7's Groundwater Management Program, Zone 7 administers oversight of the local groundwater basin, the Livermore Valley Groundwater Basin (Main Basin), and prevents groundwater overdraft. The Main Basin is the portion of the Livermore-Amador Valley Groundwater Basin that contains high-yielding aquifers and good quality groundwater. Within this capacity, Zone 7 monitors groundwater extractions and imports water to both artificially recharge the Main Basin (to supplement natural recharge) and to provide potable water through

[3] The Tri-Valley Area includes the City of Dublin, City of Livermore, City of Pleasanton, and part of the City of San Ramon.
[4] West Yost Associates, 2010. DRAFT Tri-Valley Water Retailers Annual Report Fiscal Year 2009/10.

direct treatment (thus allowing local agencies to reduce pumping demands on the Basin). Zone 7's groundwater management policies and programs are described in the Groundwater Management Plan[5], which is included as a CD attachment. Every year Zone 7 completes an update of its Groundwater Management Program. The most recent update was completed in May 2010 for the 2009 water year[6].

2.2 SERVICE AREA

2.2.1 Location of the Service Area

Zone 7's water service area is located about 40 miles south-east of San Francisco, and encompasses an area of approximately 425 square miles of the eastern portion of Alameda County, including the Livermore-Amador Valley, Sunol Valley, and portions of the Diablo Range. Zone 7's service area also overlies the Alameda Creek Watershed. This watershed encompasses almost 700 square miles, and extends from Altamont Pass to the east, San Francisco Bay to the west, Mount Diablo to the north, and Mount Hamilton to the south. Figure 2-1 illustrates the location of Zone 7's service area.

2.2.2 Major Streams and Arroyos in the Service Area

Major streams in Zone 7's service area include the Arroyo del Valle, Arroyo Mocho, Arroyo Las Positas, Alamo Canal, South San Ramon Creek, and Tassajara Creek (see Figure 2-1). Both the Arroyo del Valle and Arroyo Mocho originate in the woodland forests of the Burnt Hills region in Santa Clara County, in the sub-watershed above Lake Del Valle. The Arroyo del Valle and Arroyo Mocho have the largest drainage areas within the Zone 7 service area.

The Arroyo del Valle flows into Lake Del Valle above Lang Canyon, and then continues its journey below the Del Valle Dam and flows westerly through a regional park on the southern border of Livermore and reaches Pleasanton. The Arroyo del Valle then flows southwesterly through the historic downtown region of Pleasanton and joins the Arroyo de la Laguna.

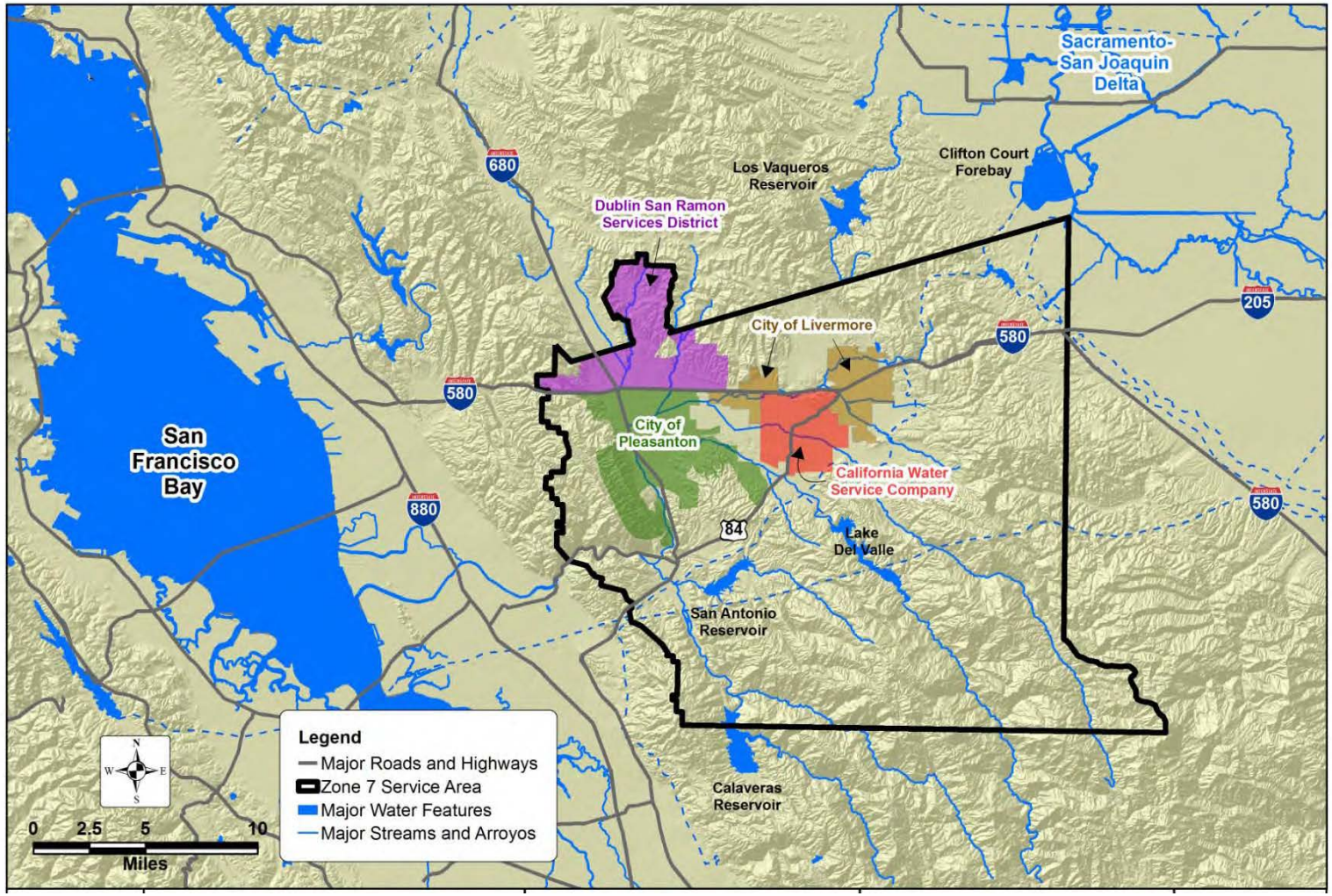
The Arroyo Mocho remains a natural waterway as it flows southwest through the oak woodlands east of Livermore, and then flows through the southern portion of Livermore; from there, it becomes an improved channel and proceeds through the gravel mining area west of Livermore and meets the Arroyo Las Positas in Pleasanton. This stream is also a major component of Zone 7's groundwater recharge program. At the request of Zone 7, the Department of Water Resources (DWR) releases water into both Arroyo Mocho and Arroyo del Valle for groundwater recharge purposes that also provide secondary aesthetic and environmental benefits.

The Arroyo Las Positas mainly flows westerly along I-580, and is fed by the Arroyo Seco, Altamont Creek, Cayetano Creek, Collier Canyon Creek, and Cottonwood Creek. In northeast Pleasanton, the Arroyo Las Positas joins the Arroyo Mocho, where the streambed becomes a

[5] Jones and Stokes, 2005. Groundwater Management Plan for the Livermore-Amador Valley Groundwater Basin.
[6] Zone 7 Water Agency, 2010. Annual Report for the Groundwater Management Program: 2009 Water Year.

wide, trapezoidal-shaped flood control channel. The Arroyo Mocho then flows into the Arroyo de la Laguna, which is a tributary of Alameda Creek.

Figure 2-1. Location of Zone 7 Water Agency's Service Area



2.3 EXISTING WATER USE SECTORS

Zone 7's service area is home to a diverse, vibrant, and rapidly growing community that supports a population of approximately 216,000 people and a myriad of vital and dynamic commercial, agricultural, and industrial enterprises. The eastern reaches of Zone 7's service area include oil wells and acres of energy generating windmills, while other areas include large employers such as AT&T, Oracle, Providian Financial, SAP, and Lawrence Livermore National Laboratory. This area also supports a number of award-winning wineries. Examples of industrial water users include: Applied Biosystems (biotech), Clorox Services Company (chemical company), Roche Molecular Systems (medical research and development), and A-1 Enterprise (waste hauler).

As discussed previously, Zone 7 provides wholesale treated water to the Retailers, who use this water for M&I purposes within their service areas; through this arrangement, Zone 7 indirectly serves approximately 66,000 residential, commercial, industrial, institutional, and landscape water use accounts. Two of the Retailers—DSRSD and Livermore—also provide recycled water for landscape irrigation to supplement treated water supply. In addition to supplying treated water, Zone 7 also supplies raw or untreated water for agricultural purposes to 3,500 acres in the service area, primarily consisting of vineyards in the southern portion of the Livermore Valley. Agriculture in the Livermore area also produces olives, pistachios, and prime beef.

As shown in Table 2-1, water accounts within Zone 7's service area are primarily residential (90%). Water use details are further discussed in Chapter 9.

Table 2-1. 2009 Accounts by Water Use Sectors Directly and Indirectly Served by Zone 7[(a)]

Water Use Sector	Accounts	% of Total
Single-Family Residential	57,198	86%
Multi-Family Residential	2,327	4%
Commercial/Institutional	3,807	6%
Industrial	175	0.3%
Landscape	1,844	3%
Agriculture	14	0.02%
Other	868	1%
TOTAL	**66,233**	**100%**

[(a)] Based on data provided by Cal Water, DSRSD, Livermore, and Pleasanton, and Zone 7's annual water supply reports. These values do not include recycled water, but do include untreated surface water provided to agriculture.

2.4 POPULATION GROWTH

As shown on Figure 2-2, the population within Zone 7's service area has increased by 65% between 1990 and 2009, and is projected to grow by another 35% by 2040, from 216,000 in 2009 to 291,000; a majority of the projected growth occurs within the next 10 years. Population projections within Zone 7's service area over the next 20 years are presented in Table 2-2. As

shown in Table 2-2, the projected population within Zone 7's service area is within 10% of the projections previously presented in Zone 7's 2005 UWMP.

Figure 2-2. Historical and Projected Population within Zone 7's Service Area

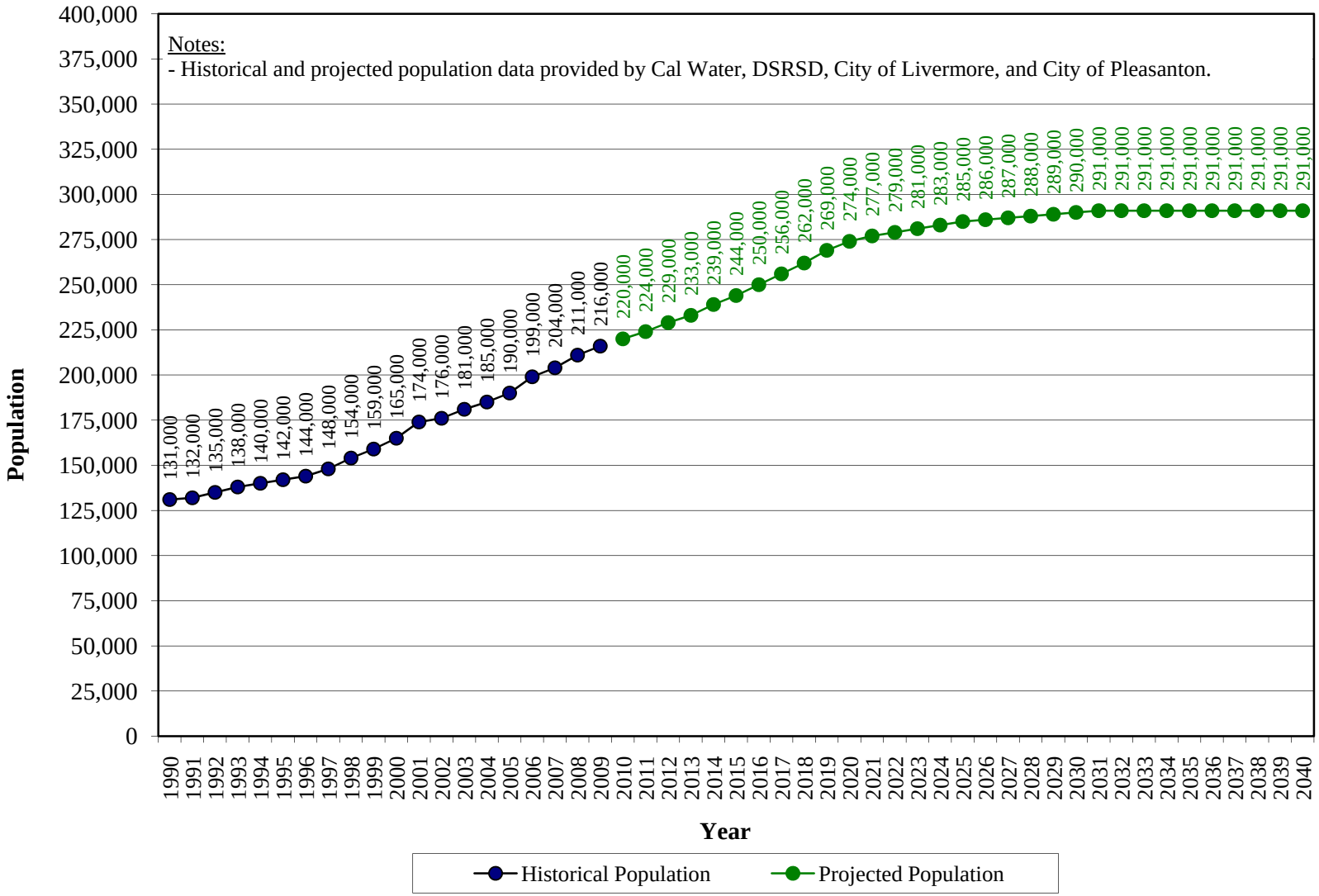


Table 2-2. Projected Population within Zone 7's Service Area[a]

UWMP Plan	Year					
	2009 (Current)	2010	2015	2020	2025	2030
2005	NA	225,000	247,000	255,000	263,000	264,000
2010	216,000	220,000	244,000	274,000	285,000	290,000
% Increase		-2.3%	-1.2%	6.9%	7.7%	9.0%

[a] Population data provided by Cal Water, DSRSD, Livermore, and Pleasanton.

2.5 CLIMATE

The climate within Zone 7's service area is best described as Mediterranean, characterized by hot, dry summers and cool, moist winters. Table 2-3 provides a more detailed picture of climate within Zone 7's service area, including average evapotranspiration (ETo)[7], temperature, and rainfall, while Figure 2-3 provides a graphical representation. As shown in Table 2-3, average annual precipitation is approximately 14.6 inches of water, while total evapotranspiration is approximately 49 inches of water; average monthly temperatures vary from 45 to 69 degrees Fahrenheit throughout the year.

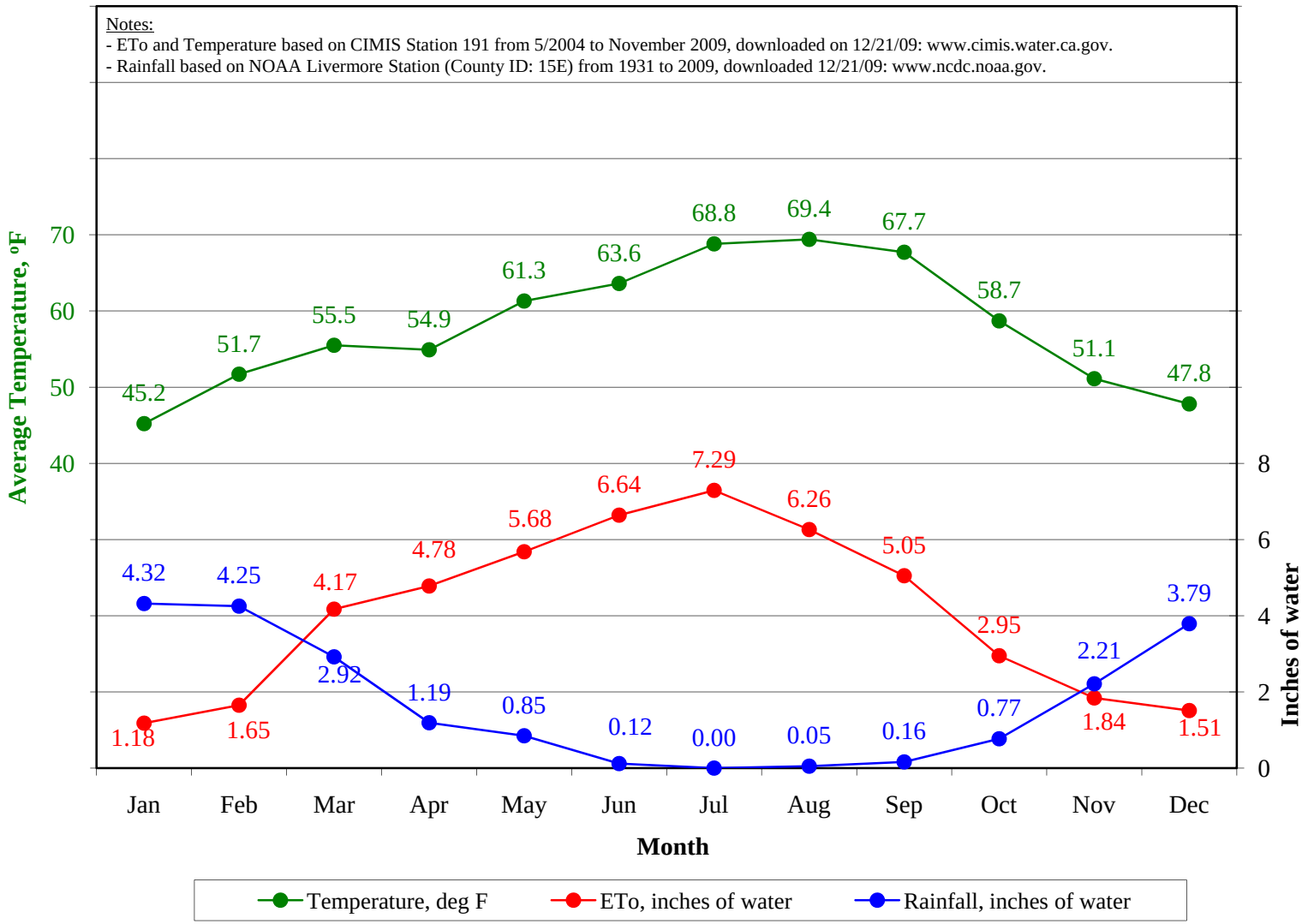
Table 2-3. Climate Data for Zone 7's Service Area

Weather Parameter	Month												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
ETo, inches of water[a],[b]	1.18	1.65	4.17	4.78	5.68	6.64	7.29	6.26	5.05	2.95	1.84	1.51	49.00
Average Temperature, °F[b]	45.2	51.7	55.5	54.9	61.3	63.6	68.8	69.4	67.7	58.7	51.1	47.8	--
Average Rainfall, inches of water[c]	2.96	2.50	2.18	1.07	0.48	0.11	0.02	0.04	0.24	0.69	1.64	2.64	14.57

[a] ETo = evapotranspiration based on standard grass as reference.
[b] Data for CIMIS Station 191 from May 2004 to November 2009, downloaded on 12/21/09: www.cimis.water.ca.gov.
[c] Obtained from Table 3.1-3 of the Annual Report for the Groundwater Management Program – 2009 Water Year (see CD attachment).

[7] Evapotranspiration based on standard grass as reference.

Figure 2-3. Climate Data



2.6 ZONE 7'S CONVEYANCE, TREATMENT, AND TRANSMISSION SYSTEM

Zone 7 has a robust water supply system consisting of aqueducts, surface water treatment plants, groundwater wells, demineralization facility, and transmission pipelines. Each is discussed below, while Figure 2-4 illustrates the location of Zone 7's major water system facilities.

2.6.1 South Bay Aqueduct

Zone 7 imports surface water from the State Water Project (SWP) through the South Bay Aqueduct (SBA) for direct use by agricultural users and for treatment, storage, and recharge for municipal and industrial customers. The SBA, which is operated by the DWR, starts from Byron Bethany Reservoir in the northeastern corner of Zone 7's service area, and then leaves the service area, southwest of San Antonio Reservoir. The SBA is described in more detail in Chapter 5.

2.6.2 Water Treatment Plants

Zone 7 operates two water treatment plants: the Del Valle Water Treatment Plant (DVWTP) and the Patterson Pass Water Treatment Plant (PPWTP).

2.6.2.1 Del Valle Water Treatment Plant

The DVWTP is located along the SBA, just south of Lake Del Valle, and has a capacity of 40 mgd. It can receive water either directly from the SBA or from Lake Del Valle. The treatment processes include coagulation, flocculation, clarification, multi-media filtration, and chlorine disinfection. In addition, chloramine is used to maintain a disinfectant residual in the distribution system.[8]

2.6.2.2 Patterson Pass Water Treatment Plant

The PPWTP is located along the SBA, just south of Interstate 580, and has a capacity of 19 mgd.[9] Because PPWTP is upstream of Lake Del Valle, it is not able to receive water directly from this water supply source[10] and instead has a small raw water reservoir onsite operated by DWR (more details on water supply sources can be found in Chapter 5). There are two separate, parallel treatment plants on the plant site: a conventional plant and an ultrafiltration plant. The two plants share the same water source, finished-water clearwell, and solids handling facilities, but are operated independently of each other by Zone 7 staff.

The treatment processes in the conventional system include coagulation, flocculation, sedimentation, dual-media filtration, and chlorine disinfection. The ultrafiltration plant consists of coagulation, flocculation, sedimentation, an Aquasource ultrafiltration membrane system, and

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[8] Zone 7, 2009. Del Valle Water Treatment Plant Site Specific BMPs Plan. September.

[9] Zone 7, 2009. Patterson Pass Water Treatment Plan Site Specific BMPs Plan. September.

[10] PPWTP can put water supply diverted under an existing water right permit to beneficial use through exchanges with other SWP contractors.

chlorine disinfection. In addition, chloramine is used to maintain a disinfectant residual in the distribution system.

2.6.3 Zone 7 Groundwater Wells

Zone 7 owns and operates nine municipal supply wells located in four well fields: the Chain of Lakes, Hopyard, Mocho, and Stoneridge well fields. All four well fields have a combined peak capacity of 40 mgd. Groundwater is chloraminated to match the disinfectant residual in the transmission system.

Construction of a Well at the Chain of Lakes Well Field

2.6.4 Mocho Groundwater Demineralization Facility

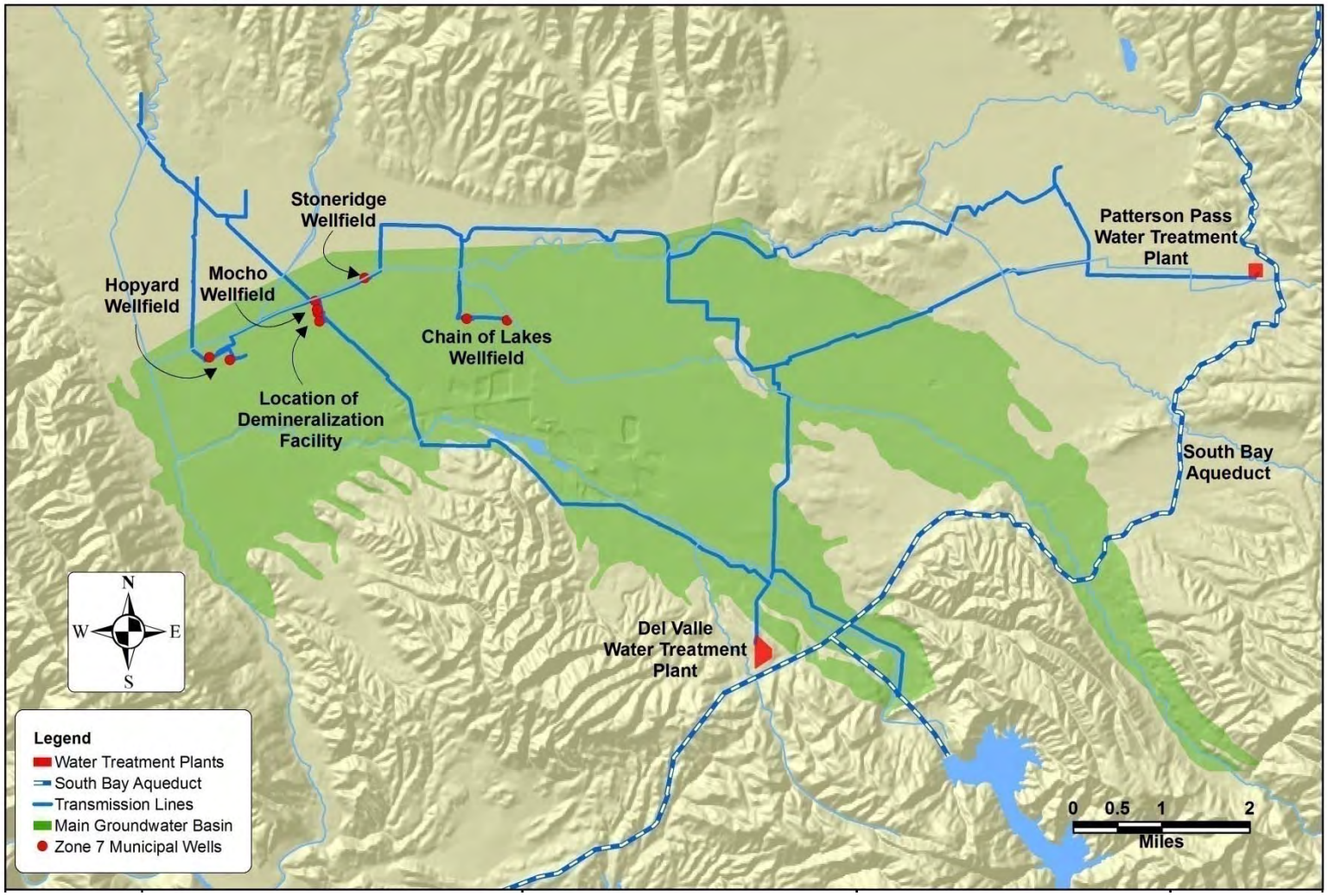
At the Mocho well field, there is also a reverse osmosis membrane-based demineralization facility designed to improve delivered water quality and mitigate salt build-up in the groundwater basin; it is described in more detail in Chapter 6. Construction of this facility, which can produce up to 6.1 mgd of demineralized water, was completed in 2009.

2.6.5 Transmission System

Zone 7's transmission system consists of approximately 35 miles of pipeline ranging from 12 to 42 inches in diameter. Elevations across the transmission system range from 600 to 680 feet above mean seal level (msl) on the eastern side of the service area, to approximately 330 feet above msl on the western side of the service area.

Construction of El Charro Pipeline in 2009

Figure 2-4. Zone 7's Major Treated Water System Facilities



3. AGENCY COORDINATION

Water Code Section 10620

The purpose of this chapter is to describe the coordination of the development of this Urban Water Management Plan (UWMP) with the relevant agencies. It also discusses how Zone 7 uses various water management tools to maximize resources and minimize the need to import water.

3.1 COORDINATION WITH OTHER AGENCIES

As a first step in the preparation of the 2010 UWMP, Zone 7 Water Agency (Zone 7) held a kick-off meeting with technical staff from its water retailers (Retailers): City of Livermore (Livermore), City of Pleasanton (Pleasanton), Dublin San Ramon Services District (DSRSD), and California Water Service Company (Cal Water). The purpose of the kick-off meeting, which was conducted in June 2009, was to coordinate the preparation of Zone 7's and the Retailers' 2010 UWMP to ensure consistency among them, particularly with respect to projected water demands and future water supplies. Zone 7 held three additional meetings with the Retailers over the UWMP development process period, between July 2009 and December 2010. The Retailers provided necessary information for the completion of this UWMP, particularly information on their population and water demand projections, wastewater management, water conservation plans, and recycled water plans. Zone 7 is also providing assistance to the Retailers in preparing their individual UWMPs.

As the wholesale water supplier to the Livermore-Amador Valley, Zone 7 notified the cities within the service area of the update process for the UWMP and the opportunity to submit comments on the Draft 2010 UWMP in compliance with Section 10642 of the Water Code. The Livermore-Amador Valley Water Management Agency was also given the opportunity to review the Draft 2010 UWMP. As a special agency within Alameda County, Zone 7 similarly coordinated with the Alameda County Planning Department. A 60-day notice of the public hearing was disseminated to cities within the service area and Alameda County. A public review period was conducted in the month of November 2010 before the public hearing at the December 2010 Zone 7 Board Meeting; the public hearing is intended to present the Draft 2010 UWMP, and receive and address comments from the public. As advertised in the local newspapers, the Draft 2010 UWMP was made available for public review and comment in public libraries, in the Zone 7 administrative office, on the Zone 7 website, and during the public hearing. Public notices are included in Appendix B.

A public hearing was conducted at one of the regular public meetings of the Zone 7 Water Agency Board of Directors (Zone 7 Board) held on December 15, 2010 to present the UWMP and obtain comments from the public.

Table 3-1. Agency Coordination for the 2010 UWMP Development

Agency	Participated in the UWMP development	Sent notice of public hearing and intention to adopt	Received copy of the draft	Commented on the Draft UWMP
Water Retailers				
California Water Service Company	X	X	X	X
City of Livermore	X	X	X	X
City of Pleasanton	X	X	X	X
Dublin San Ramon Services District	X	X	X	X
Other Water Management Agencies				
Department of Water Resources	X		X	X
Relevant Public Agencies				
Alameda County Planning Department		X	[(a)]	
City of Dublin Planning Department		X	[(a)]	
City of San Ramon Planning Department		X	[(a)]	
Livermore-Amador Valley Water Management Agency (LAVWMA)		X	[(a)]	
Alameda County Public Library – Dublin			X	
Livermore Public Library			X	
Pleasanton Public Library			X	

[(a)] Notified of availability of copies in public libraries, at the Zone 7 office, and online.

Zone 7 is strongly committed to coordinating with the Retailers on issues that affect their own operations. A key area in which Retailers are closely involved is water supply planning. Zone 7 conducts a review of the Sustainable Water Supply and develops water management strategies on an annual basis. This process is vetted in a number of forums, including public presentations to the Zone 7 Board, presentations to and discussions with the Tri-Valley Water Retailers Group (TWRG), and publication of the Annual Review of Sustainable Water Supply for Zone 7 Water Agency on the internet for public access. Zone 7 also regularly meets with the TWRG on other key issues such as budgeting, water quality issues, and others. The Retailers are also being consulted regularly on the update of the Water System Master Plan (WSMP).

As a contractor of the State Water Project (SWP) (discussed in more detail in Chapter 5), Zone 7 is heavily engaged with the Department of Water Resources (DWR). Zone 7 also regularly interacts with other water agencies receiving water from the SWP and serving a total of over 25

million people across the state. These interactions ensure that Zone 7 stays abreast of major water resource issues not just at the local level, but also at the regional and state levels.

3.2 RESOURCE MAXIMIZATION AND IMPORT MINIMIZATION

As discussed in more detail in Chapter 5, 83% of Zone 7's water supply is imported water derived from the SWP. Zone 7 continues to strive to develop local sources of water, and to diversify its water supply portfolio to generally increase reliability. An updated WSMP is to be completed in early 2011 (discussed further in Chapter 11), with the goal of developing a set of water supply and infrastructure portfolios that will provide the flexibility required to respond to an uncertain future caused by legal and environmental constraints in the Delta and climate change, and offer a reliable supply of high quality water to the Livermore-Amador Valley. One set of portfolios being developed is focused on sources within the Livermore-Amador Valley, such as recycled water, rainfall capture, and completion of facilities required to fully perfect Zone 7's water right permit for Arroyo del Valle. Water conservation also plays an important role in local water resource management; as described in Chapter 10, Zone 7 has been proactively implementing water demand management measures in the service area in cooperation with the Retailers.

To optimize use of its local resources, Zone 7 practices conjunctive use of the Livermore Valley Groundwater Basin (Basin) (see Chapters 6 and 7), with local runoff from Arroyo del Valle stored in the local reservoir owned and operated by DWR (Lake Del Valle). Artificial recharge into the Basin utilizing stored local water or imported water from the SWP supplements natural recharge. More details about Zone 7's conjunctive use program can be found in Zone 7's Groundwater Management Plan[11] (attached as a CD).

Finally, Zone 7 has entered into several long-term water storage ("banking") agreements with agencies outside of the service area in Kern County (Semitropic Water Storage District and Cawelo Water District) to gain additional flexibility in managing fluctuations in supplies and providing water during drought and other emergency conditions. These agreements are described in Chapter 8.

[11] Jones and Stokes, 2005. Groundwater Management Plan for the Livermore-Amador Valley Groundwater Basin.

4. PUBLIC PARTICIPATION

Water Code Section 10642

The purpose of this chapter is to describe the level of public participation in the development of this Urban Water Management Plan (UWMP).

4.1 PUBLIC PARTICIPATION

The California Urban Water Management Planning Act (UWMP Act) requires each water agency to encourage the active involvement of the public in the development of the UWMP. Zone 7 Water Agency (Zone 7) sought public participation by allowing any interested member of the general community in the service area to have access to the Draft 2010 UWMP (Draft) starting in early November 2010. The Draft was made available for public inspection at local libraries (as listed in Table 3-1), as well as on Zone 7's website. In addition, Zone 7 had a hard copy of the Draft available for public review at the Zone 7 Administrative Office in Livermore, California. Copies of the Draft were sent for review and comment to all Zone 7 retail water supply agencies. Notice of the public hearing on December 15, 2010 was sent to the cities, Alameda County, and Livermore-Amador Valley Water Management Agency 60 days before the public hearing as required under Section 10642 of the Water Code. Public notices regarding the availability of the Draft for public inspection, and of the public hearing, were also posted in the local media (Valley Times and Tri-Valley Herald) twice in November (November 8 and 15, 2010), one week apart, and on the Zone 7 website. Public notices are included in Appendix B.

The public hearing was conducted on December 15, 2010 to allow for public comment on the Draft 2010 UWMP before being formally adopted by the Zone 7 Board of Directors. A copy of the Board resolution adopting the UWMP is attached as Appendix C.

5. WATER SUPPLY: SOURCES AND STORAGE OPTIONS

Water Code Section 10631

The purpose of this chapter is to describe Zone 7's water supply system. This system includes two major components: (1) incoming water supplies available through contracts and water rights and 2) accumulated water supplies in storage. Incoming water supplies consist of annually allocated imported surface water supply and local surface water runoff. Accumulated or "banked" water supplies are available in local and non-local storage locations.

Two of Zone 7's retailers, Dublin San Ramon Services District (DSRSD) and the City of Livermore (Livermore), also produce recycled water for their service areas; more details about recycled water are available in Chapter 14. The two other retailers in the service area, the City of Pleasanton (Pleasanton) and the California Water Service Company (Cal Water), pump groundwater in addition to the water supply provided to them by Zone 7. DSRSD has a contract with Zone 7 to pump groundwater on its behalf. More details about the Livermore Valley Groundwater Basin, which is used as a supply by the retailers as described above and as local storage by Zone 7, are provided in Chapter 6. Water transfers are discussed in more detail in Chapter 8.

In accordance with its reliability policy (Appendix D), Zone 7 continues to explore other options for acquiring additional future water supplies (see Chapter 11) such as desalination (see Chapter 12).

5.1 IMPORTED SURFACE WATER SUPPLY

Imported surface water is by far Zone 7's largest water source, providing over 80% of the treated water supplied to its customers on an annual basis. As described below, Zone 7 imports water from the State Water Project and surplus water from the Byron Bethany Irrigation District.

5.1.1 State Water Project

In November 1961, Zone 7 entered into a 75-year agreement with the Department of Water Resources (DWR) to receive water from the State Water Project (SWP). The SWP is the nation's largest publicly-built water storage and conveyance system and currently serves over 25 million people throughout California. SWP water originates within the Feather River watershed, is captured in and released from Lake Oroville, and flows through the Sacramento-San Joaquin Delta before it is conveyed by the South Bay Aqueduct (SBA) to Zone 7 or by the California Aqueduct to other south-of-Delta SWP contractors.

Supply from the SWP is delivered via the SBA. Over 90% of Zone 7's existing supply is conveyed through the SBA.

The SBA also delivers water to other water suppliers, namely Santa Clara Valley Water District and Alameda County Water District. Lake Del Valle is part of the SBA system and is used for storage of SWP water, as well as local runoff. At Zone 7, SWP water is used to meet treated water demands from municipal and industrial customers—both wholesale and retail—and untreated water demands from agricultural customers. It is also used to artificially recharge the local groundwater basin as discussed below in Section 5.3, or fill non-local storage.

5.1.1.1 Table A Allocation

Zone 7 has the ability to carry Table A water from one year to another. Zone 7's SWP carryover is stored in San Luis Reservoir

The primary allocation agreement between DWR and its SWP contractors is recorded in Articles 12(a) and 18(a) of the agreements and is based on each contractor's annual water delivery request. Each contractor is limited to an annual contractual amount as specified in Article 6(c) and Table A. Zone 7's current agreement or contract with the DWR is for the delivery of up to 80,619 acre-feet annually (AFA). This contract expires in 2036 with an option to renew for 75 years. In practice, the actual amount of SWP water available to Zone 7 under the Table A allocation process varies from year to year due to hydrologic conditions, water demands of other contractors, SWP facility capacity, and environmental/regulatory requirements. In January 2010, DWR issued the State Water Project Delivery Reliability Report for 2009[12] that estimates a long-term average yield of 60% of Table A amounts, equivalent to 48,400 AFA for Zone 7. The SWP provides a median yield in a normal water year of 51,400 AFA (approximately 64%) to Zone 7.

As a SWP contractor, Zone 7 has the option to carry over unused Table A water from one year to the next when there is available storage in San Luis Reservoir. This "carryover" water is also called Article 12e and 56c water. Article 12e water must be taken by March 31 of the following year, but Article 56c water may be carried over as long as San Luis Reservoir storage is available. When possible, Zone 7 typically sets aside between 10,000 to 15,000 acre-feet (AF) of carryover water from its SWP Table A allocation.

5.1.1.2 Article 21 Water (Interruptible or Surplus Water)

Under Article 21 of Zone 7's contract with DWR, Zone 7 also has access to excess water supply from the SWP that is available only if: 1) it does not interfere with SWP operations or Table A allocations, 2) excess water is available in the Delta, and 3) it will not be stored in the SWP system. Per the State Water Project Reliability Report for 2009[12], the projected yield from Article 21 is very low and does not represent a significant water supply for Zone 7.

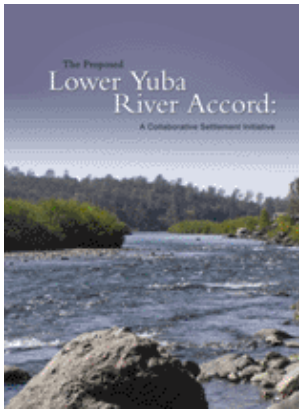
[12] DWR, 2010. State Water Project Delivery Reliability Report for 2009. (Available at http://baydeltaoffice.water.ca.gov/swpreliability/index.cfm).

5.1.1.3 Article 56d Water (Turnback Pool Water)

Article 56d is a contract provision that allows SWP contractors with unused Table A water to sell their water to contractors who have water needs that exceed their allocation for the year. Historically, only a few SWP contractors have been in a position to make Turnback Pool water available for purchase, particularly in normal or dry years. Zone 7 currently does not anticipate a significant amount of water supply to be available under Article 56d until there is a resolution to the current Delta crisis.

5.1.1.4 Yuba Accord

In 2008, Zone 7 entered into a contract with DWR to purchase additional water under the Lower Yuba River Accord (Yuba Accord). The contract expires in 2025. There are four different types ("Components") of water available; Zone 7 has the option to purchase Components 2 and 3 water during drought conditions, and Component 4 water when the Yuba County Water Agency has determined that it has water supply available to sell.



The annual amount of water supply available to Zone 7 during dry years under the Yuba Accord is relatively small: 159 AF in 2009 and approximately 1,000 AF in 2010. Zone 7 estimates average and median yields of 250 AFA and 145 AFA, respectively, under the Yuba Accord (see Chapter 7 for more detail).

5.1.2 Byron Bethany Irrigation District

The Byron Bethany Irrigation District (BBID) diverts water from the Sacramento-San Joaquin Delta (Delta) pursuant to a "Notice of Appropriation of Water" dated May 18, 1914[13]. Zone 7 entered into a 15-year contract with BBID, renewable every five years, for a minimum yield of 2,000 AFA and up to 5,000 AFA of water supply under this appropriation. Water purchased from BBID is delivered to Zone 7 via the SBA. The current contract was recently extended through 2030, with an option to extend through 2039. While Zone 7 has had a contract with BBID since 1998, Zone 7 has historically requested less than the full amount available; this will change in the future.

5.2 LOCAL SURFACE WATER RUNOFF

Zone 7, along with Alameda County Water District (ACWD), has water right permits to divert flows from Arroyo del Valle[14]. Runoff from the Arroyo del Valle watershed above Lake Del Valle is stored in the lake, which is managed by DWR. As noted above, Lake Del Valle is also used to store imported surface water deliveries from the SWP through late winter and spring. In late fall, DWR typically lowers lake levels in anticipation of runoff from winter storm events,

[13] Source: Mountain House Master Plan.
[14] Permit 11319 (Application 17002).

and to provide flood control capacity. Water supply in Lake Del Valle is made available to Zone 7 via the SBA through operating agreements with DWR. Inflows to Lake Del Valle, after accounting for permit conditions, are equally divided between ACWD and Zone 7.

A review of historic runoff from Arroyo del Valle from 1913 to 2008[15] indicates that the median inflow available to Zone 7 is approximately 7,100 AFA; Chapter 7 provides more detail on the reliability of supply from the Arroyo del Valle.

Supply from Arroyo del Valle is stored in Lake Del Valle

5.3 LOCAL STORAGE

Zone 7 has three options for local storage: storage in Lake Del Valle, storage in the local groundwater basin and, in the future, surface storage in the Chain of Lakes. Each of these is described below.

5.3.1 Lake Del Valle

As described above, Lake Del Valle is used to store runoff from the Arroyo del Valle watershed above the lake and also to store imported surface water deliveries from the SWP.

5.3.2 Livermore Valley Groundwater Basin

Zone 7 overlies the Livermore Valley Groundwater Basin (Basin); the Main Basin is the portion of the Livermore Valley Groundwater Basin that contains high-yielding aquifers and good quality groundwater.[16] It has an estimated storage capacity of about 254,000 AF. Detailed descriptions of the Main Basin are available in Zone 7's Groundwater Management Plan (GMP)[17], which is included as a CD attachment. Chapter 6 also provides more details on the Main Basin and its operation. ***DWR has not identified the Main Basin (DWR Basin No. 2-10) as either a basin in overdraft or a basin expected to be in overdraft.***

For Zone 7, the Basin is considered a storage facility and not a long-term water supply because Zone 7 does not have a groundwater-pumping quota, and only pumps groundwater it artificially recharges using its surface water supplies. As part of its conjunctive use program, Zone 7's policy is to maintain groundwater levels above historic lows in the Main Basin through artificial recharge of SWP water or locally-stored runoff from Arroyo del Valle. Currently, this is accomplished by releasing water to the arroyos for subsequent percolation and replenishment of the aquifers.[18] Zone 7 established historic lows based on the lowest measured groundwater

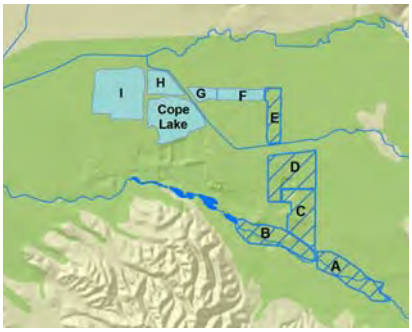
[15] Note that actual data is only available for the following years: 1912 (partial)-1930, 1942, 1944-1952, 1958–present. Gaps were filled using correlations with local rainfall.
[16] Zone 7, 2009. Annual Report for the Groundwater Management Program – 2008 Water Year. May.
[17] Jones & Stokes, 2005. Groundwater Management Plan for Livermore-Amador Valley Groundwater Basin.
[18] Zone 7, 2009. Annual Report for the Groundwater Management Program – 2008 Water Year. May.

elevations in various wells in the Main Basin; historical lows correspond to a groundwater storage volume of about 128,000 AF.[19] In general, the difference between water surface elevations when the Main Basin is full and water surface elevations when the Main Basin is at historic lows defines Zone 7's operational storage. Operational storage is about 126,000 AF based on Zone 7's experience operating the Main Basin.

5.3.3 Chain of Lakes – Lake I and Cope Lake

The Chain of Lakes refers to a series of ten mined out or active gravel quarry pits that have been or will be transferred to Zone 7 for water resources applications. These might include surface storage of stormwater or other local runoff, surface storage of water from the SWP, and/or use as groundwater recharge basins once mining has been completed. The ten quarry pits or lakes are named Cope Lake, and Lakes A through I.

Although the Chain of Lakes will ultimately cover approximately 2,000 acres and store approximately 100,000 AF of water, Zone 7 currently only owns Cope Lake and Lake I. Zone 7 expects to take ownership of Lake H sometime within the next five years, while the remaining lakes will be transferred to Zone 7 over the next 20 years.



The Chain of Lakes is located over the Main Basin, and will enhance Zone 7's existing artificial recharge activities

The Chain of Lakes will be used to store water supplies in wet years for later use during droughts, recharge the groundwater basin, capture additional flow from Arroyo del Valle, and help control flooding along the Arroyo Mocho and Arroyo Las Positas.

5.4 NON-LOCAL STORAGE

In addition to local storage, Zone 7 also participates in the two non-local (also called "out of basin") groundwater-banking programs described below; both banks are located in Kern County. Note that while these banking programs provide a water source during drought years, they represent water previously stored from Zone 7's surface water supplies during wet years. Therefore, they do not have a net contribution to Zone 7's water supply over the long-term and in fact result in some operational losses as described below. Furthermore, this banked water supply is only available when the SBA is operational.

5.4.1 Semitropic Water Storage District

Zone 7 originally acquired a storage capacity of 65,000 AF in the Semitropic Water Storage District (Semitropic) groundwater banking program in 1998. Subsequently, Zone 7 agreed to participate in Semitropic's Stored Water Recovery Unit, which increased pumpback capacity and allowed Zone 7 to contractually store an additional 13,000 AF. Zone 7 currently has a total of 78,000 AF of groundwater banking storage available to augment water supplies during drought

[19] Zone 7, 2010. Annual Report for the Groundwater Management Program – 2009 Water Year. May.

conditions. During non-drought periods, Zone 7 can put up to 5,883 AFA into the Semitropic groundwater bank. Note that a 10% loss is associated with water put into Semitropic. During a drought year, Zone 7 has the ability to request up to 9,100 AF of pumpback and any amount between 0 to 8,645 AF of exchange water; the availability of exchange water depends on projected SWP allocation. Pumpback is water that is pumped out of the Semitropic aquifer and into the SWP system. Exchange water is water that is transferred between Zone 7 and Semitropic by adjusting the amounts of Table A water allocated between Zone 7 and Semitropic. The agreement is in effect through December 31, 2035.

5.4.2 Cawelo Water District

Similar to the arrangements with Semitropic, Zone 7 has 120,000 AF of groundwater banking storage available with the Cawelo Water District, as executed in an agreement in 2006. During non-drought periods, Zone 7 can put into storage up to 5,000 AFA in the bank.[20] During droughts, Zone 7 has the ability to request up to 10,000 AFA of pumpback (or exchange water) from Cawelo. The agreement is in effect through December 31, 2035.

5.5 TOTAL SUPPLY AND STORAGE

Zone 7's existing water supply sources and storage options are summarized in Tables 5-1 and 5-2, respectively. The quantities listed in Table 5-1 are median quantities in normal water years. Under dry, drought, or emergency conditions, the percentage distribution of sources used by Zone 7 to meet demands may shift; in particular, Zone 7 is likely to tap into water stored in the various storage facilities listed in Table 5-2.

[20] Zone 7 only gets storage credit for 50% of the water provided to Cawelo. Per the existing contract, Zone 7 can normally only send 10,000 AF in any given year to Cawelo; therefore, the maximum contractual credit is 5,000 AFA (10,000 divided by 2).

Table 5-1. Zone 7's Existing Water Supply Sources in Normal Water Years[a]

Median Yields (Acre-Feet)		Year				
		2010	2015	2020	2025	2030
Imported Surface Water	SWP – Table A[b]	51,400	51,400	51,400	51,400	51,400
	SWP – Yuba Accord	145	145	145	145	0[c]
	BBID[d]	4,500	4,500	4,500	4,500	4,500
Local Runoff	Arroyo del Valle[e]	7,100	7,100	7,100	7,100	7,100
Total Water Supply		**63,145**	**63,145**	**63,145**	**63,145**	**63,000**

[a] Normal water years are defined as the median yield for this Urban Water Management Plan. The table does not show groundwater pumping from the Main Basin as it represents water stored from the sources already listed above.
[b] Zone 7's contractual Table A amount is 80,619 acre-feet annually; the amount listed here is the projected median yield, after correcting for carryover, in the 2009 State Water Project Delivery Reliability Report.
[c] The Yuba Accord contract ends in 2025.
[d] Byron Bethany Irrigation District. Historical deliveries cannot be used to develop water supply yields. A review of cumulative rainfall in 2009 and 2010 indicates that both years were at or above the historic median rainfall. Deliveries from this contract were 4,500 and 5,000 AF in 2009 and 2010, respectively. A yield of 4,500 AF was assumed available during normal water years.
[e] Based on inflow data (actual and estimated) and existing diversion or facility limitations. The median supply available is approximately 7,100 AF.

Table 5-2. Zone 7's Water Storage Options

Storage Option		Water in Storage through April 2010[a] (Acre-Feet)	Total Storage Capacity (Acre-Feet)
Local	Lake Del Valle	4,900	7,500
	Main Basin	74,000	126,000
Non-Local	Semitropic	78,100	78,000
	Cawelo	5,000	120,000
Total Storage		**162,000**	**324,000**

[a] As presented in the May 2010 Annual Review of Sustainable Water Supply for Zone 7 Water Agency. Note that Zone 7 also has "carryover" water available in the SWP, amounting to 20,500 as of April 2010.

6. GROUNDWATER

Water Code Section 10631(b)

Under Zone 7's Groundwater Management Program, Zone 7 administers oversight of the local groundwater basin, the Livermore Valley Groundwater Basin (Main Basin). The Main Basin is the portion of the Livermore-Amador Valley Groundwater Basin that contains high-yielding aquifers and good quality groundwater. As discussed in Chapter 5, Zone 7 uses the Main Basin as a storage facility and not as a supply: ***Zone 7 does not have a groundwater pumping quota and it can only pump groundwater it has recharged from its other supplies.***

This chapter describes in more detail the Livermore Valley Groundwater Basin and Zone 7's management and use of the Main Basin. Zone 7's strategy for managing the Main Basin is based on conjunctive use principles as described in detail in Zone 7's Groundwater Management Plan[21] (GMP), which was developed in accordance with Assembly Bill 3030 (AB 3030)[22] and is included as a CD attachment. The 2009 Annual Report for Zone 7's Groundwater Management Program is also included in the CD. A brief summary of the key elements of the GMP follows.

6.1 THE LIVERMORE VALLEY GROUNDWATER BASIN

As defined in DWR Bulletin 118 update 2003 *(California's Groundwater)*, the Livermore Valley Groundwater Basin (DWR Basin 2-10) extends from the Pleasanton Ridge east to the Altamont Hills and from the Livermore Uplands north to the Tassajara Uplands. *DWR has not identified Basin 2-10 as either in overdraft or expected to be in overdraft.* Surface drainage features include Arroyo del Valle, Arroyo Mocho, and Arroyo Las Positas as principal streams, with Alamo Creek, South San Ramon Creek and Tassajara Creek as minor streams. All streams converge on the west side of the basin to form Arroyo de la Laguna, flowing south and joining Alameda Creek in Sunol Valley, and ultimately draining to the San Francisco Bay. Some geologic structures restrict the lateral movement of groundwater, but the general groundwater gradient is from east to west, towards Arroyo de la Laguna, and from north to south along South San Ramon Creek and Arroyo del la Laguna.

The entire floor of the Livermore Valley and portions of the upland areas on all sides of the valley overlie groundwater-bearing materials. The materials are mostly continental deposits from alluvial fans, outwash plains, and lakes. They include valley-fill materials, the Livermore Formation, and the Tassajara Formation. Under most conditions, the valley-fill and Livermore Formation yield adequate to large quantities of groundwater to all types of wells, with the larger supply wells being located in the Main Basin. The Main Basin is composed of the Castle, Bernal, Amador, and Mocho II sub-basins.

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[21] Jones & Stokes, 2005. Groundwater Management Plan for Livermore-Amador Valley Groundwater Basin.

[22] AB 3030 (Sections 10750-10756 of the California Water Code) provides a systematic procedure for the development of a groundwater management plan by existing agencies.

6.2 GROUNDWATER QUANTITY

Zone 7 routinely monitors groundwater levels within the Main Basin. Two independent methods are used to estimate groundwater storage: 1) Hydrologic Inventory and 2) Nodal Groundwater Elevation. The Hydrologic Inventory method computes storage change each quarter from basin supply and demand data. This method can also be used to forecast future water storage conditions. The Nodal Groundwater Elevation method computes storage from hundreds of water level measurements. Figure 6-1 depicts Main Basin storage levels calculated using the two methods. Zone 7 is currently evaluating the reasons for the difference in results from the two methods; the mean of the two results is generally used as the estimate of total groundwater storage volume. As such, the Main Basin is estimated to have a total storage capacity of 254,000 acre-feet (AF), of which approximately 126,000 AF are available for Zone 7 operational storage.

As shown on Figure 6-1, the Main Basin went through an extended withdrawal from 1987 to 1992 due to drought. Figure 6-1 also shows the Main Basin responding to the current drought. At the end of the 2009 water year, there was 204,000 AF[23] of stored water in the Main Basin; of this amount, 76,000 AF of groundwater was available for Zone 7's use (as discussed below, the Main Basin is to be maintained at or above 128,000 AF at all times). This left 50,000 AF of available storage capacity for recharge activities at the end of the 2009 water year.

6.2.1. Artificial Recharge

Before the construction of the State Water Project (SWP) in the early 1960s, groundwater was the sole water source for the Livermore-Amador Valley. This resource has gone through several periods of extended withdrawal and subsequent recovery. In the 1960s, when approximately 110,000 AF of groundwater was extracted, the Main Basin reached its historic low of 128,000 AF. The Main Basin was allowed to recover from 1962 to 1983. It was during this era that Zone 7 first conducted a program of groundwater replenishment by recharging imported surface water via its streams ("in-stream recharge") for storage in the Main Basin, began supplying treated surface water to customers to augment groundwater supplies, and regulating municipal pumping by contractually establishing Independent Quotas (IQ) as discussed further below.

Figure 6-2 shows Zone 7's total annual artificial recharge amounts from 1974 to 2009. As discussed in Chapter 5, Zone 7's operational policy is to maintain the balance between the combination of natural and artificial recharge and withdrawal. This ensures that groundwater levels do not drop below the historic level of 128,000 AF.

Zone 7 plans to augment its current groundwater in-stream recharge capacity with off-stream recharge using the future Chain of Lakes facilities. As described in Chapter 5, reclaimed gravel quarries located in the central portion of the Livermore-Amador Valley are to be used for capturing additional local runoff and imported surface water, and recharging the Main Basin. Ultimately, the Chain of Lakes could cover 2,000 acres and store approximately 100,000 AF of

[23] Calculated as the average of the results from the two storage calculation methods. See Table 4.2-4 of the 2009 Annual Report for the Groundwater Management Program included as a CD attachment.

water as surface water. Zone 7 would store excess surface water during wet and/or normal years and use those supplies during dry years thereby increasing annual groundwater replenishment capability.

Although full implementation of this plan would not occur until after 2030, there would likely be opportunities to use individual gravel quarries or lakes as they become available. The first of these, Lake I, located off Arroyo Mocho, was dedicated to Zone 7 in June 2003. Zone 7 expects to take ownership of Lake H within the next five years.

In addition to Lake I, Zone 7 also acquired Cope Lake, a 220-acre former mining pit that was used as a settling pond by the gravel operators. Although largely sealed from the aquifer, and not a part of the Chain of Lakes, Cope Lake does offer some potential for other uses such as flood detention, settling, and water storage.

Figure 6-1. Main Basin Groundwater Storage

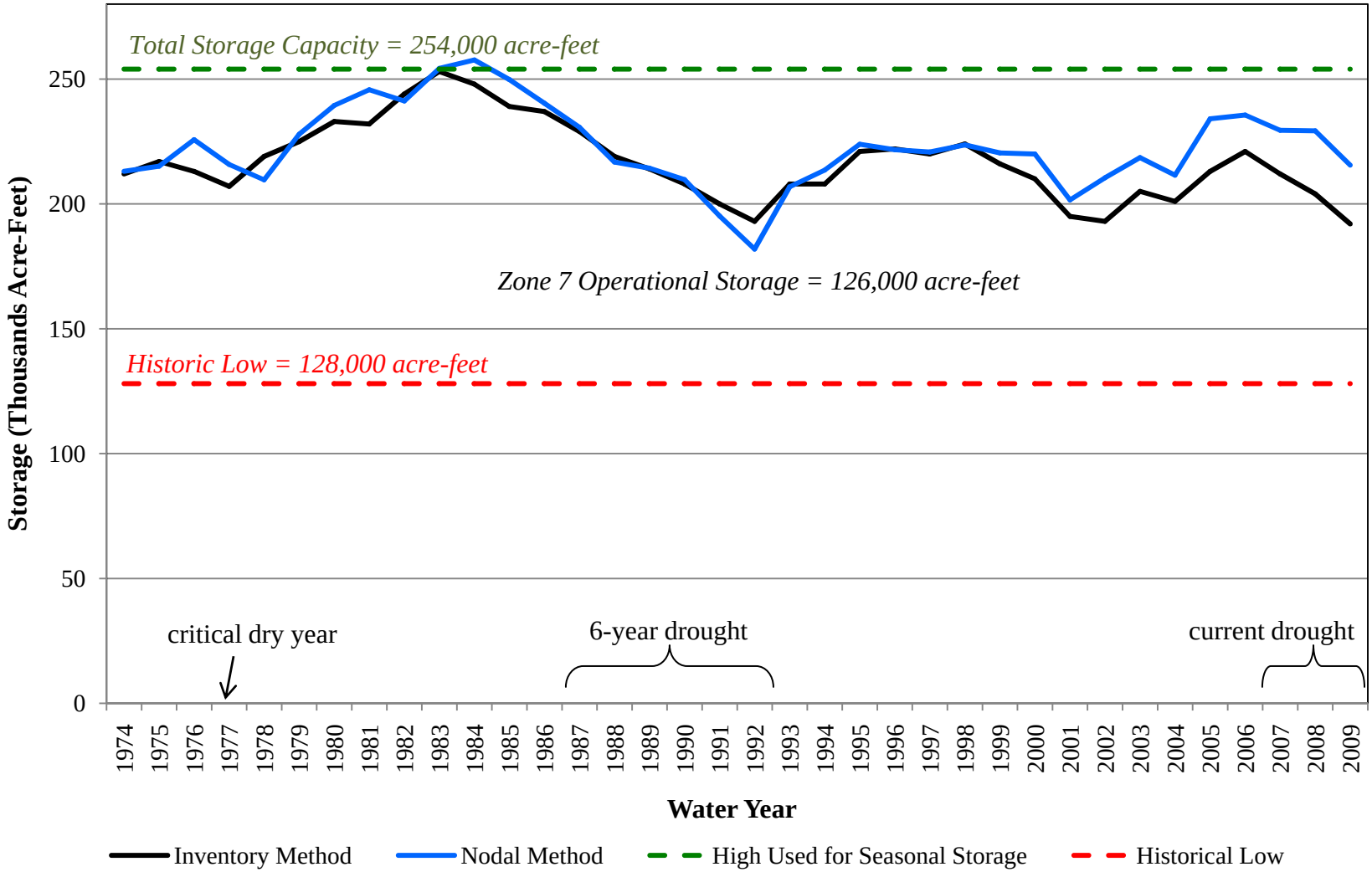
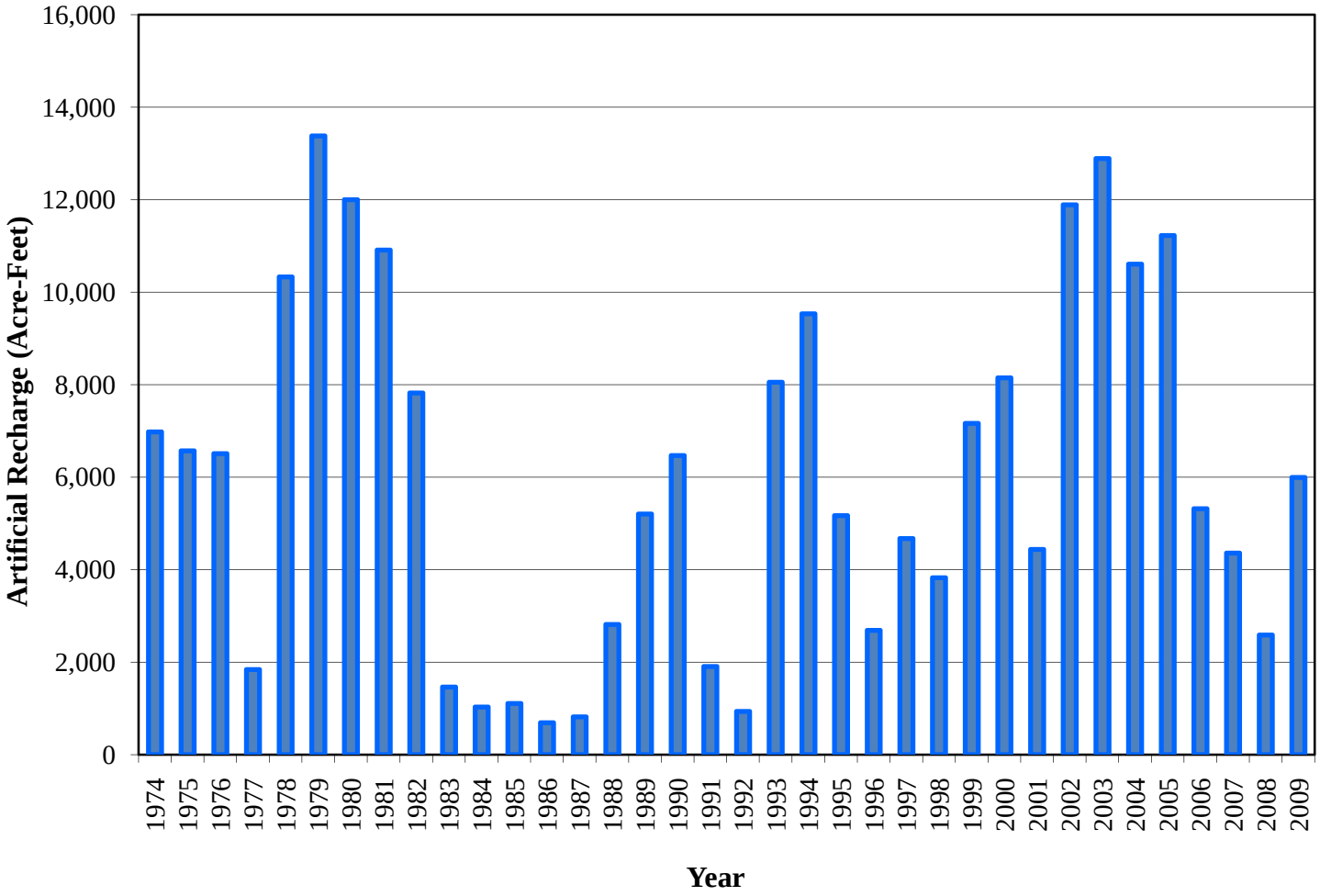


Figure 6-2. Zone 7 Historical Artificial Recharge Between 1974 and 2009



6.2.2. Current Sustainable Yield and Groundwater Pumping Quotas

Long-term natural sustainable yield is contractually defined as the average amount of groundwater annually replenished by natural recharge in the Main Basin—through percolation of rainfall, natural stream flow, and irrigation waters, and inflow of subsurface waters—and which can therefore be pumped without lowering the long-term average groundwater volume in storage. In contrast, "artificial recharge" is the aquifer replenishment that occurs from artificially induced or enhanced stream flow, as described in the previous section. With artificial recharge, more groundwater can be sustainably extracted from the Main Basin each year.

The natural sustainable yield of the Main Basin has been determined to be about 13,400 AFA, which is 10-11% of the total estimated useable groundwater storage. This long-term natural sustainable yield is based on over a century of hydrologic records and projections of future recharge conditions. Based on this sustainable yield value, California Water Service Company (Cal Water), Dublin San Ramon Services District (DSRSD), the City of Livermore (Livermore), and the City of Pleasanton (Pleasanton) (collectively referred to as the Retailers) are permitted to pump 7,245 AFA. Each retailer has an established "Groundwater Pumping Quota" (GPQ), formerly referred to as the "Independent Quota" in the original Municipal and Industrial water supply contract between Zone 7 and each retailer[24].

Pleasanton and Cal Water pump their own GPQ; they are also permitted to pump groundwater in excess of their GPQ under a recharge fee paid to Zone 7. This fee covers the cost of importing and recharging additional water into the Main Basin. Zone 7 pumps DSRSD's GPQ. The City of Livermore has not had any groundwater pumping capability for the last five to six years, and has therefore not pumped their GPQ over this time period. The balance of the natural sustainable yield is pumped for other municipal, agricultural, and gravel mining uses.

Zone 7's groundwater extraction for its treated water system does not use the natural sustainable yield from the Main Basin; instead, ***Zone 7 pumps only water that has been recharged as part of its artificial recharge program using its surface water supplies***. During high demands, groundwater is used to supplement surface water supply delivered via the South Bay Aqueduct (SBA). Groundwater is also used when the SBA is out of service due to maintenance and improvements or when Zone 7's surface water treatment plants are operating under reduced capacity due to construction, repairs, etc. Finally, Zone 7 taps into its stored groundwater under emergency or drought conditions, when there may be insufficient surface water supply available. Zone 7 also pumps groundwater out of the Main Basin during normal water years to help reduce the salt loading in the Main Basin. As discussed in Section 6.3, to achieve additional salt removal, a demineralization facility has been in operation starting in 2009. Zone 7 plans to recharge 9,200 acre-feet annually on average, which means that Zone 7 can pump an equivalent 9,200 acre-feet annually on average from the Main Basin as indicated in Table 6-1.

[24] The GPQs in acre-feet are as follows: Cal Water – 3,069, DSRSD – 645, Livermore – 31, and Pleasanton – 3,500.

Table 6-1. Zone 7 Projected Artificial Recharge and Groundwater Extraction for 2010-2030 during Normal Water Years[a]

Amount (Acre-Feet)	2010	2015	2020	2025	2030
Artificial Recharge	9,200	9,200	9,200	9,200	9,200
Groundwater Extraction	9,200	9,200	9,200	9,200	9,200

[a] Zone 7 does not have a groundwater pumping quota so it only pumps what it recharges.

6.2.3. Groundwater Pumping Capacity

Zone 7 has a total of nine wells available for pumping groundwater in the Hopyard, Mocho, Stoneridge, and Chain of Lakes well fields. Their sustained and peak capacities are summarized in Table 6-2 below, and their total extraction between 2005 and 2009 in AF are presented in Table 6-3.

Table 6-2. Zone 7 Groundwater Extraction Wells

Facility	Peak Capacity		Sustained Capacity[a]	
	GPM	MGD	MGD	AFA
Hopyard Well Field	4,910	7.1	6.4	7,160
Hopyard 6	3,800	5.5	5.0	5,540
Hopyard 9	1,110	1.6	1.4	1,610
Mocho 1 and 2 Well Field	4,580	6.6	5.9	6,650
Mocho 1	2,360	3.4	3.1	3,430
Mocho 2	2,220	3.2	2.9	3,230
Mocho 3 and 4 Well Field[b]	8,060	11.6	10.4	11,690
Mocho 3	4,170	6.0	5.4	6,050
Mocho 4	3,890	5.6	5.0	5,640
Stoneridge Well Field	4,650	6.7	6.0	6,750
Chain of Lakes Well Field	6,000	8.6	7.7	8,670
Chain of Lakes 1	2,500	3.6	3.2	3,630
Chain of Lakes 2	3,500	5.0	4.5	5,040
TOTAL	28,200	39	**35**	**40,920**

[a] Estimated as 90% of peak capacity.
[b] This does not include the reduction in net water production due to brine concentrate losses when the demineralization facility is operating.

6.3 GROUNDWATER QUALITY

The Main Basin is characterized by relatively good quality groundwater that meets all state and federal drinking water standards; groundwater is chloraminated simply to match the disinfectant residual in the distribution system. However, there has been a slow degradation of groundwater quality as evidenced by rising Total Dissolved Solids (TDS) and hardness levels over the last few decades. To address this problem, Zone 7 developed a Salt Management Plan (SMP)[25], which was approved by the Regional Water Quality Control Board in 2004 as a condition of the Master Waste Reuse Permit (for more details, see Chapter 14) and incorporated into Zone 7's GMP in 2005.

Zone 7 implements a wastewater and recycled water monitoring program as part of the GMP. In 2009, twenty percent of the recycled water produced in the service area was applied over the Main Basin[26]. Nitrates and salinity have historically been the primary water quality parameters of concern in recycled water, but nitrates have become less of a concern since 1995 when the City of Livermore Water Reclamation Plant—which, along with Dublin San Ramon Services District, is one of the two largest wastewater agencies in the area—stopped nitrifying its effluent. Salinity levels are being addressed through demineralization as described later in this section. In addition to recycled water application over the Main Basin, there are also approximately eighty septic tanks over the Main Basin that discharge their settled effluent but their use is not monitored.

To further manage the water quality in the Main Basin, Zone 7 also runs a Toxic Site Surveillance Program, documenting and tracking sites across the groundwater basin that pose a potential threat to drinking water supplies. Zone 7 works closely with the Regional Water Quality Control Board and the Alameda County Environmental Health in these efforts. In general, there are two types of contamination threatening the Livermore Valley Groundwater Basin: petroleum-based fuel products and industrial chemical contaminants. In 2009, Zone 7 tracked the progress of 81 active sites where groundwater contamination has been detected or contamination is threatening groundwater. Eleven of the sites are designated as high priority because of their proximity to drinking water supply wells (none of Zone 7's wells is affected) and occurrence in the Main Basin. Affected water supply well owners are employing granular activated carbon to remove contamination prior to water consumption. More details on the affected sites and their remediation can be found in the Annual Report for the Groundwater Management Program – 2009 Water Year[27].

As part of its efforts to address salinity in the Main Basin, Zone 7 completed construction of a wellhead demineralization facility in 2009. Employing a reverse osmosis membrane-based treatment system, this facility simultaneously allows for the removal and export of concentrated minerals or salts[28] from the Main Basin and the delivery of treated water with reduced TDS and hardness levels to Zone 7's customers. Table 6-3 lists the total annual amounts of groundwater

[25] Zone 7 Water Agency, 2004. Salt Management Plan.
[26] Zone 7 Water Agency, 2010. Annual Report for the Groundwater Management Program – 2009 Water Year.
[27] Zone 7 Water Agency, 2010. Annual Report for the Groundwater Management Program – 2009 Water Year.
[28] The brine concentrate resulting from the treatment system is exported to the San Francisco Bay via a regional wastewater export pipeline.

pumped by Zone 7 from 2005 to 2009, and the associated average water quality characteristics measured as TDS and hardness. Note that 2007 to 2009 were drought years, resulting in decreased availability of surface water from the SWP and increased use of groundwater by Zone 7 as a fraction of Zone 7's total water supply.

Table 6-3. Zone 7 Groundwater Production[(a)] and Quality (2005 – 2009)

Year	Groundwater Production (Acre-Feet)	% of Total Water Production	Total Dissolved Solids (mg/L)	Hardness (mg/L)
2005	5,167	13%	491	312
2006	4,198	10%	486	305
2007	4,004	9%	500	315
2008	8,127	18%	490	315
2009[(b)]	10,420	26%	419	274

[(a)] Zone 7 pumps only water that has been recharged as part of its artificial recharge program using its surface water supplies.
[(b)] Groundwater production net of demineralization loss of 492 AF. Lower TDS and hardness levels reflect demineralization facilities coming online in mid-2009.

As described above and in Chapter 5, conjunctive use of the Main Basin increases the reliability of Zone 7's water supply. Water reliability is discussed further in Chapter 7. The impacts of water quality on reliability are discussed in Chapter 15, and Zone 7's overall water service reliability is discussed in more detail in Chapter 16.

7. RELIABILITY OF SUPPLIES

Water Code Section 10631(c)

The purpose of this chapter is to discuss Zone 7's existing reliability policy, criteria for establishing the basis of water year, the projected reliability of each of Zone 7's water supply sources, and the maximum storage available during normal or drought conditions.

7.1 ZONE 7'S EXISTING WATER SUPPLY RELIABILITY POLICY

On August 18, 2004, Zone 7 adopted the Reliability Policy for Municipal and Industrial (M&I) Water Supplies (Resolution 04-2662).[29] This policy guides the management of Zone 7's M&I water supplies as well as its capital improvement program (CIP) through two goals:

- Goal 1: Meet 100% of M&I water demands over the next 20 years through average, single dry, and multiple dry years.[30]
- Goal 2: Meet 75% of maximum day demands with a major facility out of service.

Zone 7 is also updating its Water System Master Plan (WSMP) and expects to complete the update in early 2011 (see additional discussion in Chapter 11). As part of this update, Zone 7 will review the applicability of this policy.

7.2 BASIS OF WATER YEAR DATA

The quantity of supply available from each of Zone 7's water supply sources varies from one year to the next depending on hydrologic conditions. Consequently, Zone 7 reviewed historical data and developed a projected yield for each water supply source under three conditions: (1) normal water year, (2) single-dry year, and (3) multiple-dry years. In accordance with the Department of Water Resources' (DWR's) UWMP guidebook, each condition was defined as follows:

- *Normal Water Year:* The year in the historical sequence most closely representing median runoff or allocation levels and patterns.
- *Single-Dry Year:* The year with the lowest annual runoff or allocation in the historical sequence.
- *Multiple-Dry Year:* The lowest runoff or allocation for a consecutive 5-year period in the historical sequence.[31]

[29] A copy of Resolution 04-2662 is provided in Appendix D.
[30] Paraphrased – see Appendix D for actual text.
[31] The Water System Master Plan update is currently evaluating the impacts of a 6-year or longer drought.

7.3 RELIABILITY OF LOCAL RUNOFF FROM ARROYO DEL VALLE

Zone 7, along with Alameda County Water District (ACWD), has a water right permit[32] to divert runoff from Arroyo del Valle. This runoff is stored in Lake Del Valle (under operating agreement with DWR) and in the Main Basin of the Livermore Valley Groundwater Basin via artificial recharge. Inflows to Lake Del Valle, after accounting for permit conditions, are equally divided between ACWD and Zone 7. Together, Zone 7 and ACWD diversions cannot exceed 60,000 acre-feet annually (AFA).

Figure 7-1 illustrates historic inflow into Lake Del Valle from 1913 to 2008[33]. As shown on Figure 7-1, the year closest to the median inflow is 1932, while the lowest 5-year average is from 1987 to 1991. Figure 7-1 also indicates that there is nearly no inflow several times in the historic record; consequently, the analysis in this UWMP assumes that no inflow is available during a single dry year and uses a base year of 1977, which is also the base year for the single dry year for the State Water Project (SWP) (see Section 7.4).

Table 7-1 summarizes the basis of water year and available supply for Zone 7 under existing conditions from local runoff under its Arroyo del Valle water right permit.[34]

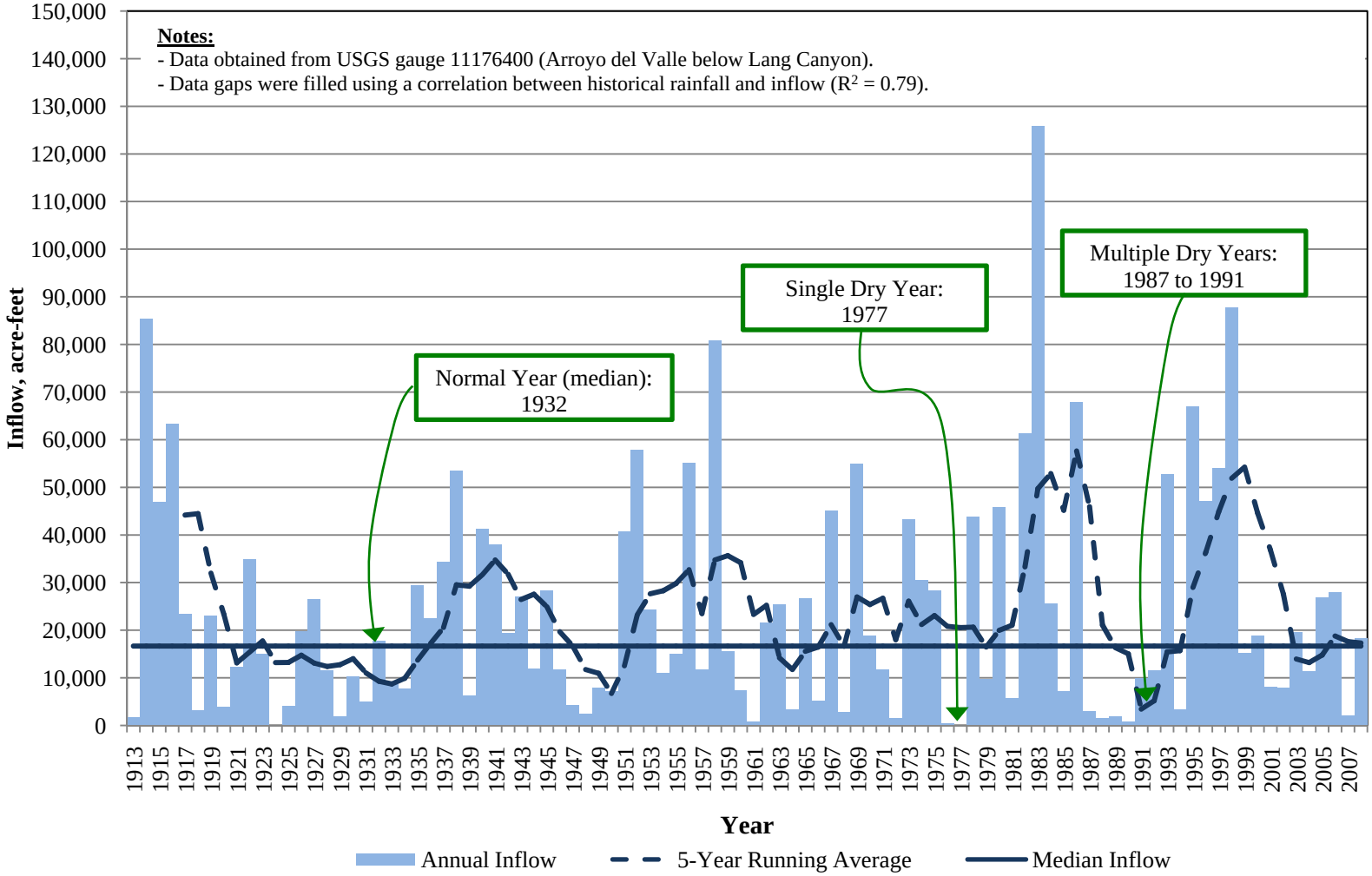
Table 7-1. Basis of Water Year and Available Supply: Arroyo del Valle[(a)]

Water Year Type	Base Year(s)	2010 to 2030	
		Yield, AFA	% of Normal
Normal[(b)]	1932	7,100	100%
Single-Dry	1977	0	0%
Multiple-Dry	Year 1 (1987)	930	27.0%
	Year 2 (1988)	350	10.2%
	Year 3 (1989)	520	15.1%
	Year 4 (1990)	150	4.4%
	Year 5 (1991)	4,400	78.2%

[(a)] Based on inflow from 1913 to 2008 (USGS gauge 11176400)—using actual and estimated data—and existing diversion or facility constraints.
[(b)] Long-term average is approximately 7,300 AF under existing conditions. Median of 7,100 AF was used in this UWMP per DWR guidelines.

[32] Permit 11319 (Application 17002)
[33] Note that actual data is only available for the following years: 1912 (partial)-1930, 1942, 1944-1952, 1958–present. Gaps were filled using correlations with local rainfall.
[34] Zone 7 should have the ability to increase the yield under this permit once quarry operations are completed in the Chain of Lakes.

Figure 7-1. Historical Inflow from Arroyo del Valle



7.4 RELIABILITY OF SUPPLY FROM THE STATE WATER PROJECT

Zone 7's long-term contract with DWR for SWP water provides Zone 7 access to Table A Water, Article 21 Water, Turnback Pool Water, Carryover, and Yuba Accord water. The reliability of each of these components is discussed below in more detail.

7.4.1 Table A Water

Zone 7 currently has a long-term contract[35] with DWR for 80,619 AFA of Table A amount, which represents Zone 7's maximum annual entitlement through this contract. Each year, DWR allocates a portion of this annual entitlement (up to 100%) depending on hydrologic conditions, DWR's operation of the SWP, and legal and environmental constraints.

Before 2007, DWR indicated that the long-term average yield from the SWP was approximately 76% of Zone 7's Table A amount, or approximately 61,300 AFA.[36] However, in 2007, DWR downgraded the water delivery reliability of the SWP due to federally imposed pumping restrictions – the restrictions were put in place due to concerns over declines in pelagic organisms in the Delta, primarily the decline of the Delta Smelt.

In August 2008, DWR published the final SWP Delivery Reliability Report 2007, which officially reduced the projected long-term average yield from the SWP to 66% of Zone 7's Table A amount, or approximately 53,200 AFA; this action reduced Zone 7's sustainable supply by 8,100 AFA (61,300 minus 53,200 AFA).

In August 2010, DWR released the final 2009 SWP Delivery Reliability Report (2009 Reliability Report); this version of the biennially-issued report included quantification of the impacts of biological opinions for species in the Delta (e.g., Salmon) issued in 2008 and new studies completed on climate change. The 2009 Reliability Report indicated that the long-term average yield from the SWP is 60% of Zone 7's Table A amount, or approximately 48,400 AFA, and the median yield is 51,400 AFA or approximately 64%; note, however, that the biological opinions are being revised per recent Federal Court rulings issued in spring and fall 2010.

Figure 7-2 illustrates projected SWP allocations from 1922 to 2003 using the results presented in the 2009 Reliability Report. As shown on Figure 7-2, the year closest to the median allocation is 1942, while the lowest 5-year average is from 1988 to 1992. Figure 7-2 also indicates that the lowest allocation occurs in 1977. Table 7-2 summarizes the basis of water year and available supply for Zone 7 from the SWP.

[35] Zone 7's contract with DWR expires in 2036 with an option to renew for 75 years.
[36] DWR, 2005. The State Water Project Delivery Reliability Report 2005.

Figure 7-2. Projected Allocation of State Water Project Water

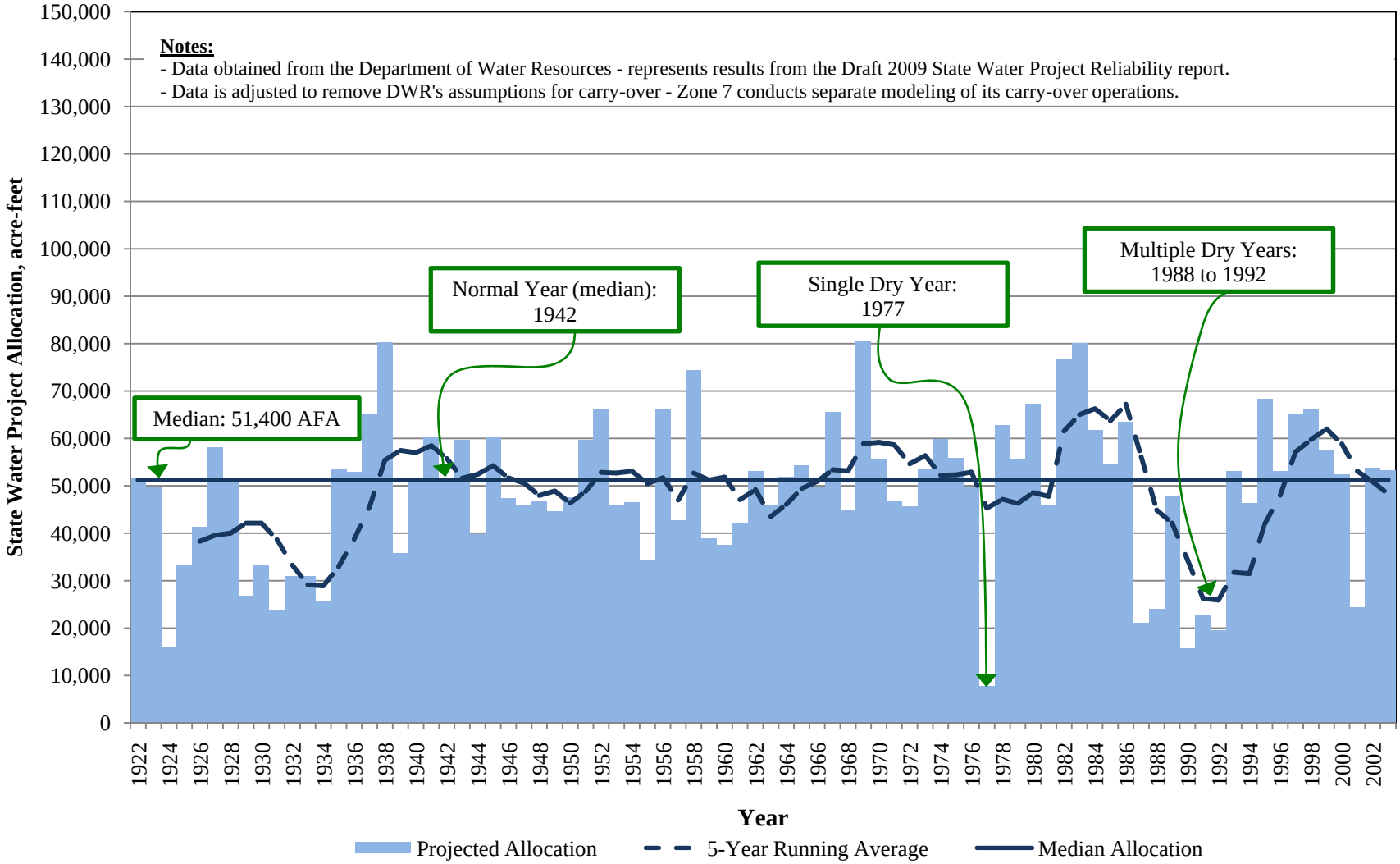


Table 7-2. Basis of Water Year and Available Supply: Table A Water[(a)]

Water Year Type	Base Year(s)	2010 to 2030	
		Yield, AFA	% of Normal
Normal	1942	51,400	100%
Single-Dry	1977	8,000	15.6%
Multiple-Dry	Year 1 (1988)	23,900	46.5%
	Year 2 (1989)	47,800	93.0%
	Year 3 (1990)	15,700	30.5%
	Year 4 (1991)	22,700	44.2%
	Year 5 (1992)	19,500	37.9%

[(a)] Obtained from DWR's 2009 Reliability Report - Future 2029 Scenario with Climate Change

7.4.2 Article 21 Water and Turnback Pool Water

As a contractor of the SWP, Zone 7 also has access to Article 21 water (formerly called surplus water) and Article 56d water (turnback pool water). Zone 7 generally incorporates any Article 21 water into its year to year operations; however, the projected yield from Article 21 water will likely be very low due to pumping restrictions in the Delta, and was not included in this UWMP for conservative planning-level purposes.

Article 56d is a provision that allows contractors with excess water to sell their water to contractors that have water needs. Typically, there is very little water available in dry years but more available in wet years. However, Zone 7 staff does not expect a significant amount of Article 56d water to be available in the future until there is a resolution to existing pumping restrictions in the Delta and therefore, Article 56d water was not included in this UWMP for conservative planning-level purposes.

7.4.3 Carryover

As a SWP contractor, Zone 7 has the ability to carry water from one year to the next in San Luis Reservoir – also called Article 56(c) water. The amount that Zone 7 can carry from one year to the next depends on DWR's allocation for that year. For example, if allocations are equal to or less than 50 percent of Zone 7's Table A amount, then carryover is limited to 25% of Zone 7's total Table A amount, or approximately 20,200 AFA (0.25 x 80,619 AFA). However, if allocations are equal to or greater than 75% of Zone 7's Table A amount, then carryover is limited to 50% of Zone 7's total Table A amount, or approximately 40,300 AFA (0.50 x 80,619 AFA). As part of its operating agreement with DWR, Zone 7 also has the ability to carry inflow from Arroyo del Valle in Lake Del Valle from one year to the next.

Typically, any carryover into a normal water year would be used in that year; however, a similar amount of current year supply would also be carried over for use in the following year. Therefore, this UWMP assumes that no carryover is available to meet water demands in a normal

water year. For conservative planning-level purposes in this UWMP, total carryover (both SWP and Arroyo del Valle runoff) was limited to the maximum carryover established by DWR in San Luis Reservoir.

Table 7-3 summarizes the maximum available carryover that would likely be available under normal, single-dry, and multiple-dry years; base years were chosen to match those for the SWP. The actual availability of carryover during a multiple-dry year event was determined using a newly developed water supply model; the results of this modeling are reflected in Chapter 16.

Table 7-3. Maximum Carryover Available to Zone 7 for Use in Following Year[a,b,c]

Water Year Type	Base Year(s)	2010 to 2030
Normal	1942	0
Single-Dry	1977	20,200
Multiple-Dry	Year 1 (1988)	20,200
	Year 2 (1989)	27,600[c]
	Year 3 (1990)	20,200
	Year 4 (1991)	20,200
	Year 5 (1992)	20,200

(a) Carryover includes both SWP and Del Valle supplies. Maximum carryover limited to DWR limits in San Luis Reservoir.
(b) Allocations used to predict maximum carryover were based on DWR's 2009 Reliability Report.
(c) The SWP allocation in 1989 is higher than 50% thereby allowing a higher maximum carryover for this year.

7.4.4 Yuba Accord Supply

In 2008, Zone 7 entered into an agreement to purchase additional water from DWR as part of the Lower Yuba River Accord; the contract expires in 2025. The contract specifies four different conditions (four components) for which Zone 7 can obtain water. The first component is not available to Zone 7, while the second and third components are available during drought conditions. The fourth component is available when Yuba County Water Agency has determined it has water supplies available to sell.

The annual amount of water available in dry years is small - only 159 AF was available in 2009, and only 1,100 are-feet will likely be available in 2010.[37] As Zone 7 gains experience using this new contract and is able to better define potential long-term yields, then Zone 7 may incorporate more of it into the long-term water supply portfolio. For planning-level purposes, Zone 7

[37] Even though approximately 1,100 acre-feet was available, Zone 7 only purchased 400 AF of Component 3 water in 2010.

included a projected median yield of 145 AFA for this UWMP.[38] Table 7-4 summarizes the available supply under each water year type. Base years were chosen to match those of the SWP.

Table 7-4. Basis of Water Year and Available Supply: Yuba Accord Water[(a)]

Water Year Type	Base Year(s)	2010 to 2025[(b)]	
		Yield, AFA	% of Normal
Normal Water Year	1922 to 2003[(c)]	145	100%
Single-Dry Year[(d)]	1977	676	270%
Multiple-Dry Years[(d)]	Year 1 to 5 (1988 to 1992)	676	270%

(a) Without component 4 water, this is essentially a dry year water supply; consequently, more water is available in drought years than other years. For planning-level purposes, only 145 AF was assumed available during normal water years.
(b) Contract ends in 2025.
(c) Based on median yield between 1922 and 2003.
(d) Only includes Components 2 and 3 water.

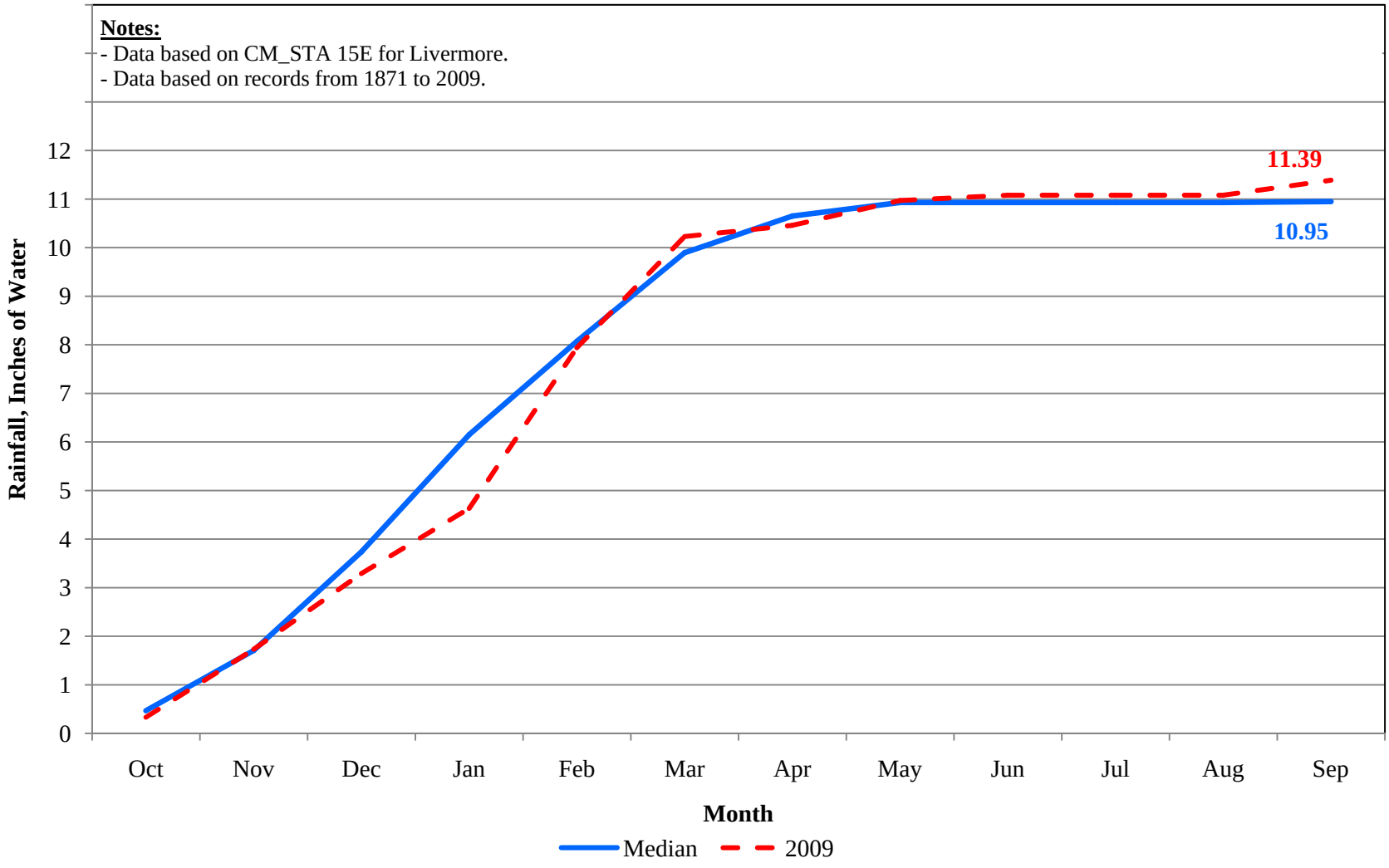
7.5 RELIABILITY OF BBID CONTRACT

Byron Bethany Irrigation District (BBID) diverts water from the Sacramento-San Joaquin Delta (Delta) pursuant to a "Notice of Appropriation of Water" dated May 18, 1914.[39] Zone 7 entered into a long-term contract with BBID for a minimum yield of 2,000 AFA and up to 5,000 AFA of water supply under this appropriation.[40,41] Water purchased from BBID via this contract is delivered to Zone 7 via the California Aqueduct and the South Bay Aqueduct for use in its service area.

Although Zone 7 has had this contract in place since 1998, Zone 7 has not always requested the full contract amount[42]; hence, historical deliveries could not be used to develop potential supply yields during various hydrologic conditions. In 2009, Zone 7 requested and received 4,500 AF. As shown on Figure 7-3, cumulative rainfall in 2009 was slightly above the historical median rainfall from 1871 to 2009, indicating that 4,500 AFA is likely to be available during normal water years.

[38] The median is based on varying the maximum yield of 676 acre-feet (only Components 2 and 3) during critically dry years to no water in wet years without considering Component 4 water.
[39] Source: Mountain House Master Plan.
[40] The Zone 7 Board certified the Environmental Impact Report for this water supply in 1999.
[41] The current contract was recently extended through 2030.
[42] Zone 7 will likely request its full contract amount in the future.

Figure 7-3. Cumulative Rainfall



For planning purposes in this UWMP, Zone 7 staff assumed that at least 4,500 AFA would be available during normal water years, but that only 2,000 AF would be available during drought years.[43] Table 7-5 summarizes the available supply under each water year type. Base years were chosen to match those of the SWP.

Table 7-5. Basis of Water Year and Available Supply: BBID

Water Year Type	Base Year(s)	2010 to 2030	
		Yield, AFA	% of Normal
Normal Water Year[(a)]	1942	4,500	100%
Single-Dry Year	1977	2,000	44%
Multiple-Dry Years	Year 1 to 5 (1988 to 1992)	2,000	44%

(a) Historical deliveries could not be used to develop water supply yields. A review of cumulative rainfall in 2009 indicated that 2009 was slightly above the historical median rainfall. Deliveries from this contract were 4,500 AF in 2009. A yield of 4,500 AF was assumed available during normal water years.

(b) The minimum contract yield is 2,000 AF; this was assumed available during single-dry and multiple-dry years.

7.6 ADDITIONAL RELIABILITY PROVIDED WITH STORAGE

In addition to its sources of water supply, Zone 7 also has storage available to meet water demands in either normal or dry conditions. The storage available during normal, single-dry, and multiple-dry years for each of Zone 7's storage programs is discussed below.

7.6.1 Reliability of Storage in the Main Basin

Zone 7's service area overlies the Livermore Valley Groundwater Basin as described in Chapter 6; the Main Basin is the portion of this groundwater basin that contains high-yielding aquifers and good quality groundwater.[44] For Zone 7, the Main Basin is considered a storage facility and not a long-term water supply because Zone 7 does not have a groundwater-pumping quota, and only pumps groundwater it artificially recharges. Zone 7 has actively managed the Main Basin for over 40 years, and administers a conjunctive use program that integrates both surface and groundwater supplies. [45]

Based on a review of current well capacities and groundwater modeling, Zone 7 estimates that it has the ability to pump approximately 26,200 AF over a one-year period. For conservative planning-level purposes in this UWMP, Zone 7 staff included limits on annual groundwater pumping during multiple dry years to ensure that water surface elevations remain above historic lows during a multiple-dry year event.[46] The pumping limit used in the analysis (14,000 AFA for

[43] Zone 7 is currently reviewing the potential to increase projected yields during drought years from its contract with BBID as part of the Water System Master Plan update.
[44] Zone 7, 2009. Annual Report for the Groundwater Management Program – 2008 Water Year. May.
[45] Zone 7, 2009. Annual Report for the Groundwater Management Program – 2008 Water Year. May.
[46] An example multiple-dry year event is the 6-year drought that occurred between 1987 and 1992.

5 years of a multiple dry-year event) was based on preliminary modeling conducted by Zone 7 staff.[47] Pumping during normal water years was limited to the recharge capacity (9,200 AFA – see Chapter 9) of existing arroyos.

Table 7-6 summarizes the available supply under each water year type. Base years were chosen to match those of the SWP.

Table 7-6. Basis of Water Year and Available Supply from Storage: Main Basin

Water Year Type	Base Year(s)	2010 to 2030	
		Yield, AFA	% of Normal
Normal Water Year	1942	9,200	100%
Single-Dry Year	1977	26,200	284%
Multiple-Dry Years	Year 1 to 5 (1988 to 1992)	14,000	152%

7.6.2. Reliability of Storage with Semitropic Water Storage District

Zone 7 has 78,000 AF of groundwater banking storage available through Semitropic Water Storage District (Semitropic) to augment water supplies during drought conditions. During non-drought periods, Zone 7 can store up to 5,883 AFA into the Semitropic groundwater bank. During droughts, Zone 7 has the ability to request 9,100 AF of pumpback and anywhere from 0 to 8,645 AF of exchange water; the availability of exchange water depends on projected SWP deliveries. Zone 7 does not rely on water stored in Semitropic during normal water years.

Table 7-7 summarizes the projected Semitropic stored water that would likely be available under normal, single-dry, and multiple-dry years. Base years were chosen to match those of the SWP.

[47] Zone 7 conducted a preliminary analysis using the calibrated groundwater model to determine the average annual pumping limit that maximizes the recovery of groundwater basin storage during a 6-year drought, assuming average conditions that existed between 1987 and 1992, and only with existing facilities.

Table 7-7. Maximum Pumpback and Exchange Water Available from Semitropic[(a)]

Water Year Type	Base Year(s)	2010 to 2030 Yield, AFA
Normal Water Year	1942	0
Single-Dry Year	1977	9,100
Multiple-Dry Years	Year 1 (1988)	10,700
	Year 2 (1989)	13,600
	Year 3 (1990)	9,600
	Year 4 (1991)	10,500
	Year 5 (1992)	10,100

[(a)] Maximum supply available to Zone 7 includes 9,100 AF of pumpback plus exchange water. Exchange water availability depends on SWP allocations. Allocations used to predict maximum carryover were based on DWR's 2009 Reliability Report.

7.6.3. Reliability of Storage with Cawelo Groundwater Banking Program

Zone 7 has 120,000 AF of groundwater banking storage available with Cawelo Water District (Cawelo) to augment water supplies during drought conditions. During non-drought periods, Zone 7 can put 5,000 AFA into the bank.[48] During droughts, Zone 7 has the ability to request 10,000 AFA of pumpback. Table 7-8 summarizes the maximum Cawelo stored water supply that would be available under normal, single-dry, and multiple-dry years. Base years were chosen to match those of the SWP.

Table 7-8. Maximum Stored Water Available from Cawelo

Water Year Type	Base Year(s)	2010 to 2030 Yield, AFA
Normal Water Year	1942	0
Single-Dry Year	1977	10,000
Multiple-Dry Years	Year 1 to 5 (1988 to 1992)	10,000

[48] Zone 7 only gets storage credit for 50% of the water provided to Cawelo. Per the existing contract, Zone 7 can only send 10,000 acre-feet in any given year to Cawelo; therefore, the maximum contractual credit is 5,000 acre-feet (10,000 divided by 2).

7.7 TOTAL SUPPLY RELIABILITY

In summary, Zone 7 relies on both incoming surface water supplies and previously stored surface water in the local groundwater basin and two non-local groundwater banking programs to meet its demands. The estimated amounts of water available during various hydrologic conditions are summarized in Table 7-9 below; the values presented reflect the expected range of water supply available based on historic use records, hydrologic records, and existing supplies and storage options. Additionally, to make its planning more robust, Zone 7 developed a new risk model that incorporates potential variations from the historical hydrologic sequence. This new dynamic model also allows for a more rigorous year-by-year analysis of water system operations in response to hydrologic conditions. The results of the risk model are presented in Chapter 16, which evaluates water service reliability.

Table 7-9. Summary of Estimated Available Water Based on Hydrologic Records and Existing Supplies and Storage Options

Water Source	Yields (Acre-Feet Annually)		
	Normal Year[a]	Single-Dry Year[b]	Multiple-Dry Years[c]
Arroyo del Valle	7,100	0	150 - 4,400
SWP – Table A	51,400	8,000	15,700 - 47,800
SWP – Carryover	0	20,200	20,200 - 27,600
SWP – Yuba Accord	145	676	676
BBID	4,500	2,000	2,000
From storage:			
Main Basin	9,200	26,200	14,000
Semitropic	0	9,100	9,600 - 13,600
Cawelo	0	10,000	10,000
TOTAL	**72,345**	**76,176**	**72,326 - 120,076**

[a] Based on median runoff or allocation levels and patterns.
[b] Based on the lowest annual runoff or allocation in the historical sequence.
[c] Based on the lowest runoff or allocation for a consecutive 5-year period in the historical sequence.

8. WATER TRANSFERS – SUPPLIES AND STORAGE

Water Code Section 10631(d)

To protect its customers in the event of a prolonged drought and to maintain its goal of 100% reliability even under extreme drought conditions, Zone 7 has entered into several long-term water transfer agreements that supplement its regular water supplies; other agreements also provide for additional storage capacity ("banking") outside of Zone 7. The purpose of this chapter is to describe these agreements for water supplies and storage.

Note that while additional storage capacity supports Zone 7's ability to provide water during dry years, stored water represents water delivered from Zone 7's other surface water supplies during normal and wet years. Therefore, storage facilities have a "zero" net contribution to Zone 7's water supply.

8.1 ADDITIONAL SUPPLIES THROUGH WATER TRANSFERS

8.1.1 State Water Project Allocation

As discussed in Chapter 5, surface water imported by the State Water Project (SWP) is by far Zone 7's largest water source, providing over 80% of Zone 7's total water supply. Zone 7 first entered into a 75-year agreement with the Department of Water Resources (DWR), the operator of the SWP, in November 1961, as recorded in a document referred to as "Table A". As the SWP was expanded and as Zone 7 demands increased over the years, Zone 7's Table A amount was increased, reaching the amount of 46,000 acre-feet annually (AFA) in 1997.

Since 1997, Zone 7 increased its supply from the SWP through a series of five permanent transfers. In December 1999, Zone 7 secured Table A SWP allocations from Lost Hills Water District of 15,000 AFA and Berrenda Mesa Water District of 7,000 AFA. In December 2000, 10,000 AFA of SWP allocation from Belridge Water Storage District was acquired. An additional 2,219 AFA was obtained from the same source in October 2003. Finally, 400 AFA of water was acquired from the Tulare Lake Basin Water Storage District in 2003. Together, these transfers have raised Zone 7's current Table A allocation to 80,619 AFA.

8.1.2 Byron Bethany Irrigation District

Zone 7 entered into a short-term water transfer demonstration project in 1994 with Byron Bethany Irrigation District (BBID), which provided a minimum supplemental water supply of 2,000 AFA. This was a five-year agreement with a potential to purchase up to 5,000 AFA. In 1998, Zone 7 and BBID agreed to convert the short-term agreement into a long-term 15-year contract, renewable every five years up to a total of 30 years. Water purchased from the BBID is delivered to Zone 7 via the SBA. The current contract was recently extended through 2030 with an option to extend through 2039.

8.1.3 Yuba Accord

In 2008, Zone 7 entered into a contract with DWR to purchase additional water under the Lower Yuba River Accord (Yuba Accord). The contract expires in 2025. Water is primarily available during dry years under the Yuba Accord, and the amount is relatively small: 159 AF in 2009 and approximately 1,000 AF in 2010. Zone 7 estimates a long-term average yield and median yield of 250 AFA and 145 AFA, respectively, under the Yuba Accord.

8.2 WATER STORAGE OUTSIDE ZONE 7

In addition to the above agreements for additional water sources, Zone 7 has purchased storage capacity in non-local groundwater banks located in Kern County (see Chapter 5 for additional details). Through an agreement with the Semitropic Water Storage District (Semitropic), Zone 7 has 78,000 AF of groundwater banking storage available to augment water supplies during drought conditions. Similar to the arrangements with Semitropic, Zone 7 also has 120,000 AF of groundwater banking storage available with the Cawelo Water District (Cawelo). During non-drought periods, Zone 7 can store up to 5,000 AFA in the Cawelo bank.[49] During droughts, Zone 7 has the ability to request up to 10,000 AF of pumpback from Cawelo.

8.3 TOTAL WATER TRANSFER AND STORAGE AGREEMENTS

Table 8-1. Zone 7's Water Transfer and Storage Agreements

Source/Agency	Contract Amount (AFA)	Term/Expiration
Water Supply Sources		
Zone 7 SWP Allocation as of 1997	*46,000*	Until 11/20/2036
SWP Contract Transfers to Zone 7:		
Lost Hills Water District	*15,000*	Until 11/20/2036
Berrenda Mesa Water District	*7,000*	Until 11/20/2036
Belridge Water Storage District	*12,219*	Until 11/20/2036
Tulare Lake Basin Water Storage District	*400*	Until 11/20/2036
Total SWP - Table A[(a)]	80,619	
Byron Bethany Irrigation District (BBID)	5,000	2030, with option to extend to 2039
SWP - Yuba Accord	No fixed cap	2025
Water Storage Options (Maximum Amount Allowed for Storage Annually)		
Semitropic Water Storage District	5,883	Until 12/31/2035
Cawelo Water District	5,000	Until 12/31/2035

(a) This is the maximum amount specified in Zone 7's contract with DWR. Actual deliveries vary based on hydrologic conditions and other factors.

[49] Zone 7 only gets storage credit for 50% of the water provided to Cawelo. Per the existing contract, Zone 7 can only send 10,000 AF in any given year to Cawelo; therefore, the maximum contractual credit is 5,000 AFA.

9. PAST, PRESENT, AND PROJECTED WATER DEMANDS

Water Code Section 10631(e)

The purpose of this chapter is to describe Zone 7 Water Agency's (Zone 7's) past, present, and projected water demands, and the portion of Zone 7's water supplies, including Zone 7's unaccounted-for water, which must meet the total demand in the Livermore-Amador Valley[50].

9.1 PAST WATER DEMANDS SERVED BY ZONE 7

Table 9-1 presents historical water demands met by Zone 7 within Zone 7's service area between 1990 and 2009. As shown in Table 9-1, water use currently served by Zone 7 has approximately doubled since the early 1990s. A majority of this increase is associated with water served to Zone 7's four water supply retailers (Retailers): California Water Service Company (Cal Water), Dublin San Ramon Services District (DSRSD), City of Livermore (Livermore), and City of Pleasanton (Pleasanton). Table 9-1 also indicates that unaccounted-for water has increased by 1,000 to 2,000 acre-feet (AF) after 2003; potential reasons for this increase are discussed in Section 9.3.4.

Table 9-2 presents the historical Municipal and Industrial (M&I) per capita demand served by Zone 7 and the Retailers (includes all groundwater pumping). M&I demand is derived by subtracting untreated surface water demand from the total water demand listed in Table 9-1. As shown in Table 9-2, per capita demands have stayed above the historical average of 213 gallons per capita per day (gpcd) over the last ten years; however, more recently, there has been a downward trend and the five-year average is now very close to the historical average at 215 gpcd.

Figure 9-1 compares historical M&I per capita demand to precipitation, which is used as an indicator of outdoor water demands. As shown, the demand pattern is generally responsive to the pattern of precipitation: that is, with an increasing rainfall trend, there is a decreasing trend in water demand.

[50] Livermore-Amador Valley includes the City of Dublin, City of Livermore, and City of Pleasanton, and is also known as the Tri-Valley.

Table 9-1. Historical Water Demand in the Zone 7 Service Area (Acre-Feet)

Year	Total Municipal and Industrial Water Use Served by Zone 7				Untreated Water for Agriculture[d]	Total Demand on Zone 7	Retailer Pumping (GPQs)	Total Water Demand
	Retailers[a]	Zone 7 Retail[b]	UAFW[c]	Total				
1990	23,869	1,070	1,876	26,815	3,170	29,985	5,882	35,867
1991	14,831	500	754	16,085	1,845	17,930	9,730	27,660
1992	20,714	1,010	1	21,725	2,344	24,069	6,447	30,516
1993	23,926	1,200	59	25,185	1,782	26,967	4,146	31,113
1994	22,734	680	691	24,105	1,985	26,090	6,598	32,688
1995	28,519	1,190	316	30,025	3,481	33,506	1,819	35,325
1996	29,901	790	4	30,695	4,329	35,024	2,920	37,944
1997	28,802	780	63	29,645	6,287	35,932	7,602	43,534
1998	26,640	510	5	27,155	4,370	31,525	7,573	39,098
1999	32,292	240	3	32,535	5,607	38,142	6,934	45,076
2000	34,632	270	423	35,325	5,899	41,224	6,826	48,050
2001	36,601	320	24	36,945	4,845	41,790	7,237	49,027
2002	38,176	260	4	38,440	3,523	41,963	6,981	48,944
2003	38,169	370	1,321	39,860	3,359	43,219	6,911	50,130
2004	42,371	770	819	43,960	3,422	47,382	6,573	53,955
2005	38,912	282	1,676	40,870	3,309	44,179	6,583	50,762
2006	40,414	316	1,064	41,794	3,488	45,282	6,581	51,863
2007	43,132	312	1,940	45,384	3,642	49,026	6,434	55,461
2008	42,982	270	1,649	44,901	4,164	49,065	6,026	55,091
2009	38,083	233	1,900	40,216	4,920	45,136	6,569	51,705
Historical Average	32,285	569	730	33,583	3,789	37,372	6,319	43,691
10-Year Average	39,347	340	1,082	40,770	4,057	44,827	6,672	51,499
5-Year Average	40,700	300	1,600	42,600	3,900	46,500	6,400	53,000

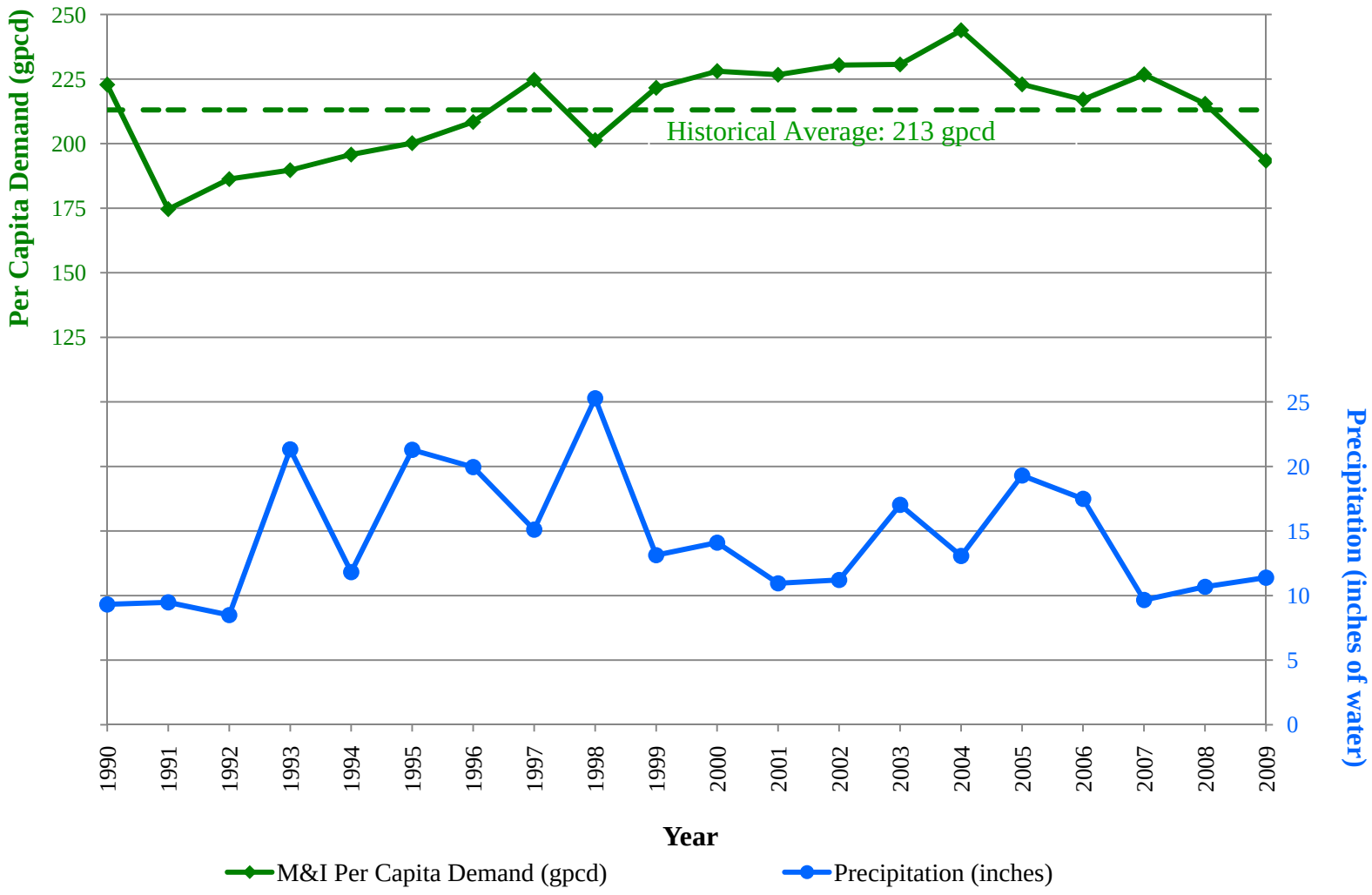
[a] Data collected from the Retailers and from the Zone 7 Annual Supply Reports (WR OM1 and WR OM3). Includes groundwater pumping quota for DSRSD (but not for the other retailers).
[b] Zone 7 directly serves six customers with potable water - data based on historical records.
[c] Unaccounted-for water (UAFW) is based on the difference between total production and actual deliveries. Production is water purchased from the State Water Project plus Zone 7 groundwater pumping minus brine concentrate losses (beginning in 2009 when the demineralization facility started operating).
[d] Zone 7 serves 74 customers through 7 accounts with untreated surface water.

Table 9-2. Historical M&I Per Capita Water Demands in the Zone 7 Service Area

Year	Total Water Demand in the Service Area (Gallons)[a]	Total Municipal and Industrial (M&I) Demand in the Service Area (Gallons)[b]	Total Population[c]	M&I Per Capita Demand (gpcd)	Precipitation (inches)[d]
1990	32,018,113	29,188,313	131,000	223	9
1991	24,692,006	23,045,009	132,000	175	9
1992	27,240,758	25,148,312	135,000	186	8
1993	27,774,133	26,183,375	138,000	190	21
1994	29,180,194	27,408,221	140,000	196	12
1995	31,533,975	28,426,551	142,000	200	21
1996	33,871,819	30,007,400	144,000	208	20
1997	38,862,055	33,249,766	148,000	225	15
1998	34,902,155	31,001,137	154,000	201	25
1999	40,238,273	35,233,007	159,000	222	13
2000	42,893,609	37,627,680	165,000	228	14
2001	43,765,482	39,440,439	174,000	227	11
2002	43,691,729	40,546,812	176,000	230	11
2003	44,750,192	41,751,675	181,000	231	17
2004	48,164,287	45,109,531	185,000	244	13
2005	45,314,135	42,360,252	190,000	223	19
2006	46,297,583	43,183,909	199,000	217	17
2007	49,508,893	46,257,746	204,000	227	10
2008	49,178,982	45,461,856	211,000	215	11
2009	46,156,104	41,764,111	216,000	193	11
Historical Average			166,200	213	15
10-Year Average			190,100	224	13
5-Year Average			204,000	215	14

[a] Data collected from the Retailers and from the Zone 7 Annual Supply Reports (WR OM1 and WR OM3). Includes all groundwater pumped for and by the Retailers.
[b] Total water demand minus untreated water for agriculture served by Zone 7.
[c] Data provided by the Retailers.
[d] Source: http://wwwcimis.water.ca.gov/.

Figure 9-1. Comparison of Historical Municipal and Industrial (M&I) Per Capita Demand Served by Zone 7 (Gallons Per Capita Per Day, gpcd) to Precipitation (inches)



9.2 BREAKDOWN OF WATER ACCOUNTS AND USE BY SECTOR IN 2009

As a wholesale water agency, Zone 7 does not track water use by individual water use sectors (e.g., Single Family Residential or Commercial). However, Zone 7 indirectly serves these sectors by supplying water to the four Retailers. Tables 9-3a and 9-3b present the breakdowns of water accounts and water use by sector in the service area, including those customers served directly by Zone 7 and including the water produced by the Retailers using their groundwater pumping quotas (see Chapter 6). Agricultural accounts, which are served untreated surface water by Zone 7, are included, while recycled water accounts are not included in these tables.

Table 9-3a. Breakdown of Water Accounts by Sector in the Service Area in 2009[(a)]

Water Use Sector	Cal Water	DSRSD	Livermore	Pleasanton	Zone 7	Total	% of Total
Single-Family Residential	16,466	13,303	7,988	19,441	-	57,198	86%
Multi- Family Residential	82	2,000	20	225	-	2,327	4%
Commercial/Institutional	1,301	432	1,084	984	6	3,807	6%
Industrial	1	168	-	6	-	175	0.3%
Landscape	-	420	440	984	-	1,844	3%
Agriculture	-	-	-	7	7	14	0.02%
Other	19	676	173	-	-	868	1%
TOTAL	**17,869**	**16,999**	**9,705**	**21,647**	**13**	**66,233**	**100%**

[(a)] Based on data provided by Cal Water, DSRSD, Livermore, and Pleasanton, and Zone 7's annual water supply reports. These values do not include recycled water, but do include untreated surface water provided to agriculture.

Table 9-3b. Breakdown of Water Use by Sector in the Service Area in 2009[a]

Water Use Sector	Cal Water	DSRSD	Livermore	Pleasanton	Zone 7	Total	% of Total
Single-Family Residential	7,597	4,722	3,224	9,484		25,027	49%
Multi-Family Residential[b]	561	1,196	N/A	760		4,726	5%
Commercial/Institutional	2,483	1,423	2,576	1,504	233	6,010	16%
Industrial	-	261	-	73		334	1%
Landscape		1,463	436	4,679		6,577	13%
Agriculture		-	-	-	4,920	4,920	10%
Other	14	6	-	-		20	0%
Unaccounted-for Water	359	457	129	916	1,900	3,762	7%
TOTAL[c]	**11,014**	**9,528**	**6,365**	**17,416**	**7,053**	**51,375**	**100%**

[a] Based on data provided by Cal Water, DSRSD, Livermore, and Pleasanton, and Zone 7's annual water supply reports. These values do not include recycled water, but do include untreated surface water provided to agriculture. These values include the total potable water supply provided by the Retailers to their customers, and therefore include groundwater-pumping quotas in 2009: DSRSD – 645 AF, Pleasanton – 3,505 AF, and Cal Water – 3,064 AF.
[b] For Livermore, this value is included under commercial/institutional.
[c] Note that because of the different accounting methods used by the various agencies, there is a minor discrepancy (<1%) between the total shown here (51,375 AF) and the total shown in Table 9-1 (51,705 AF).

As shown in Table 9-3b, three of the top water use sectors by volume are: residential (54%), commercial/institutional (16%), and landscape (13%).

9.3 PROJECTED WATER DEMANDS

Projected water requirements for Zone 7 were estimated by evaluating demands for the Retailers, Zone 7's retail customers, untreated customers, unaccounted-for water, potential future water conservation savings, and water required for groundwater recharge. Each is discussed in more detail below.

9.3.1 Water Supply Retailers Served by Zone 7

Zone 7 obtained projected water demands from each of the Retailers through a series of stakeholder and one-on-one meetings[51]. Table 9-4 presents the amounts of water supply required from Zone 7 by the Retailers. These amounts do not include groundwater pumped by three of the four retailers under their groundwater-pumping quotas (GPQ) to meet the rest of their demands: Cal Water (3,069 AF), Pleasanton (3,500 AF), and Livermore (31 AF); Zone 7 pumps DSRSD's GPQ of 645 AF and this amount is included in the table. DSRSD and Livermore currently

[51] Zone 7 staff met with and collected water demand and supply information from these four retailers during June, August, and September 2009, and in January 2010 as part of developing this UWMP. Additional information was provided by the Retailers throughout 2010.

produce recycled water to supplement their water supplies; recycled water demands are not included in the table.

The water demand projections presented in Table 9-4 do not include additional water conservation efforts that may result from more aggressive water conservation programs undertaken by the Retailers to comply with recent California legislation (i.e., California's 20x2020 Program). Additional water conservation that may result from California's 20x2020 Program is discussed in Section 9.3.5.

In compliance with Senate Bill 1087 *(SB 1087; Projected Water Use for Lower Income Households)*, the projected demands presented in Table 9-4 include the projected water use for single-family and multi-family residential housing for low-income households. Zone 7's current policy, as discussed in Chapter 7, is to meet 100% of projected demands[52]. Zone 7 is therefore planning to meet 100% of the water demand associated with low-income households as required in SB 1087.

Table 9-4. Supply Required from Zone 7 for the Retailers (Acre-Feet)[(a)]

Retailer	*2005 (Actual)*	2010[(b)]	2015[(c)]	2020[(d)]	2025[(d)]	2030[(d)]
Cal Water	*8,108*	9,200	9,400	10,700	12,200	12,300
DSRSD[(f)]	*9,626*	13,100	14,100	16,100	18,200	19,200
Livermore[(f)]	*6,625*	7,400	7,400	8,200	8,200	8,200
Pleasanton	*14,553*	16,600	17,500	18,700	19,700	20,700
Required from Zone 7[(e)]	*38,912*	46,300	48,400	53,700	58,300	60,400

(a) All values rounded to the nearest 100 AF for projected demands (2010-2030).
(b) Based on 2009 5-Year Delivery Requests and data collected from Retailers for the UWMP.
(c) Based on 2010 5-Year Delivery Requests and data collected from the Retailers for the UWMP.
(d) Based on data collected from the Retailers for the UWMP.
(e) Includes demands associated with low-income households. These amounts do not include groundwater pumped by three of the four retailers under their groundwater-pumping quotas (GPQ) to meet the rest of their demands: Cal Water (3,069 AF), Pleasanton (3,500 AF), and Livermore (31 AF); Zone 7 pumps DSRSD's GPQ of 645 AF and this amount is included in the table.
(f) DSRSD and Livermore currently produce recycled water to supplement their water supplies; recycled water demands are not included in the table.

9.3.2 Zone 7 Retail Demand

Zone 7 sells treated water directly to several smaller customers within the service area. These commercial/institutional customers currently include the Dublin Housing Authority (DHA), East

[52] The merits of this policy are being reviewed as part of the Water System Master Plan.

Bay Regional Parks District (EBRPD), Department of Water Resources (DWR)[53], Livermore Area Regional Parks District (LARPD), Lawrence Livermore National Laboratory (LLNL), Veterans Association (VA) Hospital, and Wente Winery.

Figure 9-2 illustrates the historical water demand from Zone 7's retail customers between 1999 and 2009. As shown on Figure 9-2, water demand for these direct retail customers has been relatively steady for the past 10 years with the exception of 2004. The spike in water demand in 2004 is the result of additional water supplied to LLNL resulting from an interruption in supplies provided to LLNL via the Hetch-Hetchy Aqueduct by San Francisco Public Utilities Commission.

For planning purposes in this analysis, Zone 7 staff assumed that water demands for Zone 7's retail customers would be equal to the average demand observed over the past 10 years, which is approximately 300 AF after rounding to the nearest 100 AF. The additional water demand spike resulting from LLNL is relatively infrequent, and can likely be accommodated using existing facilities. Table 9-5 presents the projected supply required from Zone 7 for its retail customers.

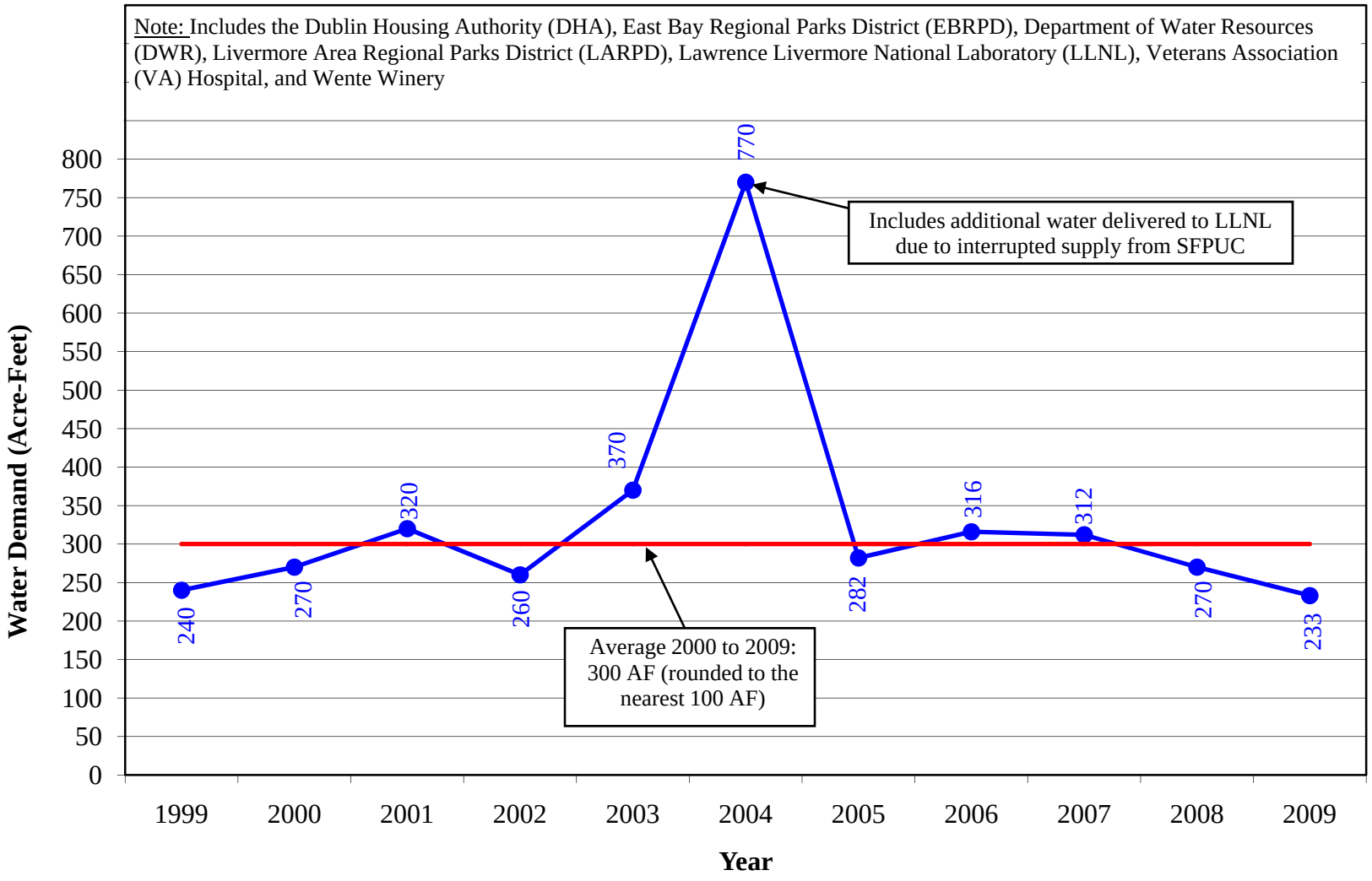
Table 9-5. Projected Supply Required for Zone 7's Retail Customers (Acre-Feet)[(a)]

Year	*2005 (Actual)*	2010	2015	2020	2025	2030
Required from Zone 7	*282*	300	300	300	300	300

[(a)] Demand based on the average delivery between 2000 and 2009 rounded to the nearest 100 AF.

[53] DWR has a storage/corporation yard located along the South Bay Aqueduct that requires treated water.

Figure 9-2. Historical Zone 7 Retail Customer Demand (Acre-Feet)



9.3.3 Zone 7's Untreated Water Demand

Zone 7 currently supplies untreated surface water to seven contract customers through eleven South Bay Aqueduct (SBA) turnouts. These seven turnout customers then branch into 74 different agricultural customers.

Figure 9-3 presents historical untreated water demands between 1985 and 2009. As shown on Figure 9-3, untreated water demands significantly increased between 1994 and 1997, and then experienced a significant decrease between 1999 and 2009; 1998 was a wet year (i.e., demands were being partially met by rainfall). This large decrease is the result of agricultural acreage being taken out of production and water conservation efforts – water conservation has reduced agricultural unit water use from approximately 1.5 AF/acre to 0.7 AF/acre (a 50% decrease).

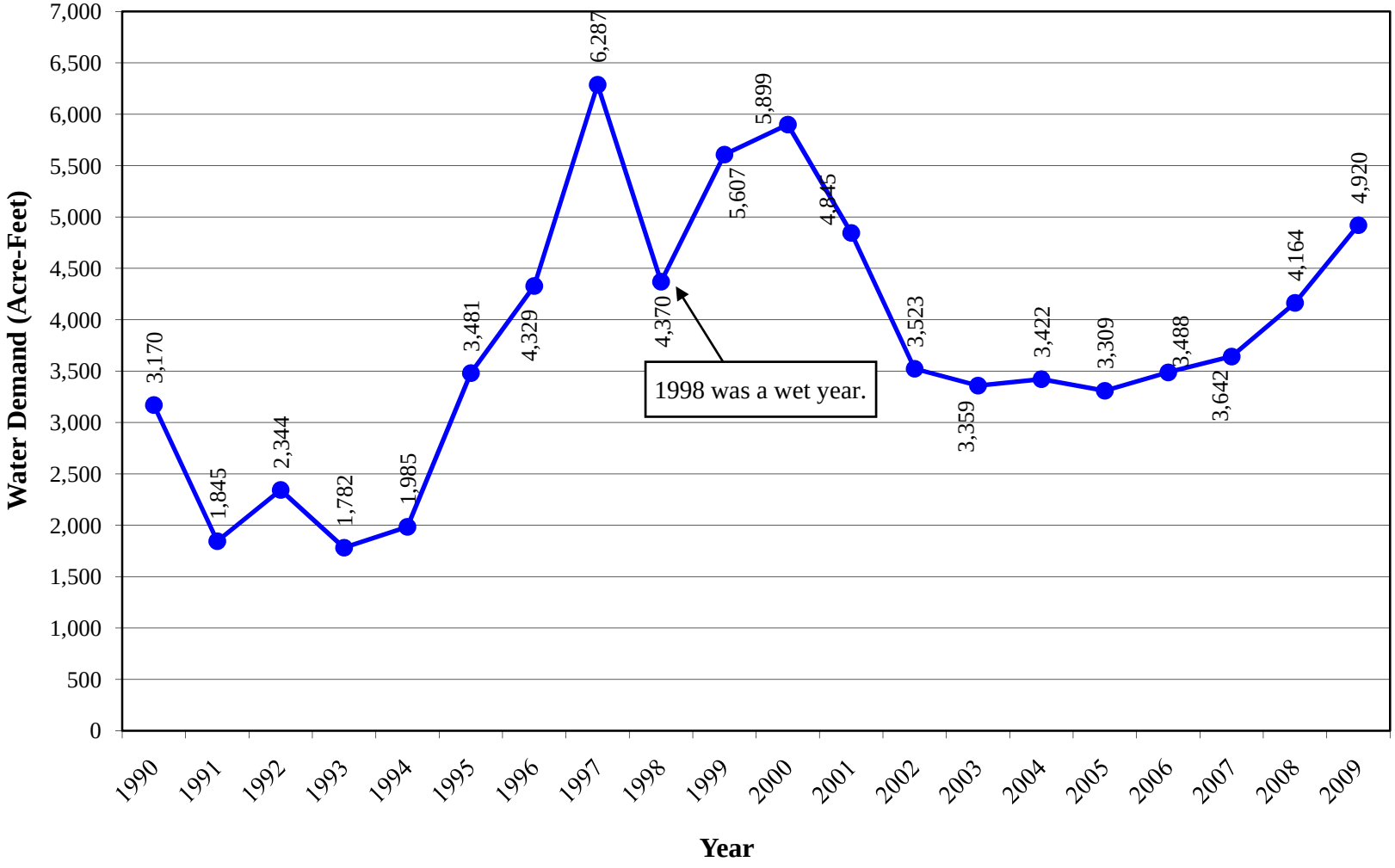
As part of its operational planning, Zone 7 collects demand projections over the next five years (2010 to 2014) from its untreated water customers. Preliminary results from this five-year projection indicate that untreated demands will remain constant at approximately 4,500 AF per year over the next five years. However, Zone 7 has existing contractual obligations up to 8,250 AFA; it is unknown when untreated water demands could increase to 8,250 AF. Consequently, for planning purposes in this Urban Water Management Plan (UWMP), it was assumed that untreated water demand would increase linearly from 4,500 AF in 2015 to 8,300 AF in 2030. Table 9-6 presents the projected supply required for Zone 7's untreated water customers.

Table 9-6. Supply Required for Zone 7's Untreated Water Customers (Acre-Feet)[(a)]

Year	*2005 (Actual)*	2010	2015	2020	2025	2030
Required from Zone 7	*3,309*	4,500	4,500	5,700	6,900	8,300

[(a)] Assumes demand increases linearly from 4,500 AF in 2014 to 8,250 AF in 2030; demands rounded to the nearest 100 AF for planning purposes.

Figure 9-3. Historical Zone 7 Untreated Water Demand (Acre-Feet)



9.3.4 Zone 7's Unaccounted-for Water

For planning purposes in this UWMP, unaccounted-for water is the difference between total production (water delivered from the SBA to water treatment plants and groundwater pumped from Zone 7 wells[54]) and the total deliveries made at each of Zone 7's transmission system turnouts. Figure 9-4 illustrates historical unaccounted-for water within Zone 7's system from 1985 to 2009. As shown on Figure 9-4, unaccounted-for water has historically been extremely low (less than 1%); however, starting in 2003, it increased significantly, and averaged approximately 4% between 2003 and 2009. One or all of the following likely caused the increased unaccounted-for water identified on Figure 9-4:

- water losses associated with Zone 7's water treatment plants,
- water losses associated with system flushing,
- meter calibration and reading errors, and/or
- transmission system leakage.

Without knowing the cause, and given the consistency of the losses, Zone 7 staff assumed that unaccounted-for water continues to average approximately 4% per year for planning purposes. Losses through the disposal of brine concentrate from the demineralization facility are accounted for separately and incorporated into "storage losses" as discussed in Section 9.3.7. As noted in Chapter 11, Zone 7 will be reviewing the cause for the increase in unaccounted-for water as part of the Water System Master Plan update. Table 9-7 presents the projected supply required from Zone 7 to cover Zone 7's unaccounted-for water.

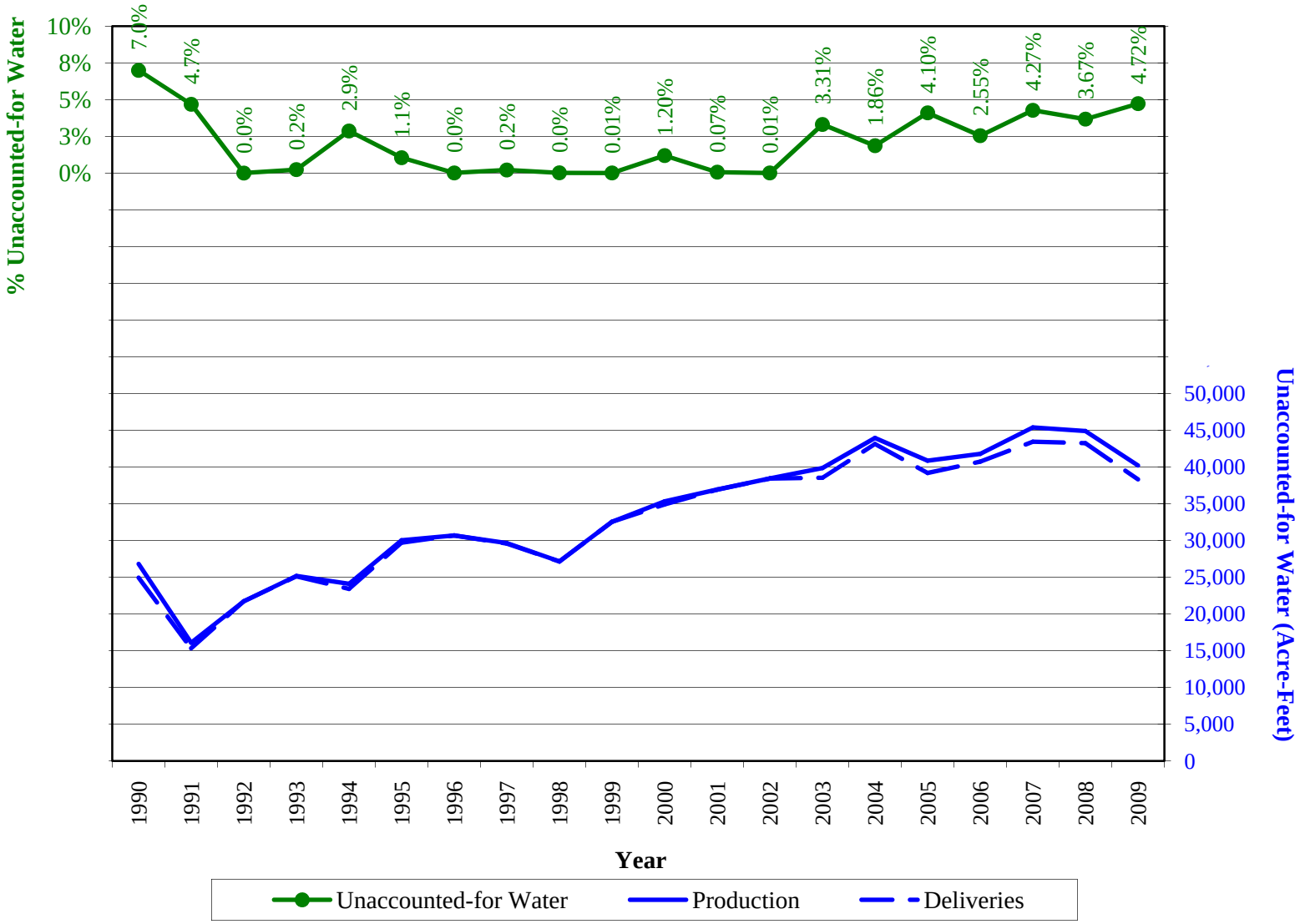
Table 9-7. Supply Required for Zone 7's Unaccounted-for Water (Acre-Feet)[(a)]

Year	*2005 (Actual)*	2010	2015	2020	2025	2030
Required from Zone 7	*1,676*	1,800	1,900	2,200	2,300	2,400

[(a)] Unaccounted-for water is based on total projected demands and the average unaccounted-for water percentage losses between 2003 and 2009.

[54] Since 2009, this amount is net of groundwater demineralization losses through brine concentrate disposal.

Figure 9-4. Historical Zone 7 Unaccounted-for Water (Acre-Feet and % of Total Supply)



9.3.5 Water Conservation (20 by 2020)

In November 2009, the California legislature passed Senate Bill SBX7-7 (SB 7). SB 7 created a framework for future planning and actions by water supply retailers and agricultural water suppliers to reduce California's water use. More specifically, SB 7 required water supply retailers to reduce their per capita water consumption 20 percent from their baseline by 2020.

Although Zone 7 is not subject to the requirements of SB 7 because it is a wholesale water agency, Zone 7 fully supports the existing and planned efforts of the Retailers within the service area to comply with this new law. To estimate the potential water conservation savings for Zone 7's service area resulting from implementation of SB 7, Zone 7 calculated a regional average baseline daily per capita consumption (227 gallons per capita per day, gpcd) over a ten-year period (1999 to 2008) based on the total potable water demand in the service area. The total potable water demand included retailer demands from Zone 7, groundwater pumping quotas, direct retail demand, and unaccounted-for water. The regional target for daily per capita consumption was then calculated assuming a 20% reduction from the baseline by 2020 (181 gpcd). Applying this target to the regional demand and population projections (derived from individual retailer data) resulted in an estimated target regional demand reduction of 7,200 acre-feet in 2020. The interim regional demand reduction target for 2015 was assumed to be half of this amount at 3,600 acre-feet.

The methodology described above is consistent with Methodology 1 of the SB 7 DWR guidelines[55]. The resulting demand reduction estimates are presented in Table 9-8 below. These estimates were developed by Zone 7 for planning purposes only; the Retailers will be calculating their individual targets for compliance with SB 7 as they prepare their individual UWMPs.

Table 9-8. Projected Water Conservation Savings or Demand Reductions Under SB 7 (Acre-Feet)[(a,b)]

Year	2010	2015	2020
Demand Reductions	0	3,600	7,200

[(a)] Projected regional water conservation savings estimated by Zone 7 based on data provided by Cal Water, DSRSD, Livermore, and Pleasanton.

[(b)] Note that if Zone 7 is able to reduce its unaccounted-for water demand from 4% to 2% of the total system demand by 2020 (a demand reduction of 1,100 acre-feet), the estimated demand reduction from the retailers under SB 7 will be the remaining 6,100 acre-feet of the 7,200 acre-feet in 2020.

9.3.6 Projected Supply Required for Zone 7's Artificial Recharge Activities

As discussed in Chapters 5 and 6, Zone 7 considers the local groundwater basin as a storage facility and not a long-term water supply because Zone 7 does not have a groundwater pumping quota; Zone 7 only pumps the groundwater it artificially recharges. For planning-level purposes in this UWMP, Zone 7 assumed that groundwater pumping in normal water years was equal to the long-term average recharge capacity of its existing recharge activities.

[55] DWR, 2010. Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use.

Planning-level analysis completed by Zone 7 staff indicates that Zone 7 could recharge, on average, as much as 9,200 AFA via artificial recharge activities in the Arroyo Mocho and Arroyo del Valle.[56] Although Zone 7 will eventually have additional recharge capacity available via the Chain of Lakes (see Chapter 5), existing artificial recharge capacity is limited to the local arroyos.

Consequently, for conservative planning-level purposes in this UWMP, Zone 7 assumed that it must artificially recharge, on average, at least 9,200 AF of water into the groundwater basin during normal water years so that it can also pump 9,200 AF of groundwater during normal water years.

Table 9-9. Supply Required for Zone 7's Artificial Recharge Activities (Acre-Feet)[(a)]

Year	*2005 (Actual)*	2010	2015	2020	2025	2030
Required from Zone 7	*12,260*	9,200	9,200	9,200	9,200	9,200

[(a)] Based on an analysis completed by Zone 7 staff of historical recharge capacity on the Arroyo Mocho and Arroyo del Valle.

9.3.7 Projected Supply Required for Storage and Demineralization Losses

As discussed in Chapter 5, there are storage losses associated with Zone 7's artificial recharge and groundwater banking programs (e.g., 10% loss associated with storing water in Semitropic and 50% for Cawelo Water District). These losses are calculated as a percentage of the amount of water placed into storage; consequently, over time, these storage losses will decrease as the amounts of water placed into storage decrease (e.g., because the storage facilities are full or there is no excess water available to bank). As noted in Section 9.3.4, water is also lost through the disposal of brine concentrate from the demineralization process. Table 9-10 presents the projected storage and demineralization losses over the next 20 years based on modeling conducted by Zone 7 staff.

Table 9-10. Supply Required for Storage and Demineralization Losses (Acre-Feet)[(a,b)]

Year	*2005 (Actual)*	2010	2015	2020	2025	2030
Required from Zone 7	*1,800*	6,300	5,100	3,600	2,500	1,500

[(a)] Based on an analysis completed by Zone 7 staff.
[(b)] Storage losses will decrease over time due to insufficient water supplies (i.e., less filling) or if storage is filled (i.e., no need to fill).

[56] Zone 7 staff used its newly developed water supply model to estimate the average and median recharge capacities along the Arroyo Mocho and Arroyo del Valle. This analysis indicated that the median and average were nearly identical at approximately 9,200 AF. Actual recharge may be significantly more or less than this estimate.

9.3.8 Total Projected Water Demand on Zone 7's Existing Water Supply System

Table 9-11 presents the total projected water demands within the Livermore-Amador Valley that would need to be met with Zone 7's existing water supply system. As shown in Table 9-11, there is a high and a low water demand projection depending on whether additional water conservation (see Table 9-8) is included in the projection; this was done because Zone 7 does not have control over how much water savings can actually be realized at the retail level.

Table 9-11 also shows that the supply required from Zone 7 to meet water demands within the Livermore-Amador Valley will increase by 25 percent (from 66,200 to 82,700 AF) without additional water conservation and by 14 percent (from 66,200 to 75,500 AF) with additional water conservation between 2010 and 2030.

Table 9-11. Projected Normal Year Water Demands Used in this UWMP[(a)]

Year	*2005 (Actual)*	2010	2015	2020	2025	2030
Retailers	*38,912*	44,100	47,200	53,300	58,300	61,000
Zone 7 Retail	*282*	300	300	300	300	300
Untreated	*3,309*	4,500	4,500	5,700	6,900	8,300
Unaccounted-for Water	*1,676*	1,800	1,900	2,200	2,300	2,400
Artificial Recharge	*12,260*	9,200	9,200	9,200	9,200	9,200
Storage and Demineralization Losses	*1,800*	6,300	5,100	3,600	2,500	1,500
High Water Demand	*58,239*	66,200	68,200	74,300	79,500	82,700
Water Conservation		0	-3,600	-7,200	-7,200	-7,200
Low Water Demand		66,200	64,600	67,100	72,300	75,500

[(a)] During single-dry and multiple-dry years, water demands will not include artificial recharge or storage losses because there will likely not be any artificial recharge or groundwater banking activities occurring.

10. WATER DEMAND MANAGEMENT MEASURES

Water Code Section 10631

The purpose of this chapter is to discuss Zone 7 Water Agency's (Zone 7's) water conservation or demand management program, which Zone 7 views as a critical element of any water resources strategy developed for the Livermore-Amador Valley. In 2008, Zone 7 became a signatory to the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU) and therefore is a member of the California Urban Water Conservation Council (Council). As a Council member, Zone 7 has committed to make a good faith effort to implement the Best Management Practices (BMPs) in urban water demand management that are relevant to wholesale water agencies. Furthermore, Zone 7 is supporting the City of Livermore, the City of Pleasanton, Dublin San Ramon Services District, and California Water Service Company (collectively referred to as the "Retailers") with other BMPs where feasible. A summary of the Council's BMPs—based on the updated format—and Zone 7's implementation efforts is presented in Table 10-1 below. Each demand management measure (DMM) category is discussed in more detail in the following sections. For the DMMs required for wholesalers, the Water Code Section 10631(f) designation is referenced in bold in each heading.

Table 10-1. California Urban Water Conservation Council Best Management Practices (BMPs)

BMP Category and Description[a]				Required for Zone 7?	Does Zone 7 implement BMP?
Foundational - Utility Operations	Operations	1.1.1	Conservation coordinator **(DMM L)**	Yes	Yes
		1.1.2	Water waste prevention ordinances or terms of service	No	Yes
		1.1.3	Wholesale agency assistance to retailers **(DMM J)**	Yes	Yes
	Water Loss	1.2	System water audits and leak detection and repair **(DMM C)**	Yes	Yes
	Metering	1.3	Metering and volume-based billing **(DMM D)**	Yes	Yes
	Pricing	1.4	Conservation pricing **(DMM K)**	Yes	No
Foundational - Education		2.1	Public educational programs	No	Yes
		2.2	School educational programs	No	Yes
OPTIONAL					
Programmatic - Residential		3.1-3.5	Residential assistance with leak detections, landscape water surveys, water-efficient appliances	No	Yes[c]
Programmatic - CII[b]		4.1-4.2	Commercial, industrial, and institutional assistance with water demand reduction	No	Yes
Programmatic - Landscape		5.1-5.3	Water demand reduction for large landscapes	No	Yes

[a] CII = Commercial, Industrial, and Institutional
[b] The Water Code Section 10631(f) designation of the Demand Management Measure (DMM) is noted in bold.
[c] Zone 7 provides support in the implementation of landscape surveys and water-efficient appliances only.

10.1 IMPLEMENTATION OF DEMAND MANAGEMENT MEASURES

10.1.1 Foundational – Utility Operations

*10.1.1.1 Conservation Coordinator **(DMM L)***

Zone 7 began implementation of this DMM in January 1992 after the adoption of the Zone 7 Board Resolution 1506, which committed Zone 7 to the implementation and support of water conservation Best Management Practices "that are uniquely suitable for and beneficial to the Zone 7 area." Zone 7 has had a full-time Water Conservation Coordinator (or equivalent) since 1996. The contact information for the current full-time Water Conservation Coordinator is listed below:

Name and Title: Robyn Navarra, Water Conservation Coordinator
Address: 100 North Canyons Parkway, Livermore, CA 94551
Contact: 925.454.5065 (tel), 925.454.5726 (fax), rnavarra@zone7water.com

The Water Conservation Coordinator is responsible for Zone 7's conservation program planning, implementation, and evaluation, and for coordinating those efforts with the Retailers. Program activities, done in coordination with Zone 7's public outreach department, include community workshops and other events, school education programs, rebate and giveaway programs, and others. The Coordinator also serves in various conservation-oriented subcommittees in regional and state organizations, including the California Urban Water Association (CUWA) and the California Urban Water Conservation Council (CUWCC). Finally, the Coordinator tracks conservation-related state legislation and local ordinances and integrates them into the program development process to ensure timely compliance. Robyn Navarra has held the position since 2008; she has ten years of experience in the water industry and over twenty years of experience in public outreach. Zone 7's Public Information Officer, Boni Brewer, also plays a key role in Zone 7's conservation efforts, overseeing the development of brochures, workshops, website messaging, newsletters, public events, and other forms of communication with the public. Contractors assist both the Water Conservation Coordinator and the Public Information Officer with their activities. Table 10-2 below summarizes funding for staff time on Zone 7's conservation activities.

Table 10-2. Funding for Zone 7 Staff Time on Conservation Activities

Year	2005-06	2006-07[(a)]	2007-08	2008-09	2009-10	2010-11 *(Projected)*
Number of Staff Involved	3	3	3	2	2	2
Number of Equivalent Full-Time Position/s	1	1	1	1.1	1.1	1.1
Expenditures	82,000	32,000	99,000	93,000	89,000	90,000

[(a)] The reduced expenditure reflects staff transition in 2006-07.

10.1.1.2 Water Waste Prevention

This DMM is not directly applicable to Zone 7; however, Zone 7 does have a water conservation clause in its contracts with its retailer water supply agencies which states, "*Zone 7 will undertake and support water conservation programs. To that end, Zone 7 will develop, implement or participate in such programs and enter into agreements with other contractors and other entities to make more efficient use of water supplies through water conservation programs so long as such agreements serve a beneficial purpose to the residents of Zone 7*." To Zone 7's knowledge, there are currently no general water waste ordinances in Zone 7's service area; however, each of the cities served by Zone 7 has adopted water-efficient landscape ordinances as discussed in Section 10.1.5. The retailers also have water conservation plans/ordinances in place that take effect when their water demands cannot be met. Pleasanton's Water Conservation Ordinance, for

example, lists the voluntary and mandatory reductions in water consumption that will be implemented under different "stages" of water supply reduction.

10.1.1.3 Wholesale Agency Assistance ***(DMM J)***

As the water wholesaler for the Livermore-Amador Valley, Zone 7 supports the Retailers' water conservation programs in five ways: 1) providing overall coordination of the conservation program for the entire area, 2) providing financial and technical assistance on retailer efforts in implementing BMPs in their service areas, 3) actively participating in regional and state water conservation organizations, 4) pursuing grant funding to benefit the Retailers, and 5) advising the Retailers on current legislative activities on water conservation. Zone 7's Conservation Coordinator oversees conservation program planning for the service area and coordinates very closely with the Retailers' equivalent staff members.

To encourage BMP implementation in the service area, Zone 7 funds giveaways such as water conservation kits, sprinkler keys, and others (see Table 10-5); co-sponsors public information efforts, workshops, and conservation campaigns (e.g., Water-Wise Gardening program and California Water Awareness Campaign; see Table 10-5); and contributes to an accreditation program for training plumbers in water-efficient technologies to increase technical expertise in the service area. Through the Zone 7's Conservation Coordinator's active involvement in conservation-oriented subcommittees in regional and state organizations (see Section 10.1.1.1), she is able track conservation-related legislation, grant opportunities (e.g., Proposition 50), and technological developments that affect and benefit the Retailers.

10.1.1.4 System Water Audits and Leak Detection and Repair ***(DMM C)***

Zone 7 implements this DMM by conducting a monthly audit of water production and delivery records to determine any losses within the transmission system. By comparing production amounts from Zone 7's water treatment plants and wells to total deliveries to the Retailers and other customers, an overall water balance is calculated to identify possible meter problems and to detect leaks. For the period from 2005 through 2009, annual overall losses ("unaccounted-for water") for Zone 7's system averaged 4% of total production (Table 10-3), which is within a reasonable range given that the error in meter readings is estimated at ±2-3%. However, Zone 7 plans to investigate the cause for the apparent increase in unaccounted-for water that began in 2003 (see Section 9.3.4) as part of the Water System Master Plan update.

Table 10-3. Zone 7 Treated Water Production, Deliveries, and Unaccounted-for Water (Acre-Feet)

	2005	2006	2007	2008	2009[c]
Total Production	40,869	41,794	45,384	44,901	40,216
Total Delivery	39,194	40,730	43,444	43,252	38,316
Unaccounted-for Water[a]	1,675	1,064	1,940	1,649	1,900
Unaccounted-for Water (%)[b]	4.1%	2.5%	4.3%	3.7%	4.7%
Average					3.9%

[a] Total production minus total delivery.
[b] (Unaccounted-for water in acre-feet/Total production in acre-feet) x 100%.
[c] Total production for 2009 is net of groundwater demineralization concentrate losses.

All facilities served by Zone 7 are metered. Raw and treated water meters are inspected and calibrated annually as part of Zone 7's preventive maintenance program. Flows in Zone 7's major facilities are monitored continuously via a SCADA system, which facilitates the detection of leaks and other problems in the system. Any reports of leaks are investigated immediately and corrected.

10.1.1.5 Metering and Volume-Based Billing ***(DMM D)***

All water sales by Zone 7 are metered, and wholesale and retail customers are billed based on volumes delivered. Meters are read every month and bills are issued monthly.

10.1.1.6 Conservation Pricing ***(DMM K)***

Under the Council's new format, this DMM is directed towards retail agencies. However, conservation pricing applies to both retailers and wholesalers in the Water Code. As noted previously, Zone 7 is primarily a wholesaler for four major water providers that in turn sell water to homes and businesses; however, Zone 7 does provide water directly to six retail customers, whose demand is approximately 1% of the total demand for the service area. These retail customers, like the wholesale customers, are similarly billed based on a tiered rate structure that reflects reduced unit costs with increasing consumption as required for cost-recovery purposes, and not for water conservation purposes.

10.1.2 Foundational – Education

10.1.2.1 Public Programs

Zone 7 has been implementing programs to inform and educate the general public about the value of water and to promote water conservation for many years. These programs include meetings with community, political, and business leaders to increase their level of awareness about water issues; establishing a cooperative relationship with the media by responding promptly to requests for information and being forthright in any dealings with them; making presentations to community organizations and participating at community events such as Earth Day celebrations, the Livermore Wine Country Festival, Home and Garden Shows, and the

annual Alameda County Fair; and developing and distributing a variety of educational media (newsletters, water conservation tools, CDs, etc.) to residents in the service area. In addition, Zone 7 has been making contributions to regional and state water conservation campaigns and other efforts. These activities, and the associated expenditures, are discussed further below and summarized in Tables 10-4 and 10-5.

Table 10-4. Summary of Zone 7's Public Information Programs – Number of Events

Events	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11 (Projected)
Community events	15	20	23	25	27	28
Water-Wise Gardening Workshops	-	-	-	3	3	3

Table 10-5. Summary of Zone 7's Expenditures for Public Programs

Program	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11 (Projected)
Public Information						
Water-Wise Gardening Website and CDs	$10,500			$6,500	$5,000	$5,000
Community Events - Contractor Support	$30,000	$56,750	$45,000	$48,700	$48,200	$48,200
Water Conservation Postcards			$17,000	$17,000	$17,000	$17,000
Waterways Newsletters			$75,000	$75,000	$75,000	$75,000
Conservation Fliers for Businesses				$2,000		
Classroom Presentations	$66,000	$62,700	$65,000	$68,500	$75,000	$75,000
Subtotal	$106,500	$119,450	$202,000	$217,700	$220,200	$220,200
Contributions to State/Regional Conservation Campaigns						
Water Saving Heroes Regional Campaign			$15,000			
East Bay's Bringing Back the Natives Garden Tours			$2,000		$1,000	
California Water Awareness Campaign			$2,050	$1,500	$2,050	$2,050
Water Conservation Showcase Sponsorship	$500			$500	$750	$750
San Francisco Estuary Project			$1,500			
Subtotal	$500	$0	$20,550	$2,000	$3,800	$2,800
Giveaways						
Drought-tolerant Poppy Seed Packs				$1,000		
Toothbrushes with Water Conservation Message				$1,200	$754	$761
Water Conservation Kits				$1,800		
Sprinkler Keys				$3,060	$1,875	
Subtotal	$0	$0	$0	$7,060	$2,629	$761
TOTAL	**$107,000**	**$119,450**	**$222,550**	**$226,760**	**$226,629**	**$223,761**

Water-Wise Gardening Program: Much of Zone 7's service area includes residences with landscaped yards. In 2003, Zone 7 worked with a software developer to develop a Water-Wise Gardening instructional CD for free distribution to residents in its service area to support attractive yet water-efficient landscapes based on climate and other conditions specific to the Tri-Valley area. An additional set of 3,000 CDs was produced in 2005. This CD was updated and converted to a web-based version in 2008, providing increased functionality and additional information. During calendar year 2009, the website had nearly 3,000 unique visitors. In addition to the website, which replaces the costlier and out-of-date CDs, Zone 7 has also been conducting—in cooperation with the Retailers—hands-on Water-Wise Gardening workshops since 2008 in all three of the cities served by Zone 7. Finally, Zone 7 has created a "Perfect Plants for Our Valley" brochure that focuses on water-use efficiency.

Community Events: Zone 7's public outreach activities have increasingly focused on water conservation over the years. The Water Conservation Coordinator and/or the Public Information Officer participate in community events such as: Home and Garden Shows, Earth Day events in Livermore and Pleasanton, the Livermore Wine Festival, the annual Alameda County Fair, Dublin Pride Week, and others. At these events, Zone 7 staff conduct "how-to" conserve demonstrations, display educational posters, and are available to answer questions about water issues and to hand out giveaways (described below). In addition, Zone 7 has been hosting conservation displays at local libraries.

Water Conservation Postcards: Starting in FY 2007-08, Zone 7 has been annually mailing out a postcard each autumn advising residents throughout the service area to adjust their irrigation system timers and irrigation schedules, reviving a program that was first implemented in FY 2004-05. The postcards are distributed to more than 60,000 addresses targeting single-family homes.

Waterways Newsletters: Although Zone 7's area-wide newsletters (mailed to approximately 80,000 commercial and residential customers) cover a variety of topics, all include at least some water conservation messaging. A number of newsletters has predominantly covered water conservation, including one devoted to local water saving heroes. Each of the three newsletters costs approximately $25,000 for design, printing and mailing ($75,000 annually), plus in-house staff time for writing/editing (15-18 hours per newsletter).

Business-Targeted Outreach: Since the previous UWMP, Zone 7 has been increasing overall outreach to local businesses. In FY 2006-07, Zone 7 staffed a table with conservation information during an environmental-awareness event for employees of Carl Zeiss Meditec in Dublin and sponsored an irrigation workshop for landscape professionals with key messages including water conservation. In FY 2008-09, Zone 7 staffed a water conservation booth at Sybase's Health & Wellness Expo that drew 800 employees. Staff also made presentations on water conservation to the Pleasanton Chamber of Commerce's Leadership Pleasanton class and to employees at Life Technologies in Pleasanton. Furthermore, Zone 7 spearheaded an effort with the retailers to distribute water conservation fliers geared to local businesses through inserts in three different Chamber of Commerce newsletters. Zone 7 paid approximately $2,000 for the development and printing of the fliers and retailers paid to have them included as inserts. Zone 7 staff made conservation presentations to two Rotary Clubs during 2008-09. Finally, in FY 2009-10, the Large Landscape Audit Survey program was piloted by Zone 7 and the retailers, targeting the highest 20% non-residential water users in the area (see Section 10.1.5).

Contributions to Regional and State Campaigns: Zone 7 contributed $15,000 to the Water Saving Heroes Bay Area regional campaign in FY 2007-08, and has contributed $1,000-2,000 to the East Bay's Bringing Back the Natives garden tour over the last few years. Zone 7 also contributes about $1,500-2,000 annually to the California Water Awareness Campaign, which in 2008 launched the *Nice Save!* campaign. Zone 7 has been a regular co-sponsor of the annual Water Conservation Showcase held at the Pacific Energy Center in San Francisco, which provides information on water-conserving strategies to building designers, managers and operators; Zone 7 water conservation materials are also distributed at this event. Locally, in 2008, 2009, and 2010, Zone 7 co-sponsored the nine-week Family Fun Film Festival at the Regal Hacienda Cinemas in Dublin as a way to disseminate water conservation messages, including those developed by the regional Water Saving Heroes campaign; this event facilitated outreach to several thousand children and adults.

Giveaways: An increasing number of giveaways at community events (e.g., workshops, fairs, etc.) are associated with water conservation, including: drought-tolerant poppy seed packs, toothbrushes with conservation messages, dye tabs to detect toilet leaks, water-conserving showerheads and aerators, sprinkler keys (to reduce over-spraying), and magazines with water-wise gardening information. Over the last two fiscal years, Zone 7 has spent about $10,000 on giveaways. In addition, Zone 7 developed a demonstration model on fixing toilet leaks in 2009.

10.1.2.2 School Programs ***(DMM H)***

Starting in September 2002, Zone 7 has been implementing an extremely progressive school education program. As the regional water wholesaler, this program provides regional consistency of water education messages. Zone 7 coordinates its efforts with the Retailers in furnishing water conservation and educational materials to area schools, and also works directly with primary and secondary schools. Water education literature, facility tours, teachers' aides, and classroom presentations are provided by Zone 7 at no charge. Zone 7 also actively participates in school assemblies and science fairs. The numbers of classroom presentations, assemblies, and science fairs that Zone 7 engaged in over the last five years are presented in Table 10-6. These types of activities reached approximately 8,250 students in the 2009-10 school year alone.

Table 10-6. Numbers of Classroom Presentations, Assemblies, and Science Fairs

Grades	Year					
	Actual					*Planned*
	2005-06[b]	2006-07	2007-08	2008-09	2009-10[a]	*2010-11*
K-3[c]	47	50	76	109	280	*280*
4-6[c]	15	15	62	49	60	*60*
7-8[d]	5	5	5	5	1	*3*
High School[e]	2	2	2	3	2	*3*
Expenditures[f]	$66,000	$62,700	$65,000	$68,500	$75,000	*$75,000*

[a] Reflects a large increase due to efficiency measures and to Zone 7's taking on classes previously handled by DSRSD.
[b] Includes development of revised curriculum introduced in 2006-07 school year and at outreach events.
[c] Number of classroom presentations.
[d] Number of school assemblies.
[e] Number of science fairs/other events.
[f] These are Zone 7 contract costs only and do not reflect in-house staff time.

Approximately 25 percent of classroom presentations deal exclusively with water conservation, with the remainder dealing with other water resource topics such as groundwater management, watershed protection, and others. However, starting in school year 2007-08, classroom presentations have included a conservation message at the beginning and end of every classroom visit, regardless of the specific subject matter. The 50-minute presentations use grade-level appropriate printed materials from the Water Education Foundation, Zone 7, and the Retailers; engaging demonstrations and hands-on activities are also part of the presentations. Teachers are provided with a water resource directory for further exploration of water issues in their classroom and copies of Zone 7 lesson plans. After each presentation, teachers are asked to complete evaluation forms designed to assess the effectiveness of the presentation and solicit suggestions for improvement. Zone 7 has been receiving overwhelmingly positive feedback from teachers, citing the relevance of the materials to state educational requirements and the high information retention rate amongst students—especially when it comes to water conservation

principles. While classroom presentations have historically targeted younger students, in 2010, Zone 7 began developing additional curricula for higher grade levels (middle to high school) dealing specifically with conservation among other topics. In addition, Zone 7 has been providing *Water for Tomorrow* magazines, developed by the Association of California Water Agencies (ACWA) and National Geographic, to middle school and high school science teachers as supplemental educational materials on the value of water and how it impacts people in California.

Zone 7's classroom curricula meet state education framework requirements in the following areas: Life, Earth and Physical Sciences, Ecology and Biology, Earth and Life History, Shaping the Earth's Surface and Investigation and Experimentation. Requirements for these areas are different at each grade level and are met through the use of printed materials appropriate for each grade level, instruction from a credentialed teacher, and demonstration of key concepts.

The impact of school education programs on water use can be estimated by assuming that students who are exposed to such programs reduce their water use through behavioral changes. These changes include simple acts such as turning the water off while brushing teeth and washing hands, and taking shorter showers. Students may also contribute to further water conservation efforts by encouraging their parents to turn off the hose while washing cars and to water their lawns for shorter times and earlier in the day, and by reporting leaks and drippy faucets to their parents. Zone 7 estimates that the actions described above could result in a net reduction in water use between 5 to 10 gallons per day (gpd) per student, potentially resulting in a water savings for 2009-10 of:

8,250 students x 5-10 gpd x 365 days/year = 15-30 million gallons saved per year or 46-92 AFA.

10.1.3 Programmatic – Residential

As noted above, BMPs under this category are optional; nonetheless, as a wholesaler, Zone 7 is supporting the Retailers on programs that are related to these BMPs.

10.1.3.1 Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers

As a treated water wholesaler, Zone 7 does not directly serve single-family or multi-family residential customers. Zone 7 is currently not involved in water survey programs for residential customers.

10.1.3.2 Residential Plumbing Retrofit

In partnership with its retailers, Zone 7 is funding and managing a program that distributes high-quality low-flow showerheads (rated at 2.0 gallons per minute [gpm] or less), toilet displacement devices, toilet flappers, and faucet aerators (rated at 0.5 gpm or less) to residences requesting them for free. Zone 7 distributes a limited number as prizes at public outreach events while the retailers distribute them upon request from customers. In addition, rebates are provided for high-efficiency washers and toilets as described in the next two sections. These giveaways and rebates are advertised on Zone 7 and Retailers' websites and mailer inserts, and at public events.

10.1.3.3 High-Efficiency Washing Machine Rebate Programs

The High-Efficiency Clothes Washer Rebate Program has been available to Livermore-Amador Valley water customers since 1999. Until June 2007, Zone 7's program was a service area-specific program. In 2008, Zone 7 partnered with other San Francisco Bay Area water agencies and Pacific Gas and Electric (PG&E) on a regional strategy to increase water and energy efficiency. Referred to as the "Bay Area Regional High-Efficiency Washer Rebate Program," this effort has increased program visibility with the public and with appliance retailers throughout the region. Over the last five years, rebate amounts have ranged between $50 to $125 for the water portion of the rebate, depending on the water efficiency level of the eligible clothes washer model. In 2008, a grant from Proposition 50 (Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002) contributed $50 towards each rebate; however, funds were exhausted in 2009. Over the last five years, Zone 7 has provided 9,749 rebates, with a total of 153 AF of water saved as shown in Table 10-7. Zone 7 plans to continue to implement this DMM.

Table 10-7. High-Efficiency Washing Machine Rebate Program

Fiscal Year	2005-06	2006-07	2007-08	2008-09	2009-10	Total
Rebate Amount ($)	50 or 100	50 or 100	50 or 100	90 or 125	90 or 125	
No. of Rebates Paid	1,673	1,679	880	2,838	2,679	9,749
Rebate Expenditures ($)[(a)]	$15,125	$150,000	$81,850	$346,665	$334,875	$928,515
Rebate Processing Costs ($)[(b)]	$18,582	$19,522	$11,896	$17,028	$20,659	$87,687
Water Savings (AFA)[(c)]	26	26	14	44	42	153

(a) Amount spent on rebates only; includes CALFED grant of $50/rebate.
(b) Program Administration Fees paid to administrator.
(c) Based on an estimated annual savings of 5,100 gallons/machine from the THELMA study.

10.1.3.4 Residential High-Efficiency Toilet Replacement Program

Zone 7 began an Ultra-Low Flush Toilet (ULFT) rebate program in 1994, offering financial incentives to replace toilets that use 3.5 gallons-per-flush (gpf) or higher with a ULFT that uses only 1.6 gpf. In July 2008, Zone 7 upgraded the program to a High-Efficiency Toilet (HET) replacement program, reflecting technical advancements and the availability of toilets that use 1.28 gpf or less. The program was also expanded to include commercial and multi-family residential customers in 2010. Table 10-8 shows a summary of the number of rebates, expenditures, and estimated annual water savings for the toilet replacement program.

Table 10-8. Ultra-Low Flush and High-Efficiency Toilet Rebate Program

Fiscal Year	2005-06	2006-07	2007-08	2008-09	2009-10	Total
Rebate Amount (maximum)	$75	$75	$90	$150	$150	
No. of Rebates Paid	394	412	568	1,273	1,059	3,706
Rebate Expenditures ($)[a]	$30,304	$30,900	$60,000	$190,950	$141,750	$453,904
Water Savings (AFA)[b]	18	18	20	48	43	147

[a] Amount spent on rebates only.
[b] For 2005-2007: based on an estimated savings of 40 gallons/day per ultra-low flush toilet (ULFT) per household. For 2008-2010: based on an estimated savings of 30 gallons/day per ULFT and 36 gallons/day per high-efficiency toilet (HET) per household (the revised numbers reflect updated data from more recent studies).

Between July 2005 and July 2008, 1,374 rebates were provided in the Zone 7 service area for ULFTs/HETs. Due to popular demand, funding for the toilet replacement program was more than tripled in July 2008, allowing for the distribution of approximately 2,332 rebates for ULFTs/HETs between July 2008 to June 2010. ULFTs were slowly phased out starting in mid-2008.

Zone 7, in cooperation with the retailers, administers the HET program. To streamline the process, online application and electronic filing for the HET rebate became available in 2010.

Currently, Zone 7 and the retailers are developing a program that would fund and facilitate the direct installation of HETs in disadvantaged communities in the service area.

To further promote water conservation, Zone 7 provided $9,000 in funding in 2010 towards GreenPlumbers USA, an accreditation program that trains plumbers in water-efficient technologies. Among other benefits, the accredited plumbers from the program will be placed on a short-list of eligible plumbers for hire in the direct HET installation program under development for disadvantaged communities. As of 2010, six plumbers have been accredited in the Zone 7 service area. Zone 7 plans to continue to support this program.

10.1.4 Programmatic – Commercial, Industrial, and Institutional Accounts

As a wholesaler, Zone 7 normally deals with retail water supply agencies rather than individual Commercial, Industrial, and Institutional (CII) customer accounts; however, Zone 7 does have one commercial account and four institutional accounts. These accounts represent only a small fraction (approximately 1%) of Zone 7's total treated water deliveries. Nonetheless, in 2009, Zone 7 began implementing a program that offers water conservation programs aimed specifically at CII accounts, including free outdoor water audit surveys for the top 20% commercial water account users (see Section 10.1.5) and free indoor and outdoor water audit surveys to schools in the Tri-Valley area. Schools that upgrade their irrigation hardware are funded at 100%, while other CII customers are given up to $5,000 in matching funds. As another

component of the CII water audit program, Zone 7 has assisted the Alameda County Green Business Program in providing water audits to businesses seeking certification.

10.1.5 Programmatic - Landscape

This DMM is not applicable to Zone 7 since it does not directly serve any large landscape customers. However, Zone 7 has been supportive of efforts to reduce water consumption for large landscapes in its service area. Over the years, Zone 7 has conducted landscape irrigation workshops for contractors and parks maintenance personnel. Zone 7 has also partnered with one of the Retailers, California Water Services Company, in funding a landscape audit of area schools. In April 2004, Zone 7 and the Department of Water Resources installed a California Irrigation Management Information System (CIMIS) station in the service area. The CIMIS station assists landscape professionals in determining an appropriate irrigation schedule for the properties they manage, leading to more efficient water use. The data obtained from this station is also available for use by any irrigation customer in developing a water budget. The approximate cost for the CIMIS station installation project was $15,000 and Zone 7 continues to provide monthly maintenance and communication equipment to the unit.

More recently, in 2009, Zone 7 led the development and implementation of the Large Landscape Survey Audit Support pilot program for CII water users. Based on the water consumption data provided by retailers, the highest 20% non-residential water users in the Livermore-Amador Valley were identified and offered a free water survey on all pre-existing landscapes. The survey is conducted according to the State Model Efficient Landscape Ordinance guidelines, codified in Title 23 of the California Code of Regulations (Sections 490-492), as required by the Water Conservation in Landscaping Act (Government Code, Section 65591 et seq.). Landscape plans, including irrigation system layout and scheduling, are reviewed for efficiency. A list of recommended improvements is provided to the customer, accompanied by an incentive program (matching funds up to $5,000) to assist the customer in implementing the recommendations.

Each of the cities within Zone 7's service area has adopted water-efficient landscape ordinances.

11. PLANNED WATER SUPPLY PROGRAMS AND PROJECTS

Water Code Section 10631(h)

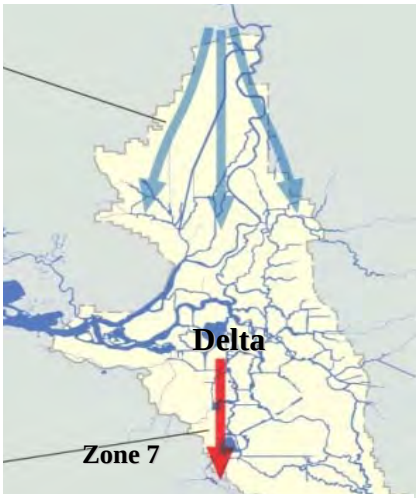
The purpose of this chapter is to discuss the programs and projects Zone 7 is undertaking to ensure that a reliable and high-quality water supply is available to meet the demands of the Livermore-Amador Valley.

In November 2009, Zone 7 Water Agency (Zone 7) completed an evaluation of the ability of existing water supplies and the existing conveyance, treatment, and transmission system (existing facilities) to meet water demands through buildout of adopted general plans. A revised analysis was also completed in July 2010.[57,58] Both analyses indicated that Zone 7's water supply is at risk and subject to a very uncertain future due to recent court rulings, biological opinions associated with the Sacramento-San Joaquin Delta (Delta), and climate change.

11.1 LONG-TERM "DELTA FIX"

Zone 7 currently has a long-term contract with the Department of Water Resources (DWR) for a maximum annual amount of 80,619 acre-feet (AF) of Table A water from the State Water Project (SWP). As described in Chapter 5, this source represents over 80% of Zone 7's supply and is therefore critical to the overall reliability of Zone 7's water system. Each year, DWR allocates a portion of this annual amount—up to 100%—depending on hydrologic conditions, DWR's operation of the SWP, and legal and environmental constraints.

From 2005 to 2009, DWR reduced the projected long-term average allocation of Table A water from approximately 76% to 60% due to projected impacts associated with pumping restrictions in the Delta and climate change. This decrease in reliability from the SWP has reduced Zone 7's sustainable water supplies by approximately 12,900 acre-feet (AF).[59]



Zone 7 is part of the BDCP and DHCCP, which would lead to solutions in the Delta that would increase SWP reliability.

As a contractor of the SWP, Zone 7 is working very closely with DWR and other water agencies, environmental groups, and regulators to develop the Bay Delta Conservation Plan (BDCP) and the Delta Habitat Conservation and Conveyance Plan (DHCCP). The goal of the BDCP is to provide for both species/habitat protection and improved reliability of water supplies from the Delta. The purpose of the DHCCP is to develop alternatives for conveying SWP (and Central Valley Project) water across the Delta in

[57] Zone 7 Water Agency, 2009. Interoffice Memo – Water Supply Update. November 18.
[58] Zone 7 Water Agency, 2010. Water System Master Plan Update to the Zone 7 Board of Directors. July 21.
[59] Reduction = 80,619 AF x (76% - 60%)

an environmentally sound manner. The DHCCP will develop an Environmental Impact Report (EIR)/Environmental Impact Study (EIS), along with the preliminary design needed to support a decision and ultimately to construct alternative Delta Conveyance facilities that would result in increased reliability.

11.2 WATER SYSTEM MASTER PLAN UPDATE

Zone 7 staff is diligently working with Zone 7's water supply retailers to develop a Water System Master Plan (WSMP) that will provide a flexible roadmap to meet the water supply needs of the Livermore-Amador Valley through buildout of adopted general plans. As part of this work effort, Zone 7 staff developed an extensive list of potential water supply options in parallel with the efforts to develop a Delta Fix as described above. A copy of this list is provided in Appendix E. Zone 7 expects to complete the WSMP update in early 2011.

A few of the larger water supply projects include, but are not limited to, the following:

- Recycled water
- Long-term or permanent water transfers
- Desalination

Each of these is discussed in more detail below.

11.2.1 Recycled Water

Zone 7 does not currently produce or distribute recycled water directly; however, two local water supply retailers (City of Livermore [Livermore] and Dublin San Ramon Services District [DSRSD]) have developed significant recycled water systems. Although small in comparison to Zone 7's other water supply sources,[60] recycled water is an important component of the total supply portfolio for the Livermore-Amador Valley as it represents a reliable drought-resistant supply.

Zone 7 is working with the Retailers to evaluate increasing local recycled water supplies, which could provide 3,400 to 17,300 AF of new supply.

As part of the WSMP and Zone 7's support for recycled water use, Zone 7 is working closely with Livermore, DSRSD, the City of Pleasanton (Pleasanton), and California Water Service Company (Cal Water) (collectively, the "Retailers") to review the potential for increasing recycled water use within the Livermore-Amador Valley. Based on a preliminary review of existing facilities and available wastewater (see water supply options list in Appendix E), it appears that approximately 3,400 AF of additional recycled water could be produced without

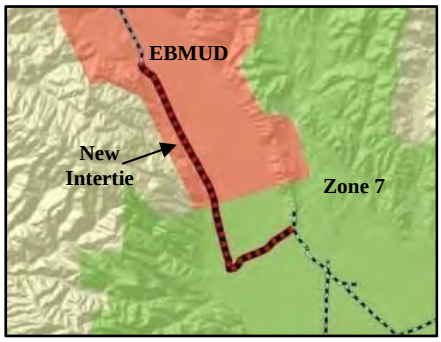
[60] DSRSD and Livermore project that they will produce a combined total recycled water supply of approximately 5,900 AF, which is less than 10% of Zone 7's other water supplies.

storage and that as much as 17,300 AF could be produced if sufficient storage were available.

Zone 7 will continue to work with the Retailers to review the merits of increased recycled water use in the Livermore-Amador Valley and identify potential opportunities for storage. As part of this review, Zone 7 will also ensure that water quality goals for the Main Basin are achieved and additional mitigation is provided if necessary. The Salt Management Plan will be updated to reflect any relevant changes. Additional information on recycled water is provided in Chapter 14.

11.2.2 Long-Term or Permanent Water Transfers

Zone 7 is also working with other Bay Area water agencies to review the potential for purchasing long-term water transfers that could be wheeled to Zone 7 without using the Delta. One example would be working with the East Bay Municipal Utility District (EBMUD) to purchase a water supply north of the Delta that would be diverted from the Sacramento River at the Freeport Regional Water Project intake, wheeled through EBMUD facilities and delivered to Zone 7 through a new EBMUD/Zone 7 intertie. Preliminary estimates indicate that this project could provide Zone 7 with as much as 14,000 AF per year of new water supply in dry years when EBMUD would be utilizing the Freeport Project.



Zone 7 is reviewing intertie options with EBMUD that could facilitate non-Delta water transfers, which could provide a new water supply

11.2.3 Desalination

Zone 7 joined the BARDP in June 2010 to evaluate the potential for receiving up to 11,200 AF of new water supply

In June 2010, Zone 7 officially joined the Bay Area Regional Desalination Project (BARDP). The BARDP is a joint effort between five Bay Area water agencies to evaluate the feasibility of a regional desalination facility. As a partner in the BARDP, Zone 7 is evaluating the feasibility of receiving up to 11,200 AF from the BARDP during normal years, and 5,600 AF during dry years, when the other agencies will have a demand for desalinated water.

Among other benefits, desalinated water offers the significant benefits of providing a drought-resistant supply to Zone 7 and diversifying Zone 7's water supply portfolio; thereby, increasing system reliability. The most likely scenario is that water would be wheeled through EBMUD's distribution system; Zone 7 would receive treated water at a proposed intertie in the western part of its service area.

Additional information on desalination and the BARDP is provided in Chapter 12.

11.3 KEY WATER SUPPLY FACILITY IMPROVEMENTS

In addition to the procurement of new water supplies, Zone 7 is also in the process of improving its facilities to reduce system losses and increase capacity. As noted previously, Zone 7 plans to undertake an investigation to reduce unaccounted-for water from 4% to 2% of total demand.

Two key projects designed to increase system capacity include expansion of surface water treatment capacity and increased artificial recharge via the Chain of Lakes, as described below.

11.3.1 Expansion of Surface Water Treatment Capacity

Between 2004 and 2007, Zone 7 completed design of the Altamont Water Treatment Plant (AWTP) and Altamont Pipeline (APL), and awarded a contract for constructing the first half of the APL, called the Livermore Reach, in April 2008. Zone 7 completed construction and testing of the Livermore Reach in September 2009.[61]

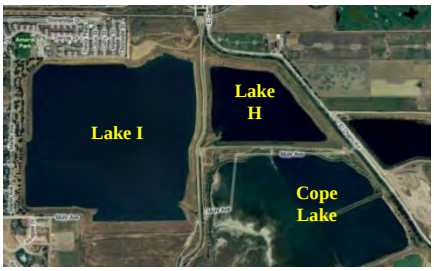
Based on a slower than anticipated growth in M&I water demands and the concerns over capital and energy costs, Zone 7 decided to conduct a peer review of the proposed AWTP site and treatment process before proceeding with construction. The peer review was completed in December 2009.[62] Based on the analysis completed, the only viable alternative to the existing AWTP site was an expansion of the existing Patterson Pass Water Treatment Plant (PPWTP). The analysis also indicated that economics alone would not necessarily determine whether expanding the PPWTP is better for Zone 7's long-term needs because the difference in costs between the two options is within the contingency estimates typically used for planning purposes for Zone 7's Capital Improvement Program (CIP).

Zone 7 is evaluating the potential for either building a new water treatment plant or expanding an existing water treatment plant.

Other factors that Zone 7 staff will evaluate, as part of the proposed Water System Master Plan, will likely drive the decision to either construct the proposed AWTP, expand the PPWTP, or neither. The major factors influencing this decision include anticipated M&I water demands (including 20% conservation by 2020 and peak day demands), capacity available in the South Bay Aqueduct (SBA), and revision of existing policies and criteria.

11.3.2 Increased Artificial Recharge via the Chain of Lakes

As previously discussed in Chapter 5, the Chain of Lakes refers to a series of ten mined out or active gravel quarry pits that have been or will be converted into surface water storage facilities and/or groundwater recharge basins once mining has been completed. The ten quarry pits or lakes are named Cope Lake, and Lakes A through I. Zone 7 currently owns only Cope Lake and Lake I, but expects to take ownership of



Zone 7 is evaluating enhanced artificial recharge using Lakes H and I.

[61] Zone 7 constructed the Livermore Reach first because it provided a valuable interconnection within Zone 7's existing transmission system regardless of whether Zone 7 constructed the AWTP or remaining portion of the APL.
[62] WQTS, 2009. Peer Review of the Altamont Water Treatment Plant Site and Treatment Process Report.

Lake H sometime within the next five years. It is anticipated that the other seven lakes will not be dedicated to Zone 7 until after 2030.

Once Zone 7 owns both Lakes H and I, Zone 7 will have the ability to direct surface water, with a new diversion structure, into Lake H. Water would then flow into Lake I through an existing conduit and then recharge into the Main Basin. This enhanced recharge will greatly improve the likelihood of having sufficient water in the local groundwater basin to meet projected water demands during drought conditions. The addition of surface water to the lakes will also help offset evaporative losses from the groundwater basin due to the existence of the gravel quarry pits, and help protect the groundwater basin from salt build-up.

11.4 NEW SUPPLY ASSUMPTIONS FOR THE UWMP

Zone 7 is committed to providing a reliable supply of high quality water to the Livermore-Amador Valley, and the WSMP is a key program necessary to meet this goal in the face of an uncertain future. Through development of the WSMP and development of new water supplies, Zone 7 is confident that implementation of the WSMP will provide sufficient water supplies to meet the needs of existing and future customers.

Based on a review of potential new water supplies (see Appendix E and discussion in previous sections), Zone 7 anticipates that it can secure a new water supply to reliably meet projected demands. The amounts of these new water supplies are summarized in Table 11-1. As indicated in the table below, 10,500 AF of new supply is projected to be available during normal water years, while 6,100 AF of new supply would only be available during dry years; these values are based on the estimated demands to be met by Zone 7. Base years were chosen to match those of the SWP. As will be shown in Chapter 16, the projected supplies in Table 11-1 are included in the supply and demand comparison for planning-level purposes in this UWMP.

Table 11-1. Projected New Water Supply

Water Year Type	Base Year(s)	2020 to 2030	
		Yield, AF	% of Normal
Normal	1942	10,500	100%
Single-Dry	1977	6,100	57%
Multiple-Dry	Year 1 to 5 (1988 to 1992)	6,100	57%

12. DEVELOPMENT OF DESALINATED WATER

Water Code Section 10631(i)

The purpose of this chapter is to describe the efforts being undertaken by Zone 7 Water Agency (Zone 7) in exploring the feasibility of a regional desalination project in partnership with other water agencies in the San Francisco Bay Area (Bay Area). Zone 7's desalination (or demineralization) of its groundwater supply, which was implemented in 2009, is discussed in Chapter 6.

12.1 OVERVIEW

Since 2003, the Bay Area's four largest water agencies—Contra Costa Water District (CCWD), East Bay Municipal Utility District (EBMUD), San Francisco Public Utilities Commission (SFPUC), and Santa Clara Valley Water District (SCVWD)—have been working together to evaluate the feasibility of a regional desalination facility to improve water supply reliability for the more than five million people served by these agencies. The project, called the Bay Area Regional Desalination Project (BARDP), has the following benefits[63]:

- minimize potential adverse environmental impacts associated with the construction of separate desalination plants in close proximity to one another and construction of other new facilities;
- provide substantial cost savings through economies of scale, such as pooling resources and sharing of project administration, as compared to individual projects conducted separately by the agencies;
- promote a strong regional cooperation concept by joint ownership, operation, and management of a regional desalination facility that will serve the needs of multiple water providers in northern California;
- provide water during emergencies such as earthquakes or levee failures;
- provide a supplemental water supply source during extended droughts; and
- allow major facilities, such as treatment plants, water pipelines, and pump stations, to be taken out of service for maintenance or repairs.

The BARDP is primarily intended to provide dry-year or emergency supply to the agencies above. Zone 7 was invited to join the BARDP in March 2010 as a potential recipient of desalinated water during normal and dry water years, and officially joined in June 2010.

[63] MWH, 2010. Bay Area Regional Desalination Project: Pilot Testing at Mallard Slough – Pilot Plant Engineering Report.

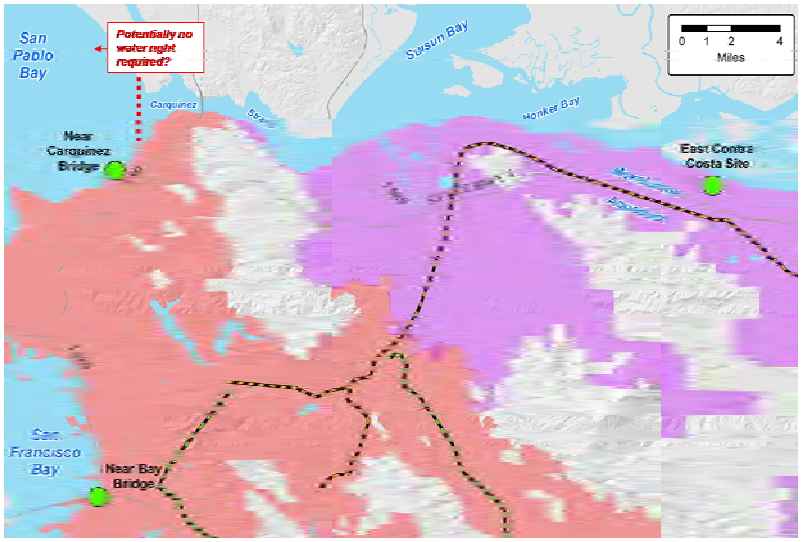
12.2 COMPLETED WORK

A Pre-Feasibility Study[64] was conducted for the BARDP in 2003, which found that a regional desalination facility in the Bay Area is feasible. A Feasibility Study[65] subsequently completed in June 2007 identified at least three Bay Area locations that are suitable for siting such a facility: east Contra Costa (Bay/Delta water), near the Bay Bridge in Oakland (Bay seawater), and on the western shore of the San Francisco peninsula (ocean seawater). Institutional options (e.g., Joint Powers Authority), institutional mechanisms, criteria for the evaluation of optimal desalination sites, and public stakeholder outreach for the BARDP were also part of the scope of the Feasibility Study.

A pilot test at CCWD's Mallard Slough Pump Station site—located in east Contra Costa County—was recommended to collect data on technical feasibility, assess the potential environmental impacts, and fill in the data gaps on the desalination process in an estuarine environment. The Pilot Study[63] was started in October 2008 and continued through April 2009; it evaluated two types of ultra-filtration pre-treatment membranes, two types of reverse osmosis (RO) membranes, and one nanofiltration membrane. In addition, the Pilot Study developed cost estimates for the desalination plant construction and operation.

The BARDP received funding from Proposition 50 (the Water Security, Clean Drinking Water, Coastal and Beach Protection Act) for both the Feasibility Study and the Pilot Study, covering 50% of project costs. Furthermore, the BARDP was authorized to receive $4 million in federal grants under the Water Resources Development Act of 2007, Section 5158 (88).

12.3 ONGOING EFFORTS



Site alternatives being considered under the BARDP. Water would likely be wheeled through EBMUD's system to Zone 7's facilities south of the area shown above.

Ongoing efforts have been focused on developing an institutional framework for the BARDP, particularly issues related to: the acquisition of any requisite water rights, the advantages and disadvantages of different site alternatives, wheeling arrangements, cost-sharing principles, and magnitudes and timing of the demands for desalinated water. Currently, the BARDP partners are exploring the pros and cons of 1) using modified versions of CCWD's existing license (or

[64] URS, 2003. Bay Area Regional Desalination Project Pre-Feasibility Study.
[65] URS, 2007. Bay Area Regional Desalination Project Feasibility Study.

license and permit) in east Contra Costa, 2) acquiring a new water right, and 3) siting a desalination plant where a water right is likely not required (west of Carquinez Straits). The State Water Resources Control Board (SWRCB) is being consulted on water rights and other related issues. The BARDP partners are currently considering a desalination plant production rate between 10 to 30 million gallons per day (mgd), depending on the demands of the individual agencies and the water rights limitations of the selected site.

At this exploratory stage, Zone 7 is considering the feasibility of receiving up to 11,200 acre-feet (AF) from the BARDP during normal years, and up to 5,600 AF during dry years, when the other agencies will have a demand for desalinated water. Among other benefits, desalinated water offers the significant benefits of providing a drought-resistant supply to Zone 7 and diversifying Zone 7's water supply portfolio, thereby increasing system reliability. The most likely scenario is that water would be wheeled through EBMUD's distribution system; treated water would be received by Zone 7 at a newly-constructed intertie in the western part of its service area. The intertie would have the added benefit of proving an emergency connection between EBMUD and Zone 7, increasing both agencies' system reliability.

13. WATER SHORTAGE CONTINGENCY PLAN

Water Code Section 10632

The purpose of this chapter is to present Zone 7's Water Shortage Contingency Plan, which addresses the following seven components as required by California Water Code Section 10632 (a–i):

- Stages of Action [10632 (a)]
- Three Year Minimum Water Supply [10632 (b)]
- Catastrophic Water Supply Interruption [10632 (c)]
- Prohibitions During Water Shortages [10632 (d-f)
- Impacts of Drought Actions on Revenues and Expenditures [10632 (g)]
- Water Shortage Contingency Ordinance [10632 (h)]
- Reduction Measuring Mechanisms [10632 (i)]

Zone 7's Reliability Policy for Municipal and Industrial Water Supplies (Resolution No. 04-2662 adopted in August 2004; included as Appendix D) calls for Zone 7 to "*meet 100% of its treated water customers water supply needs…*" during an average water year, single dry water year, and multiple dry water years[66] and "*provide sufficient treated water production capacity and infrastructure to meet at least 75% of the maximum daily…demands should any one of Zone 7's major...facilities experience an unplanned outage*". Furthermore, if Zone 7 finds that the goals above might not be met, then the Zone 7 Board will consider remedial actions (e.g., voluntary conservation, mandatory rationing, acquisition of additional supplies, moratorium on new water connections, etc.) that will bring Zone 7 into substantial compliance. The process of evaluating such remedial actions to address forecasted differences between water supply and demand over the next twenty years is described in Chapter 11. While Chapter 11 discusses Zone 7's long-term planning efforts, this chapter focuses on Zone 7's real-time response to a water shortage.

Note that Zone 7's 2005 Water Shortage Contingency Plan was adopted by the Zone 7 Board in 2005 as part of the 2005 UWMP. This Water Shortage Contingency Plan supersedes that document.

[66]Water years are defined as follows in Resolution 04-2662: **average water year** – statistical average quantity of water from all of the water supplies available to Zone 7 on a contractual or legal basis based on the historical hydrologic records available to Zone 7; **single dry water year** – for the purposes of meeting the requirements of the UWMP, the Zone 7 staff will identify and justify the selection of a calendar year from the historic record that represents the lowest yield from all normally contracted or legally available supplies; **multiple dry water years** – for the purposes of meeting the requirements of the UWMP, the Zone 7 staff will identify and justify the selection of three or more consecutive dry years from the historic record that represent the lowest yields from all normally contracted or legally available supplies.

13.1 STAGES OF ACTION

Zone 7 has established two stages of action for the purposes of water supply shortage contingency planning: 1) partial losses of supply and 2) catastrophic loss of a major supply. Each is discussed in more detail below. Since Zone 7 operates as a wholesale water agency, it has not adopted ordinances or imposed mandatory provisions restricting the use of water and does not set or enforce consumption limits at the retail level. As a result, this contingency plan does not include per capita allotment, penalties, or incentives for conservation for any customer sector. The development of such mechanisms is left to the authority of the retail water supply agencies.

13.1.1 Stage 1: Partial Losses of Supply

Stage 1 is simply defined as a reduction in water delivery from the State Water Project (SWP) that is less than 100% *and* that leads to a deficit between water supply and water demand. Since the SWP provides over 80% of Zone 7's water supply, this definition includes a 50% supply shortage scenario as required by the Water Code. Under Stage 1, Section B (Water Service Provisions) of Subsection 14 (Availability of Water) of Zone 7's Municipal and Industrial Water Supply Contract or Terms and Conditions applies:

> *"In any year in which a shortage occurs due to drought or other cause in the supply of water available for delivery to Each Contractor such that the supply to Zone 7 is less than the total amount included in the approved delivery schedule of Each Contractor for that year, Zone 7 shall reduce deliveries to Each Contractor in an amount that results in a reduction of total water used within Contractor's service area that is equal to the percent reduction for total water used within Zone 7's service area for that year, all as determined by Zone 7; provided, that Zone 7 may apportion on another basis if such is required to meet minimum demands for domestic supply, fire protection, or public health during the year".*

The clause above gives Zone 7 the authority to determine the water supply reductions necessary for each retailer to achieve equitable overall reductions across the service area, while accounting for the groundwater resources available to each retailer. As noted in Chapter 6, three of the four retailers have access to groundwater; the City of Livermore relies on Zone 7 for all of its potable water supply. Retailers determine the priorities for the use of the water supply available to them, as described in their Urban Water Management Plans (UWMPs).

In general, Zone 7 and the retailers have cooperated effectively in handling water shortage situations. During the South Bay Aqueduct (SBA) outage in June 2001, for example, Zone 7 prepared daily water supply operations plans and coordinated production and delivery of SWP water closely with the retailers during the month-long outage. Additionally, during the critically dry year of 1991—when the SWP was only able to deliver 20% of Zone 7's requested deliveries—the 25% voluntary conservation goal was essentially met in the Livermore-Amador Valley through the coordinated efforts of Zone 7 and the retailers.

As part of its contingency planning, Zone 7 factors into its Annual Operational Plans the possibility of a dry or critically dry year occurring with consequent reductions in SWP deliveries.

13.1.2 Stage 2: Catastrophic Loss of a Major Supply

Stage 2 is defined as the loss of water delivery through the SBA as the result of a catastrophic event, such as an earthquake. Under this condition, Zone 7's water supply could be reduced by over 80%. To meet 75% of the estimated maximum day treated water demands, Zone 7 plans to operate its wells and make use of water stored in Lake Del Valle, which will be conveyed to the Del Valle Water Treatment Plant. Patterson Pass Water Treatment Plant can only receive water from the SBA; therefore, it would be shut down during an SBA outage.

According to the Department of Water Resources (DWR)[67], the worst disruption to SWP deliveries would likely result from a moderate to a large earthquake, causing multiple Delta islands levee failures and cessation of exports from the Delta of up to a year. Under this scenario and under current conditions, Zone 7 estimates that it would be able to make full deliveries to the retailers during non-summer months using a combination of groundwater and Arroyo del Valle runoff stored in Lake Del Valle. During the peak demand of the summer months, however, Zone 7 will need to reduce deliveries to the retailers as described under Stage 1. Zone 7 analysis shows that Zone 7 has sufficient groundwater supply to serve the indoor water use needs of the service area over a one-year period; the availability of water supply for outdoor water use during the summer months will depend on the amount of water available in Lake Del Valle. Under this scenario, untreated water customers normally served via the SBA would not be able to receive water.

13.2 THREE-YEAR MINIMUM WATER SUPPLY

An estimate of the minimum water supply available during the next three years based on the driest three-year historic sequence for Zone 7's water supplies is presented in Table 13-1. Note that the years in which the minimum supplies have historically occurred are different between the imported surface water and local runoff, as determined by local hydrological conditions, water supply infrastructure, and other conditions. A more detailed description of the estimates of the minimum water supplies can be found in Chapter 7.

Table 13-1. Three-Year Estimated Minimum Water Supply[(a)] (Acre-Feet Annually)

Acre-Feet Annually		Year			
		2011	2012	2013	Normal
Imported Surface Water	SWP[(b)] – Table A	15,700	22,700	19,500	51,400
	SWP[(b)] – Yuba Accord	676	676	676	145
	BBID[(c)]	2,000	2,000	2,000	4,000
Local Runoff	Arroyo del Valle	350	520	150	3,440
	Total Water Supply	18,726	25,896	22,326	58,985

[(a)] Based on the driest three-year historic sequence applicable for each water supply.
[(b)] State Water Project
[(c)] Byron-Bethany Irrigation District

[67] DWR, 2009. 2009 State Water Project Delivery Reliability Report.

13.3 CATASTROPHIC WATER SUPPLY INTERRUPTION

A catastrophic water supply interruption due to a regional power outage, an earthquake, or other disaster would trigger Stage 2, as described in Section 13.1.2.

Zone 7 has prepared an Emergency Operations Plan that deals with a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster. Zone 7 also has an Emergency Operations Center (EOC) and EOC Staff made up of personnel representing different skills and disciplines within Zone 7. The EOC Staff train regularly to maintain proficiency and would respond in the event of a natural or man-made emergency.

As noted in Section 13.1.2, even if there were a complete interruption of deliveries from the SBA, Zone 7 would still be able to meet its current water demands with existing facilities during non-summer months using groundwater and water stored in Lake Del Valle. Deliveries to retailers would be reduced as necessary during the summer months in compliance with the contract stipulation on reduction equity across the service area. The retailers' water shortage contingency plans and the associated voluntary and mandatory water consumption reductions would go into effect. Under this scenario, untreated water customers reliant on the SBA would receive no water.

Zone 7 has emergency generators (both portable and dedicated) at strategic locations in preparation for any regional power outage. These generators would allow both the Del Valle Water Treatment Plant and the Patterson Pass Water Treatment Plant to continue operating even under a power outage. Assuming no interruptions in surface water supply, Zone 7 would be able to provide service to all treated water contractors. If warranted by demand, Zone 7 would also operate the wells, which have either a dedicated generator in place (Mocho 1) or have the necessary hook-ups installed for connection to a portable generator. If the power failure were to occur during high demand season (i.e., summer months), Zone 7 would be unable to meet hourly peak demands throughout the distribution system.

Damage to the Del Valle Branch Pipeline in December 2009

The recent break in the Del Valle Branch pipeline, which is owned and operated by DWR as part of the SWP and delivers water from Lake Del Valle to the SBA is a good illustration of how Zone 7 has handled catastrophic interruption in water supply from the SWP during non-summer months. For the third year in a row, expansion work was being performed on the portion of the SBA between the South Bay Pumping Plant and Del Valle Check 7, interrupting the delivery of water from the Delta. This shutdown was scheduled for mid-November through mid-January, when demands are lower and water could be released from Lake Del Valle. In late December 2009, sudden failure of the Del Valle Branch pipeline near the

surge tank resulted in the complete cut-off of supply from Lake Del Valle within hours. Combined with the SBA repairs, this essentially resulted in 100% supply loss from the SWP. In response, Zone 7 switched to 100% groundwater supply until the planned SBA outage ended in mid-January 2010; Zone 7 continued to rely on a combination of Delta-derived SWP water and groundwater until the Del Valle Branch pipeline was back online in mid-April 2010. During this time, no reductions in water supply to the retailers were necessary, and Zone 7 coordinated with the retailers on a regular basis.

13.4 PROHIBITIONS AND ORDINANCES

As mentioned previously, Zone 7 operates as a wholesale water agency. As such, Zone 7 ***does not have direct authority to restrict the specific use of treated water for purposes such as street cleaning, etc. at the individual customer level***. However, Zone 7 does have provisions for allocating water supply shortages to retailers as set forth in its contracts with the retailers. Zone 7 also ***does not have the direct authority to levy penalties and charges for excess use at the individual customer level***.

As a result, this chapter does not include per capita allotment, penalties, or incentives for conservation for any customer sector. (Programs implemented by Zone 7 as part of its normal demand management or conservation program are described in Chapter 10). Mandatory prohibitions during water shortages are enacted by the individual retailers, as detailed in their UWMPs, Water Shortage Contingency Plans, and city ordinances (e.g., City of Pleasanton Water Conservation Ordinance 2010). Zone 7 fully supports actions taken by the retailers to curb water consumption in response to water shortages.

13.5 IMPACTS OF DROUGHT ACTIONS ON REVENUES AND EXPENDITURES

Delivery reductions to retailers, as discussed in Section 13.1, above, result in revenue losses. As an enterprise, Zone 7 is required to recover all expenditures from revenues. In anticipation of revenue losses from delivery reductions due to droughts (and catastrophic events), Zone 7 initiated a Drought Contingency Funding Program after the 1991 drought. Under this program, Zone 7 maintains a number of reserve funds to ensure that there is adequate funding for emergencies, cash flow requirements, capital improvement plans, and future operating requirements while avoiding significant rate fluctuations due to changes in funding needs from one year to the next.

The two types of reserves that most specifically apply to droughts and other emergency situations are the Emergency/Operating Reserves and the Rate Stabilization Reserve. The Emergency/Operating Reserves are designated by the Zone 7 Board of Directors (Board) for providing for emergencies and cash flow requirements. The Rate Stabilization Reserve, which is currently maintained at $5 million, is designated by the Board to provide funds to offset losses in revenue and other unanticipated costs. The target for this reserve is based on two years of 10% reduction in revenue due to a drought or a disaster.

Funding for reserves is incorporated into the regular water rate, which is adjusted every year as necessary.

13.6 REDUCTION MEASURING MECHANISMS

The Urban Water Management Planning Act requires a mechanism for determining actual reductions in water use in response to conservation measures implemented under the Zone 7 Water Agency Water Shortage Contingency Plan.

As noted in Section 13.4, Zone 7 has not adopted ordinances or imposed mandatory prohibitions restricting the use of water, and does not set or enforce consumption limits at the retail level. However, Zone 7 is committed to working with and supporting the retailers in the implementation of their Water Shortage Contingency Plans.

Zone 7 staff continuously monitors water production rates and water deliveries at the turnouts to retailers. Records of total water volumes provided to each retailer are prepared daily. These monitoring systems will ensure that Zone 7 is making the necessary reductions in water deliveries to the retailers in case of drought or other emergencies.

14. RECYCLED WATER PLAN

Water Code Section 10632(a-i)

The purpose of this chapter is to discuss the following items: coordination of recycled water use in the service area; wastewater collection, treatment, and disposal practices; recycled water production; and ongoing efforts to optimize recycled water use in the service area.

Zone 7 Water Agency (Zone 7) does not currently produce or distribute recycled water directly. Recycled water treatment and distribution is managed by two retail water supply agencies within the Zone 7 service area that also manage wastewater: Dublin San Ramon Services District (DSRSD) and the City of Livermore (Livermore). In 2009, 3,100 acre-feet (AF) of recycled water was supplied by Livermore and DSRSD. Although small in comparison to the other sources, recycled water does form an important drought-resistant component of regional water supply. Further details regarding the two local recycled water programs are available in the Urban Water Management Plans (UWMPs) prepared by these two agencies.

14.1 COORDINATION

In 1992, Zone 7, in conjunction with DSRSD and Livermore, conducted a water recycling study for the Livermore-Amador Valley that concluded that recycled water can provide a safe and cost-effective source of water supply. The Zone 7 Board of Directors (Board) is committed to continually supporting the search for safe, economically feasible, and publicly-acceptable methods to increase local water resources. This includes the optimal use of recycled water, in cooperation with DSRSD and Livermore.

Plans for water recycling within the Zone 7 service area are coordinated amongst Zone 7 Water Agency, the water retailers, the wastewater agencies (Livermore and DSRSD), the regulatory agencies such as the California Department of Public Health and the Regional Water Quality Control Board (RWQCB), and planning agencies such as the City of Livermore Community Development Department. Zone 7 reviews recycled water plans both from a water supply management perspective and from a groundwater protection perspective. Given Zone 7's integral role in water supply and groundwater management in the Livermore-Amador Valley, Zone 7 is a co-permittee under the Master Waste Reuse Permit issued by the RWQCB in December 1993 (Order No. 93-159).

The permit required the development of a Salt Management Plan[68] to assess cumulative salt loading impacts on the Livermore Valley Groundwater Basin (Basin). The Salt Management Plan identified demineralization with export of the brine stream as the best means of mitigating salt loading in the Basin. The Salt Management Plan has been incorporated into the more comprehensive Groundwater Management Plan[69] developed in September 2005 (included as a

[68] Zone 7 Water Agency, 2004. Salt Management Plan.
[69] Jones and Stokes, 2005. Groundwater Management Plan for the Livermore-Amador Valley Groundwater Basin.

CD attachment). Both documents were developed in close consultation with a technical advisory group composed of water retailer representatives and a Zone 7 citizens committee. The RWQCB approved the SMP in October 2004.

14.2 WASTEWATER QUANTITY, QUALITY AND CURRENT USES

DSRSD and Livermore collect all of the wastewater produced within the city limits of Pleasanton, Dublin, and Livermore, and portions of San Ramon. Wastewater transport out of the area is handled through the Livermore-Amador Valley Water Management Agency (LAVWMA), a joint powers authority (JPA) composed of DSRSD, Livermore, and Pleasanton. Since 1979, LAVWMA has owned the conveyance facilities that ship treated wastewater from the treatment plants west over the Dublin grade, and eventually to the East Bay Discharge Authority, which dechlorinates the effluent and discharges it through a deepwater pipeline into San Francisco Bay.

In Livermore, tertiary-treated water (mono-filtration followed by ultraviolet [UV] disinfection) is used to irrigate Livermore's Municipal Golf Course, Las Positas College, business parks along the north side of I-580 and the west side of Highway 84, and Highway 84 corridor landscapes. Livermore has been irrigating its golf course with recycled water since the 1960s. In Livermore, recycled water use was 988 AF in 2009. Livermore's facilities can produce up to 5,600 acre-feet annually (AFA)[70] should the demand increase.

In 1995, DSRSD and East Bay Municipal Utility District (EBMUD), a major water retailer, formed a JPA called the "DSRSD-EBMUD Recycled Water Authority" (DERWA). This entity operates the San Ramon Valley Recycled Water Program (SRVRWP), which supplies recycled water to portions of DSRSD's and EBMUD's service areas. Through the SRVRWP, DSRSD began supplying tertiary-treated water (sand filtration or microfiltration followed by UV disinfection) in 2006 for landscape irrigation. As of August 2007, SRVRWP was providing recycled water to over 170 customer sites. Its facilities are sized to provide up to 3,700 AF of recycled water annually to DSRSD and an additional 2,700 AF to EBMUD[71]. In 2009, DSRSD supplied 2,100 AF of recycled water.

A summary of the wastewater quantities collected and treated, and the quantity that meets recycled water standards (Title 22), in the Zone 7 service area is presented in Table 14-1. For details of wastewater collection and treatment systems, quantities treated, excess recycled water capacity not currently being distributed to non-potable customers, and type, place and quantity of use, refer to the UWMPs of DSRSD and Livermore. Nearly all of the recycled water is used for landscape irrigation in the service area.

[70] City of Livermore, 2005. Livermore Municipal Water 2005 Urban Water Management Plan.
[71] http://www.derwa.org/pdf/DERWA_quick_facts.pdf

Table 14-1. Wastewater Collection and Treatment (Acre-Feet Annually)

Year	2005		2010		*Projected*			
	Projected[(b)]	Actual	Projected[(b)]	Estimated	*2015*	*2020*	*2025*	*2030*
Wastewater Collected and Treated[(a)]	20,400	20,462	22,400	20,000	*22,500*	*24,800*	*26,000*	*28,000*
Quantity that Meets Recycled Water Standards	2,700	2,020	4,000	3,400	*4,300*	*5,600*	*5,900*	*5,900*

(a) Wastewater collected and treated by Livermore as presented in their 2005 UWMP. DSRSD values as provided to Zone 7 in 2009.
(b) Projections as reported in the 2005 UWMP.

All of the wastewater collected by DSRSD and Livermore undergo, at a minimum, secondary treatment. Wastewater is also disinfected and dechlorinated prior to discharge to the San Francisco Bay. After secondary treatment, the recycled water stream undergoes filtration and disinfection to meet Title 22 standards as described above.

14.3 POTENTIAL AND PROJECTED USE, OPTIMIZATION PLAN WITH INCENTIVES

Within Zone 7's service area, there are a number of potential uses for recycled water including agricultural and landscape irrigation, fire protection, industrial use, construction, wetlands, and other miscellaneous uses. Some of these are already occurring (e.g., landscape irrigation), while others (e.g., agricultural irrigation) have not yet been implemented. By 2030, DSRSD and Livermore estimate a total demand of 5,900 AFA, accounting for the projected development and growth in recycled water infrastructure.

As the groundwater basin management agency, Zone 7 is cognizant of the potential salt loading impacts arising out of recycled water use. Zone 7 has taken a pro-active approach to mitigate such impacts particularly within the Main Basin, as described in the Groundwater Management Plan[69] (see CD attachment). Zone 7 is currently operating a demineralization facility to balance the salt loading in the Main Basin. The demineralization facility has the added benefit of providing softer water to Zone 7's potable water customers in the western portion of Zone 7's service area, where there is a regional concentration of groundwater production facilities. Expansion of recycled water use over the groundwater basin will require additional measures to mitigate the associated additional salt loading.

Recognizing that recycled water is an important part of a complete water resource management program for the Livermore-Amador Valley, Zone 7 is incorporating its use in future water supply planning. In joint efforts with DSRSD and Livermore, Zone 7 plans to continually support the search for safe, economically feasible, and publicly acceptable methods to increase local water resources by optimizing the use of recycled water.

15. WATER QUALITY IMPACTS ON RELIABILITY

Water Code Section 10634

Zone 7 Water Agency (Zone 7) does not anticipate that water quality will negatively impact its ability to provide a reliable supply of water over the next 20 years, although water quality is certainly a key consideration in Zone 7's Water Supply Master Plan efforts. The purpose of this chapter is to describe the water quality issues associated with Zone 7's water supplies. Imported and local water supply sources are discussed separately below, as well as storage options.

15.1 IMPORTED SURFACE WATER SUPPLY

As described in Chapter 5, imported surface water from the State Water Project (SWP) is by far Zone 7's largest water source, providing over 80% of the treated water supplied to its retail customers. Much of this imported surface water is derived from the Feather River watershed, in the northern part of California, and ultimately flows through the Sacramento-San Joaquin Delta (Delta) before it is conveyed by the California Aqueduct and the South Bay Aqueduct (SBA) to Zone 7's water facilities.

Zone 7's other imported surface water supply, the Byron Bethany Irrigation District (BBID), is also linked to the Delta: BBID diverts water from the Delta and provides water to Zone 7 via the SBA.

There are some important water quality considerations associated with the water that moves through the Delta. In 1982, the Department of Water Resources (DWR) formed the Interagency Delta Health Aspects Monitoring Program to monitor water quality in the Delta for human health protection. The program was renamed the Municipal Water Quality Investigations Program (MWQI Program) in 1990. From a municipal water supply perspective, water quality issues in the Delta are associated with salinity from seawater intrusion; wastewater effluent discharges; agricultural drainages from the islands; and recreational activities. Water quality issues of specific concern to Zone 7 are:

- *taste and odor (T&O)* - primarily a problem in the warmer months, when algal blooms may be present. It can affect supplies from the Delta and from Lake Del Valle. Algae produce geosmin and 2-methylisoborneol (MIB), which are key taste and odor-causing compounds in surface water supply. Zone 7 currently treats T&O using powdered activated carbon (PAC), which is of limited effectiveness under high levels of geosmin and MIB. High levels of T&O in surface water require a switch to groundwater supplies.

- *total and dissolved organic carbon (TOC/DOC*) – levels of organic carbon affect the amounts of coagulant and disinfectant chemicals used at Zone 7's water treatment plants (WTPs), and therefore result in higher costs. In addition, the formation of disinfectant byproducts is dependent upon the amount of TOC/DOC. TOC/DOC levels have historically not affected the amount of imported surface water supply available to Zone 7.

- *turbidity* – like TOC/DOC, turbidity affects the amounts of chemicals used at the WTPs, and Zone 7's ability to meet drinking water standards. Turbidity levels have historically not affected the amount of imported surface water supply available to Zone 7.

- *salinity or total dissolved solids (TDS)* – salinity is a water quality parameter that has significant impacts on SWP operations and the availability of water. To meet the salinity objectives in the Delta, water exports from the Delta may be restricted, reducing the amount of water supply available during certain times of the year.

As noted in Chapter 11, Zone 7 and other SWP contractors are currently working with the DWR and other key stakeholders in the development of a "Delta Fix" to address the challenges—including water quality issues—related to the transport of water through the Delta. The Delta Habitat Conservation and Conveyance Program (DHCCP), in conjunction with the Bay Delta Conservation Plan (BDCP), is expected to increase the reliability of supplies from the Delta.

To protect water quality once the water from the Delta reaches the SBA, recipients of water from the SBA (Alameda County Water District, Santa Clara Valley Water District, and Zone 7; known collectively as the SBA Contractors) developed the SBA Watershed Protection Program Plan in 2008[72]. The SBA Watershed Protection Program Plan is designed to protect the SBA system, including Lake Del Valle and Bethany Reservoir, from identified potential contaminant sources (e.g., septic tanks) for urban water supply purposes, as well as agricultural, recreational, and environmental uses.

15.2 LOCAL SURFACE WATER RUNOFF

Runoff from the Arroyo del Valle watershed above Lake Del Valle is stored in the lake. Lake Del Valle is also used to store SWP imported surface water deliveries through late winter and spring. In general, the water quality of Arroyo del Valle runoff is good, and does not affect the reliability of this water supply. As noted above, water collected from the local watershed is protected under the SBA Watershed Protection Program Plan.

15.3 LOCAL STORAGE

Zone 7 has three options for local storage: storage in Lake Del Valle, storage in the Main Basin and, in the future, surface storage in the Chain of Lakes. The Chain of Lakes will also be used for groundwater recharge.

A water quality issue associated with Lake Del Valle is the occurrence of taste and odor as described in Section 15.1.

The Main Basin is characterized by relatively good quality groundwater that meets all state and federal drinking water standards. Groundwater is chloraminated to maintain consistent disinfectant residual in the distribution system and to preserve delivered water quality. However,

[72] ESA, 2008. SBA Watershed Protection Program Plan.

there has been a slow degradation of groundwater quality as evidenced by rising Total Dissolved Solids (TDS) and hardness levels over the last few decades. To address this problem, Zone 7 developed a Salt Management Plan (SMP)[73], which was approved by the Regional Water Quality Control Board in 2004. As part of this SMP, Zone 7 completed construction of a wellhead demineralization facility in 2009. Employing a reverse osmosis membrane-based treatment system, this facility simultaneously allows for the removal and export of salts[74] from the Main Basin and the delivery to customers of treated water with reduced TDS and hardness levels.

The Water System Master Plan update currently under development (see Chapter 11) addresses the need for salt mitigation under the various water supply options—including future use of the Chain of Lakes—that are being considered.

15.4 NON-LOCAL STORAGE

In addition to local storage, Zone 7 also has storage contracts with two non-local groundwater-banking districts in Kern County: the Semitropic Water Storage District (Semitropic) and Cawelo Water District. Zone 7 stores water into these banks during non-drought conditions to have supply available during droughts.

The presence of elevated levels of arsenic in a portion of the Semitropic groundwater bank is a water quality issue that needs to be addressed. During a drought, Zone 7 will take an additional amount of water from the SWP equal to the amount requested from Semitropic. Semitropic will then replace this water downstream on behalf of Zone 7 by pumping water into the California Aqueduct for use by contractors downstream of Semitropic; the water quality of this "pump-in" water will therefore have an effect on these contractors. Arsenic criteria were established for this pump-in by the DWR Facilitation Group to mitigate any impacts to the downstream contractors, and DWR, Semitropic, and the banking partners have been testing arsenic treatment options since 2008. While the presence of arsenic in the Semitropic groundwater bank is likely to increase the cost of this water storage option, it is not likely to affect its overall reliability.

[73] Zone 7 Water Agency, 2004. Salt Management Plan.
[74] The brine concentrate resulting from the treatment system is exported to the San Francisco Bay via a regional wastewater export pipeline.

16. WATER SERVICE RELIABILITY

Water Code Section 10635

The purpose of this chapter is to present Zone 7 Water Agency's (Zone 7's) assessment of the reliability of its water service during normal, single dry, and multiple dry water years. To perform this assessment, projected water supplies were compared against projected water demands over the next twenty years in five-year increments. Tables 16-1, 16-2, and 16-3 present these comparisons for normal, single dry, and multiple dry water years, respectively. The tables present demand scenarios without potential water conservation ("High Water Demand") and with potential water conservation ("Low Water Demand") associated with Senate Bill SBX7-7[75] (SB 7). Projected water supplies include the projected new water supplies presented in Table 11-1.

Zone 7's water supply sources are described in more detail in Chapters 5, 6, and 8. Chapter 7 presents an analysis of the reliability of these existing supplies. For more details on the projected demands, see Chapter 9. Planned programs and projects designed to increase Zone 7's water system reliability are discussed in Chapter 11. Zone 7's current policy is to meet 100% of projected demands over the next 20 years; however, as discussed in Chapter 11, Zone 7 is evaluating the merits of this policy as part of the Water System Master Plan (WSMP) update.

Under normal water years, Zone 7 does not anticipate any difficulty in meeting projected water demands, with or without additional conservation measures, assuming Zone 7 can successfully implement planned programs and projects (Table 16-1). Note that a portion of the water demand during a normal water year includes the storage of water supply for use during dry years. The maximum potential shortage—based on the High Water Demand scenario—could be as high as 10,500 acre-feet (AF) between 2020 and 2030 if Zone 7 cannot implement planned programs and projects.

Under single dry years, Zone 7 does not expect shortages through 2030 with the implementation of planned programs and projects (Table 16-2). The maximum potential shortage—based on the High Water Demand scenario—could be as high as 8,700 AF between 2020 and 2030 if Zone 7 cannot implement planned programs and projects. The maximum potential shortage during single dry years is lower than that for normal water years because Zone 7 makes use of its stored water distributed between the local groundwater basin and the banking programs in Kern County.

Finally, under multiple dry years, planned programs and projects have similarly been designed to prevent any shortages. Zone 7's analysis indicates that, without such programs and projects, shortages of up to 36,000 AF can be expected under a multiple dry year scenario ending in 2030 based on the High Water Demand scenario. The water supply amounts shown in Tables 16-3(a) through (d)—as well as in the other tables—reflect the results of analysis using Zone 7's newly developed water supply model, which uses Monte Carlo methods for incorporating uncertainty.

[75] Discussed in more detail in Section 9.3.5.

The higher water supply availability during the second year of each multiple dry year scenario is primarily due to the occurrence of a wet year in the midst of the dry year sequence that was used in the model. This sequence is based on the 1988 to 1992 drought as shown on Figure 7-2.

In summary, Zone 7 is aggressively developing a strategy via the WSMP for providing a reliable, high-quality water supply that will meet the needs of the Livermore-Amador Valley through buildout of adopted general plans. As part of its strategy, Zone 7 will also re-evaluate its current reliability policy.

Table 16-1. Comparison of Projected Water Supply and Demand in Normal Water Years (Acre-Feet)[a]

Supply and Demand Component		Year				
		2010	2015	2020	2025	2030
Imported Supplies	State Water Project[b]	51,400	51,400	51,400	51,400	51,400
	BBID[c]	4,500	4,500	4,500	4,500	4,500
	Yuba Accord[d]	145	145	145	145	0
Local Supplies	Arroyo del Valle[e]	7,100	7,100	7,100	7,100	7,100
Storage	Zone 7 Wells[f,g]	9,200	9,200	9,200	9,200	9,200
	Semitropic[h]	0	0	0	0	0
	Cawelo[h]	0	0	0	0	0
Planned Programs and Projects[i]		0	0	10,500	10,500	10,500
Total Water Supply		72,350	72,350	82,850	82,850	82,700
High Water Demand[j]		66,200	68,200	74,300	79,500	82,700
Comparison	Difference	6,150	4,150	8,550	3,350	0
	Difference as % of Supply	9%	6%	10%	4%	0%
	Difference as % of Demand	9%	6%	12%	4%	0%
Low Water Demand[k]		66,200	64,600	67,100	72,300	75,500
Comparison	Difference	6,150	7,750	15,750	10,550	7,200
	Difference as % of Supply	9%	11%	19%	13%	9%
	Difference as % of Demand	9%	12%	23%	15%	10%
Potential Shortage without Planned Programs and Projects[l]		0	0	(2,000)	(7,200)	(10,500)

Notes for Table 16-1

[a] Normal water years are defined as the median runoff or allocation years.
[b] Projected median allocation from State Water Project is approximately 64% (51,400 divided by 80,619 AF) of Zone 7's Table A amount per the 2009 Reliability Report.
[c] Zone 7's contract with BBID provides up to 5,000 acre-feet, and at least 2,000 acre-feet is available in a single dry year. Zone 7 staff has estimated the yield of this contract to be 4,500 acre-feet during a normal water year.
[d] Zone 7 has a contract with DWR for water available through the Yuba Accord; the contract ends in 2025. There are four components within the contract that provide water; however, Component 1 water is used for environmental purposes and the potential yield from Component 4 water is unknown. Consequently, for conservative planning-level purposes, only Components 2 through 3 water were used in this Urban Water Management Plan.
[e] Most of the runoff from the Arroyo del Valle watershed occurs in the winter and spring. Until the Chain of Lakes is available for diverting runoff, actual yield is limited to that which can be treated and delivered directly. Although the long-term average is7,300 acre-feet, the median supply of 7,100 acre-feet was used per UWMP guidelines.
[f] Zone 7 only pumps groundwater previously recharged - quantities already account for demineralization losses.
[g] Does not include groundwater pumping quotas.
[h] Stored water supply is not intended for normal water year conditions, but for use in dry years.
[i] See Table 11-1. As discussed in Chapter 11, Zone 7 is updating its Water System Master Plan, and is either pursuing or identifying several future water supplies, including a Delta Fix, recycled water, water transfers, and desalination.
[j] Includes municipal, industrial, and agricultural demands. Does not include potential water conservation savings associated with Senate Bill SBX7-7.
[k] Includes municipal, industrial, and agricultural demands. Includes potential water conservation savings associated with Senate Bill SBX7-7.
[l] Based on the High Water Demand scenario.

Table 16-2. Comparison of Projected Water Supply and Demand in Single Dry Years (Acre-Feet)[a]

Supply and Demand Component		Year				
		2010	2015	2020	2025	2030
Imported Supplies	State Water Project (10% Allocation)[b]	8,000	8,000	8,000	8,000	8,000
	Carry Over[c]	24,000	17,000	13,000	10,000	8,000
	BBID[d]	2,000	2,000	2,000	2,000	2,000
	Yuba Accord[e]	676	676	676	676	0
Local Supplies	Arroyo del Valle[f]	0	0	0	0	0
Storage	Groundwater[g]	26,200	26,200	26,200	26,200	26,200
	Semitropic[h]	9,100	9,100	9,100	9,100	9,100
	Cawelo[i]	5,000	10,000	10,000	10,000	10,000
Planned Programs and Projects[j]	Additional Supply in Existing Storage	0	0	1,000	7,000	6,000
	New Dry Year Supply	0	0	6,100	6,100	6,100
Total Water Supply		75,000	73,000	76,100	79,100	75,400
High Water Demand[k]		50,700	53,900	61,500	67,800	72,000
Comparison	Difference	24,300	19,100	14,600	11,300	3,400
	Difference as % of Supply	32%	26%	19%	14.3%	4.5%
	Difference as % of Demand	48%	35%	24%	16.7%	4.7%
Low Water Demand[l]		50,700	50,300	54,300	60,600	64,800
Comparison	Difference	24,300	22,700	21,800	18,500	10,600
	Difference as % of Supply	32%	31%	29%	23%	14%
	Difference as % of Demand	48%	45%	40%	31%	16%
Potential Shortage without Planned Programs and Projects[m]		0	0	0	(1,800)	(8,700)

Notes for Table 16-2

[a] Single dry year corresponds to lowest runoff or allocation.
[b] DWR's 2009 Reliability report indicates the minimum allocation is 10%, or approximately 8,000 acre-feet (0.10 x 80,619) - this corresponds to 1977 conditions.
[c] Carryover represents the ability to carry water from the previous year into the next. The availability of carryover decreases in the future as demands increase because more of the supply is used in the current year and is unavailable to "carry" into the following year. During a single dry year, all of the carryover is used, and there is no surplus supply to carry into the following year.
[d] Zone 7's contract with BBID provides up to 5,000 acre-feet, and at least 2,000 acre-feet in a single dry year.
[e] Zone 7 has a contract with DWR for water available through the Yuba Accord; the contract ends in 2025. For conservative planning-level purposes, only Components 2 through 3 water were used in this Urban Water Management Plan.
[f] There is no Arroyo del Valle supply available to Zone 7 in a single dry year.
[g] Zone 7 has sufficient groundwater pumping capacity to withdraw 26,200 acre-feet of stored supply. Does not include groundwater pumping quotas.
[h] Only includes Zone 7's contracted pumpback amount. SWP allocation during 1977 conditions precludes the availability of exchange water.
[i] For planning-level purposes, it is assumed that Zone 7 will have at least 10,000 acre-feet in Cawelo by 2015.
[j] See table 11-1. As discussed in Chapter 11, Zone 7 is updating its Water System Master Plan, and is either pursuing or identifying several future water supplies, including a Delta Fix, recycled water, water transfers, and desalination.
[k] Includes municipal, industrial, and agricultural demands. Does not include potential water conservation savings associated with Senate Bill SBX7-7.
[l] Includes municipal, industrial, and agricultural demands. Includes potential water conservation savings associated with Senate Bill SBX7-7.
[m] Based on the High Water Demand scenario.

Tables 16-3(a). Comparisons of Projected Water Supply and Demand in Multiple Dry Years (Acre-Feet)[a] Ending in 2015

Supply and Demand Component		Year				
		2011 (Year 1)	2012 (Year 2)	2013 (Year 3)	2014 (Year 4)	2015 (Year 5)
Imported Supplies	State Water Project[b]	23,900	47,800	15,700	22,700	19,500
	Carry Over[c]	21,000	20,200	27,600	18,100	15,600
	BBID[d]	2,000	2,000	2,000	2,000	2,000
	Yuba Accord[e]	676	676	676	676	676
Local Supplies	Arroyo del Valle[f]	930	350	520	150	4,400
Storage	Groundwater[g]	14,000	9,200	14,000	14,000	14,000
	Semitropic[h]	10,700	13,600	9,600	10,500	10,100
	Cawelo[i]	0	0	0	0	8,000
Planned Programs and Projects[j]	Additional Supply in Carry Over	0	0	0	0	0
	Additional Supply in Existing Storage	0	0	0	0	0
	New Dry Year Supply	0	0	0	0	0
Total Water Supply		73,206	93,826	70,096	68,126	74,276
High Water Demand[k]		51,300	52,000	52,600	53,300	53,900
Comparison	Difference	21,906	41,826	17,496	14,826	20,376
	Difference as % of Supply	30%	45%	25%	22%	27%
	Difference as % of Demand	43%	80%	33%	28%	38%
Low Water Demand[l]		50,600	50,500	50,500	50,400	50,300
Comparison	Difference	22,606	43,326	19,596	17,726	23,976
	Difference as % of Supply	31%	46%	28%	26%	32%
	Difference as % of Demand	45%	86%	39%	35%	48%
Potential Shortage without Planned Programs and Projects[m]		0	0	0	0	0

Tables 16-3(b). Comparisons of Projected Water Supply and Demand in Multiple Dry Years (Acre-Feet)[a] Ending in 2020

Supply and Demand Component		Year				
		2016 (Year 1)	2017 (Year 2)	2018 (Year 3)	2019 (Year 4)	2020 (Year 5)
Imported Supplies	State Water Project[b]	23,900	47,800	15,700	22,700	19,500
	Carry Over[c]	16,000	12,400	27,600	11,400	10,300
	BBID[d]	2,000	2,000	2,000	2,000	2,000
	Yuba Accord[e]	676	676	676	676	676
Local Supplies	Arroyo del Valle[f]	930	350	520	150	4,400
Storage	Groundwater[g]	14,000	14,000	14,000	14,000	14,000
	Semitropic[h]	10,700	13,600	9,600	10,500	10,100
	Cawelo[i]	0	0	0	9,000	10,000
Planned Programs and Projects[j]	Additional Supply in Carry Over	0	0	0	0	0
	Additional Supply in Existing Storage	0	0	0	0	0
	New Dry Year Supply	0	0	0	0	6,100
Total Water Supply		68,200	90,800	70,100	70,400	77,100
High Water Demand[k]		55,400	56,900	58,500	60,000	61,500
Comparison	Difference	12,800	33,900	11,600	10,400	15,600
	Difference as % of Supply	19%	37%	17%	15%	20%
	Difference as % of Demand	23%	60%	20%	17%	25%
Low Water Demand[l]		51,100	51,900	52,700	53,500	54,300
Comparison	Difference	17,100	38,900	17,400	16,900	22,800
	Difference as % of Supply	25%	43%	25%	24%	30%
	Difference as % of Demand	33%	75%	33%	32%	42%
Potential Shortage without Planned Programs and Projects[m]		0	0	0	0	0

Tables 16-3(c). Comparisons of Projected Water Supply and Demand in Multiple Dry Years (Acre-Feet)[a] Ending in 2025

Supply and Demand Component		Year				
		2021 (Year 1)	2022 (Year 2)	2023 (Year 3)	2024 (Year 4)	2025 (Year 5)
Imported Supplies	State Water Project[b]	23,900	47,800	15,700	22,700	19,500
	Carry Over[c]	13,000	2,300	16,600	0	0
	BBID[d]	2,000	2,000	2,000	2,000	2,000
	Yuba Accord[e]	676	676	676	676	676
Local Supplies	Arroyo del Valle[f]	930	350	520	150	4,400
Storage	Groundwater[g]	14,000	14,000	14,000	14,000	7,000
	Semitropic[h]	10,700	13,600	9,600	10,500	10,100
	Cawelo[i]	0	0	4,000	10,000	10,000
Planned Programs and Projects[j]	Additional Supply in Carry Over	4,000	10,200	11,000	16,900	16,500
	Additional Supply in Existing Storage	0	0	2,000	0	7,000
	New Dry Year Supply	6,100	6,100	6,100	6,100	6,100
Total Water Supply		75,300	97,000	82,200	83,000	83,300
High Water Demand[k]		62,800	64,000	65,300	66,500	67,800
Comparison	Difference	12,500	33,000	16,900	16,500	15,500
	Difference as % of Supply	17%	34%	21%	20%	19%
	Difference as % of Demand	20%	52%	26%	25%	23%
Low Water Demand[l]		55,600	56,800	58,100	59,300	60,600
Comparison	Difference	19,700	40,200	24,100	23,700	22,700
	Difference as % of Supply	26%	41%	29%	29%	27%
	Difference as % of Demand	35%	71%	41%	40%	37%
Potential Shortage without Planned Programs and Projects[m]		0	0	(2,200)	(6,500)	(14,100)

Tables 16-3(d). Comparisons of Projected Water Supply and Demand in Multiple Dry Years (Acre-Feet)[a] Ending in 2030

Supply and Demand Component		Year				
		2026 (Year 1)	2027 (Year 2)	2028 (Year 3)	2029 (Year 4)	2030 (Year 5)
Imported Supplies	State Water Project[b]	23,900	47,800	15,700	22,700	19,500
	Carry Over[c]	10,000	0	100	0	0
	BBID[d]	2,000	2,000	2,000	2,000	2,000
	Yuba Accord[e]	0	0	0	0	0
Local Supplies	Arroyo del Valle[f]	930	350	520	150	4,400
Storage	Groundwater[g]	14,000	14,000	6,000	0	0
	Semitropic[h]	10,700	2,600	9,600	10,500	10,100
	Cawelo[i]	1,300	3,000	10,000	2,700	0
Planned Programs and Projects[j]	Additional Supply in Carry Over	6,000	6,300	24,300	12,000	6,300
	Additional Supply in Existing Storage	0	11,700	8,000	21,300	24,000
	New Dry Year Supply	6,100	6,100	6,100	6,100	6,100
Total Water Supply		74,900	93,900	82,300	77,500	72,400
High Water Demand[k]		68,600	69,500	70,300	71,200	72,000
Comparison	Difference	6,300	24,400	12,000	6,300	400
	Difference as % of Supply	8%	26%	15%	8%	1%
	Difference as % of Demand	9%	35%	17%	9%	1%
Low Water Demand[l]		61,400	62,300	63,100	64,000	64,800
Comparison	Difference	13,500	31,600	19,200	13,500	7,600
	Difference as % of Supply	18%	34%	23%	17%	10%
	Difference as % of Demand	22%	51%	30%	21%	12%
Potential Shortage without Planned Programs and Projects[m]		(5,800)	0	(26,400)	(33,200)	(36,000)

Notes for Table 16-3

[a] The multiple dry year period corresponds to the lowest consecutive 5-year projected runoff or allocation. Each five year period is a new five-year drought.
[b] Median Table A amount was used as the normal year allocation. Based on DWR's 2009 Reliability report, the lowest consecutive 5-year allocation is over 1988 to 1992.
[c] Carryover represents the ability to carry water from the previous year into the next, and includes both the SWP and Lake Del Valle. The availability of carryover decreases in the future as demands increase because more of the supply is used in the current year and is unavailable to "carry" into the following year.
[d] Zone 7's contract with BBID provides up to 5,000 acre-feet, and at least 2,000 acre-feet over a multi year drought.
[e] Zone 7 has a contract with DWR for water available through the Yuba Accord; the contract ends in 2025. For conservative planning-level purposes, only Components 2 and 3 water were used in this Urban Water Management Plan.
[f] Most of the runoff from the Arroyo del Valle watershed occurs in the winter and spring. Until the Chain of Lakes is available for diverting runoff, actual yield is limited to that which can be treated and delivered directly. Although the long-term average yield is 7,300 acre-feet the median supply of 7,100 acre-feet was used in normal water years per UWMP Guidelines. The lowest consecutive 5-year runoff occurred over 1987 to1991.
[g] Zone 7 only pumps groundwater previously recharged. Does not include groundwater pumping quotas.
[h] Includes Zone 7's contracted pump back amount (9,100 af) and available exchange water. Exchange water depends on SWP allocation.
[i] For planning-level purposes, it is assumed that Zone 7 will have at least 10,000 acre-feet in Cawelo by 2015.
[j] As discussed in Chapter 11, Zone 7 is updating its Water System Master Plan, and is either pursuing or identifying several future water supplies, including a Delta Fix, recycled water, water transfers, and desalination.
[k] Includes municipal, industrial, and agricultural demands. Does not include potential water conservation savings associated with Senate Bill SBX7-7 or voluntary water conservation savings.
[l] Includes municipal, industrial, and agricultural demands. Includes potential water conservation savings associated with Senate Bill SBX7-7.
[m] Based on the High Water Demand scenario.

17. UWMP ADOPTION AND IMPLEMENTATION

Water Code Sections 10640-10645

Zone 7 Water Agency (Zone 7) has taken (or will take) all the required steps in adopting this 2010 Urban Water Management Plan (UWMP) as indicated below:

- A copy of the adoption resolution by the Zone 7 Board of Directors is attached in Appendix C.
- Zone 7 has reviewed the Demand Management Measures (DMMs) identified in the 2005 UWMP and determined that Zone 7's current Water Conservation Program is consistent with the applicable DMMs. In fact, Zone 7 continues to improve its Water Conservation Program by streamlining the rebate application program, improving coordination with the retailers, expanding the free water audit survey program to include commercial and institutional customer accounts, and others.
- While Zone 7 does not implement recycled water projects, it continues to work with retailers in the development of their recycled water plans. These plans are integrated into Zone 7's Water System Master Plan update efforts.
- Zone 7 will make the 2010 UWMP available for a 30-day public review period starting on the day that the 2010 UWMP is submitted to the Department of Water Resources (DWR).
- Zone 7 will provide copies of the final adopted 2010 UWMP—including the reliability and supply and demand sections—to DWR, the California State Library, its four water supply retail agencies (including the Cities of Pleasanton and Livermore), the Cities of Dublin and San Ramon, and Alameda County within 30 days of adoption. Any amendments or changes will similarly be distributed.

Finally, as discussed in Chapter 4, Zone 7 has actively sought wide public participation in the development of this 2010 UWMP using various media. Notice of the availability of the Draft UWMP and the public hearing was widely disseminated in local newspapers (Appendix B). A public review period was conducted in the month of November. A public hearing was subsequently conducted on December 15, 2010 to present the revised UWMP and to allow for further public comment before formal adoption by the Zone 7 Board of Directors.

Appendix A

UWMP Act

Established: AB 797, Klehs, 1983
Amended: AB 2661, Klehs, 1990
AB 11X, Filante, 1991
AB 1869, Speier, 1991
AB 892, Frazee, 1993
SB 1017, McCorquodale, 1994
AB 2853, Cortese, 1994
AB 1845, Cortese, 1995
SB 1011, Polanco, 1995
AB 2552, Bates, 2000
SB 553, Kelley, 2000
SB 610, Costa, 2001
AB 901, Daucher, 2001
SB 672, Machado, 2001
SB 1348, Brulte, 2002
SB 1384, Costa, 2002
SB 1518, Torlakson, 2002
AB 105, Wiggins, 2004
SB 318, Alpert, 2004
SB 1087, Florez, 2005
SBX7 7, Steinberg, 2009

CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING

CHAPTER 1. GENERAL DECLARATION AND POLICY

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

CHAPTER 2. DEFINITIONS

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS
Article 1. General Provisions

10620.

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)

(1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621.

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the

past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.
(2) A single dry water year.
(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)

(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the ‘‘Memorandum of Understanding Regarding Urban Water Conservation in California,’’ dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier’s plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c), including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5 Water Service Reliability

10635.

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled

pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Articl 3. Adoption and Implementation of Plans

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644.

(a) An urban water supplier shall file with the department and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be filed with the department and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. MISCELLANEOUS PROVISIONS

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water

supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

10657.

(a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

Appendix B

Public Notices

Flores, Amparo

From: Brewer, Boni
Sent: Friday, October 15, 2010 8:46 AM
To: Dan Smith; rwerner; J Freeman; Bert Michalczyk (michalczyk@dsrsd.com); Ed Cummings (cummings@lavwma.com); 'jeffbaker@dublin.ca.gov'; 'pwong@sanramon.ca.gov'; 'albert.lopez@acgov.org'; 'roberta.goulart@dcd.cccounty.us'; 'fwedingt@ebmud.com'
Subject: Urban Water Management Plan

NOTICE OF REVIEW & POTENTIAL AMENDMENTS
Urban Water Management Plan
October 15, 2010

Zone 7 Water Agency is a water wholesaler serving more than 200,000 people in Pleasanton, Livermore and Dublin in Alameda County, and the Dougherty Valley area of San Ramon in Contra Costa County. It sells treated water to four retailers: the City of Pleasanton, City of Livermore, Dublin San Ramon Services District and California Water Service Company.

As an urban water provider, Zone 7 prepares an Urban Water Management Plan aimed at analyzing and planning for a reliable water supply over a 20-year planning horizon considering normal, dry and multiple dry years.

This is to notify cities and counties within which Zone 7 provides water that on December 15, 2010, the Zone 7 Board of Directors plans to conduct a public meeting on, and consider adoption of, the Agency's draft Urban Water Management Plan as required under section 10610 et seq. of the California Water Code. The hearing will be part of a regularly scheduled Board meeting to begin at 7 p.m. at Zone 7 Administrative Offices, 100 North Canyons Parkway, Livermore.

Zone 7 plans to make a copy of the Draft Urban Water Management Plan available for download from its website, www.zone7water.com, on or around November 2, 2010. Comments on the draft Urban Water Management Plan prior to the public hearing can be provided to Amparo Flores at aflores@zone7water.com, by 5 p.m. on November 30, 2010.

If you would prefer a copy to be mailed to you, please contact Boni Brewer, Public Information Officer, at (925) 454-5015.

Boni Brewer
Public Information Officer
Zone 7 Water Agency
100 North Canyons Parkway
Livermore, CA 94551
925-454-5015
bbrewer@zone7water.com

NOTICE OF PUBLIC HEARING AND PUBLIC REVIEW PERIOD
Urban Water Management Plan

Zone 7 Water Agency is a water wholesaler serving more than 200,000 people in Pleasanton, Livermore, Dublin and the Dougherty Valley area of San Ramon. It sells treated water to four retailers: the City of Pleasanton, City of Livermore, Dublin San Ramon Services District and California Water Service Company.

As an urban water provider, Zone 7 every five years prepares an Urban Water Management Plan aimed at analyzing and planning for a reliable water supply over a 20-year planning horizon considering normal, dry and multiple dry years.

This is to notify the public that at its meeting to begin at 7 p.m. on December 15, 2010, the Zone 7 Water Agency Board of Directors plans to conduct a public hearing on, and consider adoption of, the Agency's Draft Urban Water Management Plan as required under Section 10610 et seq. of the California Water Code. The hearing will be held at Zone 7 Administrative Offices, 100 North Canyons Parkway, Livermore.

A copy of the Draft Urban Water Management Plan is available for public review at the Zone 7 Water Agency office at 100 North Canyons Parkway in Livermore, on the website, www.zone7water.com, and at the following local libraries:

Livermore Public Library
1188 South Livermore Ave., Livermore

Pleasanton Public Library
400 Old Bernal Ave., Pleasanton

Alameda County Public Library in Dublin
200 Civic Plaza, Dublin

Public comment will be welcome at the hearing and you are encouraged to comment before then, if possible, by contacting Amparo Flores at aflores@zone7water.com**.** If you have any questions regarding this notice, contact Boni Brewer, Public Information Officer, at (925) 454-5015.

NOTICE OF PUBLIC HEARING AND PUBLIC REVIEW PERIOD
Urban Water Management Plan

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200 Civic Plaza, Dublin

Public comment will be welcome at the hearing and you are encouraged to comment before then, if possible, by contacting Amparo Flores at aflores@zone7water.com. If you have any questions regarding this notice, contact Boni Brewer, Public Information Officer, at (925) 454-5015.

TVH#3746321
Nov 8, 15, 2010

NOTICE OF PUBLIC HEARING AND PUBLIC REVIEW PERIOD
Urban Water Management Plan

Zone 7 Water Agency is a water wholesaler serving more than 200,000 people in Pleasanton, Livermore, Dublin and the Dougherty Valley area of San Ramon. It sells treated water to four retailers: the City of Pleasanton, City of Livermore, Dublin San Ramon Services District and California Water Service Company.

As an urban water provider, Zone 7 every five years prepares an Urban Water Management Plan aimed at analyzing and planning for a reliable water supply over a 20-year planning horizon considering normal, dry and multiple dry years.

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400 Old Bernal Ave., Pleasanton

Alameda County Public Library in Dublin
200 Civic Plaza, Dublin

Public comment will be welcome at the hearing and you are encouraged to comment before then, if possible, by contacting Amparo Flores at aflores@zone7water.com. If you have any questions regarding this notice, contact Boni Brewer, Public Information Officer, at (925) 454-5015.

PT/VT#3746311
Nov 8, 15, 2010

Appendix C

Board Resolution No. 11-4058: Adoption of the 2010 UWMP

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
BOARD OF DIRECTORS

RESOLUTION NO 11-4058

INTRODUCED BY DIRECTOR PALMER
SECONDED BY DIRECTOR QUIGLEY

Adoption of the 2010 Urban Water Management Plan, Including the Water Shortage Contingency Plan

WHEREAS, the Assembly Bill, commonly known as the Urban Water Management Planning Act (Water Code Division 6, Part 2.6, Sections 10610 through 10650), requires all urban water purveyors serving more than 3,000 customers either directly or indirectly, or more than 3,000 acre-feet of water annually, to prepare and submit a plan, or plan update, once every five years; and

WHEREAS, said plan is for the purpose of evaluating and developing water management policies to achieve conservation and efficient use of urban water supplies; and

WHEREAS, Zone 7 Water Agency is the overall water management agency for the Livermore-Amador Valley, including the cities of Dublin, Livermore, Pleasanton and a portion of San Ramon; and

WHEREAS, Zone 7 Water Agency's 2005 Urban Water Management Plan was approved by the California Department of Water Resources in early 2006; and

WHEREAS, Zone 7 Water Agency has prepared and circulated for public review an updated Draft 2010 Urban Water Management Plan, which includes the required Water Shortage Contingency Plan; and

WHEREAS, a public hearing regarding the Draft 2010 Urban Water Management Plan was properly noticed and held to receive comments.

NOW, THEREFORE, BE IT RESOLVED that the Draft 2010 Urban Water Management Plan be approved as the 2010 Urban Water Management Plan for Zone 7 Water Agency; and

BE IT FURTHER RESOLVED that Zone 7 reaffirms its commitment to maintain the long-term reliability of its water supply; and

BE IT FURTHER RESOLVED that the 2010 Urban Water Management Plan be filed with the California Department of Water Resources.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS FIGUERS, GRECI, MACHAEVICH, MOORE, PALMER, QUIGLEY, STEVENS

NOES: NONE

ABSENT: NONE

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a Resolution adopted by the Board of Directors of Zone 7 of Alameda County Flood Control and Water Conservation District on

December 15, 2010

By _____
President, Board of Directors

Appendix D

Board Resolution 04-2662: Reliability Policy

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BOARD OF DIRECTORS

RESOLUTION NO 04-2662

INTRODUCED BY DIRECTOR MARCHAND
SECONDED BY DIRECTOR CONCANNON

Reliability Policy for Municipal & Industrial Water Supplies

WHEREAS, the Zone 7 Board of Directors desires to maintain a highly reliable Municipal and Industrial (M&I) water supply system so that existing and future M&I water demands can be met during varying hydrologic conditions; and

WHEREAS, the Board has an obligation to communicate to its M&I customers and municipalities within its service area the ability of the Zone's water supply system to meet projected water demands.

WHEREAS, the Board on May 15, 2002 adopted Resolution No. 02-2382 setting forth its Reliability Policy for Municipal & Industrial Water Supplies; and

WHEREAS, the Zone's current water supply policy includes a provision for a valley-wide groundwater production capability to meet 75% of valley-wide M&I demand in the event of an outage of the South Bay Aqueduct; and

WHEREAS, the Board desires to revise the Reliability Policy to include all Zone 7 water supply facilities and to clarify demand levels for planning purposes;

NOW, THEREFORE, BE IT RESOLVED that the Board hereby rescinds Resolution No. 02-2382 adopting the May 15, 2002 Reliability Policy for Municipal & Industrial Water Supplies; and

BE IT FURTHER RESOLVED that the Board hereby adopts the following policy goals regarding reliability[1] to guide the management of the Zone's M&I water supplies as well as its Capital Improvement Program (CIP)[2]:

GOAL 1. Meet 100% of its treated water customers water supply needs in accordance with Zone 7's most current Contracts for M&I Water Supply, including existing and projected demands for the next 20 years as specified in Zone 7's Urban Water Management Plan, (UWMP), which will be coordinated with Zone 7's M&I water Contractors. Zone 7 will endeavor to meet this goal during an average water year[3], a single dry water year[4], and multiple dry water years[5], and

GOAL 2: Provide sufficient treated water production capacity and infrastructure to meet at least 75% of the maximum daily M&I contractual demands should any one of Zone 7's major supply, production or transmission facilities experience an extended unplanned outage.

BE IT FURTHER RESOLVED that to ensure that this Board policy is carried out effectively, the Zone 7 General Manager will provide a water supply status report to the Board every five years with the Zone 7 Urban Water Management Plan that specifies how these goals can be, or are being, achieved.

If the General Manager finds that the goals might not be met, then the Board will hold a public hearing within two months of the General Manager's finding to consider remedial actions that will bring the Zone into substantial compliance with the stated reliability goals. Remedial actions may include, but are not limited to, voluntary conservation or mandatory rationing to reduce water demands, acquisition of additional water supplies, and/or a moratorium on new water connections. After reviewing staff analyses and information gathered at the public hearing, the Board shall, as expeditiously as is feasible, take any additional actions that are necessary to meet the reliability goals during the following five-year period; and

BE IT FURTHER RESOLVED that the Zone 7 General Manager shall prepare an Annual Review of the Sustainable Water Supply Report which includes the following information:

(1) An estimate of the current annual average water demand for M&I water as well as a five-year projection based on the same information used to prepare the UWMP and CIP;

(2) A summary of available water supplies[6] to Zone 7 at the beginning of the calendar year;

(3) A comparison of current water demands with the available water supplies; and

(4) A discussion of water conservation requirements and other long-term water supply programs needed to meet Zone 7 M&I water demands for a single dry water year and multiple dry years, as specified in the Zone's UWMP.

A summary of this review will be provided to M & I customers.

Definitions

[1]**Reliability**—the ability of a water supply system to provide water during varying hydrologic conditions without the need for reductions in water use.

[2]**Capital Improvement Program (CIP)**—the CIP is the Zone's formal program for developing surface and ground water supplies, along with associated infrastructure, including import water conveyance facilities, surface water treatment plants, groundwater wells, and M&I water transmission system to meet projected water demands.

[3]**Average water year**—the statistical average quantity of water from all of the water supplies available to Zone 7 on a contractual or legal basis (e.g., surface water runoff to Del Valle reservoir), based on the historical hydrologic records available to Zone 7.

[4]**Single dry water year**—for the purposes of meeting the requirements of the UWMP, the Zone 7 staff will identify and justify the selection of a calendar year from the historic record that represents the lowest yield from all normally contracted or legally available supplies.

[5]**Multiple dry water years**—for the purposes of meeting the requirements of the UWMP, the Zone 7 staff will identify and justify the selection of three or more consecutive dry years from the historic record that represent the lowest yields from all normally contracted or legally available supplies.

[6]**Available water supplies** consist solely of (1) water supplies that the Zone 7 has contracted for (e.g., listed under Schedule A of the State Water Contract, dry-year water options, special contracts with other water districts, etc.) and (2) water actually stored in surface and subsurface reservoirs.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS CONCANNON, GRECI, KOHNEN, MARCHAND, QUIGLEY

NOES: NONE

ABSENT: DIRECTORS KALTHOFF, STEVENS

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a resolution Adopted by the Board of Directors of Zone 7 of Alameda County Flood Control and Water Conservation District on

August 18, 2004

By

Vice President, Board of Directors

Appendix E

Summary of Potential Water Supply Options Being Considered in the 2010 Water System Master Plan

Appendix E. Summary of Potential Water Supply Options Being Considered in the 2010 Water System Master Plan

Water Supply Option or Strategy	Availability[a]	Dry Year Yield[b]		Average Annual Yield[c]		Peak Day Capacity, mgd[d]	Estimated Timing: Supply is Available to Zone 7[e]	Total Costs *(does not reflect funding source)*			Comments
		af	mgd	af	mgd			Capital Cost, $[f]	Annual Operation and Maintenance Cost, $/year[g]	Total Amortized Cost, $/acre-foot[h]	
Increase Yield from Existing Supplies											
Delta Conveyance *(increase long-term average yield of existing State Water Project contract)*	Depends on hydrologic conditions	no change	no change	15,300	13.6	0	2020 - 2030	$97,000,000 to $142,000,000	$380,000 to $420,000	$500 to $700	This project involves fixing the Delta to increase the long-term average yield from existing State Water Project contract. The additional supply from Delta Conveyance is based on an increased long-term average yield of 60% to 79%. The costs, timing, and yield are not within Zone 7's control.
Arroyo Valle Water Right *(re-operation of Lake Del Valle)*	Depends on hydrologic conditions	no change	no change	600	0.9	0	2015 - 2020	$500,000 to $1,000,000	$48,000	$140 to $200	The water supply yield is based on reoperation of Lake Del Valle - lower level to 20,000 af, instead of 25,000 af between Sep and Dec to capture more inflow. Cost is for coordination and moving EBRP intake located within the lake.
Byron Bethany Irrigation District *(maximize existing contract)*	Available during all hydrologic conditions	3,000	2.7	3,000	2.7	0	2011 - 2015	$50,000 to $100,000	$850,000	$285	Zone 7 is currently renewing its contract with BBID. Although the contract provides up to 5,000 acre-feet of water, 2,000 acre-feet has been used for planning. This supply is based on a study that will help justify the use of a higher yield from this contract. Additional O&M expenses for treating and delivery the supply every year.
New or Additional Surface Water Supplies											
Additional State Water Project Water *(increase contract above 80,619 af)*	Depends on hydrologic conditions	10% to 30% of Contract Amount	10% to 30% of Contract Amount	60% of Contract Amount	60% of Contract Amount	0	2015 - 2020	$10,000 to $12,500 per acre-foot.	$130	$840 to $1,050	The availability of water depends on price and the willingness of State Water Contractors to sell. The cost is based on historical and recent sales. Cost range based on 25% increase between last sale and time Zone 7 decides to purchase State Water Project Water (next 10 years).
Long-term Non-State Water Project Purchase, Transfer, or Contract *(not spot market water)*	Depends on hydrologic conditions	5,600	5.0	8,600	7.7	5.0	2015 - 2020	$32,000,000 to $46,000,000	$335 to $480 per af	$700 to $1,100	The availability of non-State Water Project Water transfers (e.g., a new BBID supply) depends on price and willingness of wholesale water agencies to sell. Costs are based on joint EBMUD-Zone 7 purchase of water supply and wheeling through EBMUD's Freeport Project and Distribution system.
Los Vaqueros Reservoir Expansion	Depends on hydrologic conditions	0 to 8,300	7.4	0 to 8,300	7.4	0	2015 - 2020	$32,400,000 to $212,000,000	$420,000 to $2,800,000	$330 to $2,200	Total yield to SBA contractors could be 25,000 af, or 8,300 for Zone 7. Yield ranges from 0 to 8,300 af because it is unknown whether unappropriated Delta water rights actually exist. Cost range reflects with and without Federal and State Project participation.

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Appendix E. Summary of Potential Water Supply Options Being Considered in the 2010 Water System Master Plan

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		af	mgd	af	mgd			Capital Cost, $[f]	Annual Operation and Maintenance Cost, $/year[g]	Total Amortized Cost, $/acre-foot[h]	
Stormwater Runoff and Rainfall Capture											
Arroyo Mocho Water Rights	Depends on hydrologic conditions	< 200	< 0.18	900 to 1,800	0.8 to 1.6	0	2020 - 2030	$3,800,000	$410,000	$400 to $800	This supply is a new water right on the Arroyo Mocho. The supply can only be used to recharge the local groundwater basin; there is no existing way to capture and treat the supply. Additionally, the Arroyo Mocho Diversion project must be completed before the water right can be perfected. Supply and cost range reflects the potential allocation to prior rights.
Arroyo Las Positas Water Rights	Depends on hydrologic conditions	< 200	< 0.18	800 to 1,600	0.7 to 1.4	0	2020 - 2030	$5,600,000	$412,000	$500 to $1,100	This supply is a new water right on the Arroyo Las Positas. Natural runoff from the Alkali Sink and inflow from the groundwater basin diminish the water quality in the Arroyo Las Positas during low flows. There is no existing way to capture and treat the supply; therefore, these costs only include capture for groundwater recharge. Costs assume completion of the StreamWISE diversion project for Flood Control. Supply and cost range reflects allocation to prior rights.
Tassajara and San Ramon Valley Creek runoff	--	--	--	--	--	--	--	--	--	--	Both of these creeks are located on the western edge of Zone 7's service area. At this time, there is no practical way to capture, store, or treat this supply.
End User Local Rain Capture for Recharge *(Low Impact Development)*	--	--	--	--	--	--	--	--	--	--	This supply is generated by directing onsite stormwater to vegetated or rock swales which then permeate water into the groundwater basin. Analysis indicates that a majority of applicable areas are located in Livermore. Zone 7 has not land use authority. Long-term supply planning cannot rely on end-user to implement and maintain each and every swale.
End User Local Rain Capture for Irrigation *(residential, commercial, institutional roof top capture)*	Available during all hydrologic conditions *(storage is less than yield during driest year on record)*	220 to 860	0.2 to 0.8	220 to 860	0.2 to 0.8	0	2015 - 2040	$94,000,000 to $395,000,000	$9,400,000 to $39,500,000	$73,600 to $79,300	Supply based on average roof size and storing two months of available supply, while the range depends on the ability to retrofit existing accounts with a rainwater capture system. Costs do not include regulatory oversight or inspection of the systems. It was assumed that this supply would not provide peak day capacity because there is little to no control over when customers decide to use their water. There is always a minimum amount of rainfall, so dry year supply is based on minimum historical rainfall of 5.2 inches.
Additional Non-Local Groundwater											
Transfers: Purchase of Agricultural Land	--	--	--	--	--	--	--	--	--	--	Significant institutional, legal, and political barriers would likely prevent implementing either of these two supply options. Most irrigation districts and cities would probably oppose any such activities. Consequently, these options were not evaluated as part of this analysis.
Transfers: Purchase of M&I Land	--	--	--	--	--	--	--	--	--	--	

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Recycled Water for Livermore-Amador Valley *(Water Demand Reduction for Zone 7 Water Agency)*												
City of Pleasanton	Direct use (without Storage)	Available during all hydrologic conditions	1,400	1.2	1,400	1.2	2.4	2015 - 2020	$14,100,000	$1,000,000	$1,500	This project would treat the City's secondary effluent to meet irrigation demands without storage. City of Pleasanton has no facilities; this option assumes the City constructs a new facility to treat all supplies that do not require storage. A lower cost option maybe available if the City uses DSRSD's existing facilities.
	Indirect use (with Storage)	Available during all hydrologic conditions	2,700 to 4,300	2.4 to 3.8	2,700 to 4,300	2.4 to 3.8	4.8 to 9.6	2020 - 2030	$29,000,000 to $73,900,000	$2,000,000 to $3,300,000	$1,500 to $2,000	This project would store tertiary water during shoulder months. Range is based on no new tertiary capacity required for shoulder month supply versus additional tertiary capacity, and storage in the Chain of Lakes versus storage in Sunol.
Dublin San Ramon Services District	Direct use (without Storage)	--	--	--	--	--	--	--	--	--	--	DSRSD has additional secondary effluent, but it requires storage; all summer month supply is fully allocated.
	Indirect use (with Storage)	Available during all hydrologic conditions	6,200	5.5	6,200	5.5	11.0	2020 - 2030	$66,600,000 to $91,500,000	$4,700,000	$1,500 to $1,800	This project would store tertiary water during shoulder months. DSRSD has sufficient capacity today to treat all of their shoulder month supply. The cost range reflects storage in the Chain of Lakes versus storage in Sunol.
City of Livermore	Direct use (without Storage)	Available during all hydrologic conditions	2,000	1.8	2,000	1.8	3.6	2015 - 2020	$20,100,000	$1,500,000	$1,500	This project would expand the City's system to treat additional water for delivery in the summer months. Pipeline costs do not include retrofits.
	Indirect use (with Storage)	Available during all hydrologic conditions	4,500 to 6,800	4.0 to 6.1	4,500 to 6,800	4.0 to 6.1	8.0 to 12.2	2020 - 2030	$48,400,000 to $106,000,000	$3,400,000 to $5,200,000	$1,500 to $1,900	This project would store tertiary water during shoulder months. Range is based on no new tertiary capacity required for direct use versus additional tertiary capacity and storage in the Chain of Lakes versus storage in Sunol.
End User Greywater Reuse for Residential Irrigation		Available during all hydrologic conditions	1,200 to 7,800	1.1 to 7.0	1,200 to 7,800	1.1 to 7.0	2.2 to 14.0	Builds up over time from 2015 to buildout	$20,000,000 to $143,000,000	$3,000,000 to $21,000,000	$3,700 to $4,000	This project involves capturing greywater from sinks, showers, bathtubs, and washing machines, filtering it, and using it for irrigation of lawns and gardens. Yield depends on retrofit of existing homes versus only new development. Additional analysis would be required to evaluate the potential impacts on water quality.
Groundwater Injection: Recycled Water *(recharge groundwater basin with recycled water treated with reverse osmosis technology)*		Available during all hydrologic conditions	Additional Supply in Main Basin: 2,800 af/yr	Additional Supply in Main Basin: 2.5	Additional Supply in Main Basin: 2,800 af/yr	Additional Supply in Main Basin: 2.5	0	2015 - 2020	$21,500,000 to $34,200,000	$1,400,000	$1,100 to $1,500	This project involves injecting treated recycled water into the Main Basin to increase local storage supply. Costs include rehabilitation of exiting RO unit, a new pipeline for Zone 7's Demineralization Facility, and a new injection well. Additional analysis required to verify travel distance/timing from existing potable production wells. Cost range reflects uncertainty of RO rehabilitation, cost to purchase secondary effluent, and Livermore participation.

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Water Supply Option or Strategy	Availability[a]	Dry Year Yield[b]		Average Annual Yield[c]		Peak Day Capacity, mgd[d]	Estimated Timing: Supply is Available to Zone 7[e]	Total Costs *(does not reflect funding source)*			Comments
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Agricultural Waste Stream Reuse	Available during all hydrologic conditions	< 100	< 0.1	< 100	< 0.1	> 0.2	--	--	--	--	A cursory review of potential water supply savings from reuse of process wastewater and residual capture of stormwater runoff at the five largest vineyards indicates that the savings are within the rounding error of future water supply needs (e.g., < 100 acre-feet). Although the savings may be significant for an individual grower, they are significantly smaller than the projected need of the Livermore-Amador Valley.
Commercial/Industrial Waste Stream Reuse	--	--	--	--	--	--	--	--	--	--	This water supply option would likely be implemented through water conservation programs, including SBX7-7; therefore, this option was not evaluated as part of this analysis.
Purchase Existing Well to Increase Recycled Water Supply in Summer Months (Yara Yara Well)	Available during all hydrologic conditions	280	0.25	280	0.25	0.75	2011 - 2015	$4,500,000	$28,000	$1,270	This project involves purchasing an existing well, located on the fringe of the Fringe Basins, and using this well to offset peak irrigation recycled water demands. Discussions with Zone 7 Groundwater staff indicate that the well would not likely be able to sustain 0.75 mgd for very long given its location in the Tassajara Formation and outside of any of the Fringe Basins. Cost assumptions based on meetings with Zone 7's water supply retailers and discussions with Zone 7's O&M Staff. The costs do not include additional piping required to add the well to DSRSD's recycled water system. Assumes the well is used at 0.75 mgd for 122 days per year.
Desalination											
Bay Area Regional Desalination Project	Available during all hydrologic conditions	5,150	5	5,150 to 9,800	5 to 8.7	5	2015 - 2020	$67,900,000	$2,680,000 to $5,100,000	$1,200 to $1,600	Based on discussions with the BARD Project member agencies and recent feasibility and pilot testing results. Participation would be subject to member agency approval.
ACWD Entitlement Exchange	Available during all hydrologic conditions	4,100	3.7	4,100	3.7	0 to 3.7	2020 - 2025	$70,000,000	$4,000,000	$2,200	This water supply option includes construction of a phase 3 desalination facility for ACWD, and in exchange for another supply either along the South Bay Aqueduct or the Hetch-Hetchy Aqueduct (e.g., Table A Water) at 80% of yield.
Demineralization of Groundwater											
Fringe Basin Development *(including Mocho Sub basin I)*	--	--	--	--	--	--	--	--	--	--	Per discussions with Zone 7 groundwater staff, potential yields from the fringe basins are extremely low, and any water pumped would likely require demineralization. A significant amount of additional study would be required to establish potential yields and costs.

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			af	mgd	af	mgd			Capital Cost, $[f]	Annual Operation and Maintenance Cost, $/year[g]	Total Amortized Cost, $/acre-foot[h]	
Operational Improvements												
Loss Reduction	Reduce Mocho Demineralization Losses (20% to 15%)	Available during all hydrologic conditions	260	0.23	260	0.230	0	2011 - 2015	$100,000	$0	$30	Influent water quality test results collected during design were less than the detection limit; consequently, the detection limit was used to design the brine waste (20%). This water supply project assumes a new study is conducted that reviews actual water quality results that recommend reoperation of the demineralization facility with only 15% losses instead of 20% losses.
	Reduce Unaccounted-for Water Losses	Available during all hydrologic conditions	1,300	1.1	1,300	1.1	2.2	2011 - 2015	$500,000	$100,000	$100	Historical records indicate that unaccounted-for water losses were less than 2% between 1995 and 2002. After 2002, unaccounted-for water losses increased to about 4% on average. This water supply project assumes a new study is conducted that reviews and corrects this increase.
	Reduce Well Startup Waste	Available during all hydrologic conditions	< 100	< 0.1	< 100	< 0.1	0	--	--	--	--	A cursory review of potential water supply savings from capture of water discharged to waste during each startup of existing groundwater wells indicates that the savings are within the rounding error of future water supply needs (e.g., < 100 acre-feet).
	Capture Gravel Mining Exports	Available during all hydrologic conditions	3,500 af of groundwater storage saved.	3.0 of groundwater storage saved.	3,500 af of groundwater storage saved.	3.0 of groundwater storage saved.	0	2011 - 2015	$140,000 to $700,000	$11,000 to $700,000 *(larger cost due to equipment rental)*	$7 to $220 per acre-foot of groundwater storage	Estimates completed by Zone 7 staff indicate that mining exports associated with gravel quarry operations could increase to as high as 3,500 acre-feet per year over the next 10 years or beyond. This project captures these exports and stores the water for recharge. Some of the methods proposed to capture the exports may require the use of Lake H, which does not become Zone 7's until sometime after 2014.
	Reduce Cawelo and Semitropic Losses	--	--	--	--	--	--	--	--	--	--	The planned-losses associated with use of Zone 7's non-local storage are specified in contracts, and in the case of Semitropic Water Storage District, involve many different parties. The institutional and political hurdles to changing assumed losses are significant, and likely insurmountable.

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			af	mgd	af	mgd			Capital Cost, $[f]	Annual Operation and Maintenance Cost, $/year[g]	Total Amortized Cost, $/acre-foot[h]	
Recharge Capacity	In-Lieu Recharge of Main Basin per Existing Contracts	Depends on hydrologic conditions	0	0	Additional Recharge in Main Basin: 500 to 830 af/yr	Additional Recharge in Main Basin: 0.4 to 0.7	0	2011 - 2020	$200,000	$40,000 to $66,400	$100 to $110 per acre-foot of additional storage	Zone 7 currently practices in-lieu recharge activities within its own operations. Per existing contracts with Zone 7's retailers, Zone 7 has the option of implementing in-lieu recharge activities associated with the use of their groundwater pumping quotas. Although this project does not provide new water supplies, it does increase the rate at which drought storage can be recovered during a drought or replenished during drought recovery - both reduce the chance of a shortage.
	Aquifer Storage and Recovery in Main Basin	Depends on hydrologic conditions & system capacity	0	0	Additional recharge in Main Basin: 3,000 af/yr	Additional Supply in Main Basin: 2.7	0	2015 - 2020	$2,400,000	$600,000	$260 per acre-foot of additional storage	The purpose of this project is to increase Zone 7's ability to conjunctively use the local groundwater basin through injection of treated surface water. This project is likely a back-up in case recharge within the Chain of Lakes is limited. Costs reflect additional analysis and study to correct clogging issues experienced by Zone 7 during previous attempts to implement an ASR program, and only include retrofit of Chain of Lakes 1 and 2.
	In Stream Infiltration Swale/Wetlands	Depends on hydrologic conditions	0	0	Additional Supply in Main Basin: 830 af/yr	Additional Recharge in Main Basin: 0.7	0	2015 - 2020	$7,800,000	$1,560,000	$2600 per acre-foot of additional storage	The purpose of this project is to enhance Zone 7's ability to recharge imported surface water through the Arryou Mocho. This project is likely a back-up in case recharge in the Chain of Lakes is limited. The project is limited to Arroyo Mocho because recharge capacity in Arroyo Valle starts downstream of the Chain of Lakes.
	Chain of Lakes Diversion *(Arroyo Mocho)*	Facility - not supply.	0	0	Additional Supply in Main Basin: 3,000 af/yr	Additional Supply in Main Basin: 2.7	0	2015 - 2020	$2,000,000	$410,000	$180 per acre-foot of additional storage	Water supply yield is based on estimated evaporative loss reduction once the diversion structure is installed. The intended purpose of the project is to increase Zone 7's artificial recharge capacity in the main groundwater basin, which increases the rate at which storage reserves are replenished during drought recovery - both reduce the chance of a shortage.
	Chain of Lakes Diversion *(Arroyo Valle)*	Depends on hydrologic conditions	0	0	3,800	3.4	0	> 2030	$5,000,000	$250,000	$160	After mining of Lake A is completed, sometime around 2030, Zone 7 will have the ability to capture flood releases from Lake Del Valle and store those releases in the Chain of Lakes. This supply can only be used to recharge the local groundwater basin; there is no existing way to capture and treat the supply for direct use. Zone 7 would likely need to construct fish screens and obtain any required reoperation permits.
	Intertie with EBMUD or SFPUC	Facilitates wheeling of 5,600 af	Facilitates wheeling of 5 mgd	Facilitates wheeling of 8,600 af	Facilitates wheeling of 7.7 mgd	up to 10 mgd	Facilitates wheeling of 8,600 af	2015 - 2020	$18,000,000 to $35,000,000	$100,000	$160 to $310	This project involves constructing a new intertie with EBMUD, SFPUC, or both. The intertie would help Zone 7 take delivery of excess supplies during normal and wet years, and then provide water to the participating agency during dry years. These costs are included in the costs of either the non-SWP water transfer or the Bay Area Regional Desalination Project.

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Water Conservation											
SBX7-7 *(20% by 2020)*	Available during all hydrologic conditions	3,000 to 7,000	2.7 to 6.2	3,000 to 7,000	2.7 to 6.2	5.4 to 12.5	2015 - 2020	Depends on the methodology used by each water supply retailer.	Depends on the methodology used by each water supply retailer.	Depends on the methodology used by each water supply retailer.	In November 2009, the California legislature passed SBX 7-7, which requires Water Retailers to reduce baseline per capita demands by 20% by 2020. The purpose of this project is to capture potential savings from this new law. Estimates are based on analysis conducted by Zone 7 staff using the new requirements, and represent conservative estimates.

[a] Availablility refers to the hydrologic conditions the water supply is available.
[b] DRY YEAR YIELD: The supply available during single dry or multiple dry years.
[c] AVERAGE YIELD: The long-term average supply available over various hydrologic conditions.
[d] Capacity available to help meet maximum day demands during the summer months. Unless limited by facilities, based on a peaking factor of 2.0 times the average supply.
[e] Potential timing is the projected years that the supply would become available to Zone 7, after planning, design, CEQA, and construction.
[f] Capital costs include all of the additional one-time costs to obtain, convey, treat, and deliver the water supply.
[g] Operation and Maintenance costs include all of the annual expenses necessary to maintain the supply (e.g., power and chemical costs).
[h] For comparative purposes, all costs were amortized based on 6 percent interest over a 30 year term.

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	Intertie with EBMUD or SFPUC	Facilitates wheeling of 5,600 af	Facilitates wheeling of 5 mgd	Facilitates wheeling of 8,600 af	Facilitates wheeling of 7.7 mgd	up to 10 mgd	Facilitates wheeling of 8,600 af	2015 - 2020	$18,000,000 to $35,000,000	$100,000	$160 to $310	This project involves constructing a new intertie with EBMUD, SFPUC, or both. The intertie would help Zone 7 take delivery of excess supplies during normal and wet years, and then provide water to the participating agency during dry years. These costs are included in the costs of either the non-SWP water transfer or the Bay Area Regional Desalination Project.

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[f] Capital costs include all of the additional one-time costs to obtain, convey, treat, and deliver the water supply.
[g] Operation and Maintenance costs include all of the annual expenses necessary to maintain the supply (e.g., power and chemical costs).
[h] For comparative purposes, all costs were amortized based on 6 percent interest over a 30 year term.

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Reference 6

Cope Lake Improvements & Maintenance

LIVERMORE, CALIFORNIA

FINAL

Environmental Initial Study/

Draft Mitigated Negative Declaration

Zone 7 Water Agency

January 26, 2012

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Appendix B Mitigation Monitoring and Reporting Plan

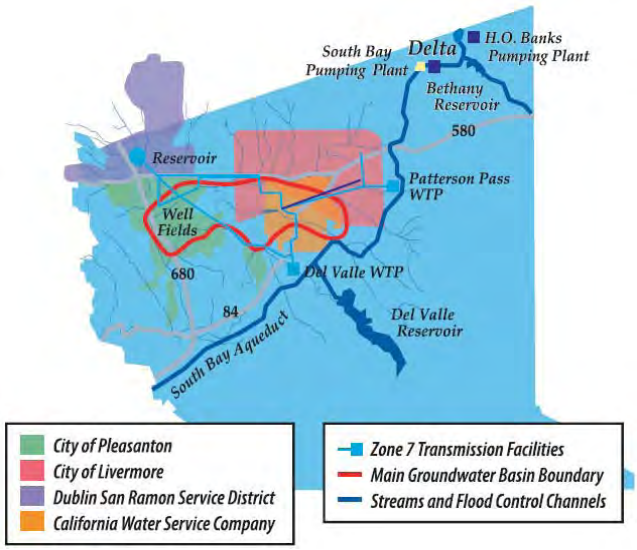
List of Abbreviations and Acronyms

CEQA	California Environmental Quality Act
IS	Initial study
MMRP	Mitigation Monitoring and Reporting Plan
MND	Mitigated Negative Declaration
PPWTP	Patterson Pass Water Treatment Plant
SWPPP	Storm Water Pollution Prevention Plan
Zone 7	Alameda County Flood Control and Water Conservation District, Zone 7

1 INTRODUCTION

1.1 Background

The Alameda County Flood Control and Water Conservation District, Zone 7 (hereinafter "Zone 7 Water Agency" or "Zone 7") is a wholesale water supplier to the cities of Livermore, Pleasanton, Dublin, and provides flood control in the eastern portion of Alameda County.



Zone 7 regularly undertakes projects involving improvement and maintenance of existing facilities, as well as construction of new facilities, and acts as Lead Agency for projects subject to the California Environmental Quality Act (CEQA). This document is a draft Initial Study /Mitigated Negative Declaration (IS/MND) for the Cope Lake Improvements Project (Project). The Zone 7 Board of Directors will consider the information in the IS/MND at a public meeting, and will decide to adopt or reject the findings.

The Delta supplies Zone 7 with roughly 80% of its water supply, the remaining comes from local rain runoff stored at Lake Del Valle and from groundwater pumped from the Valley's groundwater basin. Zone 7 serves as the primary manager of the local groundwater basin.

The Livermore-Amador Valley Groundwater Basin is located in Alameda County including the cities of Pleasanton, Livermore, and Dublin. Zone 7 is the groundwater basin manager of the Livermore-Amador Valley Groundwater Basin. In, roughly, the center of the groundwater basin is an area actively being mined for sand and gravel. Pursuant to the 1981 Livermore-Amador Valley Quarry Area Reclamation Specific Plan, the gravel quarries are required to turn over a series of mined pits to Zone 7 as mitigation for removing aquifer material from the groundwater basin. These pits (Lakes A-I and Cope Lake) will be connected to form a chain of lakes that could be used for water management including water storage, conveyance, stormwater detention or groundwater recharge.

Zone 7 currently owns and manages Lake I and Cope Lake. Lake H is scheduled to be dedicated to Zone 7 in November 2014. Zone 7 may lease other lakes within the Chain of Lakes prior to taking ownership. Pursuant to an agreement, Vulcan Materials Company, the gravel mining company, and Zone 7 agreed that the Vulcan would discharge water into Lake I when it has capacity to capture and store such water.

1.2 Purpose and Need for the Project

Cope Lake is a former silt pond that was used by the quarry operator to let fines settle out of the processing water. As a result, the lake bottom and sides are lined with silt and the lake does not communicate with the groundwater. Cope Lake was given to Zone 7 in an "as is" condition because it was not originally part of the established Chain of Lakes. There are some improvements that need to be made to Cope Lake to make it functional for future water management operations. These include:

- Drainage - grading, hydroseeding, concrete lined v-ditches, trenching, installation of drain pipe and drain inlets;
- Upper embankment slope layback – cutting back the slope to 2:1, removing cut material and placing in low lying areas or in lower slope as part of slope repair, hydroseeding; and
- Lower slope repair and stabilization – grading, cutting back slope, placing fill, erosion control measures.

As part of the groundwater basin management, Zone 7 uses surface water to recharge the groundwater basin to store for future pumping. As part of their mining operations Vulcan Materials, Inc. (Vulcan) pumps groundwater from actively mined pits. Vulcan currently discharges this water to the Arroyo Mocho under a National Pollutant Discharge Elimination System (NPDES) permit issued by the California Regional Water Quality Board, San Francisco Bay Region. A small amount of the discharge water is recharged back into the groundwater basin through the stream bottom but most of it flows out of the groundwater basin and out to the Bay. To reduce the amount of water leaving the groundwater basin, a pipeline will be installed from Vulcan's current discharge point, in the Arroyo Mocho, and into Lake H, I or Cope Lake. If this water is discharged into Cope Lake, the water would eventually be transferred to Lake I so that it can percolate through the gravel slopes of Lake I and recharge the groundwater basin.

The Cope Lake improvements and maintenance activities will be phased and coordinated due to their close proximity to each other.

1.3 Environmental Review

Zone 7, acting as the Lead Agency under CEQA, prepared this document to provide information about the potential environmental effects of the Proposed Project.

Pursuant to CEQA, the purpose of an Initial Study is to:

- determine whether the project may have a significant effect on the environment (i.e. whether an Environmental Impact Report (EIR) or an Negative Declaration should be prepared);
- identify measures that mitigate project impacts to a less than significant level (mitigated negative declaration);
- determine scope of the EIR, if one is required:
- justify the lead agency's decision to adopt a Negative Declaration, if one is prepared; and
- determine whether to rely on a previously prepared EIR.

According to CEQA, a public agency shall prepare or have prepared a proposed negative declaration or mitigated negative declaration for a project subject to CEQA when:

a) The initial study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or

b) The initial study identifies potentially significant effects, but:

    1) revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review

would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and

2) there is no substantial evidence, in light of the whole record before the agency, that the project as revised may have significant effect on the environment.

Upon completion of the Initial Study, Zone 7 identified potentially significant impacts and corresponding mitigation to reduce these impacts to a level that is considered less than significant. Zone 7 prepared this Mitigated Negative Declaration to provide the public, and Responsible and Trustee Agencies reviewing this project, with information about the Project and potential effects on the local and regional environment. This Mitigated Negative Declaration was prepared in compliance with Section 15070 of the CEQA Guidelines of 1970 (as amended). In accordance with Section 15073 of the CEQA Guidelines, this document was circulated to applicable local, state and federal agencies and to interested organizations and individuals who may wish to review and comment on the report.

1.4 Project Approvals

The CEQA review process is intended to provide responsible agencies with an opportunity to provide input into the project in order to assist with their responsibilities. Responsible agencies are those that have some responsibility or authority for carrying out or approving a project; in many instances these public agencies must make a discretionary decision to issue a permit; provide right-of-way, funding or resources to the project.

The following are the permits and approvals (and approving entity) needed for this Project:

- CEQA (Zone 7 Board of Directors)

1.5 Public Review Process

This MND will be circulated to local, state and federal agencies, interested organizations and individuals who may wish to review and provide comments on the project description, the proposed mitigation measures or other aspects of the report. The publication will commence a minimum 30-day public review period consistent with CEQA Guidelines §15105(b) beginning on December 19, 2011 and ending on January 20, 2012.

The draft IS/MND and all supporting documents are available for review at the following locations:

Zone 7 Water Agency
100 North Canyons Parkway
Livermore, CA 94551

Livermore Public Library
1188 South Livermore Avenue
Livermore, CA 94550

It will also be posted online at www.zone7water.com. Written comments or questions regarding the draft IS/MND are due by **5 p.m. on January 20, 2012**, and should be submitted to:

Zone 7 Water Agency
Attn: Mary Lim, Associate Water Resources Planner
100 North Canyons Parkway

Livermore, CA 94551
Or, via e-mail to mlim@zone7water.com

Zone 7 will consider all comments and make any necessary changes to the document prior to adoption of the final Mitigated Negative Declaration by the Board of Directors.

2 PROJECT DESCRIPTION & CONSTRUCTION

2.1 Project Location

The project is located in Alameda County between the cities of Livermore and Pleasanton off the El Charro Road exit, on the south side of Interstate 580 (Figure 1). The entire site is located within the Alameda Creek Watershed. The project area is in Unincorporated Alameda County and is bound to the north, south, east and west, respectively by the Arroyo Mocho, Pleasanton City Limit, Arroyo Mocho, and the quarry haul road. The only major streams in the area are the Arroyo Mocho and its tributary, the Arroyo Las Positas.

Figure 1. Project Location

2.2 Proposed Facilities

The Cope Lake slope repairs portion of the project includes installing concrete lined v-ditches, trenching, up to three 12 to 18-inch high density polyethylene (HDPE) drain pipes and drain inlets to improve drainage. See Figure 2.

The Vulcan discharge pipeline project includes installing a 24-inch HDPE pipeline. This pipeline will be connected to the existing discharge outfall, which is located at the Arroyo Mocho, and will connect to Lake H, I or Cope Lake. The pipeline shall be designed to protect the lake slope from eroding as a result of the discharge flow (e.g. energy dissipater). See Figure 3 for three possible alignments for the discharge pipeline. The chosen alignment and the timing of the pipeline installation will depend upon the timing of the Cope Lake slope repairs and availability of Lake H.

Figure 2. Cope Lake Slope Repairs

Figure 3. Vulcan Discharge Pipeline – Proposed Pipeline Routes

2.3 Construction Activities

2.3.1 Project Sequencing and Schedule

Project construction can commence only after adoption of this CEQA document and project approval by Zone 7's Board of Directors. Construction for the Cope Lake slope improvements is anticipated to commence in summer~~May~~ 2012 and could occur in phases depending upon extent of repairs needed around the lake. Slope repairs will take approximately 3 to 6 months, on average. In order to minimize impacts to the resident, located nearby, construction will generally occur during normal working hours, or 8 a.m. to 5 p.m., Monday through Friday. Work on the weekend is not anticipated. Installation of the Vulcan discharge pipeline will depend upon the chosen alignment and would take approximately six weeks to install.

2.3.2 Site Clearing/Grading and Trenching

Cope Lake Slope Repair

The Cope Lake slope repair activities will require that the existing vegetation on the upper surface will be cleared and grubbed for grading. Following clearing and grubbing, the surface will be graded a minimum of 2% towards a constructed concrete curb and gutter, V-ditch, or other drainage conveyance. In areas where there are sink holes, the slope may be laid back 2:1 or filled and compacted, depending on the severity of the sinkhole and proximity to the top of erosion. Once the drainage system is in place, it will convey the runoff to a low point with a flared end section, which will transport the runoff to the discharge line. A portion of the upper slope will be laid back at least 2:1 for the drainage line to run down the upper slope, over the access road and into Cope Lake via an HDPE pipe (up to three 12 – 18" diameter pipes). In order to install the drainage system, a narrow trench will need to be excavated.

Vulcan Discharge Pipeline

A pipeline will be constructed from Vulcan's existing discharge outfall at the Arroyo Mocho and will be connected to Lake H, I and/or Cope Lake. Pipeline installation will involve clearing and grubbing. The pipeline will primarily be aboveground. There will be grading in areas where sharp drops will need to be leveled off to accommodate the pipeline. Trenching will be required for the areas where the pipeline goes underground. In addition, sink holes will be filled in along the pipeline route.

2.3.3 Truck Trips and Haul Route

There will be some soil transport to and from the Project site during the Cope Lake slope repair project. Truck traffic will be minimal since excavated dirt will, as much as possible, be spread out around the project area. There is also the possibility for limited trips to and from the site by concrete trucks for various portions of the work. Site access routes are shown in Figure 2 above.

2.3.4 Construction Equipment and Workers

The following construction equipment is anticipated to be used:

- bulldozer with rippers
- excavator with roller compactor or separate vibratory plate machine
- trencher
- grader
- scraper

In addition, there will be up to 10 construction workers anticipated at the construction site.

2.3.5 Post-Construction Site Cleaning and Restoration

Once the grading and drainage installations are complete on the Cope Lake improvements, the upper slope will be hydroseeded and other slope protection measures (e.g. Geomat, rip rap, etc.) will be installed in the cut section where the discharge line runs down the upper slope. Once the Vulcan discharge pipeline is installed, areas that have been cleared and grubbed will be hydroseeded, when appropriate.

3 ENVIRONMENTAL SETTING

This section provides an overview of key environmental features of the project site. Additional information is included within the topical discussions in section 4.2.

The Project site is located in an aggregate mining area in Township 3 south, Range 1 east, Sections 10, 11, and 14 in unincorporated east Alameda County. Cope Lake and Lake I are located near the south end of El Charro Road, south of Interstate 580 and north of the Western Pacific Railroad tracks, west of the City of Livermore, and east of the City of Pleasanton. The site is currently bounded by a residential development to the west, operational gravel mining to the south and east, and undeveloped land (part of the City of Livermore's El Charro Specific Plan Area) to the north.

Vegetation at the Project site includes riparian scrub, coastal scrub, and annual grassland cover. There are some eucalyptus trees and saplings on the Project site as well.

4 ENVIRONMENTAL IMPACTS AND DISCUSSION

4.1 Basic Project Information

Project Title:	Cope Lake Improvements
Lead Agency Name and Address:	Zone 7 Water Agency 100 North Canyons Parkway Livermore, CA 94551
Contact Person and Phone Number:	Ms. Mary Lim Associate Water Resources Planner, Zone 7 (925) 454-5036

Project Location:	See Section 2.0 – Project Description
General Plan Designation:	Water Management and Large Parcel Agriculture
Zoning:	Agriculture
Property Description:	The site is located in Township 3 south, Range 1 east, Sections 10, 11, and 14 in east Alameda county. Cope Lake, Lake H and Lake I are located near the south end of El Charro Road, south of Interstate 580 and north of the Western Pacific Railroad tracks, west of the City of Livermore, and east of the City of Pleasanton. The site is currently bounded by a residential development to the west, operational gravel mining to the south and east, and undeveloped land (part of the City of Livermore's El Charro Specific Plan Area) to the north.
Project Description:	The proposed activities include (1) Cope Lake slope repairs; and (2) installing a discharge pipeline from Vulcan's existing discharge point, over the Arroyo Mocho, and connecting into Lake H, I and/or Cope.
Surrounding Land Uses:	See Section 4 – Environmental Setting
Other Agencies Whose Approval is Required:	None

4.2 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture and Forestry Resources	☒ Air Quality
☒ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality
☐ Land Use/Planning	☐ Mineral Resources	☐ Noise
☐ Population/Housing	☐ Public Services	☐ Recreation
☐ Transportation/Traffic	☐ Utilities/Service Systems	☐ Mandatory Findings of Significance

☐ Transportation/Traffic ☐ Utilities/Service Systems ☐ Mandatory Findings of Significance

DETERMINATION: (To be completed by the Lead Agency)

On the basis of the initial evaluation that follows:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. A TIERED ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental document is required. FINDINGS consistent with this determination will be prepared.

Mary Lim — Dec. 19, 2011

Signature — Date

Mary Lim

Printed Name

5 Evaluation of Environmental Impacts

I. AESTHETICS Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Discussion

a.b.c.d. **No Impact.** The Project will be located in an area that is predominately industrial, specifically sand and gravel mining activities, with open space. Both the Cope Lake slope repairs and the Vulcan discharge pipeline installation will result in short-term visual impacts during construction. Construction activities would require the use of some heavy equipment. The Vulcan discharge pipeline would not alter the aesthetic quality of the surrounding area because the pipeline will lie along the ground through Cope Lake. Since the Project area is already disturbed due to decades of and ongoing mining activities, there will no potential damage to scenic resources. Therefore, there is no impact to the scenic resources or scenic highways. In addition, there are no proposed lights or building surfaces that would create a new source of substantial light. Therefore, there would be no impact related to light or glare.

II. AGRICULTURE AND FORESTRY RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project, and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion

a.b.c.d.e. **No Impact.** The Project area is considered Other Lands (quarry) in the *Alameda County Important Farmland Map*, which has been mined for gravel. The quarry lakes are part of the larger Chain of Lakes designed for water management activities in the *Reclamation Specific Plan*. Lake I and Cope Lake have already been transferred to Zone 7 as mitigation for the loss of aquifer storage associated with the quarry operations. Due to their current condition as depleted gravel mining pits, and the dedication of these pits to water management, these areas are no longer consistent with the prime agricultural soil definition. As such, there would be no impact related to loss of agricultural lands associated with implementation of the Project.

III. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐

e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

Discussion

a. **No Impact.** The most recently adopted air quality plan for the San Francisco Bay Area is the Bay Area 2010 Clean Air Plan (2010 CAP). The 2010 CAP is an update to the Bay Area Air Quality Management District (BAAQMD)'s 2005 Ozone Strategy to comply with State air quality planning requirements. The 2010 CAP also serves as a multi-pollutant air quality plan to protect public health and the climate. The 2010 CAP control strategy includes revised, updated, and new measures in the three traditional control measure categories, including stationary sources measures, mobile source measures, and transportation control measures. In addition, the 2010 CAP identifies two new categories of control measures, including land use and local impact measures and energy and climate measures (BAAQMD, 2010a). BAAQMD recommends that the agency approving a project where an air quality plan consistency determination is required, analyze the project with respect to the following questions: 1) does the project support the primary goals of the air quality plan; 2) does the project include applicable control measures from the air quality plan; and 3) does the project disrupt or hinder implementation of any 2010 CAP control measures? If all the questions are concluded in the affirmative, BAAQMD considers the project consistent with air quality plans prepared for the Bay Area (BAAQMD, 2010b).

Any project that would not support the 2010 CAP goals would not be considered consistent with the 2010 CAP. The recommended measure for determining project support of these goals is consistency with BAAQMD CEQA thresholds of significance. As presented in the subsequent impact discussions, the proposed project would result in virtually no new long-term operations-related emissions and proposed project-related construction emissions would not exceed the BAAQMD significance thresholds; therefore, the proposed project would support the primary goals of the 2010 CAP. As mentioned above, projects that incorporate all feasible air quality plan control measures are considered consistent with the 2010 CAP. There appear to be no 2010 CAP control measures that would be directly applicable to the proposed project; however, implementation of **Mitigation Measure AIR-1** (see discussion b) below) would ensure that BAAQMD basic construction control measures would be implemented.

The proposed project would support the primary goals of the 2010 CAP and it would not disrupt or hinder implementation of any 2010 CAP control measures. Therefore, there would be no impact associated with conflicting or obstructing implementation of the applicable air quality plan.

b. **Less Than Significant With Mitigation Incorporated.** Based on the following analysis, construction and operation of the proposed project would not result in a violation of an air quality standard or contribute significantly to an existing or projected air quality violation.

Lakes H, I and Cope were previously used for mining operations. There is one residence near the southeast corner of Cope Lake near/on El Charro Road adjacent to the planned improvements to Cope Lake. There are a subdivisions north and on the southeast corner of Lake I in Pleasanton that are about 3400 and 2,900 feet, respectively from the planned location of the Vulcan discharge pipeline into Lake I. Sensitive receptors are limited to these residences any future residences developed as part of the quarry reclamation.

Construction emissions would result from excavation of soil, combustion of fuel to power heavy construction equipment, delivery and haul trucks and construction worker vehicle trips. The primary

pollutants generated from construction would be NO_x (from combustion of diesel fuel) and PM-10 (from grading and excavation and vehicle travel over unpaved surfaces). Heavy-duty construction equipment used during clearing and grading would include a bulldozer with rippers and excavator with roller compactor or separate vibratory plate machine. Fugitive dust emissions would vary from day to day depending upon the level and type of activity, silt content of the soil and prevailing weather. Installation of the Vulcan discharge pipeline is estimated to take approximately six weeks.

Construction emissions would result in a temporary increase in criteria air pollutant emissions. To address this temporary increase, the following mitigation measure shall be implemented:

> **Mitigation Measure AIR-1: Implement BAAQMD Basic Mitigation Measures.** Zone 7 Water Agency and its construction contractors shall control fugitive dust emissions by implementing, as applicable, the following basic control measures based on BAAQMD recommendations:
>
> All exposed surfaces (e.g., parking areas, staging areas, soil piles, and graded areas, and unpaved access roads) shall be watered two times a day.
>
> All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
>
> All visible mud or dirt track-out onto adjacent public roads shall be removed at least once per day.
>
> All vehicle speeds on unpaved roads shall be limited to 15 mph.
>
> All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California Airborne Toxics Control Measure Tile 13, Section 2485 of California of Regulations). Clear signage shall be provided for construction workers at all access points.
>
> All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
>
> Post a publicly visible sign with the telephone number and person to contact at Zone 7 Water Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Operations: Once construction is complete, the proposed project would result in virtually no sources of air pollutants. Therefore, there would be no net change in long-term proposed project emissions compared to the baseline conditions and there would be no long-term operational impact.

c. **Less Than Significant Impact.** Based on BAAQMD guidance, if a project would result in an increase in ROG, NO_x, PM10, or PM2.5 of more than its respective average daily mass significance thresholds, then it would also be considered to contribute considerably to a significant cumulative impact. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a

project's individual emissions would be cumulatively considerable. If a project would exceed the identified significance thresholds, its emissions would be cumulatively considerable, and if a project would not exceed the significance thresholds, its emissions would not be cumulatively considerable. As presented under discussion b) above, short-term construction emissions would not exceed the applicable significance thresholds and there would be virtually no increase in long-term operational emissions. Therefore, the proposed project would not be cumulatively considerable and cumulative impacts would be less than significant.

d. **Less than Significant Impact.** The BAAQMD recommends that lead agencies quantitatively assess the incremental toxic air contaminant (TAC) exposure risk to all sensitive receptors within a 1,000-foot radius of a project's fence line. Long-term operations that would be associated with the proposed project would result in no new TAC emissions. However, proposed project construction activities would generate diesel particulate matter (DPM), which is considered to be a TAC. The majority of PM10 and PM2.5 exhaust emissions that would be generated during construction would be DPM due to the use of diesel off-road equipment.

As stated above, there is one residence near the southeast corner of Cope Lake near/on El Charro Road adjacent to the planned improvements to Cope Lake. There are a subdivisions north and on the southeast corner of Lake I in Pleasanton that are about 3400 and 2,900 feet, respectively, from the planned location of the Vulcan discharge pipeline into Lake I. Sensitive receptors are limited to these residences any future residences developed as part of the quarry reclamation. Given the anticipated relatively short period of potential exposure, TAC emissions associated with proposed project construction equipment would be sufficiently diluted and would not be substantial at the nearest residential locations. Impacts would be less than significant.

e. **Less than Significant Impact.** Diesel equipment used to construct the proposed project may emit objectionable odors associated with combustion of diesel fuel. However, these emissions would be temporary and intermittent in nature, thus odor impacts associated with diesel combustion during construction activities would be less than significant. Regarding long-term operational odors, the sewer pipeline would be located underground in an air tight closed system; therefore, there would be no expected operational odors associated with the proposed project and no long-term impact would occur.

IV. BIOLOGICAL RESOURCES Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐

b) Have a substantial adverse effect on any riparian aquatic, or wetland habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local applicable policies protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other applicable habitat conservation plan?	☐	☐	☐	☒

Discussion

The biological study area includes the project area and all accessible areas within 300 feet of aquatic habitat adjacent to the project area. This 300-foot area was included to evaluate project related effects on California red-legged frog (*Rana draytonii*). The 300-foot assessment distance was chosen over the typical 1-mile study distance for California red-legged frog because construction of the proposed project would be limited to the dry season (generally May 1 to September 30), which is a time period when California red-legged frogs typically stay within 300 feet of aquatic habitat.

Existing information on biological resources reviewed for the project includes the following:

- United States Geological Survey (USGS) Livermore 7.5-minute quadrangle (1961, photorevised 1980);
- United States Fish and Wildlife Service (USFWS) list of special-status species in the U.S. Geological Survey (USGS) 7.5-minute Livermore quadrangle (June 24, 2011);
- California Department of Fish and Game's (CDFG's) California Natural Diversity Database (CNDDB) (2011) records search for the Livermore, CA 7.5-minute USGS quadrangle;
- CDFG's CNDDB (2011) records search for special-status plant species occurrences within a 10 mile radius of the project area;
- California Native Plant Society's (CNPS's) Inventory of Rare and Endangered Plants (2011) records search for the Livermore USGS 7.5-minute quadrangle; and
- Biological Reconnaissance Report, Chain of Lakes Site, Alameda County, California (Padre Associates, Inc., 2008).

Survey Date and Personnel

Surveys that were conducted for the Project include a floristic survey, wildlife survey, and habitat mapping. A reconnaissance level survey was conducted by ICF International (formerly Jones & Stokes) biologist and botanist/ecologist on June 7, 2011. This reconnaissance level survey was intended to document existing biological resources and determine the occurrence or potential for special-status species to occur in the study area and provide an initial habitat assessment of the project area.

Existing Conditions

The biological study area is located between the cities of Livermore and Pleasanton within Alameda County, California and can be found on the USGS Livermore, CA 7.5-minute topographic quadrangle within Township 3 South, Range 1 East, Sections 10, 11 and 14. The elevation of the study area ranges from approximately 300 to 380 feet above mean sea level, and is topographically variable due to the construction of the water quality basins (i.e., Cope Lake, Lake H and Lake I), and drains from the roads and levees towards the respective basins.

Habitat Types

Eight habitat types were identified in the study area: perennial stream, riparian woodland, riparian scrub, coyote brush scrub, tamarisk scrub, non-native annual grassland, open water, and disturbed/developed areas. The boundaries of the habitat types are approximations based on visual assessment during the reconnaissance level survey. A list of the plant species observed during the reconnaissance survey of the study area is included in Appendix A.

Perennial Stream

One perennial stream, Arroyo Mocho, runs along the southeastern edge of the study area. Arroyo Mocho is a 34.7 mile long stream that traverses the cities of Livermore and Pleasanton. It is located in the Mocho subbasin of the Livermore Valley Basin, which drains to Alameda Creek, the largest of all local watersheds draining directly into San Francisco Bay (East Bay Regional Park District 2002). Approximately 0.49-acre of perennial stream occurs within the study area only, as the stream is not located within the project area. Arroyo Mocho is one of the major drainages in the Livermore Valley. Within the study area, Arroyo Mocho generally runs northwest and parallel to El Charro Road. The section of Arroyo Mocho within the study area is confined to its current alignment by high levees.

During the reconnaissance level survey conducted on June 7, 2011, Arroyo Mocho was observed flowing within the channel varying in width from 12 to 30 feet. The channel has a low gradient and has a substrate comprised predominantly of silt and sand, with some embedded gravel and cobbles. Signs of high flows were observed in the form of wrack deposition along herbaceous and woody vegetation beyond the banks but within the levees of the stream channel.

Surface water in Arroyo Mocho consists of both natural and artificial flow. Natural flow is often limited to winter and spring (wet) months. Artificial flow includes both releases from the South Bay Aqueduct made for the purposes of groundwater recharge, and releases from mining activities. The artificial releases can be sporadic, made only when water is available for groundwater recharge, or when there is ample mining activity requiring discharge of groundwater.

Riparian woodland

Approximately 3.29 acres and 0.37-acre of riparian woodland occur, respectively, within the study area and project area. The west bank of Arroyo Mocho within the study area is dominated by an overstory of gum trees (*Eucalyptus sp.*) with herbaceous vegetation such as mulefat (*Baccharis salicifolia*), poison

hemlock (*Conium maculatum*), Harding grass (*Phalaris aquatica*), smilo grass (*Piptatherum miliaceum*), and bentgrass (*Agrostis sp.*) commonly occurring in the understory. Other trees and shrubs observed in this community included California walnut (*Juglans californica*), edible ficus (*Ficus carica*), and elderberry (*Sambucus nigra ssp. caerulea*). This grove of eucalyptus trees runs above the western bank of Arroyo Mocho and along an old dirt road above the eastern side of Cope Lake. Further up on the bank and above the dirt road the overstory includes Monterey pine (*Pinus radiata*) trees. The understory in this area also changes to predominantly non-native grasses and forbs including wild oat (*Avena sp.*), ripgut brome (*Bromus diandrus*), foxtail barley (*Hordeum murinum ssp. leporinum*), Harding grass, milk thistle (*Silybum marianum*), and Italian thistle (*Carduus pycnocephalus*). The east bank of Arroyo Mocho is dominated by willows (*Salix sp.*) and Himalayan blackberry (*Rubus armeniacus*). Wildlife observed in this habitat type during the field survey includes American crow (*Corvus brachyrhynchos*), house finch (*Carpodacus mexicanus*), black phoebe (*Sayornis nigricans*), red-tailed hawk (*Buteo jamaicensis*), European starling (*Stunrus vulgaris*), and mocking birds (*Mimus polyglottos*).

Riparian Scrub

Approximately 2.70 acres and 2.37 acres of riparian scrub occur, respectively, within the study area and project area. Riparian scrub was observed along the eastern bank of Cope Lake and the banks of the peninsula that begins along the eastern bank of Cope Lake and extends midway across the lake. This vegetative type also occurs in patches along the western edge of Cope Lake. Species commonly observed in this vegetative community include several willow species (Salix sp.), tamarisk (*Tamarix ramosissima*), mulefat, Fremont cottonwood (*Populus fremontii*), and scattered coyote brush (*Baccharis pilularis*). In addition to tree and shrub species, several non-native forb species were observed in this vegetative type including wild oat, Harding grass, rattail fescue (*Vulpia myuros*), soft brome (*Bromus hordeaceus*), and Italian thistle. Wildlife observed within this habitat type consists of Pacific tree frog (*Hyla regilla*), snakefly (*raphidopteran*), black-tailed deer (*Odocoileus hemionus*), tree swallow (*Tachycineta bicolor*), and killdeer (*Charadrius vociferus*).

Coyote Brush Scrub

Approximately 1.43 acres of coyote brush scrub occur within project area, which is encompassed by the study area. The coastal scrub vegetative type was observed along the top of the peninsula extending from the eastern edge of Cope Lake and along the western edge of Cope Lake. Coyote brush was the dominant species in this vegetative type. Other species observed in this vegetative type were primarily non-native grasses and forbs including wild oat, Harding grass, red brome (*Bromus madritensis ssp. rubescens*), rattail fescue, wild mustard (*Brassica sp.*), and Italian thistle. Non-native forbs such as wild mustard and milk thistle were particularly dense in the eastern and western edges of the coyote brush scrub habitat along the peninsula. Additionally, the non-native invasive stinkwort (*Dittrichia graveolens*) was abundant in the coyote brush scrub along the western edge of Cope Lake. Wildlife observed within this habitat type consists of house sparrow (*Passer domesticus*), western scrub jay (*Aphelocoma californica*), brewer's blackbird (*Euphagus cyanocephalus*), western fence lizard (*Sceloporus occidentalis*), western dog tick (*Dermacentor occidentalis*), and deerfly (*tabanidae*).

Tamarisk Scrub

Approximately 4.31 acres and 2.36 acres of tamarisk scrub occur, respectively, within the study area and project area. Although tamarisk appears as a component of the riparian scrub vegetative type, an area in the center of the study area consists predominantly of tamarisk. According to Holland (1986), this vegetative type is characterized as a "weedy, virtual monoculture of any of several Tamarix species, usually supplanting native vegetation following major disturbance." Two hydrophytic species,

rabbitsfoot grass (FACW) and mulefat (FACW), were also commonly observed in this vegetative type. In 2008, this area was characterized as open water and non-vegetated mud flats (Padre Associates, Inc. 2008). Wildlife observed within this habitat type consists of brown-headed cowbird (*Molothrus ater*), red-winged blackbird (*Agelaius phoeniceus*), western dog tick, house sparrow, and western scrub jay.

Non-native Annual Grassland
Approximately 10.52 acres and 3.89 acres of non-native annual grassland occur, respectively, within the study area and project area. Non- native annual grassland is located along an old road running below the riparian woodland/eucalyptus grove on the eastern shore of Cope Lake, and on the east and west sides of the road running between Cope Lake and Lake I in the western portion of the study area. This vegetative type consists predominantly of non-native grasses and forbs. Dominant non-native grasses observed during the reconnaissance level survey in 2011 included ripgut brome, wild oats, Italian wild rye (*Lolium perenne ssp. multiflorum*), Harding grass, soft brome, and foxtail barley. Non-native forbs commonly observed included Italian thistle, wild mustard, milk thistle, and yellow-star thistle (*Centaurea solstitialis*). Wildlife observed in this habitat type includes black-tailed deer, western scrub jay, northern mocking bird, turkey vulture (*Cathartes aura*), and red-tailed hawk . A small number of sparsely spaced mammal burrows were observed in this habitat type, particularly near concrete structures and concrete-stabilized slopes.

Open Water
Approximately 25.31 acres and 0.49-acre of open water occur, respectively, within the study area and project area. This habitat type occurs adjacent to the study area in the middle of Cope Lake. Water depth of the lake is unknown but relatively shallow. Wildlife observed within this habitat type includes tree swallow, bufflehead (*Bucephala albeola*), mallard (*Anas platyrhynchos*), black phoebe, turkey vulture, great egret (*Ardea alba*), and Canada goose (*Branta canadensis*).

Disturbed/Developed Areas
Approximately 2.34 acres and 0.84-acre of disturbed/developed areas respectively occur within the study area and project area. Developed areas within the study area consist of a paved road and graded road shoulders along the western edge of the study area, a dirt road along the eastern side of Cope Lake, concrete rip-rap along the southeastern and a dirt boat ramp on the western edge of the study area. The developed areas in general do not provide habitat for wildlife, other than upland foraging for birds and basking habitat for reptiles.

a. **Less Than Significant With Mitigation Incorporated.** Special-status species are plants and animals that are legally protected under the California Endangered Species Act (CESA), the federal Endangered Species Act (ESA), or other regulations, as well as species considered sufficiently rare by the scientific community to qualify for such listing. For the purposes of this document, special-status species include:

- Species listed or proposed for listing as threatened or endangered under ESA (50 Code of Federal Regulations [CFR] 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the Federal Register [FR] [proposed species]);
- Species that are candidates for possible future listing as threatened or endangered under ESA;
- Species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 CCR 670.5);

- Animals fully protected in California (California Fish and Game Code Section 3511 [birds], 4700 [mammals], and 5050 [amphibians and reptiles]);
- Animal species of special concern to the California Department of Fish and Game;
- Plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.); and
- Plants considered by CNPS to be "rare, threatened, or endangered in California" (Lists 1B and 2, California Native Plant Society 2005).

Special-Status Plant Species

Based on a search of the CNDDB (2011), the CNPS Inventory (2011), and species list obtained from the USFWS, a list was compiled with special-status plant species known to occur in the project region. The study area lacks suitable habitat for most of these species, including serpentine soils and/or certain plant communities (e.g., chaparral, seeps, and vernal pools). The remaining 15 special-status plant species for which the study area may support suitable plant communities and soils are summarized in Table A.2, in Appendix A. These species were concluded to have either no potential to occur, due to lack of suitable microhabitat in the study area, or a low potential to occur, due to the highly disturbed nature of the annual grassland habitat and riparian habitat in the study area. No special-status plants were observed during the June 7, 2011 reconnaissance level survey; however, protocol-level surveys were not conducted. Because no special-status plants are likely to occur in the study area due to the lack of suitable habitat and degraded condition of the site, and because no special-status plants were observed in previous surveys, the proposed project would not be expected to affect special-status plants.

Special-Status Wildlife Species

Although much of the study area consists of disturbed habitat, it does provide potential habitat for certain special-status wildlife species. No special-status fish species occur in the project area, although central California coast steelhead have the potential to occur in Arroyo Mocho in the future. A list of potentially occurring special-status species was generated from the CNDDB records search and from the list obtained from the USFWS. These species were evaluated for their potential to occur in the study area based on the results of previous studies and the reconnaissance level assessment conducted on June 7, 2011. Table A.1, in Appendix A, presents this list of special-status wildlife species, their distributions, their general habitat requirements, and their potential to occur in the study area. Those species that have a moderate to high potential to occur in the study area and have a potential to be affected by the proposed project include the federally threatened California red-legged frog (*Rana draytonii*) and the following California state species of special concern: western pond turtle (*Actinemys marmorata*), pallid bat (*Antrozonous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), hoary bat (*Lasiurus cinereus*), western burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lainus ludovicianus*), tricolored blackbird (*Agelaius tricolor*), ferruginous hawk (*Buteo regalis*); and the California fully protected white-tailed kite (*Elanus leucurus*). The study area also provides habitat for other raptors and for migratory birds protected by the Migratory Bird Treaty Act.

Central California Coast Steelhead

Central California coast steelhead are federally listed as threatened (71 FR 834, January 5, 2006), excluding those behind man-made barriers in this watershed. Historically, steelhead have periodically occurred in Arroyo Mocho, which provides limited suitable spawning and rearing habitat in its upper reaches (Alameda Creek Alliance 2011). Currently, there are many barriers downstream of the project site both in Arroyo Mocho and surrounding tributaries such as Alameda Creek which preclude steelhead migration into the project area, or within the watershed as a whole. Also see discussion under item D.

California Tiger Salamander
The federally and state threatened California tiger salamander (*Ambystoma califoriense*) (CTS) is known to occur in the region; however the site is isolated from these occurrences. The nearest occurrence, located approximately 0.69-mile south of the study area, is separated from the project area by Stanley Road, a relatively busy main road, and active quarries. Three CTS occurrences north of the study area are all located north of Interstate 580 (I-580), which is a significant barrier to individuals from these metapopulations. Additionally, in 2008 the USFWS determined that the El Charro Specific Plan Area, located north of the site (east of El Charro Road, immediately south of Interstate 580 and northwest of the Livermore Municipal Airport), did not provide suitable habitat for California tiger salamander and did not warrant coverage under the Biological Opinion issued for that project (USFWS 2008). This determination was based on negative results from drift fence studies conducted in the Specific Plan Area in 2006 and 2007, and the fact that all records for this species are north of I-580, which was identified as a substantial barrier to dispersal to potential aquatic habitat within the El Charro Specific Plan Area. Considering this recent determination and the fact that the study area does not provide suitable aquatic habitat for California tiger salamander, this species is not expected to occur within the study area nor be affected by the proposed project.

Impacts to California Red-Legged Frog
California red-legged frog (CRLF) has been documented at five locations within two miles of the action area (CNDDB 2011). Most of these occurrences are north of I-580. In August 1997, an adult CRLF was reported in a small pool in Arroyo Las Positas, approximately 1.09 miles northeast of the action area (CNDDB 2011). No suitable breeding pools were observed in the portion of Arroyo Mocho adjacent to the study area during the June 7, 2011 field survey and the stream flow observed is expected to be too great to provide habitat for CRLF. The water basins (Cope Lake, Lake H and Lake I) within the study area represent potential aquatic habitat for CRLF and adjacent upland areas (within 300 feet) are potential upland dispersal habitat. In addition, the seasonally inundated portions of the water basins in the study area could be used by CRLF as habitat; although these areas would not necessarily be suitable aquatic habitat, they could be used as refugia. These seasonally inundated basins provide ample suitable refugia, namely crevices and soil cracks, for CRLF. In addition, CRLF could disperse throughout most of the action area during the rainy season. If CRLF are present in aquatic and upland habitats in the construction area, construction activities (i.e., staging and excavation) could result in direct impacts (i.e., loss of adult frogs). Impacts to aquatic and upland habitat would be temporary and would occur during the dry season.

Implementation of the proposed action would temporarily disturb approximately 11.25 acres of CRLF upland habitat and 0.49-acre of CRLF aquatic habitat (slope layback along Cope Lake and ground disturbance during pipeline construction). During construction in aquatic and upland areas, there is potential for CRLF to be killed by construction equipment unless avoidance measures are implemented.

Loss of habitat and potential direct effects to individual frogs are considered a potentially significant impact that can be mitigated to a less than significant level through the following mitigation measures:

> **Mitigation Measure BIO-1: Conduct an Environmental Education Program for all Construction Personnel.** Develop and implement an environmental education program for all construction personnel about the importance of on-site biological resources. The program, to be provided to all construction personnel, shall brief them on the need to avoid impacts on biological

resources—including California red-legged frog, as well as the penalties for not complying with biological mitigation requirements. All construction personnel shall be informed about the life history of federally listed species and other special status species that could occur on site; the importance of habitats for these species and the terms and conditions of the biological opinion. The construction supervisor shall ensure that any new personnel arriving to the site are briefed before they begin work.

Mitigation Measure BIO-2: Conduct a Preconstruction Survey for California Red-Legged Frog and Monitor Construction Activities within California Red-Legged Frog Habitat. To avoid and minimize impacts on CRLF, the applicant or its contractor shall retain a qualified wildlife biologist to conduct preconstruction clearance surveys for California red-legged frogs no more than 48 hours before ground disturbance anywhere within the project area. The qualified biologist also shall be responsible for monitoring all construction activities within CRLF aquatic habitat (Cope Lake and Lake I) and adjacent upland habitat (within 100 feet of the aquatic habitat). The biologist shall look for CRLF during grading, excavation, and any ground disturbing construction activities. If a CRLF is encountered during any project activities, construction shall cease until the frog is removed by a USFWS-approved biologist and relocated to nearby suitable aquatic habitat. USFWS and CDFG shall be notified within five (5) working days of any CRLF relocation.

Mitigation Measure BIO-3: Use Exclusion Fencing for Construction Activities (Including Grading) during All Seasons and Avoid Grading Activities within California Red-Legged Frog Upland Habitat during the Wet Season (October 1 to April 30). Exclusion fencing shall be placed around the project area to keep CRLF from entering the work area during all work activities. Exclusion fencing shall be in place at least 48 hours prior to construction. A biological monitor shall be on-site during fence installation. To minimize disturbance of dispersing CRLF, all grading activity within CRLF upland habitat (within 100 feet of aquatic habitat) should be conducted during the dry season (between May 1 and September 30) or before the onset of the rainy season, whichever occurs first.

Mitigation Measure BIO-4: Minimize Ground-Disturbing Activities in California Red-Legged Frog Aquatic and Upland Habitat. To minimize disturbance and mortality of CRLF in Cope Lake and Lake I, and upland habitat (within 100 feet of the aquatic habitat), the applicant or its contractor shall minimize the extent of ground-disturbing activities by minimizing the project footprint and limiting the work area to the minimum area necessary for construction.

Mitigation Measure BIO-5: Avoid and Minimize the Disturbance of Aquatic Habitat. To the extent possible, the applicant or its contractor shall minimize impacts to aquatic habitat by implementing all of the following measures:

- Construction activities in waters during the wet season (October 1 to April 30) shall be avoided.
- During construction, trees, shrubs, debris, or soils that are inadvertently deposited shall be removed in a manner that minimizes disturbance to the aquatic habitat.
- All construction-related activities shall be completed promptly to minimize their duration and resulting impacts.

- Construction inspectors shall routinely inspect protected areas to ensure that protective measures are in place and effective.
- All protective measures shall remain in place until all construction activities near the resource have been completed and shall be removed immediately following construction activities.
- An erosion control plan shall be prepared and implemented. It shall include the following provisions and protocols:

  - Discharge from dewatering operations, if needed, and runoff from disturbed areas shall be made to conform to the water quality requirements of the waste discharge permit issued by the Regional Water Quality Control Board (RWQCB).
  - Material stockpiles shall be located in non-traffic areas only. Side slopes shall not be steeper than 2:1. All stockpile areas shall be surrounded by a filter fabric fence and interceptor dike.
  - Temporary erosion control measures, such as sandbagged silt fences, shall be applied throughout construction of the proposed project and shall be removed after the working area is stabilized or as directed by the engineer. The Storm Water Pollution Prevention Plan (SWPPP) for the project shall detail the applications and type of measures and the allowable exposure of unprotected soils.

Mitigation Measure BIO-6: Inspect Exclusion Fences Daily during Construction. The biological monitor shall inspect the exclusion fences around the work area daily during construction within the action area. If ground disturbance activities are completed and the biological monitor is no longer required to monitor construction activities, an inspector trained by the biologist shall conduct the daily fence inspections for any frogs. If a frog (regardless of species) is found near a fence, work in the area shall stop, the biologist shall be notified, determine the species, and the frog shall be relocated (if found to be CRLF, then a USFWS-approved biologist shall relocate the frog) to suitable habitat outside of the work area. Fences shall be inspected according to this schedule until the fences are removed, as approved by the biological monitor or the resident inspector. The construction contractor monitor shall be responsible for maintaining the exclusion fences. The biological monitor or resident inspector shall immediately report any encroachment on fenced areas to the foreman or engineer, who shall stop construction or notify the contractor of the situation to be addressed. The biological monitor or resident inspector shall document the results of the inspections on construction monitoring log sheets, which shall be kept on file with the applicant.

Impacts to Western Pond Turtle

Western pond turtle has the potential to occur within Cope Lake and Lake I and adjacent upland areas within 300 feet of aquatic habitat. No pond turtles were observed during the June 7, 2011 reconnaissance level survey. Construction activities associated with the proposed project could result in the disturbance to or loss of western pond turtles. This impact is considered potentially significant but would be reduced to a less-than-significant level by implementation of Mitigation Measures BIO-1, BIO-3, BIO-4, BIO-6, BIO-7, and BIO-8 listed above as well as Mitigation Measure BIO-9 below. It should be noted that while Mitigation Measures BIO-1, BIO-3, BIO-4, BIO-6, BIO-7, and BIO-8 are mitigation for

impacts to CRLF, they also significantly benefit western pond turtle and partially mitigate for impacts to this species.

> **Mitigation Measure BIO-7: Conduct a Preconstruction Survey for Western Pond Turtles.** To avoid and minimize impacts on western pond turtles, the applicant or its contractor shall retain a qualified wildlife biologist to conduct a preconstruction clearance survey for western pond turtles no more than 48 hours before ground disturbance in aquatic habitats and after the exclusion fencing is installed. If turtles are observed during the survey, they shall be relocated to suitable habitat outside of the work area or as determined during coordination with CDFG. The person handling turtles shall be permitted to capture and relocate western pond turtle individuals at the time of project initiation or need to amend their CDFG collecting permit to include capture and relocation.

Other Nesting Migratory Birds and Raptors, including Western Burrowing Owl, Loggerhead Shrike, Ferruginous Hawk, Tricolored Blackbird, and White-tailed Kite

Migratory birds and raptors, including loggerhead shrike, ferruginous hawk, tricolored blackbird, western burrowing owl, and white-tailed kite may nest and forage within the study area. No nests were observed in the study area during the reconnaissance level survey conducted on June 7, 2011. The riparian woodland, especially the large eucalyptus trees, and various shrub-dominated habitats within the study area may be used for nesting by raptors and common birds, including white-tailed kites and shrikes. There is marginal nesting habitat for white-tailed kite in the disturbed annual grassland within the study area and potential foraging habitat in this same habitat type. These areas may also be used by other ground nesting migratory birds. A few burrows were observed in the disturbed annual grassland, around concrete structures, and concrete-stabilized slopes that represent suitable burrows for burrowing owl. The proposed project would impact areas of disturbed annual grassland, which may be used by ground nesting birds or western burrowing owl. The project could also disturb birds nesting in the adjacent riparian habitat. These impacts are considered potentially significant but would be reduced to a less-than-significant level by implementation of the following mitigation measure.

> **Mitigation Measure BIO-8: Conduct a Pre-construction Survey for Nesting Migratory Birds and Raptors.** A preconstruction survey for nesting raptors, special-status bird species, and migratory bird species shall be conducted by a qualified biologist. Since burrowing owl can be present during any time of the year, a survey for this species shall be conducted by a qualified biologist. Further, if construction activities are scheduled to occur during the avian breeding season (February 1-August 31), a preconstruction survey for other nesting raptors, special-status bird species, and migratory bird species shall be conducted by a qualified biologist. The survey will cover all potential nesting substrate in the study area relevant to the species being surveyed for and will be conducted no more than two weeks prior to the initiation of construction or ground disturbing activities associated with the project. If no active nests are located, then no further mitigation is necessary. If an active nest is located, a no-disturbance buffer will be established around the active nest site to avoid disturbance or destruction of the nest until after the nesting season is over or a biologist determines that the young have fledged. The extent of such a buffer will be determined by the biologist and will be influenced by the amount of noise and other disturbances, and other topographic or artificial barriers.
>
> If construction activities begin prior to the breeding season (i.e., if construction activity begins between September 1 and February 28), then only a burrowing owl survey is necessary. Once

project initiation begins, construction activities should be in full force, including, at a minimum, grading of the site and development of infrastructure. A minor activity that initiates construction but does not involve the full force of construction activities will not qualify as "pre-existing construction." Optimally, all necessary vegetation removal should be conducted prior to the breeding season so that there is no potential for nesting birds or raptors to occur in the construction area. If any birds or raptors nest in the vicinity of the project under this pre-existing construction condition, then it is assumed that they are habituating or will habituate to the construction activities. Under this scenario, the preconstruction survey still should be conducted on or after March 1 to identify any active nests in the vicinity, and active sites should be monitored by a wildlife biologist periodically until after the breeding season or after the young have fledged (usually late-June to mid-July). If active nests are identified in or immediately adjacent to the project area, then all nonessential construction activities (e.g., equipment storage, meetings, etc.) should be avoided in the immediate vicinity of the nest site; however, construction activities can proceed. If construction activities stop for more than two weeks during the avian nesting season, an additional nesting raptor and migratory bird survey shall be conducted.

Impacts to Special Status Bat Species

Bats may roost in the large eucalyptus and riparian trees that occur along Arroyo Mocho and the large trees along the maintenance road. Further, a concrete stabilized slope in the eastern portion of the study area contains a crevice that could be a suitable roost for bats. No sign of use by bats (e.g., bat guano) was observed during the field survey and no buildings are in the impact area. Bats typically develop day and maternal roosts under bridges and within buildings that are not subject to frequent and on-going disturbance (e.g., vehicle and pedestrian traffic and construction/maintenance noises from adjacent developed areas). The proposed project could directly impact potential roost sites and result in the loss of individual bats, or result in indirect impacts from the level of noise or vibration disturbance generated by the proposed project. These impacts would be considered significant, but are reduced to less-than-significant impacts to bats with the incorporation of the following mitigation measure.

Mitigation Measure BIO-9: Conduct a Preconstruction Survey for Roosting Bats. To avoid and minimize impacts to roosting bats, the applicant or its contractor shall retain a qualified wildlife biologist to conduct a preconstruction clearance survey for bats no more than 48 hours before ground disturbance associated with project implementation. If bats are observed during the survey, they shall be relocated through humane exclusion methods agreed upon with CDFG. A qualified biologist shall oversee the implementation of the exclusion process. The bat exclusion device installer shall be qualified to perform such activities.

b. **Less Than Significant With Mitigation Incorporated.** The project area extends into the riparian habitat along either side of the isthmus spanning Cope Lake, the eastern shoreline of the southern quadrant Cope Lake, and along the maintenance road the action area. Construction activities necessary for pipeline construction and slope layback within these areas could encroach on riparian vegetation. If damage to woody riparian vegetation is avoided or is minimal, this impact would be less than significant. However, implementation of Mitigation Measures BIO-1, BIO-4, and the following measures to avoid and minimize damage to riparian vegetation would further ensure that this impact is less than significant.

Mitigation Measure BIO-10: Install Construction Barrier Fencing around the Construction Area to Protect Sensitive Habitats. The applicant or its contractor shall install orange construction barrier fencing at the edge of the project area where it abuts or includes water basins and seasonally inundated areas within the project area. The fencing shall be installed before project activities are initiated, maintained throughout the construction portion of the project, and removed after construction completion.

Mitigation Measure BIO-11: Avoid and Minimize Potential Disturbance of Riparian Communities. The applicant or its contractor shall avoid and minimize potential disturbance of woody vegetation in the riparian habitat by implementing the following measures.

- The potential for long-term loss of woody riparian vegetation shall be minimized by trimming vegetation rather than removing entire woody plants. Woody plants that need to be trimmed shall be cut at least 1 foot above ground level to leave the root systems intact and allow for more rapid regeneration. Cutting shall be limited to the minimum area necessary within the construction zone. To protect nesting birds, the applicant or its contractor shall not allow pruning or removal of woody riparian vegetation between January 1 and August 31 without preconstruction surveys as required by Mitigation Measure BIO-8~~10~~.
- A certified arborist shall be retained to perform any necessary pruning or root cutting of riparian trees.

c. **No Impact.** The project is located wholly in upland areas and water basins (Cope Lake, Lake H and Lake I) and will not impact jurisdictional wetlands; therefore, implementation of the project would not result in an impact.

d. **Less Than Significant With Mitigation Incorporated.** The proposed project would temporarily interfere with wildlife species that may disperse over the isthmus that runs east-west through Cope Lake. The proposed project would occur during the summer months when upland wildlife migration is not typically active and only dissuade wildlife movement during daytime, minimizing the potential for affecting dispersing wildlife. The implementation of Mitigation Measures BIO-1 through -5, BIO-8, and BIO-9, described above, would reduce any impacts to migratory wildlife to less than significant.

Currently, the Alameda Creek Alliance is encouraging removal of barriers so steelhead can be restored to the Alameda Creek watershed and various tributaries (Alameda Creek Alliance 2011). Therefore, a review of stream gage data both upstream and downstream of the Vulcan discharge point on Arroyo Mocho, as well as on Arroyo Las Positas near its confluence with Arroyo Mocho, was completed in order to assess the role, if any, that Vulcan's mining discharges may have on potential future fish migration, such as steelhead. Complete records for three water years were reviewed (October 2007 through September 2010). Three major points were revealed:

1. Fish migrating up the lower portions of Arroyo Mocho (below the confluence with Arroyo Las Positas) benefit from year-around influx of water from Arroyo Las Positas. While the Vulcan mining discharges do have some limited and sporadic contribution to the perennial flow in lower Arroyo Mocho, this year-round flow also exists without the mining discharges.
2. Assuming they are made during the time-sensitive migration windows, mining discharges may have a limited benefit for migrating fish attempting passage up the Arroyo Mocho fish ladder,

which is just downstream of the Vulcan discharge point. However, the mining discharges are not required for fish passage through the ladder.

3. Data from upstream of both the Arroyo Mocho fish ladder and the Vulcan discharge point indicates that this central section of Arroyo Mocho is often dry (0 cfs) or only slightly wetted (less than 1 cfs) for days or weeks on end, with the exception of short periodic wet spells due to rainfall, artificial recharge, or mining releases.

Vulcan's monthly discharge records from 1974 to 2010 were also reviewed. Most notably, the data reveal many long periods where no discharges were made (e.g., 1987-1992, 1999-2004). Since 2006, Vulcan has been discharging semi-regularly to Arroyo Mocho although, at times, many months go by with no discharge at all. Also, their higher discharges come in the wet months when Arroyo Mocho would already be wetted naturally.

Thus, Vulcan's mining discharges appear to contribute little towards fish migration to the upper reaches of Arroyo Mocho where potential spawning habitat may exist. Therefore, the reduction of water into Arroyo Mocho will not affect steelhead. Steelhead are not currently in the project area and it may take years before the reach is accessible to steelhead. Also, any loss of riparian vegetation will be minimized (Mitigation Measure BIO-13: Avoid and Minimize Potential Disturbance of Riparian Communities). Therefore, there would be no effects on steelhead or their habitat.

e. **No Impact.** The Alameda County Tree Ordinance applies to trees within County road rights of way, and there is no County road right of way within the project area. The proposed project would not conflict with this or other local policies or ordinances.

f. **No Impact.** There are no adopted Habitat Conservation Plans (HCP), Natural Community Conservation Plans (NCCP), or other approved local, regional, or state habitat conservation plans relevant to the project site and thus no conflict would exist. The project and its mitigation measures are consistent with the East Alameda County Conservation Strategy (EACCS) but the Strategy is a voluntary plan and is currently in Draft form only and is not a HCP or NCCP.

References

Alameda Creek Alliance. 2011. Arroyo Mocho. Available: http://www.alamedacreek.org/Fish_Passage/Arroyo%20Mocho/Arroyo%20Mocho.htm. Accessed: July 11, 2011. Web page updated June 30, 2011.

V. CULTURAL RESOURCES Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

Discussion

a.b.c.d. **Less Than Significant Impact.** The Project area consists primarily of quarry lands and according to archival resources at the Northwest Information Center (NWIC) and William Self and Associates, there are no known archeological sites within the Project area. In addition, Cope Lake and Lake I have been completely mined and there have been no encounters with cultural resources during reclamation activities. In the event that suspected archeological or paleontological resources are encountered during construction, all work shall cease until an archeologist is consulted and their recommendations are followed. Therefore, the potential impact of the Project on pre-historic and historic resources and archeological remains is less than significant.

VI. GEOLOGY AND SOILS Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Discussion

a.b.c.d.e. **No Impact.** The Project area is located approximately within five to seven miles of the Alquist-Priolo earthquake fault zones delineated by the State Geologist. The Cope Lake lower slope repair will stabilize the slope that has been oversteepened due to erosion and drainage issues and it will also protect the existing maintenance road. In addition, the upper slope is currently oversteepened due to erosion that could potentially impact the residence located adjacent to this lake. Slope stabilization and drainage installation will address the current erosion issue in order to prevent the potential impact to the residence.

The Vulcan discharge pipeline is non-habitable and would not expose people to injury or death. In addition the Project site not publically accessible. Therefore, this Project will have no impacts to geology or soil.

VII. GREENHOUSE GAS EMISSIONS Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

Discussion

a. **Less Than Significant Impact.** The project area is located within an active gravel mining area. In addition, the project area is located just off Interstate 580, which generates significant greenhouse gases due to the number of vehicles traveling on this interstate. The project will involve use of heavy-duty equipment and potentially transporting soil to and from the project site. The Cope Lake repairs portion of the project may be phased depending upon the extent of repairs needed. On average, slope repairs will take three to six months. Installation of the Vulcan discharge pipeline will take approximately six weeks. Within the construction period, there will be a limited amount of vehicle trips. Therefore, there will be some greenhouse gas emissions from the project. However, when the project is completed, there will be no ongoing greenhouse gas emissions generated since the project involves a slope repair and installing a pipeline. Due to the short duration of the construction period and the ongoing gas emissions from the active gravel mining activities and the vehicle traffic on I-580, the limited greenhouse gas emissions from this project will be less than significant.

b. **No Impact.** The project is located in unincorporated Alameda County, which has an adopted Community Climate Action Plan. The project will not conflict with this plan because no structures will be

built as part of the project; therefore, there will not be any permanent greenhouse gas emission. Therefore, this project will have no impact with respect to Alameda County's Community Climate Action Plan.

VIII. HAZARDS AND HAZARDOUS MATERIALS Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

Discussion

a.b. **Less Than Significant Impact.** The Cope Lake slope repair will require the use of certain potentially hazardous materials such as fuels, oils, and concrete. Fuels and oil would generally be used within excavation equipment and other construction equipment and would be contained within vessels engineered for safe storage. The curb and gutter for drainage will be made with concrete. Storage of

these materials may occur at the construction site. Spills during on-site fueling of equipment or an upset condition, could result in a release of these material into the environment. Inclusion of hazardous materials management/spill prevention measures listed in contractor specifications would reduce impacts from hazardous materials release to a less than significant level.

In the event contaminated materials are encountered, the materials would be classified as hazardous waste, designated waste, or special waste, depending on the type and degree of contaminant. Disposal of contaminated soils as standard demolition waste or use as fill for another construction site would pose a hazard to people, or animal or plant populations. Inclusion of site remediation procedures in contractor specifications, would reduce this impact to less-than-significant.

c. **No Impact.** There are no existing or proposed schools within one-quarter mile of the site. Therefore, there would be no impact on schools within one-quarter mile of the site related to hazardous emissions or materials.

d. **No Impact.** The project is not included on the hazardous materials sites compiled pursuant to Government Code §65962.5. Therefore, there is no impact with respect to this list.

e. **No Impact.** The project site is located approximately one mile from the Livermore Municipal Airport's southern boundary. There is an airport land use plan (Alameda County Airport Land Use Policy Plan) and a General Plan Airport Protection Plan, which restricts new residential land use designations within a 5,000-foot buffer. The project is not within this buffer nor will it result in new structures that would impede airport traffic. In addition, this project is located away from the residential area, with exception of the single residence adjacent to Cope Lake. Therefore, this project will have no impact related to the Livermore Municipal Airport with respect to safety hazards for people residing or working in the project area.

f. **No Impact.** There are no private airstrips within two miles of the project site. Therefore, there would be no impact with respect to private airstrips.

g. **No Impact.** The project would not result in any impediments to existing traffic and circulation routes, which could potentially interfere with implementation of an emergency response or evacuation plan. Therefore, there would be no impact with respect to such emergency plans.

h. **No Impact.** The project site is not located in an extreme or high fire risk area. The project area is a gravel mining area and is adjacent to open water. The project would not result in creation of structures for habitation and would not expose people to wildfires. Therefore, there would be no impact with respect to extreme or high fire risks.

IX. HYDROLOGY AND WATER QUALITY Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?				

i) Is the project tributary to an already impaired water body, as listed in the Clean Water Act Section 303(d) list? If so, will it result in an increase in any pollutant for which the water body is already impaired?	☐	☐	☐	☒
ii) Will the proposed project cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
i) Review the final approved CWP Hydrograph Modification Plan (HMP) to assess the significance of altering existing drainage patterns.	☐	☐	☐	☒
ii) Potentially cause streambed or bank erosion downstream from the project?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
i) Would the proposed project result in increased impervious surfaces and associated increased runoff? Does the project meet the NPDES permit's Group 1 or Group 2 criteria? Note that Provision C.3 requirements need to be met in environmental documents. For projects that do not meet Group 1 or Group 2 criteria, consider incorporating appropriate site design and source control measures.	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?				

i) Would the proposed project result in an increase in pollutant discharges to receiving waters? Consider water quality parameters such as temperature, dissolved oxygen, turbidity, and other typical stormwater pollutants (e.g., heavy metals, pathogens, petroleum derivatives, synthetic organics, sediment, nutrients, oxygen-demanding substances, and trash).	☐	☐	☐	☒
ii) Would the proposed project result in significant alternation of receiving water quality during or following construction?	☐	☐	☐	☒
iii) Would the proposed project have a potentially significant environmental impact on surface water quality to marine, fresh, or wetland waters?	☐	☐	☐	☒
iv) Would the proposed project have a potentially significant adverse impact on ground water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Discussion

a.b. **No Impact.** The Project is located approximately 300 feet from the Arroyo Mocho, which is listed in the Clean Water Act Section 303(d) list as an impaired water body for diazanon. The Project will not result in an increase of this pollutant because there will be no additional discharges into the Arroyo Mocho.

Zone 7 is the groundwater basin manager for the Livermore Valley Groundwater Basin. The water currently being discharged by Vulcan to the Arroyo Mocho is water that would otherwise be considered groundwater, and would help fulfill the Municipal & Industrial (M&I) needs of the approximately 220,000 residents in the Livermore-Amador Valley. The Arroyo Mocho is a major component of Zone 7's groundwater recharge program, which in turn is a critical component of the local water supply. As it is available, Zone 7 purchases water for groundwater recharge purposes that is imported from the Delta via the South Bay Aqueduct. The water is released from the aqueduct into the Arroyo Mocho, and because the middle reaches of the Arroyo Mocho are highly permeable, this water ultimately recharges the Livermore Valley Groundwater Basin. This is important because the Livermore Valley Groundwater

Basin is being depleted by municipal uses, and from activities like gravel mining that requires discharging of groundwater as the mining progresses deeper into the underlying aquifer material. Groundwater wells, mostly in the western end of our service area, allow the Cities to extract groundwater for their M&I needs year-round. Water released to Lake I will support the recharge of the Livermore Valley Groundwater Basin, thereby helping to improve local water supply reliability which may help reduce reliance on the Delta for additional supply. There are no surface water rights holders on Arroyo Mocho; the natural water in this watershed has not been appropriated to downstream users. To ensure groundwater quality is not impacted, Vulcan will obtain the appropriate waste discharge requirements from the California Regional Water Quality Control Board, San Francisco Bay.

Therefore, there will be no impact to water quality standards or waste discharge requirements.

c.d.e.f. **No Impact.** The stormwater runoff generated at this site would be managed by conveying the runoff to unpaved surfaces that surround the site or to Cope Lake. Cope Lake was formerly used as a settling pond for gravel mining operations, and as a result it is essentially isolated from all "waters of the U.S." Therefore, this impact would be considered less than significant.

The acreage of disturbed land would likely exceed one acre and may require coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (NPDES No. CAS000002, Order No. 2009-0009-DWQ). Construction activities may result in uncontaminated water discharge to Cope Lake. Discharge of turbid waters into the storm drain and creek systems would constitute a potentially significant impact, but since the discharges will be directed to a former siltation basin having no outlet to local creek(s), the potential for impact is not significant. Compliance with NPDES General Permit requirements would ensure Zone 7 is in compliance with state regulatory policies and minimizes the potential for water quality impacts from the construction activities.

g.h.i.j. **No Impact.** The major stream within the project area is the Arroyo Mocho (north and east boundary). The 100-year floodplain is contained to the north of the Arroyo Mocho (FEMA, 1990). No housing will be built as part of the project. The location of the Vulcan discharge pipeline would not be affected by flooding because of its location in the Chain of Lakes area. In the event that the Arroyo Mocho overflows its south bank, water would sheet flow into one or more of the gravel pits. These excavations have sufficient capacity to contain a 100-year event. In addition, the project area is not in a location affected by seiche, tsunami, or mudflow. Therefore, there is no impact with respect to flooding.

X. LAND USE AND PLANNING Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the LRDP, general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Discussion

a. **No Impact.** There is no potential to physically divide an established community; therefore, there would be no impact since there is no established community.

b. **No Impact.** The Project is located in unincorporated Alameda County, between the cities of Pleasanton and Livermore. Currently, the site is within a former aggregate quarry area. As part of its reclamation identified in the *Reclamation Specific Plan*, the gravel pits area would be converted to a "Chain of Lakes" for groundwater management. Zone 7 currently owns Lake I and Cope Lake pursuant to the *Reclamation Specific Plan* and subsequent agreements. Project construction in this area will not impact aggregate resources because production of sand and gravel within this area have ceased.

The Project area consists primarily of industrial (mining) uses, and limited ranchettes along El Charro Road. Both, El Charro Road and the haul road are private roads having limited access. Access impacts to the industrial and residential uses would be reduced to less than significant levels with implementation traffic control measures, where necessary during the slope stability activities and construction of the pipeline. Zone 7 or its contractors shall obtain and comply with encroachment permits, when necessary.

c. **No Impact.** There are no habitat conservation or natural community conservation plans in the project area. Therefore, there is no impact.

XI. MINERAL RESOURCES Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Discussion

a.b. **No Impact.** The Chain of Lakes area is considered as an "Area of Regional Significance" by the California Geological Survey and contains a deposit of minerals in which extraction would be "judged to be of prime importance in meeting future needs for minerals in a particular region of the State within which the minerals are located and which, if prematurely developed for alternative Incompatible Land Uses, could result in the premature loss of minerals that are of more than local significance" (Ordinance No. 0-99-60, Section 6.80-070). This quarry is currently being used for the production of sand and gravel, but the production has ceased in the Project area. Therefore, the project will have no impact with respect to the loss of availability of mineral resources.

XII. NOISE Would the project result in:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in any applicable plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Discussion

a.b.d. **Less Than Significant Impact.** The project is located in an unincorporated area of Alameda County. The gravel pits are currently used for mining operations. As part of the quarry reclamation, the gravel pit area would be converted to a "Chain of Lakes" area for water management and redeveloped for agricultural and recreational use. One residence is located along El Charro Road. Therefore, sensitive receptors are limited to the single residence along El Charro Road and any future residences developed in conjunction with the agricultural uses identified in the *Reclamation Specific Plan*. The noise generated from the project will come from construction equipment used at the project site.

For residential land uses, noise levels less than 60 dBA, Ldn (from the property line) are normally considered acceptable (Alameda County 2002; City of Livermore 2004). A noise level of 60 dBA is similar to noise levels in an average office with normal levels of talking (City of Livermore 2004). This level is identified as Normally Acceptable, in the Livermore Community General Plan Noise Element (2004).

Noise levels generated during construction activities will be periodically above current ambient noise levels at the project site. The noise levels generated by construction activities will be temporary and intermittent in nature and will vary according to construction activity. Construction will only take place during daytime hours (8 a.m. to 5 p.m.), the least-noise sensitive time of the day, and is not expected to occur on weekends. To minimize noise impacts due to construction on the single residence along El Charro Road, Zone 7 shall notify the resident four weeks in advance of the start of construction. The

resident shall receive a brief description of the construction activities and the proposed schedule. Therefore, there will be less than significant impact to sensitive receptors.

c. **No Impact.** There will be no impact with respect to a permanent increase in ambient noise as a result of the project since the Cope Lake slope repair will not generate noise once installed. Water discharged from the Vulcan discharge pipeline and into the selected lake(s) will generate some noise but it is not anticipated that it will be more than the existing noise generated from the existing discharge into the Arroyo Mocho. As such, noise from this project is limited to the noise during the construction phase.

e. **No Impact.** The project site is located approximately one mile from the Livermore Airport, and is in the area encompassed by the Alameda County Airport Land Use Policy Plan. However, there is no impact of the project with respect to noise exposure from the airport because the project would not result in any change in exposure to airport noise or introduce a substantial number of people to airport noise.

f. **No Impact.** There is no impact with respect to noise from a private airstrip, since the project is not within the vicinity of a private airstrip.

XIII. POPULATION AND HOUSING Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion

a.b.c. **No Impact.** Growth inducement impacts will not occur because the project improves the current condition of Cope Lake. In addition, recapturing groundwater into Lake I will improve local water supplies by reducing reliance on outside water sources. However, this will not increase the water supply. The proposed Project will be constructed within the existing gravel mining area and no existing housing will be displaced necessitating construction of replacement housing. Therefore, there are no impacts with respect to population/housing.

XIV. PUBLIC SERVICES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Discussion

No Impact. The Cope Lake slope repair and the Vulcan discharge pipeline installation would be constructed within unincorporated Alameda County. Emergency service providers shall be the Alameda County Sheriff's Department for police services and Alameda County Fire Department for fire services and emergency medical response to this area. There is no water or fire hydrants within the project area because the area is unincorporated. However, water for emergency situations is available from the adjacent quarry ponds. Because there are limited developments within the Project area, water would be provided by Zone 7 through turnouts and pipelines. There are no storm drain facilities at the Project site; therefore, stormwater would be managed onsite with drainage to Cope Lake. As a result, there will be no impact to with respect to existing public services.

XV. RECREATION	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion

a.b. **No Impact.** The proposed project is located within unincorporated Alameda County and in an area currently used for sand and gravel mining. There are no recreational facilities located within the project area. Therefore, this proposed project will have no impact on recreation. Nor should it impact or preclude future recreational opportunities in the area.

XVI. TRANSPORTATION/TRAFFIC Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to a level of service standard and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Result in inadequate parking capacity	☐	☐	☐	☒
g) Conflict with applicable policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

Discussion

a.b. **Less Than Significant Impact.** The Project area is located in an area developed for sand and gravel mining. There are no arterial or collector roads within this area. Private access roads around the gravel pits make up the roadway system within the quarry. El Charro Road is an arterial street and is adjacent to the Project site. This portion of El Charro Road does not impact Livermore-Amador Valley Transit Authority (LAVTA) or Bay Area Rapid Transit (BART) Express routes because they do not operate bus services within the project area. The project area is not located near or around an emergency facility, such as a hospital or fire station, or in an area where there is recreation or commercial uses.

Off-site vehicle trips generated by construction would primarily consist of truck movements associated with transporting the heavy equipment to the site, potential transport of soil to and from the project site, and the daily arrival and departure of construction workers. The impact of construction-related traffic would be a temporary since the slope repairs would take on average three to six months and the

installation of the pipeline would take approximately six weeks. As a result, the proposed project would not result in any long-term degradation in operating conditions or level of service on any project roadway.

Alameda County requires construction work that would affect roadway traffic flow on weekdays to be restricted to off-peak hours in order to minimize the number of affected people. However, since quarry operations and other permitted activities generate 24-hour truck traffic through the area, there are no peak or off peak hours. Zone 7 will provide a 24-hour emergency telephone resource to address public questions and complaints during project construction. Therefore, the project will have a less than significant impact on the existing traffic and the level of service.

c. **No Impact.** The project is located within one mile of the Livermore Municipal Airport; however, the project will not impact the air traffic since the project will not involve erecting structures that could impede flight path or radio signals.

d. **Less Than Significant Impact.** El Charro Road is currently being used by truck haulers that haul sand and gravel from the gravel mining area. The project will involve transport of heavy duty equipment and material to and from the project site, which could affect road conditions on the designated haul routes by increasing the rate of road wear. However, the project will be limited in duration. The road is meant to accommodate big trucks hauling heavy equipment. In addition, the project will not require closure of El Charro Road at any time. Thus, El Charro Specific Plan development projects will not be affected by this project. Therefore, the project will have less than significant impact to El Charro Road.

e. **No Impact.** Access to the project site is off of El Charro Road. The project will not impede the existing access; therefore, there is no impact to emergency access.

f. **No Impact.** The project will require parking for construction workers. There is adequate parking to accommodate construction workers within the project area. Therefore, there is no impact with respect to parking.

g. **No Impact.** The project area is not accessible to the public and does not contain any public transit, bicycle, or pedestrian facilities. Therefore, there is no impact on these alternative transportation facilities or plans for the area.

XVI. UTILITIES AND SERVICE SYSTEMS Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with applicable federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion

a.b.d.e.f.g. **No Impact.** The Project includes slope repairs on Cope Lake and installing a discharge pipeline for Vulcan Materials from their existing discharge line on the Arroyo Mocho to Lake H, I or Cope. Neither activity will require water or wastewater service onsite. Therefore, no expansion of existing or construction of new water or wastewater facilities would be required, and wastewater treatment requirements would not be exceeded. In addition, there will be no solid waste generated as a result of this project. There would be no impact on water, wastewater, or solid waste disposal services.

c. **No Impact.** Drainage will be installed as part of the Cope Lake slope repairs portion of this Project. This is to protect both the residence located adjacent to Cope Lake and the overall integrity of the lake's function. As such, the project will not have a significant environmental effect.

XVII. MANDATORY FINDINGS OF SIGNIFICANCE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Discussion

a. **Less Than Significant Impact.** Without mitigation, the proposed project does have the potential to degrade the quality of the environment during construction activities. However, with the mitigation measures included as part of this Initial Study, all potentially significant impacts would be reduced to a less-than significant level.

b. **Less Than Significant Impact.** Potential impacts associated with the proposed project are only related to construction activities. Due to the limited extent and duration of the proposed activities, the proposed project would not contribute to cumulatively considerable impacts. Therefore, potential impacts are considered to be less than significant.

c. **Less Than Significant Impact.** Without mitigation, the proposed project does have the potential to adversely affect human beings, primarily through activities related to project construction. However, these impacts would be temporary (lasting only for the duration of construction) and the mitigation measures included as part of this Initial Study would reduce these potential impacts to a less-than-significant level.

XVIII. FISH AND GAME DETERMINATION

Based on the information above, there is no evidence that the project has a potential for a change that would adversely affect wildlife resources or the habitat upon which the wildlife depends. The presumption of adverse effect set forth in 14 CCR 753.5 (d) has been rebutted by substantial evidence.

☐ Yes (Certificate of Fee Exemption)

☒ No (Pay fee)

6 Public Comments

The Draft Initial Study/ Mitigated Negative Declaration document was mailed to agencies and interested parties, including property owners within an approximately 1000-foot radius of the proposed Project site, on December 19, 2011. It was also made available at the public library in Livermore. A 30-day public review period was held from December 19, 2011 through January 20, 2012, which was noticed in the Valley Times newspaper.

7 Mitigation Monitoring and Reporting Plan

The Mitigation Monitoring and Reporting Plan (MMRP) is included as Appendix B; it identifies the implementation procedure, monitoring and reporting actions, monitoring responsibility, and monitoring schedule for all mitigations measures in the Final IS/MND.

APPENDIX A

Special Status Species – Potential Occurrence Tables

Table A-1. Plant Species Observed in the Cope Lake Improvements Project Study Area (June 7, 2011)

Scientific Name	Common Name	Nativity
Agrostis sp.	bentgrass	non-native
Agrostis viridis	water bent	non-native
Ailanthus altissima	tree of heaven	non-native
Artemisia douglasiana	mugwort	Native
Arundo donax	giant reed	non-native
Avena sp.	wild oat	non-native
Baccharis pilularis	coyote brush	Native
Baccharis salicifolia	mulefat	Native
Bellardia trixago	Mediterranean lineseed	non-native
Brassica nigra	black mustard	non-native
Brassica rapa	field mustard	non-native
Bromus diandrus	ripgut brome	non-native
Bromus hordeaceus	soft brome	non-native
Bromus madritensis ssp. *rubens*	red brome	non-native
Carduus pycnocephalus	Italian thistle	non-native
Centaurea solstitialis	yellow star-thistle	non-native
Cirsium vulgare	bull thistle	non-native
Claytonia sp.	miner's lettuce	Native
Conium maculatum	poison hemlock	non-native
Convovulus arvensis	field bindweed	non-native
Conyza canadensis	horseweed	native
Cortaderia jubata	pampas grass	non-native
Cyperus sp.	flatsedge	native
Dactylis glomerata	orchard grass	non-native
Dittrichia graveolens	stinkwort	non-native
Erodium botrys	long-beaked filaree	non-native
Erodium cicutarium	redstem filaree	non-native
Eucalyptus camaldulensis	red gum	non-native
Eucalyptus globulus	blue gum	non-native
Ficus carica	edible fig	non-native
Foeniculum vulgare	fennel	non-native
Galium sp.	bedstraw	varies
Gnaphalium luteo-album	common cudweed	non-native
Grindelia camporum	gumplant	native
Heliotropium curassavicum	salt heliotrope	native
Hordeum murinum ssp. *leporinum*	foxtail barley	non-native
Juglans californica	California walnut	native
Lactuca serriola	prickly lettuce	non-native
Lolium perenne ssp. *multiflorum*	Italian ryegrass	non-native
Lotus corniculatus	birdsfoot trefoil	non-native
Melilotus indicus	annual yellow sweetclover	non-native

Polygonum lapathifolium	common knotweed	native
Phalaris aquatic	Harding grass	non-native
Picris echioides	bristly ox-tongue	non-native
Pinus radiate	Monterey pine	non-native
Piptatherum miliaceum	smilo grass	non-native
Polypogon monspeliensis	rabbitsfoot grass	non-native
Populus fremontii	Fremont's cottonwood	native
Quercus agrifolia	coast live oak	native
Raphanus sativus	radish	non-native
Rosa sp.	rose	varies
Rubus armeniacus	Himalayan blackberry	non-native
Rumex crispus	curly dock	non-native
Salix exigua	narrow-leaved willow	native
Salix laevigata	red willow	native
Salix lasiolepis	arroyo willow	native
Salsola tragus	Russian thistle	non-native
Scirpus acutus	tule	native
Silybum marianum	milk thistle	non-native
Sonchus asper	spiny sowthistle	non-native
Sonchus oleraceus	common sowthistle	non-native
Tamarix ramosissima	tamarisk	non-native
Tragopogon sp.	salsify	non-native
Trifolium hirtum	rose clover	non-native
Trifolium sp.	clover	non-native
Vicia villosa	hairy vetcy	non-native
Vulpia myuros	rattail fescue	non-native

Table A-2. Special-Status Plants Known to Occur or that May Occur in the Project Area

Species	Status[a] Federal/State/CNPS	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area[c]
Astragalus tener var. *tener* Alkali milk-vetch	–/–/1B.2	Historically found in western San Joaquin Valley, San Francisco Bay Area, and Monterey County; likely extirpated from all historical occurrences except those in Merced, Solano, and Yolo Counties	Playas and grasslands with adobe clay soils and alkaline vernal pools	March–June	None—no suitable microhabitat within study area; annual grassland habitat is highly disturbed
Atriplex cordulata Heartscale	–/–/1B.2	Western Central Valley and valleys of adjacent foothills.	Alkali grasslands, alkali meadows, alkali scrublands at elevations from MSL to 660 feet.	May–October	Low—annual grassland habitat within study area is highly disturbed; suitable alkaline soil unlikely within study area
Atriplex depressa Brittlescale	–/–/1B.2	Western Central Valley and valleys in foothills on west side of Central Valley.	Alkali grasslands, alkali meadows, alkali scrublands, chenopod scrublands, playas, valley and foothill grasslands; on alkaline or clay soils at elevations from MSL to 660 feet.	May–October	Low—annual grassland habitat within study area is highly disturbed; suitable alkaline soil unlikely within study area
Atriplex joaquiniana San Joaquin spearscale (saltbush)	–/–/1B.2	West margin of Central Valley from Glenn to Tulare Counties.	Alkali grasslands, alkali scrublands, alkali meadows, saltbush scrublands	April–September	Low—annual grassland habitat within study area is highly disturbed; suitable alkaline soil unlikely within study area
Balsamorhiza macrolepis var. *macrolepis* Big-scale balsamroot	–/–/1B.2	Alameda, Butte, Mariposa, Napa, Placer, Santa Clara, and Tehama Counties.	Cismontane woodland and valley and foothill grassland with serpentine soils	March-June	None—there are no serpentine soils known to occur within the study area

Table A-2. Continued

Species	Status[a] Federal/State/CNPS	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area[c]
California macrophylla Round-leaved filaree	–/–/1B.1	Scattered occurrences in the Great Valley, southern North Coast Ranges, San Francisco Bay Area, South Coast Ranges, Channel Islands, Transverse Ranges, and Peninsular Ranges	Cismontane woodland, valley and foothill grassland on clay soils	March-May	Low—annual grassland habitat within study area is highly disturbed
Centromadia parryi ssp. *congdonii* Congdon's tarplant	–/–/1B.2	Eastern San Francisco Bay Area, Salinas Valley, and Los Osos Valley.	Lower slopes, flats, and swales in annual grasslands; locally on alkaline or saline soils at elevations from MSL to 700 feet.	June–November	Low—annual grassland habitat within study area is highly disturbed; suitable alkaline soil unlikely within study area
Chloropyron (Cordylanthus) palmatus Palmate-bracted bird's-beak	E/E/1B.1	Known from seven populations in Livermore Valley and Central Valley from Colusa County to Fresno County.	Alkali grasslands, alkali meadows, and chenopod scrublands	May–October	Low—annual grassland and riverine wetland habitat within the study area is highly disturbed; suitable alkaline soil unlikely within study area
Cordylanthus mollis ssp. *hispidus* Hispid bird's-beak	–/–/1B.1	Central Valley (Kern, Merced, Placer, and Solano Counties) and Alameda County	Meadows, grasslands, and playas; on alkaline soils	June–September	Low—annual grassland and riverine wetland habitat within the study area is highly disturbed; suitable alkaline soil unlikely within study area
Deinandra bacigalupii Livermore tarplant	–/–/1B.2	Endemic to Alameda County (Livermore Valley)	Alkaline meadows and seeps, not in Jepson Manual	June-October	Low—annual grassland habitat within study area is highly disturbed; minimal suitable wet habitat (seeps pools) exists within study area

Species	Status[a] Federal/State/CNPS	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area[c]
Helianthella castanea Diablo helianthella	–/–/1B.2	San Francisco Bay area: Alameda, Contra Costa, Marin[b], San Francisco[b], and San Mateo Counties; also reported from San Diego County	At chaparral/oak woodland ecotone, often in partial shade, on rocky soils, also coastal scrub, riparian woodland, broadleafed upland forest, valley and foothill grassland	March-June	Low—annual grassland and riparian habitats within study area is highly disturbed
Hesperolinon breweri Brewer's western flax	–/–/1B.2	Contra Costa, Napa, and Solano Counties.	Chaparral, cismontane woodland, and valley and foothill grasslands; usually on serpentine soils	May – July	None—there are no serpentine soils known to occur within the study area
Plagiobothrys glaber Hairless popcorn-flower	–/–/1A	Coastal valleys from Marin County to San Benito Count.	Alkaline meadows, coastal salt marsh	April–May	Low—annual grassland habitat within the study area is highly disturbed. No coastal salt marsh habitat is present within the study area
Trifolium depauperatum var. *hydrophilum* Saline clover	–/–/1B.2	Alameda, Colusa, Monterey, Napa, San Benito, Santa Clara, San Luis Obispo, San Mateo, Solano, and Sonoma Counties.	Marshes and swamps, valley and foothill grassland (mesic, alkaline), and vernal pools	April–June	Low—minimal suitable wet habitat (marshes, swamps, vernal pools) exists within study area: annual grassland habitat within study area is highly disturbed

Species	Status[a] Federal/State/CNPS	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area[c]
Tropidocarpum capparideum Caper-fruited tropidocarpum	–/–/1B.1	Historically known from the northwest San Joaquin Valley and adjacent Coast Range foothills	Grasslands in alkaline hills	March–April	None—no suitable microhabitat (hills) within study area; annual grassland habitat is highly disturbed. Presumed extirpated in Alameda County.

MSL = Mean Sea Level

[a] Status explanations:

Federal

E = listed as endangered under the ESA

– = no listing

State

E = listed as endangered under the CESA

– = no listing

California Native Plant Society (CNPS)

1A = List 1A species: presumed extinct in California

1B = List 1B species: rare, threatened, or endangered in California and elsewhere

2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere

CNPS Code Extensions:

0.1 = seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat

0.2 = fairly endangered in California (20- 80% of occurrences threatened)

[b] Populations uncertain or extirpated in the county

[c] Definitions of levels of Occurrence likelihood:

Moderate: Plant known to occur in the region from the CNDDB, or other documents in the vicinity of the project, or habitat conditions are of suitable quality.

Low: Plant not known to occur in the region from the CNDDB, or other documents in the vicinity of the project; or habitat conditions are of poor quality.

None: Plant not known to occur in the region from the CNDDB, or other documents in the vicinity of the project; or suitable habitat is not present in any condition.

Table A-3 Special-Status Wildlife Species with Potential to Occur in the Project Region

Scientific and Common Names	Status Federal/State	Geographic Distribution	Habitat Requirements	Potential Occurrence in Study Area
Invertebrates				
Branchinecta conservatio Conservancy fairy shrimp	E/–	Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, and Glenn Counties	Large, deep vernal pools in annual grasslands	None—no suitable habitat in the study area. There are no occurrences within 2 miles of the site (CNDDB 2011).
Branchinecta longiantenna Longhorn fairy shrimp	E/–	Eastern margin of central Coast Ranges from Contra Costa County to San Luis Obispo County; disjunct population in Madera County	Small, clear pools in sandstone rock outcrops of clear to moderately turbid clay- or grass-bottomed pools	None—no suitable habitat in the study area. There are no occurrences within 2 miles of the site (CNDDB 2011).
Branchinecta lynchi Vernal pool fairy shrimp	T/–	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County; isolated populations also in Riverside County	Common in vernal pools; also found in sandstone rock outcrop pools	None—no suitable habitat in the study area. There are no occurrences within 2 miles of the site (CNDDB 2011).
Fish				
Hypomesus transpacificus Delta smelt	T/T	Primarily in the Sacramento–San Joaquin Estuary, but has been found as far upstream as the mouth of the American River on the Sacramento River and Mossdale on the San Joaquin River; range extends downstream to San Pablo Bay.	Occurs in estuary habitat in the Delta where fresh and brackish water mix in the salinity range of 2–7 parts per thousand (Moyle 2002).	None – outside of species known range. .
Oncorrhynchus mykiss Central California Coastal steelhead	T/-	Coastal drainages along the central California coast.	An anadromous fish that spawns and spends a portion of its life in inland streams, typically maturing in the open ocean	None –downstream barriers to migration from San Francisco Bay.
Oncorrhynchus mykiss Central Valley steelhead	T/-	Sacramento and San Joaquin River and their tributaries.	An anadromous fish that spawns and spends a portion of its life in inland streams, typically maturing in the open ocean	None - outside of species known range..

Scientific and Common Names	Status Federal/State	Geographic Distribution	Habitat Requirements	Potential Occurrence in Study Area
Amphibians				
Ambystoma californiense California tiger salamander	T/T	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Sonoma County south to Santa Barbara County	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy.	None—study area contains suitable upland migration habitat; however, the site has been significantly disturbed by past quarrying and water storage activities. Further, the site is significantly isolated from surrounding areas by residential development, perennial water quality basins, active quarries, and busy roadways (e.g., Stanley and El Charro Roads). The nearest occurrence is ~0.69-mile south of study area (CNDDB 2011); but the study area is separated from the location of this occurrence by a busy road (Stanley Road) and active quarries.
Rana boylii Foothill yellow-legged frog	--/SSC	Occurs in the Klamath, Cascade, north Coast, south Coast, Transverse, and Sierra Nevada Ranges up to approximately 1,800 meters (6,000 feet).	Creeks or rivers in woodland, forest, mixed chaparral, and wet meadow habitats with rock and gravel substrate and low overhanging vegetation along the edge. Usually found near riffles with rocks and sunny banks nearby.	None – There is currently no potential for foothill yellow-legged frog to occur in the project area, as the portion of Arroyo Mocho that runs through the study area has been significantly altered and channelized. There are no CNDDB occurrences within 2 miles of the study area (2011).

Scientific and Common Names	Status Federal/State	Geographic Distribution	Habitat Requirements	Potential Occurrence in Study Area
Rana draytonii California red-legged frog	T/SSC	Found along the coast and coastal mountain ranges of California from Mendocino County to San Diego County and in the Sierra Nevada from Butte County to Stanislaus County.	Permanent and semipermanent aquatic habitats, such as creeks and cold-water ponds, with emergent and submergent vegetation; may aestivate in rodent burrows or cracks during dry periods	Moderate—study area represents suitable aquatic habitat within the water quality basins (i.e., Cope Lake and Lake I) and upland dispersal habitat. The nearest occurrence is 1.09 miles northeast of study area (CNDDB 2011). The site has been historically disturbed by quarrying activities and is relatively isolated by active quarries, commercial development, and a busy road (El Charro Road), which reduces the likelihood for this species to occur within the study area. No breeding habitat (pools) was observed within Arroyo Mocho and the stream has been historically disturbed. Arroyo Mocho could be used as a migration corridor when flows are low
Reptiles				
Emys marmorata Western pond turtle	–/SSC	The western pond turtle is uncommon to common in suitable aquatic habitat throughout California, west of the Sierra-Cascade crest and absent from desert regions, except in the Mojave Desert along the Mojave River and its tributaries.	Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests. Nests are typically constructed in upland habitat within 0.25 mile of aquatic habitat.	Moderate— the water quality basins (i.e., Cope Lake and Lake I) and Arroyo Mocho represent suitable aquatic habitat, and suitable upland migration habitat occurs within the uplands of the study area. There are no CNDDB occurrences within 2 miles of the study area (2011).

Scientific and Common Names	Status Federal/State	Geographic Distribution	Habitat Requirements	Potential Occurrence in Study Area
Masticophis lateralis euryxanthus Alameda whipsnake	T/T	Restricted to Alameda and Contra Costa Counties; fragmented into five disjunct populations throughout its range	Valleys, foothills, and low mountains associated with northern coastal scrub or chaparral habitat; requires rock outcrops for cover and foraging	None—no suitable habitat present, and the study area is surrounded by former quarries that have been converted to ponds. There are no CNDDB occurrences within 2 miles of the site (2011).
Mammals				
Antrozonous pallidus Pallid bat	--/SSC	Widespread throughout California	Roosts in fissures in caves, tunnels, mines, hollow trees, and locations with stable	Low— suitable roosting habitat present within snags in the eastern portion of the study area adjacent to Arroyo Mocho. There are no CNDDB occurrences within 2 miles of the site (2011).
Corynorhinus townsendii Townsend's big-eared bat	--/SSC	Widespread throughout California	Roosts in caves, tunnels, mines, crevices, hollow trees, and buildings; usually near water.	Low— suitable roosting habitat present within snags in the eastern portion of the study area adjacent to Arroyo Mocho. There are no CNDDB occurrences within 2 miles of the site (2011).
Lasiurus cinereus Hoary bat	--/--	Widespread throughout California	Roosts in trees, typically within forests.	Low— suitable roosting habitat present within snags in the eastern portion of the study area adjacent to Arroyo Mocho. There are no CNDDB occurrences within 2 miles of the site (2011).

Scientific and Common Names	Status Federal/State	Geographic Distribution	Habitat Requirements	Potential Occurrence in Study Area
Taxidea taxus American badger	–/SSC	In California, badgers occur throughout the state except in humid coastal forests of northwestern California in Del Norte and Humboldt Counties	Badgers occur in a wide variety of open, arid habitats but are most commonly associated with grasslands, savannas, mountain meadows, and open areas of desert scrub; the principal habitat requirements for the species appear to be sufficient food (burrowing rodents), friable soils, and relatively open, uncultivated ground	None—the study area is surrounded by residential development, busy roads (e.g., Stanley and El Charro Roads), water quality basins and the undeveloped portion is too small to support this species or a suitable prey-base. There are no CNDDB occurrences within 2 miles of the site (2011).
Vulpes macrotis mutica San Joaquin kit fox	E/T	Principally occurs in the San Joaquin Valley and adjacent open foothills to the west; recent records from 17 counties extending from Kern County north to Contra Costa County	Saltbush scrub, grassland, oak, savanna, and freshwater scrub	None—the study area is not within species' geographic range, and study area is entirely surrounded by water quality basins, busy roads (i.e., Stanley and El Charro Roads), Arroyo Mocho, and residential development. There are no occurrences of this species within 2 miles of the study area (CNDDB 2011).
Birds				
Agelaius tricolor Tricolored blackbird	–/SSC	Permanent resident in the Central Valley from Butte County to Kern County; breeds at scattered coastal locations from Marin County south to San Diego County and at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grain fields; habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony	High—there is suitable marsh habitat immediately adjacent to the study area, species observed ~0.21-mile south of the study area (CNDDB 2011) on the margin of Cope Lake.

Scientific and Common Names	Status Federal/State	Geographic Distribution	Habitat Requirements	Potential Occurrence in Study Area
Athene cunicularia Western burrowing owl	–/SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast	Level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows	Low—the species was observed 0.44-mile northeast of study area (CNDDB 2011). Very limited habitat is located within the annual grassland habitat in the western and eastern portions of the study area.
Buteo regalis Ferruginous hawk	--/--	Winter migrant to California except north coast	Forages in grasslands and other treeless areas.	Low (foraging habitat only)—there is suitable foraging habitat in the annual grassland in the eastern and western portions of the study area. This species does not nest in California, and foraging habitat is very limited as study area is surrounded by development. There are no occurrences of this species within 2 miles of the study area (CNDDB 2011).
Elanus leucurus White-tailed kite	–/FP	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging	Low (foraging and nesting)—nesting habitat in large trees in the eastern and western portions of the study area, and foraging habitat in marsh and grassland habitats in the eastern and western portions of the site. Foraging habitat is limited as it is surrounded by water quality basins (i.e., Cope Lake and Lake I). There are no occurrences of this species within 2 miles of the study area (CNDDB 2011).

Scientific and Common Names	Status Federal/State	Geographic Distribution	Habitat Requirements	Potential Occurrence in Study Area
Lanius ludovicianus Loggerhead shrike	--/SSC	Throughout California, except north coast	Open pastures and grasslands	Low (foraging and nesting habitat)—trees and shrubs throughout the site represent suitable nesting habitat, and marsh and grassland habitat represent suitable foraging habitat within the study area. There are no occurrences of this species within 2 miles of the study area (CNDDB 2011).
Sternula antillarum ssp. *browni* California least tern	E/E	Found along the Pacific Coast of California from San Francisco to Baja California	Nest on open beaches kept free of vegetation by natural scouring from tidal action	None – outside of species geographic range and there is no suitable habitat within the study area. There are no occurrences of this species within 2 miles of the study area (CNDDB 2011).

Scientific and Common Names	Status Federal/State	Geographic Distribution	Habitat Requirements	Potential Occurrence in Study Area

Notes:

Status explanations:

Federal

E = listed as endangered under the ESA
T = listed as threatened under the ESA
PT = proposed for federal listing as threatened under the ESA
C = species for which USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list, but issuance of the proposed rule is precluded
D = delisted
– = no listing

State

E = listed as endangered under CESA
T = listed as threatened under CESA
FP = fully protected under the California Fish and Game Code
SSC = species of special concern in California
D = delisted
– = no listing

Potential Occurrence in the Study Area

High: Known occurrences of the species within the study area, or CNDDB, or other documents, records the occurrence of the species within a 2-mile radius of the study area; suitable habitat is present within the study area

Moderate: CNDDB, or other documents, records the known occurrence of the species within a 2-mile radius of the study area; poor quality suitable habitat is present within the study area

Low: CNDDB, or other documents, does not record the occurrence of the species within a 2-mile radius of the study area; suitable habitat is present within the study area

APPENDIX B

Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation Responsibility	Monitoring and Reporting Actions	Monitoring Responsibility	Timing/ Frequency
Mitigation Measure AIR-1: Implement BAAQMD Basic Mitigation Measures. Zone 7 Water Agency and its construction contractors shall control fugitive dust emissions by implementing, as applicable, the following basic control measures based on BAAQMD recommendations: • All exposed surfaces (e.g., parking areas, staging areas, soil piles, and graded areas, and unpaved access roads) shall be watered two times a day. • All haul trucks transporting soil, sand, or other loose material off-site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed at least once per day. • All vehicle speeds on unpaved roads shall be limited to 15 mph. • All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California Airborne Toxics Control Measure Tile 13, Section 2485 of California of Regulations). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. • Post a publicly visible sign with the telephone number and person to contact at Zone 7 Water Agency regarding dust complaints. This person shall respond and take	**Construction contractor**	Daily inspections and bi-weekly documentation to Zone 7 that measures are being implemented, and identifying any lapses or issues.	**Construction contractor**	Control measures must be in place at start of construction. Daily inspections and bi-weekly documentation during construction,

Mitigation Measure	Implementation Responsibility	Monitoring and Reporting Actions	Monitoring Responsibility	Timing/ Frequency
corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.				
Mitigation Measure BIO-1: Conduct an Environmental Education Program for all Construction Personnel. Develop and implement an environmental education program for all construction personnel about the importance of on-site biological resources. The program, to be provided to all construction personnel, shall brief them on the need to avoid impacts on biological resources—including California red-legged frog, as well as the penalties for not complying with biological mitigation requirements. All construction personnel shall be informed about the life history of federally listed species and other special status species that could occur on site; the importance of habitats for these species and the terms and conditions of the biological opinion. The construction supervisor shall ensure that any new personnel arriving to the site are briefed before they begin work.	**Zone 7** shall develop environmental education program and train construction personnel at onset of project/construction. **Construction supervisor** shall train new personnel thereafter.	Document training (i.e. who was trained and when).	**Zone 7** retains all training documentation. **Construction supervisor** responsible to identify new personnel who need training after start of construction.	Training shall occur prior to construction. Train new construction personnel before they begin work on site involving ground disturbance or similar.
Mitigation Measure BIO-2: Conduct a Preconstruction Survey for California Red-Legged Frog and Monitor Construction Activities within California Red-Legged Frog Habitat. To avoid and minimize impacts on CRLF, the applicant or its contractor shall retain a qualified wildlife biologist to conduct preconstruction clearance surveys for California red-legged frogs no more than 48 hours before ground disturbance anywhere within the project area. The qualified biologist also shall be responsible for monitoring all construction activities within CRLF aquatic habitat (Cope Lake and Lake I) and adjacent upland habitat (within 100 feet of the aquatic habitat). The biologist shall look for CRLF during grading, excavation, and any ground disturbing construction activities. If a CRLF is	**Zone 7 / Biological Consultant**	Preparation of pre-construction survey results report. Regular inspections and documentation that measures are being implemented, and identifying any lapses or issues.	**Zone 7/ Biological Consultant**	Preconstruction survey to be complete no more than 48 hours prior to start of ground disturbance. Ongoing monitoring during construction. Frequency to be established by

Mitigation Measure	Implementation Responsibility	Monitoring and Reporting Actions	Monitoring Responsibility	Timing/ Frequency
encountered during any project activities, construction shall cease until the frog is removed by a USFWS-approved biologist and relocated to nearby suitable aquatic habitat. USFWS and CDFG shall be notified within five (5) working days of any CRLF relocation.				qualified biologist.
Mitigation Measure BIO-3: Use Exclusion Fencing for Construction Activities (Including Grading) during All Seasons and Avoid Grading Activities within California Red-Legged Frog Upland Habitat during the Wet Season (October 1 to April 30). Exclusion fencing shall be placed around the project area to keep CRLF from entering the work area during all work activities. Exclusion fencing shall be in place at least 48 hours prior to construction. A biological monitor shall be on-site during fence installation. To minimize disturbance of dispersing CRLF, all grading activity within CRLF upland habitat (within 100 feet of aquatic habitat) should be conducted during the dry season (between May 1 and September 30) or before the onset of the rainy season, whichever occurs first.	**Zone 7**	Regular inspections and documentation that measures are being implemented, and identifying any lapses or issues.	**Zone 7**	During construction. Frequency to be established by qualified biologist.
Mitigation Measure BIO-4: Minimize Ground-Disturbing Activities in California Red-Legged Frog Aquatic and Upland Habitat. To minimize disturbance and mortality of CRLF in Cope Lake and Lake I, and upland habitat (within 100 feet of the aquatic habitat), the applicant or its contractor shall minimize the extent of ground-disturbing activities by minimizing the project footprint and limiting the work area to the minimum area necessary for construction.	**Zone 7**	Regular inspections to check that all activities are within the designated work areas.	**Zone 7 and Construction Contractor** will both ensure that activities remain within the designated work areas.	Prior to and during construction.
Mitigation Measure BIO-5: Avoid and Minimize the Disturbance of Aquatic Habitat. To the extent possible, the	**Construction contractor**	Prepare SWPPP.	**Construction contractor**.	Prior to and during

Mitigation Measure	Implementation Responsibility	Monitoring and Reporting Actions	Monitoring Responsibility	Timing/ Frequency

applicant or its contractor shall minimize impacts to aquatic habitat by implementing all of the following measures:
 	
• Construction activities in waters during the wet season (October 1 to April 30) shall be avoided.
• During construction, trees, shrubs, debris, or soils that are inadvertently deposited shall be removed in a manner that minimizes disturbance to the aquatic habitat.
• All construction-related activities shall be completed promptly to minimize their duration and resulting impacts.
• Construction inspectors shall routinely inspect protected areas to ensure that protective measures are in place and effective.
• All protective measures shall remain in place until all construction activities near the resource have been completed and shall be removed immediately following construction activities.
• An erosion control plan shall be prepared and implemented. It shall include the following provisions and protocols:
 	
  • Discharge from dewatering operations, if needed, and runoff from disturbed areas shall be made to conform to the water quality requirements of the waste discharge permit issued by the Regional Water Quality Control Board (RWQCB).
  • Material stockpiles shall be located in non-traffic areas only. Side slopes shall not be steeper than 2:1. All stockpile areas shall be surrounded by a filter
		Regular inspections and documentation that measures are being implemented, and identifying any lapses or issues.		construction.
				
				Prepare SWPPP and install protective measures prior to construction.
				
				All protective measures should be inspected daily.
				
				Documentation of corrective actions, as needed

Mitigation Measure	Implementation Responsibility	Monitoring and Reporting Actions	Monitoring Responsibility	Timing/ Frequency
fabric fence and interceptor dike. • Temporary erosion control measures, such as sandbagged silt fences, shall be applied throughout construction of the proposed project and shall be removed after the working area is stabilized or as directed by the engineer. The Storm Water Pollution Prevention Plan (SWPPP) for the project shall detail the applications and type of measures and the allowable exposure of unprotected soils.				
Mitigation Measure BIO-6: Inspect Exclusion Fences Daily during Construction. The biological monitor shall inspect the exclusion fences around the work area daily during construction within the action area. If ground disturbance activities are completed and the biological monitor is no longer required to monitor construction activities, an inspector trained by the biologist shall conduct the daily fence inspections for any frogs. If a frog (regardless of species) is found near a fence, work in the area shall stop, the biologist shall be notified, determine the species, and the frog shall be relocated (if found to be CRLF, then a USFWS-approved biologist shall relocate the frog) to suitable habitat outside of the work area. Fences shall be inspected according to this schedule until the fences are removed, as approved by the biological monitor or the resident inspector. The construction contractor monitor shall be responsible for maintaining the exclusion fences. The biological monitor or resident inspector shall immediately report any encroachment on fenced areas to the foreman or engineer, who shall stop construction or notify the contractor of the situation to be addressed. The biological monitor or resident inspector shall document the results of the inspections on construction monitoring log sheets, which shall be kept on file with the applicant.	**Zone 7/ Biological Consultant**	Daily inspections and documentation that measures are being implemented, and identifying any lapses or issues.	**Zone 7/ Biological Consultant**	During construction, conduct daily exclusion fence inspections.

Mitigation Measure	Implementation Responsibility	Monitoring and Reporting Actions	Monitoring Responsibility	Timing/ Frequency
Mitigation Measure BIO-7: Conduct a Preconstruction Survey for Western Pond Turtles. To avoid and minimize impacts on western pond turtles, the applicant or its contractor shall retain a qualified wildlife biologist to conduct a preconstruction clearance survey for western pond turtles no more than 48 hours before ground disturbance in aquatic habitats and after the exclusion fencing is installed. If turtles are observed during the survey, they shall be relocated to suitable habitat outside of the work area or as determined during coordination with CDFG. The person handling turtles shall be permitted to capture and relocate western pond turtle individuals at the time of project initiation or need to amend their CDFG collecting permit to include capture and relocation.	**Zone 7/ Biological Consultant**	Preparation of pre-construction survey results report. If relocation is necessary, document relocation.	**Zone 7/ Biological Consultant**	No more than 48 hours prior to ground disturbance.
Mitigation Measure BIO-8: Conduct a Pre-construction Survey for Nesting Migratory Birds and Raptors. A preconstruction survey for nesting raptors, special-status bird species, and migratory bird species shall be conducted by a qualified biologist. Since burrowing owl can be present during any time of the year, a survey for this species shall be conducted by a qualified biologist. Further, if construction activities are scheduled to occur during the avian breeding season (February 1-August 31), a preconstruction survey for other nesting raptors, special-status bird species, and migratory bird species shall be conducted by a qualified biologist. The survey will cover all potential nesting substrate in the study area relevant to the species being surveyed for and will be conducted no more than two weeks prior to the initiation of construction or ground disturbing activities associated with the project. If no active nests are located, then no further mitigation is necessary. If an active nest is located, a no-disturbance buffer will be established	**Zone 7/ Biological Consultant** **Zone 7/ Biological Consultant**	Preparation of pre-construction survey results report. Regular inspections and documentation that measures are being implemented, and identifying any lapses or issues. Frequency to be established by qualified biologist.	**Zone 7/ Biological Consultant**	Preconstruction survey no more than two weeks prior to construction. During construction, monitoring of buffer zones or active sites (if needed) will occur at a frequency to be established by qualified biologist.

Mitigation Measure	Implementation Responsibility	Monitoring and Reporting Actions	Monitoring Responsibility	Timing/ Frequency
around the active nest site to avoid disturbance or destruction of the nest until after the nesting season is over or a biologist determines that the young have fledged. The extent of such a buffer will be determined by the biologist and will be influenced by the amount of noise and other disturbances, and other topographic or artificial barriers. If construction activities begin prior to the breeding season (i.e., if construction activity begins between September 1 and February 28), then only a burrowing owl survey is necessary. Once project initiation begins, construction activities should be in full force, including, at a minimum, grading of the site and development of infrastructure. A minor activity that initiates construction but does not involve the full force of construction activities will not qualify as "pre-existing construction." Optimally, all necessary vegetation removal should be conducted prior to the breeding season so that there is no potential for nesting birds or raptors to occur in the construction area. If any birds or raptors nest in the vicinity of the project under this pre-existing construction condition, then it is assumed that they are habituating or will habituate to the construction activities. Under this scenario, the preconstruction survey still should be conducted on or after March 1 to identify any active nests in the vicinity, and active sites should be monitored by a wildlife biologist periodically until after the breeding season or after the young have fledged (usually late-June to mid-July). If active nests are identified in or immediately adjacent to the project area, then all nonessential construction activities (e.g., equipment storage, meetings, etc.) should be avoided in the immediate vicinity of the nest site; however, construction activities can proceed. If construction activities stop for more than two weeks during the avian nesting season, an additional				

Mitigation Measure	Implementation Responsibility	Monitoring and Reporting Actions	Monitoring Responsibility	Timing/ Frequency
nesting raptor and migratory bird survey shall be conducted.				
Mitigation Measure BIO-9: Conduct a Preconstruction Survey for Roosting Bats. To avoid and minimize impacts to roosting bats, the applicant or its contractor shall retain a qualified wildlife biologist to conduct a preconstruction clearance survey for bats no more than 48 hours before ground disturbance associated with project implementation. If bats are observed during the survey, they shall be relocated through humane exclusion methods agreed upon with CDFG. A qualified biologist shall oversee the implementation of the exclusion process. The bat exclusion device installer shall be qualified to perform such activities.	**Zone 7 / Biological Consultant**	Preparation of pre-construction survey results report. Regular inspections and documentation that measures are being implemented, and identifying any lapses or issues.	**Zone 7/ Biological Consultant**	Preconstruction survey more than 48 hours prior to construction. Monitoring during construction, as needed. Frequency to be established by qualified biologist.
Mitigation Measure BIO-10: Install Construction Barrier Fencing around the Construction Area to Protect Sensitive Habitats. The applicant or its contractor shall install orange construction barrier fencing at the edge of the project area where it abuts or includes water basins and seasonally inundated areas within the project area. The fencing shall be installed before project activities are initiated, maintained throughout the construction portion of the project, and removed after construction completion.	**Zone 7**	Regular inspections and documentation that measures are being implemented, and identifying any lapses or issues.	**Zone 7**	During construction. Fencing will be inspected once per week or more.
Mitigation Measure BIO-11: Avoid and Minimize Potential Disturbance of Riparian Communities. The applicant or its contractor shall avoid and minimize potential disturbance of woody vegetation in the riparian habitat by implementing the following measures. The potential for long-term loss of woody riparian vegetation shall be minimized by trimming vegetation rather than removing	**Zone 7 / Biological Consultant**	Document that measures are implemented and identify any lapses or issues.	**Zone 7/ Biological Consultant**	Prior to construction.

Mitigation Measure	Implementation Responsibility	Monitoring and Reporting Actions	Monitoring Responsibility	Timing/ Frequency
entire woody plants. Woody plants that need to be trimmed shall be cut at least 1 foot above ground level to leave the root systems intact and allow for more rapid regeneration. Cutting shall be limited to the minimum area necessary within the construction zone. To protect nesting birds, the applicant or its contractor shall not allow pruning or removal of woody riparian vegetation between January 1 and August 31 without preconstruction surveys as required by Mitigation Measure BIO-8. A certified arborist shall be retained to perform any necessary pruning or root cutting of riparian trees.				

Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines

1. Carollo Engineers, 2012. Project Memorandum: Analysis of New Alternatives for the LCWD Recycled Water Distribution System.
2. Farrar and Metzger, 2003. Ground-Water Resources in the Lower Milliken–Sarco–Tulocay Creeks Area, Southeastern Napa County, California, 2000–2002. USGS Water-Resources Investigations Report 03-4229.
3. Napa County, 2005. Napa County Baseline Data Report, Chapter 16 – Groundwater Hydrology, November.
4. Napa Sanitation District (NSD), 2011. Resolution 11-004 – Summer Water Allocation.
5. NSD, 2012a. General Information Regarding Groundwater Permits for Projects Within the MST Groundwater Deficient Area. July 2005 (Updated 2012).
6. NSD, 2012b. NSD Minute Resolution MR 12-072 – Establish 800 AFY winter water allocation to LCWD, and 150 AFY of summer water.
7. NSD, 2013a. NSD Minute Resolution MR 13-019 – Allocates an additional 300AFY of summer water to LCWD.
8. NSD, 2013b. 2013 Annual Self-Monitoring Report for Napa Sanitation District (inclusive of data submitted directly to CIWQS; not included here).
9. North Bay Water Reuse Authority (NBWRA), 2009. North San Pablo Bay Restoration and Reuse Project (North Bay Water Recycling Program) EIR/EIS, November.
10. San Francisco Bay Regional Water Quality Control Board (RWQCB), NPDES Permit No. CA0037575.
11. SBM Environmental, 2013. Los Carneros Water District Recycled Water Pipeline Project, Initial Study/MND/EA, October.

Reference 1

Engineers...Working Wonders With Water®

PROJECT MEMORANDUM

Project Name:	Los Carneros Alternative 6 – A, B, and C	**Date:**	November 2, 2012
Client:	Los Carneros Water District	**Project Number:**	8430A.00
Prepared By:	Aaron Hope, P.E.		
Reviewed By:	Tracy Clinton, P.E.		
Subject:	Analysis of new Alternatives for the LCWD Recycled Water Distribution System		
Distribution:	J. Stewart		

1.0 PURPOSE AND INTRODUCTION

This Technical Memorandum summarizes the results of two new alternatives, and a sub-alternative, for the proposed Los Carneros recycled water system. These alternatives, referred to as alternative 6A and 6B are modifications of the "Alternative 5 Future" recommended in the 2011 Recycled Water Feasibility Study completed by Carollo Engineers for the Los Carneros Water District (District or LCWD). The two new alternatives, 6A and 6B, consider how the Napa Marsh recycled water pipeline, currently under design by the Sonoma Valley County Sanitation District (SVCSD), could affect LCWD's planned recycled water distribution system.

The SVCSD, in collaboration with the Sonoma County Water Agency (SCWA), will use the Napa Marsh pipe to supply recycled water to the Napa Marsh for a limited period of time. Concurrently, it is also planned to be used for recycled water irrigation in the LCWD area. Once flows to the Napa Marsh are no longer necessary, either SVCSD or LCWD may continue to use the pipeline to wheel recycled water to irrigators. Regardless of who operates the pipeline, the planned LCWD distribution system will be affected. The objective of this work is to determine what these affects may be on the Alternative 5 Future scenario by considering two alternatives, 6A and 6B. More information about each of these alternatives is provided below. A sub-alternative 6C was also developed as an iteration of Alternative 6A in the future – this would allow the LCWD system to be sized down as in 6A, but could accommodate a future condition of the parcels that were excluded, to be added into the LCWD system at some point.

- Alternative 6A – Under this scenario, certain parcels previously included in LCWD's distribution system as part of Alternative 5 Future are assumed to connect to the Napa Marsh pipeline. These parcels would receive water from SCWA in perpetuity, or basically, not be supplied recycled water from LCWD. As a result, the peak hour demand in LCWD's system would be reduced causing some pipe diameters in the southwestern portion of the system to decrease and others to become superfluous (and thus removed).

- Alternative 6B – This scenario assumes that LCWD will build a recycled water distribution system with extra capacity (above that required in Alterative 6A) in order to incorporate the Napa Marsh pipeline into its system once it is no longer needed to

supply the Napa Marsh. LCWD would then own and operate the pipeline to meet the same demands proposed in the Alternative 5 Future scenario. In order for LCWD to integrate the Napa Marsh pipeline into the planned distribution system, some modifications to the Alternative 5 Future scenario are needed such as new pipe segments, modifications to pipe diameters, and elimination of redundant pipes.

- Alternative 6C (i.e.: 6A Future) – This scenario assumes that LCWD builds and implements Alternative 6A and then later incorporates the Napa Marsh pipeline and the associated demands into its system. Because the distribution system under 6A cannot serve these additional demands, a new pump station would be needed to compensate for pressure losses associated with the additional flow to new customers.

More information about Alternative 6A, 6B, and 6C along with engineering and financial implications are provided in this technical memorandum.

2.0 ALTERNATIVE 6A

As described above, this scenario assumes that some of the parcels identified as being served under Alternative 5 Future in the 2011 Feasibility Study will connect to SVCSD's pipeline instead of the LCWD system.

2.1 Alternative 6A Demands

Alternative 6A effectively eliminates the majority of recycled water demands in the southwestern portion of the system. The parcels to be excluded in Alternative 6A were identified by the SCWA and provided to Carollo in an email dated October 1st, 2012. SCWA identified a total of 16 parcels that could potentially be served by the Napa Marsh pipeline totaling 1,005 acres. However, only 10 of these parcels are in the LCWD service area and slated for service under Alternative 5 Future. Although removing these 10 parcels from the southwestern portion of the system eliminated the majority of demands south of Las Amigas Road, two parcels remained to be served at the far western side along Duhig Road. Serving just these two parcels would no longer be cost effective because of the length of pipe necessary to connect them to the distribution system. After conversations with LCWD, these two parcels were also removed from consideration in Alternative 6A. These two parcels along with the 16 identified by SCWA are provided in Table 1**.**

More information such as area, storage assumptions, and specific demands associated with the parcels removed from Alternative 5 Future for Alternative 6A is provided in **Attachment 2**.

Table 1: Demands Removed from Alternative 6A

Mod APN	Owner Name	Peak RW Demand in Alt. 5 Fut (GPM)	Excluded based on data from SCWA or LCWD
047320030000	Koerner Rombauer	61.50	SCWA
047320031000	Bouchaine Vineyards Inc.	166.24	SCWA
047330052000	Midnight Sun Inc. III UBS AgriVest LLC	104.18	SCWA
047320027000	Buchli Station Vineyards LLC	248.45	SCWA
047320005000	Beckstoffer Vineyard	91.61	SCWA
047320006000	Beckstoffer Vineyard	124.64	SCWA
047320003000	Diageo Chateau & Estates Wine Company	121.94	SCWA
047320013000	Beckstoffer Vineyard	192.18	SCWA
047320022000	Joseph F Cabral Sr. and Deanna K. Cabral Trust	5.39	SCWA
047320024000	Napa County Resource Conservation District	26.04	SCWA
047320009000	Sonoma Marin Area Rail Transit District	0	SCWA
047320010000	Sonoma Marin Area Rail Transit District	0	SCWA
048010003000	State of California	0	SCWA
048010004000	State of California	0	SCWA
048020015000	State of California	0	SCWA
047320021000	Unknown	7.82	LCWD
047320025000	Cabral	154.86	LCWD

2.2 Alternative 6A Distribution System

By removing demands that would connect to the Napa Marsh pipe (and thus receive recycled water from SCWA), the peak hour demand from Napa Sanitation District decreased from 4,153 GPM to 3,535 GPM. The most significant modification to the distribution system is the elimination of two reaches south of Las Amigas Road that were part of Alternative 5 Future. A map showing the updated distribution system along with pipe sizes is provided in **Figure 1.**

Also, under this alternative, two parcels previously being served by the 'eliminated' reaches but not slated to receive recycled water from SCWA were rerouted to adjacent transmission pipes. Parcel 047271002000 was rerouted from a turnout on Duhig Road (Model Node J28) to a turnout at the corner of Las Amigas and Duhig Road (Model Node J25). Parcel 047330053000, owned by Ahmann, was rerouted from a turnout on Buchli Station Road (Model Node J23) to Milton Road (Model Node J20). Rerouting this parcel to the pipe in Milton Road necessitates an increase in pipe size from 6-inch to 10-inch to account for the additional demand down Milton.

The demand decrease in this alternative also reduces the size of the transmission main between the Napa River crossing to Cuttings Wharf Road from 24-inches to 20-inches. However, there were no other significant reductions in pipe size. The constraining factor in Alternative 6A is the minimum pressure requirement in the northwestern portion of the system. Even though the minimum 50-psi pressure requirement was relaxed along Neuenschwander Road as part of Alternative 5 Future, a minimum turnout pressure of 50 psi is still required along

Duhig Rd[1]. To meet this requirement (and to be consistent with the Alternative 5 Future criteria) many of the pipes could not be significantly reduced even though velocities and headlosses are low.

2.3 Alternative 6A Financing

The total capital cost for Alternative 6A is estimated to be approximately $16 million (2011 dollars). This cost includes costs associated with the recycled water pipeline to the property line of individual users and the Napa River crossing. The estimated costs do not include retrofit costs or costs associated with piping required within the individual users' property lines.

Additional cost data is shown in **Attachment 1** including financing costs (assuming SRF loans), annual operating expenses, and unit costs. The financing model used in these estimates is the same model used for the 2011 Feasibility Study. A more detailed description of the financing methodologies and assumptions can be found in Chapter 8 of the 2011 Feasibility Study.

3.0 ALTERNATIVE 6B

As previously described, this alternative assumes that LCWD will take control of the SVCSD Napa Marsh pipe and integrate it into the planned distribution system. Overall, the alignment would fit well into the planned Alternative 5 Future distribution system with some modifications. The portion of the Napa Marsh pipe that would be useful to LCWD is the 18" PVC portion that runs east-west along Duhig Road and continues straight, cross-country on private land, to where it intersects Buchli Station Road. The Napa Marsh pipe then runs north-south along Buchli Station Road until it terminates at the Napa Marsh. LCWD would connect to the Napa Marsh pipe via a 10" main that runs along Buchli Station Road, south of Las Amigas. This 10-inch pipe was already included in the Alternative 5 Future. The proposed distribution system under alternative 6B is shown in **Figure 2.**

3.1 Alternative 6B Demands

The demands in Alternative 6B are assumed to be equivalent to those in Alternative 5 Future.

3.2 Alternative 6B Distribution System

The distribution system in Alternative 6B is similar to the proposed system in Alternative 5 Future with two exceptions:

1. The pipeline going south from Las Amigas along Duhig is eliminated. The Napa Marsh pipeline now serves as the primary transmission line from Buchli Station.

2. To be consistent with Alternative 6A, two parcels were rerouted to different locations in the model. Parcel 047271002000 was rerouted from a turnout on Duhig Road (Model

[1] Based on conversations with LCWD, the District may be willing to accepted turnout pressures lower than 50 psi. However, the 50 psi criteria for areas south of Neuenschwander remains in this alternative for the purpose of developing comparable alternatives.

Node J28) to a turnout on the corner of Las Amigas and Duhig Road (Model Node J25). Parcel 047330053000, owned by Ahmann, was rerouted from a turnout on Buchli Station Road (Model Node J23) to Milton Road (Model Node J20). Rerouting this parcel to the pipe in Milton Road necessitates an increase in pipe size from 6-inch to 8-inch to account for the additional demand on Milton.

3.3 Alternative 6B Financing

The total capital costs for Alternative 6B is estimated to be approximately $19 million (2011 dollars). This includes cost associated with the recycled water pipeline to the property line of individual users and the Napa River crossing. The estimated costs do not include retrofit costs or costs associated with piping required within the individual users' property lines. The cost to acquire the Napa Marsh Pipe was assumed equivalent to the cost of constructing a new 6-inch pipeline along the same alignment. A 6-inch pipeline is the minimum size necessary to serve the demands off the Napa Marsh pipeline while meeting the hydraulic criteria.

Additional cost data is shown in **Attachment 1** including financing costs (assuming SRF loans), annual operating expenses, and unit costs. The financing model used in these estimates is the same model used for the 2011 Feasibility Study. A more detailed description of the financing methodologies and assumptions can be found in Chapter 8 of the 2011 Feasibility Study.

4.0 ALTERNATIVE 6C

This is the "no regrets" scenario whereas LCWD moves forward with a smaller distribution system (same as Alternative 6A) but then later incorporates the Napa Marsh pipeline (and associated demands) into the system. The benefit of this alternative is that it takes a phased approach to constructing the distribution system. This is important because at this time it is not known if LCWD will take control of the Napa Marsh pipeline. There is risk in building a distribution system that has built-in capacity for future users (such is the case with Alternative 6B). Instead, this alternative considers how LCWD could serve the Napa Marsh demands without initially constructing an oversized system.

4.1 Alternative 6C Demands

The demands in Alternative 6C are assumed to be equivalent to those in Alternative 5 Future and Alternative 6B. .

4.2 Alternative 6C Distribution System

To serve the parcels deleted in Alternative 6A in the future, LCWD would need to construct an additional 8-inch pipeline along Buchli Station Road to connect to the Napa Marsh pipeline. The hydraulic model shows that it is not possible to serve these "additional" demands without sacrificing pressure in the northwestern portion of the distribution system during peak demand periods. To compensate for reduced pressure, this alternative includes a pump station, located on Duhig Road for planning purposes. The distribution system and assumed pump station

location is shown in **Figure 3**. Note that the pump station location was selected based on the proposed location in Alternatives 1-4 in the 2011 Feasibility Study.

There are some operational compromises required to make this scenario feasible:

- All demands associated with the Napa Marsh pipeline would receive recycled water during the peak time (from 6 am to 6 pm) during the summer months including landscape irrigation. Alternatively, these demands could be supplied with more recycled water in the winter months (for seasonal storage) to offset summer demands if storage is available.
- An exception to the minimum pressure requirement is necessary at one of the turnouts along Las Amigas Road, even with the pump station. The minimum design criteria is 50 psi. The turnout at Junction J24 would only be 44 psi during peak irrigation periods. The rest of the system will meet the 50 psi minimum pressure requirements with the addition of the pump station on Duhig Road. This may be mitigated by moving the pump station from its proposed location to Junction J24 on Las Amigas Road.
- An exception to the maximum headloss per 1000-feet criteria (HL/1000ft) is necessary along Stanley Cross Road between Las Amigas and Cuttings Wharf Road. Current criteria stipulates that headloss remain below 3ft/1000ft for pipes larger than 12-inches. However, under this alternative friction losses are as high as 5ft/1000ft in some 16-inch and 18-inch pipes. Even so, losses of 5ft/1000ft are within normal hydraulic parameters.

4.3 Alternative 6C Cost Sharing

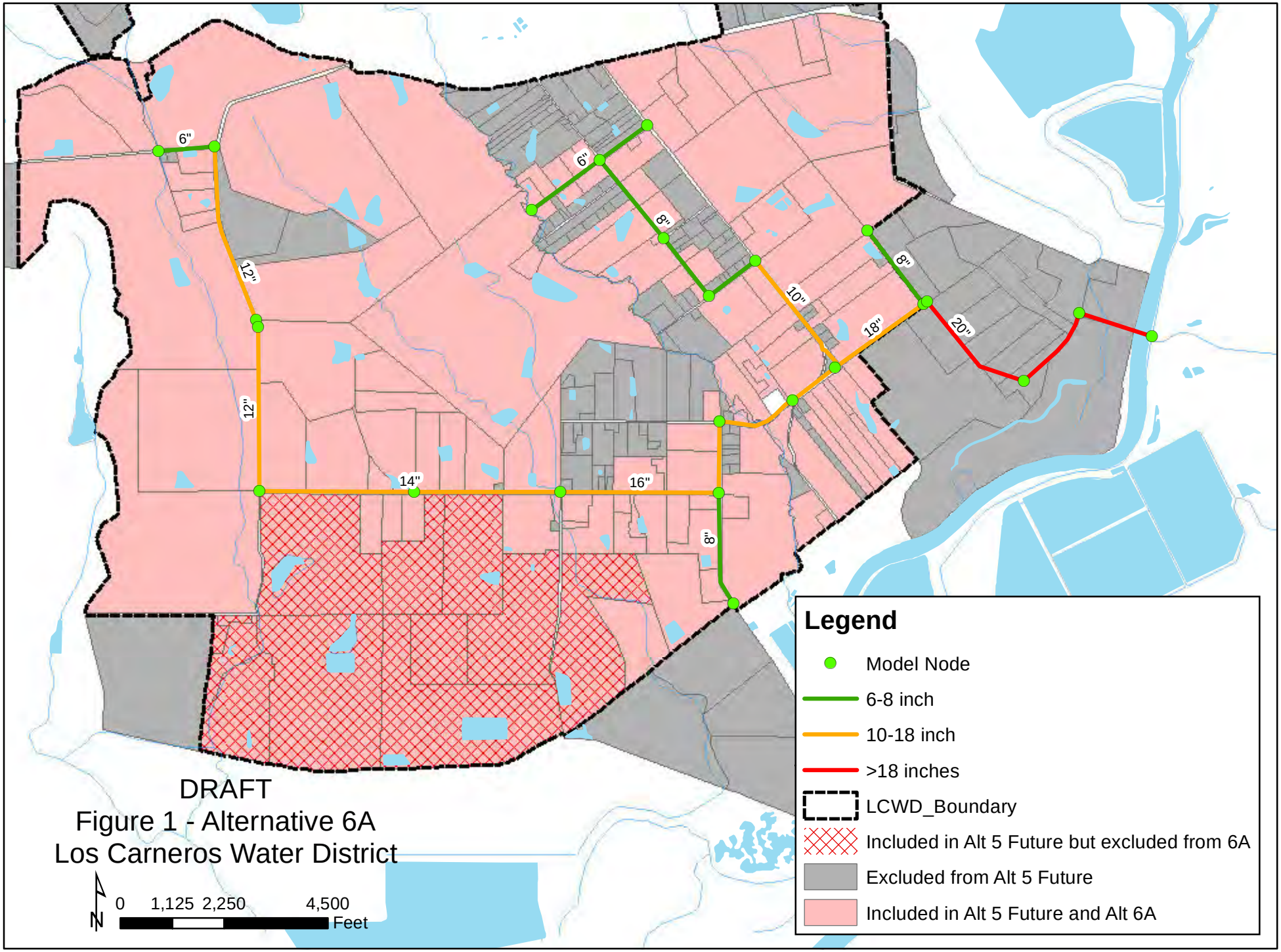
The total capital cost for Alternative 6C is estimated to be approximately $19 million (2011 dollars). This includes costs associated with the recycled water pipeline to the property line of individual users and the Napa River crossing and a new pump station. The estimated costs do not include retrofit costs or costs associated with piping required within the individual users' property lines. The cost to acquire the Napa Marsh Pipe was assumed equivalent to the cost of constructing a new 6-inch pipeline along the same alignment. A 6-inch pipeline is the minimum size necessary to serve the demands off the Napa Marsh pipeline while meeting hydraulic criteria. Additional long-term costs would also be needed to account for the added O&M of the new pump station.

Because this scenario consists of two phases, costs have been phased accordingly. The main distribution system would likely be paid for by those who receive recycled water as soon as the project is brought online. Areas that are initially excluded from the project (because they receive recycled water from the Napa Marsh pipeline) but later choose to join the LCWD system, would most likely pay a "buy-in" cost up to the original cost per acre paid by initial users (estimated to be $4,075/acre) plus "expansion costs" (estimated to be $2,730/acre). The purpose of a buy-in fee is to recover costs that have already been incurred by LCWD. LCWD could reimburse "initial" users when the system adds new users so that eventually all customers have paid the same amount for the first phase of the distribution system. The expansion costs are meant to recover the costs associated with expanding the system to meet the increased capacity needs

of growth. Expansion costs are paid for entirely by new users because they are the only ones who benefit from the improvements.

4.4 Alternative 6C Financing

Additional cost data is shown in **Attachment 1** including financing costs (assuming SRF loans), annual operating expenses, and unit costs. The financing model used in these estimates is the same model used for the 2011 Feasibility Study. A more detailed description of the financing methodologies and assumptions can be found in Chapter 8 of the 2011 Feasibility Study.



DRAFT
Figure 1 - Alternative 6A
Los Carneros Water District

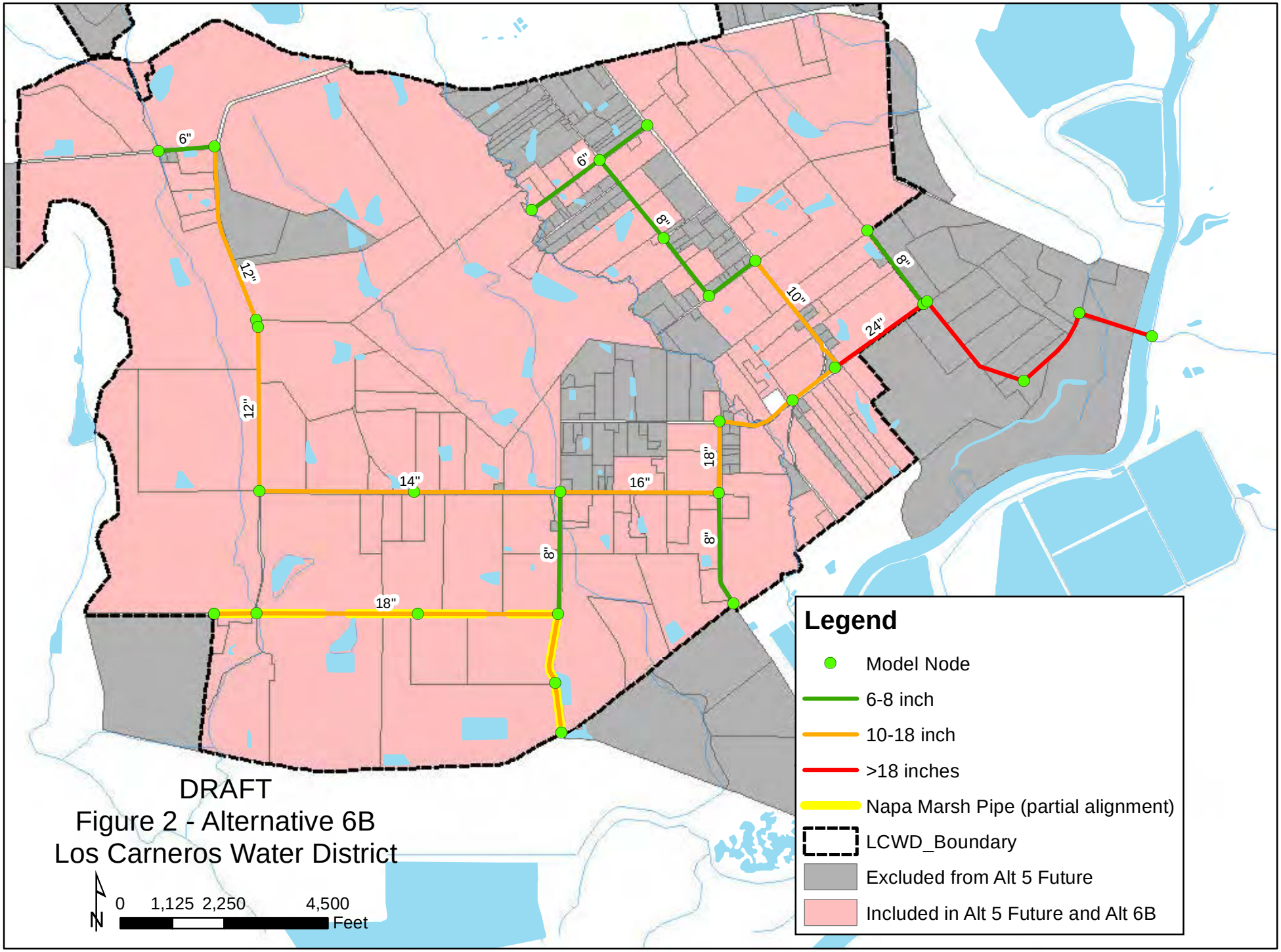


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Figure 2 - Alternative 6B
Los Carneros Water District

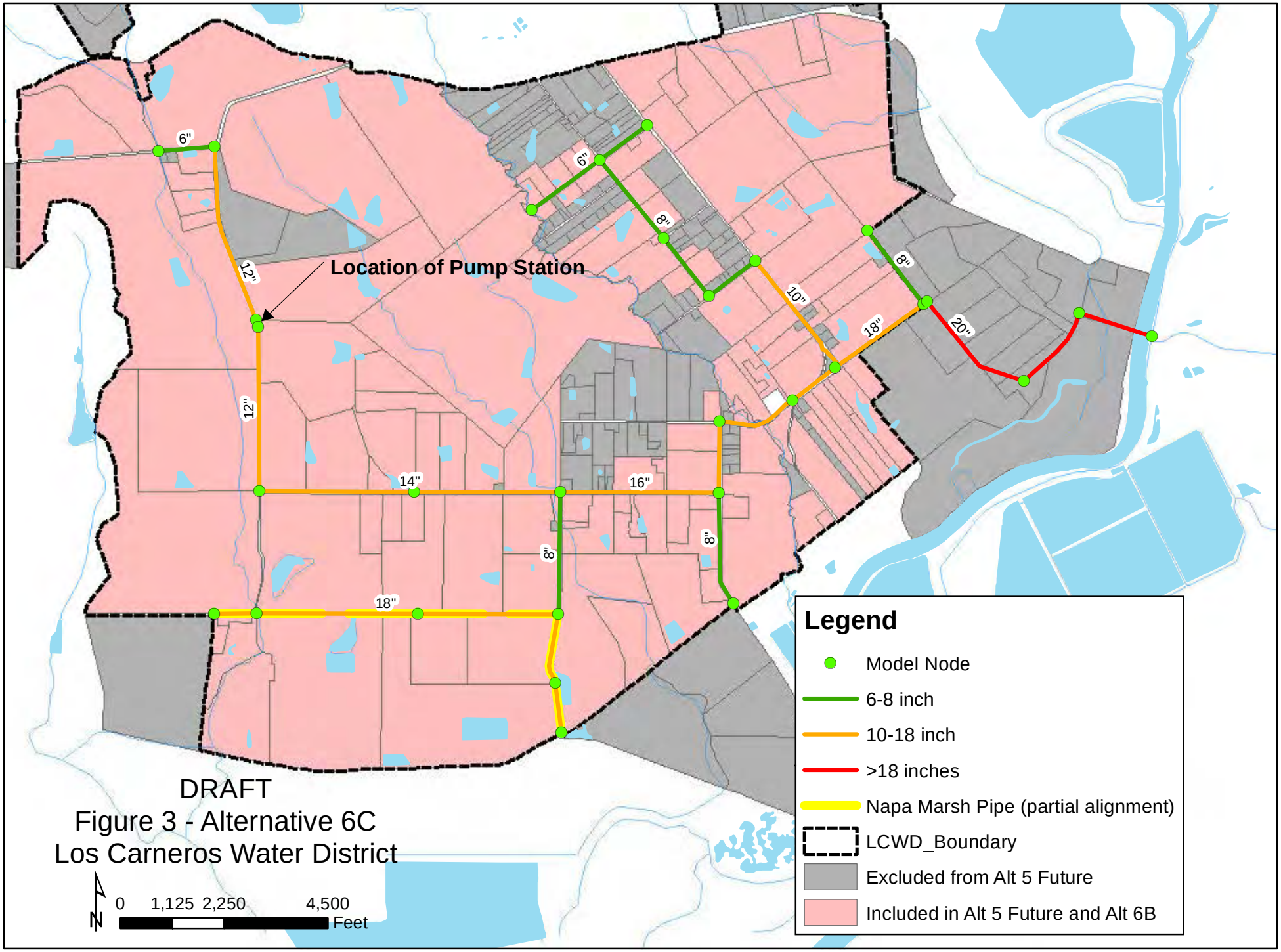

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Figure 3 - Alternative 6C
Los Carneros Water District

Attachment 1

Updated 10/31/2012

Alternative Cost Comparison Summary
Recycled Water Feasibility Study
Los Carneros Water District

RW Service Statistics	Alternative 5 Future	Alternative 6A	Alternative 6B	Alternative 6C
Demand (AFY)	1,783	1,465	1,783	1,783
Initial gross area served (Acres)	5,619	4,614	5,619	4,614
Ultimate gross area served (Acres)	5,619	4,614	5,619	5,619
Total LCWD Area + Areas served outside (Acres)	6,463	6,463	6,463	6,463
Number of parcels served	142	130	142	142
No of parcels over 2 acres [10]	140	128	140	140
Questionnaire Statistics				
No. of parcels served who responded to Questionnaire	96 (4,532 Acres)	87 (3,807 Acres)	96 (4,532 Acres)	96 (4,532 Acres)
No. of parcels served who indicated interest in RW	95 (4,509 Acres)	86 (3,784 Acres)	95 (4,509 Acres)	95 (4,509 Acres)
No. of parcels served not interested in RW [5]	1 (23 Acres)	1 (23 Acres)	1 (23 Acres)	1 (23 Acres)

Capital Costs				Alternative 5 Future[9]	Alternative 6A	Alternative 6B	Alternative 6C	Alternative 5 Future	Alternative 6A	Alternative 6B	Alternative 6C
Pipeline Diameter (inches)		Unit Cost	Unit	Quantity	Quantity	Quantity	Quantity	Cost	Cost	Cost	Cost
	6	$ 84	LF	11,511	4,333	4,333	4,333	$ 967,000	$ 364,000	$ 364,000	$ 364,000
	8	$ 112	LF	11,835	9,546	12,204	12,204	$ 1,326,000	$ 1,069,000	$ 1,367,000	$ 1,367,000
	10	$ 140	LF	7,157	2,958	2,958	2,958	$ 1,002,000	$ 414,000	$ 414,000	$ 414,000
	12	$ 168	LF	7,637	7,637	7,637	7,637	$ 1,283,000	$ 1,283,000	$ 1,283,000	$ 1,283,000
	14	$ 196	LF	6,534	6,534	6,534	6,534	$ 1,281,000	$ 1,281,000	$ 1,281,000	$ 1,281,000
	16	$ 224	LF	3,440	7,938	3,440	7,938	$ 771,000	$ 1,778,000	$ 771,000	$ 1,778,000
	18	$ 252	LF	4,498	2,358	4,498	2,358	$ 1,133,000	$ 594,000	$ 1,133,000	$ 594,000
	20	$ 280	LF	0	6,525	0	6,525	$ -	$ 1,827,000	$ -	$ 1,827,000
	24	$ 336	LF	10,387	0	8,884	0	$ 3,490,000	$ -	$ 2,985,000	$ -
Napa River Xing[1]		$ 1,750	LF	1,000	1,000	1,000	1,000	$ 1,750,000	$ 1,750,000	$ 1,750,000	$ 1,750,000
Total New Pipeline			LF	63,000	47,830	50,488	50,488	**$ 13,003,000**	**$ 10,360,000**	**$ 11,348,000**	**$ 10,658,000**
			Miles	11.9	9.1	9.6	9.6				
Annexed 18" Napa Marsh Pipe [2]		$ 84	LF	0	0	10,682	10,682	$ -	$ -	$ 897,316	$ 897,316
Pump Station [8]				None	None	None	30 HP@600 GPM	$ -	$ -	$ -	$ 575,000
Total Construction Cost								**$ 13,003,000**	**$ 10,360,000**	**$ 12,245,316**	**$ 12,130,316**
Estimating Contingency (25%)								$ 3,251,000	$ 2,590,000	$ 3,061,000	$ 3,033,000
Engineering/Legal/Admin./Environmental (30%)								$ 3,901,000	$ 3,108,000	$ 3,674,000	$ 3,639,000
Total Capital Cost[3]								**$ 20,155,000**	**$ 16,058,000**	**$ 18,980,316**	**$ 18,802,316**

Unit Costs (Costs/Acre)				
Initial cost distributed among areas initially receiving RW	**$ 3,587** [11]	**$ 3,480**	**$ 3,378**	**$ 4,075**
Initial cost distributed by ALL areas ultimately receiving RW	**Not applicable**	**Not applicable**	**Not applicable**	**$ 3,346**
"Buy-in" cost distributed among areas initially served by Napa Marsh pipeline to pay for system expansion	**Not applicable**	**Not applicable**	**Not applicable**	**$ 2,731**

Financing Costs [6]				
Annual Debt Service	$ 1,317,000	$ 1,050,000	$ 1,241,000	$ 1,229,000
Total Payments over Duration of Debt	$ 26,340,000	$ 21,000,000	$ 24,820,000	$ 24,580,000

Variable O&M Costs				
NSD water purchase annual cost [4]	$ 912,159	$ 749,475	$ 912,159	$ 912,159
Pumping Costs	$ -	$ -	$ -	$ 33,503

Unit Costs (Costs/Acre-foot)				
Unit Cost[7] ($/acre-foot)	**$1,574**	**$1,544**	**$1,560**	**$1,566**

Notes:

1. Includes 1,000 LF for Napa River crossing @ $1,750/LF (jack and bore construction with 42-inch casing and 24-inch RW pipeline and 6-inch SSFM. Note that Alternative 6A requires a 20-inch crossing which may result in cost savings -- these cost savings are not accounted for in this analysis.
2. The cost to acquire the Napa Marsh Pipe was assumed equivalent to the cost of constructing a new 6-inch pipeline along the same alignment. A 6-inch pipeline is the minimum size necessary to meet the hydraulic criteria.
3. Cost per ENR 10,151 (March 2011, San Francisco)
4. Based on Ordinance No. 92. Peak month charges are $1.57/1000 Gallons. NSD charges include operation and maintenance, repair and replacement, billing, administrative fees. Additional customer metering charges will apply. Starting in 2019, charges will increase by 2% + CPI. Annual CPI change is assumed to be 2%.
5. Parcel 047390019000 (Gross area of 23 acres) responded as "not interested" but is included in this analysis.
6. Financing assumes SRF Loan for 20 years at 2.7% interest.
7. Unit costs have been estimated using the total present worth of annual cash flows and recycled water demands with a discount rate of 6 percent over a 20 year period. Salvage value for each of the facilities was estimated using a 50 year useful life.
8. Pump Station costs based on Figure 6.11 in the 2011 Feasibility Study
9. The information provided for Alternative 5 Future matches the 2011 Feasibility Study. Some minor changes to pipeline alignments have been implemented in subsequent modeling work.
10. Parcels under 2-acres were excluded unless owner owns adjacent land larger than 2 acres
11. This cost is $4,080 including financing and distributed among all areas outside the district that receive recycled water and all areas within LCWD

Parcel ID	Owner	Model Node	Irrigation Type	Area (Acres)	Irrigable Area (Acres)	Current On-Stream Storage	Current Off-Stream Storage	Assumed Storage for Analysis including plans for future storage (AF)	Dmd Vines No Storage (AFY)	Dmd Vines Storage (AFY)	Dmd Landscaping (AFY)	Dmd Storage (AFY)	Annual Demand (AFY)
47320003000	Diageo Chateau & Estates Wine Company	J26	Vines	145.0	125.3	10.0	-	25.0	-	16.4	-	25.0	41.4
47320005000	Beckstoffer Vineyard	J24	Vines	58.7	46.8	-	-	-	15.5	-	-	-	15.5
47320006000	Beckstoffer Vineyard	J24	Vines	79.9	63.7	18.0	-	-	21.0	-	-	-	21.0
47320013000	Beckstoffer Vineyard	J26	Vines	195.9	156.3	77.0	108.0	108.0	-	-	-	51.6	51.6
47320021000	Cabral	J27	Vines	4.8	4.0	-	-	-	1.3	-	-	-	1.3
47320022000	Joseph F Cabral Sr. and Deanna K. Cabral Trust	J27	Vines and Landscaping	2.8	3.0	-	-	-	0.9	-	0.8	-	1.6
47320024000	Napa County Resource Conservation District	J27	Vines and Landscaping	20.6	14.5	-	-	-	4.3	-	3.6	-	7.9
47320025000	Unknown	J27	Vines and Landscaping	62.5	49.8	-	-	6.0	-	8.8	12.5	6.0	27.3
47320027000	Buchli Station Vineyards LLC	J23	Vines and Landscaping	173.4	138.3	-	-	104.5	-	-	34.6	41.1	75.7
47320030000	Koerner Rombauer	J22	Vines and Landscaping	42.9	34.2	-	-	-	10.2	-	8.6	-	18.7
47320031000	Bouchaine Vineyards Inc.	J22	Vines	102.3	85.0	-	-	-	28.1	-	-	-	28.1
47330052000	Midnight Sun Inc. III UBS AgriVest LLC	J22	Vines	115.2	84.7	-	49.0	49.0	-	-	-	28.0	28.0
TOTALS				**1,004.1**	**805.9**	**105.0**	**157.0**	**292.5**	**81.2**	**25.1**	**60.0**	**151.6**	**318.0**

Parcel ID	Owner	Peak Vines No Storage (GPM)	Peak Vines Storage (GPM)	Peak Landscaping (GPM)	Peak Storage (GPM)	Peak Winter (GPM)	Peak Night (GPM)	Peak Day (GPM)	Peak Demand (GPM)
47320003000	Diageo Chateau & Estates Wine Company	-	121.9	-	93.2	93.2	121.9	-	121.9
47320005000	Beckstoffer Vineyard	91.6	-	-	-	-	-	91.6	91.6
47320006000	Beckstoffer Vineyard	124.6	-	-	-	-	-	124.6	124.6
47320013000	Beckstoffer Vineyard	-	-	-	192.2	192.2	-	-	192.2
47320021000	Cabral	7.8	-	-	-	-	-	7.8	7.8
47320022000	Joseph F Cabral Sr. and Deanna K. Cabral Trust	5.3	-	5.4	-	-	5.4	5.3	5.4
47320024000	Napa County Resource Conservation District	25.5	-	26.0	-	-	26.0	25.5	26.0
47320025000	Unknown	-	65.4	89.5	22.4	22.4	154.9	-	154.9
47320027000	Buchli Station Vineyards LLC	-	-	248.5	153.1	153.1	248.5	-	248.5
47320030000	Koerner Rombauer	60.3	-	61.5	-	-	61.5	60.3	61.5
47320031000	Bouchaine Vineyards Inc.	166.2	-	-	-	-	-	166.2	166.2
47330052000	Midnight Sun Inc. III UBS AgriVest LLC	-	-	-	104.2	104.2	-	-	104.2
TOTALS		**481.4**	**187.3**	**430.9**	**565.0**	**565.0**	**618.2**	**481.4**	

Update **Recommended Project Potential Customers**
Table 7.2 Detail **Recycled Water Feasibility Study**
Los Carneros Water District

Parcel ID	Node	Irrigation Type	Responded to Questionaire	Intrested in RW	Not Interested in RW	Area (Acres)	Irrigable Area (Acres)	Storage (AF)	Annual Demand (AFY)	Peak Demand (GPM)
047070007000	J31	Vines and Landscaping	1	1		132.04	115.32	0.00	63.08	207.11
047120001000	J32	Vines	1	1		50.69	40.00	0.00	13.20	78.23
047120002000	J30	Vines	1	1		308.25	217.00	75.00	71.61	266.82
047120003000	J30	Vines	1	1		6.40	4.00	0.00	1.32	7.82
047120005000	J31	Vines	1	1		206.00	200.00	130.00	66.00	245.92
047120006000	J31	Vines	1	1		186.36	80.00	35.00	26.40	98.37
047120010000	J30	Vines	1	1		9.84	7.00	10.00	2.31	8.61
047120012000	J30	Vines and Landscaping	0	0		10.00	7.98	6.55	4.36	14.33
047120013000	J30	Vines and Landscaping	0	0		10.17	8.11	0.00	4.44	14.57
047120015000	J29	Vines	1	1		120.52	101.06	0.00	33.35	197.65
047130001000	J07	Vines and Landscaping	0	0		101.71	81.14	24.96	44.38	145.72
047130002000	J09	Vines	1	1		18.75	17.00	0.00	5.61	33.25
047130005000	J09	Vines and Landscaping	1	1		30.55	26.68	0.00	14.59	47.92
047130006000	J09	Vines and Landscaping	1	1		18.90	14.30	3.04	7.82	34.68
047130007000	J09	Vines	1	1		28.25	26.46	0.00	8.73	51.75
047130008000	J09	Vines	1	1		5.16	1.56	0.00	0.51	3.05
047150011000	J13	Vines and Landscaping	0	0		4.92	3.92	0.00	2.15	7.05
047150012000	J14	Vines and Landscaping	0	0		4.50	3.59	0.00	1.96	6.45
047150013000	J14	Landscaping	1	1		6.18	5.00	0.00	12.50	89.80
047150019000	J14	Vines and Landscaping	0	0		5.00	3.99	1.75	2.18	7.16
047150025000	J14	Vines	1	1		7.68	6.02	0.00	1.99	11.77
047160009000	J14	Vines and Landscaping	0	0		4.00	3.19	2.47	1.75	5.73
047160011000	J13	Vines and Landscaping	0	0		6.27	5.00	0.00	2.74	8.98
047160019000	J13	Vines and Landscaping	0	0		10.58	8.44	1.57	4.62	22.17
047160025000	J14	Vines and Landscaping	0	0		3.09	2.46	0.00	1.35	4.43
047170001000	J12	Vines and Landscaping	1	1		30.20	24.09	19.00	13.18	43.27
047170002000	J12	Vines and Landscaping	0	0		0.91	0.73	0.00	0.40	1.30
047170003000	J12	Vines	1	1		27.10	17.00	10.00	5.61	20.90
047181005000	J10	Vines and Landscaping	0	0		2.05	1.64	0.00	0.89	2.94
047181006000	J10	Vines and Landscaping	1	1		6.97	6.00	0.00	3.28	10.78
047182011000	J10	Vines and Landscaping	1	1		9.78	5.50	0.00	3.01	9.88
047190002000	J10	Vines	1	1		30.93	27.89	6.51	9.20	24.26
047190003000	J07	Vines and Landscaping	0	0		11.36	9.06	0.00	4.96	16.28
047201005000	J12	Vines and Landscaping	1	1		11.35	8.59	0.00	4.70	15.42
047202001000	J12	Vines and Landscaping	0	0		2.33	1.86	0.00	1.02	3.34
047212001000	J09	Vines and Landscaping	0	0		8.70	6.94	0.00	3.80	12.46
047212002000	J09	Vines and Landscaping	1	1		15.83	12.50	0.00	6.84	22.45
047212003000	J09	Vines and Landscaping	0	0		1.24	0.99	0.00	0.54	1.78
047230001000	J04	Vines and Landscaping	0	0		11.37	9.07	0.00	4.96	16.29
047230008000	J07	Vines	1	1		68.21	61.50	14.35	20.30	53.47
047230011000	J04	Vines and Landscaping	1	1		48.13	36.41	7.72	19.92	88.43
047230013000	J07	Vines	1	1		25.14	22.00	0.00	7.26	43.03
047230032000	J07	Vines and Landscaping	0	0		3.26	2.60	0.00	1.42	4.67
047230033000	J07	Vines and Landscaping	1	1		29.81	12.00	6.00	6.56	21.55
047230035000	J07	Vines	1	1		19.00	19.00	9.00	6.27	23.36
047230036000	J07	Vines	1	1		2.76	1.00	0.00	0.33	1.96
047230042000	J06	Vines and Landscaping	0	0		46.56	37.14	16.17	20.32	66.71
047230045000	J04	Vines and Landscaping	1	1		143.00	108.18	22.96	59.18	262.65
047230046000	J04	Vines and Landscaping	1	1		52.97	40.07	8.48	21.92	97.45
047230049000	J03	Stanly Ranch	1	1		23.85	19.78	0.00	3.77	22.34
047230050000	J03	Stanly Ranch	1	1		21.09	19.78	0.00	3.77	22.34
047230051000	J03	Stanly Ranch	1	1		25.28	19.78	0.00	3.77	22.34
047230052000	J03	Stanly Ranch	1	1		25.32	19.78	0.00	3.77	22.34
047230053000	J03	Stanly Ranch	1	1		20.10	19.78	0.00	3.77	22.34
047230054000	J03	Stanly Ranch	1	1		31.91	19.78	0.00	3.77	22.34
047240004000	J07	Vines	1	1		12.50	11.27	2.63	3.72	9.80
047240006000	J07	Vines and Landscaping	0	0		11.55	9.21	2.37	5.04	19.25
047240007000	J16	Vines and Landscaping	0	0		21.60	17.23	0.00	9.43	30.95
047240009000	J06	Landscaping	1	1		10.01	10.00	0.00	25.00	179.59
047240017000	J03	Stanly Ranch	1	1		120.50	19.78	0.00	3.77	22.34
047240018000	J03	Stanly Ranch	1	1		20.50	19.78	0.00	3.77	22.34
047240019000	J03	Stanly Ranch	1	1		20.05	19.78	0.00	3.77	22.34
047240020000	J03	Stanly Ranch	1	1		20.12	19.78	0.00	3.77	22.34
047240021000	J03	Stanly Ranch	1	1		22.26	19.78	0.00	3.77	22.34
047240022000	J03	Stanly Ranch	1	1		20.42	19.78	0.00	3.77	22.34
047240023000	J03	Stanly Ranch	1	1		20.44	19.78	0.00	3.77	22.34
047240024000	J03	Stanly Ranch	1	1		212.42	19.78	0.00	3.77	22.34
047240025000	J03	Stanly Ranch	1	1		29.65	19.78	0.00	3.77	22.34
047240033000	J03	Stanly Ranch	1	1		21.93	19.78	0.00	3.77	22.34
047240034000	J03	Stanly Ranch	1	1		20.28	19.78	3.00	3.77	11.18
047240035000	J03	Stanly Ranch	1	1		35.79	19.78	0.00	3.77	22.34
047240036000	J16	Vines and Landscaping	0	0		9.25	7.38	0.00	4.04	13.25
047240037000	J16	Vines and Landscaping	0	0		10.42	8.31	2.03	4.55	18.20
047251001000	J16	Vines and Landscaping	0	0		7.22	5.76	0.00	3.15	10.34
047251003000	J16	Vines and Landscaping	0	0		2.76	2.20	0.00	1.20	3.95
047251004000	J16	Vines and Landscaping	0	0		20.17	16.09	0.00	8.80	28.90

Update **Recommended Project Potential Customers**
Table 7.2 Detail **Recycled Water Feasibility Study**
Los Carneros Water District

Parcel ID	Node	Irrigation Type	Responded to Questionaire	Intrested in RW	Not Interested in RW	Area (Acres)	Irrigable Area (Acres)	Storage (AF)	Annual Demand (AFY)	Peak Demand (GPM)
047252001000	J16	Vines and Landscaping	0	0		31.79	25.36	0.00	13.87	45.54
047252004000	J16	Vines and Landscaping	1	1		12.73	12.00	0.00	6.56	21.55
047252005000	J16	Vines and Landscaping	1	1		19.97	15.00	0.00	8.21	26.94
047252007000	J06	Vines and Landscaping	0	0		25.00	19.94	24.60	10.91	35.82
047252009000	J06	Vines and Landscaping	0	0		6.00	4.79	5.95	2.62	8.60
047252010000	J06	Vines and Landscaping	0	0		3.15	2.51	0.00	1.37	4.51
047252011000	J16	Vines and Landscaping	1	1		11.71	10.00	0.00	5.47	17.96
047271001000	J25	Vines	1	1		160.00	100.00	20.00	33.00	96.88
047271002000	J28	Vines and Landscaping	0	0		258.11	205.90	0.00	112.63	369.79
047272010000	J24	Vines	1	1		23.72	18.00	21.00	5.94	22.13
047272011000	J25	Vines	1	1		49.22	42.55	0.00	14.04	83.22
047272012000	J25	Vines	1	1		49.67	42.94	0.00	14.17	83.98
047272015000	J24	Vines and Landscaping	1	1		5.39	5.50	1.00	3.01	14.60
047272016000	J24	Vines	1	1		36.70	31.73	0.00	10.47	62.05
047272017000	J24	Vines	1	1		21.64	16.20	0.00	5.35	31.68
047272018000	J24	Vines	1	1		20.74	17.93	0.00	5.92	35.06
047272019000	J24	Vines	1	1		23.16	21.46	10.00	7.08	26.39
047272020000	J24	Vines	1	1		20.00	18.54	0.00	6.12	36.26
047272021000	J29	Vines	1	1		88.18	73.94	0.00	24.40	144.61
047280005000	J21	Vines and Landscaping	1	1		50.00	43.00	15.00	23.52	77.23
047280006000	J17	Vines	1	1		15.70	8.00	0.00	2.64	15.65
047280007000	J19	Vines and Landscaping	0	0		23.00	18.35	0.00	10.04	32.95
047280016000	J14	Vines and Landscaping	0	0		6.65	5.30	0.00	2.90	9.53
047280017000	J14	Vines	1	1		365.13	285.00	175.00	94.05	350.43
047290026000	J19	Vines and Landscaping	0	0		2.47	1.97	0.00	1.08	3.54
047290027000	J19	Vines and Landscaping	1	1		17.53	14.02	0.00	7.67	25.19
047300009000	J17	Vines and Landscaping	0	0		5.85	4.67	0.00	2.55	8.38
047300014000	J17	Vines and Landscaping	0	0		2.01	1.60	0.00	0.88	2.88
047300015000	J17	Vines	1	1		3.20	3.00	0.00	0.99	5.87
047300016000	J17	Vines	1	1		17.26	17.00	0.00	5.61	33.25
047310006000	J17	Vines	1	1		21.61	16.10	0.00	5.31	31.49
047320003000	J26	Vines	1	1		145.00	125.35	25.00	41.36	121.94
047320004000	J24	Vines	1	1		14.25	13.25	0.00	4.37	25.91
047320005000	J24	Vines	1	1		58.72	46.84	0.00	15.46	91.61
047320006000	J24	Vines	1	1		79.89	63.73	0.00	21.03	124.64
047320011000	J24	Vines and Landscaping	0	0		10.68	8.52	0.00	4.66	15.30
047320012000	J24	Vines	1	1		10.44	9.00	0.00	2.97	17.60
047320013000	J26	Vines	1	1		195.93	156.30	108.00	51.58	192.18
047320021000	J27	Vines	1	1		4.77	4.00	0.00	1.32	7.82
047320022000	J27	Vines and Landscaping	1	1		2.84	3.00	0.00	1.64	5.39
047320024000	J27	Vines and Landscaping	1	1		20.63	14.50	0.00	7.93	26.04
047320025000	J27	Vines and Landscaping	0	0		62.45	49.82	6.02	27.25	154.86
047320027000	J23	Vines and Landscaping	0	0		173.42	138.34	104.45	75.67	248.45
047320030000	J22	Vines and Landscaping	0	0		42.93	34.25	0.00	18.73	61.50
047320031000	J22	Vines	1	1		102.28	85.00	0.00	28.05	166.24
047330026000	J21	Vines and Landscaping	1	1		33.30	25.00	0.00	13.68	44.90
047330032000	J20	Vines and Landscaping	0	0		78.62	62.72	0.00	34.31	112.64
047330033000	J20	Vines and Landscaping	0	0		7.00	5.58	0.00	3.05	10.03
047330041000	J20	Vines	1	1		54.73	49.34	11.51	16.28	42.89
047330051000	J20	Landscaping	1	1		6.67	2.50	0.00	6.25	44.90
047330052000	J22	Vines	1	1		115.24	84.73	49.00	27.96	104.18
047330053000	J23	Landscaping	1	1		41.40	40.00	20.00	100.00	596.16
047380008000	J32	Vines and Landscaping	0	0		6.71	5.35	0.00	2.93	9.61
047380009000	J32	Vines	1	1		61.74	42.00	17.00	13.86	51.64
047380010000	J32	Vines	1	1		61.56	24.00	37.00	7.92	29.51
047390002000	J21	Vines and Landscaping	0	0		2.36	1.88	0.00	1.03	3.38
047390003000	J21	Vines and Landscaping	1	1		8.18	8.00	0.00	4.38	14.37
047390008000	J19	Vines and Landscaping	0	0		3.64	2.90	0.00	1.59	5.21
047390009000	J19	Vines and Landscaping	1	1		17.94	14.35	0.00	7.85	25.78
047390013000	J19	Vines and Landscaping	0	0		3.31	2.64	0.00	1.44	4.74
047390014000	J19	Vines and Landscaping	1	1		9.61	7.69	0.00	4.21	13.81
047390016000	J19	Vines and Landscaping	1	1		5.23	4.18	0.00	2.29	7.51
047390018000	J21	Vines	1	1		2.47	2.00	0.00	0.66	3.91
047390019000	J21	Vines	1	0	1	23.26	23.00	0.00	7.59	44.98
047390021000	J19	Landscaping	1	1		11.43	3.50	0.00	8.75	62.86
047390022000	J19	Vines and Landscaping	1	1		20.94	16.75	20.00	9.16	30.09
TOTALS			**96**	**95**	**1**	**5,619**	**4,187**	**1,091**	**1,783**	

Reference 2

Prepared in cooperation with the Napa County Department of Public Works

Ground-Water Resources in the Lower Milliken–Sarco–Tulucay Creeks Area, Southeastern Napa County, California, 2000–2002

Water-Resources Investigations Report 03-4229

U.S. Department of the Interior
U.S. Geological Survey

Ground-Water Resources in the Lower Milliken–Sarco–Tulucay Creeks Area, Southeastern Napa County, California, 2000–2002

By Christopher D. Farrar *and* Loren F. Metzger

U.S. GEOLOGICAL SURVEY

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2008-19

Sacramento, California
2003

U.S. DEPARTMENT OF THE INTERIOR
GALE A. NORTON, *Secretary*

U.S. GEOLOGICAL SURVEY
Charles G. Groat, *Director*

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CONVERSION FACTORS, VERTICAL DATUM, ABBREVIATIONS, and WELL-NUMBERING SYSTEM

CONVERSION FACTORS

Multiply	By	To obtain
	Length	
inch (in.)	2.54	centimeter
foot (ft)	0.3048	meter
foot per foot (ft/ft)	1	meter per meter
mile (mi)	1.609	kilometer
	Area	
acre	0.4047	hectare
square foot (ft^2)	0.09290	square meter
square mile (mi^2)	259.0	hectare
	Volume	
acre-foot (acre-ft)	1,233	cubic meter
acre-foot per acre (acre-ft/acre)	0.0000003	cubic hectometer per square meter
gallons (gal)	3.785	liter
	Flow rate	
acre-foot per day (acre-ft/d)	0.01427	meter per day
acre foot per day per mile [(acre-ft/d)/mi]	0.000766	cubic hectometer per second
acre-foot per year (acre-ft/yr)	1,233	cubic meter per year
foot per second (ft/s)	0.3048	meter per second
cubic foot per day (ft^3/d)	0.02832	cubic meter per day
cubic foot per second (ft^3/s)	0.3048	cubic meter per second
gallon per minute (gal/min)	0.06309	liter per minute
	Hydraulic conductivity	
foot per day (ft/d)	0.3048	meter per day

Temperature in degrees Celsius (^oC) may be converted to degrees Fahrenheit (^oF) as follows:

$$^0F=1.8\ ^0C+32.$$

Specific conductance is given microsiemens per centimeter at 25 degrees Celsius (µS/cm at 25^oC).

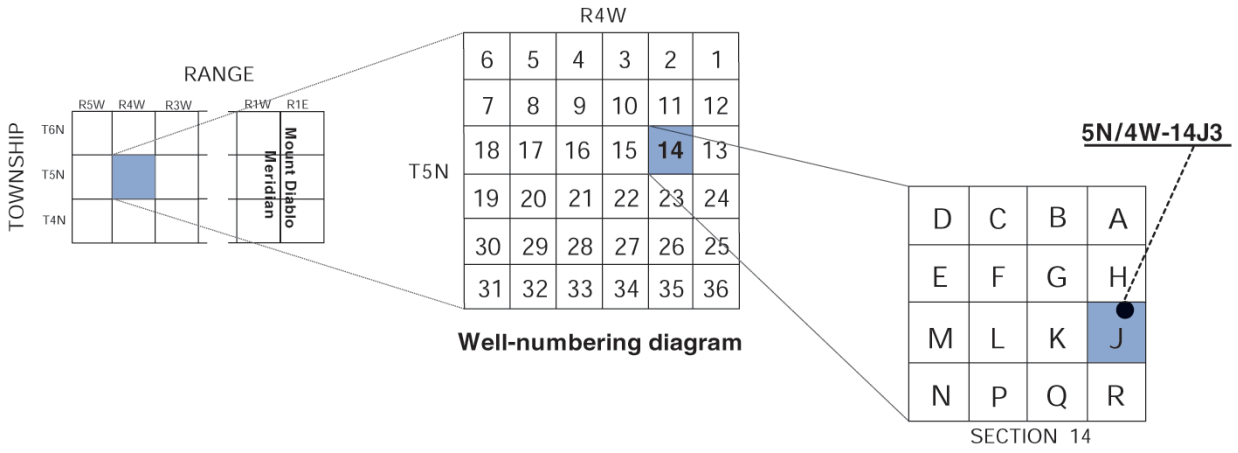
Concentrations of chemical constituents in water are given either in milligrams per liter (mg/L) or micrograms per liter (µg/L).

Abbreviations

cm^3/L	cubic centimeters per liter
hr/d	hour per day
kg	kilogram
L	liter
mg/L	milligrams per liter
mL	milliter
pg/kg	picogram per kilogram
µg/L	micrograms per liter
µS/cm	microsiemens per centimeter
AL	action level
bls	below land surface
DWR	Department of Water Resources
GIS	geographic information system
GPS	global positioning system
GULP	Groundwater Under Local Protection
MCL	maximum contaminant level
NWIS	National Water Information System
pptv	part per trillion by volume
STP	standard temperature and pressure
USGS	U.S. Geological Survey
V-SMOW	Vienna Standard Mean Ocean Water
Ar	argon
$CaCO_3$	calcium carbonate
CFC	chloroflurocarbons
CH_4	methane
CO_2	carbon dioxide
H_2	hydrogen gas
^1H	hydrogen isotope
^2H	deuterium
^3H	tritium
He	helium
^3He	helium-3
^4He	helium-4
H_2S	hydrogen sulfide
N_2	nitrogen
Ne	neon
O_2	oxygen
^{16}O	oxygen-16
^{18}O	oxygen-18
TU	tritium units
δ	delta notation
‰	parts per thousand

WELL-NUMBERING SYSTEM

Wells are identified and numbered according to their location in the rectangular system for the subdivision of public lands. Identification consists of the township number, north or south; the range number, east or west; and the section number. Each section is divided into sixteen 40-acre tracts lettered consecutively (except I and O), beginning with "A" in the northeast corner of the section and progressing in a boustrophedonic manner to "R" in the southeast corner. Within the 40-acre tract, wells are numbered sequentially in the order they are inventoried. The final letter refers to the base line and meridian. In California, there are three base lines and meridians; Humbolt (H), Mount Diablo (M), and San Bernardino (S). All wells in the study area are referred to the Mount Diablo base line and meridian (M). Well numbers consist of 15 characters and follow the format 005N004W14J003M. In this report, well numbers are abbreviated and written 5N/4W-14J3. The following diagram shows how the number for well 5N/4W-14J3 is derived.



Ground-Water Resources in the Lower Milliken–Sarco–Tulucay Creeks Area, Southeastern Napa County, California, 2000–2002

By Christopher D. Farrar and Loren F. Metzger

ABSTRACT

Ground water obtained from individual private wells is the sole source of water for about 4,800 residents living in the lower Milliken–Sarco–Tulucay Creeks area of southeastern Napa County. Increases in population and in irrigated vineyards during the past few decades have increased water demand. Estimated ground-water pumpage in 2000 was 5,350 acre-feet per year, an increase of about 80 percent since 1975. Water for agricultural irrigation is the dominant use, accounting for about 45 percent of the total. This increase in ground-water extraction has resulted in the general decline of ground-water levels. The purpose of this report is to present selected hydrologic data collected from 1975 to 2002 and to quantify changes in the ground-water system during the past 25 years.

The study area lies in one of several prominent northwest-trending structural valleys in the North Coast Ranges. The area is underlain by alluvial deposits and volcanic rocks that exceed 1,000 feet in thickness in some places. Alluvial deposits and tuff beds in the volcanic sequence are the principal source of water to wells.

The ground-water system is recharged by precipitation that infiltrates, in minor amounts, directly on the valley floor but mostly by infiltration in the Howell Mountains. Ground water moves laterally from the Howell Mountains into the study area. Although the area receives abundant winter precipitation in most years, nearly half of the precipitation is lost as surface runoff to the Napa River. Evapotranspiration also is high, accounting for nearly one-half of the total precipitation received. Because of the uncertainties in the estimates of precipitation, runoff, and evapotranspiration, a precise estimate of potential ground-water recharge cannot be made.

Large changes in ground-water levels occurred between 1975 and 2001. In much of the western part of the area, water levels increased; but in the central and eastern parts, water levels declined by 25 to 125 feet. Ground-water extraction produced three large pumping depressions in the northern and east-central parts of the area. The general decline in ground-water levels is a result of increases in ground-water pumpage and possibly changes in infiltration capacity caused by changes in land use.

Ground-water-level declines during 1960–2002 are evident in the records for 9 of 10 key monitoring wells. In five of these wells, water levels dropped by greater than 20 feet since the 1980s. The largest water-level declines have occurred since the mid 1970s, corresponding with a period of accelerated well construction and ground-water extraction.

Analysis of samples from 15 wells indicates that the chemical quality of ground water in the study generally is acceptable. However, arsenic concentrations in samples from five wells exceed the U.S. Environmental Protection Agency primary drinking-water standard of 10 micrograms per liter, and iron concentrations in samples from five wells exceed the U.S. Environmental Protection Agency and the California Department of Health Services secondary drinking-water

standard of 300 micrograms per liter. Water from 12 of 15 wells sampled contained concentrations of manganese that exceed the U.S. Environmental Protection Agency and the California Department of Health Services secondary drinking-water standard of 50 micrograms per liter. Two wells produced water that had boron in excess of the California Department of Health Services action level of 1 milligram per liter.

Stable isotope, chlorofluorocarbon, and tritium data indicate that ground water in the area is a mixture of waters that recharged the aquifer system at different times. The presence of chlorofluorocarbons and tritium in water from the study area is evidence that modern recharge (post 1950) does take place. Water-temperature logs indicate that ground-water temperatures throughout the study area exceed 30°C at depths in excess of 600 feet. Further, water at depths greater than 600 feet in parts of the study area may contain objectionable concentrations of some constituents that may limit the use of the ground water.

INTRODUCTION

The Milliken–Sarco–Tulucay Creeks area, in southeastern Napa County, California, lies adjacent to the city of Napa and extends eastward into the Howell Mountains. This part of Napa County is approximately 40 mi northeast of San Francisco. The Milliken, Sarco, and Tulucay Creeks are the main streams that drain the Howell Mountains between 38° 25´ and 38° 17´ north latitude; the creeks have a combined drainage area of 42 mi^2. Land-surface altitudes range from about 10 ft above sea level at the Napa River, in the southwest part of the area, to 1,877 ft above sea level on the summit of Mt. George in the Howell Mountains. The lower parts of the three drainage basins, which cover about 15 mi^2 of rolling hills that extend westward from the mountain front to the Napa River, were the focus of this study (fig. 1). The study area has been extensively developed into agricultural land and rural home sites. Most home sites are on parcels larger than 1 acre.

Ground water is the only source of water in much of the lower Milliken–Sarco–Tulucay Creeks area. The city of Napa supplies part of this area with surface water delivered through a pipeline distribution system. For most of the area, however, each developed land parcel has an individual water system supplied by one or more wells. Single-family dwelling units, irrigated agriculture, and golf courses are the main users of the local ground water. An increase in ground-water extraction since the 1950s has resulted in the general decline of ground-water levels throughout the area. Declining ground-water levels are evidence of a ground-water system under stress.

Purpose and Scope

The U.S. Geological Survey (USGS) in cooperation with the Napa County Department of Public Works undertook this study to evaluate possible strategies for reducing water-level declines in the Milliken–Sarco–Tulucay Creeks area. A previous hydrologic assessment of the area was completed more than 25 years ago (Johnson, 1977). Many wells have been completed and significant hydrologic data have been collected since Johnson's study. These more recent data were used in this study to increase the level of knowledge of the local geohydrology of the area and to describe changes in land use, water use, and ground-water levels since 1975.

The purpose of this report is to present selected hydrologic data collected from 1975 to 2002 and to quantify changes in the ground-water system that occurred during the past 25 years. This information is essential for the future management of the ground-water system, which is the primary source of water supply for a rapidly developing area of the county. Specific objectives of the study were to refine the conceptual model of the geohydrologic framework, quantify changes in water use, describe present day ground-water conditions, identify the locations with the largest changes in ground-water storage, provide a more complete description of ground-water quality, and update the hydrologic budget of the lower Milliken–Sarco–Tulucay Creeks area. The emphasis of this study was on documenting changes in ground-water levels within the study area and identifying the principal causes of the ground-water level declines. An additional objective was to determine the source and movement of ground water in the different drainage basins.

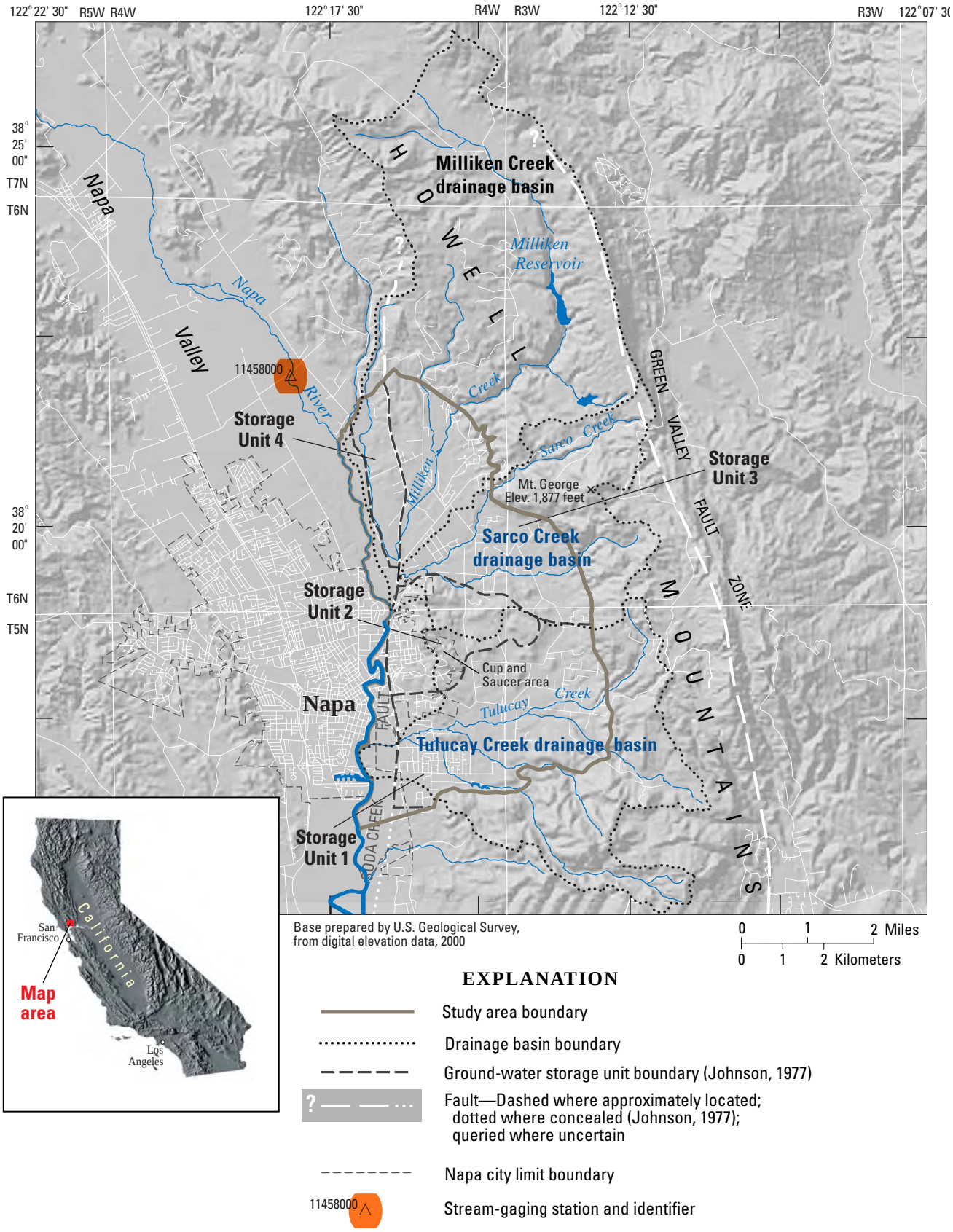


Figure 1. Location of study area, southeastern Napa County, California.

To meet the objectives of this study, four principal tasks were identified: (1) evaluation of existing geohydrologic and geochemical data, (2) collection and analysis of new geohydrologic data including subsurface lithologic data, ground-water levels, and streamflow gains and losses, (3) collection and analysis of new water chemistry and isotopic data, and (4) updating estimates of water use and changes in ground-water storage and movement.

New hydrologic data presented in this report were collected between April 2000 and November 2002. These data include ground-water levels, surface-water discharge measurements, water chemistry including isotopic composition, and temperature logs in wells.

Description of Study Area

The study area, which is a topographic depression underlain by lava flows, tuff beds, and volcanic debris, is enclosed on the north, east, and south by the Howell Mountains and is bounded on the west by the Napa River (fig. 1). Johnson (1977) divided most of the study area into four storage units on the basis of geologic structure and surface-water drainage basins. However, parts of the study area near the western boundary are not included in these storage units. Storage unit 1 consists of 3,873 acres in the southern part of the study area and includes most of the lower reach of Tulucay Creek and several tributary streams. Storage unit 2 consists of about 1,638 acres of hilly land along the western side of the central part of the study area and is drained only by a few minor unnamed ephemeral streams. This area is known as The Cup and Saucer area in reference to the somewhat cup-shaped topography. Storage unit 3 consists of about 3,584 acres in the northern and eastern parts of the study area and is drained by Milliken and Sarco Creeks. Storage unit 4 comprises about 815 acres in a narrow area west of the Soda Creek Fault.

Ground-water level and geochemical data collected during this study do not support the notion that these storage units are hydraulically separate. The storage unit designations, nevertheless, are useful because they are used by local governmental agencies and residents as names for partitions of the study area. For this reason the storage units are referred to in the text and the boundaries are shown in several figures in this report.

The study area consists of predominantly unincorporated land within the county of Napa, but it also includes a part of the city of Napa on the western side of the area. Land use is a combination of urban, agriculture, and unimproved open space (fig. 2). Land-use mapping by the California Department of Conservation in 2000 (Sherron Muma, California Department of Conservation, written commun., 2002) showed that unimproved open space with mixed residential use predominates, amounting to about 40 percent of the total area, followed by urban use of 31 percent, and irrigated agriculture mixed with residential use of 21 percent (table 1, at back of report). Major changes in land use have taken place in the study area over the past 40 years. On the basis of land-use analysis completed as a part of this study using the earliest available aerial photographs, land use for unimproved open space with mixed residential use decreased by 35 percent, urban use increased by 58 percent, and irrigated agriculture with residential use increased by 304 percent since 1958. The dramatic increase in irrigated agriculture is attributable to the emergence of drip-irrigated vineyards for the production of wine grapes. Other agricultural uses, such as orchards, row crops, and non-irrigated grass and pasture lands, have been almost completely replaced by vineyards in the study area.

Census data for the year 2000 indicate that about 16,500 people live in the study area (Association of Bay Area Governments, 2002), an increase of about 21 percent since Johnson's study in the early 1970s . The population in the unincorporated county part of the study area is about 8,000. However, a direct comparison of the present day population in the county area with Johnson's data cannot be made because some previously unincorporated areas are now part of the city.

The climate of the study area is mediterranean, with distinct wet and dry seasons. About 90 percent of the area's yearly precipitation occurs from November through April. Mean annual precipitation at Napa State Hospital averaged about 24.5 inches from water years 1918 through 2002 (fig. 3*A*) (National Oceanic and Atmospheric Administration, 2002). Figure 3*A* shows that annual precipitation in any given year can deviate as much as 200 percent from the 85-year average. During the study period, water years 2000 through 2002, rainfall at Napa State Hospital ranged from about 6 inches below average in 2001 to about 1.5 inches above average in 2000 and 2002 (fig. 3*B*).

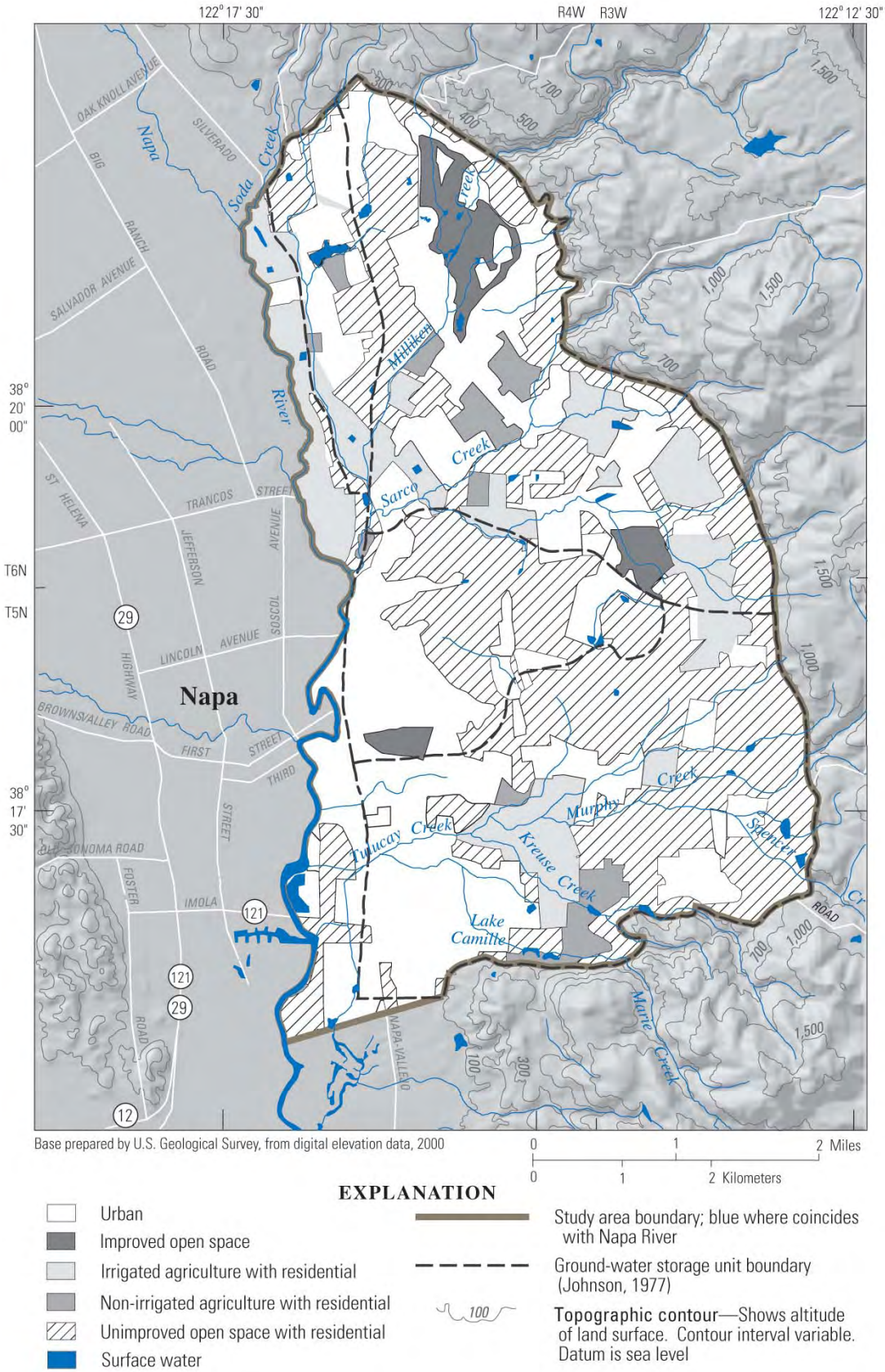


Figure 2. Land use in 2000 in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California.

(Modified from Important Farmland Data, Napa County, California, 2000, 1:24,000 enlargement, Sherron Muma, California Department of Conservation, Farmland Mapping and Monitoring Program, written commun., 2000)

The areal distribution of mean annual precipitation for 1961–90 in the study area is shown in figure 4. Isohyetal contours show that precipitation generally increases from south to north and with increasing altitude. Average annual precipitation is as much as 40 inches in the highest altitudes of the Howell Mountains. This is about 65 percent more precipitation than the amount received at the lower altitudes (Daly and Taylor, 1998).

The average total amount of precipitation received in the Milliken, Sarco, and Tulucay Creeks drainage basins is about 69,000 acre-ft/yr based on the isohyetal map (fig. 4). Of this amount, about 29,000 acre-ft/yr leaves the watershed as runoff in local streams to the Napa River. This estimate is based on streamflow records for stations on the Napa River and Tulucay Creek and is consistent with estimated unit-runoff for this area given in Rantz (1968). Johnson (1977) estimated that evapotranspiration in the basins consumes about 30,500 acre-ft/yr. An estimate of about 34,000 acre-ft/yr is obtained when Johnson's estimate is adjusted for the slightly larger area mapped for this study. Using these estimates, it is clear that most of the water entering the basins leaves as runoff or evapotranspiration. Potential ground-water recharge can be calculated as the residual of total precipitation minus runoff and evapotranspiration, assuming no other inflows or outflows. Using this method, a residual of 6,000 acre-ft/yr is calculated based on the estimates made in this study. However, because of the uncertainty in the estimates of precipitation, runoff, and evapotranspiration, this value is not a precise estimate of potential ground-water recharge and should not be construed as the safe yield for the study area.

Residential water supplies in the study area are a combination of municipal and private sources. The City of Napa Municipal Water Department supplies almost 79,000 people within the city limits of Napa and in several unincorporated parts of Napa County (Don Ridenhour, City of Napa Municipal Water Department, written commun., 2002). The water supplied by the city of Napa primarily is obtained from Lake Hennessey and the Milliken Reservoir (fig. 1) and imported surface water obtained from the North Bay Aqueduct through a contract with the State Water Project. County areas served by public water supply include residences in an area bounded by Monticello Road, Sarco Creek, and Vichy Avenue, and the Silverado Country Club east of Atlas Peak Road and north of Monticello Road (fig. 5). An estimated 3,200 people are served by about 1,000 metered public-supply connections. The remaining estimated 4,800 residents of the county part of the study area rely on private water systems. Ground water is the predominant source of water for both domestic and irrigation use.

Previous Investigations

Weaver (1949) carried out one of the earliest published geologic investigations that included the study area. His work defined the basic geology of the area in terms of stratigraphy and structure. Studies by Fox and others (1973) and Sims and others (1973) provide the most detailed geologic maps for the study area to date.

Hydrologic data have been collected in the study area since the late 1940s but some earlier sources of information also are available. Water levels have been measured in the study area since about the late 1910s as part of local or special studies and through cooperative efforts by various government entities [California Department of Water Resources (DWR), 1995]. Intermittent water-level measurements through the 1940s were made primarily by the USGS. Regular long-term regional water-level monitoring by the USGS, DWR, and the Napa County Agricultural Advisor began in the late 1950s. Since 1973, Napa County in cooperation with DWR has collected water-level data semiannually for a network of about 10 wells. These data were reviewed for this study and provided a basis for documenting long-term trends in ground-water levels throughout the study area. The study area also was included in a comprehensive hydrogeologic investigation of Napa and Sonoma Counties by the U.S. Geological Survey (Kunkel and Upson, 1960). Their data and interpretation provided the foundation for later hydrologic studies. In the mid-1970s, the USGS carried out a more detailed study focused solely on the Milliken–Sarco–Tulucay Creek area (Johnson, 1977).

The Regional Water Quality Control Board has developed a geographic information system (GIS) for Napa Valley (Jeff Kapellas, California Regional Water Quality Control Board, written commun., 2000) that includes surficial geology, soils, ground-water basins, well yield, depth to ground water, recharge areas, well data, Napa County septic systems, hazardous material storage sites, landfills, and land use.

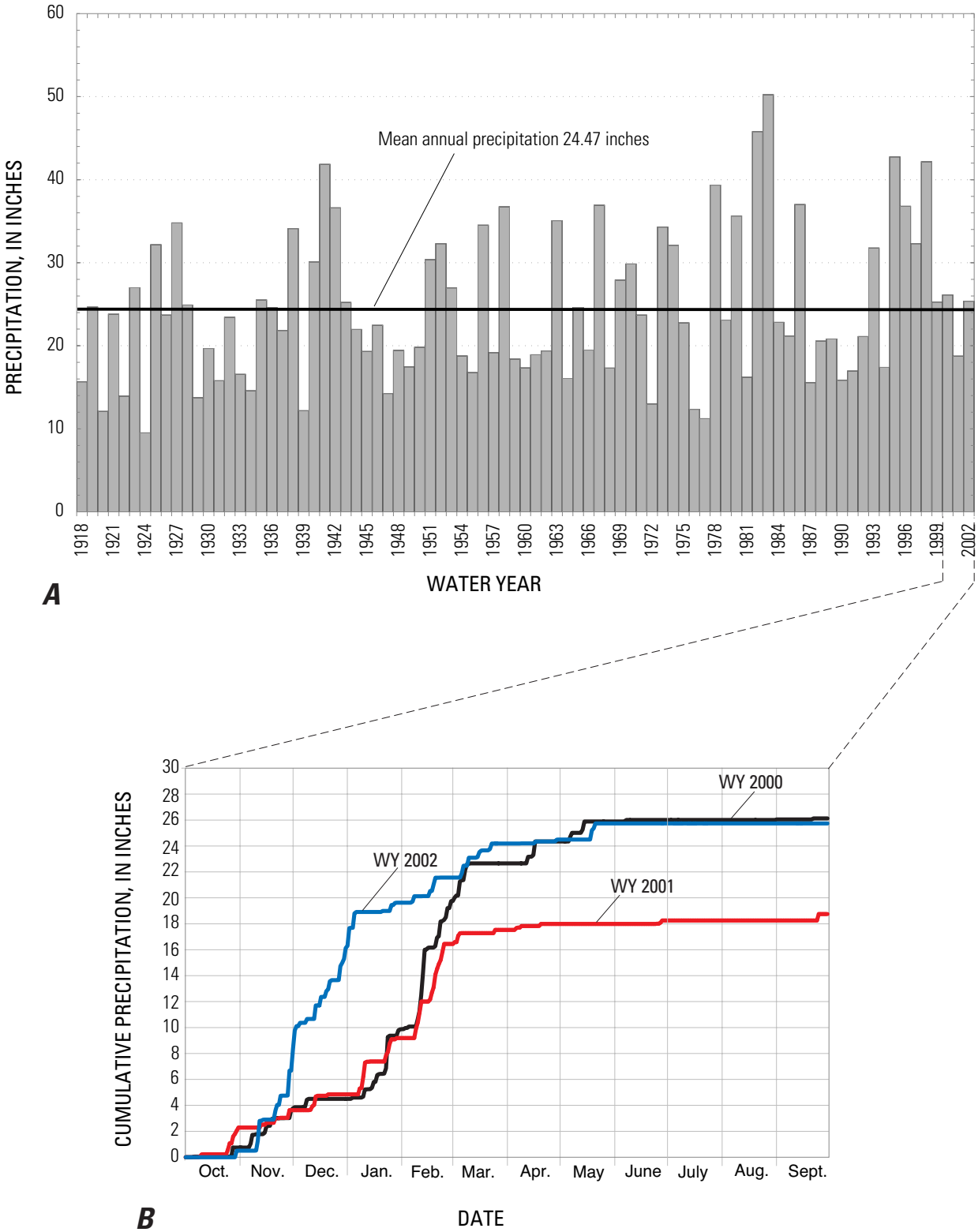
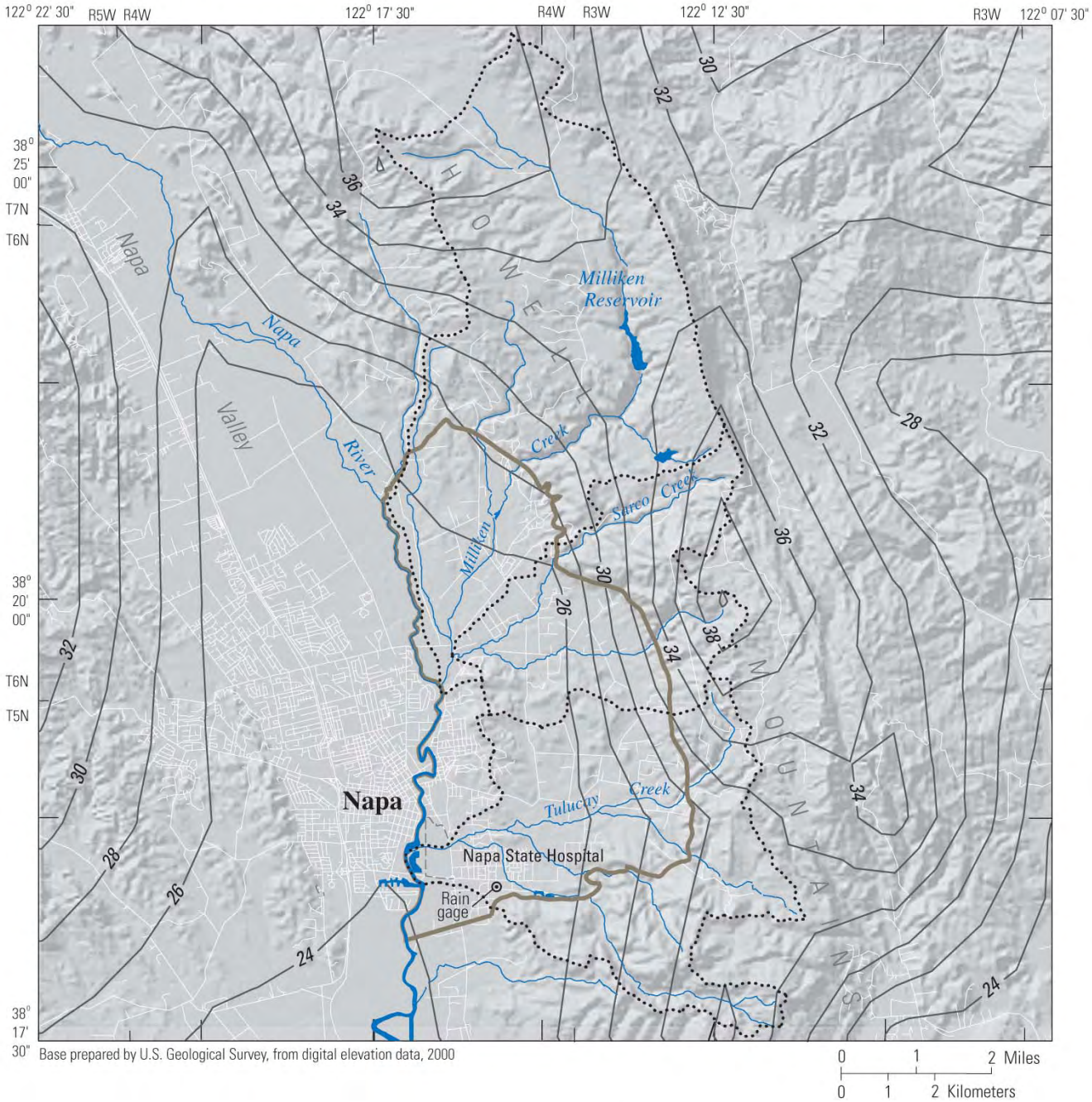


Figure 3. (A) Annual precipitation for water years 1918–2002, and (B) distribution of cumulative precipitation for water years (WY) 2000–2002 at Napa State Hospital, southeastern Napa County, California.

(See figure 4 for areal distribution.)



EXPLANATION

24	Line of equal mean annual precipitation (isohyet). Contour interval 2 inches (Daly and Taylor, 1998)
	Study area boundary; blue where coincides with Napa River
	Drainage basin boundary

Figure 4. Mean annual precipitation in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California, 1961-90. (Modified from Daly and Taylor, 1998)

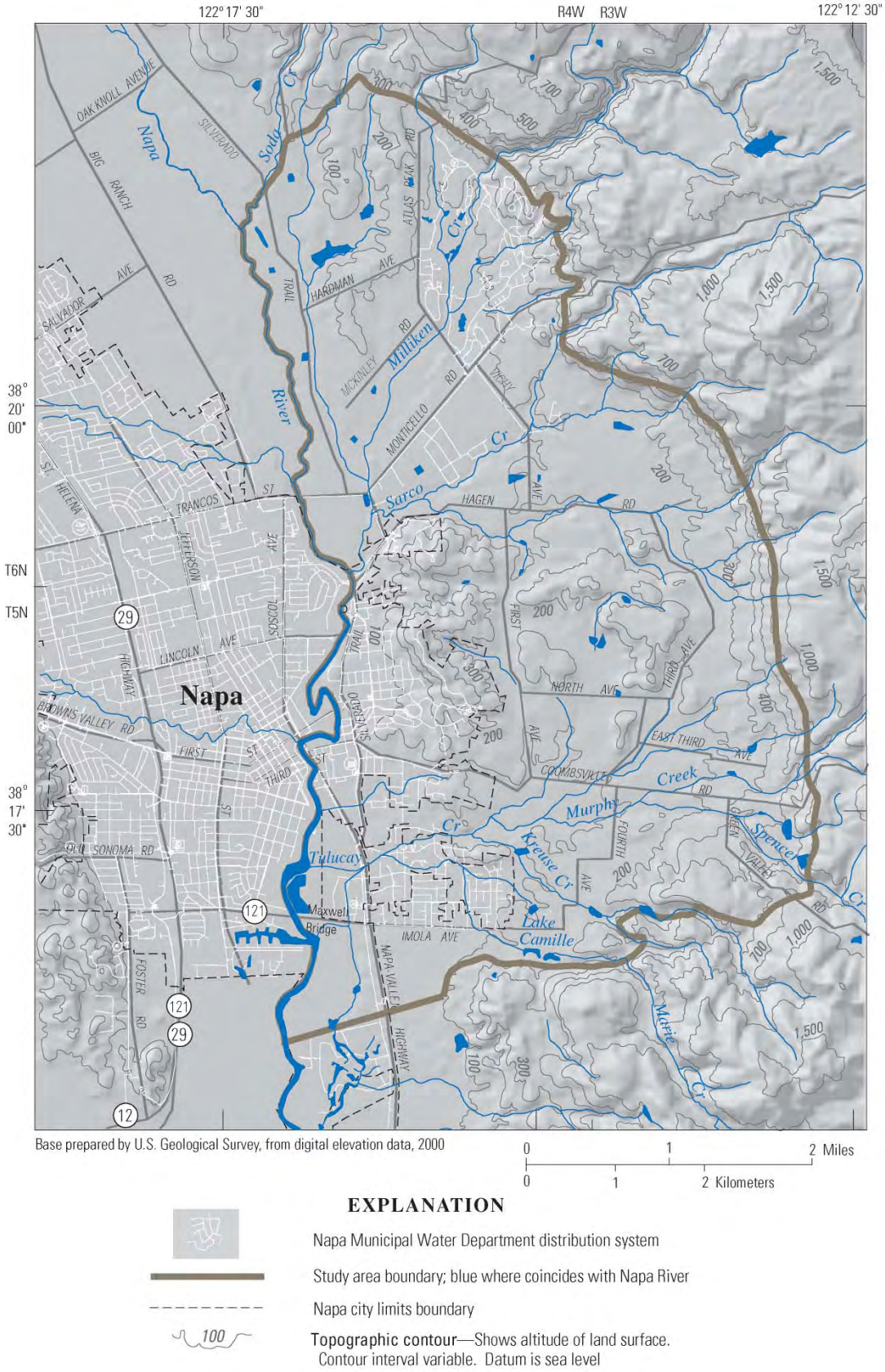


Figure 5. City of Napa Municipal Water Department distribution system, in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California.

Acknowledgments

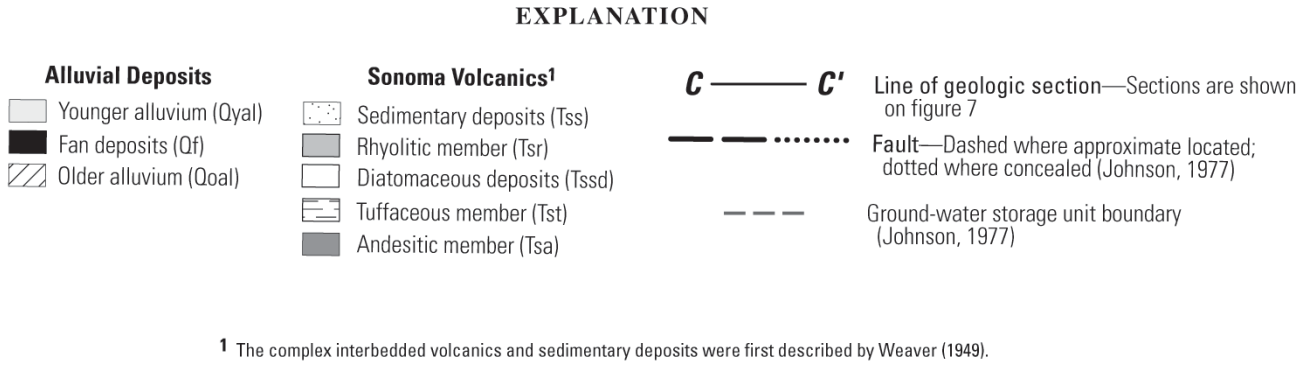
The authors acknowledge the assistance of the staffs of the Napa County Departments of Public Works and Environmental Management, Napa County GIS Services, the City of Napa Municipal Water Department, the Central District of the Department of Water Resources, the California Department of Conservation, Farmland Mapping and Monitoring Program, and the resident volunteers of the Groundwater Under Local Protection (GULP) committee. Special thanks are extended to the more than 100 private property owners for allowing access to wells.

GEOLOGY

The study area lies in the southeastern part of Napa Valley, one of several prominent northwest-trending structural valleys in the North Coast Ranges. Napa Valley was formed between 1 and 2 million years ago by faulting and downwarping in the crust, processes that are related to plate tectonics and the transformation of a subduction zone into the strike-slip movement on the San Andreas and related faults (Howell and Swinchatt, 2000). Most of the study area is bounded on the west by the Soda Creek Fault and on the east by the steep west-facing slope of the Howell Mountains. The Green Valley Fault strikes north-northwest through the Howell Mountains east of the study area (fig. 1).

Stratigraphy

Geologic formations exposed at the surface include the Sonoma Volcanics and younger, thin, unconsolidated Quaternary alluvial deposits (fig. 6). Drillers' logs of a few wells drilled greater than 1,000 ft deep indicate that the thickness of the Sonoma Volcanics exceeds 1,000 ft in some parts of the study area. The Sonoma Volcanics unconformably overlie much older rocks—either of the Lower Cretaceous age Great Valley sequence, which mostly consist of highly indurated marine siltstones, sandstones, and conglomerates, or possibly of the Jurassic-Cretaceous age Franciscan Complex (Wagner and Bortugno, 1982). Rocks in the Great Valley sequence and Franciscan Complex are highly lithified and generally of low permeability. In other areas of northern California, these geologic assemblages generally provide only small quantities of water to wells. The Great Valley sequence or Franciscan Complex form the bottom boundary of the ground-water basin in the study area because the rocks in these assemblages are relatively impermeable compared with the rocks of the Sonoma Volcanics and sediments in the Quaternary alluvial deposits.



1 The complex interbedded volcanics and sedimentary deposits were first described by Weaver (1949).

Figure 6. Explanation.

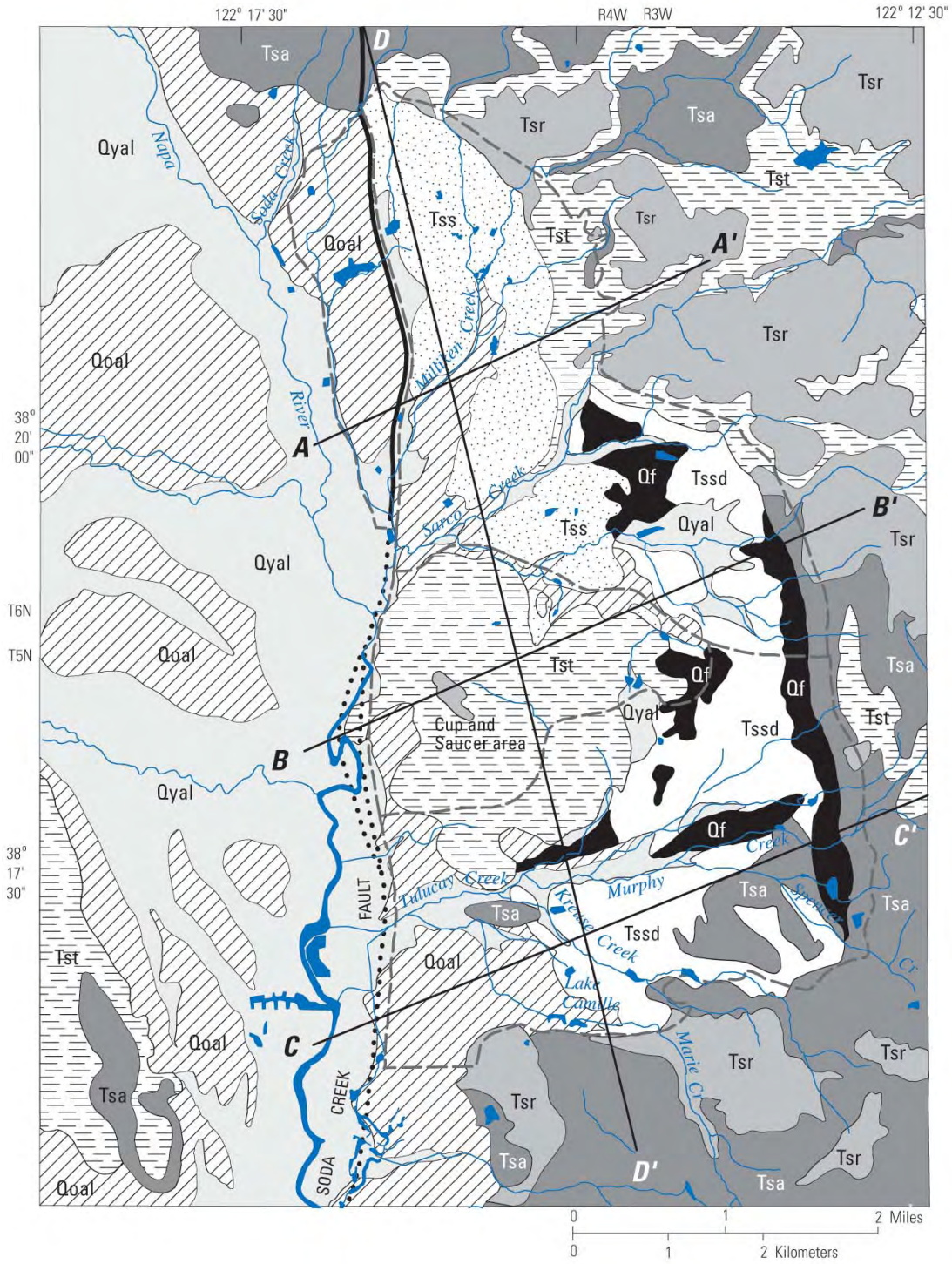


Figure 6. Geology of, and cross section locations in, the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California. (Modified from Johnson, 1977)

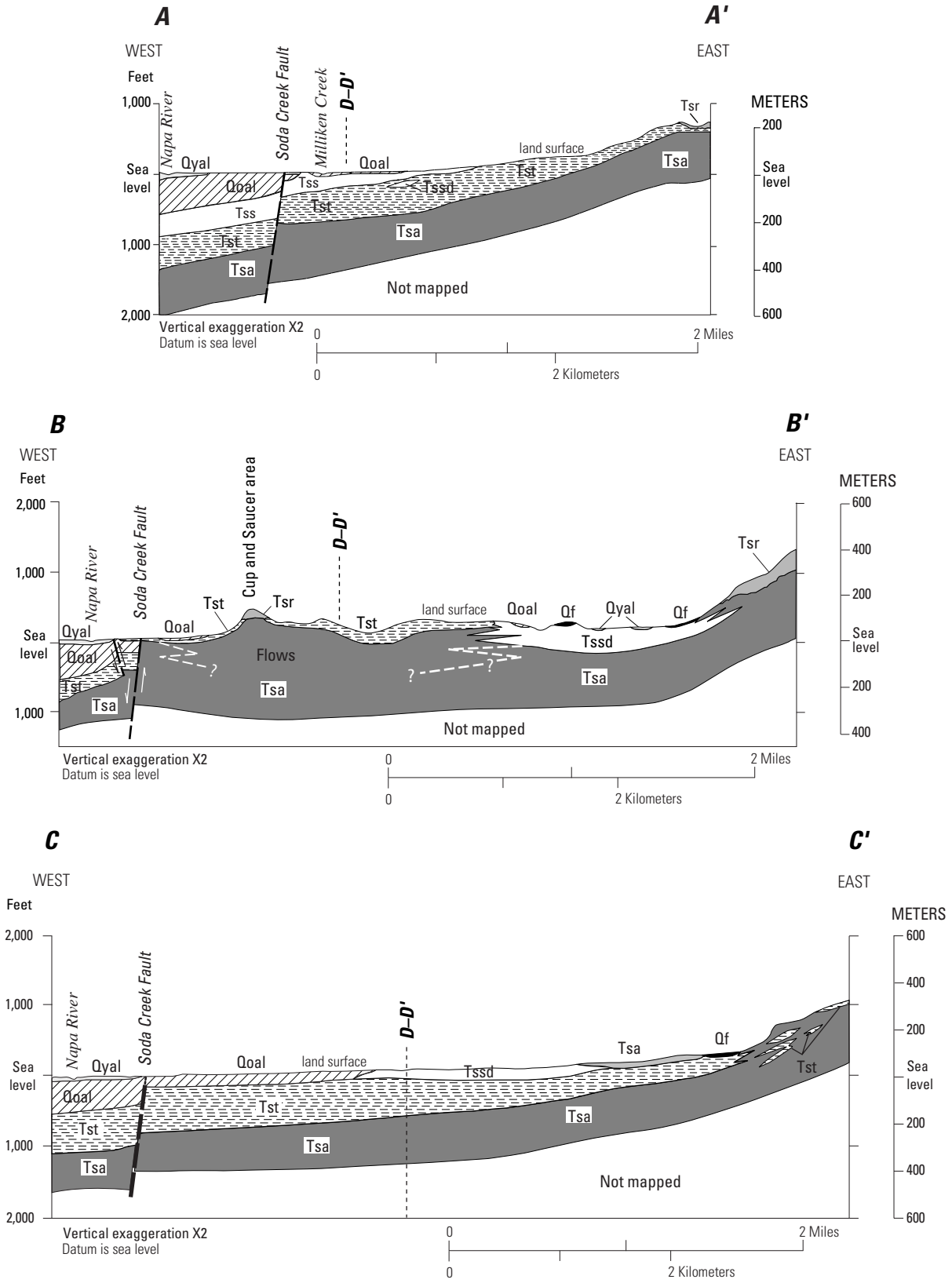


Figure 7. Generalized geologic cross sections in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California. (Modified from Johnson, 1977)

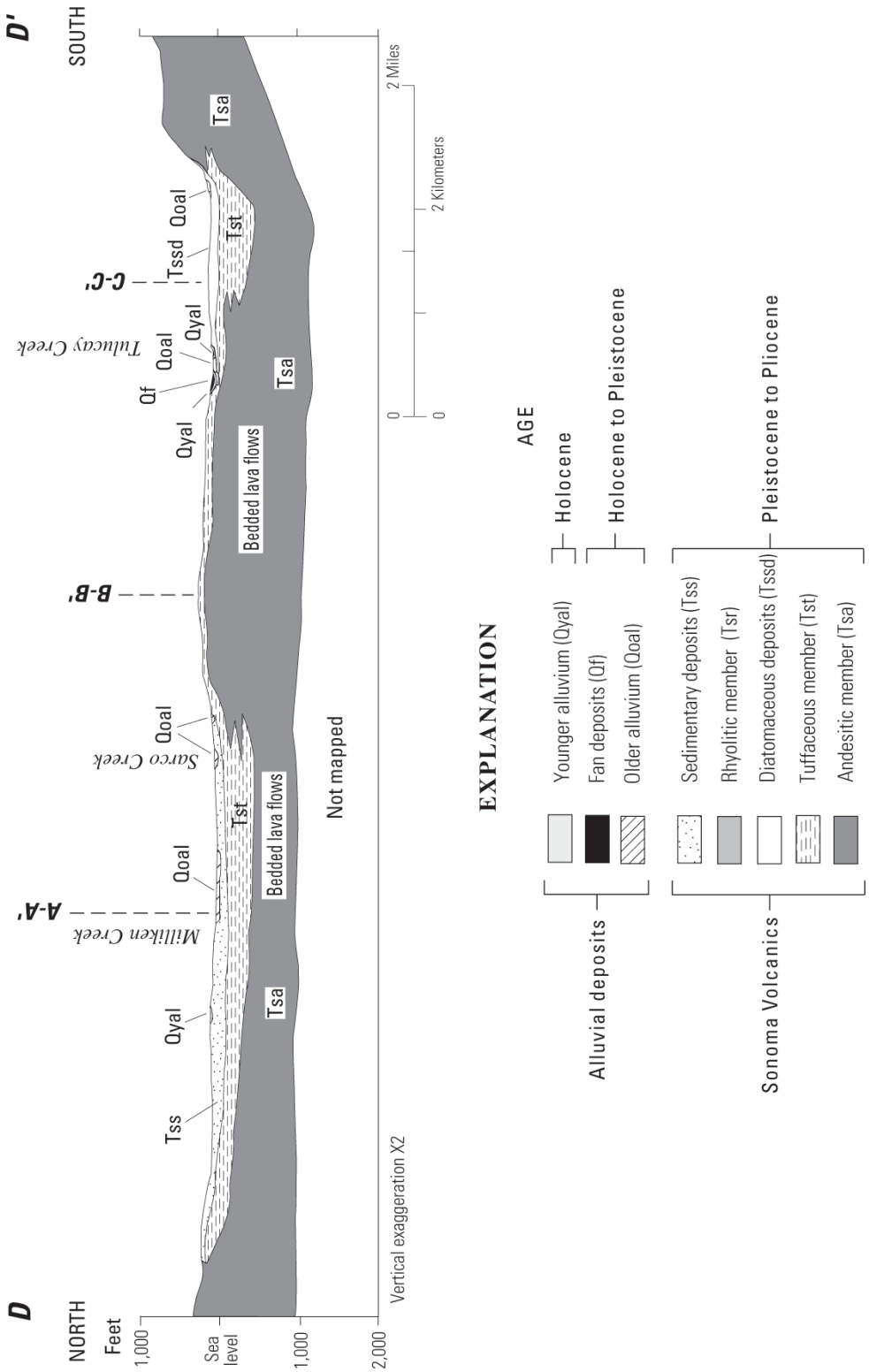


Figure 7.—Continued.

Sonoma Volcanics

The Sonoma Volcanics range in age from about 6 to 3 million years old (A. Sarna-Wojcick, U.S. Geological Survey, oral commun., 2002) and are distributed over hundreds of square miles in Napa and Sonoma Counties. Within the study area, they are exposed in road cuts along Monticello Road through the Howell Mountain block, where a stratigraphic section 1,290 ft thick can be observed. First described by Weaver (1949), the Sonoma Volcanics consist of a complex variety of lithologies and compositions including basalt, andesite, and rhyolite lavas; tuffs; debris flows; diatomaceous lacustrine sediments; and sedimentary volcanic rocks. A detailed description of the Sonoma Volcanics is given in Kunkel and Upson (1960). For regional geologic mapping, the Sonoma Volcanics have been subdivided into five members (Sims and others, 1973; Fox and others, 1973). Johnson (1977) followed this stratigraphic nomenclature and described the Sonoma Volcanics as consisting of three volcanic members: the lower andesitic member (Tsa), the middle tuffaceous member (Tst), and the upper rhyolitic member (Tsr), separated by two subaqueous deposits: diatomaceous deposits (Tssd) and sedimentary deposits (Tss), interbedded between the volcanic units (fig. 7). This "layer-cake" model of the five members is a useful simplification for some purposes, but it ignores the true complexity in the distribution of the various lithologies found in the Sonoma Volcanics. Many lithologic units in the Sonoma Volcanics lack wide areal continuity and some units have a lenticular geometry or have interfingering contacts with adjacent lithologic units.

Erosion during the past 3 million years has modified the landscape and obscured the locations of volcanic centers and the relations between the various lithologic units. On the basis of studies of active volcanic systems elsewhere and the sequence of rocks derived from them, it is clear that the distribution of the different rock types in the study area is equally complex. It is likely that several volcanic vents were sources for the Sonoma Volcanics in the study area. Volcanic materials ejected from any one vent changed as the eruptions progressed from vent clearing to tephra (pumice and ash) eruptions to lava flows. Such sequences of volcanic activity from individual vents probably occurred repeatedly over periods of thousands of years. The volcanic activity produced a variety of rock types and chemical compositions, emplaced as lava flows, dikes, plugs, breccias, pumice beds, and avalanche deposits. The volcanic vents in proximity to each other may have been in different phases of eruptive evolution so that lava was being extruded in one location while tephra was being explosively ejected from a nearby vent. This type of activity results in a very heterogeneous sequence of rock types and compositions with depth and over distances of miles or less.

Quaternary Alluvial Deposits

Thin unconsolidated, uncemented alluvial deposits blanket about 6 mi^2 of the study area and directly overlie the Sonoma Volcanics. During previous studies (Kunkel and Upson, 1960; Sims and others, 1973; Johnson, 1977), these alluvial deposits were subdivided into alluvial fan deposits, older alluvium, and younger alluvium on the basis of age and depositional environment. The alluvial fan deposits crop out mostly at the foot of the Howell Mountain block in the eastern part of the study area (fig. 6). The alluvial fan deposits are wedge-shaped bodies that are thickest near the mountain front; they are formed by colluvium, landslide debris, and alluvial material carried by ephemeral streams that discharged from steep canyons eroded into the mountain front. The deposits are composed of boulders, cobbles, gravel, sand, and finer-grained material. Generally the coarsest, more angular, and poorly sorted material occurs near the mountain front and the finer, more rounded, and better-sorted material occurs toward the central part of the basin.

The largest outcrops of older alluvium are in the southwestern and northwestern parts of the study area. The younger alluvium primarily crops out along present-day stream channels and associated flood plains. Both the older and younger alluvium consist of boulders, cobbles, gravel, sand, and fine-grained material that were deposited by streams over the past few thousand years. These deposits are better sorted and include more rounded clasts than the fan deposits and thus potentially are more permeable.

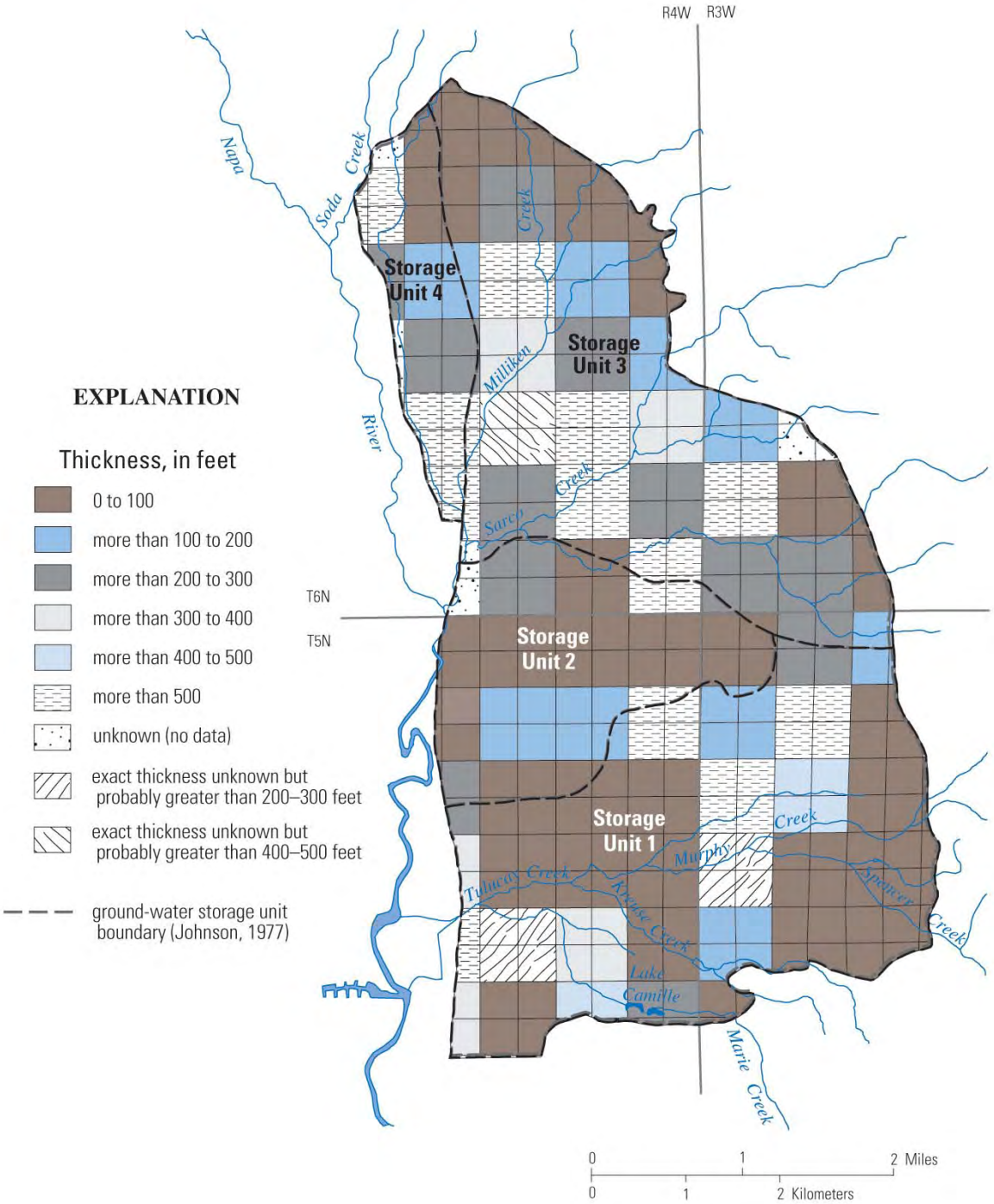


Figure 8. Generalized thickness of unconsolidated deposits in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California.

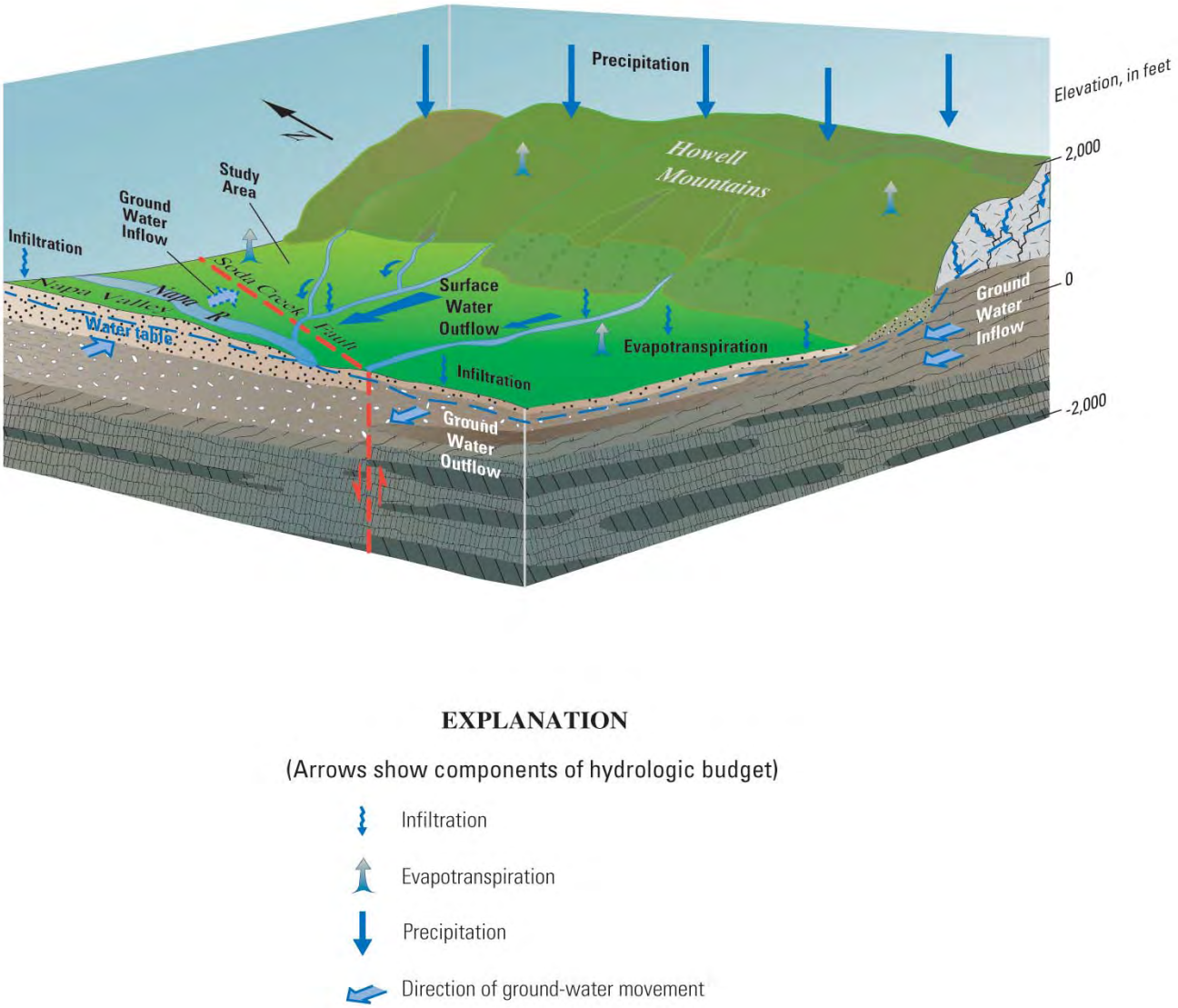


Figure 9. Conceptual model of the ground-water flow system in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California.

GROUND-WATER HYDROLOGY

The principal water-bearing units in the study area are alluvial deposits west of the Soda Creek Fault and the tuffaceous member of the Sonoma Volcanics east of the fault. Alluvial deposits overlie the Sonoma Volcanics throughout much of the study area. The alluvial deposits are not highly productive aquifers in parts of the study area to the east of the Soda Creek Fault (storage units 1, 2, and 3) because they are fairly thin and generally are above the water table. West of the Soda Creek Fault (storage unit 4), the alluvial deposits are an important source of water because the deposits are considerably thicker and largely saturated. Throughout much of Napa Valley west of the study area, alluvial deposits constitute the major aquifer (Faye, 1973). Several tens to a few hundred gallons per minute of water can be pumped from wells completed in clean sand and gravel lenses in the younger alluvial deposits (Kunkel and Upson, 1960). Older alluvial deposits contain large fractions of clay and silt or are poorly sorted coarse- and fine-grained materials and in some beds are highly compacted or slightly cemented. The presence of large percentages of fine-grained materials, poor sorting, compaction, or cementation greatly reduces the permeability in many areas underlain by older alluvial deposits. Wells tapping such deposits generally produce less than 50 gal/min.

Alluvial fan deposits crop out over an extensive area at the base of the Howell Mountains. Although these deposits contain large percentages of boulders, cobbles, and gravel, the sorting generally is poor and some beds or lenses are cemented, greatly limiting the permeability. The topographic occurrence of the fan deposits places them above the zone of saturation in most of the area; therefore, these deposits are not an important source of water to wells.

East of the Soda Creek Fault, ground water is pumped almost exclusively from the Sonoma Volcanics. The andesitic member is the basal member of the Sonoma Volcanics and underlies the entire study area (fig. 7). This member consists of andesitic and basaltic lavas that have little primary permeability except in the interflow zones. Fracture zones produced by faulting and folding provide some secondary permeability to this member and yield small amounts of water to wells. In storage unit 2, the andesitic member lies within 100 ft of the surface and is essentially the only source of water to wells.

The tuffaceous member overlies the lower andesitic member throughout most of the area and is the principal water-bearing unit within the study area. This unit is about 500 ft thick in storage units 1, 3, and 4. Thick sections of uncemented and non-welded tuff or pumice beds can provide moderate to large quantities of water to wells. Well yields of 500 gal/min or more have been reported for wells open to the non-welded tuff.

The upper rhyolite member overlies the tuffaceous member in the eastern parts of the study area and consists of low-permeability, banded rhyolitic lava with intercalated rhyolitic tuff. Many of the tuff beds in the rhyolite member are slightly to densely welded, which reduces intergranular permeability. In some areas, lava beds or welded tuffs in the rhyolite member confine ground water in the underlying tuffaceous member.

The low permeability of the diatomaceous and sedimentary members of the Sonoma Volcanics restricts the downward movement of recharge water throughout much of the study area. The diatomaceous deposits are mostly in the eastern part of storage units 1 and 3 and consist of diatomaceous clay and silt deposited in a lacustrine or paludal environment (Kunkel and Upson, 1960). The sedimentary deposits mostly are in storage unit 3 where they reach a maximum thickness of 250 ft. The diatomaceous and sedimentary members have low permeability and confine ground water in underlying geologic units.

Within the study area, the largest amount of ground water per unit volume of material is contained in the uncemented, poorly consolidated, coarse clastic materials (either volcanic or sedimentary in origin), referred to in this report as unconsolidated material. The greatest potential for ground-water production is in the coarse clastic materials (sand, gravel, cobbles, pumice, and volcanic tephra). The least amount of ground water is contained in the well-lithified volcanic rocks (andesite, basalt, rhyolite, and welded tuff).

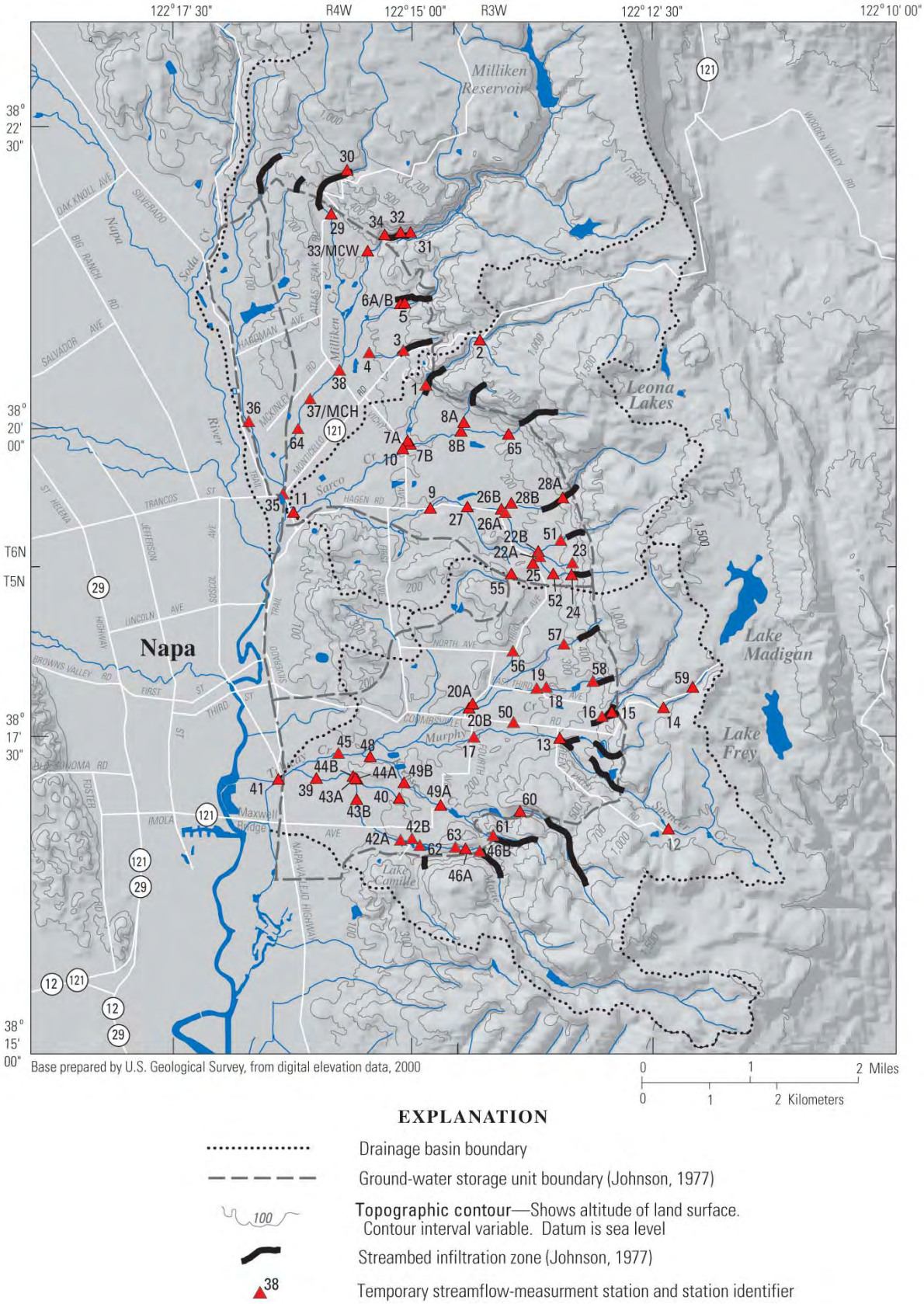


Figure 10. Locations of streamflow-measurement stations and streambed infiltration zones in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California.

The thickness of the unconsolidated deposits and the percentage of coarse clastic materials within these deposits were determined by inspection of drillers' logs. Drillers' logs for the deepest well in each quarter section of land (160 acres) were examined: this included 69 wells that range in depth from 150 to 1,554 ft. The term *rock* generally is used in the drillers' logs to describe well-lithified volcanic rocks. For this report, the thickness of the unconsolidated deposits included all material above the depth where materials were described predominantly as rock.

The thicknesses of the unconsolidated deposits within the study area are shown by 100-foot depth intervals in figure 8. Because of the complexity in the distribution of the lithologies in the study area, this generalized summary cannot be used to accurately determine the thickness of unconsolidated deposits at any particular well site. In general, the thickness of unconsolidated deposits is less than 100 ft at the northern, eastern, and southern perimeters of the study area and is as much as 500 ft or greater along the western perimeter. The thickness of the unconsolidated deposits generally is less than 200 ft in storage units 1 and 2 and greater than 200 ft in storage unit 3. The thickness of the deposits is greater than 300 ft over about one-third of the area of storage unit 3. In storage unit 4, the thicknesses of the unconsolidated deposits range from less than 100 to more than 500 ft. The greater thicknesses of the unconsolidated deposits in storage unit 4 probably are related to the downward displacement of Sonoma Volcanics along the west side of the Soda Creek Fault and the contemporaneous deposition of sediments.

The thickness of unconsolidated deposits (fig. 8) is consistent with the results of a regional gravity survey (Youngs and others, 1989), which shows that the lowest gravity values occur along the western edge of the study area, corresponding with the areas underlain by thick sections of unconsolidated deposits. A gravity high occurs in a large part of the southern half of the study area where the unconsolidated deposits generally are less than 100 ft thick.

Drillers' logs also were examined to determine the percentage of uncemented coarse-grained materials contained in the upper 300 ft of unconsolidated deposits. Uncemented coarse-grained materials include boulders, cobbles, gravel, sand, pumice, or any combination of these not specifically described as cemented or imbedded in clay. The most productive wells generally are located in areas underlain by large amounts of uncemented coarse grained-material in the zone of saturation. Nearly one-third of the study area is underlain by deposits made up of greater than 10 percent uncemented coarse-grained material. This includes a large part of storage unit 3 and the southern half of storage unit 4. More than half the study area is underlain by deposits having 5 percent or less uncemented coarse-grained material. This includes the eastern part of the study area overlying the syncline mapped by Fox and others (1973) and most of the southwest perimeter of the study area. Less than 20 percent of storage unit 2 is underlain by deposits containing greater than 5 percent uncemented coarse-grained material.

Recharge

The principal source of recharge to the ground-water system in the Milliken–Sarco–Tulucay Creeks drainage basin is precipitation within the basin; this recharge occurs as seepage from creeks, lakes, and man-made ponds, and areally as direct infiltration. Other significant sources of recharge are ground-water inflow from the Howell Mountains and, in the northern part of the area, ground-water inflow from the west. Minor sources of recharge include infiltration from septic tanks, leaking water-supply pipes, irrigation water in excess of crop requirements, and crop frost-protection applications. Although recharge from excess irrigation sometimes can be a significant part of total recharge within some basins, within this study area it is considered minor because the predominant crop is wine grapes and local growers use highly efficient drip systems.

A schematic of the conceptual model of the ground-water system is shown in figure 9. The block diagram shows the geologic framework of the study area and the main components of the hydrologic budget, including direct recharge from precipitation, ground-water underflow into and out of the study area, streambed infiltration, surface-water outflow, and evapotranspiration.

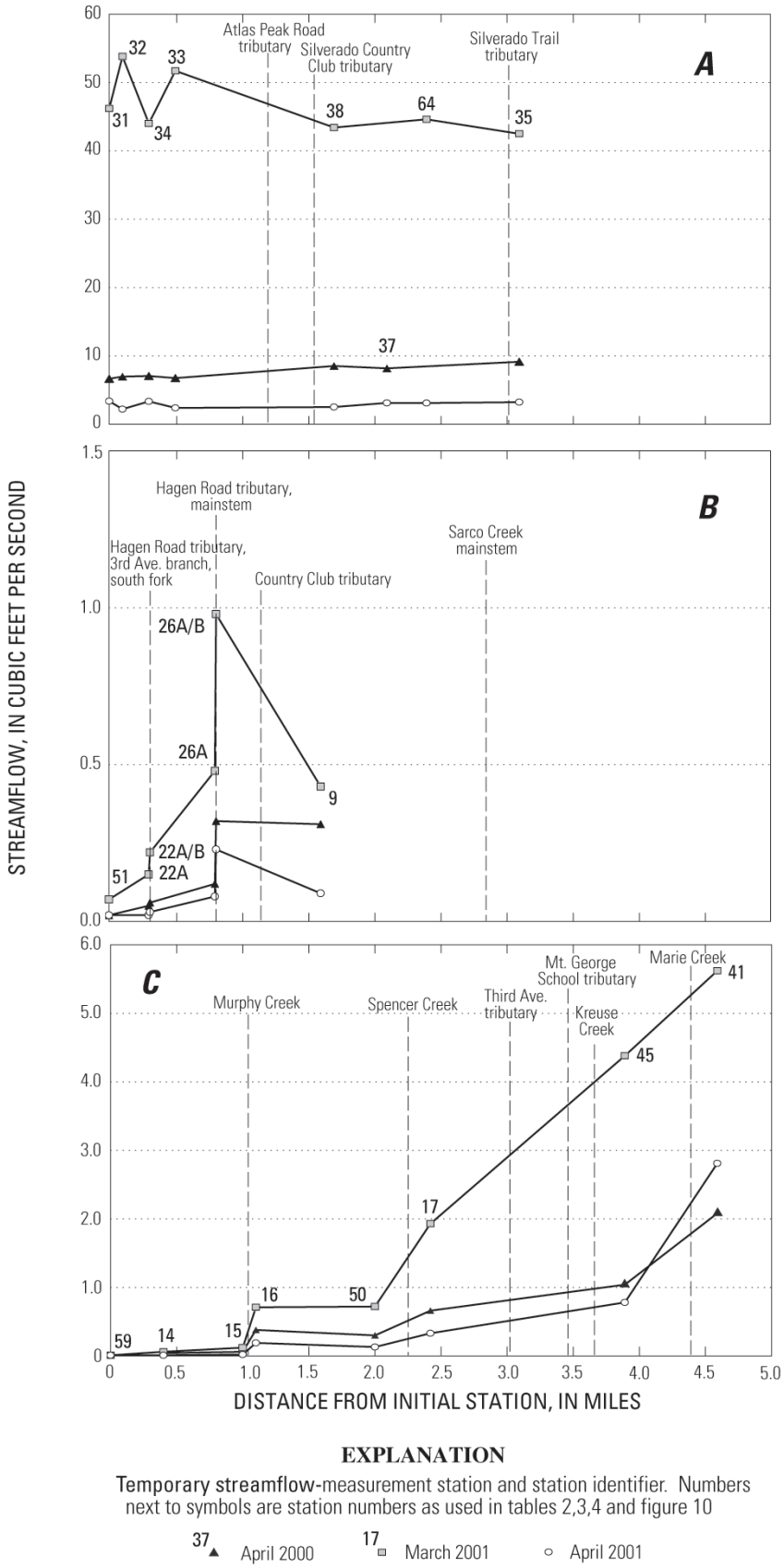


Figure 11. Streamflow measurements for the three seepage runs for selected parts of the (A) Milliken, (B) Sarco, and (C) Tulucay Creeks and their tributaries, southeastern Napa County, California.

Johnson (1977) estimated that the average annual recharge in the area of this study in 1975 was 5,400 acre-ft/yr: 3,050 acre-ft/yr from streamflow infiltration; 2,100 acre-ft/yr from subsurface inflow from the Howell Mountain block; and about 250 acre-ft/yr from direct infiltration of precipitation. According to Johnson (1977), most of the streamflow infiltration was restricted to 22 areas, defined as streambed-infiltration zones, along the eastern margin of the study area. Johnson's conclusions were based on measured streamflow losses in Milliken Creek, Sarco Creek, and a few unnamed streams along reaches that cross tuffaceous materials near the base of the Howell Mountain block. Streamflow measurements were collected along Milliken, Sarco and Tulucay Creeks and their tributaries as part of this study to help identify streambed infiltration.

Streamflow Gains and Losses

Streamflow gains and losses along Milliken, Sarco, and Tulucay Creeks and their tributaries were determined from streamflow measurements made during three seepage runs between April 2000 and April 2001. A seepage run consists of a series of streamflow measurements made at several sites along a stream to quantify streamflow gains and losses (Riggs, 1972). A gaining reach is defined as one in which streamflow increases in the downstream direction due to ground-water inflow, tributary inflow, or precipitation (Blodgett and others, 1992). If ground-water inflow is the only source of streamflow gain, it may be referred to as a seepage gain. In contrast, a losing reach is defined as one in which streamflow decreases by infiltration to the subsurface or by evapotranspiration. A seepage loss is a decrease in streamflow attributable to infiltration only.

Methods of Data Collection and Analysis

Streamflow was measured or observed at 16 stations in the Milliken Creek drainage basin, at 23 stations in the Sarco Creek drainage basin, and at 33 stations in the Tulucay Creek drainage basin (fig. 10). These stations were assigned numbers sequentially at the time of the initial measurement.

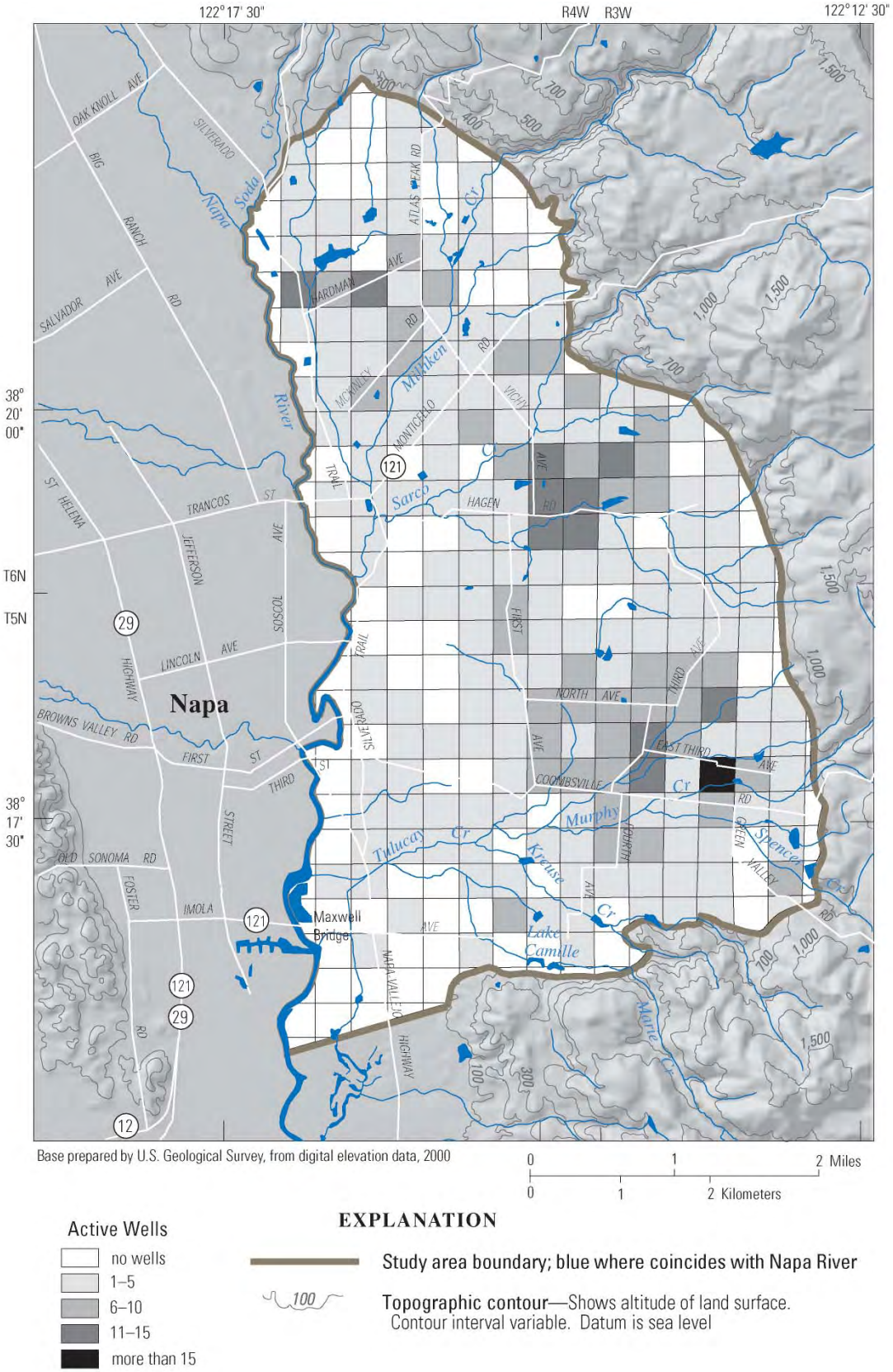
No-flow conditions were observed at some of the stations for all three seepage runs during 2000 and 2001 (April 17–26, 2000; March 13–16, 2001; and April 10–12, 2001). Flow was estimated when it was too low for direct measurement. The seepage runs were scheduled to avoid peak-flow conditions and periods of significant changes in stage, such as receding storm flows.

Most of the streamflow measurements were made using velocity-area methods [for a description of these methods see Rantz and others (1982)]. During low-flow conditions at stations where velocities were less than 0.2 ft/s and stream depths were less than 0.3 ft, streamflow was measured using a modified 3-inch Parshall flume (Rantz and others, 1982). At stations where flows were too low and channel configurations unsuitable for conventional measurement techniques, miscellaneous methods including floats, volumetric, or visual estimates were used to estimate streamflow (Rantz and others, 1982).

The accuracy of streamflow measurements is largely dependent on flow conditions and measurement technique (Rantz and others, 1982). For this study, the accuracy of streamflow measurements was determined using a computer program (Sauer and Meyer, 1992) that determines the uncertainty or error of individual streamflow measurements. This program assigns a corresponding qualitative rating (excellent, good, fair, or poor) for each streamflow measurement. The streamflow-measurement rating ranged from good (2 to less than 5 percent error) to poor (greater than 8 percent error) for the individual pygmy meter measurements. In contrast, the measurements made using the modified 3-inch Parshall flume generally were rated good (within 2 to 3 percent error). The miscellaneous discharge measurement methods (floats, volumetric, and visual estimates) generally had an accuracy of plus or minus 10 percent or more and were assigned a measurement rating of poor.

Streamflow Measurements and Estimated Gains and Losses

Streamflow gains and losses were calculated for each reach using streamflow measurements from successive stations. Duplicate measurements made during the same seepage run for individual sites were averaged prior to calculating gains and losses. Streamflow measurements, gains or losses between stations, flow distances, and rates of gain or loss of flow are shown in tables 2, 3, and 4 (at back of report) for the three seepage runs. The measurements indicate that few reaches have significant streamflow losses, and those that do are not consistently losing reaches. These data indicate that most winter runoff leaves the study area as streamflow to the Napa River and that only a small amount infiltrates beneath the streambeds.



Base prepared by U.S. Geological Survey, from digital elevation data, 2000

0 1 2 Miles

0 1 2 Kilometers

EXPLANATION

Active Wells

- no wells
- 1–5
- 6–10
- 11–15
- more than 15

Study area boundary; blue where coincides with Napa River

100 Topographic contour—Shows altitude of land surface. Contour interval variable. Datum is sea level

Figure 12. Geographic distribution of known active and potentially active wells per quarter-quarter section in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California.

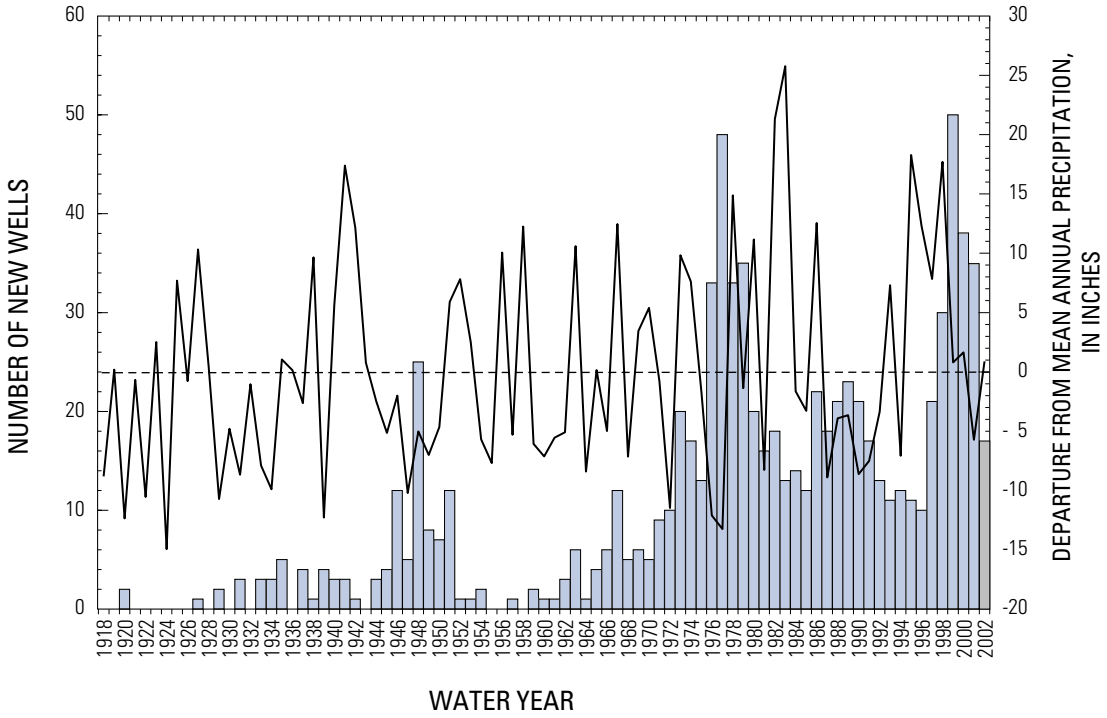


Figure 13. Historical well development (bars) and departure from mean annual precipitation (line) (at Napa State Hospital) in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California, water years 1918-2002.

Well data incomplete for water year 2002.

Seepage measurements were attempted at the 22 reaches, referred to as streambed infiltration zones by Johnson (1977); but because of limited access and poor channel conditions, measurements were made in only three of the zones: Atlas Peak Road tributary to Milliken Creek (station 30 to station 29), main stem of Milliken Creek (station 31 to station 34), and main stem of Sarco Creek (station 2 to station 1). On the Altas Peak Road tributary to Milliken Creek reach, minor losses of 0.1 acre-ft/d were calculated for April 2000 and April 2001 (tables 2 and 4, respectively, at end of report), but a gain of about 0.3 acre-ft/d was calculated for March 2001 (table 3, at end of report). On the main stem of the Milliken Creek reach, streamflow losses of 4.4 and 0.1 acre-ft/d were calculated for the March and April 2001 seepage runs, respectively, but a streamflow gain of about 0.8 acre-ft/d was calculated for the April 2000 seepage run. On the main stem of the Sarco Creek reach, a streamflow loss of 0.1 acre-ft/d was calculated for the April 2001 seepage run. The results for the three seepage runs do not show significant streamflow losses along the streambed-infiltration zones that were delineated by Johnson (1977).

Measurements of streamflow as a function of stream distance for selected reaches of the main stem of Milliken Creek (fig. 11A), tributaries of Sarco Creek (fig. 11B), and tributaries of Tulucay Creek (fig. 11C) indicate a combination of gaining and losing reaches. Streamflow gains between some stations during the three seepage runs can be attributed to inflows from tributary streams, surface runoff, and water released from bank storage. Ground water also may be a source of streamflow gains in some of the lower reaches of

Milliken, Sarco, and Tulucay Creeks near the Napa River. For example, spring ground-water levels in well 69 were about 8 ft below land surface (table 5, at end of report), indicating that the regional water table may coincide with the channel bottom along the lower part of Sarco Creek near station 11, particularly during the winter and early spring when water levels usually reach their maximum.

Streamflow measurements from the three seepage runs indicate that significant infiltration occurs at various times in reaches other than the infiltration zones defined by Johnson (1977). On the main stem of Milliken Creek a loss of 16.5 acre-ft/d was calculated between stations 33 (Westgate Drive) and 38 (Atlas Peak Road) for the March 2001 seepage run (table 3, at end of report). This reach of Milliken Creek may be favorable for significant streambed infiltration because the underlying unconsolidated alluvial deposits are highly permeable (fig. 7, section A-A´). Smaller losses were measured on parts of Sarco and Tulucay Creeks and their tributaries. For example, on the Hagen Road tributary to Sarco Creek, between the confluence of the Hagen Road and Third Avenue tributaries (26A/26B) and station 9 (Grange Hall), streamflow losses ranged from negligible during the April 2000 seepage run to 1.1 acre-ft/d during the March 2001 seepage run. In the lower Tulucay Creek drainage basin, streamflow losses in the reach between station 16 (Mustang Road) and site 50 (Coombsville Road) averaged about 0.1 acre-ft/d for the three seepage runs.

In summary, the seepage run data collected for this study indicate that the total streamflow loss along the 22 streambed infiltration zones along the eastern margin of the study may be less than the 3,050 acre-ft/yr estimated by Johnson (1977). However, the data for this current study also indicate that infiltration takes place in reaches downstream from Johnson's infiltration zones. Although additional seepage runs could more accurately quantify gains and losses, such an effort would be difficult because of poor channel conditions, multiple sources of surface inflow, and surface-water diversions. Other approaches to quantify gains and losses can be tried, such as dye-dilution, which is not adversely affected by boulder covered channels or shallow water depths (Kilpatrick and Cobb, 1985).

Discharge

Ground-water discharge from the study area is predominantly pumpage from wells and underflow across the western boundary. A small amount of ground water discharges to streams. Johnson (1977) estimated that the total ground-water discharge in 1975 was 5,650 acre-ft/yr: 3,000 acre-ft/yr of pumpage and 2,650 acre-ft/yr of underflow from the study area toward the Napa River. For this study, ground-water pumpage and underflow across the western boundary were estimated for hydrologic conditions during the period 2000–2002.

Discharge from Pumpage

A well inventory and (or) drill dates for January 1950 or later indicate that approximately 800 wells were known or were assumed to be active in the study area. The number of wells per quarter-quarter section (40 acres) is shown in figure 12. The greatest number of wells is near Hagen Road, in the east-central part of the study area, and centered around Third Avenue between Coombsville Road and North Avenue in the southeastern part of the study area.

The actual number of active wells in the study area is probably much larger than the approximately 800 wells for which specific information is available. Records from the County Tax Assessor and the City of Napa Municipal Water Department identify about 1,450 parcels as residential and about 132 parcels as either agricultural or agriculture mixed with residential use. Most of these parcels probably have individual water systems. Drillers' reports and parcel records indicate that there is an average of about 1.1 wells per residential parcel. The well inventory for this study confirmed that some residential properties have more than one well per parcel. Assuming an average of 1.1 wells per parcel, there are an estimated 1,595 domestic wells on the 1,450 residential parcels (table 6). A similar examination of drillers' reports for irrigation wells on agricultural and mixed agricultural and residential properties indicates an average of about 1.4 wells per agricultural or agricultural mixed with residential parcel. This translates to about 185 irrigation wells in the study area.

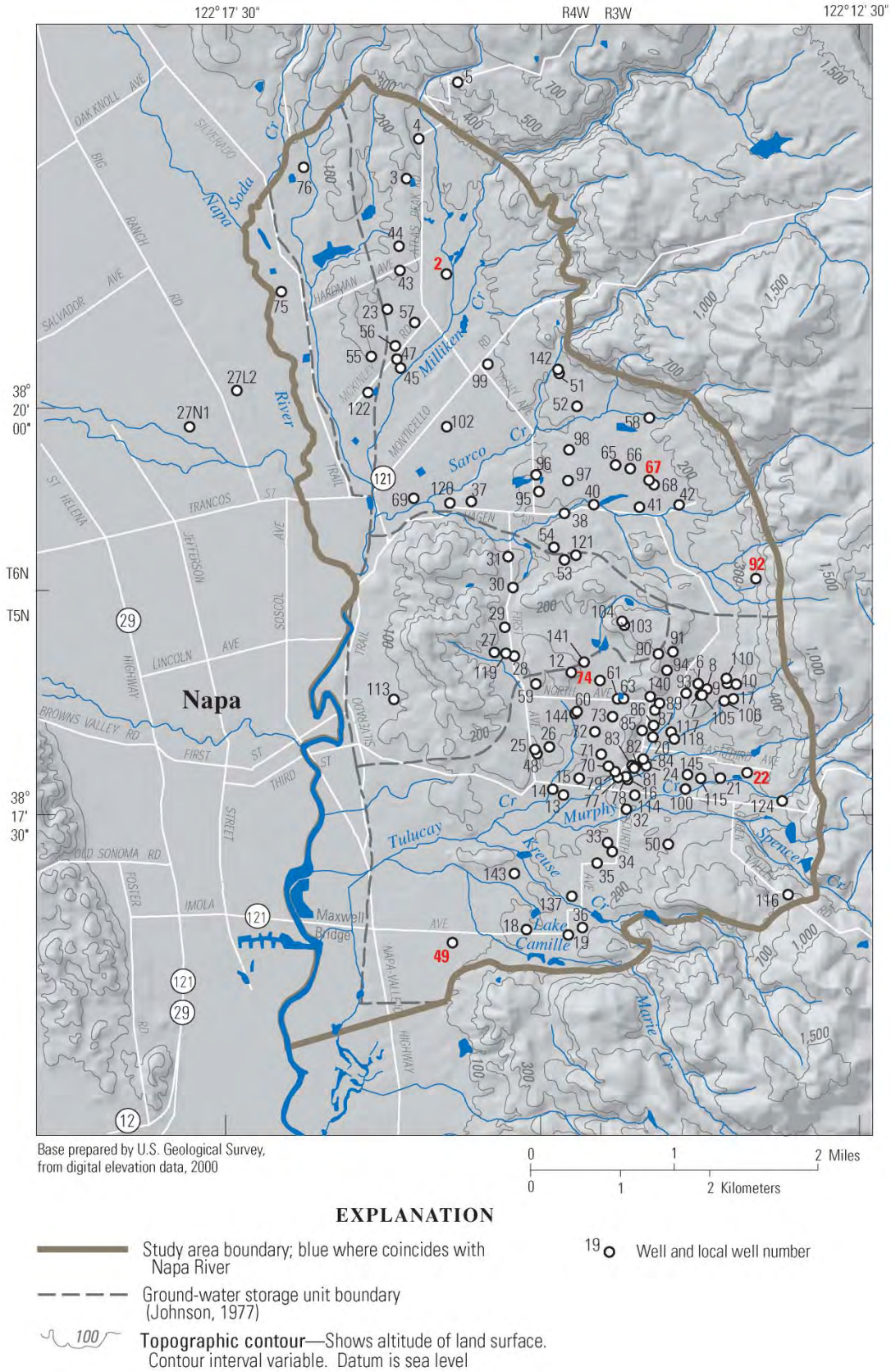


Figure 14. Locations of wells in the water-level monitoring network in the lower Milliken—Sarco—Tulucay Creek area, southeastern Napa County, California. Wells equipped with transducers for continuous monitoring identified by local well number (in red).

Approximately 570 of the estimated 1,595 wells existing in 2002 were constructed between 1975 and 2002, an increase of 56 percent from that estimated by Johnson (1977). Figure 13 shows the number of wells drilled annually between 1918 and 2002 compared to the departure from mean annual precipitation. The years with the greatest annual increases in the drilling of new wells generally coincide with periods when rainfall was at least 5 inches (20 percent) less than the annual mean. During the drought years of 1976–77 and 1987–91, well drilling increased markedly with respect to non-drought years. However, fairly large numbers of new wells were drilled between 1993 and 2002, a period when rainfall was normal or above normal. This recent surge in new well construction may have been due to, at least in part, a ground-water protection ordinance introduced by Napa County in 1996 to regulate the conditions under which a new well can be constructed (Christine Secheli, Napa County Department of Environmental Management, oral commun., 2002). The ordinance was adopted in 1999. Drillers' reports and other well records suggest that an average of only three wells per year were drilled in the study area prior to 1975, whereas an estimated average of 22 wells per year were drilled between 1975 and 2002. Although improved reporting over the years may account for part of the increased rate of well drilling, increases in both population and in irrigated agriculture probably account for most of the increase.

The amount of ground water pumped from the study area only can be estimated because domestic wells in the area are not metered and electrical power consumption records for irrigation wells are not readily available. Ground-water pumpage for residential domestic use and for irrigation for agricultural and improved open space (golf courses, cemeteries, and public institutions) were estimated using several different approaches (table 6).

Domestic pumpage was estimated using a well-based method and a population-based method. The well-based method involved multiplying the estimated number of residential wells (1,595) by an estimated average pumping rate (20 gal/min) and an assumed average daily use value of 1 hr/d. The population-based method involved multiplying the estimated self-supplied population in year 2000 (4,800) by an estimated per capita use value derived from water-use data for the Napa Municipal Water Department for 1990-2000 (148 gallons per person per day). The well-based method yielded a pumpage estimate of about 800 acre-ft and the population-based method yielded a pumpage estimate of about 2,100 acre-ft (table 6, at end of text).

Irrigation pumpage for agriculture was estimated using a well-based method and a land-use method. The well-based method involved multiplying the number of wells (185) by an estimated average pumping rate (75 gal/min) and an assumed average daily use (about 2.9 hr/d). The land-use method involved multiplying estimates of irrigated acreage (2,369 and 2,869 acres) by two different unit applied water coefficients for grapes (0.5 and 1.2 acre-ft/acre). The well-based method yielded a pumpage estimate of 2,690 acre-ft and the land-use method yielded pumpage estimates ranging from 1,180 to 3,440 acre-ft (table 6, at end of text).

Pumpage for irrigation of improved open space (golf courses, cemeteries, and public institutions) was estimated by multiplying acreage (391 acres) by a water coefficient for pasture (4.0 acre-ft/acre). The estimated annual pumpage for improved open space is about 1,560 acre-ft (table 6, at end of text).

In summary, estimates of the 2000-2002 annual ground-water pumpage in the study area range from 3,600 to 7,100 acre-ft, and average 5,350 acre-ft. Assuming that the average of the estimate (5,350 acre-ft) represents the annual ground-water pumpage, annual ground-water pumpage has increased by 2,350 acre-ft compared with the pumpage for 1975 of 3,000 acre-ft (Johnson, 1977). The estimated increase in the quantity of annual ground-water pumpage between 1975 and the 2000-2002 period is consistent with the marked increase in the number of new wells drilled in the study area and the large increase in irrigated agriculture during this period (fig. 13; table 1, at end of report).

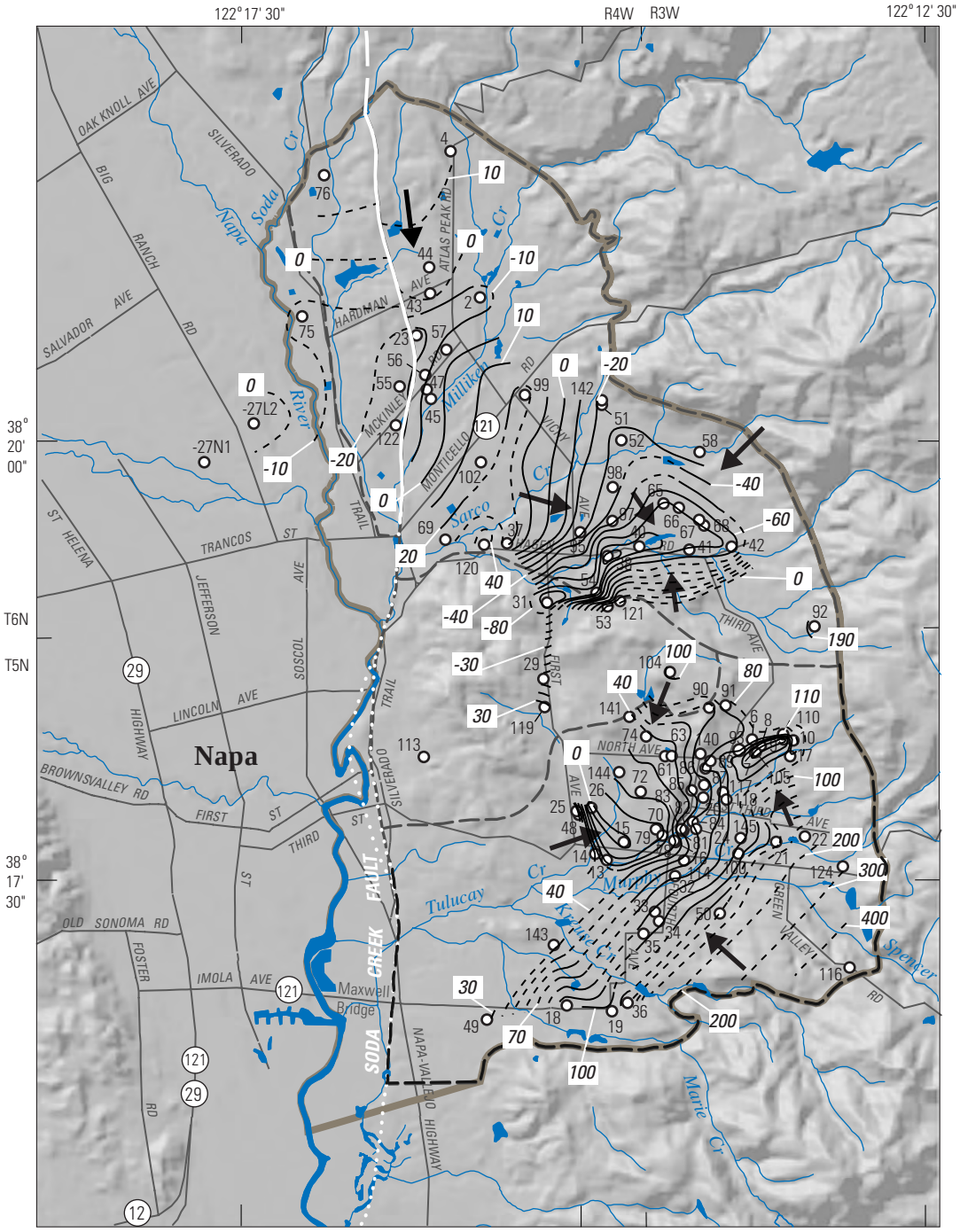


Figure 15. Generalized hydraulic head in the lower Milliken–Sarco–Tulucay Creeks area, southeastern Napa County, California, October 2001.

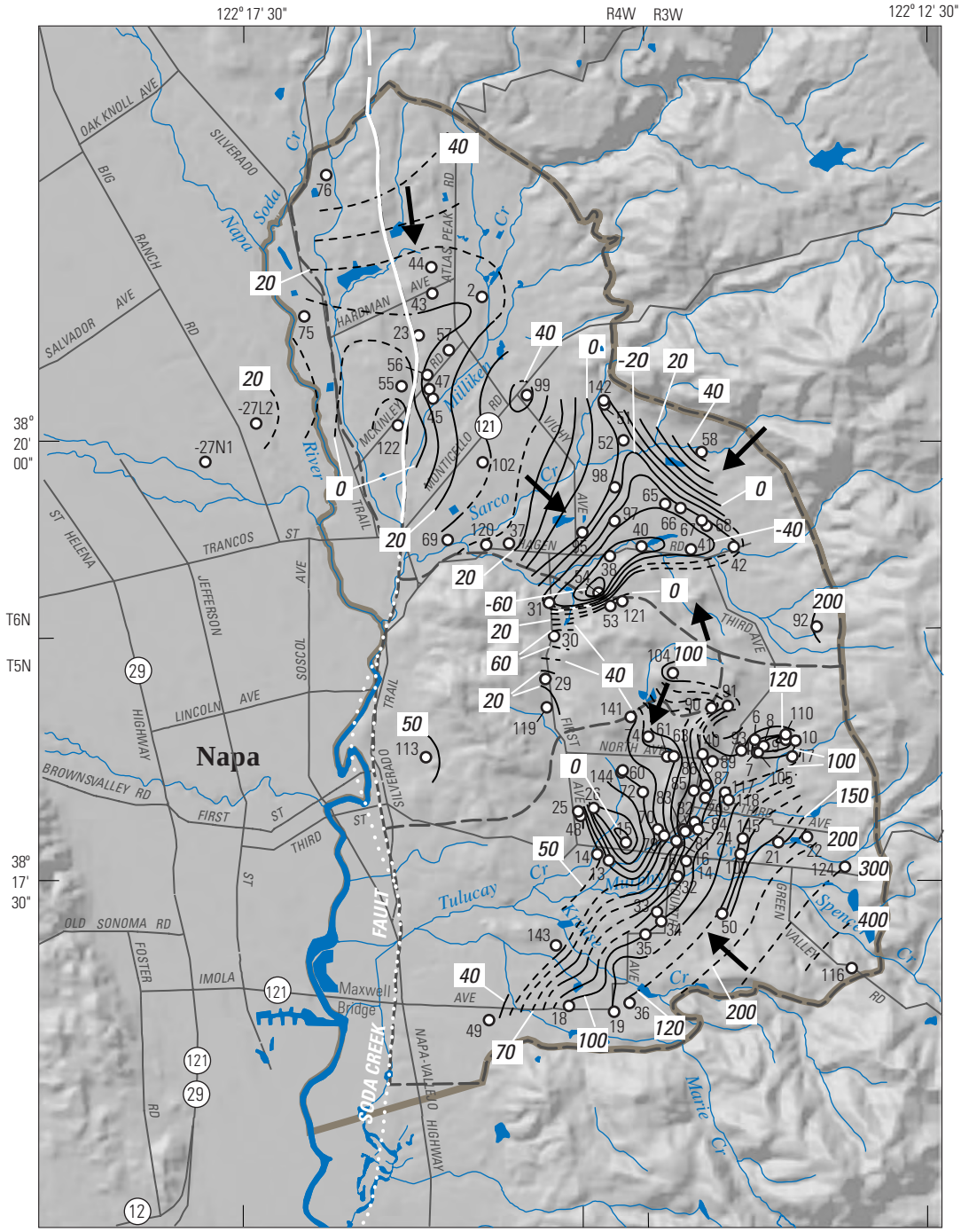


Figure 16. Generalized hydraulic head in the lower Milliken–Sarco–Tulucay Creeks area, southeastern Napa County, California, April 2002.

Ground-Water Underflow

Ground-water underflow out of the study area occurs along the western boundary of storage unit 1, and ground-water underflow into the study area occurs across the western boundary of storage unit 4. Underflow out of storage unit 1 and into storage unit 4 was calculated on the basis of ground-water level data for 2000–2001. Insufficient ground-water level data were available for calculating underflow from storage unit 2, however, the quantity of underflow is probably small because of the low permeability of the deposits in this unit. The total quantity of underflow estimated for this study was compared with estimates made by Johnson (1977) for conditions during 1975.

For this study, underflow was estimated using the following form of Darcy's Law:

$$Q = KIA,$$

where Q is ground-water underflow (L^3/T), K is the average hydraulic conductivity of the saturated, unconsolidated deposits (L/T), I is the hydraulic gradient (L/L), and A is the cross-sectional area (L^2). The average hydraulic conductivity in storage unit 4, based on data from Johnson (1977), is 2 ft/d; the hydraulic gradient based on ground-water levels in 2000-2001 was 7×10^{-3} ft/ft toward the study area, and the cross-sectional area was 4.5×10^{6} ft^2. Ground-water inflow along the western boundary of storage unit 4 from outside the study area was calculated to be about 530 acre-ft/yr during 2000-2001. The average hydraulic conductivity in storage unit 1, based on Johnson (1977), was 2 ft/d; the hydraulic gradient based on ground-water levels in 2000-2001 was 1.5×10^{-2} ft/ft away from the study area, and the cross-sectional area was 4.5×10^{6} ft^2. Ground-water underflow for storage unit 1 was calculated to be about 1,130 acre-ft/yr. Therefore, the net ground-water underflow across the western boundaries of storage units 1 and 4 was about 600 acre-ft/yr leaving the study area. This value is about 2,050 acre-ft/yr less than the amount Johnson (1977) estimated for 1975. The 2,050 ace-ft/yr decrease closely matches the estimated increase in ground-water pumpage between 1975 and 2000 for the study area. Underflow across the western boundary has changed since 1975 because ground-water pumping has caused ground-water gradients in the study area to change.

Ground-Water Levels and Movement

Water-level monitoring can detect ground-water level declines related to excessive pumping and (or) deficient recharge. Water levels can be expressed in two ways: as depth-to-water below land surface or as hydraulic head. Hydraulic head is particularly useful because it expresses water level as an altitude relative to an arbitrary datum plane, such as sea level. Because ground water moves in the direction of decreasing hydraulic head, contour maps of hydraulic head can be used to determine the general direction of ground-water flow in an aquifer.

Monitoring Network

Water levels were measured semiannually by personnel from the Napa County Department of Public Works; as many as 120 wells were measured between the spring of 2000 and the spring of 2002 (fig. 14). The period of record for most wells is 1 year or more, but some were measured for less than 1 year. During the study, measurements at some wells were discontinued because of difficult access or well bore obstructions. As the study progressed, other wells were added to replace wells removed from the network or to improve areal coverage of the initial network. Measurements generally were made in April and October at the beginning and ending of the dry season, respectively.

Water levels in all the wells were measured using a 300-foot calibrated electric tape with graduations of 0.01 ft, but measurements were recorded and reported to the nearest 0.1 ft (table 5, at end of report). Care was taken to ensure that measurements were not made while wells were pumping or recovering from recent pumping. Despite these efforts, some water-level measurements may have been made during non-static conditions. Measurements suspected of having been affected by recent or nearby pumping were excluded from the analysis of water-level conditions in this report (table 5, at end of report).

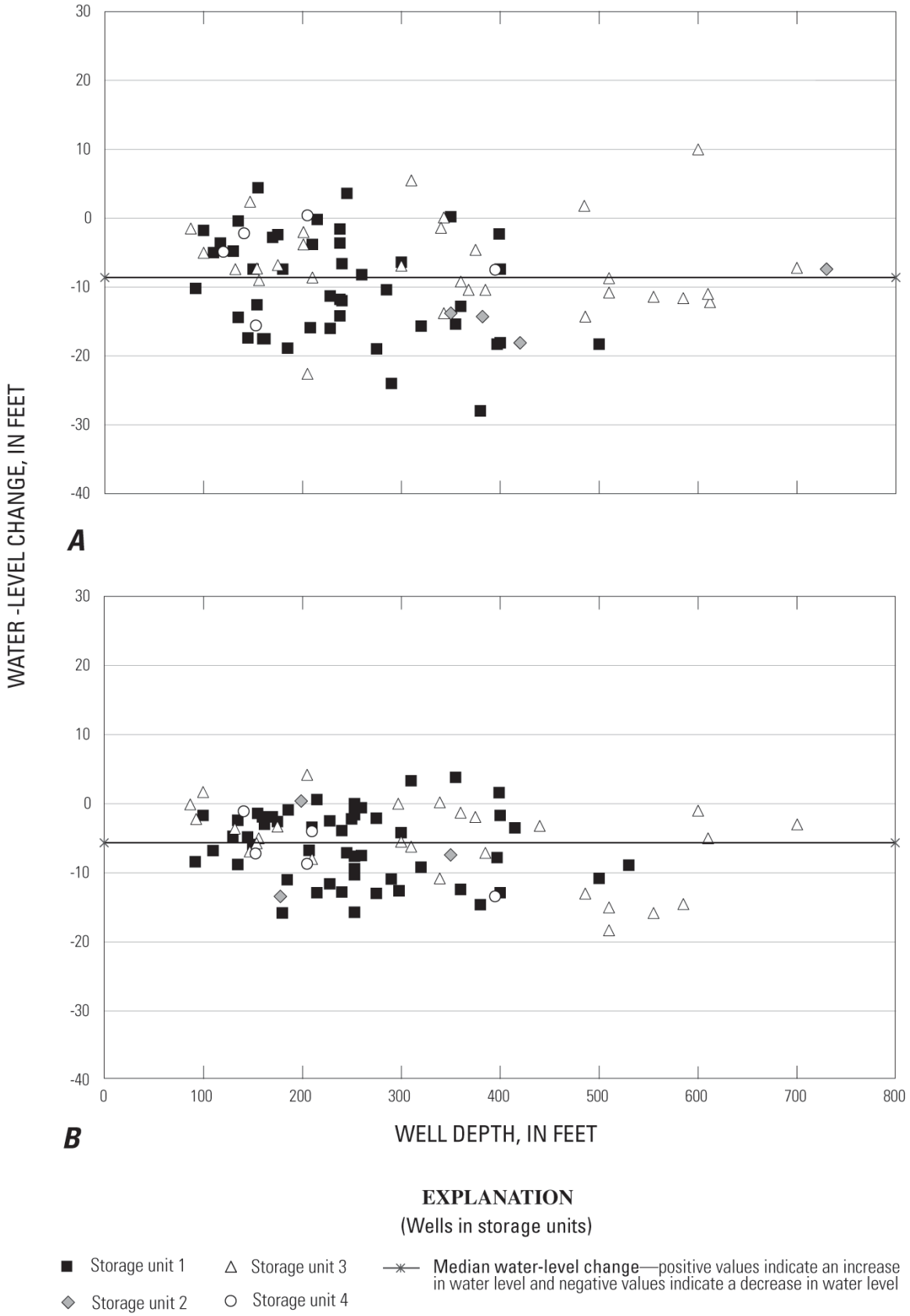


Figure 17. Change in water levels compared with well depth between (A) October 2000-October 2001 and (B) October 2001-October 2002 in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California.

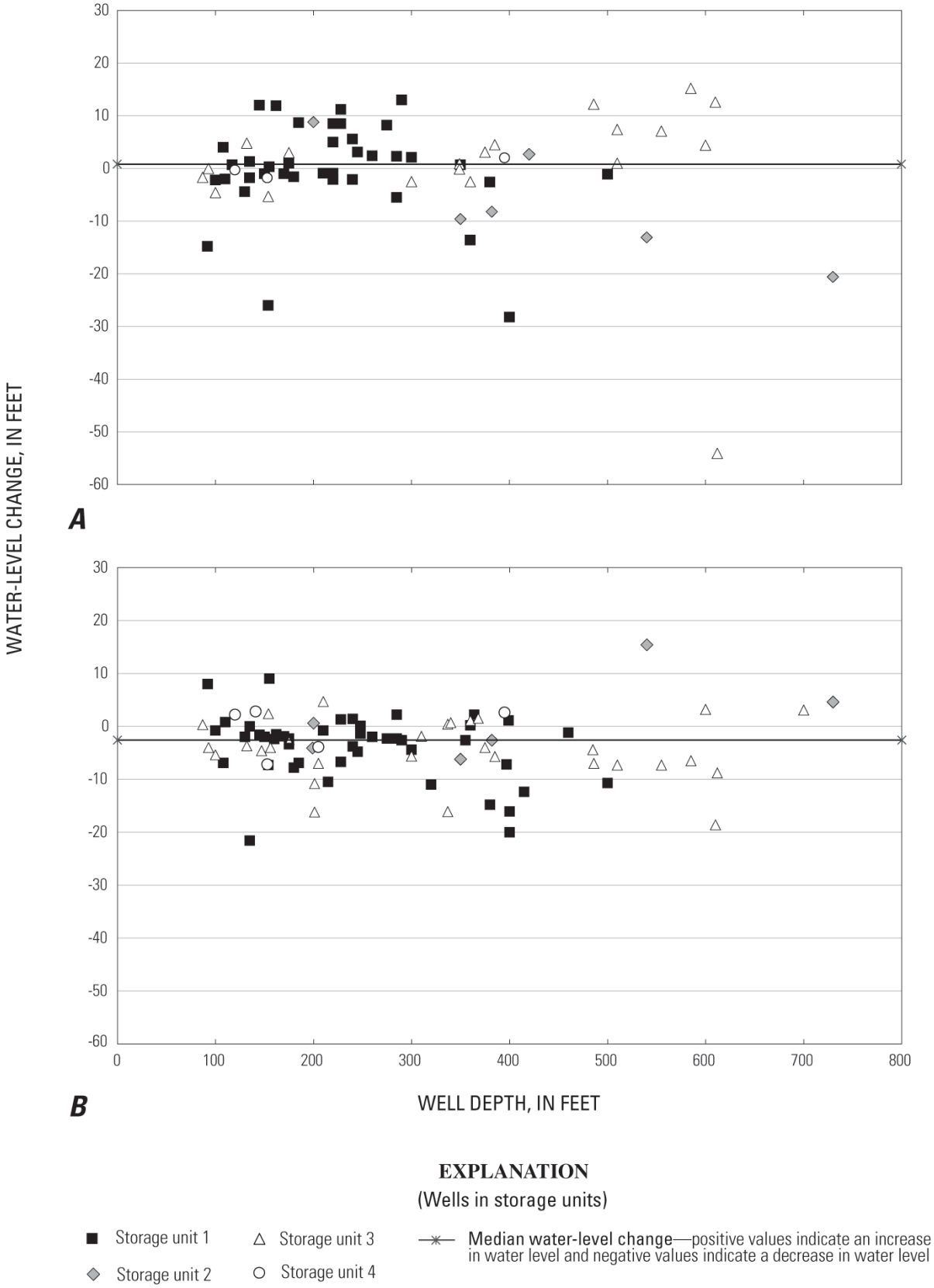


Figure 18. Change in water levels compared with well depth between (A) April 2000-April 2001 and (B) April 2001-April 2002 in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California.

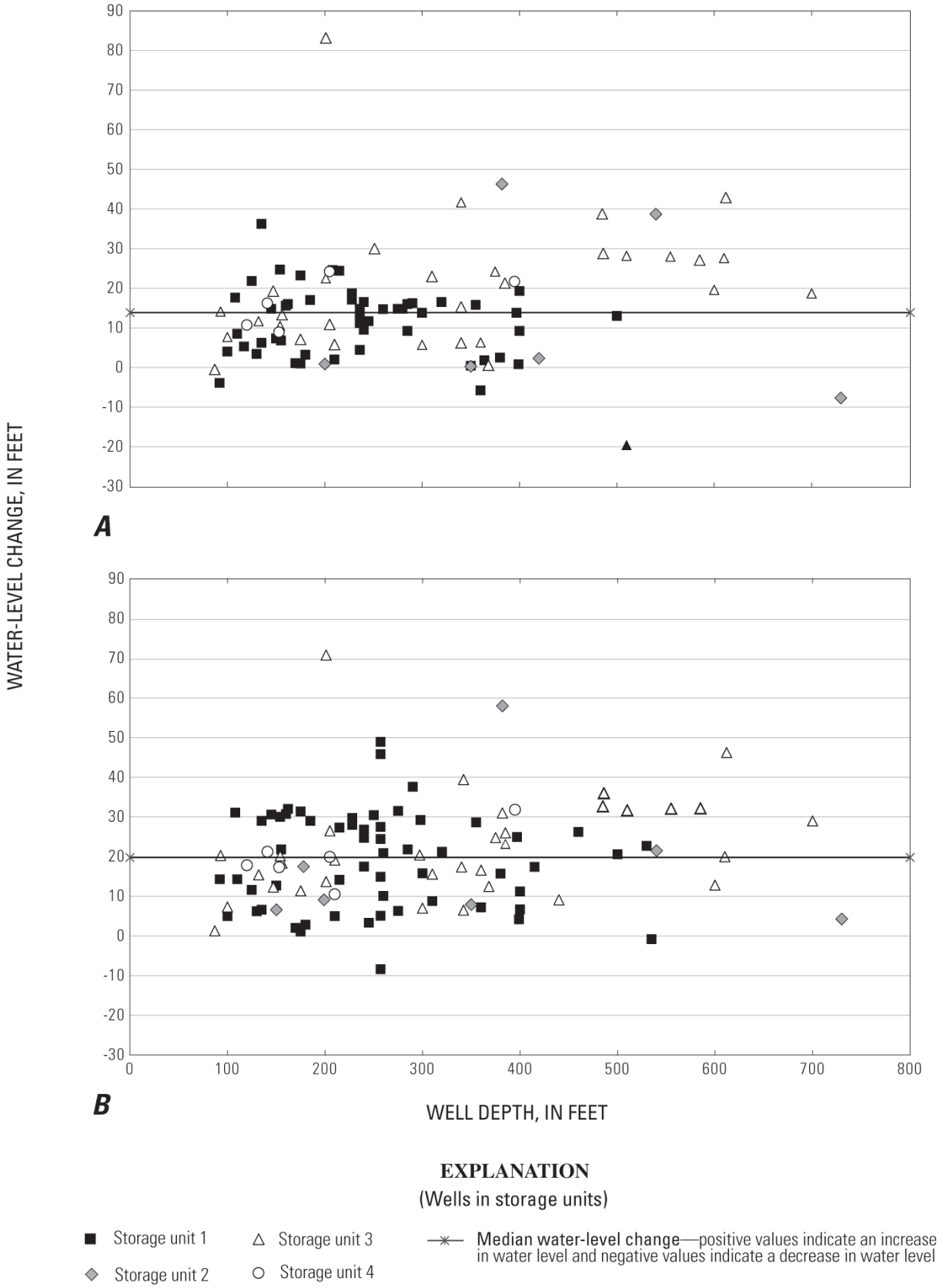


Figure 19. Change in water levels compared with well depth between (A) October 2000-April 2001, and (B) October 2001-April 2002 in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California.

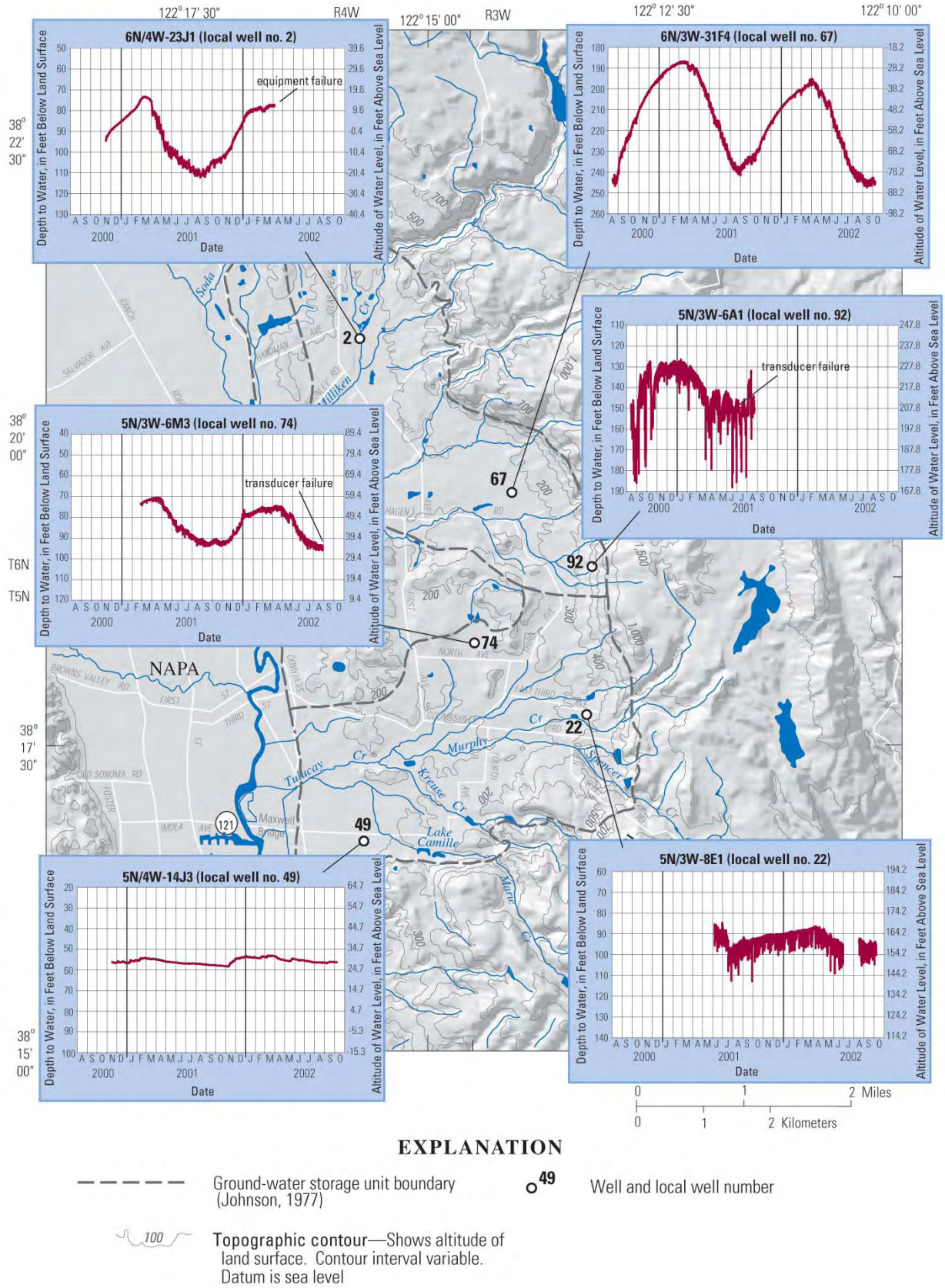


Figure 20. Continuous ground-water levels recorded in selected wells in the lower Milliken–Sarco–Tulucay Creeks area, southeastern Napa County, California.

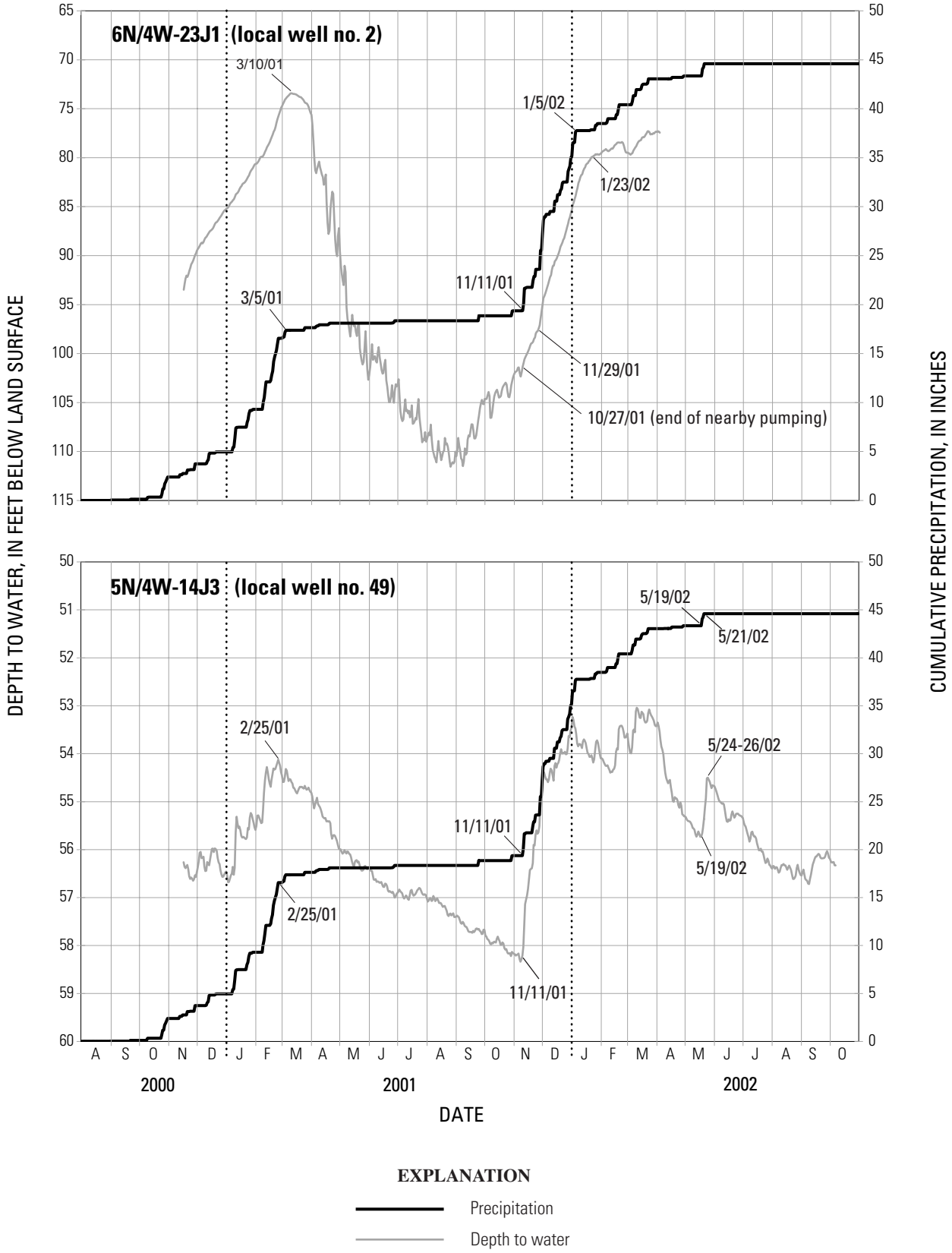


Figure 21. Ground-water levels in selected wells and cumulative precipitation in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California.

In addition to the periodic measurements made using the calibrated electric tape, continuous measurements were made in six wells on which submersible pressure transducers and data loggers were installed (fig. 14). Staff from the Napa County Department of Public Works downloaded the data to a laptop computer every 3 months, replaced the datalogger batteries, and measured the water levels to evaluate transducer performance (Lee Driggers, Napa County Department of Public Works, written commun., 2001). The continuous water-level data were converted from readings representing the submergence depth of the transducer below the water surface to values representing the depth to water below land surface. Transducer performance was evaluated by comparing water levels measured with a calibrated electric tape with water levels measured by the transducers; differences in water levels were attributed to transducer drift or to extraneous factors such as cable slippage. Corrections were applied to the data to compensate for these factors.

Land-surface altitudes at the wells were determined by Napa County Department of Public Works staff using a combination of differential Global Positioning System (GPS) surveying and third-order differential leveling surveying (Lee Driggers, Napa County Department of Public Works, written commun., 2002). The land-surface altitudes at the wells in the monitoring network at the beginning of the study in 2000 were derived from differential GPS surveying and have an accuracy of 0.5 ft. The land-surface altitudes at the wells added to the monitoring network in 2001 were derived from third-order differential leveling and have an accuracy of less than 0.1 ft. Land-surface altitudes at some wells that were not included in either survey were determined by interpolating between the 20-foot contour intervals on USGS 7-1/2-minute topographic maps for the Napa and Mt. George quadrangles. The contours have an accuracy of plus or minus 10 ft.

Ground-Water Levels

Graphs and a map showing long-term water-level changes were made using both recent measurements collected as part of this study and historical water-level measurements obtained from the Napa County Department of Public Works (internal files) and the California Department of Water Resources (1995). These measurements do not necessarily represent the water table because hydraulic head can vary with depth in an aquifer. Therefore, the water levels in wells open to large depth intervals represent composite heads for the respective depth intervals. The correct interpretation of ground-water level data is, in part, dependent upon complete well-construction information, including total depth, perforation intervals, seals, and gravel-pack depth. Complete construction information, however, was not available for several of the wells in the 2000–2002 network, which limited analysis and interpretation of the data.

Ground-Water Movement

Maps of hydraulic head were made using water-level data from October 2001 and April 2002 (figs. 15 and 16) to determine approximate ground-water flow directions; the direction of ground-water movement is from areas of higher hydraulic head toward areas of lower hydraulic head. Hydraulic-head values were calculated by subtracting the measured depth to water from the land-surface altitudes at the wells. Under present-day conditions, the general direction of ground-water movement is from recharge areas in the mountains around the perimeter of the study area toward pumping depressions in storage units 1, 3, and 4 (figs. 15 and 16). The locations of the pumping depressions in storage units 1 and 3 correspond with areas having the highest concentrations of active and potentially active wells (fig. 12). The water-level contours in figures 15 and 16 differ from the water-level contours in the maps by Johnson (1977) for April and September 1975. One obvious difference is the deep depression of hydraulic heads in the west-central part of storage unit 1 (figs. 15 and 16) that is not evident in the 1975 data. Other significant differences between 1975 and 2001–2002 are the deepening and broadening of the pumping depression in the south-central part of storage unit 3 and the reduction in the depth and lateral extent of the pumping depression in the northwest part of storage unit 3. Changes in hydraulic head and directions of ground-water movement are more complicated in storage unit 4. A comparison of hydraulic heads for April 2002 with hydraulic heads for 1975 indicate a pumping depression in the southern part of storage unit 4 that was not evident in 1975. In September 1975, a large part of storage unit 4 was underlain by a pumping depression, but in October 2002 the depression was not as deep as it was in 1975 and it had shifted farther to the east.

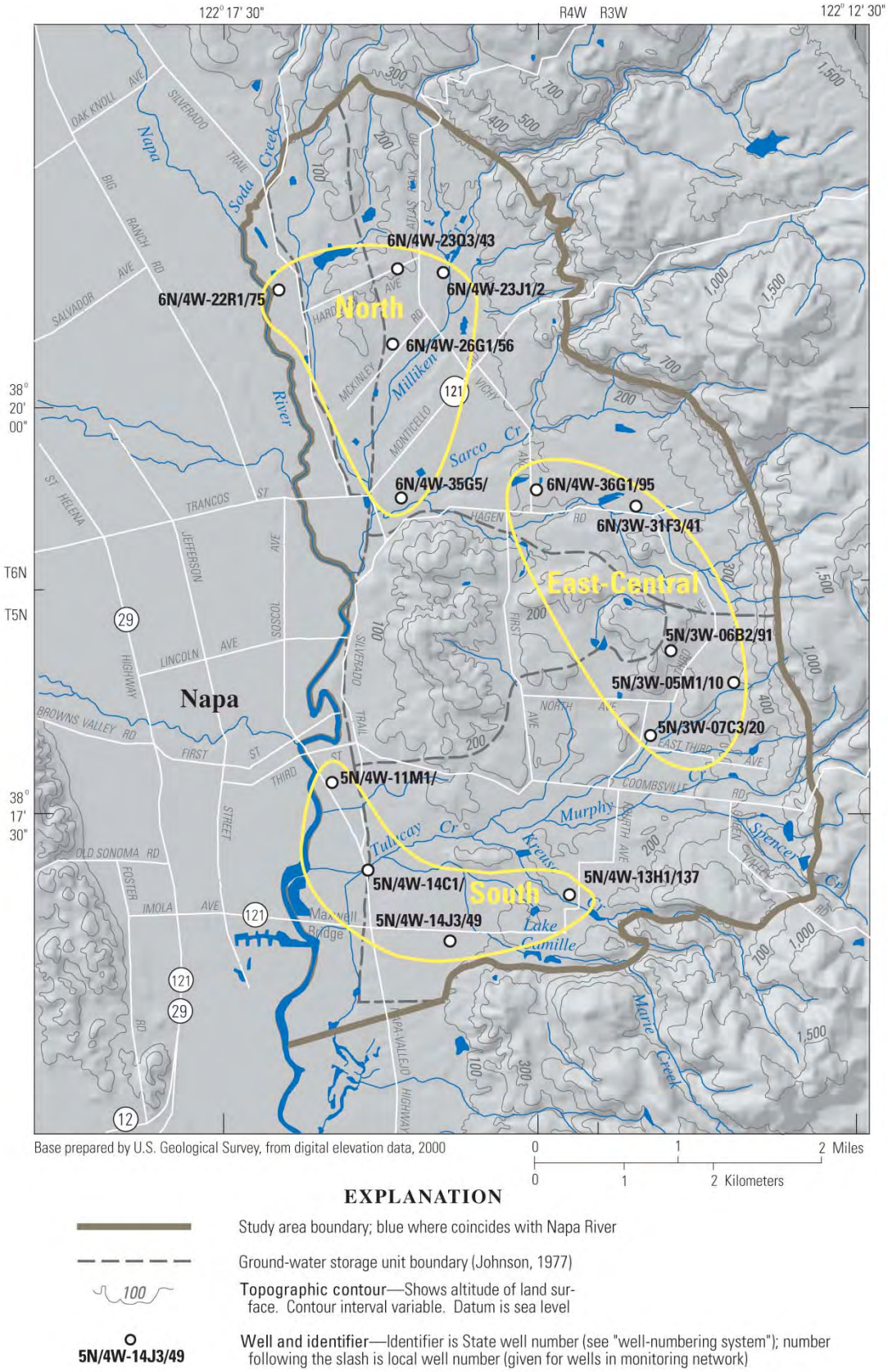


Figure 22. Locations of selected wells at which periodic water levels were made in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California, early 1960s through 2002.

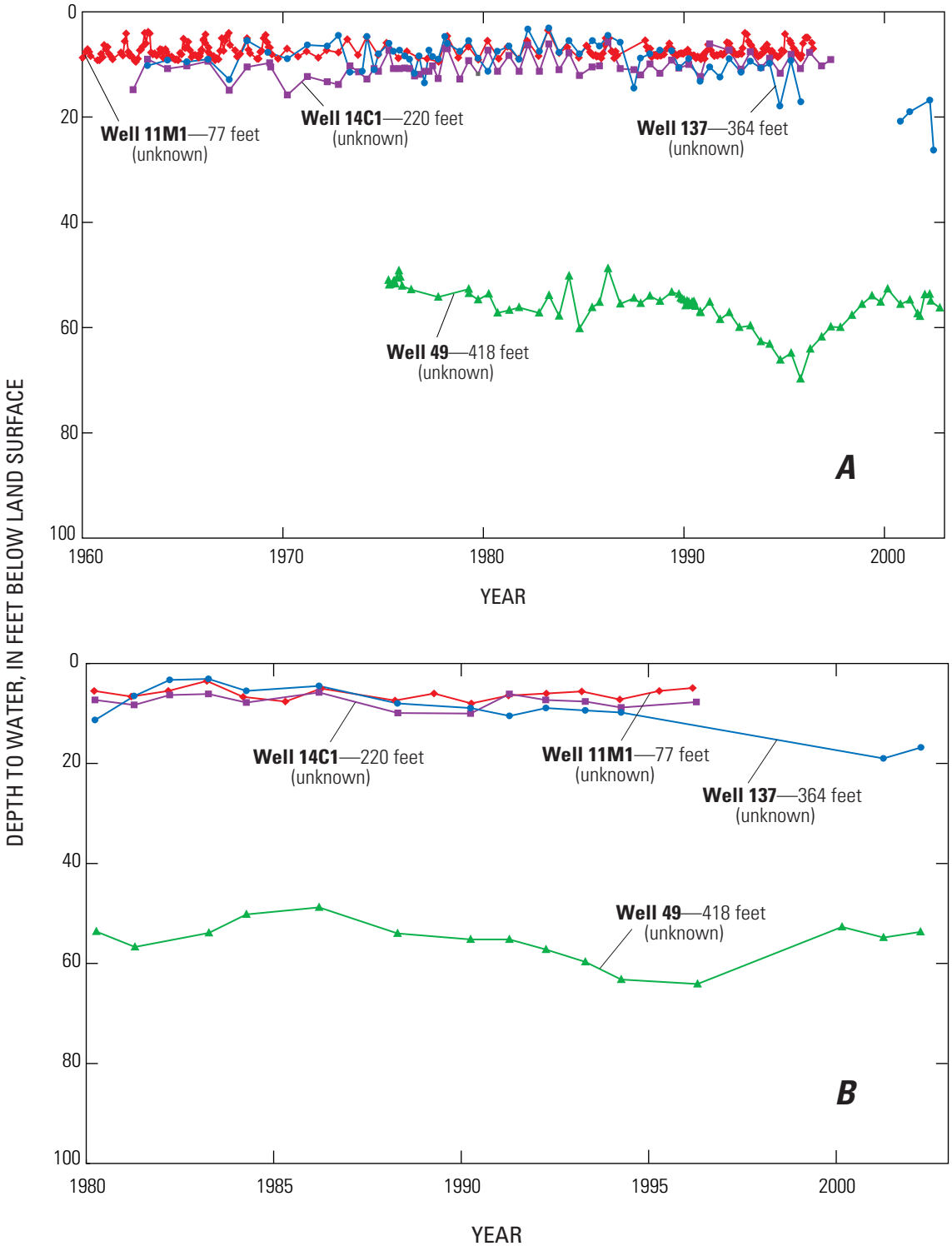


Figure 23. Periodic water levels in selected wells in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California, early 1960s through 2002. A, south group, all data. B, south group, highest water levels measured in spring. C, north group, all data. D, north group, highest water levels measured in spring. E, east-central group, all data. F, east-central group,highest water levels measured in spring.

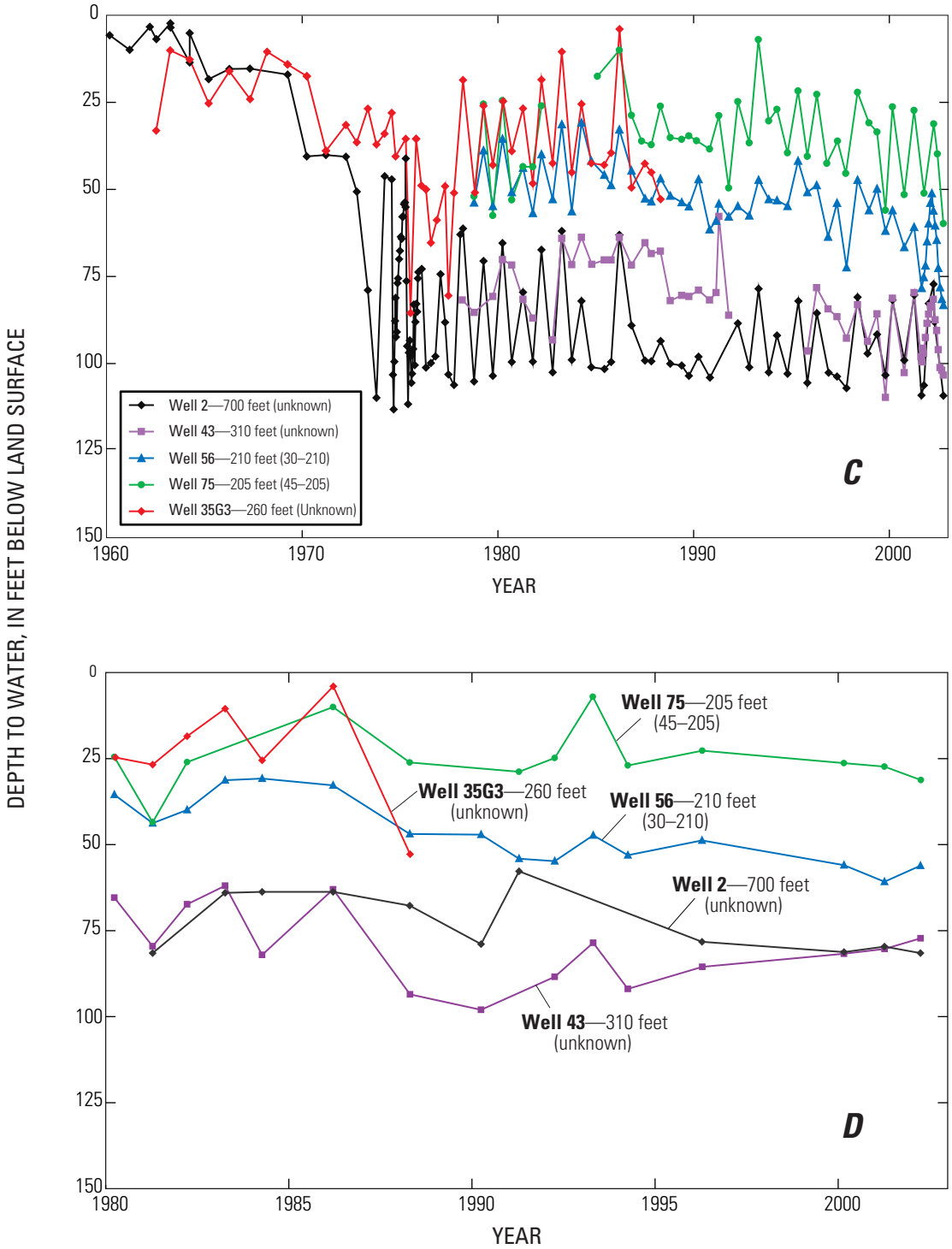


Figure 23.—Continued.

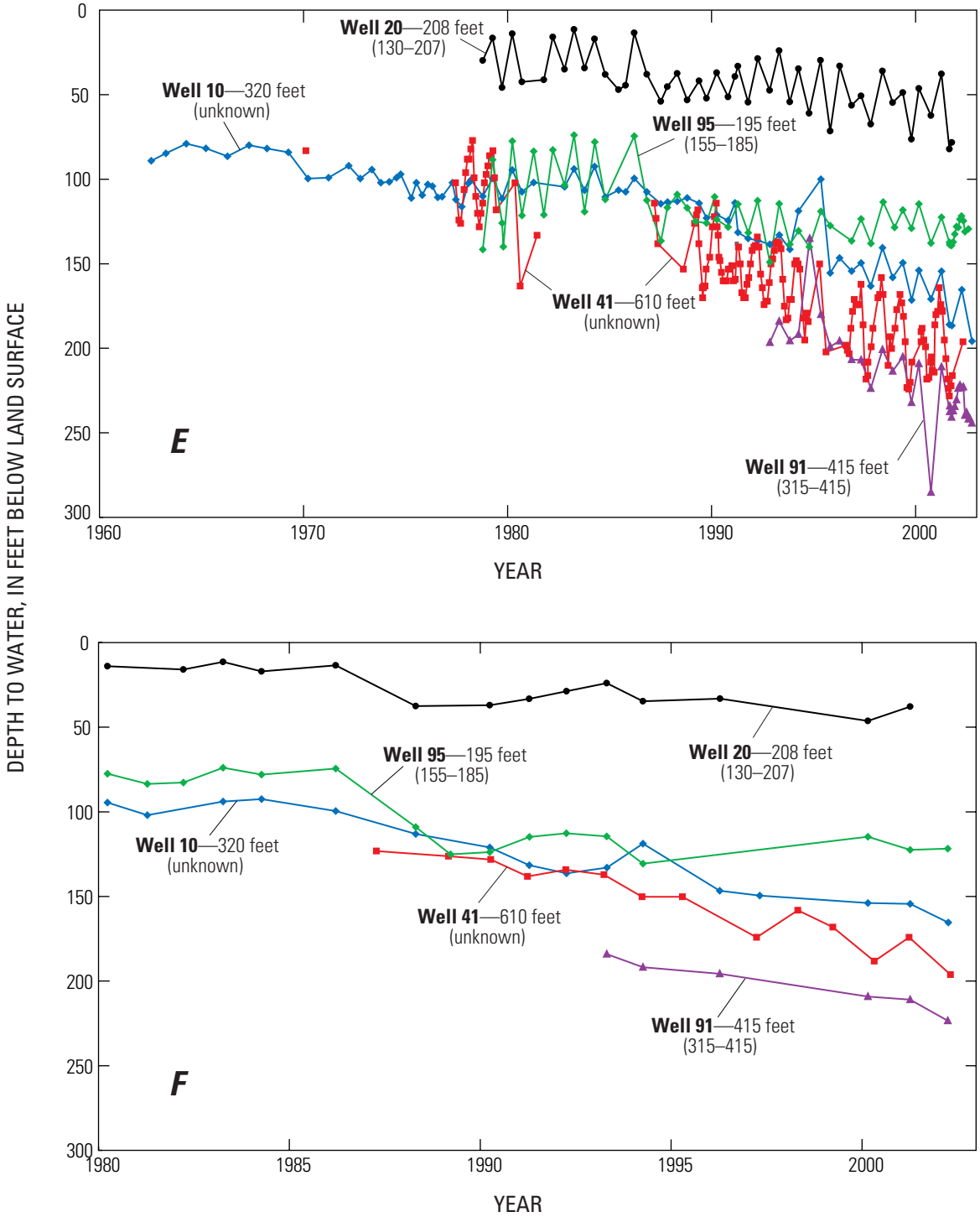


Figure 23.—Continued.

Insufficient data were collected during this current study to determine precisely the direction of ground-water flow in storage unit 2. However, given that large pumping depressions were mapped for October 2001 and April 2002 near the northeast and southeast periphery of storage unit 2, it is likely that ground water moves from storage unit 2 toward these depressions. West of the surface-water divide, running north-south through the central part of storage unit 2, ground water probably generally moves westward toward the Napa River.

The Soda Creek Fault, on the west side of the study area, is a partial barrier to ground-water movement between storage units 3 and 4. This fault is described as a normal fault having more than 700 ft of vertical displacement (Weaver, 1949) that juxtaposes different geologic units on either side of the fault. In October 2001 water-level altitudes were about 10 ft higher on the east side of the fault than on the west side of the fault (figs. 15 and 16).

Annual and Seasonal Water-Level Fluctuations

Measured water levels and calculated hydraulic heads, as altitudes above sea level, in wells in the monitoring network are given in table 5 (at end of report) for October and April 2000 to 2002. Changes in water levels for October and April 2000 through 2002 as related to well depth are shown in figures 17, 18, and 19 and table 7, at end of report. Water levels generally declined between October 2000 and October 2001 (median water-level change was –8.6 ft) and between October 2001 and October 2002 (median water-level change was –5.5 ft) (fig. 17A, B). Water levels generally were unchanged between April 2000 and April 2001 (median water-level change was +0.7 ft), but declined slightly between April 2001 and April 2002 (median water-level change was -2.6 ft) (fig. 18A, B). Comparisons of annual water-level changes as related to well depth for autumn (fig. 17A, B) and for spring (fig. 18A, B) showed no clear correlation between water-level change and total depth of well. Water levels rose in almost every well between October 2000 and April 2001 (fig. 19A) and between October 2001 and April 2002 (fig. 19B); the median water-level change was +14.1 ft and +19.9 ft, respectively. Ground-water levels generally rise between October and April owing to a reduction of ground-water pumping during the winter rainy season, ground-water inflow from outside the study area, and possibly minor direct recharge. The slightly higher water-level rise during the winter of 2002 can be attributed to greater rainfall in 2002 than in 2001 (fig. 3).

Water levels were measured continuously in six wells in the study area from 2000 to 2002 (fig. 20). Two of the wells (2 and 49) were not pumped; the other four wells (22, 67, 74, and 92) were pumped frequently. Water levels fluctuated 20 to 50 ft seasonally in wells 2, 67, 74, and 92 but fluctuated only 5 to 15 ft seasonally in wells 22 and 49. The larger water-level fluctuations were in wells located near pumping depressions in storage units 1 and 3 (figs. 15 and 16). The continuous hydrographs show seasonal ground-water level changes more precisely than semiannual measurements. The hydrographs for the six continuously measured wells show that maximum annual ground-water levels can occur in individual wells any time between January and April and that the minimum annual ground-water level can occur any time between August and October. These data suggest continuous water-level monitoring is the most reliable means of determining the seasonal maximum and minimum ground-water levels. If other considerations necessitate a semiannual measurement schedule, then measuring during the periods March to April and September would be best for recording the maximum and minimum water levels.

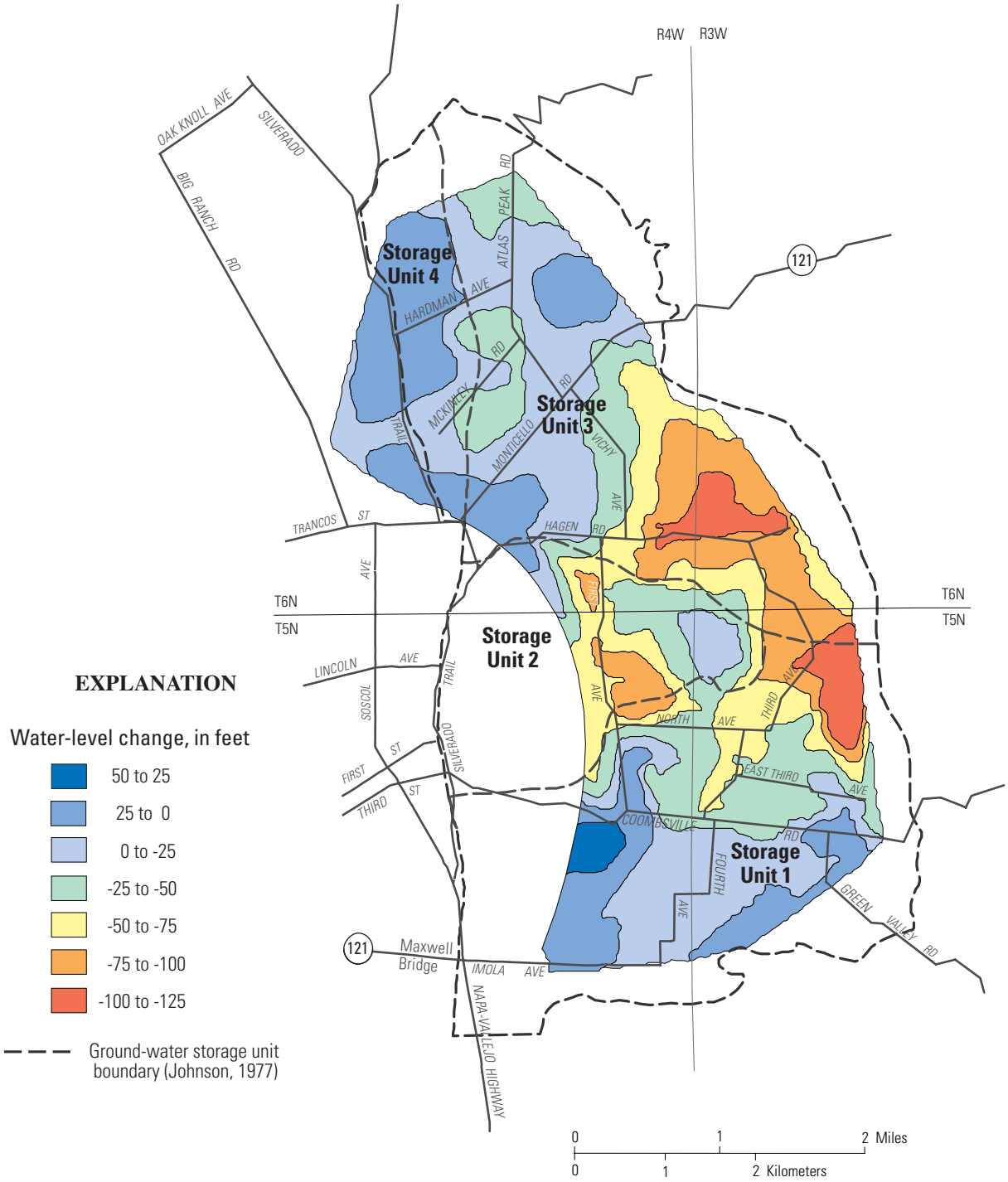


Figure 24. Change in water levels in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California, autumn 1975 to autumn 2001.

Water levels in well 2 (unused) fluctuated about 35 ft between the highest and the lowest levels. This is a response to recharge from nearby Milliken Creek and recovery after cessation of pumping in nearby wells used for golf course and landscape irrigation. Examination of the expanded hydrograph for well 2 clearly illustrates the overall decline and daily fluctuations in water levels between March and November owing to nearby pumping (fig. 21). The transition from a cessation of nearby pumping to rapid water-level recovery in late October 2001 is marked by the beginning of a smooth and more steeply rising hydrograph. In late November 2001, the rate of water-level recovery increased in response to the onset of heavy winter rains several weeks earlier. A 2- to 3-week lag time between precipitation and water-level response in January 2002 also is clearly evident in figure 21. The heavy precipitation tapered off in early January, and by the third week of January, the rate of water-level recovery also was leveling off.

The hydrograph for unused well 49 shows little water-level response to seasonal stresses due to the lack of pumping at nearby wells and its location away from major natural sources of recharge. Without complete well-construction information, an unambiguous interpretation of water-level fluctuations was not possible; however, water level seems to respond rapidly to precipitation (fig. 21). If any part of the well is screened in a confined aquifer, part of the water-level rise may be attributable to diminished pumping in distant wells.

Long-Term Changes in Ground-Water Levels

In the early 1900s, water flowed to land surface from many of the wells drilled in the area; by the 1950s, most of the wells had ceased flowing (Kunkel and Upson, 1960). Although water-level records for this period were insufficient for creating hydrographs, long-term hydrographs for the early 1960s through 2002 were created for 14 wells in the study area using periodic water-level measurements of 10 or more years. The locations of these wells are shown in figure 22, and the hydrographs for them are shown in figure 23.

The hydrographs are divided into three groups on the basis of geographic location and similarities in water-level fluctuations. The three groups are delineated in figure 22 and are identified as south, north, and east-central. The depth range of perforated intervals is known for only five of the wells. The lack of information on the perforated intervals of nine of the wells limits understanding similarities and differences in ground-water level fluctuations and trends between wells and geographic locations. The ground-water level network can be improved by using only wells that have complete construction information. However, the long-term trends of ground-water levels in these 14 wells still are instructive because they show areas where ground-water level declines have been greatest and areas where ground-water levels have not changed significantly over periods of several years.

Water-level data for each group of wells are shown in two hydrographs—one shows all available data for each well from 1960 to 2002; the second shows the highest water level measured each spring from 1980 to 2002. The data used for the spring water levels includes only values measured for March or April. The annual high water level generally occurs in the spring and is a measure of ground-water level recovery in the aquifer near the well. The amount of recovery depends upon recharge derived from precipitation during the previous season and the amount of reduction in ground-water pumping during October to February.

Long-term water-level data were available from four wells in the southern part of the study area. . Water-level measurements were discontinued in the mid-1990s for wells 11M1 and 14C1, however, prior to that time, there was no significant long-term trend in increasing or decreasing water levels. The other two wells (49 and 137) in the south group show small water-level declines between the 1980s and 2002 of about 1 and 12 ft, respectively (fig. 23B). Annual water-level fluctuations in the wells in this area were generally much less than 10 ft.

Water-level declines have been greater in the northern part of the study area than in the southern part but have been less than those in the east-central part. Long-term water-level data were available for five wells in the northern part of the area (fig. 23C). Water levels in well 2 declined by about 70 ft between 1960 and 1975 and by less than 10 ft between 1975 and 2002. Water levels in well 6N/4W-35G3 declined about 40 ft between 1962 and 1975, recovered to near 1962 levels by the mid 1980s, and then declined by about 30 ft by 1988, when measurements were discontinued. Wells 43, 56, and 75 have water-level data from about 1980 to 2002, and the water levels in these wells declined by about 10 to 25 ft during this period (fig. 23D). Annual water-level fluctuation in wells from this group were more than 25 ft during many years (fig. 23C).

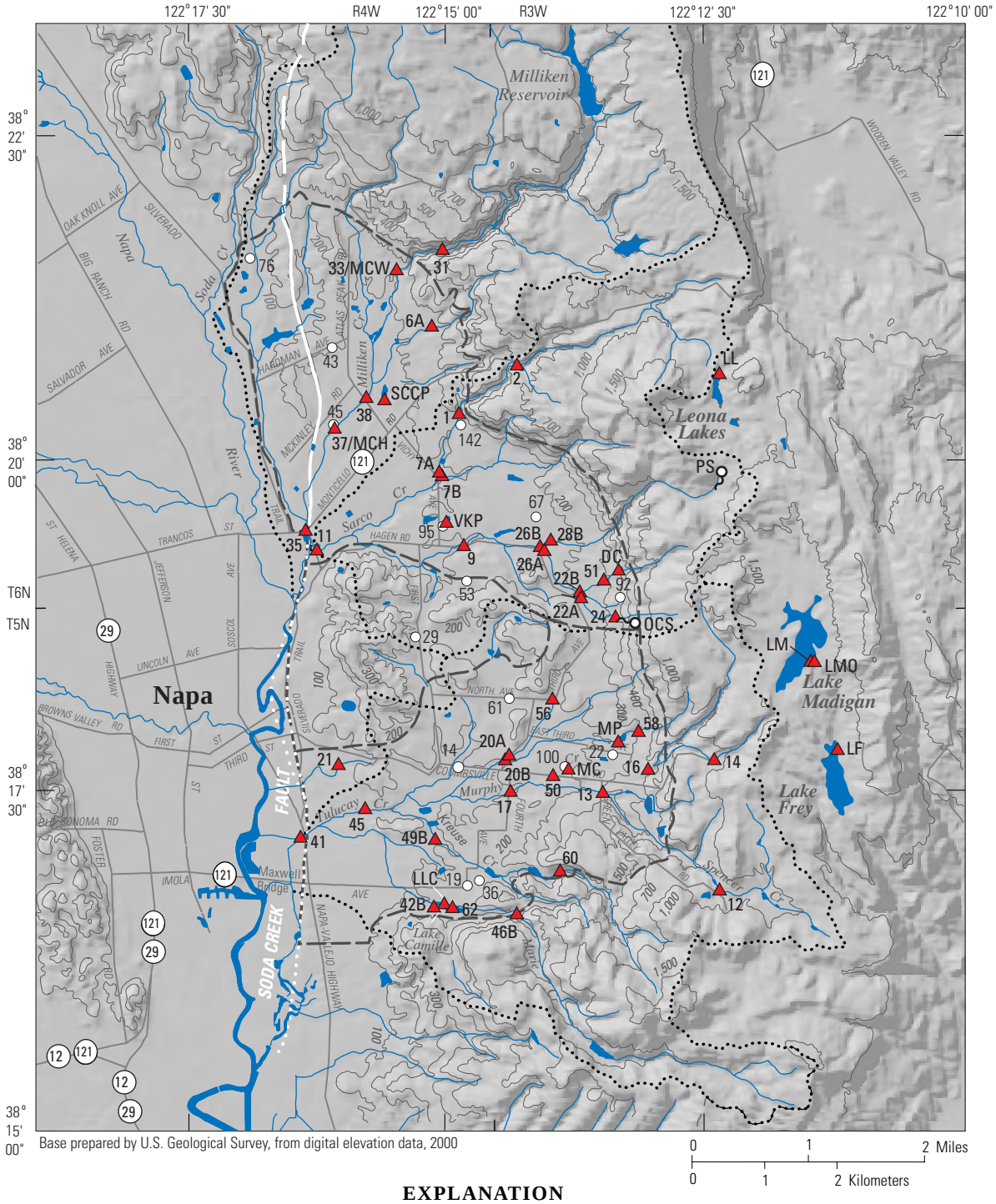


Figure 25. Locations of ground-water, surface-water, and miscellaneous water-chemistry sampling sites in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California.

Long-term water-level data were available from five wells in the east-central part of the study area, and show that water-level declines were largest in this part of the study area (fig. 23E). Water levels in well 10, which has the longest period of record for the east-central group, declined by more than 100 ft between 1962 and 2002. Annual high water levels measured in wells 20 and 41 (fig. 23F) declined between about 25 and 70 ft between the 1980s and the 2000-2002 period. Annual water-level fluctuations in wells in this group range from about 10 to more than 50 ft (fig. 23E).

In summary, ground-water levels have declined since the 1960s over large parts of the study area especially in the central part. These water-level declines have occurred despite near average to above average precipitation for the past four decades. A decade by decade comparison of precipitation recorded at the Napa State Hospital for the 1960s, 70s, 80s, and 90s shows that precipitation was 95, 99, 117, and 115 percent of the average. Water levels declined in 9 of 10 key monitoring wells (figs. 23B, 23D, and 23F) during the period 1980–2002. The water levels in five of these wells declined by greater than 20 ft since the 1980s. The general decline in ground-water levels in the study area may be attributed to an increase in ground-water pumping as more wells were constructed in the area especially since the mid 1970s.

Ground-Water Level Changes, 1975-2001

A water-level change map for the study area (fig. 24) was developed by computing the differences between the hydraulic-head map for autumn 2001 (fig. 15) presented in this report and the hydraulic-head map for autumn 1975 presented in Johnson (1977). Because most of the wells used to measure water levels during 2000-2002 were not the same wells measured by Johnson during 1974-75, the changes in figure 24 cannot be related to specific wells. In addition, it is important to recognize that water-level data used for the autumn 2001 and autumn 1975 hydraulic-head maps represent composite hydraulic heads because the water levels were measured in wells that mostly were constructed with long gravel packs, long screens, or multiple-depth zones open to geologic formations.

The water-level changes shown in figure 24 are consistent with the water-level changes evident in the long-term hydrographs (fig. 23A–F). In general, water levels declined in the northeastern part of ground-water storage unit 1, in the central part of storage unit 2, and in the southeastern part of storage unit 3. Water levels during 1975–2001 declined 100 to 125 ft in an area east of Third Avenue, straddling storage units 1 and 3, and along and north of Hagen Road in an area that is underlain by a pumping depression (figs. 15 and 16). In the central part of storage unit 2 along First Avenue, ground-water levels during 1975–2001 declined as much as 75 to 100 ft. Water-level declines were moderate (25 to 75 ft) in large areas of storage units 1, 2, and 3, including the western and the northern parts of storage unit 3 along Atlas Peak Road (fig. 24). Water-levels declines were small (0 to 25 ft) in storage unit 1 along Fourth Avenue between Imola Avenue and Coombsville Road and throughout a large part of the western half of storage unit 3. Water levels rose 0 to 50 ft throughout much of the western part of storage unit 1 between Imola Avenue, near Napa State Hospital, and at First Avenue south of North Avenue. Areas of 0- to 25-foot water-level rises extended through the central and southern parts of storage unit 4, the southwest part of storage unit 3, and a small area in the northeast part of storage unit 3, in the vicinity of the Silverado Country Club. Although water-level monitoring in and west of storage unit 4 was less extensive during 2000–2002 than during 1974–75 (Johnson, 1977), the limited data collected for this study indicate that water levels in most of this area rose less than 25 ft during 1975–2001.

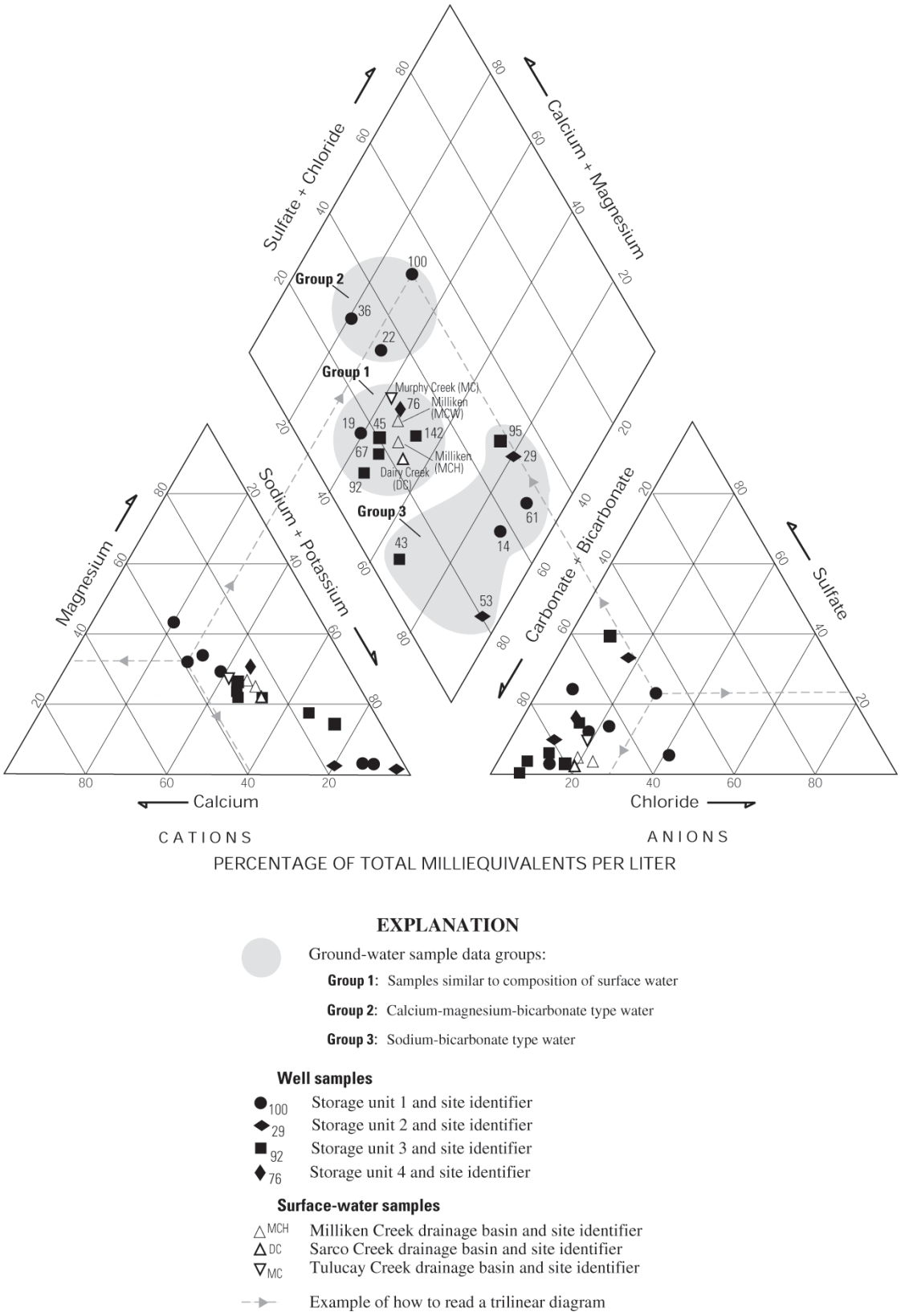


Figure 26. Chemical composition of water from selected ground-water and surface-water sampling sites in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California, September-November 2001.

SURFACE-WATER AND GROUND-WATER QUALITY

Surface water and ground water were sampled for analyses of major ions, selected trace elements, silica, nutrients, the stable isotopes of oxygen and hydrogen, selected dissolved atmospheric gases [nitrogen (N_2), argon (Ar), oxygen (O_2), carbon dioxide (CO_2), methane (CH_4), helium (He), hydrogen (H_2), and neon (Ne)], chloroflurocarbons (CFCs), and tritium. These data, summarized in tables 8 and 9 (at back of report) and tables10 and 11 (at back of report), were used to help characterize the areal variations in ground-water and surface-water chemistry and to help identify the ages and sources of ground waters. Surface-water samples were collected from sites along Milliken, Sarco, and Tulucay Creeks and their tributaries and at several lakes and ponds. Ground-water samples were collected from 15 wells in ground-water storage units 1 through 4 and from 2 springs in the Howell Mountains (fig. 25). Selection of wells was based on accessibility, type of well construction, and proximity to other wells selected for sampling in order to maximize the geographic coverage.

In general, water chemistry and (or) isotopic composition can vary with depth in ground-water systems. Most wells in the study area have shallow (less than 50 ft) seals and are perforated over long intervals, from shallow depths (less than 100 ft) to near the bottom of the well. This type of well construction is used to maximize well yield, but it greatly restricts the number of wells that tap only the deeper parts of the ground-water system and limits the utility of chemical data for characterizing the ground-water flow system. Of the 15 wells sampled for this study, only 2 are known to have perforated intervals that begin at depths greater than 100 ft (wells 92 and 142). For this reason, no statistically meaningful comparison of water chemistry or isotopes between deep and shallow ground water can be made for the 15 samples collected.

Methods of Water Sampling and Analysis

Surface-water samples were collected using a DH-81 sampler according to methods given in Wilde and others (1999); for streams too shallow for this method, water was collected in a polyethylene beaker from near the centroid of flow. Ground-water samples from wells were collected from faucets either at or near the well head to minimize potential chemical alteration of the water between the well and the sampling point. Prior to the collection of the ground-water samples, the wells were purged a minimum of three casing volumes of water. Sequential measurements of specific conductance, pH, and temperature were made at 5-minute intervals until readings had stabilized. All samples collected for the analysis of major ions, trace elements, silica, and nutrients were collected, treated, and preserved following procedures outlined by U.S. Geological Survey (1997 to present). These samples were analyzed at the USGS National Water Quality Laboratory in Denver, Colorado, using standard analytical methods described by Fishman and Friedman (1989), Fishman (1993), and Struzeski and others (1996).

Water samples for determinations of stable isotopes of hydrogen and oxygen were collected in unrinsed 60-mL glass bottles. Surface-water samples were collected directly from creeks, lakes, ponds, and springs by immersing the bottle until filled. Ground-water samples were bottom filled using a tygon tubing connected to the sampling point and allowed to overflow several sample volumes of water prior to being capped. Bottles were capped with conical-seal caps. Ratios of stable isotopes of oxygen and hydrogen were determined by the USGS Isotope Fractionation Project in Reston, Virginia, using a hydrogen water-equilibration technique (Coplen and others, 1991).

Samples for dissolved N_2, Ar, O_2, CO_2, and CH_4 analysis were collected by submerging 150-mL glass bottles in a plastic bucket that was continuously filled to overflowing with well water. A copper tube attached to the sample point and used to fill the plastic bucket was placed in the bottom of the glass sample bottle and allowed to displace several bottle volumes of water from the sample bottle prior to sealing the bottle. While the bottle was submerged in water, a rubber stopper pierced through by a syringe needle was firmly inserted in the bottle. The syringe needle allowed water, displaced by insertion of the stopper, and bubbles to escape. The syringe needle was removed with the bottle still submerged in water. A replicate sample was collected for each ground-water sampling site for quality assurance and control. Samples were stored and shipped on ice to the USGS Dissolved Gas Laboratory in Reston, Virginia, for analysis using gas-chromatographic methods as described by the U.S. Geological Survey (2001).

Water sampled for CFCs was pumped through copper tubing that was attached to the sampling point with hose fittings. The copper tubing was used to avoid contamination by chlorofluorocarbons that might diffuse through the tygon tubing used for chemical samples. Samples for CFCs were collected in five 62-mL ampoules that had been pre-flushed with ultrapure nitrogen gas for 1 minute to exclude atmospheric gases. The ampoules were then flushed with well water for several minutes before being filled and sealed with an oxygen-MAPP gas torch. Samples for CFCs (CFC-11, CFC-12, and CFC-113) were analyzed by the USGS CFC Laboratory in Reston, Virginia, using purge-and-trap gas chromatography methods described by Busenberg and Plummer (1992).

Samples for dissolved helium (He), hydrogen (H_2), and neon (Ne) were collected using the same bottles and procedures as described for the collection of dissolved gases. These samples were also collected in duplicate for quality assurance and control. Samples were analyzed for He by thermal conductivity detection at the USGS Dissolved Gas Laboratory in Reston, Virginia, using methods similar to those described by Sugisaki and others (1982).

Samples for tritium analyses were collected in unrinsed 1-L polyethylene bottles. The bottles were bottom filled using a tygon tubing connected to the sampling point and allowed to overflow with several sample volumes of water prior to being capped. Bottles were sealed with conical-seal caps to minimize exchange with the atmosphere. These samples were analyzed at the USGS Tritium Laboratory in Menlo Park, California, by electrolytic enrichment and gas counting as described by Ostlund and Dorsey (1975).

Surface-Water and Ground-Water Chemistry

Selected samples were measured on site for dissolved oxygen, pH, specific conductance, water temperature, and alkalinity following procedures outlined by U.S. Geological Survey (1997 to present). Dissolved-oxygen concentrations ranged from less than 0.1 to 8.9 milligrams per liter (mg/L); the highest concentrations were in the creek samples. The dissolved-oxygen concentrations exceeded 1 mg/L in water from six wells; the maximum concentration (6.6 mg/L) was in a sample from well 53.

The pH of all the samples ranged between 6.3 and 8.6 (table 8, at end of report). The lowest and highest values, 6.3 and 8.6, respectively, do not meet the secondary drinking-water standard range of 6.5 to 8.5 established for the protection of taste, odor, or appearance of drinking water (California Department of Health Services, 2003).

Specific conductance, a measurement of the ability of water to conduct an electrical current and an indicator of ionic concentration, varied widely depending on the type of the sample, the location, and the time of year. The specific conductance measured in stream samples ranged from 58 to 610 microsiemens per centimeter (μS/cm) (tables 8 and 9, at end of report). The lowest specific conductance values were measured in samples collected from creeks, lakes, and ponds on the Howell Mountain block. The highest specific conductance values were measured in samples collected from small culverts or tributaries to Milliken, Sarco, and Tulucay Creeks that drain areas of concentrated residential development (sites 20A, 21, and 9) or vineyards (sites 56, and 22B). Specific conductance of creek water was highest when streamflow was lowest. This suggests that recently discharged ground water makes up a greater part of streamflow during low-flow conditions than during times of high runoff. Specific conductance values in samples from lakes and ponds in the lower Milliken and Tulucay drainage basins in September 2001 ranged from 166 to 317 μS/cm. Samples from wells in the lower Milliken, Sarco, and Tulucay drainage basins in September and November 2001 ranged from 124 to 1,220 μS/cm. Water from one well (61) exceeded the State secondary drinking-water standard of 900 μS/cm (California Department of Health Services, 2003).

Major-ion concentrations in surface- and ground-water samples are plotted in a trilinear diagram (fig. 26). A trilinear diagram shows the proportions of common cations and anions for comparison and classification of water samples independent of total analyte concentrations (Hem, 1985). Trilinear diagrams can be used to identify groups of samples that have similar relative ionic concentrations (Freeze and Cherry, 1979). Water samples from the lower Milliken–Sarco–Tulucay Creeks area were separated into three groups, each group having a different relative chemical composition (fig. 26).

Group 1 includes samples from six wells (19, 45, 67, 76, 92, and 142), four of which exceed 350 ft in total depth, and all four surface-water samples [Murphy Creek (MC), a tributary of Tulucay Creek; Dairy Creek (DC), a tributary of Sarco Creek; and at two sites (site 33/MCW and site 37/MCH) along Milliken Creek]. Wells 45, 76, 92, and 142 are located close to creeks. Group 1 samples can be characterized as a mixed cation-bicarbonate type water. Sodium was the predominant cation in all group 1 water samples. Samples in this group had relatively low ionic concentrations compared with samples in groups 2 and 3. Dissolved-solids concentrations (solids, sum of constituents) for the creek samples ranged from 128 to 164 mg/L and for ground-water samples ranged from 144 to 282 mg/L (compared with the median of 282 mg/L for all 15 well samples).

Group 2 includes samples from three wells (22, 36, and 100, all having total depths of less than 250 ft) in the southeastern part of the study area (fig. 25). The chemical composition of this group is characterized as a calcium-magnesium bicarbonate (two samples) or a calcium-magnesium mixed anion type water (one sample). The dissolved-solids concentrations for this group, which were higher than those for group 1, ranged from 217 to 435 mg/L.

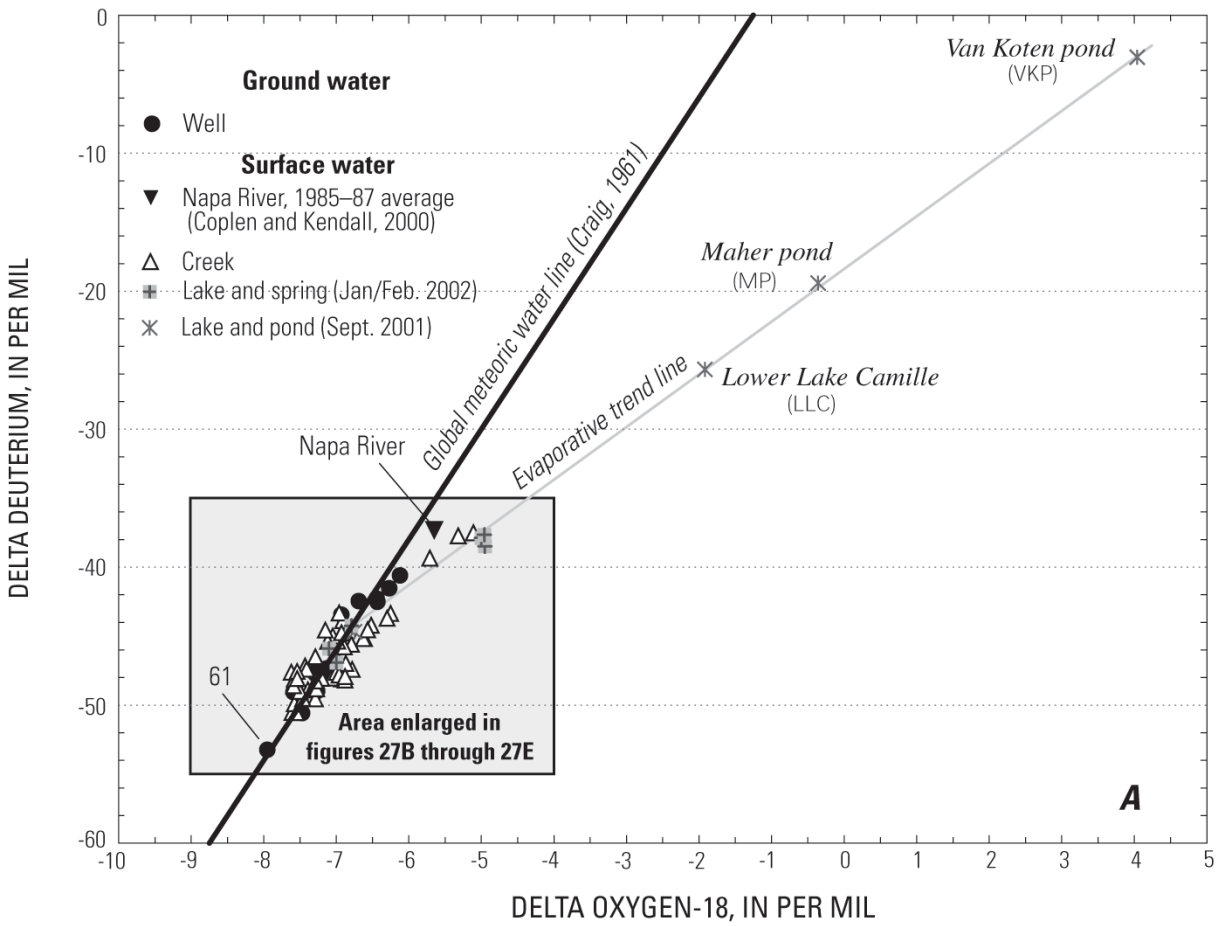


Figure 27. Relation between delta deuterium and delta oxygen-18 in water samples for the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California. A, all water samples. B, enlargement of part of figure 27A. C, creek samples grouped by month. D, creek samples for March and April 2001 grouped by range. E, ground-water samples and selected surface-water samples.

Group 3 includes samples from six wells (14, 29, 43, 53, 61, and 95). Five of the wells are located in or within 1 mi of the hilly region in ground-water storage unit 2 referred to as the Cup and Saucer (Johnson, 1977). Group 3 samples are sodium-bicarbonate type water (fig. 26). Most samples in this group had higher ionic concentrations than the samples in groups 1 and 2. Dissolved-solids concentrations ranged from 285 to 732 mg/L. Concentrations of sodium ranged from 51 to 247 mg/L and were higher compared with those in the samples from groups 1 and 2. Samples from wells in group 3 had the highest concentrations of chloride (175 mg/L in the sample from well 61), fluoride (1.5 mg/L in the sample from well 61), and sulfate (80 mg/L in the sample from well 95).

Boron concentrations in samples from wells 14 and 61 were 1.4 mg/L (1,440 micrograms per liter [µg/L]) and 11 mg/L (11,000 µg/L), respectively. These concentrations exceeded the California Department of Health Services action level (AL) of 1 mg/L (California Department of Health Services, 2002). The high boron concentration in well 61, as well as a strong hydrogen sulfide odor noted at the time of sampling and the overall chemical composition of the sample, indicates that the chemical composition of water in this well is similar to the composition of the samples collected in 1950 from two wells in the same area (Kunkel and Upson, 1960). Water from wells identified as State well numbers 5N/3W-6N2 and -6P1 had boron concentrations in 1950 of 18 and 8 mg/L, respectively (Kunkel and Upson, 1960). Wells 5N/3W-6N2 and -6P1 were of comparable depth to well 61 (completed depth 260 ft) at 205 and 285 ft, respectively, suggesting that aquifers underlying the diatomaceous deposits of the Sonoma Volcanics in this particular area yield poor quality water.

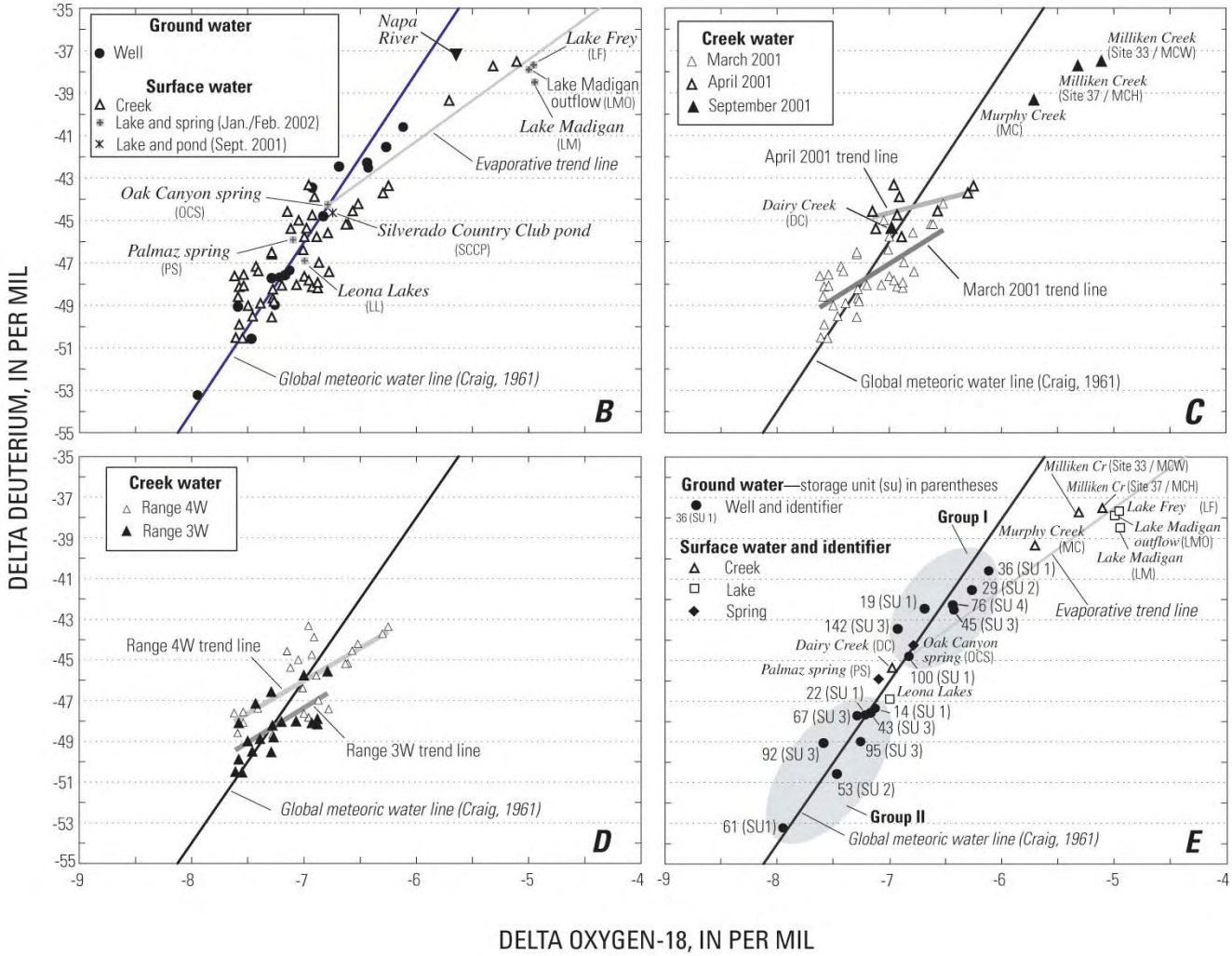


Figure 27.—Continued.

The concentration of arsenic in samples from wells 29, 36, 43, 45 and 76 ranged from 11 to 67 μg/L. These concentrations exceeded the primary maximum contaminant level (MCL) of 10 μg/L (U.S. Environmental Protection Agency, 2002). Wells 43, 45, and 76 are located in the northwestern part of the study area near the Soda Creek Fault, where deep up-flow of ground water along the fault may account for the relatively high concentration of arsenic in these well samples compared with that in other well samples from the study area.

Samples from several wells contained dissolved iron and manganese in concentrations exceeding the secondary Federal and State MCL of 300 μg/L for iron and 50 μg/L for manganese (U.S. Environmental Protection Agency, 2002; California Department of Health Services, 2003).

Variations in ground-water composition within the study area can be summarized as follows:

1. Ground water from the perimeter of the study area, nearest recharge areas in the Howell Mountains, generally was less mineralized than ground water closer to the central part of the study area. Surface-water and ground-water samples from the perimeter of the area can be characterized as calcium-magnesium bicarbonate composition, low dissolved solids, and relatively high silica concentrations compared with samples from other parts of the study area.
2. Ground water in the southeastern part of the lower Tulucay drainage basin contains higher percentages of calcium and magnesium (greater hardness), slightly lower percentages of bicarbonate, and intermediate dissolved solids, compared with ground water in other parts of the study area.
3. Ground water in the central part of the study area, centered near the Cup and Saucer area, is characterized by higher dissolved-solids concentrations, a higher percentage of sodium, a higher percentage of chloride or sulfate, and higher concentrations of boron than ground water from areas closer to the Howell Mountains. Ground water from three wells (14, 61, 100), ranging in total depth from 228 to 260 ft, have the highest dissolved solids (all greater than 400 mg/L) and highest chloride concentrations (54 to 175 mg/L). These three wells are all located within about 0.5 mi of Coombsville Road and Fourth Avenue.
4. Ground water having high arsenic concentrations may be related to deep upward circulation of ground water along the Soda Creek Fault. Water samples with the highest arsenic concentrations (16 to 67 μg/L) came from three wells located within 0.5 mi of the Soda Creek Fault in the northwest part of the area.
5. Water in contact with volcanic rocks often has high concentrations of dissolved boron, iron, and manganese (Hem, 1985). The volcanic rocks that underlie the study area are probably the source of the observed high concentration of the constituents.

Oxygen-18 and Deuterium

Water samples were collected from selected sites in the study area for analysis of oxygen-18 (^{18}O) and deuterium (^{2}H). Oxygen-18 and deuterium data can provide information on the source and movement of ground water.

Background

Oxygen-18 and deuterium are naturally occurring stable isotopes of oxygen and hydrogen. The abundance of oxygen-18 and deuterium relative to lighter oxygen-16 (^{16}O) and hydrogen (^{1}H) atoms can be used to help infer the source and the evaporative history of water. Oxygen-18 and deuterium abundances are expressed in delta notation (δ as per mil (parts per thousand [‰]) differences in the ratios of $^{18}O/^{16}O$ and $^{2}H/^{1}H$ in samples relative to a standard known as Vienna Standard Mean Ocean Water (VSMOW) (Gat and Gonfiantini, 1981):

$$\delta^{18}O = \left[\frac{(^{18}O/^{16}O)_{sample}}{(^{18}O/^{16}O)_{VSMOW}} - 1\right] \times 1,000$$

and

$$\delta D = \left[\frac{(^{2}H/^{1}H)_{sample}}{(^{2}H/^{1}H)_{VSMOW}} - 1\right] \times 1,000$$

Because the source of much of the world's precipitation is derived from the evaporation of seawater, the $\delta^{18}O$ and δD composition of precipitation throughout the world cluster along a line known as the global meteoric water line (Craig, 1961)

$$\delta D = \delta^{18}O + 10.$$

Differences in the isotopic composition of precipitation occur along this line if water vapor originated from evaporation of cooler or warmer seawater (Gat and Gonfiantini, 1981). Storms that originate over the cold waters in the Gulf of Alaska have a lighter isotopic composition than storms that originate over warm tropical waters in the vicinity of Hawaii. Differences also occur as the result of moist air masses moving over land; as storms move inland from coastal areas, the concentration of heavier isotopes relative to lighter isotopes decreases as water molecules repeatedly undergo evaporation and condensation. In addition, precipitation that condenses at high altitudes and at cool temperatures tends to be isotopically lighter than precipitation that forms at low altitudes and warm temperatures (Muir and Coplen, 1981). Water that has not undergone evaporation will plot near the global meteoric water line.

Stable Isotope Results

The $\delta^{18}O$ and δD values for the entire suite of water samples ranged from +4.04 to –7.95 per mil and –3.04 to –53.23 per mil, respectively (table 9, at end of report). These values plot on either side of and along the global meteoric water line (fig. 27A). Waters affected by evaporation plot to the right of the meteoric water line; the sample from a small artificial impoundment, designated as Van Koten pond for the purposes of this report, has the isotopically heaviest (least negative) water ($\delta^{18}O$ and δD values, +4.04 and –3.04 per mil, respectively) and exemplifies the effect of evaporation. The sample from well 61, located in ground-water storage unit 1, was the isotopically lightest (most negative) water sampled ($\delta^{18}O$ and δD values of –7.95 and –53.23 per mil, respectively). Figure 27B is an enlargement of part of the plot shown in figure 27A and shows in more detail the distribution of data for all samples except the three lake or pond samples that are most strongly affected by evaporation.

The $\delta^{18}O$ and δD composition of surface-water samples from creeks in the lower Milliken, Sarco, and Tulucay drainage basins ranged from –5.11 to –7.62 per mil for $\delta^{18}O$ and from –37.51 to –50.54 per mil for δD (fig. 27C, table 9, at end of report). In contrast, the average $\delta^{18}O$ and δD composition for the Napa River near Napa (Station number 1145800; fig. 1) for 1985-87 was –5.64 and –37.32, respectively (Coplen and Kendall, 2000). The average isotopic composition of the Napa River is representative of the average for streams in the part of Napa Valley (about 218 mi^2) upstream of station 1145800 and is heavier than the composition of nearly all the creek samples collected in the study area (fig. 27B). The creek water samples, excluding those from Milliken Creek, are composed of recently discharged ground water and seepage of shallow soil water (they were collected long after any significant rainfall). Milliken Creek is fed by controlled releases from Milliken Reservoir, therefore the water samples from this stream can contain large fractions of water derived from precipitation and surface-water runoff.

Seasonal variations in the isotopic composition of creek water between March 2001 and September 2001 are illustrated in figure 27C. The isotopic composition of creek samples from March, April, and September 2001 became progressively heavier due to higher air and water temperatures that result in greater losses of lighter isotopes through evaporation. The isotopic composition of creek water was progressively lighter (more negative) from west (range 4W) to east (range 3W) (fig. 27D), probably because the higher altitude in the eastern part of the study area results in fractionation of the isotopes in rainfall. Evaporation from creeks, however, can cause isotopic concentrations to become heavier as water flows from the headwaters to locations in the western part of the study area.

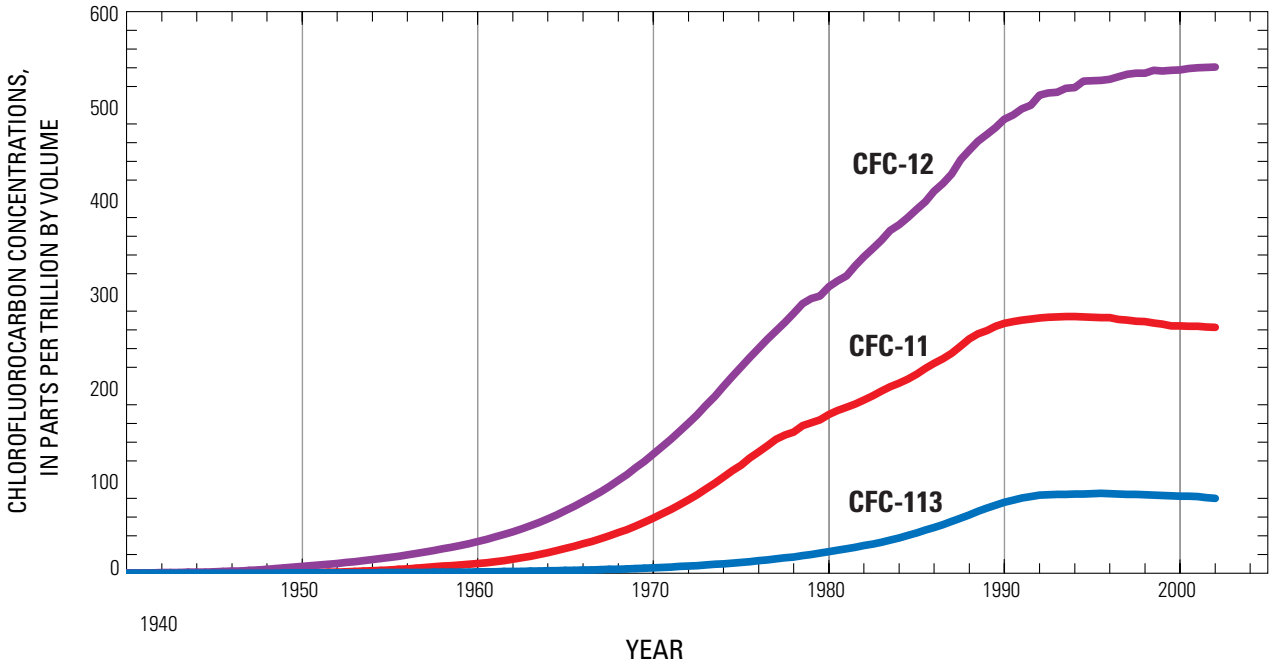


Figure 28. Concentrations of chlorofluorocarbons CFC-11, CFC-12, and CFC-113 in North American air. (Modified from Plummer and Busenberg, U.S. Geological Survey, written commun., 2002)

The $\delta^{18}O$ and δD composition of the samples from the lakes, ponds, and springs showed a wider variation of isotopic composition than the samples from the creeks, ranging from +4.04 to –7.10 per mil for $\delta^{18}O$ and –3.04 to –46.90 per mil for δD (table 9, at end of report). Three of four lake and pond samples collected in September 2001 had the heaviest isotopic composition of any sample collected and analyzed. Samples from lower Lake Camille (LLC), located in the lower Tulucay Creek drainage basin, and from two private artificial ponds, Maher pond (MP), located in the lower Tulucay Creek drainage basin, and Van Koten pond (VKP), located in the Sarco Creek drainage basin, define an evaporative trend line (fig. 27A). The isotopic composition of the fourth sample collected in September 2001 from a pond at the Silverado Country Club (SCCP) plots slightly to the right of the global meteoric water line but within the same area of fig. 27B where most of the creek and ground-water samples plot. This sample most likely represents ground water pumped to fill and maintain the Silverado Country Club pond.

Four samples collected in January 2002 from three lakes, located east of the surface-water divide in the Howell Mountains, plot to right of the global meteoric water line (fig. 27E). The three samples from Lake Madigan and Lake Frey plot along the evaporative trend line and have an isotopic composition similar to the samples collected from Milliken Creek in September 2001. The fourth sample collected from Lake Leona, had an isotopic composition similar to most of the creek and ground-water samples, indicating that the water in this lake was relatively unaffected by evaporation compared with water from other sites, perhaps owing to recent runoff or ground-water inflow. Samples collected from Oak Canyon spring and Palmaz spring had a similar composition and plot close to the global meteoric water line (fig. 27B). The samples from Leona Lakes, Oak Canyon spring, and Palmaz spring probably are the most representative of the isotopic composition of ground-water recharge to the study area that originates in the Howell Mountains.

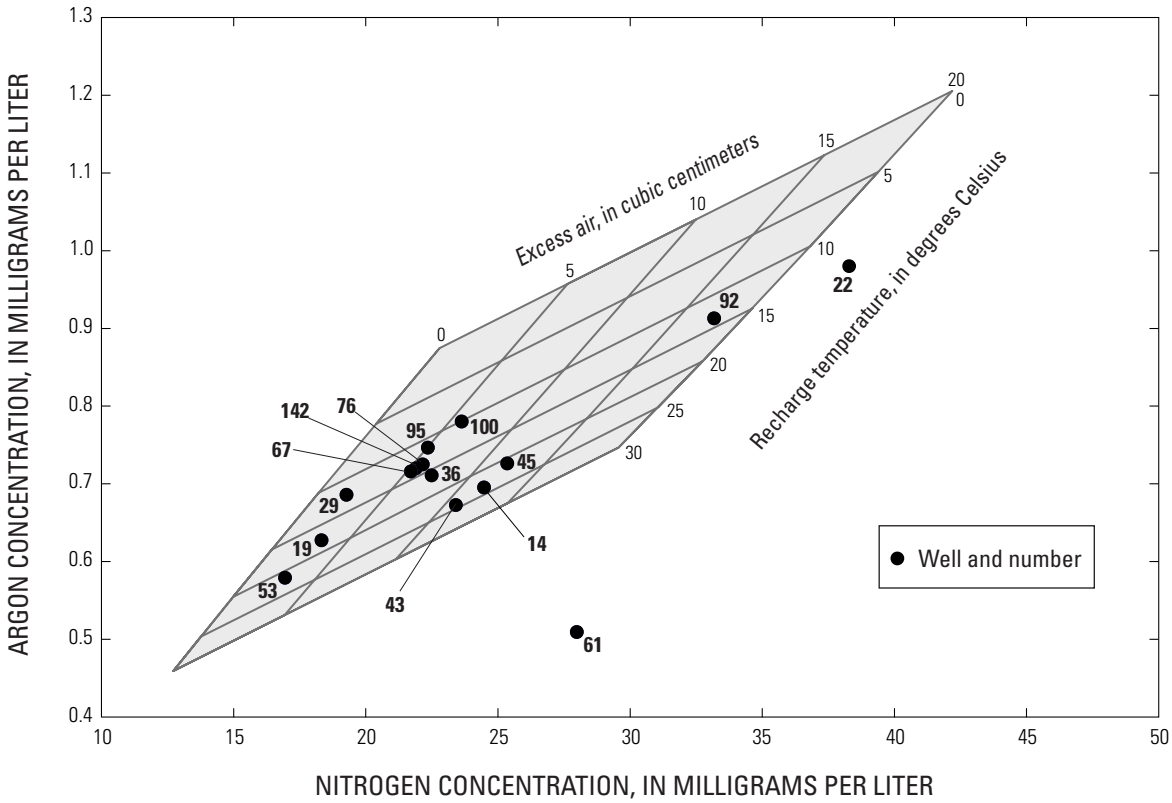


Figure 29. Comparison of argon and nitrogen concentrations in ground-water samples from wells and calculated water temperatures at the time of recharge, lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California.

The $\delta^{18}O$ and δD compositions of ground-water samples collected from wells in the study area generally were similar to the isotopic composition of the samples collected from creeks in spring 2001, ranging from –6.12 to –7.95 per mil for $\delta^{18}O$ and –40.6 to –53.23 per mil for δD (fig. 27B; table 9, at end of report). The isotope samples from wells can be divided into two groups based on where they plot in figure 27E. Group I includes water samples from seven wells having $\delta^{18}O$ and δD greater than –7 and –45 per mil, respectively. The seven wells are distributed throughout the study area: three in ground-water storage unit 1 (19, 36, and 100), one in ground-water storage unit 2 (29), two in ground-water storage unit 3 (45 and 142), and one in ground-water storage unit 4 (76). The water from well 36 had the heaviest isotopic composition of all ground-water samples possibly because of its proximity to Lake Camille, which may be a recharge source. The group I samples generally plot between the samples that are most representative of precipitation that recharges ground water in the Howell Mountains (samples from Leona Lakes, Palmaz spring, Dairy Creek, and Oak Canyon spring) and samples that were affected by evaporation (samples from Murphy and Milliken Creeks and from Lakes Madigan and Lake Frey) (fig. 27E): the samples probably represent mixing of infiltrated precipitation and partly evaporated water in lakes in the Howell Mountains.

Group II consists of water samples from eight wells having $\delta^{18}O$ and δD less than –7 and –47 per mil, respectively; samples are lighter than the group I samples. The eight wells in group II are distributed among three of the four ground-water storage units—three in storage unit 1 (14, 22, and 61), one in storage unit 2 (53), and four in storage unit 3 (43, 67, 92, and 95). Samples from five of the six wells (14, 43, 53, 61, and 95) having the group-II isotopic composition had a group-3 water-chemistry characterized by sodium-chloride type water and high dissolved solids. Water from well 61 had the lightest (most negative) isotopic concentration and the greatest dissolved-solids concentration of any sample. The relatively light isotopic composition of the Group II samples, compared with that of the Group I samples, may be due to a mixture of water in creeks during the winter and

water recharged in the Howell Mountains or from a mixture of recent and older recharge due to precipitation during a cooler and wetter climatic period. Over time, the older recharge water could have become mineralized due to water-rock interaction or this older mineralized water may have originated from deeper ground water, possibly including geothermal sources.

Ground-Water Age Dating

Water samples were collected from 15 wells and analyzed for dissolved gases and chlorofluorocarbons (CFCs). Six of those wells also were sampled for tritium (^3H), the radioactive isotope of hydrogen. Concentrations of CFCs and tritium can provide information on the ages of the water samples, which can be used to infer rates of ground-water flow. Ground-water age, when based on measurements of the concentrations of a chemical or isotope, refers to the time elapsed since the water containing the chemical or isotope was recharged and isolated from the atmosphere. Age dating ground water requires matching the concentrations of a chemical or isotope in the water to the historical atmospheric concentrations of the substances. Historical atmospheric concentrations of both CFCs and tritium are well documented (Plummer and Busenberg, 2000). Concentrations of dissolved gases were used to interpret the results of CFC analyses by providing data to estimate recharge temperatures, quantities of excess air, and redox conditions.

Chlorofluorocarbons

Chlorofluorocarbons CFC-11 ($CFCl_3$), CFC-12 (CF_2Cl_2), and CFC-113 ($C_2F_3Cl_3$) are stable synthetic organic compounds that were first produced in the 1930s for use as refrigerants, aerosol propellants, cleaning agents, solvents, and blowing agents for foam rubber and plastics (Busenberg and Plummer, 1992). CFCs provide excellent tracers and dating tools for modern water (0- to 50-year time scale). The analytical detection limit of CFC-12, CFC-11, and CFC-113 in water is about 0.3 picogram per kilogram (pg/kg) of water, corresponding to water recharged in approximately 1941, 1947, and 1955, respectively. Atmospheric CFC concentrations have increased steadily over time with CFC-11 and CFC-113 peaking in North America during the early 1990s (Niwot Ridge, Colorado) at values of about 275 and 85 parts per trillion by volume (pptv), respectively (fig. 28) (Plummer and Busenberg, 2000). CFC-12 may have reached its peak concentration in North America within the last several years (prior to 2002) at about 545 pptv. Once in the atmosphere, CFCs undergo equilibrium partitioning with water vapor and become incorporated into the hydrologic cycle through precipitation.

The accuracy of CFC-determined ground-water ages can be limited by chemical and physical processes including CFC exchange between recharge water and the atmosphere, degradation and sorption during transit along ground-water flow paths, and ground-water mixing (Plummer and Busenberg, 2000). Local point-source CFC contamination, for example from septic tanks or leaking sewer lines, also may affect the accuracy of CFC-determined ages. Environmental contamination usually is indicated by large differences between CFC-11, CFC-12, and CFC-113 concentrations or CFC concentrations that are greater than that possible for atmospheric concentrations. If CFC contamination occurs, CFC-determined ages will be interpreted as younger than the actual ages. Young-age bias of CFC-determined ages also can result if the recharge temperature and (or) recharge elevation are overestimated and if excess air (air entrapped in recharge water and transported into the saturated zone) is not accounted for in the age interpretation (Plummer and Busenberg, 2000). In contrast, CFC-determined ages will be interpreted as older in water from geologic formations that have thick unsaturated zones (greater than about 100 ft) because air in deep unsaturated zones tends to be older and therefore has lower CFC concentrations than the present-day atmosphere. Old-age bias of CFC-determined ages also can result from underestimation of the recharge temperature and (or) the recharge elevation, as well as from microbial degradation, particularly in anaerobic (oxygen-poor), sulfate-reducing, or methane rich environments (Plummer and Busenberg, 2000). Because of the difficulty in accounting for all of the physical and chemical processes that affect the concentrations of CFCs in ground water, age is usually referred to as "model" or "apparent" age.

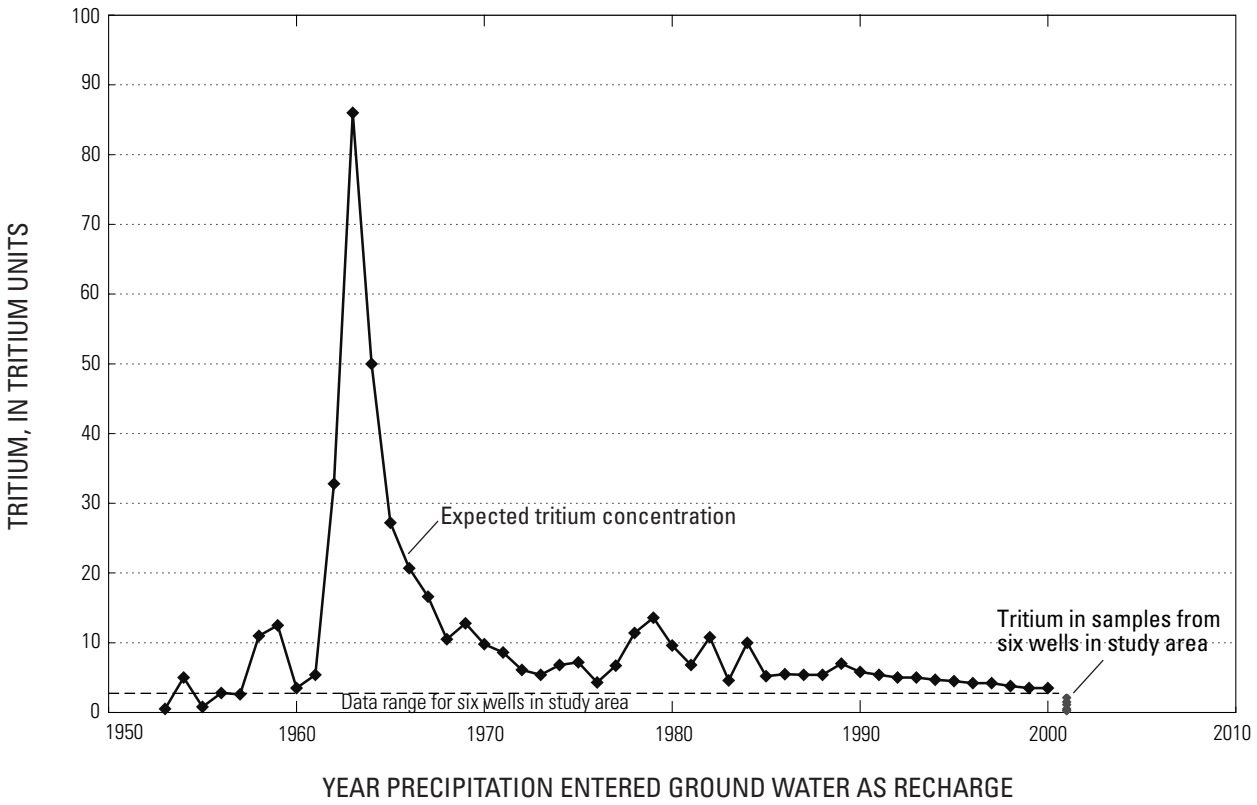


Figure 30. Tritium concentrations in samples from six wells and tritium concentrations expected in ground water in southeastern Napa County, California, that originated as precipitation between 1953 and 2000, southeastern Napa County, California.

Calculation of CFC-model ages requires estimating water temperature at the time of recharge and determining the amount of excess air in samples. The water temperature at the time of recharge is needed because the solubility of gases varies as a function of temperature and atmospheric partial pressures (Busenberg and Plummer, 1992). Excess air is important because high concentrations, common in fractured rock aquifers, may result in calculated CFC ages younger than actual ages if not taken into account (Busenberg and Plummer, 1992). Water temperature at the time of recharge can be estimated from ratios of nitrogen (N_2) and argon (Ar) corrected for excess air. Calculated recharge temperatures, based on nitrogen and argon-gas analyses of samples from 15 wells in the study area, range from 10.2 to 90.7 degrees Celsius (°C) (fig. 29; table 10, at end of report). The high recharge temperature (90.7°C), combined with a high excess air value of almost 25 cubic centimeters per liter (cm^3/L) of solution in the sample from well 61 is attributable to degassing, specifically the loss of nitrogen and argon, from ground water in the presence of high methane (14.7 mg/L) and low oxygen (less than 0.1 mg/L) concentrations. Excluding the sample from well 61, the mean recharge temperature for the remaining 14 well samples is 15.7°C. This value agrees well with the 30-year (1961–90) average air temperature for the Napa area of 14.7°C (National Oceanic and Atmospheric Administration, 2002).

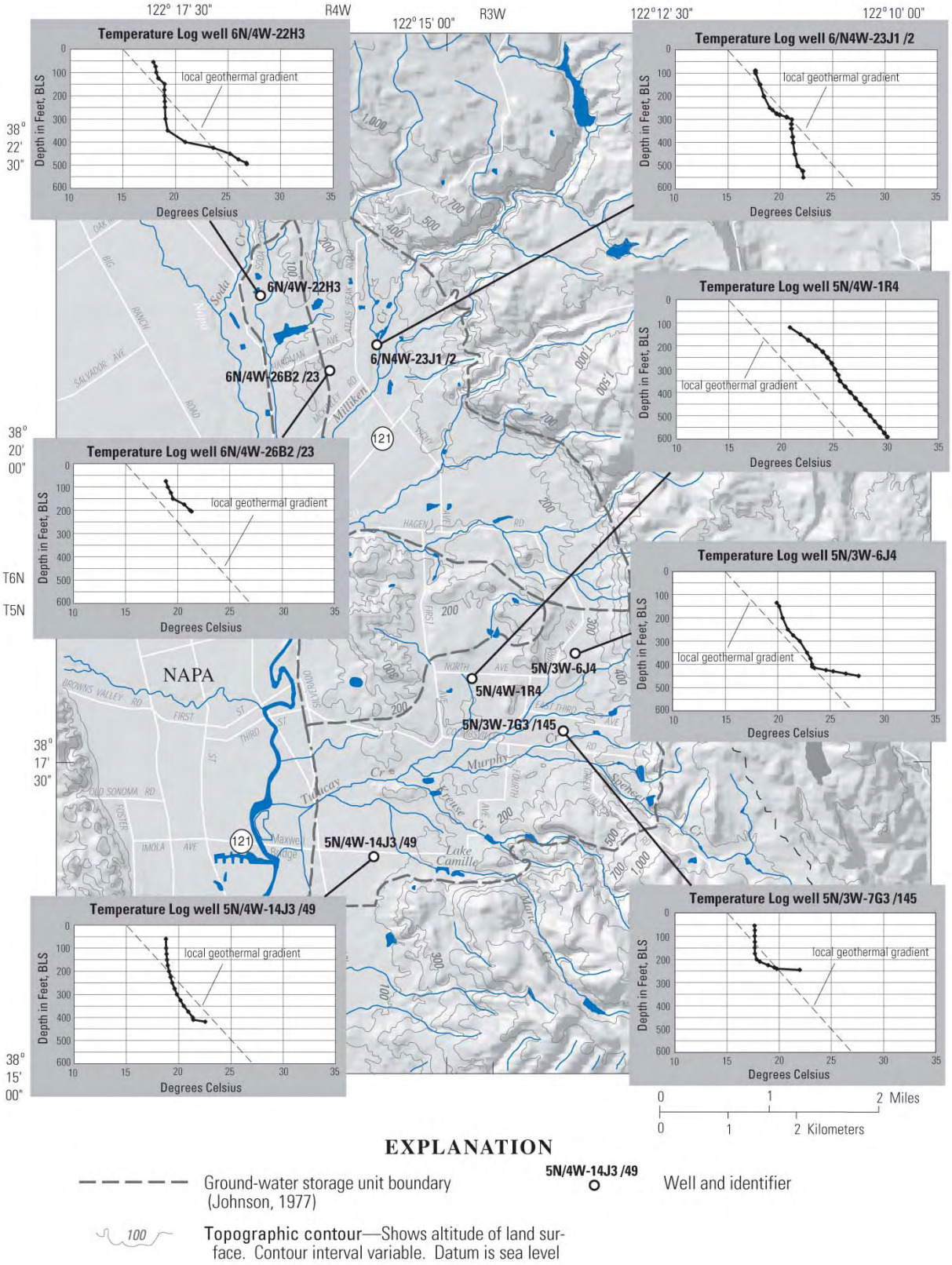


Figure 31. Temperature logs for selected wells in the lower Milliken—Sarco—Tulucay Creeks area, southeastern Napa County, California. (bls, below land surface)

Table 10 (at end of report) contains ranges of recharge dates and CFC-model ages. The ages are the median ground-water ages that represent the differences between the midpoints of the recharge ranges and 2001, the year of sample collection. The ages correspond to recharge in the 1950s through the 1980s for all well samples. The samples representing the youngest waters, based on CFC-model ages, are from wells 29 and 53 located in ground-water storage unit 2; water from these wells have median ages of 21 and 15 years, respectively. Three of four water samples representing median ages between 25 and 35 years old are from wells located near creeks in ground-water storage units 3 and 4 (wells 45, 76, and 92). The younger age of these samples may be due to infiltration of modern surface water. Most of the samples (nine) have median ages between 40 and 50 years, including the samples from five of six wells in ground-water storage unit 1 (14, 19, 36, 61, and 100). The CFC-model ages for the samples from the shallow and the deep wells are similar, supporting the conclusion that most recharge originates in the hills on the east side of the study area and flows laterally into shallow and deeper permeable layers (fig. 9). Strong vertical mixing of ground water or small contributions of water from wells from depths below 350 ft may explain the lack of clear age differences between the deep and the shallow wells. The young age dates for the samples from wells 29 and 53, both of which are in storage unit 2, suggest that the hills underlain by tuff in the Cup and Saucer area may be a catchment area for some local recharge.

Age dates based on CFC concentrations should be used with caution due to the possibility of local contamination of ground water by CFCs or of modification of CFC concentrations in the aquifer by geochemical, biological, or hydrologic processes (Busenberg and Plummer, 1992). Samples from only seven wells (14, 36, 43, 61, 67, 95, and 100) had fairly consistent age dates (varying by 10 years or less) for all three CFC compounds and for the three samples from each well. The median age dates of the samples from these seven wells are between 1951 and 1961, but comments from the USGS CFC Laboratory caution that the samples from wells 14, 36, 61, and 100, as wells as the samples from wells 45, 76, and 142, may have degraded, degassed, or been contaminated by local sources of CFCs. For example, the age date of the sample from well 61 may be older than its actual age because of CFC losses caused by degassing and (or) chemical degradation under reducing conditions. Another example is the age date of the samples from well 76, which contained CFC-12 in concentrations greatly exceeding the historical atmospheric concentrations of this compound; this suggests possible contamination from a local source.

Tritium

Tritium (^3H) is the radioactive isotope of hydrogen; it has a half-life of 12.43 years. Tritium, because of its short half-life, is useful for determining the age of water that generally is less than 50 years old. Tritium activity is measured in disintegrations per unit of time and is commonly reported in tritium units (TU); each tritium unit equals one ^3H atom in 10^{18} atoms of hydrogen. Approximately 800 kg of ^3H were released as a result of atmospheric testing of nuclear weapons during 1952–62 (Michel, 1976). As a result, ^3H concentrations in precipitation and in ground water recharged during that time increased. Because ^3H is part of the water molecule and its concentration is not affected significantly by reactions other than radioactive decay, ^3H is an excellent tracer of the movement of water on time scales ranging from 0 to 50 years before present (2002).

Tritium can be used alone to determine the age of water, but in some cases this yields a non-unique value. A specific age can be determined if the amounts of ^3H and its radiogenic daughter, helium (^3He), are quantified (Clark and Fritz, 1997). Samples were collected from six wells with the intention of using the tritium-helium method to determine recent ground-water ages. However, results from analysis of dissolved helium (table 11, at end of report) indicated that this method may not yield reliable tritium-based ages because of the presence of helium [derived from the Earth's crust and mantle (terrigenic helium)] that greatly exceeded concentrations derived from thermonuclear tritium. Elevated He concentrations and $^3He/^4He$ ratios are common in some areas underlain by volcanic rocks or near fault zones; therefore, six samples were analyzed for tritium alone to provide qualitative estimates of recent ground-water ages.

Tritium concentrations expected in ground water in the Napa area, the source of which was precipitation between 1953 and 2000, are shown in figure 30. These expected concentrations were calculated by determining the radioactive decay of tritium between the time that the precipitation fell and the time that the ground water was sampled. Historical tritium

concentrations were based on measured concentrations at several stations in North America and correlations with tritium concentrations in precipitation at Ottawa, Canada, and Vienna, Austria (Robert Michel, U.S. Geological Survey, written commun., 2002). Given a half-life of 12.43 years, ground-water samples collected in 2001 should have tritium levels of 0.6 TU if they were recharged entirely in 1952. A more recent recharge date (after 1952) would yield higher tritium levels; whereas, an older recharge date would yield lower levels (less than 0.6 TU). For this study, ground water that had ^{3}H concentrations less than the detection limit of 0.3 TU was interpreted as water recharged prior to 1952; ground water that had detectable levels ^{3}H was interpreted as water recharged after 1952.

Concentrations of tritium ranged from 0.25 to 2.12 TU in six of the ground-water samples (table 10). The concentrations in these samples are consistent with that for water recharged prior to 1956 (fig. 30), assuming the sampled waters are not mixtures of waters of two or more ages. Tritium concentrations ranged from 0.25 to 0.50 TU in samples collected from three shallow wells (22, 36, and 95), all less than 200 ft deep. Tritium concentrations ranged from 1.12 to 2.12 TU for three deeper wells (29, 76, and 142), all greater than or equal to 350 ft in depth. The three shallow wells are perforated in fractured volcanic rocks and volcanic tuff. The low concentrations of tritium in water from these three wells may indicate that the water is relatively old and unmixed compared with water from the three deep wells, possibly owing to longer travel paths or slow movement through geologic units having low hydraulic conductivity. The higher concentrations of tritium in the three deep wells may be the result of the mixing of younger ground water with older ground water. The deep wells have long perforated sections in volcanic sediments or alluvium. Wells 76 and 142 are located less than 0.25 mi from creeks, and well 29 is located in an area that may receive local runoff from surrounding hills, which may be the sources of the recent recharge to these wells. Tritium ages for water from wells 36, 95, and 142 are in fair to good agreement with the CFC-model ages of the early 1960s or earlier.

Water Temperature

Ground-water temperatures were measured at the land surface in water samples pumped from 15 wells; water-temperature logs were made from the water surface to the bottom of 11 other wells. The sample temperature measurements were made after several minutes of pumping, when temperatures were stable and measurements were within 0.5°C. The temperature logs were made using a precision thermistor suspended on a calibrated 4-conductor cable. The number and spacing of measurements were chosen on the basis of the total depth of the water-filled section of the well and the rate of temperature change with depth. Resistance at discrete depths was recorded after the thermistor output stabilized. The recorded resistance was converted to temperature using a polynomial calibration curve. This system provides temperature measurements accurate to 0.1°C.

The temperatures ranged from 17.5 to 27.0°C in the samples pumped from wells that ranged from 93 to 500 ft in depth. The maximum temperatures in the 11 wells that were logged ranged from 18.5 to 30.5°C. The temperature logs are for depths ranging from 68 to 592 ft; in all cases, the maximum temperature was recorded at the bottom depths. Temperature logs for seven wells are shown in figure 31. Temperature logs are not shown for the remaining four logged wells because they had short water-filled sections that had less than 3°C of temperature variation.

The occurrence of warm ground water in some areas of Napa County has been known since the 1800s. Kunkel and Upson (1960) cite ground-water temperatures of as much as 60°C in wells completed in the Sonoma Volcanics northwest of the study area. The mean annual air temperature is about 14.7°C. Shallow ground water typically has a temperature close to the mean annual air temperature. Ground-water temperatures rise with depth owing to the prevailing geothermal gradient. Todd (1980) cites an average geothermal gradient of 1°C per 100 ft. On the basis of a linear best-fit correlation of temperature as related to depth, the geothermal gradient in the study area is about 2°C per 100 ft from a base temperature of about 16°C. The local geothermal gradient is approximately twice the average for continental temperate zones worldwide.

All the wells having depths greater than 400 ft had water temperatures higher than 22°C. For the 22 sites for which well depths and water temperatures

were available, the estimated temperatures for depths of 500 ft below land surface, based on the bottom-hole temperature and a gradient of 0.02°C per foot, ranged from 22 to 29°C. Nineteen of the 22 sites have estimated temperatures greater than or equal to 25°C. The temperatures for the three sites that had lower temperatures ranged from 22 to 24°C. The temperatures at two of these three sites, which are located in the northern part of study area, probably are cooled by recharge from nearby perennial streams. Although the estimated temperatures at depths of 500 ft below land surface are fairly uniform throughout the study area, the highest temperatures (27–29°C) were from wells in the southern half of the study area, primarily in the northern and eastern parts of storage unit 1. The area that had the highest temperatures has diatomaceous sediments at the surface. The diatomaceous sediments have low permeability and restrict vertical flow. The lack of recharge may be a contributing factor to the high ground-water temperatures.

In many areas, ground water having elevated temperatures correlates with poor water quality. This is because the solubility of most common minerals increases with temperature. Thermal waters often contain trace elements such as arsenic, fluoride, and boron in concentrations that exceed drinking-water standards (Hem, 1985). No strong correlation between water chemistry and temperature was evident for the 15 wells sampled in the study area.

The deepest well sampled for water quality is 500 ft deep and is screened in shallow formations. Water in deep wells that were not sampled may be 30°C or higher and the chemical quality may be diminished. The uniformly high water temperatures at depth in the study area could place a depth limitation on high quality ground water and limit the total amount of useable ground water in storage.

Temperature logs for wells 5N/3W-7G3, 5N/4W-14J3, 6N/4W-22H3, and 6N/4W-23J1 show isothermal or near isothermal sections over lengths of 100 to 200 ft. These isothermal sections are likely caused by lateral ground-water flow that masks the conductive temperature gradient. The isothermal sections in wells 6N/4W-22H3 and 23J1, which are in the northern part of the study area, are from 150 to 350 ft and 300 to 500 ft, respectively. The isothermal sections in wells 5N/3W-7G3 and 5N/4W-14J3, which are in the southern part of the study area, are shallower (between depths of 50 to 200 ft). The differences in the depths of the isothermal sections may be due to differences in the depths of the geologic units that have the highest hydraulic conductivity; thicker and deeper in the northern part and thinner and shallower in the southern part. All four logs are consistent with a conceptual model of ground-water flow depicting recharge in the Howell Mountains, downward percolation of recharge water to permeable zones, and lateral flow away from the mountain front toward the Napa River (fig. 9).

SUMMARY AND CONCLUSIONS

The entire study area is underlain by the Sonoma Volcanics, a geologic formation consisting of a complex sequence of volcanic rocks and volcanic sedimentary units. The volcanic rocks are covered in places by thin clastic sedimentary formations. In general, the geologic units have low hydraulic conductivity, which inhibits recharge and limits well yields. Lithologic variations in the study area affect well productivity and water quality. Areas underlain by hard rock formations at shallow depths are more likely to have low well yields and to be more adversely affected by declining water levels (common in storage units 1, 2, and 3) than areas underlain by thick unconsolidated materials (typical in storage unit 4).

The predominant source of local recharge to the ground-water system is precipitation falling within the Milliken, Sarco, and Tulucay Creeks drainage basins; however, a small amount of the recharge may be from infiltration of water piped into the area from sources external to the drainage basins and from local sources including septic tank leakage. The principal source of ground-water replenishment to the study area is lateral flow of ground water that is recharged in the Howell Mountains to the east of the study area. Additional ground water enters the study area by inflow through the permeable alluvium along parts of the northwestern boundary of the study area. The amount of inflow varies depending on the local distribution of hydraulic heads. In 2000, ground-water outflow across the western boundary exceeded inflow by an estimated 600 acre-ft/yr. Precipitation over the entire Milliken, Sarco, and Tulucay Creeks drainage basins totals an estimated 69,000 acre-ft/yr. Nearly half of this amount (29,000 acre-ft/yr) flows out of the study area as surface-water discharge to the Napa River. Evapotranspiration from the drainage basins is estimated to be about 34,000

acre-ft/yr. This leaves 6,000 acre-ft/yr residual, but because of the uncertainity in estimates of precipitation, runoff, and evapotranspiration, this value is not a precise estimate of potential ground-water recharge and should not be construed as the safe yield for the study area.

Population and agricultural irrigation have increased substantially in the study area since 1975. An estimated 16,500 people lived in the area at the time of the 2000 census, an increase of 21 percent since 1975. About 4,800 people living in the area rely solely on ground water from individual private wells. Vineyards are the predominant use of agricultural land; in 2000, about 2,400 acres were cultivated. Increases in population and in irrigation for grape production in the past few decades have increased water demand. Ground-water pumpage was estimated to be about 3,000 acre-ft/yr in 1975; by 2000, it was about 5,350 acre-ft/yr, an increase of about 80 percent but could be as much as 7,100 acre-ft/yr. Ground-water pumpage for domestic use, improved open-space irrigation, and agriculture was estimated to be about 27, 29, and 43 percent of the total pumpage, respectively.

Ground-water pumping has produced dramatic changes in hydraulic heads within the study area. Under pre-pumping conditions, hydraulic heads probably were highest around the perimeter of the area, and ground water generally flowed westward toward the Napa River from recharge areas in the mountains on the north, east, and south sides. Under present-day conditions, ground-water pumping has reduced hydraulic heads sufficiently to form three large ground-water level depressions within the study area. Under current (2001–2002) conditions, ground water flows from the perimeter predominantly toward the hydraulic depressions. A comparison of maps of hydraulic heads in 1975 and in 2001 showed that water levels increased in much of the western part of the area but declined by 50 to 125 ft in pumping depressions in the central and eastern parts of the study area These two pumping depressions coincide with the areas having the highest density of active or potentially active wells in study area. Water levels declined by 25 to 50 ft in a third pumping depression, which is located in the northwestern part of the study area. Long-term hydrographs for wells in the study area indicate that the greatest rate of decline occurred after the early 1970s and coincides with an increase in the number of wells drilled in the study area. Declining ground-water levels evident over a large part of the Milliken, Sarco, and Tulucay Creeks area is an indication that current (2000–2002) ground-water use exceeds average ground-water replenishment.

The chemical quality of ground water in the study, which was based on the water samples collected from 15 wells, generally is acceptable. The water from some wells, however, contains one or more constituents in excess of the recommended standards for drinking water. Total dissolved solids ranged from 144 to 732 mg/L; water in one sample exceeded the recommended standard of less than 500 mg/L. Arsenic concentrations ranged from less than 2 to 67 µg/L; concentrations in samples from five of the wells exceeded the standard of less than 10 µg/L. Samples from three wells located in the northwestern part of the study area, close to the Soda Creek Fault, had arsenic concentrations greater than 15 µg/L. The source of the arsenic may be ground water that circulates deeply along the fault zone. Samples from two wells located in the southern part of the study area had boron in excess of 1 mg/L. Water in samples from five wells had concentrations of iron that exceed the secondary drinking-water standard of 300 µg/L. Water samples from 12 of the 15 wells contained concentrations of manganese that exceed the secondary drinking-water standard of 50 µg/L. The arsenic, boron, iron, and manganese probably are derived from minerals in the volcanic rocks or from the deeper and older rocks of the Franciscan Complex or Great Valley Sequence.

The observed variations in the chemical composition of ground water are consistent with that shown by the conceptual model of the study area which shows recharge in the Howell Mountains and lateral inflow around the northern, eastern, and southern parts of the study area. As ground water moves into and through the study area it reacts with and dissolves minerals in the rocks and sediments along the flow path, increasing the concentrations of some elements. The samples with the highest concentrations of dissolved solids were from wells in the central part of the study area in and around the Cup and Saucer area. Major ion compositions in samples from storage units 1 and 3 are variable, but the ranges in variation overlap to a considerable degree. This suggests that recharge water to both areas is chemically similar and that similar reactions take place along ground-water flow

paths in both areas. The lack of chemical distinctions between water from storage units 1 and 3 is consistent with the hydraulic connections between the two storage units, which behave as one contiguous ground-water reservoir.

The maximum ground-water temperatures measured in 15 samples pumped from wells and from 11 temperature logs ranged from 17.5 to 30.5°C in wells that ranged from 68 to 592 ft deep. The temperature gradient for the study area was calculated to be about 0.02°C per foot, approximately double the average for continental United States. The deepest temperature logs suggest that temperatures at depths greater than 600 ft may exceed 30°C in parts of the area. No correlation between temperature and chemical composition is apparent for the 15 ground-water samples; but as a general principal, the solubilities of inorganic compounds increase with increasing temperatures, except for bicarbonate. On the basis of this general principal, ground water at depths greater than 600 ft in parts of the study area may contain objectionable concentrations of some constituents. Abnormally high water temperatures may limit the use of ground water in some parts of the study area.

Ratios of the stable isotopes of hydrogen and oxygen showed a greater range in the surface-water samples than in the ground-water samples; this is because the surface-water samples were affected by evaporation, which concentrates the heavier isotopes. Samples from lakes, ponds, and Milliken Creek (downstream from Milliken Reservoir) collected during the warmest and driest part of the year had the heaviest isotopic ratios because of evaporation. Most of the other surface-water samples, including those from unregulated creeks and springs, plot along or close to the global meteoric water line. The isotopic ratios of the ground-water samples plot in two distinct groups (I and II) along the global meteoric water line. Samples in group I plot between the slightly lighter samples from springs and the slightly heavier samples from Milliken Creek. The waters in group I samples probably are mixtures of precipitation that infiltrated in the Howell Mountains and infiltrated surface water affected by evaporation. The group II samples are lighter than the group I samples and probably were mixtures of precipitation that infiltrated in the Howell Mountains and winter streamflow or water that was recharged during an earlier time when climatic conditions were cooler than at present. Most of the group II samples came from wells that also produced water with higher dissolved-solids concentrations than the wells in group I. The higher dissolved-solids concentrations are an indication that these waters have been in the ground-water system longer than waters with lower dissolved-solids concentrations.

Ground-water ages based on chloroflurocarbon and tritium analyses ranged from 15 to about 50 years before present (2002). These ages, especially the CFC-determined ages, should be used with caution because the actual ages may have been overestimated or underestimated because of difficulties in accounting for all the geochemical, biological, and hydrologic processes. Samples for age dating probably were mixtures of waters of different ages because most of the wells available for sampling for this study were constructed with gravel packs and long screens open to the geologic formation. The presence of tritium and CFCs in water from the study area is evidence that modern recharge (post 1950) does take place.

The results of this study indicate that ground water is being depleted under current pumping and recharge conditions. To achieve a hydrologic balance that stops ground-water level declines, it would be necessary to supply additional water to the area or to decrease the amount of ground-water withdrawn. If ground-water levels continue to decline, especially near the western boundary of the area, additional ground water may flow into the area from the main part of Napa Valley. However, increasing ground-water inflow from the west probably would reduce future water-level declines in the study area but would not increase heads in the main pumping depressions along Hagen Road and in the Coombsville area.

The area of this current (2002) study was subdivided by Johnson (1977) into four ground-water storage units on the basis of topography and geology. Results of this current study found evidence that storage units 1 and 3 are not hydraulically separate. The low hydraulic conductivity of most of the geologic units in the study area greatly restrict the feasibility of artificial recharge through wells or from surface retention facilities. Encouraging reductions in ground-water pumping by supplying imported water or reclaimed water to users in and near the pumping depressions might hold the greatest promise of reducing or reversing ground-water level declines. Small improvements to the hydrologic balance may be made by increasing recharge along streams by building a number of retention dams, directing water from agricultural subdrains to infiltration ponds rather than

to storm drains or streams, or increasing the use of best-management practices for irrigation of agricultural lands.

Hydrologic monitoring cannot improve the water balance of an area, but data from monitoring programs can be used to better understand how a particular hydrologic system functions and to determine changes that take place in the system in response to water-resource use. The long-term records of ground-water levels in the study area were critical for analysis of present-day conditions and changes that have happened over the past few decades. Likewise, land-use, surface-water discharge, and climatological data are critical for understanding the water balance.

Most wells in the study area were constructed with gravel packs and long screens open to the geologic formation to maximize well yield. This type of well construction is not optimal for ground-water monitoring because depth-dependent differences in hydraulic head, water chemistry, and ground-water age cannot be distinguished. Future monitoring of the ground-water system can be improved by using wells perforated at short depth intervals, including the shallow wells (100 to 200 ft); intermediate depth wells (greater than 200 to 400 ft); and deep wells (greater than 400 ft). Because locating existing supply wells with these characteristics may not be possible, it would be necessary to drill new wells specifically for monitoring. The new monitoring wells can be drilled and constructed to tap and isolate different depth zones to provide information on vertical variations in hydraulic head and water quality.

A continuation of the semi-annual water-level measurements in the current (2002) network of about 10 wells may provide enough data to track changes in the ground-water system over periods of a few years. The timing of the annual maximum and minimum water levels in any given year varies depending on the timing and quantity of precipitation and pumping during the antecedent period. Data from the use of continuous water-level monitoring at some wells may help to accurately identify seasonal fluctuations in water levels. To prepare maps of hydraulic heads would require a larger number of monitoring wells. Ground-water level measurements made on a 5-year cycle in a network similar to that used for this and earlier studies (consisting of more than 100 wells) would provide sufficient data for constructing hydraulic-head maps and water-level change maps. These maps could be used to determine the effectiveness of water-conservation programs or of the use of imported water for reducing local ground-water use in parts of the study area.

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TABLES

Table 1. Summary of land-use change in the lower Milliken–Sarco–Tulucay Creeks area, southeastern Napa County, California, 1958–2000

[See figure 2 for distribution of land use in 2000. <, actual value is less than value shown]

Land-use category	Total acreage inventoried				Percent change
	1958	Percent of total	2000	Percent of total	
Urban (residential, commercial, and industrial)	2,252	20	3,567	31	+58
Improved open space (golf course, cemetery)	120	1	391	4	+226
Irrigated agriculture with residential (vineyard)	586	5	2,369	21	+304
Non-irrigated agriculture with residential (grassland, pasture)	1,340	12	388	3	–71
Unimproved open space with residential	7,023	62	4,562	40	–35
Surface water (ponds, lakes)	30	<1	74	<1	+147
Total	11,351	100	11,351	100	

Table 2. Streamflow measurements, gain or loss of streamflow between stations, flow distance between stations, and rate of gain or loss of streamflow between stations at sites along Milliken, Sarco, and Tulucay Creeks and their tributaries, southeastern Napa County, California, April 17–26, 2000

[See figure 10 for station locations. Measurement rating: excellent (less than 2 percent error), good (2 percent to less than 5 percent error), fair (5 to 8 percent error), poor (greater than 8 percent error). ft^3/s, cubic foot per second; acre-ft/d, acre-foot per day; mi, mile; (acre-ft/d)/mi, acre-foot per day per mile. <, actual value is less than value shown; na, not applicable]

Station		Streamflow		Measurement method	Measurement rating	Gain (+) or loss (–) of streamflow between stations (acre-ft/d)	Flow distance between stations (mi)	Rate of gain (+) or loss (–) of streamflow between stations [(acre-ft/d)/mi]
Station identifier	Location	(ft^3/s)	(acre-ft/d)					
	Milliken Creek Drainage Basin—Silverado Trail tributary							
36	2200 block of Silverado Trail, 0.7 mi north of West Trancas Road (near old gage site 11458120)	< 0.5	< 0.1	estimated	poor	na	na	na
	Milliken Creek Drainage Basin—Atlas Peak Road tributary							
30	Atlas Peak Road, 0.6 mi north of Westgate Drive	0.11	0.2	float	poor	na	na	na
29	Atlas Peak Road	0.04	0.1	volumetric	poor	–0.1	0.6	–0.2
	Milliken Creek Drainage Basin—Silverado Country Club tributary							
5	East of Hillcrest Drive near Westgate Drive	0.02	< 0.1	float	poor	na	na	na
6A	West of Hillcrest Drive near Westgate Drive	[1] 0.11	[1] 0.2	flume/float	good	na	< 0.1	na
	Milliken Creek Drainage Basin—Hillcrest Drive tributary							
3	2100 block Monticello Road	0.00	0.00	observed	na	na	na	na
4	Silverado Country Club, east of Hillcrest Drive, near St. Andrews Drive	0.04	0.1	flume	good	+0.1	0.4	+0.2
	Milliken Creek Drainage Basin—Milliken Creek main stem							
31	0.5 mi northeast of Westgate Drive	6.67	13.2	pygmy	fair	na	na	na
32	0.4 mi northeast of Westgate Drive	6.99	13.8	pygmy	fair	+0.6	0.1	+6.0
34	0.2 mi northeast of Westgate Drive	7.07	14.0	pygmy	good	+0.2	0.2	+1.0
33	Westgate Drive bridge	6.76	13.4	pygmy	good	–0.6	0.2	–3.0
38	Altas Peak Road	8.53	16.9	pygmy	fair	+3.5	1.2	+2.9
37	Hedgeside Avenue (old gage site 11458100)	8.19	16.2	pygmy	good	–0.7	0.4	–1.8
35	West Trancas Road bridge	9.15	18.1	pygmy	good	+1.9	1.0	+1.9
	Sarco Creek Drainage Basin—Hagen Road tributary, Third Avenue branch, south fork							
24	0.2 mi east of 2200 block Third Avenue	0.05	0.1	estimated	poor	na	na	na
52	2200 Third Avenue	< 0.01	< 0.1	estimated	poor	[2] <–0.1	0.2	[2] <–0.5
25	Unnamed tributary, west of Third Avenue above confluence with Third Avenue branch, south fork	0.05	0.1	estimated	poor	na	na	na
	Below confluence [3]	[4] < 0.06	[4] 0.1	na	na	[2] + 0.1	0.2	[2] +0.5
22A	2400 block Third Avenue	0.01	< 0.1	estimated	poor	[2] <–0.1	0.1	[2] < –1.0

See footnotes at end of table.

Table 2. Streamflow measurements, gain or loss of streamflow between stations, flow distance between stations, and rate of gain or loss of streamflow between stations at sites along Milliken, Sarco, and Tulucay Creeks and their tributaries, southeastern Napa County, California, April 17–26, 2000—Continued

Station		Streamflow		Measurement method	Measurement rating	Gain (+) or loss (–) of streamflow between stations (acre-ft/d)	Flow distance between stations (mi)	Rate of gain (+) or loss (–) of streamflow between stations [(acre-ft/d)/mi]
Station identifier	Location	(ft^3/s)	(acre-ft/d)					
Sarco Creek Drainage Basin—Hagen Road tributary, Third Avenue branch, middle fork								
23	NW 1/4, Section 5, T5N, R3W	0.00	0.0	observed	na	na	na	na
Sarco Creek Drainage Basin—Hagen Road tributary, Third Avenue branch main stem								
51	SE 1/4, Section 31, T6N, R3W	0.02	< 0.1	flume	fair	na	na	na
22B	2400 block Third Avenue	< 0.05	< 0.1	estimated	poor	[2]< +0.1	0.3	[2]< +0.3
22A/22B	Below confluence [5]	[6] < 0.06	[6] 0.1	na	na	[2] +0.1	na	na
26A	Third Avenue and Hagen Road	[7] 0.12	[7] 0.2	flume	good	[2] +0.1	0.5	[2] +0.2
Sarco Creek Drainage Basin—Hagen Road tributary, Napa Valley Country Club tributary								
55	NW1/4, Section 6, T5N, R3W	0.00	0.0	observed	na	na	na	na
27	Above confluence with Hagen Road tributary main stem	0.05	0.1	flume	fair	+0.1	0.8	+0.1
Sarco Creek Drainage Basin—Hagen Road tributary main stem								
28A	NE 1/4 Section 31, T6N, R3W	0.06	0.1	flume	fair	na	na	na
26B	East branch Hagen Road tributary	[8] 0.20	[8] 0.4	pygmy/flume [8]	poor/fair	+0.3	0.6	+0.5
26A/26B	Below confluence [9]	[10] 0.32	[10] 0.6	na	na	[2] +0.2	na	na
9	Grange Hall	0.31	0.6	pgymy	poor	[2] 0.0	0.8	[2] 0.0
Sarco Creek Drainage Basin—La Grande Avenue/Mt. George Avenue tributary, north branch								
8A	SW 1/4 Section 30, T6N, R3W	0.01	< 0.1	estimated	poor	na	na	na
Sarco Creek Drainage Basin—La Grande Avenue/Mt. George Avenue tributary main stem								
7B	Vichy Avenue bridge	0.18	0.4	flume	poor	na	na	na
Sarco Creek Drainage Basin - Sarco Creek main stem								
2	SW 1/4 Section 19, T6N, R3W	2.14	4.2	pgymy	good	na	na	na
1	Langley Park	8.00	15.8	estimated	poor	[2] +11.6	0.8	[2] +14.5
7A	Vichy Avenue bridge, east side	2.03	4.0	pgymy	good	[2] –11.8	0.6	[2] –19.7
10	Vichy Avenue bridge, west side	0.90	1.8	pgymy	good	–2.2	na	na
11	Silverado Trail bridge	1.14	2.2	pygmy	poor	+0.4	1.4	+0.3
Tulucay Creek Drainage Basin–Murphy Creek tributary, Wild Horse Valley Road branch								
14	Wild Horse Valley Road	0.04	0.1	flume	good	na	na	na
15	Mustang Road	0.06	0.1	flume	good	< +0.1	0.6	< +0.1

See footnotes at end of table.

Table 2. Streamflow measurements, gain or loss of streamflow between stations, flow distance between stations, and rate of gain or loss of streamflow between stations at sites along Milliken, Sarco, and Tulucay Creeks and their tributaries, southeastern Napa County, California, April 17–26, 2000—Continued

Station		Streamflow		Measurement method	Measurement rating	Gain (+) or loss (–) of streamflow between stations (acre-ft/d)	Flow distance between stations (mi)	Rate of gain (+) or loss (–) of streamflow between stations [(acre-ft/d)/mi]
Station identifier	Location	(ft^3/s)	(acre-ft/d)					
Tulucay Creek Drainage Basin—Murphy Creek tributary main stem								
16	Mustang Road	0.38	0.8	pygmy	poor	na	na	na
50	Coombsville Road	0.30	0.6	pygmy	fair	–0.2	0.9	–0.2
Tulucay Creek Drainage Basin—Spencer Creek tributary main stem								
12	SW 1/4, Section 16, T5N, R3W	0.10	0.2	estimated	poor	na	na	na
13	Green Valley Road	0.29	0.6	pygmy	fair	[2] +0.4	1.4	[2] +0.3
Tulucay Creek Drainage Basin—Third Avenue tributary, west culvert								
20A	Above confluence with Third Avenue tributary main stem	0.04	0.1	flume	good	na	na	na
Tulucay Creek Drainage Basin—Third Avenue tributary main stem								
18	Kirkland Road	0.05	0.1	estimated	poor	na	na	na
19	East Third Avenue	0.04	0.1	flume	good	[2] 0.0	0.1	[2] 0.0
20B	Above confluence with Third Avenue tributary west culvert	0.04	0.1	flume	good	0.0	0.7	0.0
20A/20B	Below confluence [11]	[12] 0.08	[12] 0.2	na	na	[2] +0.1	na	na
Tulucay Creek Drainage Basin—Kreuse Creek tributary main stem								
49A	Fourth Avenue	0.01	< 0.1	estimated	poor	na	na	na
48	Los Robles Drive	0.00	0.0	observed	na	[2] <–0.1	0.9	[2] <–0.1
Tulucay Creek Drainage Basin—Marie Creek tributary, Penny Lane branch								
40	Penny Lane	0.02	< 0.1	flume	fair	na	na	na
44A	Shurtleff Park above confluence with Marie Creek tributary	0.10	0.2	pygmy	poor	+0.1	0.5	+0.2
Tulucay Creek Drainage Basin—Marie Creek tributary main stem								
46A	SW 1/4, Section 18, T5N, R3W	0.30	0.6	pygmy	poor	na	na	na
42A	Lower Lake Camille, west spillway	0.15	0.3	pygmy	poor	[13] na	na	[13] na
43A	Shurtleff Park above confluence with Penny Lane branch	0.01	< 0.1	estimated	poor	[2] –0.2	0.8	[2] –0.2
44A/43A	Below confluence [14]	[15] 0.11	[15] 0.2	na	na	[2] +0.1	na	na
39	Terrace Drive	0.00	0.0	observed	na	[2] –0.2	0.4	[2] < –0.5

See footnotes at end of table.

Table 2. Streamflow measurements, gain or loss of streamflow between stations, flow distance between stations, and rate of gain or loss of streamflow between stations at sites along Milliken, Sarco, and Tulucay Creeks and their tributaries, southeastern Napa County, California, April 17–26, 2000—Continued

Station		Streamflow		Measurement method	Measurement rating	Gain (+) or loss (–) of streamflow between stations (acre-ft/d)	Flow distance between stations (mi)	Rate of gain (+) or loss (–) of streamflow between stations [(acre-ft/d)/mi]
Station identifier	Location	(ft^3/s)	(acre-ft/d)					
Tulucay Creek Drainage Basin—Tulucay Creek main stem								
17	Fourth Avenue	0.66	1.3	pgymy	good	na	na	na
45	Shurtleff Avenue.	1.04	2.1	pygmy	fair	+0.8	1.4	+0.6
41	Tulucay Creek at Napa (discontinued stream gage 11458350)	2.08	4.1	pygmy	good	+2.0	0.7	+2.9

[1] Summation of two small culverts; (A) main east–west channel from site 5, and (B) secondary north–south culvert parallel to Hillcrest Drive.
[2] Estimated.
[3] Below confluence of unnamed tributary west of Third Avenue and south fork of Third Avenue branch of Hagen Road tributary to Sarco Creek.
[4] Summation of sites 52 and 25 streamflow estimates.
[5] Below confluence of upper and middle forks of Third Avenue branch of Hagen Road tributary to Sarco Creek.
[6] Summation of sites 22A and 22B streamflow measurements/estimates.
7 Average of two streamflow measurements on two separate days (4/21/00 and 4/26/00).
[8] Average of two streamflow measurements on two separate days (4/21/00 and 4/26/00) and two different methods, pygmy and flume, respectively.
[9] Below confluence of main stem of Third Avenue branch of Hagen Road tributary and Hagen Road tributary main stem.
[10] Summation of sites 26A and 26B streamflow measurements/estimates.
[11] Below confluence of Third Avenue tributary main stem and Third Avenue tributary west culvert.
[12] Summation of sites 20A and 20B streamflow measurements.
[13]Not comparable with previous site.
[14] Below confluence of Marie Creek tributary, Penny Lane branch, and Marie Creek tributary main stem.
[15] Summation of sites 44A and 43A streamflow measurements.

Table 3. Streamflow measurements, gain or loss of streamflow between stations, flow distance between stations, and rate of gain or loss of streamflow between stations at sites along Milliken, Sarco, and Tulucay Creeks and their tributaries, southeastern Napa County, California, March 13–16, 2001

[See figure 10 for station locations. Measurement rating: excellent (less than 2 percent error), good (2 percent to less than 5 percent error), fair (5 to 8 percent error), poor (greater than 8 percent error). ft^3/s, cubic foot per second; acre-ft/d, acre-foot per day; mi, mile; (acre-ft/d)/mi, acre-foot per day per mile. <, actual value is less than value shown; na, not applicable]

Station		Streamflow		Measurement method	Measurement rating	Gain (+) or loss (–) of streamflow between stations (acre-ft/d)	Flow distance between stations (mi)	Rate of gain (+) or loss (–) of streamflow between stations [(acre-ft/d)/mi]
Station identifier	Location	(ft^3/s)	(acre-ft/d)					
Milliken Creek Drainage Basin—Silverado Trail tributary								
36	2200 block of Silverado Trail, 0.7 mi north of West Trancas Road (near old gage site 11458120)	0.72	1.4	pygmy	fair	na	na	na
Milliken Creek Drainage Basin—Atlas Peak Road tributary								
30	Atlas Peak Road, 0.6 mi north of Westgate Drive	0.13	0.3	pygmy	poor	na	na	na
29	Atlas Peak Road	0.30	0.6	pygmy	fair	+0.3	0.6	+0.5
Milliken Creek Drainage Basin—Silverado Country Club tributary								
5	East of Hillcrest Drive near Westgate Drive	0.02	< 0.1	flume	good	na	na	na
6A	West of Hillcrest Drive near Westgate Drive, main east–west channel	0.03	0.1	flume	good	na	< 0.1	na
6B	West of Hillcrest Drive near Westgate Drive, secondary north–south culvert	0.01	< 0.1	flume	good	na	na	na
6A/6B	Below confluence [1]	[2] 0.04	[2] 0.1	na	na	na	na	na
Milliken Creek Drainage Basin—Hillcrest Drive tributary								
3	2100 block Monticello Road	0.04	0.1	flume	good	na	na	na
4	Silverado Country Club, east of Hillcrest Drive, near St. Andrews Drive	0.02	< 0.1	flume	good	<–0.1	0.4	< –0.2
Milliken Creek Drainage Basin—Milliken Creek main stem								
31	0.5 mi northeast of Westgate Drive	46.2	91.5	AA meter	good	na	na	na
32	0.4 mi northeast of Westgate Drive	53.8	106.5	AA meter	good	+15.0	0.1	+150.0
34	0.2 mi northeast of Westgate Drive	44.0	87.1	AA meter	good	–19.4	0.2	–97.0
33	Westgate Drive bridge	51.7	102.4	AA meter	good	+15.3	0.2	+76.5
38	Altas Peak Road	43.4	85.9	AA meter	good	–16.5	1.2	–13.8
64	1100 block Monticello Road	44.6	88.3	AA meter	good	+2.4	0.7	+3.4
35	West Trancas Road bridge	42.5	84.2	AA meter	good	–4.1	0.6	–6.8
Sarco Creek Drainage Basin—Hagen Road tributary, Third Avenue branch, south fork								
24	0.2 mi east of 2200 block Third Avenue	0.02	< 0.1	flume	good	na	na	na
52	2200 Third Avenue	0.03	0.1	flume	good	< +0.1	0.2	< +0.5
22A	2400 block Third Avenue	[3] 0.08	[3] 0.2	flume	good	+0.1	0.3	+0.3

See footnotes at end of table.

Table 3. Streamflow measurements, gain or loss of streamflow between stations, flow distance between stations, and rate of gain or loss of streamflow between stations at sites along Milliken, Sarco, and Tulucay Creeks and their tributaries, southeastern Napa County, California, March 13–16, 2001—Continued

Station		Streamflow		Measurement method	Measurement rating	Gain (+) or loss (–) of streamflow between stations (acre-ft/d)	Flow distance between stations (mi)	Rate of gain (+) or loss (–) of streamflow between stations [(acre-ft/d)/mi]
Station identifier	Location	(ft^3/s)	(acre-ft/d)					
Sarco Creek Drainage Basin—Hagen Road tributary, Third Avenue branch, middle fork								
23	NW 1/4, Section 5, T5N, R3W	0.03	0.1	flume	good	na	na	na
Sarco Creek Drainage Basin—Hagen Road tributary, Third Avenue branch main stem (Dairy Creek)								
51	SE 1/4, Section 31, T6N, R3W	0.07	0.1	flume	good	na	na	na
22B	2400 block Third Avenue	0.15	0.3	flume	good	+0.2	0.3	+0.7
22A/22B	Below confluence [4]	[5] 0.22	[5] 0.4	na	na	[6] +0.1	na	na
26A	Third Avenue and Hagen Road	0.48	1.0	pygmy	poor	+0.6	0.5	+1.2
Sarco Creek Drainage Basin—Hagen Road tributary, Napa Valley Country Club tributary								
55	NW1/4, Section 6, T5N, R3W	< 0.01	< 0.1	estimated	poor	na	na	na
27	Above confluence with Hagen Road tributary main stem	0.11	0.2	pygmy	poor	+0.1	0.8	+0.1
Sarco Creek Drainage Basin—Hagen Road tributary main stem								
28B	NW 1/4 Section 31, T6N, R3W	0.46	0.9	pygmy	fair	na	na	na
26B	East branch Hagen Road tributary	0.50	1.0	pygmy	fair	+0.1	0.1	+1.0
26A/26B	Below confluence [7]	[8] 0.98	[8] 1.9	na	na	[6] +0.9	na	na
9	Grange Hall	0.43	0.8	pygmy	poor	[6] –1.1	0.8	[6] –1.4
Sarco Creek Drainage Basin—La Grande Avenue/Mt. George Avenue tributary, north branch								
8A	SW 1/4 Section 30, T6N, R3W	0.02	< 0.1	flume	good	na	na	na
Sarco Creek Drainage Basin—La Grande Avenue/Mt. George Avenue tributary main stem								
65	Mt. George Avenue	0.00	0.0	observed	na	na	na	na
	Above confluence [9]	[10] 0.10	[10] 0.2	na	na	[6] +0.2	0.5	[6] +0.4
8B	SE 1/4 Section 25, T6N, R4W	0.12	0.2	flume	good	na	na	na
7B	Vichy Avenue bridge	0.62	1.2	pygmy	fair	+1.0	0.5	+2.0
Sarco Creek Drainage Basin—Sarco Creek main stem								
2	SW 1/4 Section 19, T6N, R3W	0.83	1.6	pygmy	fair	na	na	na
7A	Vichy Avenue bridge, east side	1.05	2.1	pygmy	fair	+0.5	1.4	+0.4
10	Vichy Avenue bridge, west side	1.49	3.0	pygmy	fair	+0.9	na	na
11	Silverado Trail bridge	2.34	4.6	pygmy	fair	+1.6	1.4	+1.1
Tulucay Creek Drainage Basin—Murphy Creek tributary, Wild Horse Valley Road branch								
59	NW 1/4 Section 9, T5N, R3W	0.01	< 0.1	flume	fair	na	na	na
14	Wild Horse Valley Road	0.06	0.1	flume	good	+0.1	0.4	+0.2
15	Mustang Road	0.12	0.2	flume	fair	+0.1	0.6	+0.2

See footnotes at end of table.

Table 3. Streamflow measurements, gain or loss of streamflow between stations, flow distance between stations, and rate of gain or loss of streamflow between stations at sites along Milliken, Sarco, and Tulucay Creeks and their tributaries, southeastern Napa County, California, March 13–16, 2001—Continued

Station		Streamflow		Measurement method	Measurement rating	Gain (+) or loss (–) of streamflow between stations (acre-ft/d)	Flow distance between stations (mi)	Rate of gain (+) or loss (–) of streamflow between stations [(acre-ft/d)/mi]
Station identifier	Location	(ft^3/s)	(acre-ft/d)					
Tulucay Creek Drainage Basin—Murphy Creek tributary main stem								
16	Mustang Road	0.71	1.4	pygmy	fair	na	na	na
50	Coombsville Road	0.72	1.4	pygmy	fair	0.0	0.9	0.0
Tulucay Creek Drainage Basin—Spencer Creek tributary main stem								
12	SW 1/4, Section 16, T5N, R3W	0.64	1.3	pygmy	fair	na	na	na
13	Green Valley Road	0.87	1.7	pygmy	fair	+0.4	1.4	+0.3
Tulucay Creek Drainage Basin—Third Avenue tributary, west culvert								
56	North Avenue	0.12	0.2	flume	good	na	na	na
20A	Above confluence with Third Avenue tributary main stem	0.27	0.5	pygmy	fair	+0.3	0.7	+0.4
Tulucay Creek Drainage Basin—Third Avenue tributary, middle branch								
57	Country Lane	< 0.01	< 0.1	estimated	poor	na	na	na
Tulucay Creek Drainage Basin—Third Avenue tributary main stem								
58	4300 block East Third Avenue	0.09	0.2	pygmy	poor	na	na	na
18	Kirkland Road	0.49	1.0	float	fair	+0.8	0.5	+1.6
19	East Third Avenue	0.30	0.6	pygmy	fair	–0.4	0.1	–4.0
20B	Above confluence with Third Avenue tributary west culvert	0.32	0.6	pygmy	good	0.0	0.7	0.0
20A/20B	Below confluence [11]	[12] 0.59	[12] 1.2	na	na	[6] +0.6	na	na
Tulucay Creek Drainage Basin—Kreuse Creek tributary, south branch								
61	End of Madrone Drive	0.01	< 0.1	flume	good	na	na	na
Tulucay Creek Drainage Basin—Kreuse Creek tributary main stem								
60	Kreuzer Lane	0.30	0.6	pygmy	poor	na	na	na
49B	Near end of Penny Lane	0.35	0.7	pygmy	poor	+0.1	1.3	+0.1
48	Los Robles Drive	0.33	0.6	pygmy	poor	–0.1	0.4	–0.2
Tulucay Creek Drainage Basin—Marie Creek tributary, Penny Lane branch								
40	Penny Lane	0.04	0.1	flume	good	na	na	na
44A	Above confluence[13]	[14] 0.88	[14] 1.7	estimated	na	[6] +1.6	0.5	[6] +3.2
Tulucay Creek Drainage Basin—Marie Creek tributary main stem								
46B	West of 46A in SW 1/4, Section 18, T5N, R3W	1.10	2.2	pygmy	fair	na	na	na
63	SE 1/4 Section 13, T5N, R4W	1.20	2.4	pygmy	fair	+0.2	0.2	+1.0

See footnotes at end of table.

Table 3. Streamflow measurements, gain or loss of streamflow between stations, flow distance between stations, and rate of gain or loss of streamflow between stations at sites along Milliken, Sarco, and Tulucay Creeks and their tributaries, southeastern Napa County, California, March 13–16, 2001—Continued

Station		Streamflow		Measurement method	Measurement rating	Gain (+) or loss (–) of streamflow between stations (acre-ft/d)	Flow distance between stations (mi)	Rate of gain (+) or loss (–) of streamflow between stations [(acre-ft/d)/mi]
Station identifier	Location	(ft^3/s)	(acre-ft/d)					
Tulucay Creek Drainage Basin—Marie Creek tributary main stem—Continued								
62	Minor culvert, northwest side of Upper Lake Camille	0.19	0.4	pygmy	poor	[15] na	na	[15] na
42B	Lower Lake Camille, north spillway	0.65	1.3	pygmy	fair	[15] na	na	[15] na
43B	Shurtleff Park at Shetler Avenue	0.00	0.0	observed	na	[15] na	na	[15] na
44B	Shurtleff Park below confluence with Marie Creek tributary, Penny Lane branch	0.88	1.7	pygmy	fair	+1.7	0.5	[15] na
39	Terrace Drive	0.56	1.1	pygmy	poor	–0.6	0.4	–1.5
Tulucay Creek Drainage Basin—Tulucay Creek main stem								
17	Fourth Avenue	1.93	3.8	pygmy	good	na	na	na
45	Shurtleff Avenue.	4.38	8.7	pygmy	fair	+4.9	1.4	+3.5
41	Tulucay Creek at Napa (discontinued stream gage 11458350)	5.62	11.1	pygmy	fair	+2.4	0.7	+3.4

[1] Below confluence of Silverado Country Club tributary main east–west channel and secondary north–south culvert.
[2] Summation of sites 6A/6B streamflow measurements.
[3] Average of two streamflow measurements at slightly different locations on same day (3/14/01).
[4] Below confluence of upper and middle forks of Third Avenue branch of Hagen Road tributary to Sarco Creek.
[5] Summation of sites 22A and 22B streamflow measurements.
[6] Estimated.
[7] Below confluence of main stem of Third Avenue branch of Hagen Road tributary and Hagen Road tributary main stem.
[8] Summation of sites 26A and 26B streamflow measurements.
[9] Above confluence of La Grande Avenue/Mt. George Avenue tributary, north branch and La Grande Avenue/Mt. George Avenue tributary main stem.
[10] Difference of sites 8B and 8A streamflow measurements.
[11] Below confluence of Third Avenue tributary main stem and Third Avenue tributary west culvert.
[12] Summation of sites 20A and 20B streamflow measurements.
[13] Above confluence of Marie Creek tributary, Penny Lane branch, and Marie Creek tributary main stem.
[14] Difference of sites 44B and 43B streamflow measurements.
[15] Not comparable with previous site.

Table 4. Streamflow measurements, gain or loss of streamflow between stations, flow distance between stations, and rate of gain or loss of streamflow between stations at sites along Milliken, Sarco, and Tulucay Creeks and their tributaries, southeastern Napa County, California, April 10–12, 2001

[See figure 10 for station location. Measurement rating: excellent (less than 2 percent error), good (2 percent to less than 5 percent error), fair (5 to 8 percent error), poor (greater than 8 percent error). ft^3/s, cubic foot per second; acre-ft/d, acre-foot per day; mi, mile; (acre-ft/d)/mi, acre-foot per day per mile. <,

Station		Streamflow		Measurement method	Measurement rating	Gain (+) or loss (–) of streamflow between stations (acre-ft/d)	Flow distance between stations (mi)	Rate of gain (+) or loss (–) of streamflow between stations [(acre-ft/d)/mi]
Station identifier	Location	(ft^3/s)	(acre-ft/d)					
	Milliken Creek Drainage Basin—Silverado Trail tributary							
36	2200 block of Silverado Trail, 0.7 mi north of West Trancas Road (near old gage site 11458120)	0.03	0.1	flume	good	na	na	na
	Milliken Creek Drainage Basin—Atlas Peak Road tributary							
30	Atlas Peak Road, 0.6 mi north of Westgate Drive	0.06	0.1	pygmy	poor	na	na	na
29	Atlas Peak Road	0.00	0.0	observed	na	–0.1	0.6	–0.2
	Milliken Creek Drainage Basin—Silverado Country Club tributary							
5	East of Hillcrest Drive near Westgate Drive	0.00	0.0	observed	na	na	na	na
6A	West of Hillcrest Drive near Westgate Drive, main east–west channel	< 0.01	< 0.1	volumetric	good	na	< 0.1	na
6B	West of Hillcrest Drive near Westgate Drive, secondary north–south culvert	< 0.01	< 0.1	flume	good	na	na	na
6A/6B	Below confluence [1]	[2] < 0.01	[2] < 0.1	na	na	na	na	na
	Milliken Creek Drainage Basin—Hillcrest Drive tributary							
3	2100 block Monticello Road	< 0.01	< 0.1	estimated	poor	na	na	na
4	Silverado Country Club, east of Hillcrest Drive, near St. Andrews Drive	0.00	0.0	observed	na	na	0.4	na
	Milliken Creek Drainage Basin—Milliken Creek main stem							
31	0.5 mi northeast of Westgate Drive	3.40	6.7	pygmy	good	na	na	na
32	0.4 mi northeast of Westgate Drive	2.23	4.4	pygmy	good	–2.3	0.1	–23.0
34	0.2 mi northeast of Westgate Drive	3.36	6.6	pygmy	good	+2.2	0.2	+11.0
33	Westgate Drive bridge	2.40	4.8	pygmy	good	–1.8	0.2	–9.0
38	Altas Peak Road	2.53	5.0	pygmy	fair	+0.2	1.2	+0.2
37	Hedgeside Avenue (old gage site 11458100)	3.13	6.2	pygmy	good	+1.2	0.4	+3.0
64	1100 block Monticello Road	3.12	6.2	pygmy	fair	0.0	0.4	0.0
35	West Trancas Road bridge	3.25	6.4	pygmy	good	+0.2	0.6	+0.3

See footnotes at end of table.

Table 4. Streamflow measurements, gain or loss of streamflow between stations, flow distance between stations, and rate of gain or loss of streamflow between stations at sites along Milliken, Sarco, and Tulucay Creeks and their tributaries, southeastern Napa County, California, April 10–12, 2001—Continued

Station		Streamflow		Measurement method	Measurement rating	Gain (+) or loss (–) of streamflow between stations (acre-ft/d)	Flow distance between stations (mi)	Rate of gain (+) or loss (–) of streamflow between stations [(acre-ft/d)/mi]
Station identifier	Location	(ft^3/s)	(acre-ft/d)					
Sarco Creek Drainage Basin—Hagen Road tributary, Third Avenue branch, south fork								
24	0.2 mi east of 2200 block Third Avenue	0.00	0.0	observed	na	na	na	na
52	2200 Third Avenue	< 0.01	< 0.1	estimated	poor	[3] < +0.1	0.2	[3] < +0.5
25	Unnamed tributary, west of Third Avenue above confluence with Third Avenue branch, south fork	< 0.01	< 0.1	estimated	poor	na	na	na
	Below confluence [4]	[5] < 0.01	[5] < 0.1	na	na	[3] 0.0	0.2	[3] 0.0
22A	2400 block Third Avenue	[6] < 0.01	< 0.1	flume	good	0.0	0.1	0.0
Sarco Creek Drainage Basin—Hagen Road tributary, Third Avenue branch, middle fork								
23	NW 1/4, Section 5, T5N, R3W	0.02	< 0.1	flume	good	na	na	na
Sarco Creek Drainage Basin—Hagen Road tributary, Third Avenue branch main stem (Dairy Creek)								
51	SE 1/4., Section 31, T6N, R3W	0.02	< 0.1	flume	good	na	na	na
22B	2400 block Third Avenue	[6] 0.02	[6] < 0.1	flume	fair	0.0	0.3	0.0
22A/22B	Below confluence [7]	[8] < 0.03	[8] < 0.1	na	na	[3] < +0.1	na	na
26A	Third Avenue and Hagen Road	0.08	0.2	flume	good	+0.1	0.5	+0.2
Sarco Creek Drainage Basin—Hagen Road tributary, Napa Valley Country Club tributary								
55	NW1/4, Section 6, T5N, R3W	0.00	0.0	observed	na	na	na	na
27	Above confluence with Hagen Road tributary main stem	0.01	< 0.1	flume	fair	+0.1	0.8	+0.1
Sarco Creek Drainage Basin—Hagen Road tributary main stem								
28B	NW 1/4 Section 31, T6N, R3W	0.16	0.3	pygmy	fair	na	na	na
26B	East branch Hagen Road tributary	0.15	0.3	flume	good	0.0	0.1	0.0
26A/26B	Below confluence [9]	[10] 0.23	[10] 0.5	na	na	[3] +0.2	na	na
9	Grange Hall	0.09	0.2	pgymy	poor	[3] –0.3	0.8	[3] –0.3
Sarco Creek Drainage Basin—La Grande Avenue/Mt. George Avenue tributary, north branch								
8A	SW 1/4 Section 30, T6N, R3W	< 0.01	< 0.1	flume	fair	na	na	na
Sarco Creek Drainage Basin—La Grande Avenue/Mt. George Avenue tributary main stem								
65	Mt. George Avenue	0.00	0.0	observed	na	na	na	na
	Above confluence [11]	[12] 0.00	[12] 0.0	na	na	[3] 0.0	0.5	[3] 0.0
8B	SE 1/4 Section 25, T6N, R4W	< 0.01	< 0.1	flume	poor	na	na	na
7B	Vichy Avenue bridge	[13] 0.08	[13] 0.2	estimated	poor	[3] +0.1	0.5	[3] +0.2

See footnotes at end of table.

Table 4. Streamflow measurements, gain or loss of streamflow between stations, flow distance between stations, and rate of gain or loss of streamflow between stations at sites along Milliken, Sarco, and Tulucay Creeks and their tributaries, southeastern Napa County, California, April 10–12, 2001—Continued

Station		Streamflow		Measurement method	Measurement rating	Gain (+) or loss (–) of streamflow between stations (acre-ft/d)	Flow distance between stations (mi)	Rate of gain (+) or loss (–) of streamflow between stations [(acre-ft/d)/mi]
Station identifier	Location	(ft^3/s)	(acre-ft/d)					
Sarco Creek Drainage Basin—Sarco Creek main stem								
2	SW 1/4 Section 19, T6N, R3W	0.25	0.5	pgymy	fair	na	na	na
1	Langley Park	0.18	0.4	pgymy	poor	–0.1	0.8	–0.1
7A	Vichy Avenue bridge, east side	0.08	0.2	pgymy	poor	–0.2	0.6	–0.3
10	Vichy Avenue bridge, west side	0.16	0.3	pgymy	poor	+0.1	na	na
11	Silverado Trail bridge	0.13	0.2	pygmy	poor	–0.1	1.4	–0.1
Tulucay Creek Drainage Basin—Murphy Creek tributary, Wild Horse Valley Road branch								
59	NW 1/4 Section 9, T5N, R3W	< 0.01	< 0.1	estimated	poor	na	na	na
14	Wild Horse Valley Road	0.01	< 0.1	flume	fair	[3] < +0.1	0.4	[3] < +0.2
15	Mustang Road	0.02	< 0.1	flume	fair	< +0.1	0.6	< +0.2
Tulucay Creek Drainage Basin—Murphy Creek tributary main stem								
16	Mustang Road	0.19	0.4	flume	poor	na	na	na
50	Coombsville Road	0.13	0.3	flume	good	–0.1	0.9	–0.1
Tulucay Creek Drainage Basin—Spencer Creek tributary main stem								
12	SW 1/4, Section 16, T5N, R3W	0.00	0.0	observed	na	na	na	na
13	Green Valley Road	0.17	0.3	pygmy	fair	+0.3	1.4	+0.2
Tulucay Creek Drainage Basin—Third Avenue tributary, west culvert								
56	North Avenue	< 0.01	< 0.1	flume	good	na	na	na
20A	Above confluence with Third Avenue tributary main stem	0.02	< 0.1	flume	good	< +0.1	0.7	< +0.1
Tulucay Creek Drainage Basin—Third Avenue tributary, middle branch								
57	Country Lane	0.00	0.0	observed	na	na	na	na
Tulucay Creek Drainage Basin—Third Avenue tributary main stem								
58	4300 block East Third Avenue	0.01	< 0.1	flume	fair	na	na	na
18	Kirkland Road	0.01	< 0.1	volumetric	fair	0.0	0.5	0.0
19	East Third Avenue	0.00	0.0	observed	na	<–0.1	0.1	<–1.0
20B	Above confluence with Third Avenue tributary west culvert	0.06	0.1	flume	good	+0.1	0.7	+0.1
20A/20B	Below confluence [14]	[15] 0.08	[15] 0.2	na	na	+0.1	na	na
Tulucay Creek Drainage Basin—Kreuse Creek tributary, south branch								
61	End of Madrone Drive	0.00	0.0	observed	na	na	na	na

See footnotes at end of table.

Table 4. Streamflow measurements, gain or loss of streamflow between stations, flow distance between stations, and rate of gain or loss of streamflow between stations at sites along Milliken, Sarco, and Tulucay Creeks and their tributaries, southeastern Napa County, California, April 10–12, 2001—Continued

Station		Streamflow		Measurement method	Measurement rating	Gain (+) or loss (–) of streamflow between stations (acre-ft/d)	Flow distance between stations (mi)	Rate of gain (+) or loss (–) of streamflow between stations [(acre-ft/d)/mi]
Station identifier	Location	(ft^3/s)	(acre-ft/d)					
	Tulucay Creek Drainage Basin—Kreuse Creek tributary main stem							
60	Kreuzer Lane	0.03	0.1	flume	good	na	na	na
49B	Near end of Penny Lane	0.00	0.0	observed	na	–0.1	1.3	–0.1
48	Los Robles Drive	0.00	0.0	observed	na	0.0	0.4	0.0
	Tulucay Creek Drainage Basin—Marie Creek tributary, Penny Lane branch							
40	Penny Lane	< 0.01	< 0.1	flume	good	na	na	na
44A	Above confluence [16]	[17] 0.05	[17] 0.1	na	na	[3] +0.1	0.5	[3] +0.2
	Tulucay Creek Drainage Basin - Marie Creek tributary main stem							
46B	West of 46A in SW 1/4, Section 18, T5N, R3W	0.23	0.5	pygmy	poor	na	na	na
63	SE 1/4 Section 13, T5N, R4W	0.21	0.4	pygmy	poor	–0.1	0.2	–0.5
62	Minor culvert, northwest side of Upper Lake Camille	0.01	< 0.1	estimated	poor	[18] na	na	[18] na
42B	Lower Lake Camille, north spillway	0.02	< 0.1	estimated	poor	[18] na	na	[18] na
43B	Shurtleff Park at Shetler Avenue	< 0.01	< 0.1	estimated	poor	[18] na	na	[18] na
44B	Shurtleff Park below confluence with Marie Creek tributary, Penny Lane branch	0.05	0.1	flume	good	[3]<+0.1	0.5	[18] na
39	Terrace Drive	0.00	0.0	observed	na	–0.1	0.4	–0.2
	Tulucay Creek Drainage Basin—Tulucay Creek main stem							
17	Fourth Avenue	0.33	0.6	pgymy	fair	na	na	na
45	Shurtleff Avenue	0.78	1.5	pygmy	fair	+0.9	1.4	+0.6
41	Tulucay Creek at Napa (discontinued stream gage 11458350)	2.81	5.6	pygmy	fair	+4.1	0.7	+5.8

[1] Below confluence of Silverado Country Club tributary main east–west channel and secondary north–south culvert.
[2] Summation of sites 6A/6B streamflow measurements.
[3] Estimated.
[4] Below confluence of unnamed tributary west of Third Avenue and south fork of Third Avenue branch of Hagen Road tributary to Sarco Creek.
[5] Summation of sites 52 and 25 streamflow estimates.
[6] Measured on 4/18/01.
[7] Below confluence of upper and middle forks of Third Avenue branch of Hagen Road tributary to Sarco Creek.
[8] Summation of sites 22A and 22B streamflow measurements.
[9] Below confluence of main stem of Third Avenue branch of Hagen Road tributary and Hagen Road tributary main stem.
[10] Summation of sites 26A and 26B streamflow measurements.
[11] Above confluence of La Grande Avenue/Mt. George Avenue tributary, north branch and La Grande Avenue/Mt. George Avenue tributary main stem.
[12] Difference of sites 8B and 8A streamflow measurements.
[13] Difference of sites 10 and 7A streamflow measurements.
[14] Below confluence of Third Avenue tributary main stem and Third Avenue tributary west culvert.
[15] Summation of sites 20A and 20B streamflow measurements.
[16] Above confluence of Marie Creek tributary, Penny Lane branch and Marie Creek tributary main stem.
[17] Difference of sites 44B and 43B streamflow measurements.
[18] Not comparable with previous site.

Table 5. Construction data and water-level data for April and October of 2000 through 2002 for selected wells in the lower Milliken–Sarco–Tulucay Creeks area, southeastern Napa County, California

[State well No.: See well-numbering diagram in text. See figures 14, 25, and 31 for well locations. USGS (U.S. Geological Survey) identification number consists of latitude, longitude, and sequence number. Depths in feet below land surface; well depth, completed well depth unless otherwise noted. Elevation of land surface in feet above sea level. Altitude, altitude of potentiometric surface in feet above sea level. —, no data]

State well No.	USGS site identification number	Local well number	Well depth	Depth of perforated interval	Elevation of land surface	April 2000 water level		October 2000 water level		April 2001 water level		October 2001 water level		April 2002 water level		October 2002 water level	
						Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude
5N/3W-5M1	381818122133201	10	320	—	259.6	—	—	170.9	88.7	154.4	105.2	186.6	73.0	165.4	94.2	195.8	63.8
5N/3W-6A1[1]	381858122132601	92	368	148–368	357.8	—	—	148.5	209.3	147.9	209.9	158.9	198.9	146.4	211.4	—	—
5N/3W-6B2	381831122140501	91	415	315–415	314.1	—	—	—	—	211.0	103.1	240.8	73.3	223.4	90.7	244.3	69.8
5N/3W-6E1	381841122142801	103	—	—	318.8	—	—	210.7	108.1	206.0	112.8	—	—	—	—	—	—
5N/3W-6E2	381842122142901	104	730	170–730	315.7	190.5	125.2	203.4	112.3	211.1	104.6	210.8	104.9	206.5	109.2	—	—
5N/3W-6J2	381821122134001	110	530	170–530	241.8	—	—	—	—	—	—	170.2	71.6	147.5	94.3	179.1	62.7
5N/3W-6J3	381819122134001	9	215	—	242.3	—	—	126.5	115.8	102.1	140.2	126.7	115.6	112.6	129.7	126.1	116.2
5N/3W-6J4[2]	381820122135101	—	[3] 455	260–455	[4]227	—	—	—	—	—	—	—	—	126.5	[5]100	—	—
5N/3W-6K2	381819122135301	6	500	140–500	222.2	117.2	105.0	131.3	90.9	118.3	103.9	149.6	72.6	129.0	93.2	160.4	61.8
5N/3W-6L1	381830122141201	90	380	260–380	299.2	209.9	89.2	215.0	84.2	212.5	86.6	243.0	56.2	227.3	71.8	257.5	41.6
5N/3W-6L2	381824122140801	94	285	165–285	228.6	107.5	121.1	121.2	107.4	105.2	123.4	—	—	107.5	121.1	126.9	101.7
5N/3W-6M3	381820122144001	74	300	100–300	129.4	73.1	56.3	84.8	44.6	71.0	58.4	91.2	38.2	75.4	54.0	95.4	34.0
5N/3W-6N4	381814122142901	63	400	—	130.8	43.4	87.4	90.9	39.9	71.6	59.2	98.3	32.5	91.6	39.2	100.0	30.8
5N/3W-6N5	381807122143401	73	460	200–460	123.5	—	—	—	—	164.5	–41.0	191.9	[5]–68.4	165.7	[5]–42.2	—	—
5N/3W-6N6[1]	381814122143101	61	260	80–260	124.4	69.4	55.0	81.7	42.7	67.0	57.4	89.9	34.5	69.0	55.4	90.5	33.9
5N/3W-6P3	381809122141401	87	185	—	147.6	47.4	100.2	55.7	91.9	38.7	108.9	74.6	73.0	45.6	102.0	85.6	62.0
5N/3W-6P5	381814122141601	140	298	100–298	174.6	—	—	—	—	—	—	107.6	67.0	78.4	96.2	120.2	54.4
5N/3W-6Q1	381812122141201	89	[6]228	24–88	156.8	62.5	94.3	70.0	86.8	51.3	105.5	86.0	70.8	58.0	98.8	97.6	59.2
5N/3W-6Q3	381815122135201	7	350	70–350	279.6	169.3	110.3	169.0	110.6	168.6	111.0	168.8	110.8	—	—	—	—
5N/3W-6Q4	381815122135101	105	175	—	277.8	157.7	120.1	157.7	120.1	156.7	121.1	160.1	117.7	159.0	118.8	162.7	115.1
5N/3W-6Q5	381815122135901	93	397	177–397	195.0	[7]93.5	[7]101.4	100.1	94.8	86.3	108.6	118.5	76.4	93.6	101.4	126.4	68.6
5N/3W-6R1	381817122134901	8	180	—	250.7	128.9	121.8	133.7	117.0	130.5	120.2	141.1	109.6	138.3	112.4	156.9	93.8
5N/3W-6R2	381813122133701	17	400	220–400	255.0	—	—	155.7	99.3	146.5	108.5	173.8	81.2	162.6	92.4	186.7	68.3
5N/3W-6R3	381813122134101	106	207	—	255.3	—	—	111.6	143.6	—	—	129.8	[5]125.5	—	—	136.4	118.9
5N/3W-7B1	381801122140601	117	[6]215	—	143.0	—	—	—	—	[7]48.4	[7]94.6	69.3	73.7	42.0	101.0	82.2	60.8

See footnotes at end of table.

Table 5. Construction data and water-level data for April and October of 2000 through 2002 for selected wells in the lower Milliken–Sarco–Tulucay Creeks area, southeastern Napa County, California—Continued

State well No.	USGS site identification number	Local well number	Well depth	Depth of perforated interval	Elevation of land surface	April 2000 water level		October 2000 water level		April 2001 water level		October 2001 water level		April 2002 water level		October 2002 water level	
						Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude
5N/3W-7B2	381759122140501	118	240	120–240	149.2	—	—	—	—	[7]50.1	[7]99.0	71.2	78.0	44.4	104.8	83.9	65.2
5N/3W-7C3	381744122141901	20	208	130–207	131.6	—	—	62.4	69.2	37.8	93.8	78.3	53.3	—	—	—	—
5N/3W-7C4	381802122142001	85	240	—	137.3	60.1	77.2	71.0	66.3	54.5	82.8	83.0	54.3	58.3	79.0	86.9	50.4
5N/3W-7C5	381804122141501	86	275	—	138.2	61.8	76.4	68.4	69.8	53.6	84.6	87.4	50.8	55.9	82.3	89.5	48.7
5N/3W-7D3	381801122144201	72	245	120–245	133.2	102.3	30.9	110.9	22.3	99.2	34.0	107.3	25.9	104.0	29.2	114.4	18.8
5N/3W-7D4	381753122143901	71	186	—	122.4	—	—	104.4	18.0	—	—	—	—	86.7	35.7	123.3	–0.9
5N/3W-7E4	381744122142801	78	160	—	109.4	—	—	66.8	42.6	51.2	58.2	84.3	25.1	53.6	55.8	86.2	23.2
5N/3W-7E5	381748122143601	70	175	75–175	119.8	[8]83.8	[8]36.0	100.6	19.2	77.4	42.4	[8]112.2	[8]7.6	80.9	39.0	101.7	18.2
5N/3W-7E6	381744122143201	77	110	—	105.3	50.0	55.3	63.6	41.7	46.0	59.3	—	—	52.9	52.4	63.2	42.1
5N/3W-7E7	381746122143301	79	154	30–100	115.4	43.8	71.6	94.5	20.9	69.8	45.6	107.1	8.3	77.1	38.3	—	—
5N/3W-7E8	381744122142701	16	135	—	114.8	34.2	80.6	69.1	45.7	32.9	81.9	83.5	31.3	54.5	60.3	92.3	22.5
5N/3W-7F1	381749122141801	24	—	—	122.6	38.0	84.6	47.7	74.8	33.0	89.6	61.9	60.6	34.4	88.2	69.6	53.0
5N/3W-7F2	381751122142001	84	—	—	129.1	50.9	78.2	55.8	73.3	42.4	86.7	67.6	61.5	43.2	85.9	77.9	51.2
5N/3W-7F3	381748122142401	81	290	50–290	114.9	41.2	73.7	44.4	70.5	28.2	86.7	68.4	46.5	30.8	84.1	79.3	35.6
5N/3W-7F4	381748122142402	82	145	—	115.6	39.9	75.6	42.7	72.8	27.9	87.6	60.1	55.4	29.5	86.0	65.0	50.6
5N/3W-7F5	381749122142501	83	162	—	115.0	41.6	73.4	45.7	69.3	29.7	85.3	63.2	51.8	31.2	83.8	66.2	48.8
5N/3W-7G2[1]	381740122140001	100	228	—	154.6	42.6	112.0	51.2	103.4	34.1	120.5	62.5	92.1	32.8	121.8	65.0	89.6
5N/3W-7G3[2]	381745122135901	145	250	50–250	168.3	—	—	—	—	—	—	77.9	90.4	47.5	120.8	80.1	88.2
5N/3W-7H4	381744122134301	21	355	175–355	203.2	—	—	75.2	128.0	59.4	143.8	90.6	112.6	62.0	141.2	86.8	116.4
5N/3W-7H5	381744122135301	115	—	—	179.9	—	—	—	—	[7]40.5	[7]139.4	—	—	41.2	138.7	64.1	115.8
5N/3W-7L3	381738122142401	114	—	—	120.4	—	—	—	—	—	—	67.0	53.4	21.2	99.2	67.1	53.3
5N/3W-7M4	381732122142801	32	—	—	98.3	12.9	85.4	25.0	73.3	13.8	84.5	28.6	69.7	13.7	84.6	38.0	60.3
5N/3W-7N2	381717122143501	34	150	—	147.5	45.4	102.1	53.7	93.8	46.4	101.1	61.1	86.4	48.4	99.1	67.0	80.5
5N/3W-7N3	381720122143601	33	110	50–110	127.3	29.5	97.8	40.0	87.3	31.5	95.8	45.0	82.3	30.7	96.6	51.8	75.5
5N/3W-7PL6	381719122140801	50	170	70–100	189.2	64.1	125.1	66.2	123.0	65.1	124.1	69.0	120.2	67.0	122.2	70.9	118.3

See footnotes at end of table.

Table 5. Construction data and water-level data for April and October of 2000 through 2002 for selected wells in the lower Milliken–Sarco–Tulucay Creeks area, southeastern Napa County, California—Continued

State well No.	USGS site identification number	Local well number	Well depth	Depth of perforated interval	Elevation of land surface	April 2000 water level		October 2000 water level		April 2001 water level		October 2001 water level		April 2002 water level		October 2002 water level	
						Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude
5N/3W-8E1[1]	381746122133101	22	135	—	254.2	85.6	168.6	93.6	160.6	87.4	166.8	94.0	160.2	87.4	166.8	96.4	157.8
5N/3W-8L2	381735122131401	124	310	—	360.4	—	—	—	—	[7]65.0	[7]295.4	69.1	291.3	60.3	300.1	65.8	294.6
5N/3W-17C2	381700122131201	116	—	—	684.7	—	—	—	—	[7]205.2	[7]479.5	195.7	489.0	[8]204.1	[8]480.6	211.4	473.3
5N/3W-18D1	381712122144101	35	92	—	135.9	29.5	106.4	40.4	95.5	44.3	91.6	50.6	85.3	36.3	99.6	59.0	76.9
5N/4W-1C2	381856122152101	30	200	—	105.0	38.5	66.5	30.6	74.4	29.7	75.3	—	—	29.1	75.9	43.2	61.8
5N/4W-1F2	381831122153001	27	420	260–420	165.4	121.6	43.8	121.2	44.2	118.9	46.5	[8]139.3	[5, 8]26.1	—	—	—	—
5N/4W-1F3[1]	381841122152401	29	350	50–350	131.4	103.5	27.9	113.4	18.0	113.1	18.3	127.2	4.2	119.3	12.1	134.6	–3.2
5N/4W-1J2	381824122145301	12	460	300–460	272.1	—	—	—	—	180.5	91.6	—	—	—	—	—	—
5N/4W-1J3	381827122144701	141	535	115–535	156.8	—	—	—	—	—	—	120.9	35.9	[8]121.7	[8]35.1	[8]141.9	[8]14.8
5N/4W-1K2	381820122151001	59	280	—	218.5	—	—	210.0	8.5	195.2	23.3	—	—	—	—	—	—
5N/4W-1L1	381830122152001	28	400	140–400	149.7	121.9	27.8	134.0	15.8	—	—	—	—	128.5	21.2	—	—
5N/4W-1L2	381831122152401	119	150	50–150	135.8	—	—	—	—	[7]96.2	[7]39.6	102.8	33.0	96.2	39.6	108.4	27.4
5N/4W-1R2	381809122145101	60	117	—	141.7	108.9	32.8	113.5	28.2	108.2	33.5	dry	dry	dry	dry	dry	dry
5N/4W-1R3	381808122145201	144	260	140–260	138.0	—	—	—	—	—	—	117.3	20.7	107.2	30.8	124.7	13.2
5N/4W-1R4[2]	381812122145201	—	[9]595	275–595	[4]150	—	—	—	—	—	—	—	—	113.0	[5]37	—	—
5N/4W-2Q1	381814122161701	113	—	—	83.4	—	—	—	—	26.6	56.8	39.9	43.6	30.8	52.6	39.4	44.0
5N/4W-12B4	381753122151001	48	[6]100	—	101.0	29.7	71.3	35.9	65.1	31.9	69.1	37.7	63.3	32.7	68.3	39.4	61.6
5N/4W-12B5	381755122151001	25	—	—	99.5	27.5	72.0	34.0	65.6	29.6	69.9	35.6	63.9	30.5	69.0	37.2	62.3
5N/4W-12B6	381756122150401	26	155	—	113.3	113.2	0.1	119.7	–6.4	112.9	0.4	115.3	–2.0	103.9	9.4	116.7	–3.4
5N/4W-12G1[1]	381740122150201	14	240	60–240	82.6	23.8	58.8	35.4	47.2	25.9	56.7	42.0	40.6	24.5	58.1	[8]55.1	[8]27.5

See footnotes at end of table.

Table 5. Construction data and water-level data for April and October of 2000 through 2002 for selected wells in the lower Milliken–Sarco–Tulucay Creeks area, southeastern Napa County, California—Continued

State well No.	USGS site identification number	Local well number	Well depth	Depth of perforated interval	Elevation of land surface	April 2000 water level		October 2000 water level		April 2001 water level		October 2001 water level		April 2002 water level		October 2002 water level	
						Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude
5N/4W-12H2	381744122145001	15	[10] —	—	104.3	[8]102.2	[8] 2.1	114.0	–9.7	92.2	12.1	[8]120.9	[8]–16.6	[8]109.3	[8]–5.0	[8]132.6	[8]–28.3
5N/4W-12J2	381738122145701	13	285	—	82.9	43.0	39.9	57.7	25.2	48.5	34.4	68.1	14.8	46.3	36.6	[8]87.3	[8]–4.4
5N/4W-13C1	381709122152101	143	[11] —	—	85.6	—	—	—	—	—	—	48.8	36.8	42.5	43.1	61.8	23.8
5N/4W-13G4	381648122151501	18	210	105–126	120.6	16.1	104.5	19.0	101.6	17.0	103.6	22.8	97.8	17.8	102.8	26.2	94.4
5N/4W-13H1	381700122145001	137	364	—	[4]132	—	—	20.8	111.2	19.0	113.0	—	—	16.8	115.2	—	—
5N/4W-13H3[1]	381649122144901	36	130	70–130	156.6	28.9	127.7	36.7	119.9	33.3	123.3	41.5	115.1	35.3	121.3	46.2	110.4
5N/4W-13J1[1]	381646122145601	19	360	45–360	144.9	21.2	123.7	29.0	115.9	34.8	110.1	41.8	103.1	34.6	110.3	54.2	90.7
5N/4W-14J3[2]	381644122154601	49	[6,12]399	—	84.7	—	—	55.6	29.1	54.8	29.9	57.9	26.8	53.7	31.0	56.3	28.4
6N/3W-30P1	381958122141601	58	—	—	168.0	—	—	186.2	–18.2	103.0	65.0	190.0	–22.0	119.2	48.8	—	—
6N/3W-31D1	381941122143201	65	585	65–565	145.9	193.5	–47.6	205.4	–59.5	178.3	–32.4	217.0	–71.1	184.8	–38.9	231.5	–85.6
6N/3W-31D2	381939122142501	66	555	—	156.3	193.3	–37.0	214.2	–57.9	186.2	–29.9	225.6	–69.3	193.5	–37.2	241.4	–85.1
6N/3W-31F2	381933122141301	68	510	—	161.7	198.3	–36.6	219.1	–57.4	190.9	–29.2	229.9	–68.2	198.2	–36.5	244.9	–83.2
6N/3W-31F3	381925122142101	41	610	—	147.7	190.2	–42.5	205.2	–57.5	177.6	–29.9	216.2	–68.5	196.2	–48.5	221.2	–73.5
6N/3W-31F4[1]	381935122141601	67	486	—	161.8	201.5	–39.6	—	—	189.2	–27.4	232.3	–70.4	196.3	–34.4	245.2	–83.4
6N/3W-31G2	381926122140201	42	382	160–382	165.4	202.3	–36.9	—	—	—	—	234.5	–69.1	203.5	–38.1	—	—
6N/4W-13E1	382204122154501	5	510	80–510	515.0	285.8	229.2	265.2	249.8	284.8	230.2	273.9	[5]241.1	—	—	292.2	222.8
6N/4W-14Q1	382143122160301	4	385	55–315	138.4	99.4	39.0	116.2	22.2	94.9	43.5	126.6	11.8	100.6	37.8	133.7	4.7
6N/4W-15R5[1]	382135122165901	76	395	60–395	94.0	47.2	46.8	66.9	27.1	45.2	48.8	74.4	19.6	42.6	51.4	87.8	6.2
6N/4W-22H3[2]	382114122165801	—	[13]500	120–500	[4]65	—	—	—	—	—	—	—	—	50.6	[5]14	—	—
6N/4W-22R1	382047122170501	75	205	45–205	37.5	—	—	51.5	–14.0	27.3	10.2	51.1	–13.6	31.2	6.3	59.8	–22.3

See footnotes at end of table.

Table 5. Construction data and water-level data for April and October of 2000 through 2002 for selected wells in the lower Milliken–Sarco–Tulucay Creeks area, southeastern Napa County, California—Continued

State well No.	USGS site identification number	Local well number	Well depth	Depth of perforated interval	Elevation of land surface	April 2000 water level		October 2000 water level		April 2001 water level		October 2001 water level		April 2002 water level		October 2002 water level	
						Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude
6N/4W-23B1	382128122161001	3	612	352–612	144.8	46.6	98.2	143.5	1.3	100.7	44.1	155.7	[5]–10.9	109.5	35.3	—	—
6N/4W-23J1[2]	382053122154701	2	700	—	89.6	—	—	99.0	–9.4	80.3	9.3	106.2	–16.6	77.2	12.4	109.2	–19.6
6N/4W-23K3	382103122161301	44	300	60–300	126.4	104.7	21.7	112.9	13.5	107.2	19.2	119.8	6.6	112.8	13.6	125.3	1.1
6N/4W-23Q3[1]	382050122160901	43	310	150–310	100.1	—	—	102.6	–2.5	79.6	20.5	97.1	3.0	81.5	18.6	103.3	–3.2
6N/4W-25E3	382019122153201	99	154	134–154	94.3	47.7	46.6	63.5	30.8	53.0	41.3	70.8	23.5	50.6	43.7	76.5	17.8
6N/4W-25G1	382016122145801	51	175	—	119.7	131.7	–12.0	135.8	–16.1	128.7	–9.0	142.6	–22.9	131.2	–11.5	145.9	–26.2
6N/4W-25G2[1]	382017122145801	142	440	160–440	119.9	—	—	—	—	—	—	142.7	–22.8	133.6	–13.7	145.9	–26.0
6N/4W-25J1	382003122145001	52	360	238–360	129.0	143.9	–14.9	152.7	–23.7	146.4	–17.4	161.9	–32.9	145.3	–16.3	163.2	–34.2
6N/4W-26B2	382035122160601	57	132	—	71.5	58.7	12.8	65.6	5.9	53.9	17.6	73.0	–1.5	57.6	13.9	76.6	–5.1
6N/4W-26B3[2]	382039122161901	23	205	—	71.7	[7]67.0	[7]4.7	73.4	–1.7	62.5	9.2	96.0	–24.3	69.5	2.2	91.8	–20.1
6N/4W-26F2	382022122162601	55	153	—	66.8	63.7	3.1	74.4	–7.6	65.5	1.3	90.0	–23.2	72.7	–5.9	97.2	–30.4
6N/4W-26G1	382035122161101	56	210	30–210	60.1	—	—	66.6	–6.5	[8]60.8	[8]–.7	75.2	–15.1	56.1	4.0	83.2	–23.1
6N/4W-26G2	382021122161401	47	156	—	53.1	—	—	48.0	5.1	34.7	18.4	57.0	–3.9	38.7	14.4	62.0	–8.9
6N/4W-26G3[1]	382018122161301	45	93	—	48.4	29.1	19.3	43.2	5.2	29.1	19.3	53.4	–5.0	33.1	15.3	55.6	–7.2
6N/4W-26L5	382008122162801	122	210	60–150	55.8	—	—	—	—	[7]67.8	[7]–12.0	82.9	–27.2	72.4	–16.6	87.0	–31.2
6N/4W-26R3	381956122155101	102	147	—	77.5	—	—	64.7	12.8	45.4	32.1	62.3	15.2	50.0	27.5	69.2	8.3
6N/4W-27L2[14]	—	—	120	60–120	50	[15]26.0	[15]24.0	[15]37.0	[15]13.0	[15]26.3	[15]23.7	[15]41.9	[15]8.1	[15]24.1	[15]25.9	—	—
6N/4W-27N1	381953122175401	—	141	39–141	50	—	—	39.5	10.5	23.3	26.7	41.7	8.3	20.5	29.5	42.8	7.2
6N/4W-35G5	381929122160701	69	—	—	39.0	8.1	30.9	14.4	24.6	8.2	30.8	14.3	24.7	7.8	31.2	14.1	24.9
6N/4W-35H1	381927122155001	120	297	157–297	68.4	—	—	—	—	47.8	20.6	62.6	5.8	42.2	26.2	62.6	5.8

Table 5. Construction data and water-level data for April and October of 2000 through 2002 for selected wells in the lower Milliken–Sarco–Tulucay Creeks area, southeastern Napa County, California—Continued

State well No.	USGS site identification number	Local well number	Well depth	Depth of perforated interval	Elevation of land surface	April 2000 water level		October 2000 water level		April 2001 water level		October 2001 water level		April 2002 water level		October 2002 water level	
						Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude	Depth	Altitude
6N/4W-36A1	381947122145401	98	375	240–375	122.2	132.5	–10.3	153.6	–31.4	129.4	–7.2	158.2	–36.0	133.4	–11.2	160.1	–37.9
6N/4W-36B4	381937122150901	96	87	—	105.9	49.5	56.4	50.7	55.2	51.2	54.7	52.2	[5]53.7	50.9	[5]55.0	52.3	53.6
6N/4W-36E1	381927122154001	37	100	—	78.1	38.2	39.9	50.5	27.6	42.8	35.3	55.5	22.6	48.2	29.9	53.8	24.3
6N/4W-36G[1]	381939122150401	95	195	155–185	112.6	—	—	137.8	–25.2	122.5	–9.9	139.2	–26.6	121.8	–9.2	—	—
6N/4W-36H4	381926122144201	40	[6, 16] 485	—	105.0	—	—	191.4	–86.4	152.6	–47.6	189.6	–84.6	156.9	–52.0	—	—
6N/4W-36H6	381935122145501	97	600	100–600	138.2	180.5	–42.2	195.7	–57.4	176.0	–37.8	185.7	–47.4	172.9	–34.6	186.7	–48.4
6N/4W-36J3	381923122145601	38	—	—	87.3	126.8	–39.5	167.6	–80.3	125.9	–38.6	181.4	–94.1	142.0	–54.7	192.2	–104.9
6N/4W-36K2	381910122150101	54	—	—	103.4	—	—	183.1	–79.7	160.6	–57.2	185.1	–81.7	171.4	–68.0	—	—
6N/4W-36P1	381907122152301	31	382	—	128.4	155.5	–27.1	210.0	–81.6	163.7	–35.3	224.3	–95.9	166.3	–37.9	[8]241.8	[8]–113.4
6N/4W-36R1[1]	381905122145601	53	530	30–530	126.2	106.1	20.1	—	—	119.2	7.0	125.3	0.9	103.8	22.4	—	—
6N/4W-36R2	381907122145001	121	[17]≥178	—	154.0	—	—	—	—	[7] 139.1	[7] 14.9	155.8	–1.8	138.3	15.7	169.2	–15.2

[1] Well used for water-chemistry sampling.
[2] Well used for temperature logging.
[3] Well depth remeasured by USGS in April 2002 is approximately 450 feet.
[4] Determined from topographic map with an accuracy of plus or minus 10 feet.
[5] Water-level measurement not included in the contouring (figs. 15 and 16).
[6] Reported drill or hole depth.
[7] Water-level measurement made in mid-May.
[8] Water-level measurement may have been affected by recent or nearby pumping, but if measured in October 2001 or April 2002 was included in the contouring on figures 15 and 16, respectively.
[9] Well depth remeasured by USGS in April 2002 is approximately 590 feet.
[10] Well depth 120 to 130 feet according to owner.
[11] Well depth 250 to 300 feet according to owner.
[12] Well depth remeasured by USGS in April 2002 is approximately 418 feet.
[13] Well depth remeasured by USGS in April 2002 is approximately 520 feet.
[14] Well monitored by the California Department of Water Resources (California Department of Water Resources, accessed August 1, 2002).
[15] Water-level data from California Department of Water Resources (California Department of Water Resources, accessed August 1, 2002).
[16] Well depth approximately 475 feet according to owner.
[17] Well depth at least 178 feet according to owner.

Table 6. Summary of estimated ground-water pumping for domestic and irrigation uses in the lower Milliken–Sarco–Tulucay Creeks area, southeastern Napa County, California, 2000–2002

[Well to parcel ratio based on distribution of identifiable wells amongst identifiable properties. Estimated average yield is approximately 0.45 of reported average yield of all wells with driller's logs; ratio of 0.45 based on the proportion of measured to reported yields for 11 wells included in this study. Assumed average daily use values from Metzger and Fio (1997). Unit applied water is an estimated value of average countywide irrigation water applied during 1980. DWR, California Department of Water Resources. FMMP, California Department of Conservation Farmland Mapping and Monitoring Program. gal/min, gallon per minute; acre-ft/acre, acre-foot per acre. na, not applicable]

Basis of estimate	Well to parcel ratio	Number of parcels	Estimated number of wells	Estimated average pumping rate (gal/min)	Assumed average daily use (hours)	Area (acres)	Unit applied water (acre-ft/acre)	Approximate population (2000 census)	Per capita use (gallon/per person/ day)	Estimated annual pumpage (acre-feet)
Domestic Use (residential use excluding residential mixed with agricultural properties)										
Well and parcel data	[1] 1.1	1,450	1,595	[2] 20	[3] 0.98	na	na	na	na	2,101
Population and water use data	na	na	na	na	na	na	na	[4] 4,800	[5] 148	796
Average										1,448
Irrigation Use—Agriculture (includes agriculture mixed with residential use)										
Well and parcel data	[6] 1.4	132	185	[7] 75	[8] 2.88	na	na	na	na	2,686
FMMP land use and DWR water use coefficient	na	na	na	na	na	[9] 2,369	[10] 1.2	na	na	2,843
FMMP land use and local water use coefficient	na	na	na	na	na	[9] 2,369	[11] 0.5	na	na	1,185
Napa County land use and DWR water use coefficient	na	na	na	na	na	[12] 2,869	[10] 1.2	na	na	3,443
Napa County land use and local water use coefficient	na	na	na	na	na	[12] 2,869	[11] 0.5	na	na	1,435
Minimum										1,185
Maximum										3,443
Average										2,318
Irrigation Use—Improved open space (includes golf courses, cemeteries, and public institutions)										
FMMP land use and DWR water use coefficient	na	na	na	na	na	[9] 391	[13] 4.0	na	na	1,564

[1] Estimated from 643 wells identified on 577 residential properties.

[2] Approximately 0.45 of average reported well yield (48 gal/min) for 589 wells identified on driller's logs as domestic use.

[3] Average daily pumping time for residential wells, from Metzger and Fio (1997).

[4] Estimated population of county portion of study area not served by public supply water.

[5] Average daily per capita water use for the City of Napa Municipal Water Department, 1990–2001 (Alan Aguilar, Department of Water Resources, written commun., 2002; Don Ridenhour,City of Napa, written commun., 2002). In comparison, per capita rate for part of study area outside of city limits estimated to be 156 gallons per person per day based on 2002 water use data from the City of Napa Municipal Water Department (Gil Harrington, City of Napa, written commun., 2002).

[6] Estimated from the identification of 104 wells distributed among 73 agricultural and agriculture mixed with residential properties.

[7] Approximately 0.45 of average reported well yield (168 gal/min) for 93 wells identified on driller's logs as irrigation use.

[8] Average daily pumping time for institutional wells used primarily for landscape irrigation, from Metzger and Fio (1997).

[9] Average determined from FMMP year 2000 land use. See figure 2.

[10] Average amount of water applied per acre for grapes in Napa County in 1980 (California Department of Water Resources, 1986).

[11] Average amount of water applied per acre for grapes in Napa County in 2001 according to local residents (John Stewart, Napa County Department of Public Works, oral commun., 2001).

[12] Acreage determined from Napa County Assessor parcel database (2002).

[13] Average amount of water applied per acre for pasture in Napa County in 1980 (California Department of Water Resources, 1986).

Table 7. Summary of median water-level change in the lower Milliken–Sarco–Tulucay Creeks area, southeastern Napa County, California, 2000–2002

[Median water-level change in feet]

Time period	Storage unit 1		Storage unit 2		Storage unit 3		Storage unit 4		All storage units	
	Number of wells measured	Median	Number of wells measured	Median	Number of wells measured	Median	Number of well measured s	Median	Number of wells measured	Median
October 2000–October 2001	45	–10.4	4	–14.0	31	–7.4	5	–4.9	85	–8.6
October 2001–October 2002	51	–5.9	4	–6.5	27	–5.0	5	–7.2	87	–5.5
Average annual change:	48	–8.2	4	–10.3	29	–6.2	5	–6.1	86	–7.1
April 2000– April 2001	38	0.5	6	–8.9	20	2.0	3	–0.3	67	0.7
April 2001-April 2002	47	–2.3	6	–1.0	30	–4.2	5	2.2	88	–2.6
Average annual change:	43	–0.9	6	–5.0	25	–1.1	4	1.0	78	–1.0
October 2000–April 2001	50	13.6	6	1.6	32	19.0	5	16.2	93	14.1
October 2001–April 2002	60	20.8	7	9.1	34	20.1	6	18.8	107	19.9
Average annual change:	55	17.2	7	5.4	33	19.6	6	17.5	100	17.0

Table 8. Field data and laboratory analyses of samples from streamflow-measurement stations and wells in southeastern Napa County, California, 2001

[State well No.: See well-numbering diagram on page ix. See figure 25 for location of streamflow-measurement stations, lakes and ponds, springs, and wells. USGS (U.S. Geological Survey) identification No. consists of latitude, longitude, and sequence number. Parameter code, in brackets, is a five-digit number in the USGS computerized data system, National Water Information System (NWIS, used to uniquely identify a specific constituent or property. $CaCO_3$, calcium carbonate; mg/L, milligram per liter; µS/cm, microsiemen per centimeter at 25°C; °C, degree Celsius; µg/L, microgram per liter. e, value estimated by the USGS National Water Quality Laboratory, Denver, Colorado; <, actual value is less than value shown; —, no data]

Stream site identifier or State well No. (abbreviated or local identifier)	USGS identification No.	Sample date	Solids, residue on evaporation at 180°C, dissolved (mg/L) [70300]	Solids, sum of constituents, dissolved (mg/L) [70301]	Oxygen, dissolved (mg/L) [00300]	pH, field (standard units) [00400]	Specific conductance, field (µS/am) [00095]	Temperature, water (°C) [00010]
Streamflow-measurement stations								
Murphy Creek (MC)	381739122140001	9-19-01	174	164	8.9	7.3	130	15.0
Dairy Creek (DC)	381909122132701	9-18-01	150	146	8.9	7.4	97	14.5
Site 33 (MCW)	382130122153501	9-20-01	130	128	—	7.1	172	15.5
Site 37 (MCH)	382017122161101	9-20-01	136	133	—	7.2	184	18.0
Wells								
5N/3W-6A1 (92)	381858122132601	9-18-01	194	196	3.5	7.2	124	26.0
5N/3W-6N6 (61)	381814122143101	11-06-01	640	732	<.1	7.8	[1] 1,220	23.0
5N/3W-7G2 (100)	381740122140001	9-19-01	451	435	<.1	6.7	638	19.5
5N/3W-8E1 (22)	381746122133101	9-19-01	282	282	1.3	6.9	356	21.5
5N/4W-1F3 (29)	381841122152401	11-07-01	278	286	3.2	7.4	386	20.5
5N/4W-12G1 (14)	381740122150201	11-06-01	([2])	417	<.1	8.0	564	20.0
5N/4W-13H3 (36)	381649122144901	11-07-01	230	217	2.4	[1] 6.3	255	19.0
5N/4W-13J1 (19)	381646122145601	11-08-01	216	217	.6	7.1	248	23.5
6N/3W-31F4 (67)	381935122141601	9-21-01	218	144	<.1	7.4	265	27.0
6N/4W-15R3 (76)	382135122165901	11-08-01	220	227	1.6	6.7	269	20.0
6N/4W-23Q3 (43)	382050122160901	9-20-01	288	296	.1	7.3	402	21.5
6N/4W-25G2 (142)	382017122145801	9-17-01	256	255	<.1	7.3	260	24.0
6N/4W-26G3 (45)	382018122161301	9-20-01	279	282	.1	7.0	404	17.5
6N/4W-36G1 (95)	381939122150401	9-18-01	324	334	<.1	6.6	310	20.0
6N/4W-36R1 (53)	381905122145601	11-05-01	280	285	6.6	[1] 8.6	428	26.0

See footnotes at end of table.

Table 8. Field data and laboratory analyses of samples from streamflow-measurement stations and wells in southeastern Napa County, California, 2001—Continued

Stream site identifier or State well No. (abbreviated or local identifier)	Sample date	Hardness, total (mg/L as $CaCO_3$) [00900]	Calcium, dissolved (mg/L) [00915]	Magnesium, dissolved (mg/L) [00925]	Potassium, dissolved (mg/L) [00935]	Sodium, dissolved (mg/L) [00930]	Alkalinity, field (mg/L as $CaCO_3$) [39086]	Bicarbonate, field (mg/L) [00453]
Streamflow-measurement stations								
Murphy Creek (MC)	9-19-01	52	11.2	5.75	2.68	15.2	59	72
Dairy Creek (DC)	9-18-01	27	6.02	3.02	3.90	11.7	45	54
Site 33 (MCW)	9-20-01	46	9.47	5.43	2.75	16.7	59	71
Site 37 (MCH)	9-20-01	46	9.53	5.38	3.59	18.5	66	79
Wells								
5N/3W-6A1 (92)	9-18-01	71	16.1	7.36	4.17	24.3	114	138
5N/3W-6N6 (61)	11-06-01	65	19.2	4.1	1.51	247	328	395
5N/3W-7G2 (100)	9-19-01	220	49.5	24.4	4.74	39.3	157	189
5N/3W-8E1 (22)	9-19-01	120	24.8	14.7	3.19	24.2	124	148
5N/4W-1F3 (29)	11-07-01	40	14.1	1.11	.69	72.1	98	118
5N/4W-12G1 (14)	11-06-01	37	11.6	2.06	5.09	109	223	268
5N/4W-13H3 (36)	11-07-01	100	18.4	13.1	1.52	10.6	90	108
5N/4W-13J1 (19)	11-08-01	79	16.7	9.14	1.82	21.9	108	132
6N/3W-31F4 (67)	9-21-01	74	17.7	7.32	4.29	26.9	113	139
6N/4W-15R3 (76)	11-08-01	73	12.9	9.83	6.67	23.3	98	118
6N/4W-23Q3 (43)	9-20-01	70	14.0	8.51	20.4	50.9	192	232
6N/4W-25G2 (142)	9-17-01	76	16.4	8.47	5.63	35.2	115	138
6N/4W-26G3 (45)	9-20-01	110	23.9	12.6	11.8	34.0	163	197
6N/4W-36G1 (95)	9-18-01	52	9.48	6.84	9.25	62.7	110	133
6N/4W-36R1 (53)	11-05-01	10	2.52	.793	1.15	97.7	176	183

Table 8. Field data and laboratory analyses of samples from streamflow-measurement stations and wells in southeastern Napa County, California, 2001—Continued

Stream site identifier or State well No. (abbreviated or local identifier)	Sample date	Chloride, dissolved (mg/L) [00940]	Fluoride, dissolved (mg/L) [00950]	Silica, dissolved (mg/L) [00955]	Sulfate, dissolved (mg/L) [00945]	Nitrogen, ammonia, dissolved (mg/L) [00608]	Nitrite plus nitrate as N, dissolved (mg/L) [00631]	Nitrogen, nitrite, dissolved (mg/L) [00613]
Streamflow-measurement stations								
Murphy Creek (MC)	9-19-01	10.9	<0.2	74.4	7.7	<0.04	e 0.03	<0.006
Dairy Creek (DC)	9-18-01	7.45	.2	85.4	1.0	<.04	.08	<.006
Site 33 (MCW)	9-20-01	12.9	<.2	42.7	2.1	0.04	.09	<.006
Site 37 (MCH)	9-20-01	11.5	e .1	41.7	3.3	<.04	e .03	<.006
Wells								
5N/3W-6A1 (92)	9-18-01	6.18	0.3	65.2	4.3	<0.04	<0.05	e 0.003
5N/3W-6N6 (61)	11-06-01	175	1.5	46.0	30.2	1.47	<.05	<.008
5N/3W-7G2 (100)	9-19-01	67.1	.3	81.7	71.7	.15	<.05	<.006
5N/3W-8E1 (22)	9-19-01	10.2	.3	88.8	41.9	e .04	<.05	e .004
5N/4W-1F3 (29)	11-07-01	16.2	.6	48.6	61.6	<.04	2.90	<.008
5N/4W-12G1 (14)	11-06-01	54.0	.6	56.5	43.9	.53	<.05	<.008
5N/4W-13H3 (36)	11-07-01	10.7	.2	84.5	14.8	<.04	2.09	<.008
5N/4W-13J1 (19)	11-08-01	11.6	.2	86.5	3.4	.05	e .04	<.008
6N/3W-31F4 (67)	9-21-01	11.1	.3	—	7.7	.06	e .02	<.006
6N/4W-15R3 (76)	11-08-01	12.9	.2	81.9	19.7	e .03	<.05	<.008
6N/4W-23Q3 (43)	9-20-01	9.98	e .1	75.4	.6	.24	<.05	<.006
6N/4W-25G2 (142)	9-17-01	16.2	.4	81.4	22.0	.04	<.05	<.006
6N/4W-26G3 (45)	9-20-01	24.1	<.2	71.3	5.5	.24	<.05	<.006
6N/4W-36G1 (95)	9-18-01	15.4	e .1	76.1	80.3	2.57	<.05	<.006
6N/4W-36R1 (53)	9-19-01	15.5	.9	40.8	20.3	.06	<.05	<.008

Table 8. Field data and laboratory analyses of samples from streamflow-measurement stations and wells in southeastern Napa County, California, 2001—Continued

Stream site identifier or State well No. (abbreviated or local identifier)	Sample date	Phosphorus, orthophosphate, dissolved (mg/L) [00671]	Arsenic, dissolved (μg/L) [01000]	Boron, dissolved (μg/L) [01020]	Iron, dissolved (μg/L) [01046]	Lithium, dissolved (μg/L) [01130]	Manganese, dissolved (μg/L) [01056]
Streamflow-measurement stations							
Murphy Creek (MC)	9-19-01	0.15	e 1	20	62	7.4	e 2.9
Dairy Creek (DC)	9-18-01	.17	e 2	20	32	10.5	e 1.9
Site 33 (MCW)	9-20-01	<.02	<2	200	55	13.8	e 2.3
Site 37 (MCH)	9-20-01	e .01	<2	160	59	12.6	8.1
Wells							
5N/3W-6A1 (92)	9-18-01	0.04	2	60	28	43.0	[1] 136
5N/3W-6N6 (61)	11-06-01	.02	<2	[3] 11,000	<10	90.7	[1] 93.0
5N/3W-7G2 (100)	9-19-01	<.02	<2	830	1,710	58.3	[1] 314
5N/3W-8E1 (22)	9-19-01	.04	4	110	[1] 991	43.4	[1] 261
5N/4W-1F3 (29)	11-07-01	.06	[1] 11	230	<10	19.1	<2.0
5N/4W-12G1 (14)	11-06-01	.03	6	[3] 1,440	11	34.6	[1] 54.5
5N/4W-13H3 (36)	11-07-01	.12	[1] 11	e 10	e 7	7.7	5.6
5N/4W-13J1 (19)	11-08-01	.07	3	140	102	97.5	[1] 81.4
6N/3W-31F4 (67)	9-21-01	e .02	e 1	200	18	50.3	[1] 117
6N/4W-15R3 (76)	11-08-01	.17	[1] 17	70	31	51.4	[1] 309
6N/4W-23Q3 (43)	9-20-01	.33	[1] 67	160	12	82.6	[1] 491
6N/4W-25G2 (142)	9-17-01	.04	6	380	[1] 310	51.4	[1] 131
6N/4W-26G3 (45)	9-20-01	.14	[1] 16	200	[1] 462	62.7	[1] 831
6N/4W-36G1 (95)	9-18-01	.62	3	490	[1] 2,290	187	[1] 656
6N/4W-36R1 (53)	9-19-01	.02	4	900	18	36.8	19.9

[1]Value exceeds the maximum contaminant level (MCL) or is outside of the acceptable range for primary or secondary Federal and State drinking-water standards (California Department of Water Resources, 1997; U.S. Environmental Protection Agency, 2002).

[2]Insufficient sample for analysis.

[3]Value exceeds State active level (California Department of Health Services, 2002).

Table 9. Field measurements and oxygen-18 and deuterium ratios in samples from streamflow-measurement stations, lakes and ponds, springs, and wells, southeastern Napa County, California, 2001–02

[See figure 25 for location of streamflow-measurement stations, lakes and ponds, springs, and wells. USGS (U.S. Geological Survey) identification No. consists of latitude, longitude, and sequence number. State well No.: see well-numbering diagram on page ix. Subarea "outside" refers to sites located outside of the Milliken, Sarco, and Tulucay drainage basins. ft^3/s, cubic foot per second; per mil, parts per thousand; µS/cm, microsiemen per centimeter at 25°C; °C, degree Celsius; µg/L, microgram per liter. —, no data]

Station identifier or State well No. (abbreviated or local identifier)	USGS Identification No.	Subarea	Sample date	Instaneous streamflow (ft^3/s)	Delta oxygen-18 (per mil)	Delta deuterium (per mil)	Field measurements	
							Specific conductance (µS/cm)	Water temperature (°C)
Streamflow-measurement stations								
Site 12	381644122123001	Tulucay	3-14-01	0.64	–7.61	–50.52	58	16.0
Site 13	381728122133801	Tulucay	3-13-01	.87	–7.39	–48.9	114	13.0
Site 14	381744122123601	Tulucay	3-13-01	.06	–7.58	–49.9	81	12.0
Site 16	381739122131101	Tulucay	3-13-01	.71	–7.29	–46.59	110	12.5
Site 17	381730122143101	Tulucay	3-14-01	1.93	–7.29	–49.55	155	11.0
Site 20A	381745122143401	Tulucay	3-14-01	.27	–6.93	–48.12	470	16.0
Site 20B	381745122143402	Tulucay	3-14-01	.32	–7.07	–48.03	242	13.0
Site 41	381709122163301	Tulucay	3-13-01	5.62	–6.87	–46.98	264	11.5
			4-10-01	2.81	–6.25	–43.36	306	11.5
Site 42B	381639122151001	Tulucay	3-13-01	.65	–6.61	–45.17	120	15.0
Site 45	381723122155501	Tulucay	3-13-01	4.38	–7.00	–47.63	270	12.0
			4-10-01	.78	–6.30	–43.7	337	11.0
Site 46B	381634122142901	Tulucay	3-13-01	1.10	–7.00	–45.77	99	11.5
Site 49B	381707122151801	Tulucay	3-14-01	.35	–7.28	–48.66	122	11.0
Site 50	381738122140601	Tulucay	3-13-01	.72	–7.20	–48.06	—	12.5
Site 56	381813122140601	Tulucay	3-15-01	.12	–6.88	–48.18	610	10.0
Site 58	381758122131601	Tulucay	3-15-01	.09	–7.55	–50.54	72	10.0
Site 60	381653122140201	Tulucay	3-14-01	.30	–7.46	–49.51	96	11.5
Site 62	381638122150501	Tulucay	3-13-01	.19	–6.96	–47.82	109	12.5
Murphy Creek (MC)	381739122140001	Tulucay	9-19-01	.10	–5.71	–39.34	130	15.0
Site 21	381743122161001	([1])	3-14-01	.01	–6.78	–47.41	498	13.0
Site 1	382024122145901	Sarco	4-12-01	.18	–6.89	–45.77	110	9.5
Site 2	382046122142501	Sarco	3-16-01	.83	–7.43	–47.16	90	9.5
Site 7A	381956122151101	Sarco	3-15-01	1.05	–7.41	–47.38	113	11.0
Site 7B	381956122151102	Sarco	3-15-01	.62	–6.63	–45.18	246	14.0
Site 9	381923122145701	Sarco	3-14-01	.43	–6.52	–44.21	462	13.5
Site 11	381922122162201	Sarco	3-15-01	2.34	–7.01	–46.38	210	11.5
			4-11-01	.13	–6.57	–44.55	270	12.5
Site 22A	381901122135201	Sarco	3-14-01	.08	–6.88	–47.92	488	13.0
Site 22B	381900122135101	Sarco	3-14-01	.15	–7.27	–48.81	213	12.0
Site 24	381849122132901	Sarco	3-14-01	.02	–7.29	–46.5	109	12.0
Site 26A	381922122141201	Sarco	3-14-01	.48	–6.79	–45.58	328	14.5
Site 26B	381922122141202	Sarco	3-14-01	.50	–7.50	–49.01	143	13.0
Site 28B	381925122140801	Sarco	3-14-01	.46	–7.58	–48.12	138	12.0
Site 51	381906122133501	Sarco	3-14-01	.07	–7.28	–48.24	128	12.0
Dairy Creek (DC)	381909122132701	Sarco	9-18-01	.04	–6.98	–45.36	97	14.5
Site 6A	382104122151401	Milliken	3-15-01	.03	–7.05	–44.99	119	11.5
Site 31	382139122150801	Milliken	3-15-01	46.2	–7.59	–48.59	61	10.0
			4-11-01	3.40	–7.12	–45.38	104	12.0
Site 33 (MCW)	382130122153501	Milliken	3-15-01	51.7	–7.62	–47.61	61	10.0
			4-11-01	2.40	–7.15	–44.57	107	12.0
			9-20-01	.43	–5.32	–37.72	172	15.5

See footnote at end of table.

Table 9. Field measurements and oxygen-18 and deuterium ratios in samples from streamflow- measurement stations, lakes and ponds, springs, and wells, southeastern Napa County, California, 2001–02—Continued

Station identifier or State well No. (abbreviated or local identifier)	USGS Identification No.	Subarea	Sample date	Instaneous streamflow (ft^3/s)	Delta oxygen-18 (per mil)	Delta deuterium (per mil)	Field measurements	
							Specific conductance (μS/cm)	Water temperature (°C)
Streamflow-measurement stations—Continued								
Site 35	381931122162901	Milliken	3-15-01	42.5	–7.54	–47.55	78	11.0
			4-12-01	3.25	–6.91	–43.88	153	11.0
Site 37 (MCH)	382017122161101	Milliken	4-11-01	3.13	–6.96	–43.32	156	13.0
			9-20-01	.46	–5.11	–37.51	184	18.0
Site 38	382031122155301	Milliken	3-15-01	43.4	–7.54	–48.08	71	10.0
			4-11-01	2.53	–6.93	–44.74	149	13.0
Lakes and ponds								
lower Lake Camille (LLC)	381638122151601	Tulucay	9-21-01		–1.92	–25.68	166	20.0
Maher pond (MP)	381752122132801	Tulucay	9-19-01		–.36	–19.42	220	—
Van Koten pond (VKP)	381934122150701	Sarco	9-18-01		4.04	–3.04	—	—
Silverado Country Club pond (SCCP)	382030122154201	Milliken	9-21-01		–6.75	–44.67	317	22.0
Lake Frey (LF)	381749122112101	([2])	1-15-02		–4.96	–37.66	64	9.5
Lake Leona (LL)	382041122122801	([2])	1-15-02		–7.00	–46.90	88	9.0
Lake Madigan (LM)	381829122113501	([2])	1-15-02		–4.95	–38.48	70	10.0
Lake Madigan outflow (LMO)	381829122113401	([2])	1-15-02		–5.00	–37.88	69	9.5
Springs								
Oak Canyon spring (OCS)	381848122131801	Sarco	1-16-02		–6.79	–44.25	98	11.5
Palmaz spring (PS)	381956122122701	Sarco	2-06-02		–7.10	–45.91	73	14.0
Wells								
5N/3W-6A1 (92)	381858122132601	Storage Unit 3	9-18-01		–7.59	–49.06	124	26.0
5N/3W-6N6 (61)	381814122143101	Storage Unit 1	11-06-01		–7.95	–53.23	1,220	23.0
5N/3W-7G2 (100)	381740122140001	Storage Unit 1	9-19-01		–6.83	–44.8	638	19.5
5N/3W-8E1 (22)	381746122133101	Storage Unit 1	9-19-01		–7.22	–47.68	356	21.5
5N/4W-1F3 (29)	381841122152401	Storage Unit 2	11-07-01		–6.27	–41.54	386	20.5
5N/4W-12G1 (14)	381740122150201	Storage Unit 1	11-06-01		–7.13	–47.35	564	20.0
5N/4W-13H3 (36)	381649122144901	Storage Unit 1	11-07-01		–6.12	–40.6	255	19.0
5N/4W-13J1 (19)	381646122145601	Storage Unit 1	11-08-01		–6.69	–42.46	248	23.5
6N/3W-31F4 (67)	381935122141601	Storage Unit 3	9-21-01		–7.29	–47.72	265	27.0
6N/4W-15R3 (76)	382135122165901	Storage Unit 4	11-08-01		–6.44	–42.28	269	20.0
6N/4W-23Q3 (43)	382050122160901	Storage Unit 3	9-20-01		–7.17	–47.58	402	21.5
6N/4W-25G2 (142)	382017122145801	Storage Unit 3	9-17-01		–6.93	–43.45	260	24.0
6N/4W-26G3 (45)	382018122161301	Storage Unit 3	9-20-01		–6.43	–42.52	404	17.5
6N/4W-36G1 (95)	381939122150401	Storage Unit 3	9-18-01		–7.26	–48.99	310	20.0
6N/4W-36R1 (53)	381905122145601	Storage Unit 2	11-05-01		–7.47	–50.58	428	26.0

[1]Outside of the Tulucay Creek subarea.
[2]Outside subarea in the Howell Mountains.

Table 10. Dissolved gas, chlorofluorocarbon (CFC), and tritium concentrations in samples from wells, and calculations of CFC concentrations in air and corresponding CFC-model age, southeastern Napa County, California, 2001

[State well No.: See well-numbering diagram on page ix. See figure 25 for locations of wells. Mean of CFC-laboratory measurements from three of five ampoules, unless otherwise noted, collected at each site; the remaining two ampoules used for quality control. N_2, nitrogen; Ar, argon; O_2, oxygen; CO_2, carbon dioxide; CH_4, methane; CFC, chlorofluorocarbon; H_2S, hydrogen sulfide. mg/L, milligram per liter; °C, degree Celsius; cm^3/L, centimeter cubed per liter; pg/kg, picogram per kilogram; TU, tritium units; pptv, parts per trillion by volume. —, no data]

State well No. (local well number in parenthesis)	Laboratory measurements											Calculated CFC concentrations in air			CFC-model age	
	Dissolved gas							CFC			Tritium concentration (TU)					
	N_2 [1] (mg/L)	Ar [1] (mg/L)	O_2 [1] (mg/L)	CO_2 [1] (mg/L)	CH_4 [1] (mg/L)	N_2/Ar temp. [1] (°C)	Excess air [1] (cm^3/L)	CFC-11 (pg/kg; mean)	CFC-12 (pg/kg; mean)	CFC-113 (pg/kg; mean)		CFC-11 (pptv)	CFC-12 (pptv)	CFC-113 (pptv)	Time of recharge and laboratory comments	Median ground-water age (years)
5N/3W-6A1 (92)	32.0	0.9	2.9	9.0	0.0	13.5	16.0	62.7	71.0	23.2	—	27.4	133.0	24.5	Late 1960s to early 1970s	31
5N/3W-6N6 (61)	27.0	.5	.0	4.8	14.7	[2] 90.7	24.9	1.6	42.0	.0	—	[2] .8	[2] 83.1	[2] .0	1950s or younger; CFCs probably degraded and degassed; high CH_4, H_2S	46
5N/3W-7G2 (100)	22.8	.8	.1	32.6	.0	10.2	5.5	1.1	19.6	.0	—	.4	31.6	.0	Mid to late 1950s; CFCs could be degraded	45
5N/3W-8E1 (22)	36.9	.9	.1	16.5	.0	15.3	21.7	21.1	35.1	6.1	.32	10.2	71.5	7.2	Mid 1960s to early 1970s	33
5N/4W-1F3 (29)	18.6	.7	3.2	4.1	.0	12.3	1.9	119.0	169.3	15.9	1.50	48.8	299.9	15.7	Late 1970s to early 1980s	21
5N/4W-12G1 (14)	23.6	.7	.0	1.7	1.0	23.3	10.2	1.7	9.8	.0	—	1.2	27.9	.0	Mid to late 1950s; CFCs could be degraded	45
5N/4W-13H3 (36)	21.7	.7	.7	41.0	.0	16.1	6.3	12.0	6.8	.0	.50	6.0	14.3	.0	Mid 1950s or younger; CFCs could be degraded	46
5N/4W-13J1 (19)	17.7	.6	.1	9.6	.0	17.8	2.7	[3] 19.0	[3]13.2	[3] 1.9	—	[3] 10.2	[3] 29.8	[3] 2.5	Late 1950s to early 1960s	41
6N/3W-31F4 (67)	20.9	.7	.1	4.4	.1	13.6	4.7	3.1	5.4	.0	—	1.4	10.1	.0	Early 1950s	50
6N/4W-15R3 (76)	21.4	.7	.1	15.7	.0	13.4	5.1	26.7	1,450.8	6.5	2.12	11.7	2,720.1	6.8	Early 1970s; excess CFC-12	30
6N/4W-23Q3 (43)	22.6	.6	.1	10.7	.0	24.2	9.4	4.9	9.0	.0	—	3.6	26.4	.0	Mid to late 1950s	45
6N/4W-25G2 (142)	21.1	.7	.1	6.9	.3	13.5	4.9	4.9	15.7	1.7	1.12	2.2	29.8	1.8	Mid 1950s; CFCs could be degraded	46
6N/4W-26G3 (45)	24.4	.7	.1	20.9	.9	20.8	10.5	3.8	76.7	2.3	—	2.4	197.6	3.5	Mid 1970s; CFCs probably degraded	26
6N/4W-36G1 (95)	21.5	.7	.1	30.5	.0	11.4	4.6	4.0	24.1	.0	.25	1.5	40.9	.0	Early 1960s	40
6N/4W-36R1 (53)	16.5	.6	3.6	.7	.0	21.8	2.6	[3] 122.4	[3]171.2	[3] 35.3	—	[3]79.8	[3] 459.2	[3] 58.0	Mid to late 1980s	15

[1]Mean of measurements for two samples collected at each site.

[2]The 30-year (1961–90) average air temperature at Napa, California (National Oceanic Atmospheric Administration, 2002); 14.7°C was used for this calculation.

[3]Mean of measurements from two ampoules; the third ampoule was "contaminated" (concentration greater than 2001 air) (Plummer and Busenberg, U.S. Geological Survey, written commun., 2002).

Table 11. Helium, hydrogen, and neon gas concentrations in water samples from wells, southeastern Napa County, California, 2001

[See figure 25 for location of wells. cc/g, cubic centimeter per gram; STP, standard temperature and pressure; He, helium; H_2, hydrogen; Ne, neon. —, no data]

State well No. (local well number in parenthesis)	Dissolved gas concentrations[1] (10^{-8} cc/g at STP)		
	He	H_2	Ne
5N/3W-6N6 (61)	534.3	3.8	—
5N/3W-7G2 (100)	29.8	74.5	22.6
5N/3W-8E1 (22)	27.7	74.6	28.0
5N/4W-12G1 (14)	96.7	6.6	—
6N/4W-26G3 (45)	255.3	26.4	—
6N/4W-36G1 (95)	20.6	1.9	31.0

[1]Mean for two samples collected at each site.

Reference 3

GENERAL INFORMATION REGARDING GROUNDWATER PERMITS FOR PROJECTS WITHIN THE MST GROUNDWATER DEFICIENT AREA
July 2005 (updated 2012)

The following are provided as general guidelines only for projects located within the Milliken-Sarco-Tulocay (MST) Groundwater Deficient Area (see attached map). These guidelines may be modified from time to time depending upon additional information that may become available to the County. The requirements for your specific project or situation may be different. Prior to the submittal of an application for a building permit for a structure or an erosion control plan for a new or expanded agricultural project within the MST groundwater basin you should consult the Department of Environmental Management regarding the possible need for the issuance of a groundwater permit, or if you are proposing a or new or expanded winery in the MST you should consult with the Conservation Development and Planning Department about a Use Permit or Use Permit modification. The following information applies to projects using groundwater located in the MST:

1. NO GROUNDWATER PERMIT REQUIRED (project considered exempt)

1. Additions and/or alterations to existing dwellings do not trigger a groundwater permit review. This includes bedroom and bathroom additions, additional living space, etc. Additionally, guest houses (no kitchen) do not trigger a groundwater review as they are considered "detached" bedrooms.
2. Replacement dwellings where an existing legal dwelling previously existed are included in the definition of a 'minor improvement' and are exempt from groundwater permit requirements.
3. Replacement wells are exempt; however the existing well must be destroyed.
4. Pools, if filled with hauled in water (from a source outside the MST) and if provided with a pool cover, do not trigger a groundwater review.
5. Agricultural land development less than or equal to a quarter (1/4) of an acre will not trigger a groundwater review.

2. MINISTERIAL GROUNDWATER PERMIT REQUIRED (project considered ministerial)

1. For parcels with no existing structures or agriculture: Applications for a single-family dwelling of any size (and may include a guest house) and the associated well and associated landscaping shall be issued a ministerial groundwater permit provided the applicant does the following: Limits the total water used on the parcel to 0.6 acre feet per year; meters the total water used on the parcel; and reports those water use numbers to the Department of Public Works as required.
2. For parcels with existing agricultural land development that wish to re-plant or re-develop: Applications for agricultural land re-development shall be issued a ministerial groundwater permit provided the applicant does the following: Limits the water use to an average of 0.3 acre feet of water per acre per year (calculated as the average water used over a three-year period with no yearly use exceeding the total average allotment by more than fifteen (15) percent); meters all wells serving the parcel to measure all groundwater used on the parcel; and reports all water use to the Department of Public Works as required.

3. GROUNDWATER PERMIT REQUIRED (project considered discretionary)

For parcels that do not meet the criteria for exemption or a ministerial permit:

To add any additional use (including, but not limited to, a second residence, a new or expanded vineyard, or a winery), an environmental assessment in the form of an initial study most likely leading to an EIR (Environmental Impact Report) will be required to be completed by the Conservation, Development Planning Department unless the applicant is able to prove that there will be "no net increase" in water consumption.

"No net increase" means that the applicant will have to show that no additional water will be used by the proposed use. This can be done by giving up an existing use, changing

practices to reduce the amount of water that is used by existing uses, or by bringing in water from outside of the MST in sufficient quantities to compensate for the new use. So-called "trucked in" water may only be used for agricultural activities.
If you are going to document an "existing use" that you wish to give up for a proposed new use, you must confer with the Department of Public Works and the Conservation Development, and Planning Department prior to submittal of a groundwater permit application. These departments will evaluate your proposal for accuracy (i.e. are the water use estimates reasonable based on the existing use), and will make an initial determination whether your claim of the existing use can be supported (i.e. is the use one that ceased in the last few years or is it an ongoing use, etc.).

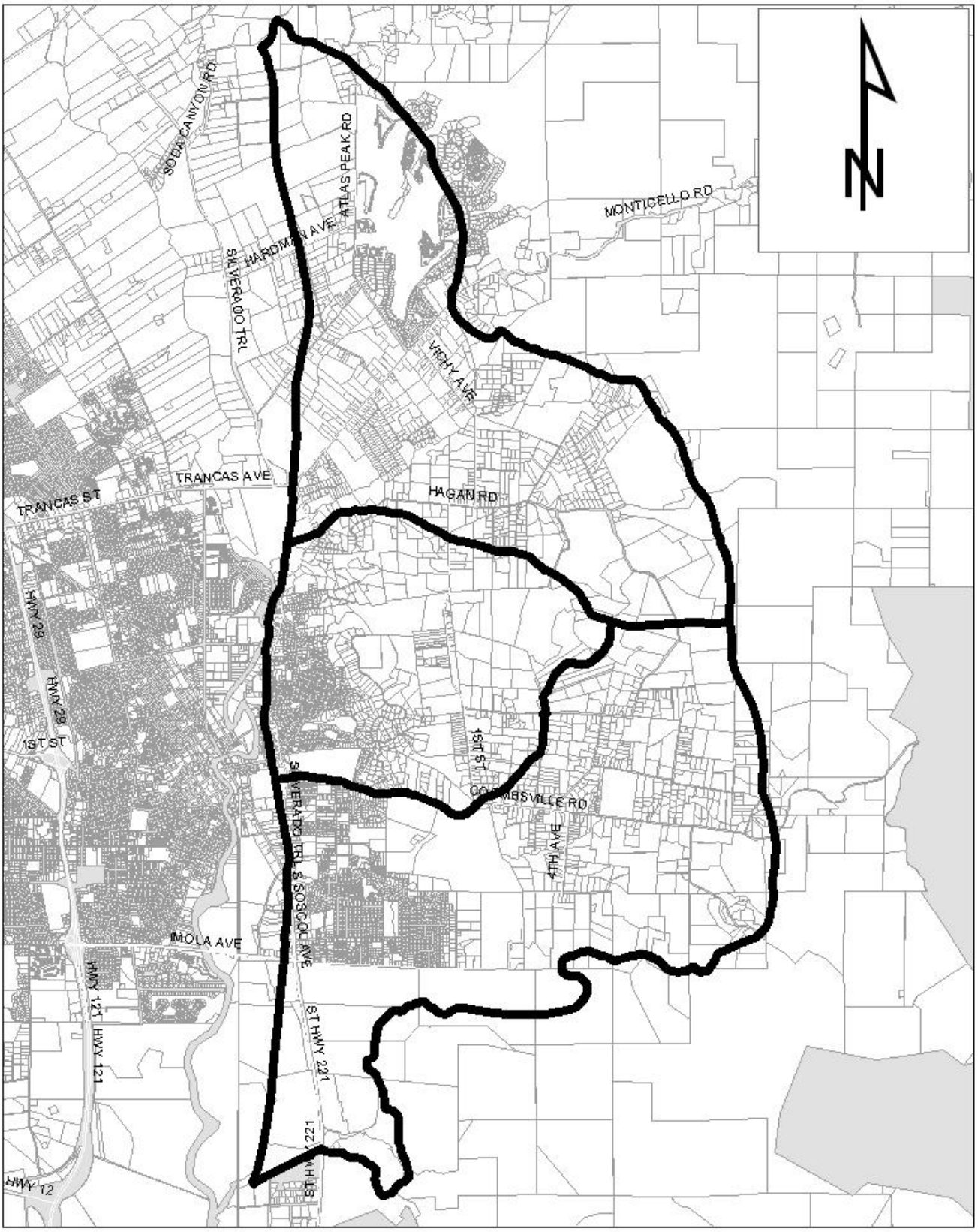
Along with the "no net increase" standard, applicants are also required to meet the "fair share" (0.3 acre-ft of groundwater/acre of land owned) specified in the Department of Public Works policy report.

The no net increase standard for CEQA review may be lifted by the Napa County Board of Supervisors when a plan (such as bringing a recycled water pipeline to the MST) is fully in place and operating.

GROUNDWATER PERMIT PROCESSING PROCEDURE

1. Ministerial Permits: Applications are available at the Department of Environmental Management. If your project meets the criteria for a ministerial permit, the application will be processed and the permit issued within a couple of days.

2. Discretionary Permits:
   - Applications and instructions are available at the Department of Environmental Management. Applications shall be returned with the required fees and certified list of adjoining property owners.
   - The complete application and all supporting material will be referred to the Department of Public Works for review of water use estimations and projections.
   - The application, along with the Department of Public Works analysis, is then referred to the Conservation, Development and Planning Department for environmental review.
   - Once the environmental review process has been completed, the environmental document is transmitted to the Department of Environmental Management for their review.
   - Following notice to the neighbors, and any requested public hearing (if a hearing request is not submitted, then no hearing is held), the groundwater permit is either issued or denied by the Department of Environmental Management.
   - Appeals to either an approval or denial of a groundwater permit application are submitted to the Napa County Board of Supervisors.



Map 13-1: Milliken Sarco Tulocay Groundwater Deficient Basin

Reference 4

RESOLUTION NO. 11-004

A RESOLUTION
OF THE BOARD OF DIRECTORS OF THE NAPA SANITATION DISTRICT TO PROVIDE POLICY FOR FUTURE ACTIVITIES ASSOCIATED WITH THE RECYCLED WATER PROGRAM

WHEREAS, the Napa Sanitation District and its ratepayers have invested significant funds to enable reliable compliance with its NPDES permit; and

WHEREAS, the Board of Directors desires to retain its NPDES permit for discharge to the Napa River but supports increasing water recycling for agricultural, urban and environmental uses; and

WHEREAS, the District has spent much time, effort and money on performing studies, completing designs and seeking funding for various expansion projects, but until recently did so without formal partnership with the beneficiaries of the expansion; and

WHEREAS, the District has determined that this approach would be more effective with partners committing to both sharing of project costs and the use of the recycled water; and

WHEREAS, the District has determined that the maximum amount of recycled water that can be treated and delivered to customers using existing treatment plant pond storage is between 3,700 and 4,600 acre-feet per year, and potential near-term demand for recycled water may be between 5,000 and 6,000 acre-feet per year; and

WHEREAS, existing treatment plant recycled water capacity is approximately 1,700 acre-feet per year; and

WHEREAS, the Wastewater Treatment Plant Master Plan identified phased capital projects to increase high quality recycled water capacity from 1,700 acre-feet per year up to a capacity that maximizes pond storage and plant influent; and

WHEREAS, the District desires to set priorities for the allocation of recycled water to potential users, based on existing commitments to users and input from potential users, and.

WHEREAS, there exist properties within the District's service area and near the District's existing recycled water system that either have not developed or have not yet connected to the District's recycled water system, but have or will be paying sewer service charges to the District that support the recycled water system, and

WHEREAS, the Board of Directors has deliberated various options for recycled water policies and received input from affected stakeholders in the region on this matter; and

WHEREAS, the Board of Directors desires to adopt various recycled water policies to provide direction to staff for future recycled water activities;

NOW THEREFORE BE IT RESOLVED, the Board of Directors of the Napa Sanitation District hereby authorizes and directs the implementation of the following policies for future recycled water activities:

1. The priorities for supply of available recycled water are set as follows, and are based on the planning information contained in Table 1, attached:
   (a) Current recycled water customers;
   (b) Parcels within the District's existing service area close to the District's existing recycled water system that either have not yet developed, or have already developed but not yet connected to the District's recycled water;
   (c) Parcels for which an agreement has been executed with the District committing recycled water in the future (e.g. MST);
   (d) Parcels that have been or will be required to use recycled water by local land use authorities or retail water suppliers; and
   (e) Parcels in areas where a recycled water delivery system has been studied and funding is being arranged for construction of piping (e.g. Los Carneros).

2. In order to maximize the availability of recycled water to the most customers, the District may require the user to store recycled water where feasible. The District may utilize pricing to encourage storage, discourage wasteful usage, and stretch water supply.

3. The District supports expansion of the recycled water system to areas outside the District's service area for the purpose of water supply, but the costs of expansion (such as studies, design, funding, construction and operation) cannot be solely the burden of the District's ratepayers. For new recycled water projects, the District may require an agreement addressing both funding of the costs of expansion and a commitment to use recycled water. The District will respect service boundaries of adjacent utilities and agreements executed with those utilities for the orderly provision of service.

4. Grant programs for the purpose of expanding recycled water to new customers will be pursued when a partnering agreement with that potential customer or beneficiary is in place.

5. The District, in partnership with Napa County, will continue pursuit of federal, state or other funding.

I hereby certify that the foregoing is a full, true and correct copy of a Resolution duly adopted and passed by the Board of Directors of the Napa Sanitation District, Napa County, California, on the 6th day of April, 2011, by the following vote:

AYES: GRAVETT, LUCE, SHINNAMON, TECHEL, VAN GORDER
NOES: NONE
ABSENT: NONE
ABSTAIN: NONE

Secretary, Napa Sanitation District
Napa County, California

APPROVED:

Chair

Table 1. Planning Information for Allocation of Summer Recycled Water

Type of User	Estimated Demand (acre-feet per year)	
Existing Uses/Commitments		
Existing Customers in Service Area	1,400	
Montelcino Golf Course (Somky)	300	
Valley Gate Vineyards & Kirkland Ranch	100	
MST (could be as little as 500 AF)*	700	
Los Carneros Water District*	450	
District Use (Jameson Ranch)	100	
SUBTOTAL EXISTING USES/COMMITMENTS		**3,050**
Probable Commitments		
Infill (Kennedy Park, Industrial Parks)*	250	
Napa State Hospital	200	
Stanly Ranch (St. Regis)	200	
SUBTOTAL PROBABLE COMMITMENTS		**650**
Other Areas Being Discussed in Near-Term		
Los Carneros Water District*	1,200	
Suscol Mountain Vineyards	150	
SUBTOTAL OTHER POSSIBLE AREAS		**1,350**
TOTAL PROBABLE DEMAND (acre-feet per year)		**5,050**

* This table includes changes made by the NSD Board of Directors since its initial adoption on April 6, 2011.

Reference 5

MINUTES OF THE REGULAR MEETING OF THE BOARD OF DIRECTORS OF THE NAPA SANITATION DISTRICT, NAPA COUNTY, CALIFORNIA, HELD AND CONVENED AT THE SOSCOL RECYCLED WATER FACILITY ADMINISTRATION OFFICE, WEDNESDAY, NOVEMBER 7, 2012 CALLED TO ORDER AT 3:03 PM.

1. **OPEN SESSION:**

2. ROLL CALL:

PRESENT: JILL TECHEL, Chair; MARK LUCE, Vice-Chair; MARK VAN GORDER (absent at roll-call, present at 3:07 p.m.), CHUCK GRAVETT and CHUCK SHINNAMON, Directors. ALSO PRESENT: TIMOTHY HEALY, General Manager, and JOHN BAKKER, Legal Counsel.

ABSENT: NONE.

3. REVIEW OF AGENDA: No Changes.

4. SAFETY MOMENT: "Driving Safety Tips"

5. PUBLIC COMMENT: None.

6. SPECIAL PRESENTATIONS: None.

7. REGULAR CALENDAR:

a. **Receive an update on the County's process and progress toward development of a Community Facility District to finance the recycled water pipeline in the MST area.**

Phil Miller, Napa County Deputy Director of Public Works, updated the Board on the County's process and progress. The County Board of Supervisors took action on October 23rd to move forward with creating a Community Facilities District (CFD). There are nine parcels (five owners) participating in the core group of the CFD. They will continue to solicit users to annex in at a later date. There are several options that will be considered on the project, such as possibly downsizing the pipe and the location and size of the pump station. The County will be applying for another federal grant to help with funding the project.

The Public Hearing for the formation of the CFD will be on December 4, 2012.

b. **MR 12-071:**
APPROVAL OF NAPA SANITATION DISTRICT REMAINING IN NBWRA PHASE 2 PROJECT AT AN ESTIMATED COST OF $71,664 FOR THE CURRENT FISCAL YEAR AND F/Y 2013/14, AND DIRECT STAFF TO STUDY ADDITIONAL PROJECTS THAT COULD BE INCLUDED IN THE PROJECT.

Motion by GRAVETT, seconded by VAN GORDER, by the following vote:

AYES: GRAVETT, LUCE, SHINNAMON, TECHEL, VAN GORDER
NOES: NONE
ABSENT: NONE
ABSTAIN: NONE

General Manager Healy updated the Board on the NBWRA Phase 2 project and budget. He reported on the Phase 1 project grants received and potential grants in the future. The District's probable Phase 2 project list currently has four projects. Healy reported NSD's portion of the study costs for the Phase 2 Scoping Study is approximately $71,664. The study is scheduled to start in January, 2013 and continue for 18 months. He discussed the potential benefits of the District participating in the Phase 2 Scoping Study. Discussion was held and the Board voted to participate in the Phase 2 Scoping Study, with direction to staff to look at adding possible storage projects to the study.

c. **MR 12-072:**
AUTHORIZE WILL-SERVE LETTER TO LOS CARNEROS WATER DISTRICT FOR 800 ACRE FEET OF RECYCLED WATER IN WINTER MONTHS, 100-150 ACRE FEET RECYCLED WATER IN SUMMER MONTHS, AND DIRECTION TO GENERAL MANAGER TO DISCUSS WITH MANAGEMENT STAFF LOS CARNEROS' REQUEST FOR 500 ACRE FEET OF EXCESS RECYCLED WATER COMMITTED TO MST IF THE WATER IS NOT USED BY MST. GENERAL MANAGER TO PREPARE THE PROPOSED WILL-SERVE LETTER AND REVIEW IT WITH BOARD CHAIR PRIOR TO ISSUANCE.

Motion by GRAVETT, seconded by SHINNAMON, by the following vote:

AYES: GRAVETT, LUCE, SHINNAMON, TECHEL, VAN GORDER
NOES: NONE
ABSENT: NONE
ABSTAIN: NONE

General Manager Healy updated the Board on the Will-Serve request from Los Carneros Water District (LCWD). Healy reported that staff has taken another look at the committed recycled water numbers. LCWD requests 800 AF of water in the winter months, and 100 AF, or more if available, of water in the summer months. Also, they request to have first option to purchase any additional summer water that MST does not need. Discussion was held with the Board and staff. Board

requested further discussion in the spring in regards to the additional 500 AF of recycled water requested by LCWD.

d. **RES. 12-018:**
ADOPT RESOLUTION AUTHORIZING THE EXECUTION AND DELIVERY OF REFUNDING REVENUE CERTIFICATES OF PARTICIPATION, AN OFFICIAL STATEMENT AND APPROVING THE EXECUTION AND DELIVERY OF CERTAIN DOCUMENTS IN CONNECTION THEREWITH AND CERTAIN OTHER MATTERS, AS REVISED IN PARAGRAPH 11.

Motion by GRAVETT, seconded by SHINNAMON, by the following vote:

AYES: GRAVETT, LUCE, SHINNAMON, TECHEL, VAN GORDER
NOES: NONE
ABSENT: NONE
ABSTAIN: NONE

Jeff Tucker, Director of Administrative Services, gave an update on the refinancing of the District's variable rate debt and issuance of new debt for projects. The proposed resolution authorizes the execution and delivery of refunding revenue Certificates of Participation and associated agreements. The proposed schedule after authorizing staff to move forward with the bond sale includes staff presentation to Standard & Poor's for bond rating on November 14, 2012; Napa Sanitation Board makes CEQA determination on new projects on December 5, 2012; the bond pricing on December 13, 2012; and the closing/funding on December 20, 2012. Board held discussion and requested a minor revision to the resolution in paragraph 11, deleting "secretary" and "or the designee and any other proper officer of the District".

8. CONSENT CALENDAR:

a. **MR 12-073:**
APPROVAL OF MINUTES FROM THE REGULAR BOARD MEETING ON OCTOBER 17, 2012.

b. **Receive County of Napa Voucher Register Dated 10/02/12 through 10/22/12.**

c. **MR 12-074:**
CANCEL THE REGULAR BOARD MEETING ON NOVEMBER 21, 2012 DUE TO LACK OF BUSINESS.

d. **MR 12-075:**
AUTHORIZE THE GENERAL MANAGER TO AWARD TASK ORDER TO KNN PUBLIC FINANCE FOR $125,000, PLUS $5,000 FOR REIMBURSABLE EXPENSES, TO PROVIDE FINANCIAL ADVISOR SERVICES FOR THE NEW SERIES 2012A CERTIFICATES OF PARTICIPATION, REFINANCING OF THE SERIES 2009A VARIABLE

RATE DEBT AND ISSUANCE OF NEW DEBT FOR NEW CAPITAL PROJECTS.

e. **MR 12-076:**
AUTHORIZE THE CHAIR TO EXECUTE AMENDMENT #4 TO THE FUNDING AGREEMENT BETWEEN THE COUNTY OF NAPA AND THE NAPA SANITATION DISTRICT RELATED TO NBWRA MEMBERSHIP, ARRA GRANT FUNDING, AND REIMBURSEMENT OF EXPENSES FOR CONSTRUCTION OF THE RECYCLED WATER PIPELINE FROM NAPA STATE HOPSITAL TOWARD SKYLINE PARK (CIP 5506A) AND THE DESIGN OF THE MST RECYCLED WATER PIPELINE (CIP 5507).

f. **MR 12-077:**
AUTHORIZE THE GENERAL MANAGER TO EXECUTE TASK ORDER NO. 7 WITH RMC WATER & ENVIRONMENT TO PROVIDE ADDITIONAL PROFESSIONAL SERVICES TO FINALIZE THE DESIGN OF THE MST RECYCLED WATER PIPELINE PROJECT (CIP 5507) IN THE AMOUNT OF $483,967.

g. **RES 12-019:**
ADOPT RESOLUTION ACCEPTING COMPLETION AND DIRECTING GENERAL MANAGER/DISTRICT ENGINEER TO FILE THE NOTICE OF COMPLETION AT THE OFFICE OF THE RECORDER, NAPA COUNTY, CALIFORNIA FOR THE FOG RECEIVING AND INJECTION FACILITY PROJECT (CIP 13734 PREVIOUSLY CIP 3008).

h. **Receive General Manager's Report for September, 2012.**

9. GENERAL MANAGER'S REPORT:

a. None.

10. LEGAL COUNSEL REPORT:

a. None.

11. UPCOMING MEETINGS:

a. NBWRA Board meeting – November 19, 2012
b. Regular Board meeting – November 21, 2012 - cancelled
c. Regular Board meeting – December 5, 2012
d. Regular Board meeting – December 19, 2012
e. Regular Board meeting – January 2, 2013 (may cancel)

12. BOARD OF DIRECTORS REPORTS/GENERAL DISCUSSIONS:

a. North Bay Watershed Association (11/02/12) – Vice-Chair Luce attended. Discussion was held on geomorphology.

b. Director Shinnamon congratulated the board members who ran for office in the recent election.

13. ADJOURN TO CLOSED SESSION: (4:35 p.m.)

a. PUBLIC EMPLOYEE APPOINTMENT
Title: Plant Manager

b. CONFERENCE WITH LABOR NEGOTIATORS
Agency designated representatives: Timothy Healy, General Manager
Unrepresented employee: Prospective Plant Manager

14. RECONVENE TO OPEN SESSION: (5:05 p.m.)

15. REPORT FROM LEGAL COUNSEL ON CLOSED SESSION: (5:05 p.m.)

Legal counsel reported that the Board took no reportable action in closed session.

16. ADJOURNMENT: (5:05 p.m.)

There being no further business, the meeting was adjourned at 5:05 p.m. to meet again on Decemb er 5, 2012 for a Regular Meeting at the Napa Sanitation District Recycled Water Facility, 1515 Soscol Ferry Road, Napa, California.

_____
CHAIR

ATTEST:

_____
Clerk of the Board

Reference 6

MINUTES OF THE REGULAR MEETING OF THE BOARD OF DIRECTORS OF THE NAPA SANITATION DISTRICT, NAPA COUNTY, CALIFORNIA, HELD AND CONVENED AT THE SOSCOL RECYCLED WATER FACILITY ADMINISTRATION OFFICE, WEDNESDAY, MARCH 6, 2013 CALLED TO ORDER AT 4:03 PM.

1. **OPEN SESSION:**

2. ROLL CALL:

PRESENT: JILL TECHEL, Chair; PETER MOTT, CHUCK GRAVETT and CHUCK SHINNAMON, Directors; and KEITH CALDWELL, Alternate Director. ALSO PRESENT: TIMOTHY HEALY, General Manager, and JOHN BAKKER, Legal Counsel.

ABSENT: MARK LUCE, Director.

3. REVIEW OF AGENDA: No Changes.

4. SAFETY MOMENT: "Sleep Awareness"

5. PUBLIC COMMENT: None.

6. SPECIAL PRESENTATIONS: None.

7. CONSENT CALENDAR:

a. **MR 13-017:**
APPROVAL OF MINUTES FROM THE REGULAR BOARD MEETING ON FEBRUARY 20, 2013.

b. **Receive County of Napa Voucher Register Dated 2/05/13 through 2/18/13.**

c. **MR. 13-018:**
CANCEL THE REGULAR BOARD MEETING ON APRIL 3, 2013 DUE TO LACK OF BUSINESS.

d. **Receive General Manager's Report for January, 2013.**

Motion by GRAVETT, seconded by SHINNAMON, by the following vote:

AYES: GRAVETT, CALDWELL, SHINNAMON, TECHEL, MOTT
NOES: NONE
ABSENT: NONE
ABSTAIN: NONE

8. REGULAR CALENDAR:

a. **MR 13-019:**
AUTHORIZE WILL SERVE LETTER TO LOS CARNEROS WATER DISTRICT FOR RECYCLED WATER DELIVERY IN THE SUMMER MONTHS FOR AN ADDITIONAL 300 ACRE FEET GREATER THAN THEIR CURRENT WILL SERVE LETTER, CONDITIONED UPON A SUCCESSFUL "YES" VOTE IN THE LCWD TO OVERSIZE THE PIPELINE UNDER THE NAPA RIVER, ACTUAL CONSTRUCTION OF THE UPSIZED PIPELINE, AND A SUCCESSFUL VOTE TO FINANCE AND CONSTRUCT A RECYCLED WATER DISTRIBUTION NETWORK WITHIN THE LCWD BOUNDARIES. STANDARD CONDITIONS OF RECYCLED WATER DELIVERY APPLY.

Motion by GRAVETT, seconded by SHINNAMON, by the following vote:

AYES: GRAVETT, CALDWELL, SHINNAMON, TECHEL, MOTT
NOES: NONE
ABSENT: NONE
ABSTAIN: NONE

General Manager Healy informed the Board that staff recommends they authorize issuance of a Will-Serve letter for up to 300 acre feet of additional recycled water to LCWD and reduce the amount allocated to MST by the same amount. The will-serve letter would be conditioned upon a successful "yes" vote in the LCWD to oversize the pipeline under the Napa River and the actual construction of the upsized pipeline, and a successful vote to finance and construct a recycled water distribution network in the LCWD boundaries. The will-serve letter would also contain the standard conditions that recycled water is delivered within three years and that the full allocation is used within five years of the issue date.

b. **Consider CASA Spring Conference Attendance to be held in Newport Beach, CA on April 24-26th.**

Staff has reserved hotel rooms tentatively for all Board members. Board members will let the Clerk know whether they will be attending the conference or not.

c. **Discuss Board's overall goals for District, and provide direction to staff.**

The Board held a priority and goal setting workshop, facilitated by Daniel Iacofano of MIG. In March of 2011, the Board held a similar workshop which resulted in the District's current Strategic Plan. The workshop allowed the Board to discuss the current direction of the District, identify new opportunities and

issues, and update the priorities for the District. General Manager Healy discussed the District's accomplishments to date. Mr. Iacofano discussed current issues, challenges and opportunities for the District. He reviewed the District's current goals and their status. The Board held discussion on their current priorities and proposed plan of action. Mr. Iacofano will prepare an overview of the Board's discussions and priorities that staff will use to prepare an updated draft Strategic Plan for the Board's consideration.

9. GENERAL MANAGER'S REPORT:

a. None.

10. LEGAL COUNSEL REPORT:

a. None.

11. BOARD OF DIRECTORS REPORTS/GENERAL DISCUSSIONS:

a. None

12. UPCOMING MEETINGS:

a. Regular Board meeting – March 20, 2013
b. NBWRA Board meeting – March 25, 2013
c. Regular Board meeting – April 3, 2013 (cancelled)
d. Regular Board meeting – April 17, 2013
e. Regular Board meeting – May 1, 2013

13. ADJOURNMENT: (7:23 p.m.)

There being no further business, the meeting was adjourned at 7:23 p.m. to meet again on March 20, 2013 for a Regular Meeting at the Napa Sanitation District Recycled Water Facility, 1515 Soscol Ferry Road, Napa, California.

_____
CHAIR

ATTEST:

_____
Clerk of the Board

Reference 7

CHAPTER 16
GROUNDWATER HYDROLOGY

GROUNDWATER WELL, PUMP, AND DISTRIBUTION PIPES

UPDATE CHRONOLOGY

NOVEMBER 30, 2005—VERSION 1

PURPOSE

This chapter summarizes the basic groundwater hydrology of Napa County and documents the construction of a local integrated groundwater model. The groundwater hydrology analysis and model development were designed to establish a baseline of existing conditions to support countywide programs.

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LIST OF ACRONYMS AND ABBREVIATIONS

3-D	three dimensional
ac-ft	acre-feet
ac-ft/yr	acre feet per year
BDR	Napa County Baseline Data Report
CB	Carneros Groundwater Basin
CB	Carneros Basin
CEQA	CEQA
DHI	DHI Water & Environment
EPA	U.S. Environmental Protection Agency
ft	feet
gpm	gallons per minute
K	hydraulic conductivity
K	spatial distribution of hydraulic conductivity
MIKE SHE	3-Dimensional Groundwater Model
MIKE SHE/MIKE11	3-Dimensional Groundwater Model
MST	Milliken-Sarco-Tulocay
MSTB	Milliken-Sarco-Tulucay Groundwater Basin
NNVB	North Napa Valley Groundwater Basin
PCG	preconditioned conjugate gradient
RWQCBs	Regional Water Quality Control Boards
S	storage coefficient
SWRCB	State Water Resources Control Board
S_y	specific yield
USGS	U.S. Geological Survey

INTRODUCTION

This chapter of the Napa County Baseline Data Report (BDR) describes the baseline conditions for groundwater hydrology of Napa County (County). In addition to summarizing the hydrogeologic system, this chapter documents the construction of a local integrated surface water and groundwater model developed for the BDR for areas where groundwater is a significant resource.

Groundwater hydrologic analysis and modeling were conducted with the intention of applying the model and analysis for future planning.

This chapter describes the groundwater component of the hydrologic cycle in Napa County, documents the groundwater system, and describes the methods used to determine existing groundwater hydrology and the policies that apply to groundwater in Napa County. In addition, this chapter details the approach and data used in developing a local integrated surface water and groundwater model. As the focus of this chapter is groundwater and the saturated zone, this analysis is complementary and builds on the general surface water hydrology discussion presented in Chapter 15, *Surface Water Hydrology*, of the BDR. A supporting technical report (*Napa BDR Groundwater Hydrology Modeling Report*) includes a more complete documentation of the groundwater model construction, calibration, sensitivity analysis, and presentation of results. Consulting hydrologists from DHI Water & Environment led the surface hydrology, groundwater, and water quality tasks of the BDR (Chapters 15, 16, and 17, respectively), working collaboratively with other specialists from the Jones & Stokes/EDAW project team.

PURPOSE

The groundwater hydrologic analyses and modeling efforts conducted in support of the BDR were undertaken with the explicit intention of applying the models and analyses toward future planning considerations. More specifically, the surface water hydrology (see Chapter 15), groundwater (this chapter), and surface water quality (see Chapter 17) studies supporting the BDR were designed to establish baseline conditions by which Countywide planning programs could be assessed and evaluated for their benefits, constraints, and environmental impacts.

SPECIALIZED TERMS USED

- *Aquifer:* A permeable body of rock capable of yielding quantities of groundwater to wells and springs.
- *Alluvial aquifer:* Aquifer of water-bearing sand and gravel typically found near lakes, streams, and rivers, deposited by a stream and retainsinga hydraulic connection with the depositing stream.
- *Confined aquifer:* An aquifer that is bound above and below by impermeable layers of rock and that contains water under pressure.
- *Unconfined aquifer:* An aquifer without an upper confining layer of impermeable soil or rock material. The water table is exposed to the atmosphere through a series of interconnected openings in the overlying permeable soil and/or rock layers and is in equilibrium with atmospheric pressure.
- *Acre-foot (ac-ft):* The volume of water required to cover one acre of land to a depth of one foot (43,560 cubic feet or 325,851 gallons). An acre-foot can be visualized as water a foot deep, covering an area about the size of a football field.
- *Artesian well:* A well into water held under pressure in porous rock or soil, confined by impermeable geologic formations. Under this pressure, an artesian well is free-flowing to the surface.
- *Darcy's Law:* An equation that can be used to compute the quantity of water flowing through an aquifer, which describes the flow rate of water through porous materials as proportional to the hydraulic gradient. The constant of proportionality is the hydraulic conductivity.
- *Drawdown:* The drop in the water table or level of water in the ground when water is being pumped from a well.
- *Groundwater basins:* A groundwater reservoir defined by all the overlying land surface and the underlying aquifers that contain water stored in the reservoir. Boundaries of successively deeper aquifers may differ and make it difficult to define the limits of the basin.
- *Groundwater recharge:* Process where water enters the soil and eventually reaches the saturated zone. Groundwater recharge can occur through natural means (precipitation, streamflow) or human enhanced means (injection, etc.).
- *Groundwater:* Subsurface water occupying the pores and voids of the saturated zone and moving under the force of gravity. In many instances, groundwater is an important source of well water for domestic and agricultural use.
- *Hydraulic conductivity:* A measure of the capacity of a substance to allow water to flow through it.
- *Interflow:* That part of the precipitation which infiltrates the surface soil and moves laterally through the upper soil horizons above the water table toward surface waters. Also called subsurface runoff or shallow subsurface flow.
- *Losing streams:* Streams that lose water over their downstream course as they supply water to groundwater basins through infiltration from their beds.
- *Permeability:* The ability of a material to allow the passage of a liquid, such as water, through rocks. Permeable materials, such as gravel and sand, allow water to move quickly through them, whereas impermeable materials, such as clay, do not allow water to flow freely.

- *Potentiometric surface:* The potential level to which water will rise above the aquifer's water level in a well that penetrates a confined aquifer; if the potential level is higher than the land surface, the well will overflow.
- *Safe yield volumes:* The annual amount of water that can be taken from a source or supply over a period of years without depleting that source beyond its ability to be replenished naturally in "wet years."
- *Specific yield:* Specific storage, storativity and specific yield (S_s, S and S_y) are aquifer properties; they are measures of the ability of an aquifer to release groundwater from storage, due to a unit change in hydraulic head. These properties are often determined in hydrogeology using an aquifer test.

POLICY CONSIDERATIONS

The following federal, state, and local policies and agencies are pertinent to and involved in management of groundwater in Napa County.

FEDERAL POLICIES

There are no applicable federal policies regulating groundwater in Napa County. In California, the State Regional Water Quality Control Boards set beneficial uses and water quality objectives for groundwater, usually consistent with Title 22 of the California (state) drinking water standards.

STATE POLICIES

GROUNDWATER RIGHTS

Groundwater rights in California are similar to surface water rights (see Chapter 15, *Surface Water Hydrology*, of the BDR); however, no permit system or comprehensive regulatory method exists. The exception is groundwater deemed to be part of a subterranean stream or underflow that is hydraulically connected to a surface water body. In such cases, the source is classified as surface water and remains subject to the permitting authority of the State Water Resources Control Board (SWRCB) (discussed in detail in Chapter 15). Groundwater law is primarily expressed through previous legal decisions, and disputes among groundwater users are usually settled through judicial actions or adjudications.

There are two main types of groundwater rights: overlying and appropriative.

OVERLYING RIGHTS

Overlying rights apply to parcels that overlie a groundwater basin. Overlying rights are analogous to riparian rights for surface water. Overlying users do not have priorities with respect to one another, and each holder has a right to a reasonable share of the total groundwater supply available. Overlying rights may be active or dormant, and are generally senior to appropriative rights (defined below). Note that water devoted to public uses (e.g., municipal water supply systems) is considered in most cases to be an appropriative use, rather than an overlying use, regardless of the location of the water use with respect to the aquifer.

> There are two main types of groundwater rights: overlying and appropriative. Overlying rights apply to parcels that overlie a groundwater basin. Appropriative rights apply to groundwater extractions used on lands that do not overlie the aquifer in question.

APPROPRIATIVE RIGHTS

Appropriative rights apply to groundwater extractions used on lands that do not overlie the aquifer in question. Appropriate rights are analogous to appropriative rights for surface water. Appropriative rights are protected by the construction and use of a well, and putting the pumped water to reasonable and beneficial use. These rights are subject to a seniority system, where the appropriative right holder with the longest standing right has first priority to groundwater in a condition of shortage.

GROUNDWATER QUALITY

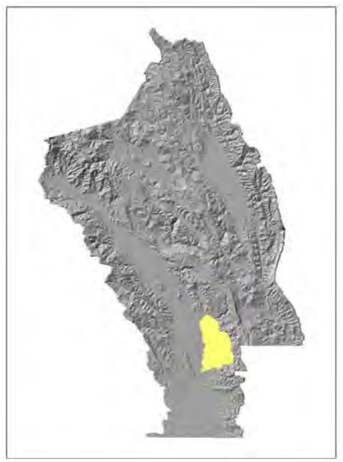
Groundwater quality is regulated through the federal Clean Water Act and State Porter-Cologne Act, and administered by the U.S. Environmental Protection Agency (EPA), the SWRCB, and local Regional Water Quality Control Boards (RWQCBs). These laws and associated regulations are discussed in Chapter 17, *Surface Water Quality*, of the BDR. Additional regulatory authority is exercised by the RWQCB and California Department of Health Services regarding standards for installation, use, and abandonment of wells and septic systems, to ensure that drinking water standards and other water quality criteria are met and beneficial uses of the aquifer are maintained.

> Groundwater quality is regulated through the federal Clean Water Act and State Porter-Cologne Act. Additional regulatory authority is exercised by the Regional Water Quality Control Board and California Department of Health Services.

LOCAL POLICIES

NAPA COUNTY DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

The County's Department of Environmental Planning is responsible for multiple issues related to groundwater in the County, including toxic site cleanup, management of groundwater quality, and permitting of underground storage tanks. The department enforces the Safe Drinking Water Act, per agreement with the California Department of Health Services, Division of Drinking Water and Environmental Management. For more information on the Department of Environmental Management's



Milliken-Sarco-Tulocay Groundwater Basin

The Milliken-Sarco-Tulocay area is a groundwater deficient area. Due to the sensitive nature of the MST groundwater basin, the County requires special consultation to determine the need for a groundwater permit.

Analysis of the Napa County's groundwater system involved construction of a spatially referenced numerical model. Following initial data collection, a conceptual model was developed to describe groundwater functioning and identify significant hydrologic variables. This two-step process provided the basis for developing a valid mathematical model.

oversight of groundwater, see the County's website: http://www.co.napa.ca.us/GOV/Departments/DeptPage.asp?DID=40500&LID=984).

GROUNDWATER ORDINANCE

The Napa County Board of Supervisors adopted a groundwater ordinance in 1996, revised in 2003, to regulate the extraction, use, and preservation of the County's groundwater resources. Compliance with this ordinance applies to development of new water systems or improvements to an existing water system that may use groundwater. Specifically, the ordinance applies to agricultural land development or re-development activities located on parcels within groundwater deficient areas, including the Milliken-Sarco-Tulocay (MST), Pope Valley, Chiles Valley, Capell Valley, and Carneros groundwater basins. The ordinance identifies issuance of groundwater permits based on three types of applications—exempt, ministerial, and required—and the process by which compliance with the ordinance is determined. Applications for a groundwater permit require identification of existing and future uses of any existing water system which is supplied by groundwater, potential alternative water sources, the number of existing and future connections, intent of groundwater use, and an assessment of the potential impacts to the affected groundwater basin. Because groundwater resources are highly valued in the County, further guidance for activities conducted within the MST groundwater deficient area have been developed, as detailed below.

GUIDELINES FOR PROJECTS WITHIN THE MILLIKEN-SARCO-TULOCAY GROUNDWATER DEFICIENT AREA

The Milliken-Sarco-Tulocay area is a groundwater deficient area. Due to the sensitive nature of the MST groundwater basin, the County requires special consultation to determine the need for a groundwater permit. This particularly applies to construction projects, erosion control plans for new or expanded agricultural projects, and new or expanded wineries that intend to use groundwater from the MST basin. Depending on the governing authority (either the Environmental Management or Conservation Development and Planning Department), the appropriate department will determine which of the following three situations is applicable to the proposed project and its potential effect on the MST groundwater basin.

- No groundwater permit is required.
- A ministerial groundwater permit is required.
- A groundwater permit is required.

A groundwater permit would not be required if agricultural land development is less than or equal to a 0.25 acre, for additions or alterations to existing dwellings, or for swimming pools that are not filled with water from the MST.

Ministerial groundwater permits for new residential units and agricultural land re-development require compliance with water use conditions. For new residential units, the total amount of water used on the parcel must be less than 0.6 acre feet per year (ac-ft/yr). Re-development of agricultural land must limit the total water use on the parcel to an average of 0.3 acre feet per acre per year calculated as an average over a three-year period, with no yearly use exceeding the total average by more than 15%. All water use must be reported to the Department of Public Works under both types of development where a ministerial groundwater permit is issued.

Groundwater permits are issued upon compliance with the "no net increase" and "fair share" standards. The "no net increase" standard encourages applicants to reduce their impact on the MST by giving up an existing groundwater use, changing practices to reduce consumption, or by importing water from outside the MST (only applies for agricultural activities). If the additional water required by the proposed use would not meet the "no net increase" standard, the Planning Department or applicant must conduct a California Environmental Quality Act (CEQA) review to assess the potential environmental impacts of the proposed use. Additionally, the proposed use must comply with the "fair share" standard that no more than 0.3 acre-feet (ac-ft) of groundwater per acre of land owned is used.

METHODOLOGY

DEFINITION OF STUDY AREA

The study area for the analysis of groundwater hydrology is all of Napa County.

GENERAL APPROACH

Analysis of the Napa County's groundwater system (as a component of the hydrologic cycle) involved a literature review, data analysis, and construction of a spatially referenced numerical model. Extensive research was conducted to provide a scientific and valid basis for understanding the groundwater resources of Napa County. Sources for information included but were not limited to local, state, and federal agency reports and data; publicly available data; university research studies; professional engineering and geology reports; privately collected water-use data from throughout the County; and personal communication with various groundwater specialists. A more complete list of sources can be found in the References section below.

Following initial data collection, the main features and driving forces of the groundwater hydrologic system were identified and a conceptual model was developed to describe groundwater functioning and to identify any significant hydrologic variables that would be required in the numeric model. This two-step process of data collection and conceptual model development provided the basis for developing a valid mathematical model.

Consistent with the description of model selection in Chapter 15, *Surface Water Hydrology*, the numerical model selected to simulate the hydrologic cycle in Napa County is based on the MIKE SHE/MIKE11 code developed by DHI Water & Environment (2005). The MIKE SHE/MIKE11 code has the capability to simulate the major flow components of the hydrologic cycle, including an integrated surface water and groundwater component, which makes the model very well suited for simulating current and future water distribution in Napa County. A more detailed description of the model's capabilities and data requirements is provided in Chapter 15, *Surface Water Hydrology*. A specific discussion of the groundwater module's computational algorithms and outputs is presented in the section *3-Dimens*ional Groundwater Model, below, or can be viewed at http://www.dhisoftware.com/mikeshe/ (DHI Water & Environment n.d.)

EXISTING STUDIES AND DATA SOURCES

DHI reviewed hydrogeologic reports and studies within Napa County. Of the reports reviewed, only one provided a comprehensive overview of the hydrogeology of the entire County. One study described the development of a numerical hydrogeologic model that simulates groundwater flow on a regional scale; however it only covered a limited portion of Napa County. The documents reviewed provide valuable guidance in understanding the hydrogeologic system in Napa County and were used in the development of the local integrated surface water and groundwater models for the areas where groundwater is a significant and valued resource.

GROUNDWATER RESOURCES STUDIES

Water Resource Study for the Napa County Region (Napa County Flood Control and Water Conservation District 1991) provides an overview of the groundwater hydrology in Napa County within the context of an examination of the current and future water use needs for the County. The report used data collected from the review of the County's general plan, master water supply plans, water management plans, agricultural land use practices, historic water production and metered sales records, historical and projected population data, and land use maps and data, as well as consultation with various agency personnel. The report provides a comprehensive overview of the agricultural, domestic, commercial, municipal, and industrial uses of water; and information regarding locations and volumes of groundwater pumping occurring throughout the County. The report also provides some basic descriptive information for each of the major groundwater basins identified in the County.

Ground-Water Hydrology of the Lower Milliken-Sarco-Tulucay Creeks Area, Napa County California by the U.S. Geological Survey (USGS) (Johnson 1977) discusses the water-bearing properties of the various hydrogeologically significant geologic formations in the Milliken-Sarco-Tulucay Groundwater Basin (MSTB). The report also discusses the occurrence, movement, recharge, discharge, water-level fluctuations, ground-water storage capacity, and changes in groundwater storage in the MSTB.

Ground-Water Resources in the Lower Milliken-Sarco-Tulucay Creeks Area, Southeastern Napa County California, 2000-2002 (Farrar and Metzger 2003) is a more recent update to the 1977 USGS study discussed above. The report discusses recharge to the aquifers in the MSTB in terms of an analysis of streamflow gains and losses, and discharge from the aquifers in terms of groundwater pumping and groundwater underflow. Groundwater levels and groundwater movement are evaluated in terms of annual, seasonal, and long-term changes in levels and flow directions. The report provides numerous datasets, including maps of the potentiometric surfaces in the aquifers, and stratigraphic information in the form of hydrogeologic cross sections.

Geology and Groundwater in Napa and Sonoma Valleys, Napa and Sonoma Counties California (Kunkel 1960) provides information on the water-bearing properties of the various geologic formations in the Napa Valley. The report discusses the groundwater hydrology of each of the significant groundwater reservoirs in the Napa Valley in terms of the groundwater abstractions, fluctuations in water levels, and storage capacities. Also included are estimates of total groundwater pumpage from wells in the Napa Valley, volume estimates of the alluvium at various depth intervals, average specific yield and groundwater storage capacities, water-level measurements and water-table maps, and driller's logs of wells developed in the Napa Valley.

Ground-Water Hydrology of Northern Napa Valley California (Faye 1973) provides information on the water-bearing properties of the various geologic formations in the northern Napa Valley. The report discusses the groundwater hydrology of each of the significant water-bearing deposits in terms of the spatial and hydrologic properties, recharge and discharge, fluctuations in water levels and streamflows; and the response of these factors to precipitation inputs. The report also documents the construction and calibration of a simple steady-state and transient mathematical groundwater flow model of the alluvial aquifer in the northern portion of the Napa Valley.

Historical Groundwater Levels in Napa Valley (California Department of Water Resources 1995) gives a summary of groundwater level data collected in the Napa Valley through 1994. It includes the locations of wells, information related to a monitoring program, hydrographs depicting changes in groundwater levels over time, and a tabulation of groundwater level measurements for 139 wells in the valley.

A series of USGS reports from 1973 are available, which contain data for selected wells within the Napa (Bader and Svitek 1973a), St. Helena (Bader and Svitek 1973b), Rutherford (Bader and Svitek 1973c), Yountville (Svitek 1973), and Calistoga (Svitek and Bader 1973) quadrangles. These reports provide a description of the wells located in each quadrangle as well as water-level records, driller's logs, pumping test results, and groundwater pumpage data for each well.

GEOLOGIC CONTEXT FOR GROUNDWATER

This section provides a general overview of the geology that is important to understanding groundwater resources in Napa County. A more complete discussion of the Napa County geology is presented in Chapter 1, *Geological Resources*, of the BDR.

Water Resource Study for the Napa County Region (Napa County Flood Control and Water Conservation District 1991) provides an overview of the groundwater hydrology in Napa County within the context of an examination of the current and future water use needs for the County.

GEOLOGIC STRUCTURE

The Napa Valley and the smaller basins in Napa County are typically structural troughs formed by folding and faulting associated with the transformation of a subduction zone into the strike-slip movements of the San Andreas and related faults (Howell and Swinchatt 2000). These basins are 1–2 million years old, and have a northwestward trend typical of the coastal basins throughout California (Planert and Williams 1995). Underlying the basins and forming the surrounding mountains are Mesozoic marine sediments and metamorphic and igneous rocks. The basins are partially filled with unconsolidated to semiconsolidated marine sedimentary rocks deposited episodically during times of high sea level. Additionally, the basin fill consists of weathered igneous and sedimentary rock clasts, deposited by mountain streams as well as permeable basalt and tuff in some locations. The rolling topography of the floor of the Napa Valley is the result of its formation primarily on alluvial fan deposits (Planert and Williams 1995).

Numerous faults present within the County generally trend to the northwest (Figure 16-1). Though the majority of these faults are not active, a few are active and others show evidence of displacement within the last 2 million years. Major faults in the County that are still active include the West Napa fault Zone, Green Valley fault Zone, Carneros fault, Cordelia fault Zone, Soda Creek fault, Wilson fault, and the Wragg fault.

In the higher elevations, geologic structures that surround the structural troughs/basins of the County create source areas for surface water and groundwater.

Geologic structures create source areas for surface water and groundwater in the higher elevations that surround the structural troughs/basins of the County. Faults, joints, and fractures in the bedrock of Napa County act as preferential flowpaths enhancing groundwater recharge from precipitation and streamflow in some areas. In other areas, geologic structures act as barriers to groundwater flow, restricting the movement of water in the subsurface.

SURFICIAL GEOLOGY

Geologic formations exposed at the surface in the County include Surficial Deposits, the Clear Lake Volcanics, the Sonoma Volcanics, the Great Valley Complex, and the Franciscan Complex (Figure 16-1) (Graymer et al. 2004).

SURFICIAL DEPOSITS (HISTORIC TO LATE PLEISTOCENE)

This formation consists of stream channel deposits, alluvium, terrace deposits, alluvial fan deposits, landslide deposits, basin deposits, bay mud, and artificial fill. The largest contiguous area of these deposits is along the floor of Napa Valley proper. The deposits extend away from the mainstem of the Napa River along the lower reaches of most of the major tributary basins; and in the southern portion of the valley, the deposits extend further along the tributaries over most of their length. Isolated deposits occur away from the valley along Troutdale Creek, Van Ness Creek, Conn Creek, Dry Creek, Milliken Creek, and adjacent to Lake Hennessey on the southeast side. Additionally, the deposits are prevalent in the southern most areas of the County that experience tidal influence. Surficial deposits are also present within Pope Valley, Chiles Valley, Capell Creek Valley, Wooden Valley, Suisun Valley, the upper Putah Creek area, along major tributaries feeding Lake Berryessa from the north, and along the northeastern shores of Lake Berryessa (Graymer et al. 2004). In terms of groundwater resources, surficial deposits are typical pathways for groundwater recharge to the nearest surface aquifers and, depending on the properties and depths of the surficial deposits, may hold groundwater to varying capacity. Within the Napa Valley floor, the majority of the groundwater is hosted within these deposits.

CLEAR LAKE VOLCANICS (HOLOCENE TO PLIOCENE)

This formation consists of rhyolite, basalt, tuff, and siltstone, sandstone, conglomerate, and poorly consolidated gravel. Rocks of this formation outcrop in the northern portions of the Putah Creek subbasin, particularly in the vicinity of the upper reaches of Putah Creek, as well as in the southwestern portion of the study area in the vicinity of Huichica Creek and Carneros Creek subbasins. These rocks are outliers of the large volcanic complex around Clear Lake to the north of the study area. The complex is very young and thought to be related to the initiation of the San Andreas fault system (Fox et al. 1985). In terms of groundwater resources, permeable rocks within the Clear Lake Volcanics exposed in Napa County are the southern extension of an aquifer system that extends northward into Lake County.

SONOMA VOLCANICS (PLIOCENE TO LATE MIOCENE)

These rocks consist of rhyolite, dacite, andesite, basaltic tuff, glass, flow rock, pyroclastic breccia, intrusives, and interbedded volcanoclastic sedimentary rocks. These rocks are exposed over much of the Napa Valley and are the second most commonly exposed rocks in Napa County. They compose the majority of the hills and mountains to the north and east of the valley as well as large portions of the Mayacama Mountains to the west of the valley. These volcanics are thought to have formed along with the Clear Lake Volcanics as part of the northward trending series of volcanic centers related to initiation of the San Andreas fault system (Fox et al. 1985). In terms of groundwater resources, tuffaceous units within the Sonoma Volcanics host significant volumes of groundwater in many parts of Napa County. In the Napa Valley, these rocks underlie the surficial deposits and receive recharge from the overlying alluvial aquifer, and host significant volumes of groundwater under both confined and unconfined conditions. In the Milliken, Sarco, and Tulucay Creeks area, these deposits are the primary aquifer material and host significant volumes of groundwater primarily under confined conditions. The other units within the Sonoma Volcanics are relatively impermeable and act as confining units, restricting the horizontal and vertical movement of groundwater.

GREAT VALLEY COMPLEX (EARLY CRETACEOUS TO LATE JURASSIC)

This formation consists of the Great Valley sequence and the Coast Range ophiolite. The Great Valley sequence consists of sandstone, shale, conglomerate, wacke, and serpentinite. The Coast Range ophiolite consists of basaltic pillow lava and breccia, mafic intrusives, gabbro, serpentinite, silica carbonate rocks, and mélange. Outcrops of this formation are exposed extensively throughout the Putah Creek and Suisun Creek subbasins and are the most commonly exposed rocks in Napa County. Exposures are also found in the central and southern portions of the Mayacama Mountains, along Conn Creek, and in the extreme southwest portion of the study area (Graymer et al. 2004). In terms of groundwater resources, the rocks of the Great Valley Complex are relatively impermeable and act as confining units restricting the horizontal and vertical movement of groundwater.

FRANCISCAN COMPLEX (EARLY CRETACEOUS TO LATE JURASSIC)

This complex consists of mélange, serpentinite, graywacke, chert, greenstone, sandstone, metagraywacke, metachert, metagreenstone, and other undifferentiated high-grade metamorphic rocks. These rocks are exposed in the central portion of the Mayacama Mountains, in the vicinity of Moore Creek and Sage Creek in the central portion of the County, in the vicinity of James Creek and upper Putah Creek, and in the region just south of Lake Berryessa (Graymer et al. 2004). In terms of groundwater resources, the rocks of the Franciscan Complex are relatively impermeable and act as confining units restricting the horizontal and vertical movement of groundwater.

OVERVIEW OF GROUNDWATER IN NAPA COUNTY

An analysis of the groundwater system in a particular region requires an understanding of the dominant groundwater processes occurring in that region. These processes include groundwater recharge in terms of the mechanisms of recharge and the spatial and temporal distribution of recharge throughout the region's groundwater basins. Groundwater discharge is another important process. An understanding of the pathways of discharge and the volumes and timing of discharge is critical to the understanding of the regional groundwater system. One important source of discharge is the anthropogenic (human) abstraction of groundwater through production wells. An understanding of the hydrogeologic properties of the various significant geologic units is also critical, as these properties influence the storage and movement of groundwater throughout the system.

This section of the chapter provides a general overview of the groundwater resources of Napa County in terms of the available groundwater supply; the mechanisms and volume estimates of aquifer recharge; the locations of the groundwater in terms of depths below land surface; and groundwater usage in terms of the volumes used, the timing and locations of use, and the types of users and uses of groundwater.

GROUNDWATER SUPPLY AND PRINCIPAL BASINS

Napa County consists of a series of roughly parallel basins filled to varying depths with unconsolidated and semiconsolidated alluvial material (Figure 16-1). Underlying the basins and forming the intervening mountain ranges are Mesozoic marine sediments, and metamorphic and igneous rocks. The largest volumes of groundwater are hosted in the alluvium, and in general the Mesozoic rocks act as confining units that restrict the flow of groundwater. One major exception is the tuffaceous beds within the Mesozoic volcanic rocks, which are permeable and host significant volumes of water. The water-bearing deposits are often lenticular (spatially discontinuous) in nature and the deeper deposits are offset by faults resulting in a series of variously connected and isolated aquifers (Planert and Williams 1995). Groundwater in the alluvium occurs primarily under unconfined conditions and groundwater in the tuffaceous volcanic rocks occurs under both confined and unconfined conditions.

The major aquifers of the County are the North Napa Valley Groundwater Basin (NNVB) with an estimated storage volume of approximately 300,000 ac-ft, and the MSTB with an estimated storage volume of approximately 200,000 ac-ft (Figure 16-2) (Napa County Flood Control and Water Conservation District 1991) (an ac-ft can be visualized as water a foot deep covering an area about the size of a football field). Smaller aquifers include the Carneros Groundwater Basin (CB) and small basins within the Putah Creek subbasin. Storage estimates for many of these smaller basins do not exist; however, Napa County Flood Control and Water Conservation District (1991) estimates that these basin storage volumes range from less than 1,000 ac-ft to approximately 10,000 ac-ft, and the total storage volume for all of the smaller basins is likely 50,000 ac-ft or less. Map 16-1 shows the primary groundwater basins in Napa County.

GROUNDWATER RECHARGE

Recharge to the alluvial aquifers occurs primarily by direct infiltration of precipitation and to a lesser extent by the application of applied water from irrigation and infiltration through the stream and lake beds. In the NNVB, average annual recharge between 1962 and 1989 was on the order of 26,800 ac-ft/yr (Napa County Flood Control and Water Conservation District 1991). Due to the dominance of precipitation as the mechanism for recharge, variations in annual recharge rates are strongly correlated with variations in annual precipitation.

Groundwater recharge in the tuffaceous volcanic rocks occurs primarily from infiltration through the stream and lake beds and subsurface inflows from outside the groundwater basins. Also contributing to the recharge but less significantly is the recharge associated with direct infiltration of precipitation and applied water from irrigation. In the MSTB, annual recharge is on the order of 5,400 ac-ft/yr, with

> Groundwater recharge in the alluvial aquifers occurs primarily by direct infiltration of precipitation. Recharge in the tuffaceous volcanic rocks occurs primarily from infiltration through the stream and lake beds and subsurface inflows from outside the groundwater basins. In both the alluvial aquifers and tuffaceous volcanic aquifers, applied water from irrigation is a relatively minor component of the total recharge.

Approximately 92% of the land under irrigation in the County is used for vineyards. Water for irrigation and frost protection are the most significant uses of groundwater in the County.

The stratigraphy, or the layers (or strata) of the aquifers, is a significant factor in the hydrogeology of groundwater basins.

3,050 ac-ft/yr derived from streambed infiltration, 2,100 ac-ft/yr derived from subsurface inflow from the Howell Mountains, and 250 ac-ft/yr derived from direct infiltration of precipitation (Johnson 1977).

In both the alluvial aquifers and tuffaceous volcanic aquifers, applied water from irrigation is a relatively minor component of the total recharge due to the dominance of vineyard growth as the primary agriculture in the County and the efficiency of the irrigation techniques used in vineyard cultivation (Farrar and Metzger 2003; Napa County Flood Control and Water Conservation District 1991).

ESTIMATED DEPTHS TO WATER

Groundwater in the unconfined alluvial aquifers occurs at relatively shallow depths ranging from approximately 50 to 300 feet below land surface (Napa County Flood Control and Water Conservation District 1991). Within the tuffaceous volcanic aquifers, groundwater occurs over a wide range of depths primarily ranging between 10 and 500 feet below land surface (Farrar and Metzger 2003).

GROUNDWATER USE

The characterization of groundwater use presented in this section is based on the most current and reliable information available at the time this chapter was prepared. This section does not include information from the *2050 Napa Valley Water Resources Study* (Napa County Flood Control and Water Conservation District 2005). An updating of the groundwater use characterization, including Updated information on water demand and water use in Napa County from the long-range 2050 study will be provided in the supporting groundwater technical report (*Napa BDR Groundwater Hydrology Modeling Report*).

USERS AND PURPOSE OF USE

Groundwater is not a significant source of water for municipal use, and based on safe yield data from 1989, only 0.25% of the total volume is used for municipal use chiefly by the city of Calistoga (Napa County Flood Control and Water Conservation District 1991). No estimates of the proportions of water use for the other categories of use are known for the County as a whole. Estimates are, however, available for the MSTB. The estimates from this basin indicate that approximately 73% of the total use is for irrigation purposes, and 27% for rural domestic use (Farrar and Metzger 2003). This distribution is probably fairly representative of the County as a whole where the dominant use is for irrigation, followed in relative importance by rural domestic use, and then by municipal use.

VOLUMES USED

Estimating groundwater pumping rates and volumes is a challenging task due to limited data availability. Estimates of safe yield volumes from groundwater resources in the County are available from 1989, which in conjunction with projections of water needs can be used as a proxy for total pumping volumes. These estimates indicate that approximately 28,700 ac-ft of groundwater was pumped from the various aquifers in the County in 1989, representing 46.4% of the total yield from all sources (Napa County Flood Control and Water Conservation District 1991). Assuming this percentage is representative of the proportion of groundwater used to meet the projected water needs, estimates of abstracted groundwater volumes are 30,100 ac-ft and 31,500 ac-ft for 2000 and 2005, respectively (Napa County Flood Control and Water Conservation District 1991).

TIMING AND LOCATION OF USE

The majority of the groundwater is abstracted from the NNVB, and based on the safe yield data, approximately 79% of the total groundwater use comes from this basin (Napa County Flood Control and Water Conservation District 1991). The safe yield data does not differentiate between the MSTB and the CB; however, an independent estimate of pumping volumes from the MSTB for the period 2000–2002 indicates that approximately 5,350 ac-ft were abstracted (Farrar and Metzger 2003). Using this estimate indicates that approximately 18% of the total groundwater use comes from this basin, and 2% from the CB. The remaining 1% comes from basins within the Putah Creek Watershed and from other areas throughout the County (Napa County Flood Control and Water Conservation District 1991).

The majority of the land under irrigation in the County (approximately 92%) is used to grow vineyards, making irrigation and other agricultural use the primary use of water in the County, accounting for approximately 61% of the total water use (Napa County Flood Control and Water Conservation District 1991). The next largest category of use in the County is municipal use, which accounts for approximately 29% of the total water use (Napa County Flood Control and Water Conservation District 1991). It is important to note that these estimates represent total water use from all sources and do not necessarily reflect the proportions of groundwater use. For example, only 0.25% of the total groundwater use is municipal, even though municipal use accounts for 29% of the total water use from all sources. These observations indicate that water for irrigation and frost protection are the most significant uses of groundwater in the County. The timing of water application to vineyards for irrigation and frost protection is likely correlated to the timing of groundwater pumping in the County in general. Groundwater is applied to vineyards during two main periods: from June through October for irrigation purposes, and from February through March for frost protection; presumably, the majority of the groundwater pumping in the County occurs during these periods as well.

GROUNDWATER BASIN OVERVIEW

This section provides a more-detailed overview of the hydrogeology of individual groundwater basins in Napa County in terms of the stratigraphy of the aquifers, the aquifer properties, the recharge to and discharge from the aquifers, the water levels and general directions of groundwater flow in the aquifers, and the groundwater pumping activities taking place in the basins. The discussion of groundwater pumping activities is based on the best information available at the time this chapter was prepared and does not include information from the *2050 Napa Valley Water Resources Study* (Napa County Flood

Control and Water Conservation District 2005). As described above, updated information regarding groundwater pumping will be provided in a supporting technical report (*Napa BDR Groundwater Hydrology Modeling Report*). Map 16-1 shows the primary groundwater basins in Napa County.

NORTH NAPA VALLEY BASIN

The largest groundwater basin in the County is the NNVB. The basin extends from just north of the city of Napa up the valley floor to the northwestern end of the valley just north of the city of Calistoga covering and an area of approximately 60 square miles (Figure 16-2). By far the most productive aquifer in the basin occurs within the alluvial material, which can locally provide water to wells at rates in excess of 3,000 gallons per minute (gpm) (Faye 1973). This aquifer is an unconfined aquifer in most locations except locally where clay lenses lead to confined conditions. A tuffaceous member of the Sonoma Volcanics, which underlies the alluvium, composes an additional aquifer in the basin, and wells tapping this aquifer yield water at an average rate of 32 gpm (Napa County Flood Control and Water Conservation District 1991). Groundwater in this aquifer occurs under both confined and unconfined conditions.

STRATIGRAPHY

The majority of the valley floor is alluvium consisting of poorly sorted lenticular stream deposits of sand and gravel interspersed with floodplain deposits of silts and clays. These deposits vary in thickness from over 300 feet at the southern end of the valley to less than 50 feet near Calistoga (Faye 1973). The alluvium also tends to be thickest near the center of the valley and the Napa River, and decreases in thickness toward the valley margins. Underlying the alluvium in most locations are the Sonoma Volcanics, which are believed to be up to 2000 feet thick. The tuffaceous member of the volcanics located within the upper half of the deposits yields moderate amounts of water, while the remaining rocks have relatively low permeabilities and serve as confining units. The Franciscan and Great Valley Complexes on the southern half of the west side of the valley are also low permeability and serve as confining units locally (Faye 1973).

AQUIFER PROPERTIES

Interpretation of driller's logs and specific capacity data indicates that the hydraulic conductivity (K) (hydraulic conductivity is a measure of the capacity of a substance to allow water to flow through it) of the alluvium ranges from 10 to greater than 100 ft/day (Faye 1973). Variations in K result from spatial variations in the relative proportions of sand and gravel in the aquifer. Although the distribution of these materials is irregular, K values follow a general pattern, increasing from north to south as well as from the valley margins toward the Napa River. K values in the tuffaceous member of the Sonoma Volcanics are on the order of 10^{-2} to 10^{-3} ft/day while the other volcanic rocks have K values on the order of 10^{-4} ft/day or less (Faye 1973).

AQUIFER RECHARGE AND DISCHARGE

Recharge in the basin occurs primarily by direct infiltration of precipitation, and to a lesser extent by the application of applied water from irrigation and by infiltration through the streambeds of losing streams (stream systems that supply water to groundwater basins). Average annual recharge between 1962 and 1989 was on the order of 26,800 ac-ft/yr (Napa County Flood Control and Water Conservation District 1991). Discharge from the aquifer occurs in the forms of evapotranspiration, discharge to the Napa River and its tributaries, groundwater pumping/extraction, and subsurface outflow. Evapotranspiration is the largest component of discharge from the basin, accounting for about half of the total outflow. Groundwater pumping and discharge to streams are the next largest components of discharge, and subsurface outflow along the southern boundary of the basin accounts for a relatively small portion of the total outflow (Napa County Flood Control and Water Conservation District 1991). A groundwater hydrologic budget for the basin was calculated for the period from 1962 to 1989, suggesting that the basin was in a state of dynamic equilibrium during this period (the total inflow to the basin from recharge approximately equaled the total discharge from the basin).

GROUNDWATER LEVELS AND FLOW DIRECTIONS

Groundwater in both the alluvial aquifer and the tuffaceous volcanic aquifer occurs at depths ranging from approximately 50 to 300 feet below land surface. Water-table elevation maps indicate groundwater flow in the basin occurs from the valley edges toward the valley axis, as well as southward toward San Pablo Bay. These general flow patterns are modified locally by faults along the valley floor; however, the only fault that has been documented to obstruct flow in the basin is the Soda Creek fault (Napa County Flood Control and Water Conservation District 1991). Water-level data collected between 1962 and 1989 indicates that significant drawdowns have not occurred within the NNVB and that as of at least 1989, the aquifer has been in a state of dynamic equilibrium (Napa County Flood Control and Water Conservation District 1991).

GROUNDWATER PUMPING

The volume of groundwater pumped from the basin can only be estimated because domestic wells are for the most part not metered and power consumption records for irrigation wells are generally not available. Direct estimates of the volumes of groundwater withdrawn from the basin in recent years are not available; however, projections of water needs for 2000 and 2005 in the basin based on estimates of water needs determined in 1989 are available (Napa County Flood Control and Water Conservation District 1991). Additionally, estimates of the relative percentages of water available from surface water and groundwater sources are available (Napa County Flood Control and Water Conservation District 1991). These two data sets allow estimates of the total volumes of groundwater pumped from the basin in both 2000 and 2005 as given by Equation 16-1.

St. Helena has the largest groundwater basin in Napa County. By far the most productive aquifer in the basin occurs within the alluvial material; it can locally provide water to wells at rates in excess of 3,000 gallons per minute.

Equation 16-1:

$Q_p = P_{gw} \times V_{pn}$

where

Q_p = the total annual groundwater pumping,
P_{gw} = the proportion of the annual water supply derived from groundwater, and
V_{pn} = the projected annual water need.

Using this method, a total of 19,000 and 19,900 ac-ft of water were abstracted from the basin in 2000 and 2005 respectively.

Aquifer recharge in the basin occurs primarily by direct infiltration of precipitation.

MILLIKEN-SARCO-TULUCAY BASIN

The MSTB is the second largest groundwater basin in the County. It is located adjacent to the city of Napa along the eastern edge of the valley floor and covers an area of approximately 15 square miles (Figure 16-2). The area is distinct from the NNVB because of the high-yielding nature of the Sonoma Volcanics to the east of the Soda Creek fault. To the west of the fault, alluvium is the primary water-bearing material and to the east of the fault, the volcanics are the primary water-bearing material. Groundwater in the basin occurs primarily under confined conditions within tuffaceous units of the Sonoma Volcanics (Farrar and Metzger 2003).

STRATIGRAPHY

West of the Soda Creek fault, the primary water-bearing units are the alluvial deposits, and east of the fault, groundwater is found almost exclusively in the Sonoma Volcanics. The andesitic member is the basal member of the Sonoma Volcanics which underlies the entire basin. These rocks have a low primary permeability and serve as a lower confining unit to the aquifers, except locally in interflow zones and where fracture zones created from folding and faulting are present. Overlying the andesitic member is the tuffaceous member which hosts the majority of the groundwater in the basin. The tuffaceous deposits constitute a leaky multilayered aquifer system with permeable tuffs interbedded with igneous flows and clay of low permeability (Johnson 1977). A high point in the impermeable andesitic bedrock underlying the tuffaceous rocks acts as a groundwater divide splitting the basin into a north basin containing Milliken and Sarco Creeks and a south basin containing Tulucay Creek.

AQUIFER PROPERTIES

Johnson (1977) estimated the specific yield (S_y) of the various deposits in the basin based on inspection of well logs. In the lower Tulucay Creek drainage basin, S_y values ranged from 0.037 to 0.052. In the central hilly portion of the basin, S_y values ranged from 0.019 to 0.037. In the lower portions of the drainage basins of Milliken and Sarco Creeks east of the Soda Creek fault, S_y values ranged from 0.04 to 0.054 and to the west of the Soda Creek fault, values ranged from 0.048 to 0.053. An aquifer test from one location in the basin indicated that the storage coefficient (S) of the tuffaceous member was on the order of 0.00026. Few estimates of K for the aquifer were found; however, Johnson (1977) estimated that the average value in the lower Tulucay Creek basin and west of the Soda Creek fault was on the order of 2 ft/day.

AQUIFER RECHARGE AND DISCHARGE

Recharge in the basin occurs primarily by infiltration through the streambeds of losing streams, groundwater inflow from the Howell Mountains to the east of the basin, and direct infiltration of precipitation. The application of applied water for irrigation is a relatively minor component of recharge except in localized situations. In 1975, total recharge to the basin was on the order of 5,400 ac-ft/yr, with 3,050 ac-ft/yr derived from streambed infiltration, 2,100 ac-ft/yr derived from subsurface inflow, and 250 ac-ft/yr derived from direct infiltration of precipitation (Johnson 1977). Discharge from the basin occurs primarily as groundwater abstractions and underflow across the western boundary of the basin and toward the Napa River. Estimates of annual groundwater pumping in 2000–2002 range from 3,600 to 7,100 ac-ft/yr, with an average of 5,350 ac-ft/yr (Farrar and Metzger 2003). The volume of water discharging as underflow across the western boundary of the basin was estimated to be about 600 ac-ft/yr in 2000 as determined based on the application of Darcy's Law and estimates of the K values of the deposits.

GROUNDWATER LEVELS AND FLOW DIRECTIONS

Water levels in the tuffaceous rocks of the Sonoma Volcanics range from 10 to 500 feet below ground surface (Farrar and Metzger 2003) (Figure 16-3). Cones of depression are formed around the largest groundwater pumping centers in the basin, and the predominant directions of groundwater flow are from areas of recharge around the margins of the basin toward the various cones of depression (Figure 16-3). Water levels have been gradually declining since at least the 1960s and probably since the early 1900s, when groundwater in many of the wells occurred under artesian conditions (Farrar and Metzger 2003). Over the period between 1975 and 2001, groundwater levels declined by as much as 125 ft in many portions of the basin, while in other areas levels were relatively unchanged or even increased by as much as 50 ft (Farrar and Metzger 2003). The observed declines in water levels are likely the result of groundwater pumping activities in the basin. In addition to these long-term trends in water levels, seasonal fluctuations in water levels by as much as 50 ft occur as a result of variable recharge rates, due to seasonal changes in streamflow and precipitation, variations in evapotranspiration rates, and differences in groundwater pumping rates (Farrar and Metzger 2003).

GROUNDWATER PUMPING

The volume of groundwater pumped from the MST basin can only be estimated because domestic wells are for the most part not metered and power consumption records for irrigation wells are generally not available. Using the data from the Napa County Flood Control and Water Conservation District (1991) report as described above, estimates of the total volume of groundwater pumped from both the MSTB and CB are in the range of 6,860 and 7,110 ac-ft for 2000 and 2005, respectively. In the absence of pumping rates tied to individual well locations, it is difficult to detail the distribution of pumping throughout the basin; however, the distribution of completed wells can serve as a proxy for understanding pumping distributions. The greatest number of wells occurs near Hagen Road, in the east-central portion of the basin, and centered around Third Avenue between Coombsville Road and North Avenue in the southeastern portion of the basin (Farrar and Metzger 2003).

A report by the USGS from 2003 (Farrar and Metzger 2003) provides some detailed estimates of groundwater pumping volumes in the basin. Using both a well-based method and a population-based method, domestic pumping in the basin was estimated at between 800 and 2,100 ac-ft/yr for 2000–2002. Farrar and Metzger 2003). Using both a well-based method and a land-use based method, pumping for irrigation of agriculture was estimated at between 1,180 and 3,440 ac-ft/yr for the same period (Farrar and Metzger 2003). Finally, pumping for irrigation of improved open spaces (golf courses, cemeteries, and public institutions) was estimated, using a land-use based method, at approximately 1,560 ac-ft/yr for 2000–2002. In total, the estimated volume of groundwater abstracted from the basin ranges from 3,600 to 7,100 ac-ft, with an average value of 5,350 ac-ft (Farrar and Metzger 2003).

CARNEROS BASIN

The Carneros Basin (CB) is located in the southwestern portion of Napa County (Figure 16-2) and very little hydrologic or hydrogeologic information is available for the region. The valley floor consists of alluvium and is underlain by Pleistocene Huichica Formation, which in turn is underlain by the Sonoma Volcanics. The alluvium in this area is generally very thin with much of its volume located above the saturated zone (Napa County Flood Control and Water Conservation District 1991). As a result, the Huichica Formation is the primary water-bearing material in the basin. No estimates of storage were found for the basin; however, lower well yields indicate that storage is probably much less than in the two previously described basins (Napa County Flood Control and Water Conservation District 1991).

STRATIGRAPHY

The floor of the Carneros Valley consists of Pleistocene terrace deposits and recent alluvium, with some Pleistocene Huichica Formation flanking the sides of the southern end of the valley (Napa County Flood Control and Water Conservation District 1991). The Huichica Formation underlies much of the basin and consists of fluvial deposits of gravel, silt, sand, and clay with interbedded tuff. The lower 200 to 300 feet contains reworked pumice from the underlying Sonoma Volcanics. The Huichica Formation is the primary water-bearing unit in the basin and the underlying Sonoma Volcanics act as a lower confining unit. Limited information is available regarding the thickness of the Huichica Formation in the basin; however it is reported to achieve a maximum thickness of 900 feet (Napa County Flood Control and Water Conservation District 1991).

AQUIFER PROPERTIES

Limited data concerning the aquifer properties of the deposits found in the basin are available; however, the Huichica Formation is described as having a low permeability, and well yields are generally less than 5 gpm, indicating relatively low K values (Napa County Flood Control and Water Conservation District 1991).

AQUIFER RECHARGE AND DISCHARGE

Recharge to the basin is reported to occur primarily from direct infiltration of precipitation falling over areas of geologic outcrops, which are primarily located along the hillsides bordering the Carneros Valley. Infiltration from streambeds is also an important source of recharge to the basin (Napa County Flood Control and Water Conservation District 1991). Groundwater pumping from the basin is likely a significant source of discharge; however, limited availability of data make it difficult to estimate the relative importance of the various inflows and outflows within the basin.

GROUNDWATER LEVELS AND FLOW DIRECTIONS

Groundwater occurs primarily under unconfined conditions and at relatively shallow depths in the basin; however, no water-table maps were found for the basin, making it difficult to specify depths to water and predominant directions of groundwater flow.

GROUNDWATER PUMPING

No estimates of the volumes of groundwater pumped from the CB basin are available. However, estimates of pumping from both the MSTB and the CB are described in the section *Overview of Groundwater in Napa County*. Taking the estimate for both basins of 6,860 ac-ft and subtracting the estimate for the MSTB determined in the Farrar and Metzger (2003) report (see *Milliken-Sarco-Tulucay Basin* above) yields a rough estimate of groundwater pumping from the CB on the order of 1,510 ac-ft/yr for 2000–2002.

Three-dimensional Mike SHE groundwater models were constructed for the North Napa Valley Groundwater Basin, Milliken-Sarco-Tulucay Groundwater Basin, and Carneros Groundwater Basin. The models can be used to produce maps showing the distribution of water levels in the aquifers under existing conditions and detailed water budgets describing the inflows to and outflows from the basins; to assess and evaluate the relative influence of land use changes on groundwater conditions; and to quantify the volumes of existing groundwater supplies and estimate the safe yield from the various aquifers.

THREE-DIMENSIONAL GROUNDWATER MODEL (MIKE SHE)

OVERVIEW

Mike SHE groundwater models were constructed for the three groundwater basins described in the sections above (NNVB, MSTB, and CB). These three models utilize the same data and methodology described in Chapter 15, *Surface Water Hydrology*, for precipitation, evapotranspiration, overland flow, and unsaturated flow (see surface water modeling portion of the text). In the saturated zone, the models differ from the surface water models in that they utilize a fully distributed (physically/spatially based) approach, where the aquifer geometries and aquifer properties are represented explicitly in three dimensions (3-D), as opposed to the simplified conceptual approach used in the surface water models.

MODELING ALGORITHM

The 3-D groundwater model used in the saturated zone describes the spatial and temporal variations of the dependent variable (hydraulic head) mathematically using a 3-D Darcy equation solved numerically by an iterative implicit finite difference technique. The models use the preconditioned conjugate gradient (PCG) groundwater solver developed by the USGS based on a preconditioned conjugate gradient solution technique. The saturated zone component of flow interacts with the other components of MIKE SHE primarily by using the boundary flows from the other components implicitly or explicitly as sources and sinks.

The three largest groundwater basins in the County are the North Napa Valley, Milliken-Sarco-Tulucay, and Carneros Basins.

DATA REQUIREMENTS

A key requirement to characterize the saturated flow component is a 3-dimensional geometric description (or mapping) of the hydrogeologic units involved in the study area. Borehole logs and geologic maps are used to delineate the contact locations between geologic units and thereby describe the geometry and spatial relationships between these units. Aquifer property data are also needed. These data include the spatial distribution of hydraulic conductivity (K) values and either the specific yield (S_y) or the storage coefficient (S) depending on the type of aquifer being simulated (i.e. confined vs. unconfined). Additional data requirements include information on the boundary conditions of the models including water levels and discharges. These boundary conditions will be determined form the results of the regional surface water model simulations and estimates of groundwater pumping determined from the literature and available data. Finally, measured water levels at representative locations in the basins are needed in order to calibrate the models to existing conditions.

ASSUMPTIONS AND LIMITATIONS

The models assume a constant density of the water in the saturated zone. The models also assume that the hydraulic properties within each hydrogeologic unit being considered are isotropic and homogenous. Additional assumptions include the assumption that no flow across the lower boundary of the models is present, that recharge due water applied for irrigation is an insignificant portion of the total recharge, and that distributing total annual volumes of groundwater withdrawals based on the distribution of wells developed in the various aquifers accurately represents the effects of anthropogenic (human) use of groundwater in each basin.

Limitations of the models include the inherent limitations associated with numerical modeling codes. Restrictions regarding the detail of input and calibration data, as well as inaccuracies associated with available data, place additional limitations on the accuracy of the models. Specific data gaps include a lack of groundwater pumping rates tied to individual well locations, a lack of detailed stratigraphic information for portions of the NNVB and CB, and a lack of information delineating the spatial variation of aquifer properties. When representing the myriad of complex hydrologic processes occurring in these basin with numerical models, the simplifying assumptions necessary to construct and calibrate the models also leads to inherent limitations in the applicability of the modeling results. Further information regarding the assumptions and limitations of the models will be provided in a supporting technical report (*Napa BDR Groundwater Hydrology Modeling Report*).

USES OF THE MODEL AND INITIAL RESULTS

The models can be used to produce maps showing the distribution of water levels or potentiometric surfaces in the aquifers under existing conditions, as well as detailed water budgets describing the magnitudes of the various inflows to and outflows from each of the three basins. Applications of the models include estimating changes in water levels, potentiometric surfaces, and water balances associated with changes in land-use and/or groundwater abstractions. There are also several direct linkages between surface land cover and land use and resulting infiltration, runoff/streamflow, and groundwater conditions, as described above for general groundwater processes and sources and in Chapter 15 on the main components of the hydrologic cycle. The groundwater models developed for the BDR can be used to assess and evaluate the relative influence of land use changes at the surface on groundwater conditions. The models can also be used to quantify the volumes of existing groundwater supplies and estimate the safe yield from the various aquifers. A more complete description of the groundwater models and presentation of their results will be provided in a supporting technical report (*Napa BDR Groundwater Hydrology Modeling Report*).

CONCLUSIONS AND REPORT UPDATE RECOMMENDATIONS

The primary water-bearing deposits in Napa County are recent and older alluvium which host groundwater primarily under unconfined conditions, and tuffaceous units within the Sonoma Volcanics which host groundwater primarily under confined conditions. The three largest groundwater basins in the County are the North Napa Valley, Milliken-Sarco-Tulucay, and Carneros Basins. Existing information and data concerning basin boundaries, storage capacities, recharge and discharge, groundwater levels, and groundwater pumping activities are available for each of these basins and allow for the characterization of the hydrogeology in each basin, as well as provide the framework for the construction of a numerical groundwater flow model. As described above, information regarding groundwater use was based on available information. Groundwater use information from the recent *2050 Napa Valley Water Resources Study* (Napa County Flood Control and Water Conservation District 2005 will be provided in the supporting groundwater technical report (*Napa BDR Groundwater Hydrology Modeling Report*).

A surface water model has been developed in MIKE SHE/MIKE 11 that simulates the major components of the hydrologic system active in Napa County on a regional scale. Data from the established MIKE SHE-MIKE 11 surface hydrology model will be modified to develop a more detailed coupled surface water and groundwater model for areas of Napa County where groundwater is a significant resource. This model will utilize a 3-D finite-difference approach to simulating flow in the saturated zone, and will focus on simulating flow in the three largest groundwater basins in the County; North Napa Valley, Milliken-Sarco-Tulucay, and Carneros.

Limitations of the combined MIKE SHE/MIKE 11 modeling arise from the inherent limitations of numerical models, the lack of detailed input and calibration data, and inaccuracies associated with available data. If the model is to be used for purposes other than regional hydrology, hydraulic, or local hydrology studies, then additional data of the study area may need to be collected for the model. The developed model will be sensitive to changes in land use and can be used for impact analyses comparing baseline conditions to future scenarios.

The Napa County MIKE SHE/MIKE 11 model is a dynamic model that can be refined and expanded as data becomes available and as new questions are identified. Because the model is set up for a regional analysis of the Napa County hydrologic system, it can be used to help evaluate alternatives developed as part of the current updating of the Napa County General Plan. More detailed recommendations for future model updates and improvements will be provided in a supporting technical report (*Napa BDR Groundwater Hydrology Modeling Report*).

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Reference 8

Draft
Volume 1

NORTH SAN PABLO BAY RESTORATION AND REUSE PROJECT (NORTH BAY WATER RECYCLING PROGRAM)

Environmental Impact Report/ Environmental Impact Statement

SCH# 2008072096

Prepared for:
Bureau of Reclamation

North Bay Water Reuse Authority

May 2009

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ESA

DRAFT ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT for the North Bay Water Recycling Program

This Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) has been prepared by the North Bay Water Reuse Authority's Member Agencies and the Bureau of Reclamation in accordance with the requirements of the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) for the North San Pablo Bay Restoration and Reuse Project or the North Bay Water Recycling Program (NBWRP). Napa County and North Marin Water District are additional agencies supporting the NBWRA through contribution of funds and staff time.

NBWRA is exploring "the feasibility of coordinating interagency efforts to expand the beneficial use of recycled water in the North Bay Region thereby promoting the conservation of limited surface water and groundwater resources." This Draft EIR/EIS describes and evaluates the potential environmental, social and economic effects of the North Bay Water Recycling Program (or North San Pablo Bay Restoration and Reuse Project). The NBWRP would provide increased recycled water supply to urban, agricultural and environmental uses in the North San Pablo Bay region.

The Draft EIR/EIS considers three action alternatives and the No Project and No Action Alternatives. Each of the action alternatives are intended to meet the purpose, objectives, and need identified by the NBWRA.

- **No Action Alternative,** provides a "future without the project" scenario as a NEPA baseline to compare the impacts of the proposed Action Alternatives.
- **Alternative 1, Basic System**, which includes use of recycled water near each of the individual wastewater treatment plants (WWTPs);
- **Alternative 2, Partially Connected System**, which adds pipelines, pump stations and storage to partially connect the existing WWTPs; and
- **Alternative 3, Fully Connected System**, which provides a fully integrated and regional recycled water distribution system connecting all four Member Agency WWTPs.

This Draft EIR/EIS analyzes the direct, indirect, and cumulative environmental effects of the project on the following resources: hydrology and drainage, water quality, terrestrial and aquatic resources, earth resources, biological resources, land use, agriculture, transportation and circulation, air quality, noise, utilities and public service systems, hazardous materials and public health, visual/aesthetic resources, recreation, cultural and paleontological resources, socioeconomic effects, environmental justice, Indian Trust Assets, growth-inducing effects, and climate change.

Please submit any comments before **5 p.m.** on **June 25, 2009** to ***Marc Bautista, Sonoma County Water Agency***, P.O. Box 11628, Santa Rosa, CA 95406-1628, Phone: (707) 547-1998, Email: marc.bautista@scwa.ca.gov or ***David White, Bureau of Reclamation***, Mid-Pacific Region, 2800 Cottage Way, MP-730, Room W-2830, Sacramento, CA 95825-1898, Phone: (916) 978-5074, Email: dtwhite@mp.usbr.gov.

- **Milliken-Sarco-Tulucay Creeks** (**MST**) **Area** – Napa SD's *Recycled Water Expansion Hydraulic and Preliminary Engineering Analysis: Phase 1 Report – Milliken-Sarco-Tulocay Area* indicates that Napa SD's MST area potentially consists of 4,335 acres (3,856 acres of vineyards, 389 acres of urban landscaping, and 90 acres of golf course/cemeteries) (Brown and Caldwell, 2007).

- **Carneros East** – Napa SD's St*rategic Plan for Recycled Water Use in the Year 2020* included the development of alternatives for a recycled water system to serve two areas of southern Napa County (LWA, 2005). According to the land use data used for the Project, Napa SD's Carneros East reuse area consists of about 6,654 acres of vineyards in the Napa County portion of the Los Carneros American Viticulture Area (AVA).

2.5 Project Objectives

In addition to the purpose and need for the proposed Federal Action identified in Section 2.3.4, the following project objectives have been developed by the NBWRA for the NBWRP. The project is proposed to promote the expanded beneficial use of recycled water in the North Bay region to achieve the following objectives:

- Offset urban and agricultural demands on potable water supplies;
- Enhance local and regional ecosystems;
- Improve local and regional water supply reliability;
- Maintain and protect public health and safety;
- Promote sustainable practices;
- Give top priority to local needs for recycled water, and;
- Implement recycled water facilities in an economically viable manner.

All of the Member Agencies already have existing recycled water programs. The NBWRA anticipates that provision of recycled water from the Proposed Action will be made available for use to new and existing water customers on reasonable terms and conditions. As appropriate, fee structures for recycled water have been or will be developed by Member Agencies within the context of each agency's rules, regulations and financial planning.

2.6 Action Alternatives to be Considered

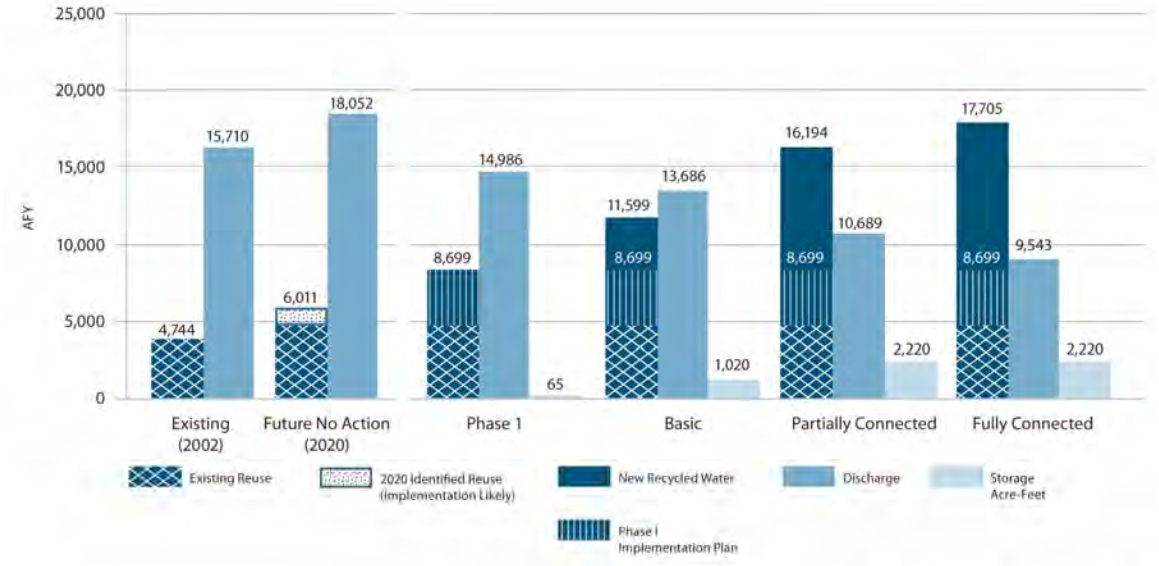
2.6.1 Action Alternatives Summary

This EIR/EIS considers the No Project Alternative, a No Action Alternative and three Action Alternatives. The Action Alternatives consist of treatment, transmission, and storage facilities necessary to meet a range of recycled water demand scenarios within the NBWRA service area through 2020. Each Action Alternative considers varying levels of recycled water use, and corresponding levels of regional facility integration. The Phase 1 Implementation Plan (discussed in Section 2.6.2 below) represents the set of projects, common to all of the NBWRP alternatives, which are defined to a level of detail that allows for project-level analysis, and would likely be

the first phase implemented under any alternative. The No Project Alternative, No Action Alternative and Action Alternatives are as follows:

- **No Project Alternative,** assumes that the proposed project is not implemented, and reviews two scenarios: 1) consideration of existing conditions without the project, a "no build scenario"; and 2) consideration of "reasonably foreseeable" future conditions without the project. This second scenario is identical to the No Action Alternative, identified below.
- **No Action Alternative,** provides a "future without the project" scenario as a baseline to compare the impacts of the proposed Action Alternatives.
- **Alternative 1, Basic System**, includes use of recycled water near each of the individual WWTPs;
- **Alternative 2, Partially Connected System**, adds additional pipelines, pump stations and storage to partially connect the existing WWTPs; and
- **Alternative 3, Fully Connected System**, provides a fully integrated recycled water distribution system connecting all four Member Agency WWTPs.

A comparison of each alternative in terms of the amount of recycled water made available, the corresponding amount of discharge to tributaries of North San Pablo Bay, and the amount of storage necessary to provide the level of recycled water use is provided in **Chart 1**, below. **Table 2-2** summarizes the existing and future recycled water supply demand and resulting discharge that would occur under Alternatives 1, 2, and 3.



SOURCE: ESA

North Bay Water Reuse Authority . 206088

Chart 1
Existing and Future Conditions (2020) vs. Proposed Project Recycled Water, Discharge, Storage (Acre-Feet Per Year)

TABLE 2-2
ALTERNATIVES SUMMARY –
RECYCLED WATER SUPPLY, DEMAND, AND RESULTING DISCHARGE (AFY)

Alternatives	WWTP Service Area	WWTP Inflow (2020)	Existing Recycled Water Demand	New Recycled Water Demand (Beneficial Reuse)	Total Recycled Water Demand	Discharge to San Pablo Bay[1]
Alternative 1: Basic System	LGVSD and Novato WWTPs	12,347	1,172	744	1,916	8,643
	SVCSD and Napa WWTPs	15,308	3,772	5,911	9,683	5,043
	Total	**27,655**	**4,944**	**6,655**	**11,599**	**13,686**
Alternative 2: Partially Connected System	LGVSD and Novato WWTPs	12,347	1,172	2,477	3,619	8,032
	SVCSD and Napa WWTPs	15,308	3,772	8,802	12,574	2,657
	Total	**27,655**	**4,944**	**11,279**	**16,193**	**10,689**
Alternative 3: Fully Connected System	LGVSD, Novato, SVCSD, and Napa WWTPs	27,655	4,944	12,761	17,705	9,543
	Total	**27,655**	**4,944**	**12,761**	**17,705**	**9,543**

[1] The number does not equal supply and demand due to evaporative and other losses (e.g. spreading).

SOURCES: CDM, 2009; ESA, 2009

A full description of the facilities proposed under each Action Alternative is provided in Section 2.8.

2.6.2 Phase 1 Implementation Plan

The Member Agencies have collectively prioritized the projects within their individual service areas to establish an Implementation Plan identifying the order in which projects would be constructed. Phase 1 of the Implementation Plan includes projects that are defined to a level of detail that allows for project-level environmental review. These projects are collectively referred to as Phase 1 Projects. The Phase 1 Projects are common to Alternatives 1, 2, and 3. This EIR/EIS may be relied upon by individual member agencies for approval of these individual Phase 1 Projects. **Table 2-3** identifies projects that would be implemented as Phase 1 Projects under any of the Action Alternatives considered. These projects will be examined at a project level of detail, and are described in Section 2.7, Project Level Analysis – Phase 1 Implementation Plan. **Figure 2-3** shows proposed facilities that would be implemented under Phase 1.

2.7 Project Level Analysis

2.7.1 Phase 1 Implementation Plan

The Member Agencies have collectively prioritized the projects within their individual service areas to identify a phased Implementation Plan under any of the alternatives being considered. The first phase of the Implementation Plan includes projects that each Member Agency has defined to a level of detail that allows for project-level environmental review. These projects are collectively referred to as Phase 1 Projects. This EIR/EIS may be relied upon by individual member agencies or other cooperating agencies for approval of these individual projects.

MST Area Project

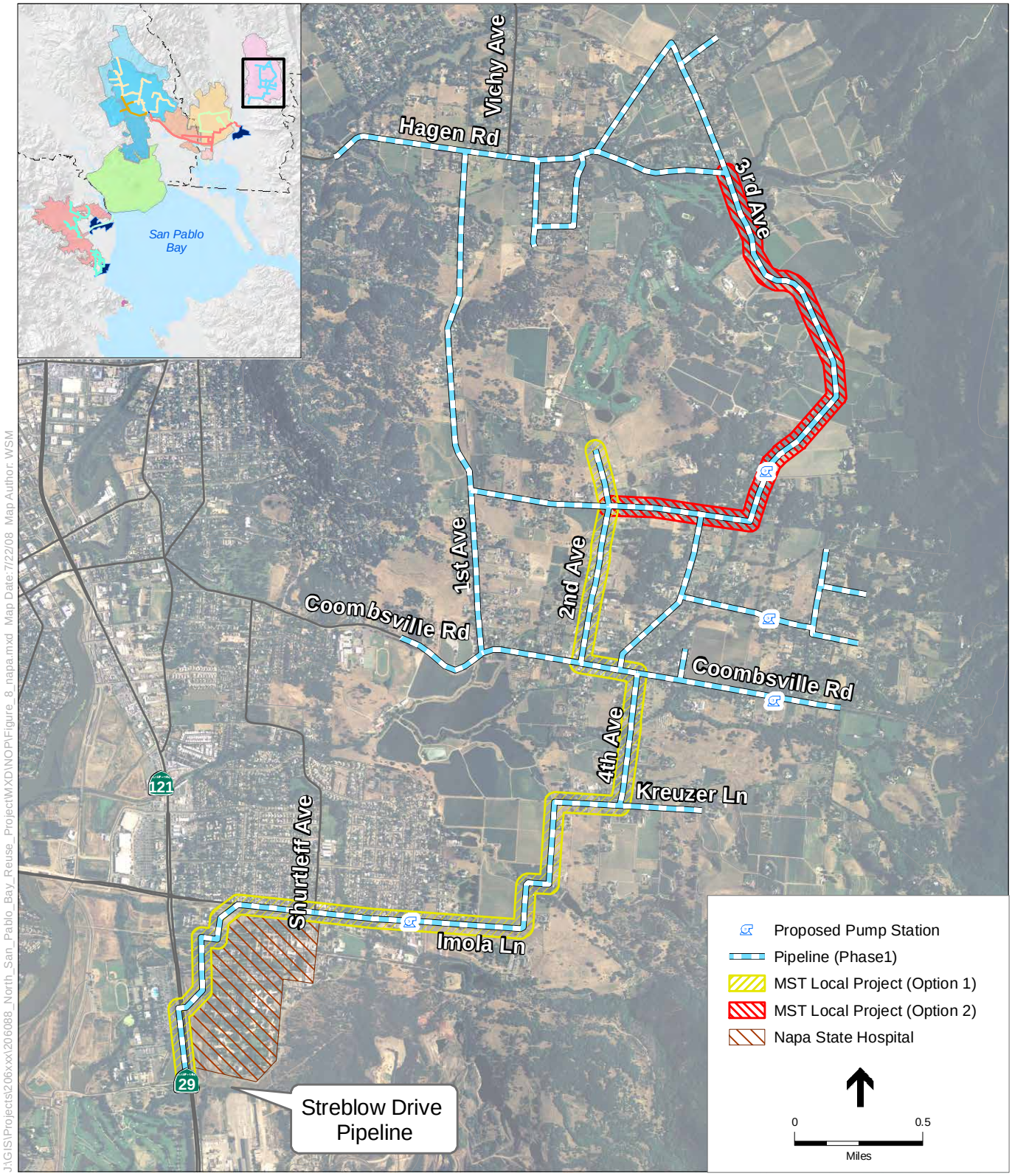
The MST Area Project would consist of 17.5 miles of new pipeline, four booster pump stations along the pipeline routes, and a new booster pump at the WWTP. The new pipeline would be installed from the end of the Streblow Drive pipeline through the Napa State Hospital grounds and north to the MST area (see **Figure 2-7**). A looped system using existing roadways would be constructed, with one segment extending west along First Avenue and the second segment extending east along Third Avenue; both segments would then merge along Hagen Road north of the Napa Valley Country Club. Four booster pump stations would be installed to maintain pressure throughout the distribution system, and an additional pump would be installed at the WWTP. Pump stations would be located on Imola, Wild Horse Valley Road, East 3rd Avenue, and 3rd Avenue. Potential recycled water users include the Napa State Hospital, the Napa Valley Country Club, and agricultural and residential parcels along the proposed pipeline route. Major roadways that would be affected by pipeline installation are listed in **Table 2-7**.

TABLE 2-7
NAPA SD MST PIPELINE SYSTEM – MAJOR ROADWAYS AFFECTED

• Imola Avenue	• Second Avenue
• 4th Avenue	• Third Avenue
• Kreuzer Lane	• East 3rd Avenue
• Coombsville Road	• North Avenue
• Wild Horse Valley Road	• Olive Hill Lane
• First Avenue	• Loma Heights Road
• North 3rd Avenue	• Hagen Road

Implementation of service to the MST area would require expansion of the Napa SD WWTP's tertiary treatment capacity by 4.5 mgd. This would include expansion of the filtration system by installing parallel filter cells adjacent to the existing filter building at the Napa SD WWTP. The location of the existing and proposed filter facilities within the fence line of the existing WWTP is shown in **Figure 2-8**. No additional storage facilities would be required.

Under the MST Local Project, a more direct pipeline system extending north from Imola Avenue along 4th Avenue, Coombsville Road, and 2nd Avenue, terminating at the Napa Valley Country Club would be implemented. The MST Local Project includes two options: Option 1 would include installation of approximately 3.5 miles of pipeline, and one pump station. Option 2 would extend the pipeline an additional 2.2 miles to provide an alternate route to the County Club. These facilities are inclusive of those identified for the larger Phase 1 MST Project; as such, analysis of these facilities is included in the discussion of impacts relative to the Phase 1 MST Project.



SOURCE: USDA, 2005; CDM, 2008; and ESA, 2008

Note: Existing Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 2-7

Napa SD MST Area:
Phase 1 Projects

2.8 Action Alternatives

2.8.1 No Project Alternative

The No Project Alternative assumes that the proposed project is not implemented, and reviews two scenarios: 1) consideration of existing conditions without the project, a "no build scenario"; and 2) consideration of "reasonably foreseeable" future conditions without the project. This second scenario is identical to the No Action Alternative, identified below, and will be examined under that heading.

2.8.2 No Action Alternative

Analysis of a No Action Alternative provides decision makers with a benchmark against which to compare the magnitude of environmental effects of the action alternatives. The No Action Alternative represents a "future-without-project" scenario: a continuation of existing conditions for an estimation of the most reasonable future conditions that could occur without implementation of any action alternatives.

The "No Action Alternative" assumes that there would be no joint project among the member agencies. It represents the "current status" in which additional wastewater treatment capacity and water recycling occurs strictly from the implementation of local plans for expansion, and the potential need to develop additional potable water supplies continues to be a regional challenge. In general, each Member Agency would continue to implement individual recycling projects, subject to the availability of funding and completion of the CEQA process. The No Action Alternative would likely result in a smaller increment of water recycling projects within the region. For example, it is anticipated that SVCSD would implement only one of the four pipeline systems identified in the Sonoma Valley Recycled Water Master Plan EIR, based upon the ability to fund such construction. Similarly, it is anticipated that LGVSD and Napa SD would prioritize funding toward NPDES compliance, and would not implement recycled water projects. Additionally, the lack of federal funding may delay or preclude the implementation of individual planned projects, due to the need to increase user rates in order to provide funds for implementation. Specific projects that would have the greatest potential to be implemented under the No Action Alternative are below, and are shown in Figure 2-8:

- **LGVSD.** LGVSD would prioritize expenditures on projects that meet its NPDES permit requirements. For the purpose of this EIR/EIS, it is assumed that this strategy would result in no additional recycled water projects being implemented in the LGVSD service area.

- **Novato SD.** Novato SD and NMWD would pursue implementation of recycled water distribution facilities solely within the Novato North Service Area. This includes 4.4 miles of pipeline, a 0.5 mgd upgrade at the Recycled Water Treatment Facility, and one pump station at the intersection of Atherton and Olive.

- **SVCSD. Sonoma Valley Recycled Water Project – Alignment 1A:** This would include construction of approximately 5.2 miles of pipeline in the Sonoma Valley, with completion of a pump station at the SVCSD WWTP.

- **SVCSD. Napa Salt Pond Pipeline:** This would include construction of approximately 3.8 miles of pipeline from the SVCSD WWTP to the SVCSD storage ponds located near the intersection of Northwestern Pacific Railroad and Ramal Road. From the ponds an additional 4.5 miles of new pipeline would be constructed to convey water to the salt pond mixing chamber. The pipeline and the pump station were discussed and analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (JSA, 2004) under the Water Delivery Project Component (Sonoma Pipeline) (see Figure 2-6). Potential route options would extend east along Ramal Road and south along Duhlig Road toward the ponds.

- **Napa SD.** Napa SD would prioritize expenditures on projects that meet its NPDES permit requirements. For the purpose of this EIR/EIS, it is assumed that this strategy would result in no additional recycled water projects being implemented in the Napa SD service area.

Facilities that would likely be implemented under the No Action Alternative are summarized in **Table 2-8**, and are shown in **Figure 2-9**. Planned treatment capacity levels are summarized in **Table 2-9** for each WWTP.

TABLE 2-8
NO ACTION ALTERNATIVE SUMMARY – FACILITIES BY MEMBER AGENCY

No Action		New Pipeline (miles)	New Demand (AFY)	Treatment Capacity Increase (mdg)	New Pump Station (HP)	New Storage (AF)
LGVSD	Peacock Gap	--	--	--	--	--
	NMWD URWP (South)	--	--	--	--	--
	Sears Point	--	--	--	--	--
Novato SD	NMWD URWP (North/Central)	4.4	193	0.5	250	x
	Sears Point	--	--	--	--	--
SVCSD	Southern Sonoma Valley	--	--	--	--	--
	Central Sonoma Valley	--	--	--	--	--
	Sonoma Valley (1A)	5.2	874	--	662	65
	Napa Salt Marsh[1]	7.9	--	--	--	--
Napa SD	Carneros East	--	--	--	--	--
	MST Area	--	--	--	--	--
	Napa (local)	--	--	--	--	--
	Napa Salt Marsh	--	--	--	--	--
Total		**17.5**	**1,067**	**0.5**	**912**	**65[1]**

1 Potential for 3,460 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type. Because this is a beneficial use that is not related to water supply, this number is tracked separately in each of the alternatives.
2 The total only represents new storage. The Proposed Action will rely on existing storage and retrofit existing facilities to accommodate storage needs, as identified in the Phase 3 Feasibility Report (CDM, 2008).

SOURCE: CDM, 2009.

TABLE 2-9
SUMMARY OF WWTP DISCHARGE VOLUMES UNDER THE NO ACTION ALTERNATIVE (MGD)

	Napa	Sonoma	Novato	LGVSD	Total	Salt Ponds
Projected 2020 WWTP Discharge	6,338	3,644	6,658	2,257	18,897	0
No Action Discharge	6,338	2,882	6,574	2,257	18,052	3,460
No Action Reduction	**(0)**	**(762)**	**(84)**	**0**	**(845)**	**+ 3,460**

SOURCE: CDM, 2009; ESA, 2009.

As a joint EIR/EIS, this impact analysis will consider two baselines; the CEQA Baseline standard, which requires a project to review it impacts relative to "change from existing conditions," as well as the NEPA baseline standard, which requires a comparison between an Alternative and the conditions anticipated under the No Action Alternative, i.e., construction of the facilities identified above. Typically, the CEQA impact analysis will include the NEPA increment of impact, as the CEQA analysis requires a broader comparison between existing conditions and post-project conditions. Where appropriate, the NEPA increment of impact between the No Action Alternative and the Project Alternatives will be identified, and reviewed for significance.

2.8.2 Alternative 1 – Basic System

Alternative 1 – Basic System would expand recycled water programs currently in operation within each of the Member Agency service areas (see **Figure 2-10**). It puts greatest emphasis on the service of local demands by the individual WWTPs. Alternative 1 would provide 6,655 AFY of new recycled water for irrigation use and 5,825 AFY for habitat restoration, and would include installation of 83 miles of new pipeline, construction of facilities onsite at the existing WWTPs to provide an additional 7.5 mgd of tertiary treatment capacity, and development of approximately 1,020 acre-feet of new storage, primarily at existing or planned storage ponds at the WWTPs. The defining features of Alternative 1 are as follows:

- Each agency would put first priority on the delivery of recycled water to its local projects. Local projects include the NMWD Urban Reuse Project, the Sonoma Valley Recycled Water Project, and projects in the Napa Milliken-Sarco-Tulucay (MST) Creeks area, and the Carneros East areas. All WWTP treatment and distribution systems are sized and designed to serve their respective local users.

- Interconnectivity between WWTPs would only occur between SVCSD and Napa SD to serve the Napa Salt Marsh Restoration Area during the restoration period (less than 10 years); however, the two agencies do not plan to size or coordinate their facilities to share recycled water in other areas. After the restoration period has been completed, additional recycled water will be required for pond and habitat maintenance.

- LGVSD tertiary treatment capacity would be increased by 0.7 mgd through onsite improvements at the LGVSD treatment plant. Recycled water from LGVSD would be

supplied by NMWD to users in the southern portion of the Novato Urban Recycled Water Project area, including Hamilton Field. One existing 0.5-million-gallon (MG) water reservoir, Reservoir Hill Tank, in the southern portion of the Novato Urban Recycled Water Project area would be rehabilitated for recycled water use.

- Novato SD tertiary treatment would be increased by 1.2 mgd through onsite improvements at the Novato SD WWTP and decommissioning of the Novato SD Recycled Water Treatment Facility. Novato SD and NMWD would pursue implementation of recycled water distribution facilities within the Novato North and Central Service Areas. The Plum Street Tank is an existing 0.5 MG facility that would be rehabilitated for recycled water storage. The system includes 9.8 miles of pipeline.
- SVCSD would treat wastewater at its existing treatment plant and distribute recycled water to local users within its existing SVCSD reuse area (in Carneros West) in addition to the Sonoma Valley Recycled Water Project and Napa Salt Marsh Restoration areas. This alternative would include construction of a new recycled water storage reservoir near the SVCSD WWTP. Additionally, it is assumed that potential user reservoirs would also be utilized for recycled water storage. SVCSD would also implement additional 13.1 miles of SVRWP pipelines.
- Napa SD tertiary treatment would be increased by an estimated 5.9 mgd through onsite improvements at the WWTP. Recycled water from Napa SD would be supplied to users in the Napa MST Area, Carneros East Areas and Napa Salt Marsh Restoration Area. Existing ponds at the WWTP would be reconfigured for recycled water storage. Additionally, it is assumed that potential user ponds would also be utilized for recycled water storage.

Recycled Water Supply, Demand, and Discharge

Table 2-10 summarizes the recycled water demand met in each WWTP service area and discharge to San Pablo Bay that would occur under Alternative 1. Each of the WWTPs currently serves some recycled water customers. **Table 2-10** presents this existing demand in acre feet (AF) for each service area, the additional demand that would be met under Alternative 1, and the total recycled water demand for Alternative 1.

TABLE 2-10
RECYCLED WATER SUPPLY, DEMAND, AND DISCHARGE UNDER ALTERNATIVE 1 (AFY)

WWTP Service Area	WWTP Inflow (2020)	Existing Recycled Water Demand	New Recycled Water Demand Developed for Alternative 1	Total Recycled Water Demand	Discharge to San Pablo Bay[1]
LGVSD WWTP	3,670	902	202	1,104	2,220
Novato SD WWTP	8,677	270	542	812	6,423
SVCSD WWTP	5,508	1,174	2,719	3,893	1,196
Napa WWTP	9,800	2,598	3,192	5,590	3,847
Total	**27,655**	**4,944**	**6,655**	**11,599**	**13,686**

1 Potential for 5,825 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type.

SOURCES: CDM, 2009; ESA, 2008

System Requirements

Table 2-11 summarizes the proposed pipeline sizes and lengths for Alternative 1 that are shown in Figure 2-10.

TABLE 2-11
PROPOSED PIPELINES UNDER ALTERNATIVE 1

Pipeline Diameter (Inches)	LGVSD (miles)	Novato SD (miles)	SVCSD (miles)	Napa SD (miles)
4	--	--	4.92	--
6	2.25	0.60	9.42	3.39
8	0.81	2.15	4.43	7.68
10	--	2.60	4.10	1.81
12	2.81	0.67	0.53	7.21
14	--	--	2.20	--
16	--	0.71	--	1.67
18	--	5.72	3.54	1.27
24	--	--	0.97	3.53
30	--	--	--	4.57
36	--	--	3.61	--
48	--	--	--	--
Total	**5.88**	**12.44**	**33.72**	**31.14**

SOURCES: CDM, 2009; ESA 2008.

Table 2-12 presents the tertiary treatment capacity upgrades that would be implemented under Alternative 1. All WWTPs currently either have tertiary treatment capability or are in the process of developing tertiary treatment capability by 2010. All WWTPs except SVCSD would need greater treatment capacity (approximately 32 million gallons per day (mgd) to meet the demands under Alternative 1.

TABLE 2-12
PROPOSED TREATMENT CAPACITY UPGRADES UNDER ALTERNATIVE 1

Facility	Tertiary Treatment Capacity without the Project (mgd)	Tertiary Treatment Capacity Required for Alternative 1 (mgd)	Tertiary Treatment Capacity Increase (mgd)
LGVSD	2.0	2.3	0.7
Novato SD	0.5	1.7	1.2
SVCSD	16.0	9.9	0.0
Napa SD	8.8	14.7	5.9
Total	**27.5**	**28.6**	**7.8**

SOURCES: CDM 2009; June 2008; ESA 2008

Table 2-13 summarizes the existing and additional recycled water storage needs (i.e., the volume in excess of existing available storage), which would be required under Alternative 1. The local project areas being served separately by LGVSD and Novato SD require less water during all months than will be treated at the two WWTPs; therefore, no storage of water is required to accommodate peak month demands, only the use of existing systems reservoirs as necessary for operational interests and system pressure management. The local project areas being served by SVCSD and Napa SD require more water during the peak summer months than each of the WWTPs is treating; additional water storage at the WWTPs, as anticipated by these Agencies' local project reports, is required to accommodate peak month demands. SVCSD will require additional new storage, and Napa SD will need to modify existing water storage basins for recycled water system use. Individual landowner ponds would be utilized throughout the reuse project areas to help offset the system storage required to serve users during peak-use periods.

TABLE 2-13
PROPOSED STORAGE FACILITIES UNDER ALTERNATIVE 1

	Volume (AF)			
Location	**Existing Storage**	**Proposed New Storage**	**Total**	**Comments**
LGVSD WWTP	0.0	0.0	0.0	None required at the WWTP
NMWD (South)	1.5	0.0	1.5	Retrofit of existing Plum Street Tank
Hamilton Field	1.5	0.0	1.5	Retrofit of existing Reservoir Hill Tank
Total for LGVSD	**3.0**	**0.0**	**3.0**	
Novato SD WWTP	0.0	0.0	0.0	
Total for Novato SD	**0.0**	**0.0**	**0.0**	
SVCSD WWTP	0.0	1,020.0	1,020.0	At the WWTP; requires land purchase
Existing SVCSD Reuse Area-1	625.0	0.0	625.0	Existing storage pond
Total for SVCSD	**625.0**	**1,020.0**	**1,645.0**	
Napa SD WWTP	950.0	0.0	950.0	Existing ponds at the WWTP to be reconfigured for recycled water storage; user ponds expected for some storage
Total for Napa SD	**950.0**	**0.0**	**950.0**	
Total	**1,578.0**	**1,020.0**	**2,598.0**	

SOURCES: CDM, 2009; ESA 2008.

Additional pump stations are needed throughout the system for distribution and to boost pressures to higher pressure zones. The locations of these pump stations are summarized below in **Table 2-14**.

Alternative 1 provides 1,183 AF of potable surface water offset in the project area: 147 AF in the Sonoma Valley Recycled Water Project, 746 AF in the NMWD Urban Reuse Area, and 200 AFY for Napa State Hospital and 90 AFY for Napa SD to deliver recycled water to a portion of Los Carneros currently served by the City of Napa potable water supply. This represents drinking water that will no longer be used for nonpotable uses, thus ensuring the highest quality water is reserved for potable uses.

TABLE 2-14
PROPOSED PUMP STATIONS UNDER ALTERNATIVE 1

Location (WWTP or Reuse Area)	Horsepower (hp)	Comments
LGVSD WWTP	71	
Total for LGVSD	**71**	
Novato WWTP	258	
Total for Novato SD	**258**	
SVCSD WWTP	872	
Existing SVCSD Reuse Area (Carneros West)	218	Existing pumps
Sonoma Valley Recycled Water Project	238	
Total for SVCSD	**1,328**	
Napa WWTP	663	
Napa WWTP	1,989	Existing pumps
MST Area	244	
Total for Napa SD	**2,896**	
Total	**4,553**	

SOURCES: CDM, 2009.

2.8.3 Alternative 2 – Partially Connected System

Alternative 2 – Partially Connected System involves development of a subregional recycled water system, taking advantage of increased storage capacity and additional pipelines under Alternative 1 to distribute recycled water more extensively throughout the project area (see **Figure 2-11**). Alternative 2 would provide 11,250 acre feet of new recycled water for irrigation uses and potentially 2,933 AFY for habitat restoration, and would include: installation of 140 miles of new pipelines, construction of facilities onsite at the existing WWTPs to provide an additional 15.9 mgd of tertiary treatment capacity, and development of approximately 2,220 acre-feet of storage, primarily at existing or planned storage ponds at the WWTPs. Alternative 2 would include those facilities previously identified for Alternative 1, in addition to the following features:

- Each agency would put first priority on the delivery of recycled water to its local projects. Additional local projects include the Peacock Gap Golf Course area, further development of the NMWD Urban Reuse Project, the Sonoma Valley Recycled Water Project, and projects in Napa MST, and the Carneros East areas.

- Interconnectivity between WWTPs would occur between SVCSD and Napa SD to serve the Napa Salt Marsh Restoration Area during the restoration period (less than 10 years) and into the maintenance period, and between Novato SD and LGVSD to serve the Sears Point Area.

- LGVSD would extend service to the Peacock Gap Golf Course Area, which would include: a new pipeline; use of additional conveyance capacity in the existing MMWD recycled water distribution system; use of existing available storage at the LGVSD WWTP, and rehabilitation of an existing 0.5-MG water reservoir near the Peacock Gap Golf Course.

- NMWD would install additional pipelines to serve to the northern, central, western, and Ignacio portions of the Novato Urban Recycled Water Project Area. An added recycled water pipeline from LGVSD would extend north to join a recycled water pipeline from Novato SD; the combined flow would continue east to jointly serve the Sears Point Area, with most of this flow originating from the Novato SD WWTP. One additional existing 0.5-MG drinking water reservoir (Norman Tank) would be modified for recycled water use, in the Ignacio portion of the Novato Urban Recycled Water Project Area. One new 0.5 MG storage reservoir would be constructed in the western portion of the service area.

- SVCSD would treat wastewater at its existing plant and distribute recycled water to local uses within its existing recycled water service area (Carneros West) in addition to the Sonoma Valley Recycled Water Project, Southern Sonoma Valley Service Area, and Napa Salt Marsh Restoration Area. This would include additional system storage in the Carneros West Area. Additionally, it is assumed that potential user ponds would also be utilized for recycled water storage.

- Napa SD would supply recycled water to an expanded Napa MST Area) to further help in reducing groundwater pumping in the region, deliver recycled water to potential users in southeast Napa, deliver recycled water to the expanded Carneros East Area (compared to Alternative 1), and to the Napa Salt Marsh Restoration Area. This alternative assumes existing ponds at the WWTP would be reconfigured for recycled water storage. Additionally, it is assumed that potential user ponds would also be utilized for recycled water storage.

Recycled Water Supply, Demand, and Discharge

Table 2-15 summarizes the recycled water demand met for each WWTP service area and discharge to San Pablo Bay that would occur under Alternative 2. Each of the WWTPs currently serves some recycled water customers. Table 2-15 presents this existing demand for each service area, the additional demand that would be met under Alternative 2, and the total recycled water demand met under Alternative 2.

As shown in Table 2-15, assuming the provision of adequate storage, there is sufficient demand in the Sonoma areas such that those WWTPs could potentially recycled all WWTP inflow under Alternative 2.

TABLE 2-15
RECYCLED WATER SUPPLY, DEMAND, AND DISCHARGE FOR ALTERNATIVE 2 (AF)

WWTP Service Area	WWTP Inflow (2020)	Existing Recycled Water Demand	New Recycled Water Demand Developed for Alternative 2	Total Recycled Water Demand	Discharge to San Pablo Bay(1)
LGVSD WWTP	3,670	902	409	1,311	2,181
Novato SD WWTP	8,677	270	2,038	2,308	5,851
SVCSD WWTP	5,508	1,174	4,381	5,555	0
Napa SD WWTP	9,800	2,598	4,421	7,019	2,657
Total	**27,655**	**4,944**	**11,250**	**16,193**	**10,689**

[1] Potential for 2,933 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type.

SOURCES: CDM, 2009; ESA 2008.

System Requirements

Table 2-16 summarizes the proposed pipeline sizes and lengths for Alternative 2 that are shown in Figure 2-5.

TABLE 2-16
PROPOSED PIPELINES UNDER ALTERNATIVE 2

Pipeline Diameter (Inches)	LGVSD (miles)	Novato SD (miles)	SVCSD (miles)	Napa SD (miles)
4	--	--	4.92	--
6	2.25	7.37	10.93	10.04
8	0.81	6.82	6.89	11.56
10	--	5.01	4.66	3.48
12	8.67	4.31	1.21	7.94
14	--	1.92	1.27	--
16	--	2.14	2.70	1.67
18	6.20	8.39	3.54	1.27
20	--	--	1.28	--
24	--	--	4.39	3.53
30	--	--	--	4.57
36	--	--	--	--
48	--	--	--	--
Total	**17.94**	**35.96**	**41.78**	**44.08**

SOURCES: CDM, 2009; ESA 2008.

Table 2-17 presents tertiary treatment capacity upgrades that would be implemented under Alternative 2, (Table 2-5). As stated earlier, all WWTPs currently either have some tertiary treatment capability or are in the process of developing tertiary treatment capability by 2010. All WWTPs would need greater treatment capacity to meet the demands under Alternative 2.

TABLE 2-17
TREATMENT IMPROVEMENT REQUIREMENTS FOR ALTERNATIVE 2

Facility	Tertiary Treatment Capacity without the Project (mgd)	Tertiary Treatment Capacity Required for Alternative 2 (mgd)	Tertiary Treatment Capacity Increase (mgd)
LGVSD	2.0	3.3	1.2
Novato SD	0.5	5.4	5.1
SVCSD	16.0	16.2	0.0
Napa SD	8.8	18.4	9.6
Total	**27.3**	**43.2**	**15.9**

SOURCES: CDM, 2009; ESA 2009.

Table 2-18 summarizes the additional recycled water storage required under Alternative 2.

TABLE 2-18
PROPOSED STORAGE REQUIREMENTS FOR ALTERNATIVE 2

Location	Volume (AF) Existing Storage	Proposed New Storage	Total	Comments
LGVSD WWTP	200.0	0.0	200.0	Existing Site to be used
NMWD (South)	3.1	0.0	3.1	Rehabilitate existing reservoirs, Plum Street, Norman), plus new western service area 0.5 mgd tank
Hamilton Field	1.5	0.0	1.5	Rehabilitate existing Reservoir Hill Tank
Peacock Gap	1.5	0.0	1.5	Rehabilitate existing MMWD reservoir
Total for LGVSD	**206.2**	**0.0**	**206.2**	
Novato WWTP	3.1	0.0	3.1	Locate at existing WWTP
Total for Novato SD	**3.1**	**0.0**	**3.1**	
SVCSD WWTP	0.0	1,020.0	1,020.0	Requires land purchase
Existing SVCSD Reuse Area-1	00.0	1,200.0	1,200.0	New storage pond, requires land purchase
Existing SVCSD Reuse Area-1	625.0	0.0	625.0	Existing storage ponds
Total for SVCSD	**625.0**	**1,020.0**	**2,845.0**	
Napa WWTP	950.0	0.0	950.0	Existing ponds at the WWTP to be reconfigured for recycled water storage; user ponds expected for some storage.
Total for Napa SD	**950.0**	**0.0**	**950.0**	
Total	**1,784.3**	**2,220.0**	**4,004.3**	

SOURCES: CDM, 2009; ESA 2008

The addition of the Peacock Gap Golf Course to the areas served by LGVSD, compared to Alternative 1, increases the summer water demand to slightly above the flow treated at the WWTP during this season; therefore, LGVSD will need to utilize existing water storage basins at the WWTP for recycled water system use during the summer. An existing 0.5-MG reservoir near the Peacock Gap Golf Course will also be rehabilitated for recycled water storage and maintaining delivery pressure.

The local project areas being served separately by Novato SD require less water during all months than will be treated at the WWTP; therefore, no storage of water is required to accommodate peak month demands. An additional 1.0-MG reservoir is anticipated to be constructed at the WWTP; in combination with two other existing 0.5-MG system reservoirs, these tanks will be used as necessary for operational interests and system pressure management.

The local project areas being served by SVCSD and Napa SD require more water during the peak summer months than each of the WWTPs is treating; additional water storage at the WWTPs, as anticipated by these Agencies' local project reports, is required to accommodate peak month

demands. SVCSD will require additional new storage at the WWTP, as well as additional pond storage within the system to accommodate users added in the Southern Sonoma Valley Area. It is anticipated this additional pond storage would occur either at the WWTP or in the Carneros West area. Napa SD will need to modify existing water storage basins for recycled water system use.

Individual landowner ponds would be used throughout the reuse project areas. Figure 2-11 displays the recycled water system and locations for new storage development.

Additional pump stations are needed throughout the system for distribution and to boost pressures to higher pressure zones. The locations of these pump stations are summarized below in **Table 2-19**.

Alternative 2 provides 1,375 AF of potable surface water offset in the project area: 147 AF in the Sonoma Valley Recycled Water Project, and 938 AF in the NMWD Urban Reuse Area, 290 AFY in Napa SD. This represents drinking water that will no longer be used for nonpotable uses, thus ensuring the highest quality water is reserved for potable uses.

TABLE 2-19
PROPOSED PUMP STATIONS UNDER ALTERNATIVE 2

Location (WWTP or Reuse Area)	Horsepower (hp)	Comments
LGVSD WWTP	91	
Peacock Gap	0	Existing MMWD Pumps
Total for LGVSD	**91**	
Novato WWTP	586	
Total for Novato SD	**586**	
SVCSD WWTP	1,315	
Existing SVCSD Reuse Area (Carneros West)	52	New Pumps
Existing SVCSD Reuse Area (Carneros West)	218	Existing Pumps
Southern Sonoma Valley	260	
Sonoma Valley Recycled Water Project	192	
Total for SVCSD	**2,037**	
Napa WWTP	673	
Napa WWTP	2,020	Existing Pumps
Napa MST Area	382	
Carneros East	105	
Total for Napa SD	**3,180**	
Total	**6,115**	

SOURCES: CDM, 2009.

2.8.4 Alternative 3 – Regional System

Alternative 3 – Fully Connected System creates a regional system that connects all four WWTPs in the project area (see **Figure 2-12**). This alternative maximizes water reuse by allowing recycled water from any WWTP to be delivered to any area that needs recycled water. Since the majority of the demand for recycled water lies in the area near Sonoma and Napa, the regional interconnection achieved under Alternative 3 would allow the other WWTPs to help satisfy the

demand in this area. Alternative 3 would provide 12,761 acre feet of new recycled water for irrigation use and 3,085 AFY for habitat restoration, and would include: installation of 153 miles of new pipelines, construction of facilities onsite at the existing WWTPs to provide an additional 20.8 mgd of tertiary treatment capacity, and development of approximately 2,220 acre-feet of storage, primarily at existing or planned storage ponds at the WWTPs. Alternative 3 would consist of project elements proposed under Alternative 2 in addition to the following features:

- A series of pipelines would connect all four WWTPs to allow for potential maximum distribution and use of recycled water.
- Each agency would put first priority on the delivery of recycled water to its local projects. Local projects include the Peacock Gap Golf Course area, NMWD Urban Reuse Project, the Sonoma Valley Recycled Water Project, and projects in Napa MST and the Carneros East areas.
- Combined flow from Novato SD and LGVSD would serve the Sears Point Area and would be extended to the Southern Sonoma Valley. Most of this flow is anticipated to originate from Novato SD.
- SVCSD would extend service north of the Sonoma Valley Recycled Water Service Area to the Central Sonoma Valley Service Area.

Recycled Water Supply, Demand, and Discharge

Table 2-20 summarizes the recycled water demand that would be met in each WWTP service area and discharge to San Pablo Bay that would occur under Alternative 3. Each of the WWTPs currently serves some recycled water customers. Table 2-20 presents this existing demand for each service area, the additional demand that would be met under Alternative 3, and the total recycled water demand for Alternative 3.

TABLE 2-20
RECYCLED WATER SUPPLY, DEMAND, AND DISCHARGE FOR ALTERNATIVE 3 (AF)

WWTP Service Area	WWTP Inflow	Existing Recycled Water Demand	New Recycled Water Demand Developed for Alternative 3	Total Recycled Water Demand	Discharge to San Pablo Bay(1)
LGVSD WWTP	3,670	902	409	1,311	2,181
Novato SD WWTP	8,677	270	3,701	3,971	4,706
SVCSD WWTP	5,508	1,174	4,230	5,404	0
Napa WWTP	9,800	2,598	4,421	6,819	2,657
Total	**27,655**	**4,944**	**12,761**	**17,705**	**9,543**

[1] Potential for 3,085 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type.

SOURCES: CDM, 2009; ESA 2008.

System Requirements

Table 2-21 summarizes the proposed pipeline sizes and lengths for Alternative 3 shown in **Figure 2-12**.

TABLE 2-21
PROPOSED PIPELINES ALTERNATIVE 3

Pipeline Diameter (Inches)	LGVSD (miles)	Novato SD (miles)	SVCSD (miles)	Napa SD (miles)
4	--	--	3.51	
6	2.25	7.69	12.51	9.72
8	0.81	5.70	5.43	11.88
10	--	5.57	4.40	3.48
12	8.67	12.56	4.56	7.94
14	--	1.92	2.97	--
16	--	4.84	1.47	1.67
18	6.20	8.39	3.83	1.27
20	--	0.41	0.87	0.92
24	--	--	4.39	3.53
30	--	--	--	4.57
36	--	--	--	--
48	--	--	--	--
Total	**17.94**	**47.08**	**43.94**	**43.72**

SOURCES: CDM, 2009; ESA 2008.

Table 2-22 presents figures on treatment upgrades required to implement Alternative 3. All WWTPs currently either have some tertiary treatment capability or are in the process of developing tertiary treatment capability by 2010, and all but SVCSD will need to increase their treatment capacity to meet the demands of Alternative 3.

TABLE 2-22
TREATMENT IMPROVEMENT REQUIREMENTS FOR ALTERNATIVE 3

Facility	Tertiary Treatment Capacity without the Project (MGD)	Tertiary Treatment Capacity Required for Alternative 3 (MGD)	Tertiary Treatment Capacity Increase (MGD)
LGVSD	2.0	2.8	1.2
Novato SD	0.5	10.5	10.0
SVCSD	16.0	15.5	0.0
Napa SD	8.8	18.4	9.6
Total	**27.3**	**47.7**	**20.8**

SOURCES: CDM, 2009; ESA 2008.

The increased recycled water demands reflected in Alternative 3 requires that all WWTPs provide some amount of secondary effluent storage for treatment and use during the peak summer period. **Table 2-23** summarizes the recycled water storage needs required under Alternative 3.

TABLE 2-23
PROPOSED STORAGE FACILITIES UNDER ALTERNATIVE 3

Location	Volume (AF)			Comments
	Existing Storage	Proposed New Storage	Total	
LGVSD WWTP	200.0	0.0	200.0	Existing storage ponds to be used
NMWD (South)	3.1	0.0	3.1	Rehabilitated existing reservoirs
Hamilton Field	1.5	0.0	1.5	Rehabilitate existing reservoir
Peacock Gap	1.5	0.0	1.5	Rehabilitate existing reservoir
Total for LGVSD	**206.1**	**0.0**	**206.1**	
Novato WWTP	437.0	0.0	437.0	Existing storage ponds to be used
Novato WWTP	3.1	0.0	3.1	
Total for Novato SD	**440.1**	**0.0**	**440.1**	
SVCSD WWTP	0.0	1,020.0	1,020	Requires land purchase
SVCSD Reuse Area	625.0	0.0	625	Existing storage ponds
SVCSD Reuse Area	0.0	1,200.0	1,200	New Storage ponds; require land purchase
Total for SVCSD	**625.0**	**2,220.0**	**2845**	
Napa SD WWTP	950.0	0.0	950	Existing ponds at the WWTP to be reconfigured for recycled water storage; user ponds expected for some storage
Total for Napa SD	**950.0**	**0.0**	**950**	
Total	**2,221.3**	**2,220.0**	**4,441.2**	

SOURCES: CDM, 2009; ESA 2008

The addition of the Peacock Gap Golf Course to the areas served by LGVSD, compared to Alternative 1, increases the summer water demand to slightly above the flow treated at the WWTP during this season; therefore, LGVSD will need to utilize existing water storage basins at the WWTP for recycled water system use during the summer. An existing 0.5-MG reservoir near the Peacock Gap Golf Course will also be rehabilitated for recycled water storage.

The addition of the Sears Point and Southern Sonoma Valley Areas, compared to Alternatives 1 and 2, increases the summer water demand above the flow treated at the Novato SD WWTP during this season; therefore, Novato SD will need to utilize existing water storage basins for recycled water system use during the summer. An additional 1.0-MG reservoir is assumed to be constructed at the WWTP; in combination with the retrofit of two other existing 0.5-MG system reservoirs, these tanks will be used as necessary for operational interests and system pressure management.

The local project areas being served by SVCSD and Napa SD require more water during the peak summer months than each of the WWTPs is treating; additional water storage at the WWTPs, as anticipated by these Agencies' local project reports, is required to accommodate peak month demands. SVCSD will require additional new storage at the WWTP, as well as additional pond storage within the system to accommodate users added in the Central Sonoma Valley Service Area. It is anticipated this additional pond storage would occur either at the WWTP or in the

Carneros West area. Napa SD will need to modify existing water storage basins for recycled water system use.

Individual landowner ponds would be utilized throughout the reuse project areas. Table 2-23 displays the recycled water system and locations for new storage development.

Additional pump stations are needed throughout the recycled water system for distribution and to boost pressures to higher pressure zones. The locations of these pump stations are shown on Figure 2-12 and are summarized in **Table 2-24**.

TABLE 2-24
PROPOSED PUMP STATIONS UNDER ALTERNATIVE 3

Location (WWTP or Reuse Area)	Horsepower (hp)	Comments
LGVSD WWTP	203	
Peacock Gap	221	Existing MMWD Pumps
Total for LGVSD	**424**	
Novato WWTP	706	
Southern Sonoma Valley	260	
Total for Novato SD	**966**	
SVCSD WWTP	1,649	
Central Sonoma Valley	409	
Existing SVCSD Reuse Area (Carneros West)	61	New Pumps
Existing SVCSD Reuse Area (Carneros West)	218	Existing Pumps
Southern Sonoma Valley	0	
Sonoma Valley Recycled Water Project	575	
Total for SVCSD	**2,912**	
Napa WWTP	672	New Pumps
Napa WWTP	2,016	Existing Pumps
Napa MST Area	382	
Carneros East	105	
Total for Napa SD	**3,175**	
Total	**7,477**	

SOURCES: CDM, 2009; ESA 2008

Alternative 3 provides 1,375 AF of potable surface water offset in the project area: 147 AF in the Sonoma Valley Recycled Water Project, and 938 AF in the NMWD Urban Reuse Area, 290 AFY in Napa SD. This represents drinking water that will no longer be used for nonpotable uses, thus ensuring the highest quality water is reserved for potable uses.

2.9 Construction

For the purposes of this EIR/EIS, impact analysis assumes that pipeline installation associated with the implementation of individual projects would be within existing roadway or railroad rights-of-way. As appropriate those pipeline segments that would intersect potentially jurisdictional features and sensitive species habitat are identified in Section 3.0, Impact Analysis.

Napa SD

City of Napa General Plan

The City of Napa General Plan identifies the following groundwater goals and policies:

Goal NR-4: To protect and enhance surface water and groundwater quality.

Policy NR-4.1: The City shall support the maintenance and improvement of surface and ground water quality.

Napa County General Plan

The Napa County General Plan identifies the following groundwater policies:

Policy CON-2: d) Encourage the use of recycled water, particularly within groundwater deficient areas, for vegetation enhancement, frost protection, and irrigation to enhance agriculture and grazing.

Policy CON-42: e) Promote and support the use of recycled water wherever feasible, including the use of tertiary treated water, to help improve supply reliability and enhance groundwater recharge.

Policy CON-51: Recognizing that groundwater best supports agricultural and rural uses, the County discourages urbanization requiring net increases in groundwater use and discourages incorporated jurisdictions from using groundwater except in emergencies or as part of conjunctive-use programs that do not cause or exacerbate conditions of overdraft or otherwise adversely affect the County's groundwater resources.

Policy CON-52: Groundwater is a valuable resource in Napa County. The County encourages responsible use and conservation of groundwater and regulates groundwater resources by way of its groundwater ordinances.

Policy CON-61: a) Environmentally sustainable water supply projects should receive priority attention, including development of sustainable alternative water supplies such as the use of recycled water or other options for non-potable uses in Carneros and the MST groundwater basins.

Policy CON-62: As stated in Policy AG/LU-74, the County supports the extension of recycled water to the Coombsville area to reduce reliance on groundwater in the MST groundwater basin and exploration of other alternatives. Also, the County shall identify and support ways to utilize recycled water for irrigation and non-potable uses to offset dependency on groundwater and surface waters and ensure adequate wastewater treatment capacity through the following measures:

a) Require (as part of continued implementation of County Code Title 13 Division 2 provisions associated with sewer systems) verification of adequate wastewater service for all development projects prior to their approvals. This requirement includes coordination with wastewater service purveyors to verify adequate capacity and infrastructure either exists or will be available prior to operation of the development project.

b) Use wastewater treatment and reuse facilities where feasible to reclaim, reuse, and deliver treated wastewater for irrigation and possible potable use depending on wastewater treatment standards.

c) Require proposals for non-residential construction in the Airport Industrial Area and lower Milliken-Sarco/Tulucay Creeks Area to incorporate dual plumbing to allow for the use of non potable/recycled water when such water becomes available.

d) Encourage the use of non-potable/recycled water wherever recycled water is available and require the use of recycled water for golf courses where feasible.

Reference 9

Linda S. Adams
Acting Secretary for Environmental Protection

California Regional Water Quality Control Board

San Francisco Bay Region

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Edmund G. Brown, Jr.
Governor

ORDER NO. R2-2011-0007
NPDES NO. CA0037575

The following Discharger is subject to waste discharge requirements set forth in this Order.

Table 1. Discharger Information

Discharger	Napa Sanitation District
Name of Facility	Soscol Water Recycling Facility, and its associated wastewater collection system
Facility Address	1515 Soscol Ferry Road, Napa CA 94558, Napa County
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as a major discharge.	

Discharges from the Soscol Water Recycling Facility at the discharge point identified below are subject to waste discharge requirements as set forth in this Order.

Table 2. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Secondary Treated Municipal Wastewater	38º 14’ 09” N	122º 17’ 10” W	Napa River

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	February 9, 2011
This Order shall become effective on:	April 1, 2011
This Order shall expire on:	March 31, 2016
The Discharger shall file a Report of Waste Discharge in accordance with title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than:	180 days prior to the Order expiration date

I, Bruce H. Wolfe, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on February 9, 2011.

_____
Bruce H. Wolfe, Executive Officer

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I. FACILITY INFORMATION

The following Discharger is subject to the waste discharge requirements set forth in this Order:

Table 4. Facility Information

Discharger	Napa Sanitation District
Name of Facility	Soscol Water Recycling Facility and its associated wastewater collection system
Facility Address	1515 Soscol Ferry Road., Napa CA 94558, Napa County
Facility Contact, Title, and Phone	Timothy B. Healy, General Manager, (707) 258-6000
Mailing Address	P.O. Box 2480, Napa CA 94558
Type of Facility	Publicly Owned Treatment Works (POTW)
Facility Design Flow	15.4 million gallons per day (mgd) (dry weather design flow)
Service Area	City of Napa and adjacent unincorporated areas in southern Napa County
Service Population	Approximately 80,600 (2009 estimate)

II. FINDINGS

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter the Regional Water Board), finds:

A. Background. The Napa Sanitation District (hereinafter the Discharger) is currently discharging under Order No. R2-2005-0008, National Pollutant Discharge Elimination System (NPDES) Permit No. CA0037575. The Discharger submitted a Report of Waste Discharge, dated September 28, 2009, and applied for an NPDES permit reissuance to discharge treated wastewater from its Soscol Water Recycling Facility to waters of the State and the United States. The Discharger is also subject to the requirements of Regional Water Board Order No. R2-2007-0077 (NPDES Permit No. CA0038849), which established requirements regarding discharges of mercury to San Francisco Bay. Order No. R2-2007-0077 is unaffected by this Order.

For the purposes of this Order, references to the “discharger” or “permittee” in applicable federal and State laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. Facility Description and Discharge Location

1. **Facility Description.** The Discharger owns and operates the Soscol Water Recycling Facility (hereinafter the Plant) and its associated wastewater collection system (hereinafter collectively the Facility.) The Plant provides secondary treatment of domestic, commercial, and industrial wastewater, serving a current population of approximately 80,600.

   During the wet season, November 1 through April 30, treatment processes consist of headworks, primary clarification, secondary treatment through activated sludge systems and/or the oxidation pond system, secondary clarification, and disinfection. Following primary clarification, a diversion structure splits the flow; up to 8 mgd of wastewater can be treated by the activated sludge system, which is followed by secondary clarification. The remaining flow is directed to the oxidation pond system, which consists of four oxidation ponds over 340 acres, followed by flocculation for algae removal and clarification. The oxidation ponds also serve as flow

equalization ponds for peak wet season influent flows. After secondary treatment, oxidation pond system effluent is commingled with activated sludge effluent, and chlorinated and dechlorinated prior to discharge to the Napa River. The oxidation ponds are lined with Bay Mud, which has high compressibility and low permeability.

The Discharger's wastewater collection system is approximately 245 miles in length and contains three pump stations. These pump stations are equipped with an alarm system, and have adequate pump capacity, redundancy, and provisions for emergency power.

2. **Discharge Description.** The Plant has an average dry weather flow (ADWF) design capacity of 15.4 mgd. From April 20, 2005, through December 31, 2009, the daily average and maximum flow rates from the Plant were 12.6 and 23.1 mgd, respectively.

3. **Discharge Location.** From November 1 through April 30, treated wastewater can be discharged from the Plant to the Napa River at Discharge Point 001 through a submerged diffuser located approximately 160 feet offshore at a depth of 13.4 feet below the surface.

   From May 1 through October 31, discharge to the Napa River is prohibited; effluent is either stored in the oxidation ponds or further treated for reclamation use. Emergency discharge to the Napa River may be granted consistent with Provision VI.C.6.c. Special effluent limitations apply under these circumstances.

4. **Reclamation Activities.** During the dry season, May 1 through October 31, influent wastewater is treated in the same manner as during the wet season. However, after secondary treatment, oxidation pond effluent is commingled with activated sludge effluent, and followed by coagulation, filtration and chlorination before reclamation. Flow not used for reclamation remains in the oxidation pond system and does not undergo flocculation and clarification until the wet season begins and discharge to the Napa River is allowed. Reclaimed water is used for irrigation for landscaping, industrial parks, golf courses, pasture lands, feed and fodder crops, a cemetery, Napa Valley College ball fields and landscaping, a recreational park, and drip irrigation of vineyards. Reclamation activities are governed by a General Water Reuse Order, Regional Water Board Order No. 96-011. The Discharger is working to expand its recycled water opportunities and plans to increase its recycled water use as discussed in Finding IV.B of the Fact Sheet (Attachment F).

5. **Biosolids Management.** Sludge from the primary clarifiers and secondary clarifiers is conveyed to an anaerobic digester. Sludge from the flocculation clarifiers and filter is conveyed to the oxidation ponds. Biosolids from the anaerobic digester are sent to the sludge holding tank and gas holder, where the gas is used for gas cogeneration, and finally conveyed to the sludge belt press for dewatering. Solids are also periodically removed from the oxidation ponds. Biosolids are either stored or land applied.

6. **Storm Water Discharge.** The Discharger is not required to be covered under the State Water Board's statewide NPDES permit for storm water discharges associated with industrial activities (NPDES General Permit No. CAS000001) because all storm water flows in contact with equipment or wastewater at the Plant and the pump stations serving the Plant are collected and directed to the oxidation ponds for treatment.

Attachment B provides a map of the area around the Plant. Attachment C provides a flow schematic of the Plant.

C. Legal Authorities. This Order is issued pursuant to Clean Water Act (CWA) section 402 and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to CWC article 4, chapter 4, division 7 (commencing with section 13260).

D. Background and Rationale for Requirements. The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for requirements of the Order, is hereby incorporated into this Order and constitutes part of the findings for this Order. Attachments A through E, and G through H, are also incorporated into this Order.

E. California Environmental Quality Act (CEQA). Under CWC section 13389, this action to adopt an NPDES permit is exempt from Chapter 3 of CEQA.

F. Technology-Based Effluent Limitations. CWA section 301(b) and NPDES regulations at Title 40 of the Code of Federal Regulations (40 CFR) section 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Secondary Treatment Standards at 40 CFR 133. Further discussion of the technology-based effluent limitation development is included in the Fact Sheet (Attachment F).

G. Water Quality-Based Effluent Limitations (WQBELs). CWA section 301(b) and NPDES regulations at 40 CFR 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

NPDES regulations at 40 CFR 122.44(d)(1)(i) mandate that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established using (1) USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion (WQC), such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in 40 CFR 122.44(d)(1)(vi).

H. Water Quality Control Plan. *The Water Quality Control Plan for the San Francisco Bay Basin* (hereinafter the Basin Plan) is the Regional Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives (WQOs) for waters of the State, including surface and groundwater. It also includes implementation programs to achieve WQOs. The Basin Plan was duly adopted by the Regional Water Board and approved by the State Water

Resources Control Board (hereinafter the State Water Board), the Office of Administrative Law, and USEPA. Requirements of this Order implement the Basin Plan. The Basin Plan specifically identifies the receiving water for this discharge, the Napa River.

The Basin Plan implements State Water Board Resolution No. 88-63, which establishes State policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Because of marine influence on the Napa River in the vicinity of the discharge, total dissolved solids levels exceed 3,000 mg/L and thereby meet an exception to State Water Board Resolution No. 88-63. The MUN designation is therefore not applicable to the receiving water in the vicinity of the discharge. The Basin Plan beneficial uses for the Napa River are listed in the table below.

Table 5. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Uses
001	Napa River	Agricultural Supply (AGR) Cold Freshwater Habitat (COLD) Fish Migration (MIGR) Preservation of Rare and Endangered Species (RARE) Fish Spawning (SPWN) Warm Freshwater Habitat (WARM) Wildlife Habitat (WILD) Water Contact Recreation (REC1) Non-Contact Water Recreation (REC2) Navigation (NAV)

The Regional Water Board adopted Resolution No. 2010-0100 on July 14, 2010, amending Basin Plan Table 2-1. This Basin Plan amendment adds nearly 275 surface water bodies to Table 2-1 and designates beneficial uses for the newly added and some existing water bodies. The Napa River near Discharge Point 001 is tidally influenced. The Basin Plan amendment lists the tidal portion of the Napa River as a new water body and designates the beneficial uses to it. The beneficial uses include all those listed in Table 5 above, except the AGR, COLD, and WARM beneficial uses. The State Water Board and USEPA have yet to consider this Basin Plan amendment.

The State Water Board adopted the *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (hereinafter the Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975. This plan contains temperature objectives for surface waters. Requirements of this Order implement the Thermal Plan.

The State Water Board's *Water Quality Control Plan for Enclosed Bays and Estuaries—Part 1, Sediment Quality* became effective on August 25, 2009. This plan integrates three lines of evidence (sediment toxicity, benthic community condition, and sediment chemistry) to determine if sediment-dependent biota and human health are protected from exposure to toxic pollutants in sediment. The plan focuses on benthic communities in enclosed bays and estuaries, and supersedes other narrative sediment quality objectives and related implementation provisions in other water quality control plans to the extent that they apply to sediment quality in bays and estuaries.

I. **National Toxics Rule (NTR) and California Toxics Rule (CTR)**. USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995, and November 9, 1999. About 40 criteria in the NTR apply in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that applied in the State. The CTR was amended on February 13, 2001. These rules contain WQC for priority pollutants.

J. **State Implementation Policy.** On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000, with respect to the priority pollutant criteria promulgated through the NTR and to the priority pollutant objectives established in the Basin Plan. The SIP became effective on May 18, 2000, with respect to the priority pollutant criteria USEPA promulgated through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005, that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.

K. **Compliance Schedules and Interim Requirements.** The State Water Board adopted Resolution No. 2008-0025 on April 15, 2008, titled *Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits*. Under limited circumstances, this policy allows the Regional Water Board to grant a compliance schedule based on a discharger's request and demonstration that it is infeasible to comply immediately with certain effluent limits. This policy became effective on August 27, 2008, superseding the Basin Plan's compliance schedule policy. This Order does not contain a compliance schedule or any interim effluent limit for any constituent.

L. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards become effective for CWA purposes. [65 Fed. Reg. 24641 (April 27, 2000), codified at 40 CFR 131.21]. Under the revised regulation (also known as the Alaska Rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

M. **Stringency of Requirements for Individual Pollutants.** This Order contains both technology-based and water quality based effluent limitations for individual pollutants. The technology-based effluent limitations consist of restrictions on biochemical oxygen demand (BOD) and total suspended solids (TSS). Derivation of these technology-based limitations is discussed in the Fact Sheet (Attachment F). This Order's technology-based pollutant restrictions implement the minimum applicable federal technology-based requirements. This Order also contains BOD and TSS effluent limitations for emergency discharges from May through October more stringent than the minimum technology-based requirements as necessary to meet water quality standards.

WQBELs have been derived to implement WQOs that protect beneficial uses. Both the beneficial uses and the WQOs have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant WQBELs were derived from the CTR, the CTR is the applicable standard pursuant to 40 CFR 131.38. The procedures for calculating individual

WQBELs for priority pollutants are based on the SIP, which was approved by USEPA on May 18, 2000. All beneficial uses and WQOs contained in the Basin Plan were approved under State law and submitted to USEPA prior to May 30, 2000. Any WQOs and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for the purposes of the CWA" pursuant to 40 CFR 131.21(c)(1).

N. Antidegradation Policy. NPDES regulations at 40 CFR 131.12 require that state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16, which incorporates the federal antidegradation policy where the federal policy applies under federal law and requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

O. Anti-Backsliding Requirements. CWA sections 402(o)(2) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous Order, with some exceptions where limitations may be relaxed.

P. Endangered Species Act. This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Discharger is responsible for meeting all requirements of applicable State and federal law pertaining to threatened and endangered species.

Q. Monitoring and Reporting. NPDES regulations at 40 CFR 122.48 require that all NPDES permits specify requirements for recording and reporting monitoring results. CWC sections 13267 and 13383 authorize the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP) establishes monitoring and reporting requirements to implement federal and State requirements. This MRP is provided in Attachment E.

R. Standard and Special Provisions. Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment D. The Discharger must comply with all standard provisions and with those additional conditions that apply under 40 CFR 122.42. The Discharger must also comply with the Regional Standard Provisions provided in Attachment G. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. The Fact Sheet (Attachment F) provides rationale for the special provisions.

S. Provisions and Requirements Implementing State Law. The requirements for groundwater monitoring near the aeration ponds (MRP, Attachment E) are to implement State Law to protect the groundwater, which is the waters of the State.

T. Notification of Interested Parties. The Regional Water Board notified the Discharger and interested agencies and persons of its intent to prescribe WDRs for the discharge and provided them

with an opportunity to submit their written comments and recommendations. The Fact Sheet (Attachment F) provides details of the notification.

U. Consideration of Public Comment. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. The Fact Sheet (Attachment F) provides details of the public hearing.

IT IS HEREBY ORDERED, that this Order supersedes Order No. R2-2005-0008, except for enforcement purposes, and, in order to meet the provisions contained in CWC Division 7 (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

III. DISCHARGE PROHIBITIONS

A. Discharge of treated wastewater at a location or in a manner different from that described in this Order is prohibited.

B. The bypass of untreated or partially treated wastewater to waters of the United States is prohibited, except as provided for in the conditions stated in sections I.G.2 and I.G.4 of Attachment D of this Order.

C. The average dry weather effluent flow shall not exceed 15.4 mgd, as measured at monitoring station INF-001 as described in the attached Monitoring and Reporting Program (MRP) (Attachment E). Average dry weather flow shall be determined over three consecutive dry weather months each year.

D. Any sanitary sewer overflow that results in a discharge of untreated or partially treated wastewater to waters of the United States is prohibited.

E. Discharge to the Napa River is prohibited during the dry weather period of May 1 through October 31, except for emergencies and only when authorized by the Executive Officer after the Discharger satisfies the conditions specified in the emergency discharge request procedure contained in Provision VI.C.6.c of this Order.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

In this section, the term “effluent” refers to the treated wastewater effluent from the Discharger’s wastewater treatment facility, as discharged to the Napa River.

A. Effluent Limitations for Conventional and Non-Conventional Pollutants – Discharge Point 001

1. Effluent Limitations Applicable to Wet Season Discharges (November 1 through April 30)

During the period of November 1 through April 30, the Discharger shall comply with the effluent limitations contained in Table 6 at Discharge Point 001, with compliance measured at Monitoring Location EFF-001, as described in the MRP (Attachment E).

Table 6. Conventional and Non-Conventional Effluent Limitations for Wet Season Discharges – Discharge Point 001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD 5-day @ 20°C (BOD_5) (or Carbonaceous BOD [CBOD])	mg/L	30 (or 25)	45 (or 40)	---	---	---
Total Suspended Solids (TSS)	mg/L	30	45	---	---	---
BOD and TSS percent removal [1]	%	85 (minimum)	---	---	---	---
Oil and Grease	mg/L	10	---	20	---	---
pH[2]	s.u	---	---	---	6.5	8.5
Total Chlorine Residual[3]	mg/L	---	---	---	---	0.0
Enterococcus Bacteria[4]	MPN/ 100ml	30-day geometric mean shall not exceed 35				

Unit Abbreviations:
mg/L = milligrams per liter
s.u. = standard units

Footnotes to Table 6:

[1] 85 Percent Removal. The arithmetic mean of the biochemical oxygen demand (BOD_5, 20°C) and total suspended solids values (TSS), by concentration, for effluent samples collected in each calendar month shall not exceed 15 percent of the arithmetic mean of the respective values, by concentration, for influent samples collected at approximately the same times during the same period.

[2] pH. If the Discharger monitors pH continuously, pursuant to 40 CFR 401.17, the Discharger shall be in compliance with the pH limitation specified herein provided that both of the following conditions are satisfied: (i) the total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month; and (ii) no individual excursion from the range of pH values shall exceed 60 minutes.

[3] Total Chlorine Residual. The Discharger may elect to use a continuous on-line monitoring system(s) for measuring flows, chlorine, and sulfur dioxide dosage (including a safety factor) and concentration to prove that chlorine residual exceedances are false positives. If convincing evidence is provided, Regional Water Board staff may conclude that false positive chlorine residual exceedances are not violations of the effluent limitation.

[4] Enterococcus Bacteria. This effluent limitation shall be implemented as a geometric mean of a minimum of five effluent samples spaced over a calendar month.

2. Effluent Limitations Applicable to Dry Season (Emergency) Discharges (May 1 through October 31)

During the period of May through October, when emergency discharges occur, the Discharger shall comply with the following effluent limitations in Table 7 at Discharge Point 001, with compliance measured at Monitoring Location EFF-001, as described in the MRP (Attachment E).

Table 7. Conventional and Non-Conventional Effluent Limitations for Dry Season Discharges – Discharge Point 001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD_5	mg/L	10	20	---	---	---
TSS	mg/L	20	30	---	---	---
BOD and TSS percent removal[1]	%	85 (minimum)	---	---	---	---
Oil and Grease	mg/L	10	---	20	---	---
pH[2]	s.u	---	---	---	6.5	8.5
Total Chlorine Residual[3]	mg/L	---	---	---	---	0.0
Enterococcus Bacteria[4]	MPN/ 100ml	30-day geometric mean shall not exceed 35				

Unit Abbreviations:
mg/L = milligrams per liter
s.u. = standard units

Footnotes to Table 7:

[1] 85 Percent Removal. The arithmetic mean of the BOD_5 and TSS, by concentration, for effluent samples collected in each calendar month shall not exceed 15 percent of the arithmetic mean of the respective values, by concentration, for influent samples collected at approximately the same times during the same period.

[2] pH. If the Discharger monitors pH continuously, pursuant to 40 CFR 401.17, the Discharger shall be in compliance with the pH limitation specified herein provided that both of the following conditions are satisfied: (i) the total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month; and (ii) no individual excursion from the range of pH values shall exceed 60 minutes.

[3] Total Chlorine Residual. The Discharger may elect to use a continuous on-line monitoring system(s) for measuring flows, chlorine, and sulfur dioxide dosage (including a safety factor) and concentration to prove that chlorine residual exceedances are false positives. If convincing evidence is provided, Regional Water Board staff may conclude that false positive chlorine residual exceedances are not violations of the effluent limitation.

[4] Enterococcus Bacteria. This effluent limitation shall be implemented as a geometric mean of a minimum of five effluent samples spaced over a calendar month, or in the event of a dry season discharge, equally spaced over the discharge period.

B. Effluent Limitations for Toxic Substances – Discharge Point 001

The Discharger shall comply with the following effluent limitations at Discharge Point 001 with compliance determined at Monitoring Location EFF-001, as described in the attached MRP (Attachment E). These effluent limitations shall apply during both the wet and dry seasons.

Table 8. Toxic Pollutant Effluent Limitations – Discharge Point 001

Constituent	Units	Effluent Limitations[1]	
		Average Monthly (AMEL)	Maximum Daily (MDEL)
Copper	µg/L	9.4	16
Nickel	µg/L	7.8	10
Cyanide	µg/L	6.4	15
Dioxin-TEQ	µg/L	1.4×10^{-8}	2.8×10^{-8}
Total Ammonia	mg/L	21	49

Unit Abbreviations:
µg/L = micrograms per liter
mg/L = milligrams per liter

Footnotes to Table 8:

[1] a. Limitations apply to the average concentration of all samples collected during the averaging period (daily = 24-hour period; monthly = calendar month).

b. All limitations for metals are expressed as total recoverable metals.

C. Whole Effluent Toxicity

1. Whole Effluent Acute Toxicity

a. Whole effluent acute toxicity limitations are applicable to wet season and dry season discharges.

b. Representative samples of the effluent at Discharge Point 001, with compliance measured at EFF-001 as described in the MRP (Attachment E), shall meet the following limits for acute toxicity. Bioassays shall be conducted in compliance with section V.A of the MRP.

(1) An eleven (11) – sample median value of not less than 90 percent survival; and

(2) An eleven (11) – sample 90th percentile value of not less than 70 percent survival.

c. These acute toxicity limitations are further defined as follows:

(1) **11-sample median**. A bioassay test showing survival of less than 90 percent represents a violation of this effluent limit, if five or more of the past ten or less bioassay tests show less than 90 percent survival.

(2) **11-sample 90th percentile**. A bioassay test showing survival of less than 70 percent represents a violation of this effluent limit, if one or more of the past ten or less bioassay tests show less than 70 percent survival.

d. Bioassays shall be performed using the most up-to-date USEPA protocol and the most sensitive species as specified in writing by the Executive Officer based on the most recent screening test results. Bioassays shall be conducted in compliance with "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms," currently 5th Edition (EPA-821-R-02-012), with exceptions granted to the Discharger by the Executive Officer and the Environmental Laboratory Accreditation Program (ELAP) upon the Discharger's request with justification.

2. Whole Effluent Chronic Toxicity

a. Whole effluent chronic toxicity limitations are applicable to both wet season and dry season emergency discharges of more than four days.

b. There shall be no chronic toxicity in the discharge as discharged. Chronic toxicity is a detrimental biological effect of growth rate, reproduction, fertilization success, larval development, or any other relevant measure of the health of an organism population or community.

Compliance with this limit shall be determined by analysis of indicator organisms and toxicity tests. Compliance shall be measured at EFF-001 as described in the MRP (Attachment E).

c. The Discharger shall comply with the following tiered requirements based on results from representative samples of the effluent at Discharge Point 001, with compliance measured at EFF-001 as described in the MRP (Attachment E), meeting test acceptability criteria and section V.B of the MRP.

(1) Conduct routine monitoring.

(2) For wet season discharges, conduct accelerated monitoring after exceeding a three-sample median of 10 chronic toxicity units (TUc[1]) or a single-sample maximum of 20 TUc.

For dry season discharges, conduct accelerated monitoring after exceeding a single sample maximum of 1 TUc.

(3) Return to routine monitoring if accelerated monitoring does not exceed the "trigger" in (2), above.

(4) If accelerated monitoring confirms consistent toxicity in excess of either "trigger" in (2), above, initiate toxicity identification evaluation/toxicity reduction evaluation (TIE/TRE) procedures in accordance with MRP section V.B (Attachment E).

(5) Return to routine monitoring after appropriate elements of TRE workplan are implemented and either the toxicity drops below the "trigger" levels in (2), above, or based on the results of the TRE, the Executive Officer authorizes a return to routine monitoring.

d. The Discharger shall monitor chronic toxicity using the test species and protocols specified in MRP section V.B (Attachment E). The Discharger shall also perform chronic toxicity screening phase monitoring as described in Appendix E-1 of the MRP.

D. Land Discharge Specifications

Not Applicable.

E. Reclamation Specifications

Water reclamation requirements for this Discharger are established by Regional Water Board Order No. 96-011.

[1] A TUc equals 100 divided by the no observable effect level (NOEL). The NOEL is determined from IC, EC, or NOEC values. These terms, their usage, and other chronic toxicity monitoring program requirements are defined in more detail in the MRP (Attachment E).

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

Receiving water limitations are based on WQOs contained in the Basin Plan and are a required part of this Order. The discharges shall not cause the following in the receiving water:

1. The discharge of waste shall not cause the following conditions to exist in waters of the State at any place:

   a. Floating, suspended, or deposited macroscopic particulate matter or foams;

   b. Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses;

   c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;

   d. Visible, floating, suspended, or deposited oil or other products of petroleum origin; and

   e. Toxic or other deleterious substances to be present in concentrations or quantities that cause deleterious effects on wildlife, waterfowl, or other aquatic biota, or that render any of these unfit for human consumption, either at levels created in the receiving waters or as a result of biological concentration.

2. The discharge of waste shall not cause the following limits to be exceeded in waters of the State at any place within 1 foot of the water surface:

a. Dissolved Oxygen	5.0 mg/L, minimum. Furthermore, the median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation. When natural factors cause concentrations less than that specified above, the discharge shall not cause further reduction in ambient dissolved oxygen concentrations.
b. Dissolved Sulfide	Natural background levels
c. pH	The pH shall not be depressed below 6.5 or raised above 8.5. The discharge shall not cause changes greater than 0.5 pH units in normal ambient pH levels.
d. Nutrients	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

3. The discharge shall not cause a violation of any particular water quality standard for receiving waters adopted by the Regional Water Board or the State Water Board as required

by the CWA and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to CWA section 303, or amendments thereto, the Regional Water Board may revise and modify this Order in accordance with such more stringent standards.

B. Groundwater Limitations

Not Applicable.

VI. PROVISIONS

A. Standard Provisions

1. **Federal Standard Provisions.** The Discharger shall comply with federal Standard Provisions included in Attachment D of this Order.

2. **Regional Standard Provisions.** The Discharger shall comply with all applicable items of the Regional Standard Provisions, and Monitoring and Reporting Requirements (Supplement to Attachment D) for NPDES Wastewater Discharge Permits (Attachment G), including amendments thereto.

B. MRP Requirements

The Discharger shall comply with the MRP (Attachment E), and future revisions thereto, including applicable sampling and reporting requirements in the standard provisions listed in VI.A above.

C. Special Provisions

1. **Reopener Provisions**

The Regional Water Board may modify or reopen this Order prior to its expiration date in any of the following circumstances as allowed by law:

a. If present or future investigations demonstrate that the discharges governed by this Order have or will have a reasonable potential to cause or contribute to, or will cease to have, adverse impacts on water quality or beneficial uses of the receiving waters.

b. If new or revised WQOs or total maximum daily loads (TMDLs) come into effect for the San Francisco Bay Estuary and contiguous water bodies (whether statewide, regional, or site-specific). In such cases, effluent limitations in this Order will be modified as necessary to reflect updated WQOs and waste load allocations in TMDLs. Adoption of effluent limitations contained in this Order is not intended to restrict in any way future modifications based on legally adopted WQOs or TMDLs, or as otherwise permitted under federal regulations governing NPDES permit modifications.

c. If translator, dilution, or other water quality studies provide a basis for determining that a permit condition should be modified.

d. If State Water Board precedential decisions, new policies, new laws, or new regulations on chronic toxicity or total chlorine residual become available.

Reference 10

PUBLIC DRAFT

LOS CARNEROS WATER DISTRICT

Recycled Water Pipeline Project

Initial Study/Mitigated Negative Declaration Environmental Assessment/Finding of No Significant Impact

OCTOBER 2013

SMB ENVIRONMENTAL

In association with
Dennis Bowker Consulting Services

Los Carneros Water District
Recycled Water Pipeline Project

Public Draft

Initial Study / Mitigated Negative Declaration
and
Environmental Assessment/Finding of No Significant Impact

Prepared by:

SMB Environmental, Inc.

and

Dennis Bowker Consulting Services

October 2013

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List of Abbreviations

ABWF	average base wastewater flow
BAAQMD	Bay Area Air Quality Management District
Basin	Bay Area Air Basin
C.C.R	California Code of Regulations
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal EPA	California Environmental Protection Agency
Cal Water	California Water Service Company
Cal/OSHA	State of California Occupational Safety and Health Administration's
CALTRANS	California Department of Transportation
CAP	Clean Air Plan
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CGS	California Geological Survey
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society's
CWA	Federal Clean Water Act
DPM	Diesel particulate matter
DTSC	Department of Toxics Substances Control
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
gpd	gallons per day
gpm	gallons per minute
HCP	Habitat Conservation Plan
I/I	infiltration/inflow

ISA	International Society of Arboriculture Standards
Leq	Equivalent Sound Level
LU	Landscape Unit
mgd	million gallons per day
MRZ	Mineral Resource Zone 4
NAAQS	National Ambient Air Quality Standards
NBWRP	North Bay Water Recycling Program
NEPA	National Environmental Quality Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NMFS	National Marine Fisheries Service
NOx	Nitrus Oxcides
NPDES	National Pollutant Discharge Elimination System
NSD	Napa Sanitation District
OHWM	Ordinary High Water Mark
PWWF	Peak wet weather flow
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SFPUC	San Francisco Public Utilities Commission
SR	State Route
SRF	State Revolving Funds
SWPPP	Stormwater Pollution Prevention Permit
SWRCB	State Water Resources Control Board
TAZ	Traffic Analysis Zones
TSP	Total Suspended Particles
USACE	United States Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
USFWS	U.S. Fish and Wildlife Service
WWTP	Wastewater Treatment Plant

Chapter 1 Introduction

This document is an Initial Study/Mitigated Negative Declaration (IS/MND) and an Environmental Assessment/Finding of No Significant Impact (EA/FONSI) that addresses the potential environmental impacts of the Los Carneros Water District's (District) proposed Recycled Water Pipeline Project (Proposed Project/Action). The purpose of the Proposed Project/Action is to augment the existing surface and groundwater supplies within the District for the irrigation of landscape, vineyards and other agricultural lands within the District.

This document has been prepared in accordance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The District is the lead agency under CEQA. It is presumed that the U.S. Bureau of Reclamation (USBR) will be the lead agency under NEPA as the District may be pursuing federal funding under the U.S. Department of the Interior's Bureau of Reclamation Public Law 102-575, Title XVI Water Reclamation and Reuse Program (Title XVI Program). In addition, the District is also seeking funds from the State Revolving Fund (SRF) Loan Program that is administered by the State Water Resources Control Board (State Board).

The purpose of this document is to provide project-level CEQA and NEPA environmental analysis of the District's Proposed Project/Action to deliver recycled water in the Los Carneros area. Additionally, this work is being prepared in order to facilitate inclusion into the NBWRP and receive federal funding under USBR's Title XVI Program and/or from the State Boards SRF Loan Program.

1.1 Project Location and Background

As shown in Figure 1, the District is located in southwest Napa County within a renowned winegrowing region. The District was formed in 1978 to provide recycled water service to parts of the unincorporated area of Los Carneros. The District is organized as an independent special district under Division 13 of the California Water Code (Section 34,000 et seq.) and is governed by a volunteer seven-member board of directors that serve staggered four-year terms. Elections are based on the landowner-voter system, which allows each landowner one vote for each dollar that his or her property is assessed. There are currently 263 assessor parcels totaling approximately 5,700 acres in the District with an estimated residential population of 535. The District's formation was engendered by local property owners for the purpose of facilitating an agreement with the Napa Sanitation District (NSD) to plan, construct, and operate projects necessary to deliver reclaimed water for agricultural use. Underlying plans included constructing a pipeline system to convey recycled water across the Napa River from NSD's wastewater treatment facilities into the Los Carneros area, and initially serve 106 of the 262 parcels within the District. The land area served is approximately 3,800 acres. However, while an agreement is in place and various recycling projects have been considered over the past 30 years, none have been implemented to date due to cost considerations. As a result, the District has yet to begin a project, and local property owners continue to depend on surface water diversions and groundwater withdrawals to satisfy water demands in the area.

In May 2010, the City of Napa certified the *St. Regis Napa Valley Project – Environmental Impact Report* (EIR) on the St. Regis Napa Valley Project that consists of a 93-acre destination resort development on Stanly Ranch adjacent to the southeast side of the District's service boundary. That EIR and its findings are incorporated by reference into this document. The resort will consist of a winery, resort units, recreation and event space, restaurants, a spa, outdoor venues, public space, offices, and maintenance and staff support facilities. Approximately 50 acres of the site would be maintained as either open space or vineyards. The proposed development will also include the construction of a 20-inch recycled water pipeline from the NSD's Soscol Wastewater Treatment Plant (WWTP) and under the Napa River to serve

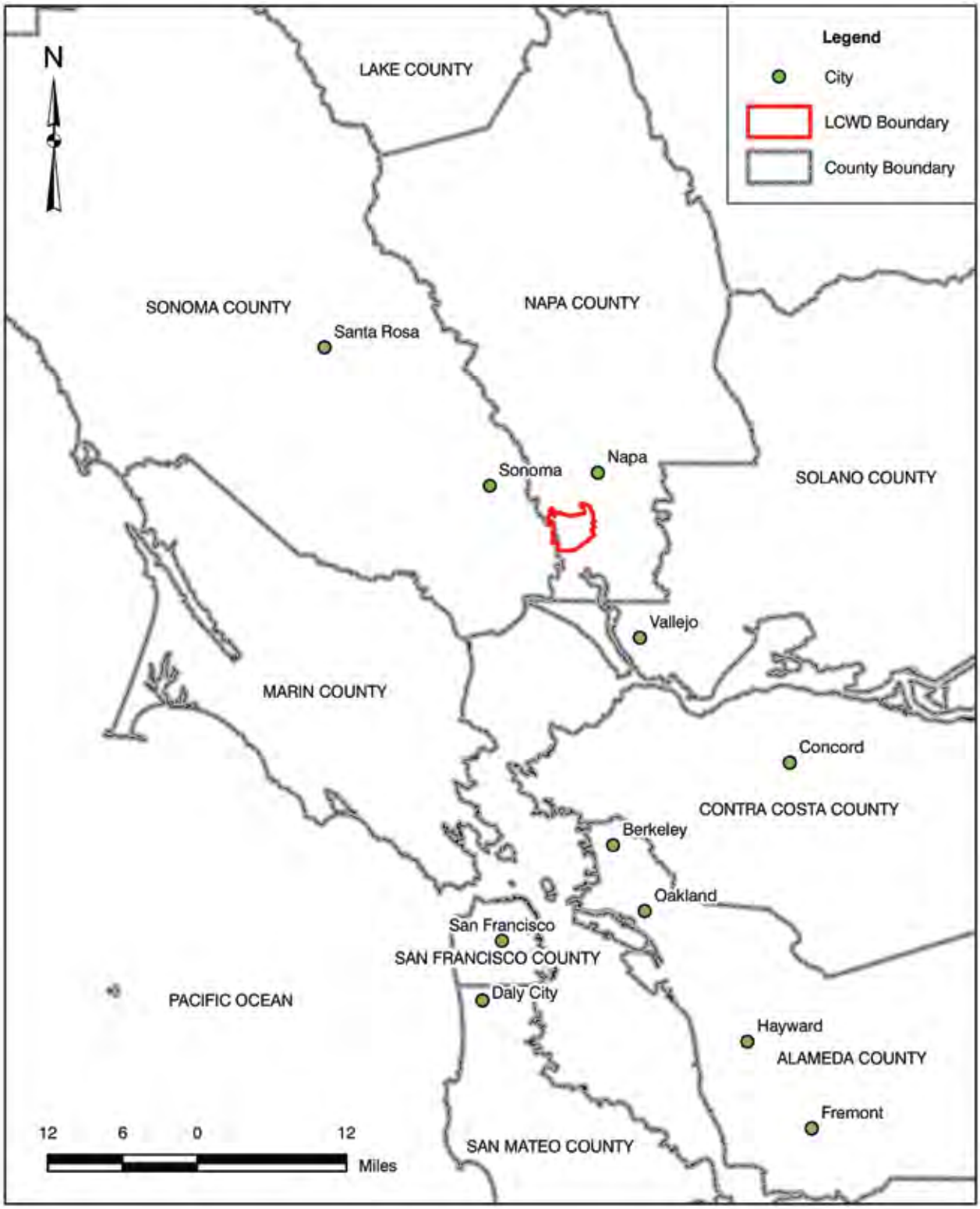

Figure 1
GENERAL LOCATION MAP
LOS CARNEROS WATER DISTRICT
RECYCLED WATER PIPELINE PROJECT
IS/MND AND EA/FONSI

Los Carneros
Water District

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the development with unrestricted use tertiary treated recycled water for irrigation. This pipeline has been designed and approved by NSD, and is presently under construction, with completion by late fall of 2013. The District recognizes that its Proposed Project/Action will not need to construct the pipeline segment that crosses under the Napa River, and was previously evaluated and disclosed in the St Regis EIR. Once constructed, the District's proposed pipeline network will connect to the end of the St. Regis recycled water pipeline system to serve lands within the Los Carneros Water District. This document focuses on the potential impacts of the District's proposed pipeline system and operations to disclose their potential environmental effects. This will include a connecting 1,300- foot pipeline on the east side of the Napa River, as well as the approximately 47,000 foot distribution pipeline system on the west side of the River.

In addition, the District is contemplating being included in the North Bay Water Reuse Authority's (NBWRA) North Bay Water Recycling Program (NBWRP). In November 2009, the NBWRA and USBR completed and approved the *North Bay Water Recycling Program Environmental Impact Report/Environmental Impact Statement*. The NBWRA and member agencies are eligible to receive Title XVI funds from the United States Bureau of Reclamation (USBR). While the District was not an original, nor an active participant in the development of the NBWRP and the EIR/EIS, the NBWRP EIR/EIS included alternatives for a recycled water system to serve the Los Carneros area in Napa County. Napa County is a member of the NBWRA, and the District would fall under their membership for inclusion to the NBWRP. The District has also incorporated by reference and summarized the findings of the NBWRP EIR/EIS into this document as appropriate to disclose their potential environmental effects of the specific Proposed Project/Action.

In April 2011, the District prepared the *Los Carneros Recycled Water Feasibility Study* under a planning grant from the California State Water Resources Control Board (State Board) that analyzed numerous alternatives to bring recycled water to the District. The recommended alternative identified in the study went forward for additional analysis. Since the Feasibility Study was completed, the District made modifications to the recommended alterative because some of the potential irrigators opted out of the project to connect with a recent extension from Sonoma County to the west. This resulted in some pipe diameters being reduced and the pipelines along Duhig Road (south of Las Amigas) being removed. The recommended alternative in the feasibility study along with the subsequent modifications is the basis of this adjusted Proposed Project/Action.

1.2 Goal and Objective and Purpose and Needs

The goal, objective, and purpose of the Proposed Project/Action is to construct an approximately 9.2-mile pipeline system to serve portions of the 3,800 acres of residential landscape and agricultural land within the District with tertiary treated recycled water from NSD's existing Soscol WWTP. Water produced at that facility meets the requirements for disinfected tertiary recycled water "unrestricted use" as defined in California Code of Regulations (CCR), Title 22, Sections 60301 through 60355. The issues and needs within the District can be summarized as follows:

- The agricultural economy, which is dominated by high-value vineyard culture, requires a highly reliable water supply to maintain and to expand its crop base;

- Surface water supplies are already diverted by multiple users, have low flows in the summer (which coincides with the irrigation season), and can have low flows in dry years; and

- Groundwater supplies are typically heavily used and in some localities have marginal quality and highly unreliable quantity from year to year.

- Groundwater availability is irregular. In some areas, especially during the dry months, pumping of the scattered groundwater aquifers often results in some residential users' well production to markedly diminish and in some cases stop altogether. This results in those homeowners having to truck in water.

- Rising seal levels, combined with groundwater and surface water extraction, have increased the risk of saltwater intrusion from San Pablo Bay in many parts of the area.

1.3 Document Organization and Review Process

This IS/MND and EA/FONSI has been prepared in accordance with both CEQA and NEPA and is to provide a preliminary environmental investigation of the Proposed Project/Action to determine if it may have a significant adverse impact on the environment. This document is organized into the following chapters:

- Chapter 1, Introduction. Chapter 1 describes the background, goals and objectives of the Proposed Project/Action, and document contents.
- Chapter 2, Project Description and Alternatives. Chapter 2 describes the major components of the Proposed Project/Action and describes the No Project/Action Alternative.
- Chapter 3, CEQA Initial Study Checklist. Chapter 3 discusses the potential environmental impacts associated with the construction and operation of the Proposed Project/Action. Each resource section of the checklist is followed by a discussion of each potential impact listed in that section. It also presents corresponding mitigation measures proposed as part of the Proposed Project/Action, to avoid or reduce impacts to a less than significant level. This checklist has been modified to include additional topics to meet the requirements of NEPA.
- Chapter 4, Determination. Chapter 4 provides the proposed action as a result of this Initial Study and Environmental Assessment.
- Chapter 5, Bibliography. Chapter 5 provides a list of reference materials and persons consulted during the preparation of the Initial Study.

This document will be available for a 30-day public review period, during which written comments may be submitted to the following address:

Mr. John Stewart, President
Los Carneros Water District
2111 Las Amigas Road
Napa, CA 94559

Responses to written comments received by the end of the 30-day public review period will be prepared and included in the final document to be considered by the District, USBR and/or the State Board prior to taking any discretionary action/decision on the Proposed Project/Action.

Chapter 2 Proposed Project Description and Alternatives

This chapter provides a detailed description of Proposed Project/Action including a discussion of the construction considerations, compliance with CCR Title 22 and State Board Requirements, operational plans, and potential approvals and permits that may be necessary. In addition, this section describes the No Project/Action Alternative as required by NEPA.

2.1 Proposed Project/Action Description

As shown in Figure 2, the Proposed Project/Action would primarily consist of approximately 9.2-miles of 20- to 6-inch recycled water pipeline to serve portions of the 3,800 acres of residential landscape and agricultural land within the District. The proposed pipeline network would be located primarily within existing roadways and would not require any pump stations or storage facilities. Any pumping and storage would be done with and from NSD's existing facilities. The Proposed Project/Action would serve approximately 106 parcels or 3,800 acres of irrigable land within the District with a recycled water supply of approximately 1,300 acre-feet per year that meets Title 22 unrestricted use requirements.

Recycled water users within the District will connect their own pipeline/irrigation systems and facilities to various turnouts to provide the recycled water to their private lands and fields, consistent with Title 22 and the State Board's policy on the use of recycled water. Recycled water users will only apply recycled water at agronomic rates to avoid runoff and/or saturation and loading of salts and nutrients to the soil, and/or surface and groundwater resources. Table 1 lists the major pipeline segments to be installed.

Table 1: Proposed Project/Action Pipeline Segments by Roadway

Location/Description	Diameter (in.)	Length (ft.)
Connection to Existing River Crossing	20	810
Ranch Road/Home Hill Road	20	4,770
Stanly Cross Road	18	2,455
Cuttings Wharf Road	10	2,960
Milton Road	8	2,340
Las Amigas Road	16-18	14,470
Duhig Road	12-16	7,640
South Avenue	8	1,260
Los Carneros Avenue	8	3,790
Withers Road	6	3,120
Neuenschwander Road	6	1,220
Private Road (north of Stanly Crossroad)	8	2,000
	Total	**46,835**

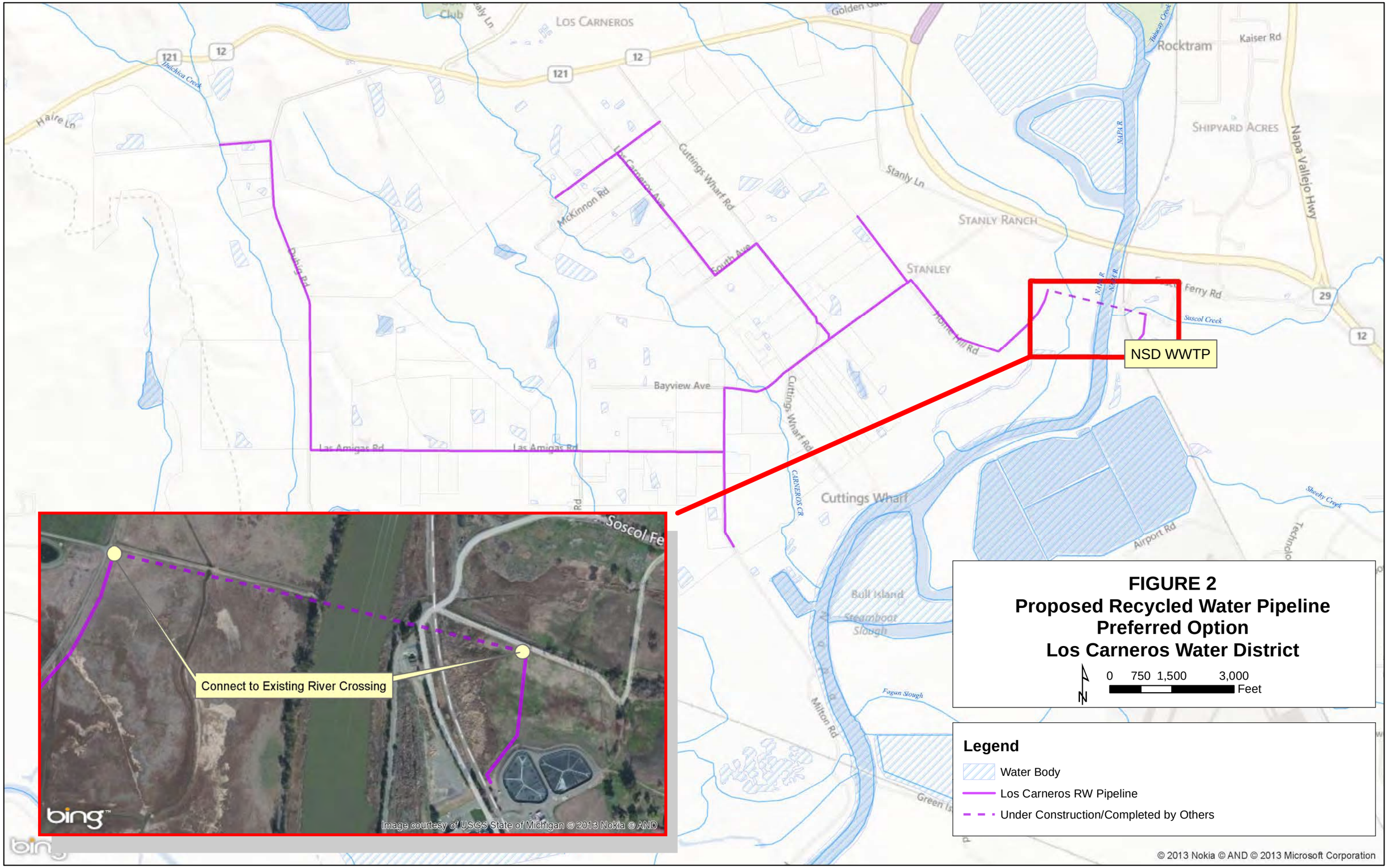

FIGURE 2
Proposed Recycled Water Pipeline
Preferred Option
Los Carneros Water District

2.2 Construction Considerations

Construction of the Proposed Project/Action facilities is expected to begin in the summer of 2014 and will likely continue into the summer of 2015. Construction work will typically be done within normal working hours, weekdays between the hours of 7 a.m. and 7 p.m., and possibly on Saturdays between the hours of 8 a.m. and 5 p.m. The Proposed Project/Action would be constructed primarily within existing roadways and any damages occurring during construction will be returned to the pre-construction condition or better. Detailed below is a summary of the construction techniques and activities.

- The majority of the pipelines would be installed in existing roadways using conventional cut and cover construction techniques, and installing pipe in open trenches. While in some instances up to a 50-foot wide construction corridor would be used to help maximize the efficiency during construction. However, in most places a 25-foot construction corridor could be realized, especially for the smaller diameter pipelines. It is anticipated that excavation would typically be no more than 6 feet deep.

- The Proposed Project/Action would connect to the east end of to the planned St. Regis/NSD pipeline that will cross under the Napa River and connect from a 36 inch line near the NSD pump station. Those environmental impacts were previously disclosed in the St. Regis EIR. This Proposed Project/Action would involve one (1) local creek crossing (e.g. Carneros Creek at Las Amigas Road) which will require using trenchless construction techniques. As a result, the District will install the pipeline on the side of the existing bridge, and will not involve cutting through or disturbing the creek. Specific design of a bridge crossing (e.g., pipe material and placement) would be determined during the design phase, once the engineers consult with the County Public Works Department and review the design of the bridge.

- The Proposed Project/Action would also require crossing numerous culverts and drainage facilities. Each of the existing culverts and drainage facilities crossing the roads will be done using conventional cut and cover construction techniques, but will be done in the dry season and will not occur during rainy weather, nor in the October 15 and April 1 timespan.

- Dewatering of the pipeline as a result of hydrostatic testing during construction, as well as any dewatering as a result of operations and maintenance activities will be discharged to land and not into any creeks, drainages, vernal pools or waterways and will obtain prior approval from the San Francisco Bay Regional Water Quality Control Board.

Construction activities for this project will typically occur with periodic activity peaks, requiring brief periods of significant effort followed by longer periods of reduced activities. In order to characterize and analyze potential construction impacts, the District has assumed that the project would be constructed by three (3) crews of 10-15 workers each and would proceed at a rate of approximately 500-1,000 feet per day. However, specific details may change or vary slightly. Staging areas for storage of pipe, construction equipment, and other materials would be placed at locations that would minimize hauling distances and long-term disruption. The proposed staging area for construction materials and equipment for the Proposed Project/Action would be located within NSD's existing facilities.

Excavation and grading activities would be necessary for construction of the Proposed Project/Action. Excavated materials resulting from site preparation would either be used on-site during construction or disposed of at a fill area authorized by the Napa County Department of Public Works. It is not anticipated that any soils would be imported for this project. If necessary, imported materials would include backfill material required by the Napa County Public Works Department. This could include Class II Aggregate Base or concrete slurry. Both of these materials would likely come from the Syar Quarry that is about

five miles away. The construction contract will allow the project contractor to determine the exact sourcing of materials. Additional truck trips would be necessary to deliver materials, equipment, and asphalt-concrete to the site. During peak excavation and earthwork activities, the Proposed Project/Action could generate up to 40 round-trip truck trips per day. In support of these activities and for the assumptions for this document, the types of equipment that may be used at any one time during construction may include, but not limited to:

- Track-mounted excavator
- Backhoe
- Grader
- Crane
- Dozer
- Compactor
- Trencher/boring machine
- End and bottom dump truck
- Front-end loader
- Water truck
- Flat-bed delivery truck
- Forklift
- Compressor/jack hammer
- Asphalt paver & roller
- Street sweeper

It is recognized that details of the construction activities and methods may change slightly as the specific details will be developed during final design and by the selected contractor. However, this description provides sufficient information on which to base the conclusions regarding probable environmental impacts associated with construction activities for this kind of project. Therefore, as long as the construction methods are generally consistent with these methods and do not conflict with any of the District's design standards or established ordinances, and does not create any new potential environmental impacts that are not described within this document, then no new environmental analyses will likely be required for any minor change in construction activities, timing, and/or schedule.

2.2 Compliance with CCR Title 22 and State Board's Recycled Water Policy

The Proposed Project/Action will be designed and operated in accordance with the applicable requirements of California Code of Regulations (CCR) Title 22 and any other state or local legislation that is currently effective or may become effective as it pertains to recycled water. The State Board adopted a Recycled Water Policy (RW Policy) in 2009 to establish more uniform requirements for water recycling throughout the State and to streamline the permit application process in most instances. As part of that process, the State Board prepared an Initial Study and Mitigated Negative Declaration for the use of recycled water. That document and the environmental analyses contained within are incorporated by reference for this document and Proposed Project/Action. The newly adopted RW Policy includes a mandate that the State increase the use of recycled water over 2002 levels by at least 1,000,000 AFY by 2020 and by at least 2,000,000 AFY by 2030. Also included are goals for storm water reuse, conservation

and potable water offsets by recycled water. The onus for achieving these mandates and goals is placed both on recycled water purveyors and potential users. The State Board has designated the Regional Water Quality Control Boards as the regulating entity for the Recycled Water Policy. In this case, the San Francisco Bay Regional Water Quality Control Board (San Francisco RWQCB) is responsible for permitting recycled water projects throughout the San Francisco Bay Area and including Napa County.
The Proposed Project/Action will be provided high quality unrestricted use tertiary treated recycled water from NSD and made available to users within the District. All irrigation systems will be operated in accordance with the requirements of Title 22 of the CCR, the State Board Recycled Water Policy, and any other local legislation that is effective or may become effective as it pertains to recycled water and any reclamation permits issued by the San Francisco RWQCB. Reclamation permits typically require the following:

- Irrigation rates will match the agronomic rates of the plants being irrigated;
- Control of incidental runoff through the proper design of irrigation facilities;
- Implementation of a leak detection program to correct problems within 72 hours or prior to the release of 1,000 gallons whichever occurs first;
- Management of ponds containing recycled water to ensure no discharges; and
- Irrigation will not occur within 50 feet of any domestic supply wells, unless certain conditions have been met as defined in Title 22.

2.3 Operational Plans

The District does not currently have, nor do they plan to have operations, maintenance and support staff. The District will to complete an operations agreement with NSD to operate and maintain its recycled water system. The District and/or NSD will enforce an irrigation schedule among its users. For instance, users with off-stream storage may fill their reservoirs in the winter season (approximately January to May). However, all other users must wait until the irrigation season (May – September) to use recycled water. During the irrigation season, regular irrigation will be based on irrigation type and storage. The irrigation schedule is assumed as follows:

- Vine Irrigation with Storage: 6 PM to 6 AM
- Vine Irrigation without Storage 6 AM to 6 PM
- Landscape Irrigation: 6 PM to 6 AM

By irrigating using the above scheduling, peak flows are reduced and pipe sizing is optimized.

2.3 Responsible Agencies, Permits and Approvals

Table 2 below summarizes the potential permits and/or approvals that may be required prior to construction of the Proposed Project/Action. Additional local approvals and permits may also be required.

Table 2: Regulatory Requirements, Permits, and Authorizations for Project/Action Facilities

Agency	Type of Approval
U.S. Army Corps of Engineers	Nationwide Permit #12 for Construction Activities (or) Section 404 (Wetlands) Permit
San Francisco Bay Regional Water Quality Control Board	National Pollutant Discharge Elimination System General Permit for Stormwater Discharge Associated with Construction Activities Recycled Water Use Permit
California Division of Occupational Safety and Health	Construction activities in compliance with CAL/OSHA safety requirements
California Department of Fish and Game	Streambed Alteration Agreements
Bay Area Air Quality Management District (BAAQMD)	Authority to Construct
	Permit to Operate
Napa Sanitation District	Recycled Water Service Agreement Connection to its recycled water system
County of Napa	Encroachment Permit – County Roads and Bridges

2.4 No Project/Action Alternative

Under the No Project/Action Alternative, the District's Proposed Project/Action would not be constructed. For this analysis, it is assumed that the existing baseline condition (i.e. No Project/Action) and the future No Project/Action condition are the same. This No Project/Action Alternative assumes that none of the Proposed Project/Action facilities would be constructed. As a result, the impact description and summary compares the Proposed Project/Action to the No Project/Action.

Chapter 3 Environmental Review and Consequences

This chapter evaluates the potential for the Proposed Project/Action to have a significant effect on the environment. Using a modified CEQA Environmental Checklist Form as presented in Appendix G of the CEQA Guidelines as a framework, the checklist identifies the potential impacts of the Proposed Project/Action pursuant to both CEQA and NEPA. This document compares the Proposed Project/Action against the No Project/Action Alternative as is required by CEQA and NEPA.

Environmental Impact Designations

For this checklist, the following designations are used to distinguish between levels of significance of potential impacts to each resource area:

Potentially Significant Impact. Adverse environmental consequences that have the potential to be significant according to the threshold criteria identified for the resource, even after mitigation strategies are applied and/or an adverse effect that could be significant and for which no mitigation has been identified. If any potentially significant impacts are identified, an EIR must be prepared to meet CEQA requirements, respectively.

Less-than-Significant Impact with Mitigation. Adverse environmental consequences that have the potential to be significant, but can be reduced to less-than-significant levels through the application of identified mitigation strategies that are not already been incorporated into the Proposed Project/Action description.

Less-than-Significant Impact. Potential adverse environmental consequences have been identified. However, they are not so adverse as to meet the significance threshold criteria for that resource. Therefore, no mitigation measures are required.

No Impact. No adverse environmental consequences have been identified for the resource or the consequences are negligible or undetectable. Therefore, no mitigation measures are required.

Environmental Resources Evaluated

The following are the key environmental resources that were evaluated in this document.

☒ Aesthetics	☒ Hazards/Hazardous Materials	☒ Population and Housing
☒ Agriculture Resources	☒ Hydrology / Water Quality	☒ Recreation
☒ Air Quality	☒ Land Use / Planning	☒ Socioeconomics
☒ Biological Resources	☒ Mineral Resources	☒ Transportation/Traffic
☒ Cultural Resources	☒ Noise	☒ Utilities and Service Systems
☒ Geology / Soils	☒ Public Services	☒ Mandatory Findings of Significance

3.1 Aesthetics

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Discussion

(a) **No Impact.** The Proposed Project/Action is not located in or near any designated scenic vistas and therefore would not have a substantial impact on a scenic vista. No impacts are anticipated and no specific mitigation measures are required.

(b) **No Impact.** The Proposed Project/Action is not located near or within a designated state scenic highway and therefore would not damage scenic resources, including but not limited to trees, outcroppings, and historic buildings within a state scenic highway. State Route 29 is designated as eligible, but is not officially designated. Nevertheless, construction and/or operation of the Proposed Project/Action would not affect State Route 29 or its designation. Therefore, no impacts are anticipated and no specific mitigation measures are required.

(c) **Less-than-Significant Impact.** Construction of the Proposed Project/Action would be visible and would involve temporary negative aesthetic effects, including open trenches as well as the presence of construction equipment and materials. Construction impacts would be temporary and are considered to be less-than-significant. Once built, the pipeline facilities would be buried underground and not visible. The expansion of the tertiary filtration system would be within the existing footprint and adjacent to the existing filter building at NSD's WWTP and would not affect any visual resources. Operation of the Proposed Project/Action would not affect any visual resources.

(d) **No Impact.** The Proposed Project/Action would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. The Proposed Project/Action would not be constructed during nighttime hours and once constructed there would be no lights or other sources of light or glare. Therefore no impacts would occur and no mitigation is required.

3.2 Agricultural Resources

Would the Proposed Project/Action:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☒	☐

Discussion

(a) **No Impact.** The Proposed Project/Action would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use. The Proposed Project/Action would be primarily constructed within existing roadways within the District. In addition, the Proposed Project/Action will not be located on any existing agricultural fields or farmlands. As a result, the Proposed Project/Action would convert any farmland to non-agricultural usage. No mitigation is required or necessary.

(b) **No Impact.** The Proposed Project/Action would not conflict with existing zoning for agricultural use or a Williamson Act contract. As stated above, the Proposed Project/Action would be primarily constructed within existing roadways within the District. In addition, the Proposed Project/Action will not be located on any existing agricultural fields or farmlands. As a result, the Proposed Project/Action would not conflict with agricultural practices and/or a Williamson Act Contract. No mitigation is required or necessary.

(c) **Less-than-Significant Impact.** As mentioned above, the Proposed Project/Action would be primarily constructed within existing roadways within the District. Recycled water users within the District will be required to connect their irrigation systems to the Proposed Project/Action. However, this is not expected to adversely affect agricultural practices and/or convert any farmland to non-agricultural usage. In fact, securing a supplemental water resource within the District will help preserve agriculture within the District.

Application of recycled water has the ability to increase salts and nutrient loadings on the soils. To address this concern, the District will enforce a strict irrigation schedule that will apply recycled water at agronomical rates and will not result in significant salt or nutrient loadings that would adversely affect agricultural practices and/or convert any farmland to non-agricultural

usage. Therefore, the Proposed Project/Action would not involve changes in the existing environment, which, due to their location or nature, would result in the conversion of farmland or agricultural practices to non-agricultural use. No mitigation is required or necessary.

3.3 Air Quality

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☒	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐
f) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
g) Conflict with an application plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

Discussion

(a) **Less-than-Significant Impact.** The Proposed Project/Action is located within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD), the regional agency empowered to regulate air pollutant emissions from stationary sources in the Bay Area. BAAQMD regulates air quality through its permit authority over most types of stationary emission sources and through its planning and review process. The Project site is located in the San Francisco Bay Area Air Basin. This Basin is currently designated “non-attainment” for the state 1-hour ozone standard. To meet planning requirements related to this standard, the BAAQMD developed a regional air quality plan, the Bay Area 2000 Clean Air Program (CAP), the BAAQMD’s most recent triennial update of the 1991 Clean Air Plan. A significant impact would occur if a project conflicted with the plan by not mirroring assumptions of the plan regarding population growth and vehicle-miles-traveled. The Proposed Project/Action could accommodate population growth because the Project would provide recycled water, making potable supplies more available, and thus increasing the overall supply of water. However, the addition of approximately 1,300 acre-feet of recycled water for

irrigation within the District would not significantly result in increased growth or development. Once constructed, the Proposed Project/Action would not generate any new significant operational vehicle trips. Any impacts are considered to be less than significant. No mitigation is required or necessary.

(b) **Less-than-Significant Impact with Mitigation.** The entire San Francisco Bay Area is currently designated "non-attainment" for the state PM_{10} and $PM_{2.5}$ standards, the state 1-hour ozone standard. The Bay Area is in "attainment" or "unclassified" with respect to the other ambient air quality standards. As part of the effort to reach attainment of these standards, the BAAQMD has established thresholds of significance for several criteria air pollutants associated with both the construction and operation of projects. Specifically, a project is considered to have a significant regional air quality impact if it would result in an increase in emissions of 80 pounds per day or 15 tons per year of PM_{10}, reactive organic gases (ROG) or nitrogen oxides (NO_X). ROG and NO_X are both ozone precursors.

Construction activities at the project site would begin in the summer of 2014 and continue into the summer of 2015 and would include excavation and grading activities. Overall construction work would require the use of various types of mostly diesel-powered equipment, including bulldozers, wheel loaders, excavators, and various kinds of trucks.

Construction activities typically result in emissions of particulate matter, usually in the form of fugitive dust from activities such as trenching and grading. Emissions of particulate matter vary day to day, depending on the level and type of activity, silt content of the soil, and the prevailing weather. Estimated construction emissions for the pipeline construction were generated using the Sacramento Metropolitan Air Quality Management District's Road Construction model (i.e. URBEMIS Model). (Note that this model was used because no comparable model has been issued by BAAQMD). The Roadway Construction Emissions Model is a Microsoft Excel worksheet available to assess the emissions of linear construction projects. The estimated construction equipment fleet-mix and the acreage and soil volume were put into the URBEMIS model in order to determine potential emissions. Table 3 provides the emissions output from URBEMIS in maximum pounds per day as well as in estimated tons for the entire construction duration. As shown in the table, emissions do not exceed BAAQMD's daily and/or annual significance thresholds.

Table 3: Proposed Project/Action Construction Emissions

Construction Phase	Construction Emissions (lbs/day)			
	ROG	NOx	PM_{10}	$PM_{2.5}$*
Grubbing/Land Clearing	9.9	47.0	12.6	4.6
Grading/Excavation	11.5	58.4	13.5	5.2
Drainage/Utilities/Subgrade	9.9	44.7	13.0	4.8
Paving	8.6	31.7	2.7	2.4
Maximum (lbs/day)**	**11.7**	**58.4**	**13.5**	**5.2**
Total Tons/Project/Year	**1.4**	**6.3**	**1.5**	**0.6**
BAAQMD Thresholds				
Pounds per Day	80	80	80	80
Tons per Project/Year	15	15	15	15
Significant Impact?	**No**	**No**	**No**	**No**
Notes				
* The BAAQMD does not have a threshold for $PM_{2.5}$; however, the same threshold for PM_{10} is used herein. ** Maximum daily emissions refers to the maximum emissions that would occur in one day. Not all phases will be occurring concurrently; therefore, the maximum daily emissions are not a summation of the daily emission rates of all phases.				

Nevertheless, BAAQMD's approach to analyses of construction impacts as noted in their BAAQMD CEQA Guidelines is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions. With implementation of these dust control measures (**Mitigation Measures AIR-1** below), the Proposed Project/Action's construction-related dust impacts would be even further reduced and would remain less-than-significant.

> **Mitigation Measure AIR-1: Dust Control.** During all phases of construction, the following dust control procedures shall be implemented:
>
> - Water all active construction sites as necessary.
> - Cover all trucks having soil, sand, or other loose material or maintain at least two feet of freeboard on all trucks.
> - Apply water as necessary, or apply non-toxic soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
> - Sweep if visible soil material is carried into adjacent streets.
> - Water or apply non-toxic soil binders to exposed soil stockpiles.
> - Limit traffic speeds on unpaved areas to 15 mph.

Once operational, emission sources resulting from project operations would be associated with regular maintenance and inspection work. Operational impacts would be considered less-than-significant. With respect to project conformity with the federal Clean Air Act, the Proposed Project/Action's potential emissions are well below minimum thresholds and are below the area's inventory specified for each criteria pollutant designated non-attainment or maintenance for the Bay Area. As such, further general conformity analysis is not required.

(c) **Less-than-Significant Impact with Mitigation.** As stated above, the entire San Francisco Bay Area is currently designated "non-attainment" for the state PM_{10} and $PM_{2.5}$ standards, the state 1-hour ozone standard. The Bay Area is in "attainment" or "unclassified" with respect to the other ambient air quality standards. The BAAQMD is active in establishing and enforcing air pollution control rules and regulations in order to attain all state and federal ambient air quality standards and to minimize public exposure to airborne toxins and nuisance odors. Air emissions would be generated during construction of the Proposed Project/Action, which could increase criteria air pollutants, including PM_{10}. However, construction activities would be temporary and would incorporate the implementation of **Mitigation Measure AIR-1** as identified above.

As mentioned above, upon completion of construction activities emission sources resulting from Project operations would be associated with regular maintenance and inspection work. Given the limited number of trips that would be required, only limited emissions would be generated; these emissions would be expected to be well below BAAQMD guidelines. See Table 3 above. As such, the Proposed Project/Action would not result in a cumulatively considerable net increase of any criteria air pollutants, and the impacts would be even less-than-significant with implementation of **Mitigation Measure AIR-1**.

(d) **Less-than-Significant Impact with Mitigation.** Diesel emissions would result both from diesel-powered construction vehicles and any diesel trucks associated with project operation. Diesel particulate matter (DPM) has been classified by the California Air Resources Board as a toxic air contaminant for the cancer risk associated with long-term (i.e., 70 years) exposure to DPM. Given that construction would occur for a limited amount of time and that only a limited number of

diesel trucks would be associated with operation of the project, localized exposure to DPM would be minimal. As a result, the cancer risks from the project associated with diesel emissions over a 70-year lifetime are very small. Therefore, the impacts related to DPM would be less-than-significant. Likewise, as noted above, the project would not result in substantial emissions of any criteria air pollutants either during construction or operation with the implementation of **Mitigation Measure AIR-1**; therefore, the project would not expose sensitive receptors, including residents in the project vicinity, to substantial pollutant concentrations. With the implementation of **Mitigation Measure AIR-1**, impacts to sensitive receptors would be less-than-significant. No specific mitigation measures are required.

(e) **Less-than-Significant Impact.** During construction of the Proposed Project/Action, the various diesel-powered vehicles and equipment in use on-site could create minor odors. These odors are not likely to be noticeable beyond the immediate area and, in addition, would be temporary and short-lived in nature. Furthermore, the Proposed Project/Action would not include development of any uses that are associated with objectionable odors. Therefore, odor impacts would be less-than-significant. No specific mitigation measures are required.

(f) **Less-than-Significant Impact.** Construction of the Proposed Project/Action would generate emissions, but those temporary emissions would not have a significant effect or impact on the environment. Also, the Proposed Project/Action would not include any new pumping station or facilities that would generate emissions. Operation of the Proposed Project/Action would require the use of NSD's existing pumping station to move the recycled water to the District. However, these indirect emissions would not be considered to have a significant impact on the environment. No mitigation is necessary or required.

(g) **No Impact.** The Proposed Project/Action would not conflict with an application plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. No mitigation is necessary or required.

3.4 Biological Resources

Would the Proposed Project/Action:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion

(a) **Less-than Significant Impact with Mitigation.** The Proposed Project/Action would be primarily constructed within existing roadways within the District and within NSD's existing Soscol WWTP. However, the Proposed Project/Action could have a substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

A record search of CDFW's Natural Diversity Database (CNDDB) and USFWS' Species List was conducted for the area within a five-mile radius of the Project area to identify previously reported occurrences of state and federal special-status plants and animals. Also, a review of the findings from the St. Regis Project EIR and the NBWRP EIR/EIS provided recent relevant information as to regards for the potential effects to special-status species within the Proposed Project/Action Study Area. In addition, several field visits were conducted in April, May and June 2011 as well as in September 2013 to determine the potential for special-status species to occur within the Proposed Project/Action Study Area. These field visits were not intended to be protocol-level surveys to determine the actual absence or presence of special-status species, but was conducted to determine the potential for special-status species to occur within the Proposed Project/Action Area. Appendix B provides a summary of the potential for special status species to occur within the Proposed Project/Action Study Area. No special-status species were observed during the field visits. Detailed below is a summary of those findings and proposed mitigation measures to reduce any potential impacts to less than significant levels.

SPECIAL-STATUS PLANT SPECIES

Of the 59 special status plant species known to occur in the vicinity of the Proposed Project/Action Study Area, ten species, were determined to have moderate to high potential to occur in the Proposed Project/Action Study Area. These include Congdon's tarplant, pappose tarplant, Contra Costa goldfields, legenere, saline clover, delta tule pea, Mason's lilaeopsis, Suisun Marsh aster, dwarf downingia, and Marin knotweed. The construction of the Proposed Project/Action has the potential to affect these species. The mitigation below would reduce any impacts to less than significant levels.

> **Mitigation Measure BIO-1: Conduct Pre-construction Protocol Level Plant Surveys.** Prior to construction, the District shall conduct two protocol-level rare plant surveys during the blooming period for these species that are during the months of May and June. These surveys shall follow the protocol for plant surveys as described in Nelson (1987), which are in compliance with CNPS, CDFW, and USFWS guidelines. Should any of these species be present within the construction footprint, CDFW and/or USFWS shall be consulted to develop appropriate mitigation and avoidance measures.

SPECIAL-STATUS WILDLIFE SPECIES

Of the 59 special status wildlife species known to occur in the vicinity of the Proposed Project/Action Study Area, eighteen were determined to have a high or moderate potential to occur in the Study Area. These include the Northen Harrier, White-tailed Kite, Golden Eagle, Swainson's hawk, Shorteared Owl, Saltmarsh Common Yellowthroat, Loggerhead Shrike, San Pablo Song Sparrow, and Ferruginous Hawk. Two mammal species, Pallid Bat and Salt Marsh Harvest Mouse, have high potential to occur in the Study Area. Additionally one special status reptile, Western Pond Turtle, six fish species, Green Sturgeon, Delta Smelt, Steelhead, Chinook Salmon, Hardhead and Sacramento Splittail and one invertebrate, California Freshwater Shrimp, have a moderate or high potential to occur with the Study Area. Recommendations for reducing impacts to these special status species are provided below.

Birds

Potential impacts to special status birds would be minimized to less than significant levels with the incorporation of the following mitigation measures and procedures:

Mitigation Measure BIO-2: Conduct Breeding Surveys. For construction activities that occur between February 1 and August 31, preconstruction breeding bird surveys shall be conducted by a qualified biologist prior to and within 10 days of any initial ground-disturbance activities. Surveys shall be conducted within all suitable nesting habitat within 250 feet of the activity. All active, non-status passerine nests identified at that time should be protected by a 50-foot radius minimum exclusion zone. Active raptor or special-status species nests should be protected by a buffer with a minimum radius of 200 feet. CDFW and USFWS recommend that a minimum 500-foot exclusion buffer be established around active white-tailed kite and golden eagle nests. The following considerations apply to this mitigation measure:

- Survey results are valid for 14 days from the survey date. Should ground disturbance commence later than 14 days from the survey date, surveys should be repeated. If no breeding birds are encountered, then work may proceed as planned.

- Exclusion zone sizes may vary, depending on habitat characteristics and species, and are generally larger for raptors and colonial nesting birds. Each exclusion zone would remain in place until the nest is abandoned or all young have fledged.

- The non-breeding season is defined as September 1 to January 31. During this period, breeding is not occurring and surveys are not required. However, if nesting birds are encountered during work activities in the non-breeding season, disturbance activities within a minimum of 50 feet of the nest should be postponed until the nest is abandoned or young birds have fledged.

Mitigation Measure BIO-3: Conduct Nesting Surveys. For any construction activities initiated between March 15 and September 1, surveys for nesting Swainson's hawk are required with 0.25 mile of areas of disturbance. If an active nest is found, a qualified biologist shall monitor the nest during construction activities within 0.25 mile of the nest to determine whether project construction may result in abandonment. The monitor shall continue monitoring the nest until construction within 0.25 mile of the nest is completed, or until all chicks have completely fledged. If the monitor determines that construction may result in abandonment of the nest, all construction activities within 0.25 mile should be halted until the nest is abandoned or all young have fledged.

Mammals

Potential impacts to special status birds would be minimized to less than significant levels with the incorporation of the following mitigation measures and procedures

Salt Marsh Harvest Mouse

Because of the status of the salt marsh harvest mouse (Federal and State Endangered, California Fully Protected), CDFW and USFWS are conservative when establishing avoidance, minimization, and mitigation measures. Since suitable habitat is present within the project site along the east side of the Napa River and because there are documented occurrences in the CNDDB, minimization and avoidance measures are set forth in **Mitigation Measure BIO-4** to address potential impacts to the salt marsh harvest mouse. This measure would reduce impacts to a level that is less than significant.

Mitigation Measure BIO-4: Protect Salt Marsh Harvest Mouse: The following measures to mitigate impacts to the salt marsh harvest mouse shall be implemented:

- Prior to the commencement of the construction of the pipeline segment on the east side of the Napa River, the footprint of the work area shall be flagged. The work area shall be the minimum necessary to complete the drilling work.

- Pickleweed within the flagged footprint area shall be removed using hand tools at least 7 days prior to start of any work. A biologist shall first survey the flagged work area for the salt marsh harvest mouse prior to vegetation removal and shall be present during the removal. If a salt marsh harvest mouse is observed, the biologist shall have authority to stop work until the species has left the flagged work area, at which time vegetation removal can continue. The vegetation removal will allow any salt marsh harvest mouse potentially present to disperse away from the work area into more dense cover away from the work area.

- Once the vegetation has been removed, a temporary barrier fence shall be constructed along the flagged boundaries of the cleared work area that will prevent salt marsh harvest mice from re-entering the work area.

- No equipment, storage of materials, or work shall be allowed within any identified salt marsh harvest mouse habitat outside of the cleared work area.

- A biologist shall conduct weekly inspections of the barrier fence to identify maintenance needs. Following completion of all work and removal of equipment, the barrier fence will be removed and the disturbed area will be re-seeded.

- If this potential impact from the project falls within the jurisdiction of the CDFW or the USFWS through a federal action, such measures shall be applied as required by the agencies to avoid or minimize impacts prior to any construction that would significantly impact the species.

Pallid Bat

Bat roosts are protected by CDFW and CEQA. The study areas contains suitable foraging habitat for pallid bats. Furthermore, the cistern and associated wooden structure may contain suitable roosting habitat for pallid bats. Accordingly, **Mitigation Measure BIO-5** is proposed requiring a preconstruction acoustic survey and an internal survey of the facility to determine the presence or absence of this species and measures to safely exclude them from buildings if they are present. The implementation of this mitigation measure would reduce impacts to a level of less than significant.

Mitigation Measure BIO-5: Conduct Preconstruction Surveys for Bats. Preconstruction surveys for bats should take place during the maternity roosting season (defined as April 1 through August 31). Surveys should be conducted by a qualified biologist no less than 14 days prior to removal of trees, snags, or buildings within the project area. Ultrasonic acoustic surveys and/or other site-appropriate

survey method should be performed to determine the presence or absence of bats utilizing the project site as roosting or foraging habitat. If special-status bat species are detected during surveys, then appropriate species- and roost-specific mitigation measures will be developed. Such measures may include postponing the removal of trees, snags, or structures until the end of the maternity roosting season or construction of species-appropriate roosting habitat within or adjacent to the project site. Trees, snags, and buildings may be removed outside of the maternity roosting season without performing preconstruction bat surveys.

Western Pond Turtle

Western pond turtle is documented to occur within the Napa River system in the vicinity of the project site. Suitable aquatic and upland nesting habitat is present within and adjacent to the study areas. **Mitigation Measures BIO-6** below would reduce impacts of filling, grading, or other ground disturbance of wetlands within the study areas to a less than significant level for Western pond turtle adults, nests, and young.

Mitigation Measure BIO-6: Provide Exclusion Fencing. Prior to construction activities associated with the pipeline segment on the east side of the Napa River, the District shall install exclusion fencing around upland areas slated for ground disturbance to prevent pond turtles from excavating nests. This measure shall apply between March 1 and April 30. The exclusion fencing should be maintained until ground disturbance in the upland habitat is complete.

Fish Species

Green Sturgeon, Delta Smelt, Central California Coast and Central Valley steelhead, Central Valley fall/late fall-run and spring run Chinook salmon, hardhead, and Sacramento splittail are known to occur in the Napa River. In addition, salmon and steelhead are known to be in the Huichica and Carneros Creeks. Suitable foraging and rearing habitat is present within and adjacent to the study areas. Additionally, the Napa River is Critical Habitat for Central California Coast steelhead, a species listed as threatened under the FESA, and have been documented in the Napa River in the vicinity of the study areas. Steelhead and Chinook salmon adults likely move upstream past the study areas between December and March. After spawning, Chinook salmon die; however, steelhead can spawn more than once and move downstream toward San Francisco Bay after spawning. Chinook salmon juveniles move downstream within a few months to rear in the lower reaches of the river and its estuary. Juvenile steelhead generally remain in fresh water for one or more years before heading to the sea. According to dredging work windows designated by the National Marine Fisheries Service, steelhead and Chinook salmon adults and juveniles near the mouth of the Napa River are at their lowest densities between June and November. Hardhead are sedentary fish that are generally associated with clear pools and runs with sand-gravelboulder substrates. The Napa River in the vicinity of the study areas is turbid and does not represent preferred habitat. According to dredging work windows designated by the National Marine Fisheries Service, Sacramento splittail adults and juveniles are likely present in the lower Napa River throughout the year. Potential impacts to these fish species are discussed below.

Erosion associated with project construction activities resulting in the introduction of sediments into the Napa River could negatively affect water quality in rearing and foraging habitat. Introduction of sediments could lead to increased embedding of river substrate, which could negatively affect invertebrate communities used as a food source by juvenile

fish. Impacts to steelhead and steelhead critical habitat that constitute harm or harassment could be considered a "take" by the FESA. This is considered a potentially significant impact if the project would substantially reduce the number or restrict the range of an endangered, rare or threatened species. **Mitigation Measures BIO-7 and BIO-8** below are proposed to reduce the potential impacts to less than significant levels. **Mitigation Measure BIO-7** is proposed requiring Best Management Practices be installed to eliminate construction-related runoff and sedimentation into the Napa River as well as in Huichica and Carneros Creeks.

> **Mitigation Measure BIO-7: Implement Best Management Practices.** To reduce potentially significant erosion and siltation, the District and/or its selected contractor(s) shall obtain a Stormwater Pollution Prevention Permit (SWPPP) and implement Best Management Practices and erosion control measures as required by the San Francisco RWQCB. Best Management Practices to reduce erosion and siltation shall include, at a minimum, the following measures: Avoidance of construction activities during inclement weather; limitation of construction access routes and stabilization of access points; stabilization of cleared, excavated areas by providing vegetative buffer strips, providing plastic coverings, and applying ground base on areas to be paved; protection of adjacent properties by installing sediment barriers or filters, or vegetative buffer strips; stabilization and prevention of sediments from surface runoff from discharging into storm drain outlets; use of sediment controls and filtration to remove sediment from water generated by dewatering; and returning all drainage patterns to pre-construction conditions. This mitigation measure shall be coordinated with **Mitigation Measure HWQ-1**.

California Freshwater Shrimp

The Proposed Project/Action also includes a local creek crossing as well as numerous drainage crossings. The California Freshwater Shrimp has a medium to low potential within Carneros Creek. As described in Chapter 2, the Project Description, all of the creek crossings will involve installing the pipelines on the side of the existing bridges and will not involve cutting through or disturbing the creek. As a result, no significant impacts would occur to the creek and any sensitive species or habitats contained there within, including the California Freshwater Shrimp. The numerous drainage crossings of existing culverts through the roads will be done during the dry season and will not occur during the rainy weather months between October 15 and through April 1. As a result, no significant impacts would occur.

Non-Sensitive Species

The construction activities of the Proposed Project/Action could result in temporary disturbance of non-sensitive plant and wildlife species that are not considered sensitive by the resource agencies. However, these temporary impacts are considered less than significant and the Proposed Project/Action would not result in adverse effects to special-status species.

As a result and with the incorporation of the mitigation measures prescribed above, the construction and/or operation of the Proposed Project/Action would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW and/or USFWS.

(b) **Less-than-Significant Impact with Mitigation.** The Proposed Project/Action would cross the Napa River through an existing/planned pipeline and therefore would not have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS. The Proposed Project/Action would also include a local creek crossing as well as numerous drainage crossings. As described in Chapter 2, the Project Description, the creek crossings will involve installing the pipelines on the side of the existing bridges and will not involve cutting through or disturbing the creek. As a result, no significant impacts would occur to the creeks and any sensitive species or habitats contained there within. The numerous drainage crossings of existing culverts through the roads will be done during the dry season and will not occur during the rainy weather months between October 15 and through April 1. As a result, no significant impacts would occur to the drainage crossings and creeks. While no significant impacts to riparian habitat along the river or to the river itself are expected, **Mitigation Measure BIO-8** is proposed requiring the project applicant to obtain all necessary authorization from regulatory agencies and implement any necessary restoration or mitigation. The implementation of this mitigation measure would reduce impacts associated with the Proposed Project/Action to a level of less than significant.

> **Mitigation Measure BIO-8: Obtain all Required Authorizations.** Prior to issuance of encroachment permits for the Proposed Project/Action, the District, as necessary, shall conduct a wetlands delineation study in sensitive areas of the Proposed Project/Action and obtain all required authorization from agencies with jurisdiction riparian habitats and jurisdictional wetlands in the area. Such agencies may include, but are not limited to, the United States Army Corps of Engineers, the California Department of Fish and Game, and the San Francisco Bay Regional Water Quality Control Board. Impacted habitat shall be offset through onsite restoration, offsite restoration, or purchase of credits at a CDFW and USFWS-approved mitigation bank in the region at no less than a 1:1 ratio. The requirements of this mitigation measure do not apply if pipeline installation activities completely avoid work within the bed, bank, or channel of the Napa River.

(c) **Less-than-Significant Impact with Mitigation.** The Proposed Project/Action could have an adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. The local creek crossing may meet the USACE criteria for Waters of the U.S. and any fill or degradation to these channels could significantly impact water quality or habitat for protected species. Specifically, any activity that results in the deposit of dredge or fill material within the Ordinary High Water mark of Waters of the U.S. typically requires a permit from the (Corps). In addition, the bed and banks of the creeks and drainage channels could also fall under the regulatory authority of the CDFW. However, as stated in Chapter 2, Project Description, all of the creek crossings will involve installing the pipelines on the downstream side of the existing bridges and will not involve cutting through or disturbing the creeks.

Excavation, grading, and other general construction activities associated with the Proposed Project/Action would expose and disturb soils, resulting in potential increases in erosion and siltation in the Project area. Construction during the rainy season could result in increases in erosion, siltation, and water quality issues. Generally, excavation, grading, paving, and other construction activities would expose disturbed and loosened soils to erosion by wind and runoff. Construction activities could therefore result in increased erosion and siltation, including nutrient

loading and increasing the total suspended solids concentration. Erosion and siltation from construction have the potential to impact the creeks and drainage crossings, therefore posing a potentially significant impact to wetlands and waters of the U.S. With the incorporation of **Mitigation Measures BIO-7and BIO-8** above, any potential impacts are reduced to less-than-significant levels.

(d) **Less-than-Significant Impact with Mitigation.** The Proposed Project/Action would not interfere substantially with the movement of any native resident or migratory fish or wildlife corridors, or impede the use of native wildlife nursery sites. As stated above, the Proposed Project/Action would be constructed primarily within existing roadways within the District. In addition all of the creek crossings would involve installing the pipeline on the downstream side of the existing bridges and avoid cutting into or through the creeks. However, construction activities could adversely affect non-listed special-status nesting raptors. Many raptors are sensitive to loud construction noise such as that associated with grading and demolition. Such activities could cause nest abandonment or destruction of individual active raptor nests. Because all raptors and their nests are protected under 3503.5 of the California Fish and Game Code, this could result in a significant impact. As a result, **Mitigation Measures BIO-4 and BIO-5** would reduce this impact to less than significant levels.

(e) **No Impact.** The Proposed Project/Action is not expected to conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. As a result, no impact is expected and no specific mitigation is required.

(f) **No Impact.** The Proposed Project/Action would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan. The construction of the Proposed Project/Action would be located within existing roadways within the District. Therefore, there is no impact.

3.5 Cultural Resources

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Discussion

(a) **Less-than-Significant Impact with Mitigation.** A cultural study along the pipeline alignment included an archival records research at the Northwest Information Center at Sonoma State University and a field survey along the pipeline routes. A field survey of the Proposed Project/Action and alignment on February 4 and April 14, 2011 did not locate or confirm the presence of any cultural resources that would or could be affected by the Proposed Project/Action. The NWIC archival research found that at least eleven cultural resources sites could be present in and/or around the vicinity of the project area. The nearest identified cultural resources are the Neuenschwander Bridge and the Duhig Bridge that crosses Huichica Creek. However, the Proposed Project/Action will terminate well short of the Neuenschwander Bridge and would not cross the Duhig Bridge. Therefore, the Proposed Project/Action will not result in any impacts to those resources.

It is possible that unidentified buried archaeological remains are present within the Proposed Project/Action area. These remains could be unearthed during project construction. To further reduce this less-than-significant impact, the following mitigation measure is recommended:

> **Mitigation Measure CR-1: Halt work if cultural resources are discovered.** In the event that any prehistoric or historic subsurface cultural resources are discovered during ground disturbing activities, all work within 100 feet of the resources shall be halted and after notification, the District shall consult with a qualified archaeologist to assess the significance of the find. If any find is determined to be significant (CEQA Guidelines

15064.5[a][3] or as unique archaeological resources per Section 21083.2 of the California Public Resources Code), representatives of the District and a qualified archaeologist shall meet to determine the appropriate course of action. In considering any suggested mitigation proposed by the consulting archaeologist in order to mitigate impacts to historical resources or unique archaeological resources, the lead agency shall determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) shall be instituted. Work may proceed on other parts of the project site while mitigation for historical resources or unique archaeological resources is carried out.

With the implementation of the above mitigation measure, the Proposed Project/Action would not result in impacts to historical resources.

(b) **Less-than-Significant Impact with Mitigation.** No known significant archaeological resources exist within the Project area. Therefore, the Proposed Project/Action is not likely to cause a substantial adverse change in the significance of unique archaeological resources. Nevertheless, there is a slight chance that construction activities of the Proposed Project/Action could result in accidentally discovering unique archaeological resources. However, with the incorporation of **Mitigation Measure CR-1** identified above, the Proposed Project/Action would not result in any significant impacts to archeological resources.

(c) **Less-than-Significant Impact with Mitigation.** Paleontologic resources are the fossilized evidence of past life found in the geologic record. Despite the tremendous volume of sedimentary rock deposits preserved worldwide, and the enormous number of organisms that have lived through time, preservation of plant or animal remains as fossils is an extremely rare occurrence. Because of the infrequency of fossil preservation, fossils – particularly vertebrate fossils – are considered to be nonrenewable resources. Because of their rarity, and the scientific information they can provide, fossils are highly significant records of ancient life.

Based on a search of the University of California Museum of Paleontology database by a qualified paleontologist, no known significant paleontological resources exist within the Project area. Also, because the Proposed Project/Action would result in minimal excavation in bedrock conditions, significant paleontologic discovery would be unlikely. However, fossil discoveries can be made even in areas of supposed low sensitivity. In the event a paleontologic resource is encountered during project activities, implementation of the following mitigation measure would reduce potential impacts to less-than-significant.

Mitigation Measure CR-2: Stop work if paleontological remains are discovered. If paleontological resources, such as fossilized bone, teeth, shell, tracks, trails, casts, molds, or impressions are discovered during ground-disturbing activities, work will stop in that area and within 100 feet of the find until a qualified paleontologist can assess the significance of the find and, if necessary, develop appropriate treatment measures in consultation with the District.

With the implementation of the above mitigation measure, the Proposed Project/Action would not result in impacts to unique paleontological or geological resources.

(d) **Less-than-Significant Impact with Mitigation.** There are no known burial sites within the project APE. The field survey did not find any evidence of human remains or burial goods within the project APE. In addition, none of the previous surveys that included the APE or were within a 0.25-mile radius reported finding any human remains. Nonetheless, the

possibility exists that subsurface construction activities may encounter undiscovered human remains. Accordingly, this is a potentially significant impact. Mitigation is proposed to reduce this potentially significant impact to a level of less than significant.

Mitigation Measure CR-3: Halt work if human remains are found. If human remains are encountered during excavation activities conducted for the Proposed Project/Action, all work in the adjacent area shall stop immediately and the Napa County Coroner's office shall be notified. If the Coroner determines that the remains are Native American in origin, the Native American Heritage Commission shall be notified and will identify the Most Likely Descendent, who will be consulted for recommendations for treatment of the discovered human remains and any associated burial goods.

3.6 Geology and Soils

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☒	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☒	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Discussion

(a) **Less-than-Significant Impact.** The Proposed Project/Action consists primarily of a pipeline system that would be constructed within and under existing roadways. However, the Proposed Project/Action does not expose people or structures to potential substantial adverse effects,

including the risk of loss and injury due to a seismic event. The proposed pipeline will not cross a known fault, but the project area is susceptible to strong groundshaking during an earthquake which could occur along known faults in the region. However, the Proposed Project/Action does not expose people or structures to potential substantial adverse effects, including the risk of loss and injury due to a seismic event.

(b) **Less-than-Significant Impact.** Construction activities associated with the Proposed Project/Action would involve excavation and earthmoving that could cause erosion or loss of topsoil. Construction activities would involve excavation, moving, filling, and the temporary stockpiling of soil. Earthwork associated with development construction could expose soils to erosion. However, the Proposed Project/Action would be constructed in existing roadways and utility corridors and would be covered and paved immediately after the pipeline has been installed. As a result, any soil erosion or loss of topsoil would be considered less-than-significant.

(c) **Less-than-Significant Impact with Mitigation.** The Proposed Project/Action may be located in areas that consist of medium dense to dense fine granular soils. In addition, perched groundwater could be present. As such, the soil in some areas of the alignment may have a high susceptibility to liquefaction during seismic shaking. Other portions of the Project may be less susceptible to liquefaction and related damage. Lateral spreading, often associated with liquefaction, is less likely because there are no steep banks or hard ground bordering the Project area, but could still potentially be a hazard. As a result, the following mitigation is proposed:

> **Mitigation Measure GEO-1: Perform Geotechnical Investigation.** The District shall require a design-level geotechnical study to be prepared prior to project implementation to determine proper design and construction methods, including any cathodic protection measures needed for installing the pipelines in these soils.

With the incorporation of this mitigation measure, any resulting impacts would be considered to be less-than-significant.

(d) **Less-than-Significant Impact with Mitigation.** The Proposed Project/Action could be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994). However, with the incorporation of **Mitigation Measures GEO-1** above, any impacts would be less-than-significant.

(e) **Less-than-Significant Impact.** The Proposed Project/Action would not include the use of septic tanks or alternative wastewater disposal systems. Application of recycled water to landscaped areas in excess of agronomic rates could alter some soil properties that influence the suitability of a site to be used for septic tanks or alternate wastewater disposal systems. However, the District will ensure that all recycled water users apply water at agronomical rates. Therefore, no adverse effects to soil resources are expected. No mitigation is required.

3.7 Hazards and Hazardous Materials

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the Project area?	☐	☐	☒	☐
f) For a Project within the vicinity of a private airstrip, would the Project result in a safety hazard for people residing or working in the Project area?	☐	☐	☒	☐
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

Discussion

(a) **Less-than-Significant Impact with Mitigation.** Operation of the Proposed Project/Action would not involve the routine transportation, use, storage, and/or disposal of hazardous materials. However, construction of the Proposed Project/Action could temporarily increase the transport of

materials generally regarded as hazardous materials that are used in construction activities. It is anticipated that limited quantities of miscellaneous hazardous substances, such as gasoline, diesel fuel, hydraulic fluids, paint, and other similarly related materials would be brought onto the project site, used, and stored during the construction period. The types and quantities of materials to be used could pose a significant risk to the public and/or the environment. In addition, construction of the Proposed Project/Action could result in the exposure of construction workers and residents to potentially contaminated soils. As a result the following mitigation measures are proposed:

Mitigation Measure HAZ-1: Store, Handle, Use Hazardous Materials in Accordance with Applicable Laws. The District shall ensure that all construction-related hazardous materials and hazardous wastes shall be stored, handled, and used in a manner consistent with relevant and applicable federal, state, and local laws. In addition, construction-related hazardous materials and hazardous wastes shall be staged and stored away from stream channels and steep banks to keep these materials a safe distance from near-by residents and prevent them from entering surface waters in the event of an accidental release.

Mitigation Measure HAZ-2: Properly Dispose of Contaminated Soil and/or Groundwater. If contaminated soil and/or groundwater is encountered or if suspected contaminated is encountered during project construction, work shall be halted in the area, and the type and extent of the contamination shall be identified. A contingency plan to dispose of any contaminated soil or groundwater will be developed through consultation with appropriate regulatory agencies.

Mitigation Measure HAZ-3: Properly Dispose of Hydrostatic Test Water. Dewatering and of the pipeline during hydrostatic testing during construction as well as any dewatering as a result of operations and maintenance activities shall be discharged to land and not into any creeks, drainages, or waterways and shall require prior approval from the San Francisco Bay Regional Water Quality Control Board.

(b) **Less-than-Significant Impact with Mitigation.** The operation of the Proposed Project/Action could create an additional significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. As with all construction activities, the potential exists for accidents to occur, which could result in the release of hazardous materials into the environment. With the incorporation of **Mitigation Measures HAZ-1 and HAZ-2** identified above, potential impacts are considered to be less-than-significant.

(c) **Less-than-Significant Impact.** Construction of portions of the pipeline segments of the Proposed Project/Action would be located be located within one-quarter mile of the Carneros Elementary School located at 1680 Los Carneros Avenue, Napa, California, 94559. However, this school is currently closed. Although construction activities would require the use of some hazardous materials, due to the short duration and limited extent of construction activity, the potential for accidental release of hazardous materials associated with construction activities to affect nearby school children would be considered less than significant. No mitigation is required.

(d) **No Impact.** The Proposed Project/Action is not located on a site which is known to be included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and therefore would not create a significant hazard to the public or the environment. Specifically, a records search was conducted using the State of California Department of Toxic Substance

Control's Envirostor Datatbase and GIS mapping system and no records of any identified hazardous waste or materials was identified within the Proposed Project/Action Area. As a result, no impact is expected and no specific mitigation is required.

(e) **Less-than-Significant Impact.** The Proposed Project/Action is located within two miles of the Napa County Airport. However, construction and/or operation of the Proposed Project/Action would not adversely affect an airport or airport operations, including, noise, take-offs, landings, flight patterns, safety, light, navigation, or communications between aircraft and the control tower within the Project area. Any potential impacts are considered to be less than significant. No specific mitigation is required.

(f) **Less-than-Significant Impact.** The Proposed Project/Action is located within two miles of the Napa County Airport. In addition, there might be private airstrips in the vicinity of the Proposed Project/Action. However, construction and/or operation of the Proposed Project/Action would not adversely affect an airport or airport operations, including, noise, take-offs, landings, flight patterns, safety, light, navigation, or communications between aircraft and the control tower within the Project area. Any potential impacts are considered to be less than significant. No specific mitigation is required.

(g) **Less-than-Significant Impact with Mitigation.** The Proposed Project/Action would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. As a result, no impacts are anticipated and no mitigation is required. However, when installing the pipelines in the existing roadways, the Proposed Project/Action could block access to nearby roadways for emergency vehicles. With the incorporation of the following mitigation, potential impacts are considered to be less than significant.

> **Mitigation Measure HAZ -3: Develop and Maintain Emergency Access Strategies.** In conjunction with Mitigation Measure Traffic-1: Develop a Traffic Control Plan identified below in the Traffic and Transportation section, comprehensive strategies for maintaining emergency access shall be developed. Strategies shall include, but not limited to, maintaining steel trench plates at the construction sites to restore access across open trenches and identification of alternate routing around construction zones. Also, police, fire, and other emergency service providers shall be notified of the timing, location, and duration of the construction activities and the location of detours and lane closures.

(h) **Less-than-Significant Impact.** Construction of the Proposed Project/Action would be located within a rural setting, but is not generally located in an area where there is the risk of wildland fire. Specifically, a records search of the California Department of Forestry and Fire Protection Fire Severity mapping system does not regard the Proposed Project/Action Area to be in an area of moderate or high risk to wildfires. As a result, there is little potential to expose people or structures to a significant risk of loss, injury or death involving wildland fires. Any potential impacts are considered to be less than significant. No specific mitigation is required.

3.8 Hydrology and Water Quality

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action:				
a) Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion of siltation on- or off-site?	☐	☒	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☒	☐	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality? (erosion potential)	☐	☒	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation of seiche, tsunami, or mudflow?	☐	☐	☐	☒

Discussion

(a) **Less-than-Significant Impact with Mitigation.** Excavation, grading, and construction activities associated with the Proposed Project/Action could violate water quality as those activities would expose and disturb soils, resulting in potential increases in erosion and siltation in the Project area. Construction during the rainy season could result in increases in erosion, station, and water quality issues. Generally, excavation, grading, paving, and other construction activities would expose disturbed and loosened soils to erosion by wind and runoff. Construction activities could therefore result in increased erosion and siltation, including nutrient loading and increasing the total suspended solids concentration. Erosion and siltation from construction have the potential to impact the creeks and drainage crossings, therefore posing a potentially significant impact to water quality. With the incorporation of the following mitigation, any potential impacts to water quality are reduced to less-than-significant levels.

> **Mitigation Measure HWQ-1: Implement Construction Best Management Practices.** To reduce potentially significant erosion and siltation, the District and/or its selected contractor(s) shall obtain a Stormwater Pollution Prevention Permit (SWPPP) and implement Best Management Practices and erosion control measures as required by the San Francisco RWQCB. Best Management Practices to reduce erosion and siltation shall include the following measures: Avoidance of construction activities during inclement weather; limitation of construction access routes and stabilization of access points; stabilization of cleared, excavated areas by providing vegetative buffer strips, providing plastic coverings, and applying ground base on areas to be paved; protection of adjacent properties by installing sediment barriers or filters, or vegetative buffer strips; stabilization and prevention of sediments from surface runoff from discharging into storm drain outlets; use of sediment controls and filtration to remove sediment from water generated by dewatering; and returning all drainage patterns to pre-existing conditions..

(b) **No Impact.** Construction and/or operation of the Proposed Project/Action would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. Construction of the Proposed Project/Action would be done primarily within existing roadways and subsurface excavation would be limited to 5-6 feet below surface elevation and would not interfere with groundwater supplies. Once constructed, the pipeline will also not adversely affect groundwater supplies. In fact, the importation of approximately 1,300 acre-feet of recycled water per year has the potential to offset current groundwater pumping which has the potential to increase local groundwater supplies through an in-lieu recharge basis. Therefore, no adverse impacts are anticipated and no mitigation is required.

(c) **Less-than-Significant Impact with Mitigation.** Construction and/or operation of the Proposed Project/Action would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion of siltation on- or off-site. As described in the Project Description, the Proposed Project/Action would be located primarily within existing roadways. The Proposed Project/Action includes a local creek and numerous drainage crossings. The creek crossing will involve hanging the pipeline on the existing bridge and will not involve cutting through or disturbing the creek. The numerous drainage crossings of existing culverts through the road will be done in the dry season and will not occur during the rainy weather months between October 15

and through April 1. These measures will be combined with erosion and siltation controls and in-stream resource protection measures as provided in **Mitigation Measure HWQ-1**, above. In addition, the Project area will be returned to pre-construction conditions. Therefore, the Proposed Project/Action would not significantly alter any existing drainage areas.

(d) **Less-than-Significant Impact with Mitigation.** Construction and/or operation of the Proposed Project/Action would not **s**ubstantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in flooding on- or off-site. As described in the Project Description, the Proposed Project/Action would be located within existing roadways and includes a local creek crossing and numerous drainage crossings. The creek crossings will involve hanging the pipeline on the existing bridge and will not involve cutting through or disturbing the creek. The numerous drainage crossings of existing culverts through the road will be done in the dry season and will not occur during the rainy weather months between October 15 and through April 1.These measures will be combined with erosion and siltation controls and in-stream resource protection measures as provided in **Mitigation Measure HWQ-1**, above. In addition, the Project area will be returned to pre-construction conditions. Therefore, the Proposed Project/Action would not significantly alter any existing drainage areas.

(e) **No Impact.** The Proposed Project/Action would not result in any new significant impervious surfaces and would not create new areas of low permeability. The Proposed Project/Action would be located primarily within existing roadways. The Proposed Project/Action would be returned to pre-construction conditions and would not increase the impervious surfaces and therefore would not create new areas of low permeability. In addition the construction of the filtration upgrades would not create a new impervious layer that would significantly affect permeability. As a result, no additional runoff is expected to be generated by the Proposed Project/Action. Therefore, the Proposed Project/Action would not result in exceeding the capacity of existing or planned storm water drainage systems. No impacts would occur and no mitigation is necessary.

(f) **Less-than-Significant Impact with Mitigation.** The Proposed Project/Action would not substantially affect water quality. As discussed earlier, the construction of the Proposed Project/Action could result in minor, temporary, and highly localized soil erosion and siltation issues. However, with the incorporation of **Mitigation Measure HWQ-1** above, potential impacts to water quality would be reduced to less-than-significant levels.

(g) **No Impact.** The Proposed Project/Action would not redirect flood flows or otherwise place housing within a 100-year flood hazard area. No impact is expected and no mitigation is required or necessary.

(h) **Less-than-Significant Impact.** The Proposed Project/Action would generally not place exposed structures within a 100-year flood hazard area. The pipeline facilities would be primarily located underground and out of the 100-year flood hazard area. The proposed pipeline alignment would cross a local creek and would be hung on the side of the existing bridges that could be within the 100-year flood zone. However, this potential impact is regarded as less than significant and no mitigation is required.

(i) **No Impact.** The Proposed Project/Action would not expose people or structures to a significant risk of loss, injury, or death involving flooding; including flooding as a result of a failure of a levee or dam. No impacts are likely or anticipated.

(j) **No Impact.** The Proposed Project/Action would not expose people or structures to a significant risk of loss, injury, or death involving a seiche or tsunami. In addition, the Proposed Project/Action area is essentially level, with minimal to no potential hazards from mudflows. No impacts are likely or anticipated.

3.9 Land Use and Planning

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Discussion

(a) **No Impact.** The Proposed Project/Action would not physically divide an established community. The Proposed Project/Action is located in Napa County and within a small portion of the City of Napa. The Proposed Project/Action would be primarily constructed primarily within and under existing roadways within the District. The Proposed Project/Action would not result in a disruption, physical division, or isolation of existing residential or open space areas. As a result, no impacts are likely or anticipated.

(b) **No Impact.** The Proposed Project/Action would be constructed primarily within and under existing roadways within the District. The Proposed Project/Action would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project area. In fact, the Napa Sanitation District and Napa County have developed strategic plans and policies to encourage the use of recycled water. Therefore, no impacts are anticipated and no mitigation is required.

(c) **No Impact.** The Proposed Project/Action would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan. As stated above, the Proposed Project/Action would be constructed primarily within existing roadways within the District. For this reason, no impact is expected.

3.10 Mineral Resources

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Discussion

(a) **No Impact.** The Proposed Project/Action site is not located on a site that is identified as a significant source of mineral resources. Specifically, the Proposed Project/Action is not located in an area identified as containing mineral resources classified MRZ-2 by the State geologist that would be of value to the region and the residents of the state. As a result, the Proposed Project/Action would not result in the loss of availability of known mineral resources; therefore, no impact is expected. No mitigation is required.

(b) **No Impact.** The Napa County General Plan does not identify any locally important mineral resources or recovery sites in the Proposed Project/Action's area. Further, as discussed in (a), the Proposed Project/Action would be unlikely to result in the loss of availability of a mineral resource deposit that has been identified as a mineral resource of value. Therefore, no adverse impacts are anticipated and no mitigation is required.

3.11 Noise

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☒	☐	☐
c) A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?	☐	☐	☒	☐
f) For a project within the vicinity of a private airstrip, would the Project expose people residing or working in the Project area to excessive noise levels?	☐	☐	☒	☐

Discussion

(a) **Less-than-Significant Impact with Mitigation.** The Proposed Project/Action is located in a rural area with limited potential for sensitive receptors. The nearest existing sensitive receptors to the project site are residences along the proposed pipeline alignment. The Proposed Project/Action has the potential to generate noise during the construction phase through the use of equipment and construction vehicle trips. Once constructed, the Proposed Project/Action would not create any new sources of operational noise. Therefore, operation of the pipeline would not result in noise impacts. Construction of the Proposed Project/Action would generate temporary and intermittent noise. Noise levels would fluctuate depending on the particular type, number, and duration of use of various pieces of construction equipment.

Back-up beepers associated with trucks and equipment used for material loading and unloading at the staging area would generate significantly increased noise levels over the ambient noise environment in order to be discernable and protect construction worker safety as required by OSHA (29 CFR 1926.601 and 29 CFR 1926.602). Residences in the vicinity of the staging area would thus be exposed to these elevated noise levels.

Construction activities associated with the project would be temporary in nature and related noise impacts would be short-term. However, since construction activities could substantially increase ambient noise levels at noise-sensitive locations, construction noise could result in potentially significant, albeit temporary, impacts to sensitive receptors. Compliance with the Napa County noise ordinance and implementation of the following mitigation measures is expected to reduce impacts related to construction noise, to a less-than-significant level. The following mitigation measures are proposed:

Mitigation Measure NOI-1: **Limit Construction Hours.** Construction activities will be limited to the least noise-sensitive times and will comply with both the Napa County and the City of Napa noise ordinances. Construction, alteration, repair or land development activities shall be allowed on weekdays between the hours of 7 a.m. and 7 p.m., on Saturdays between the hours of 8 a.m. and 5 p.m. No construction shall be permitted on Sundays.

Mitigation Measure NOI-2: Locate Staging Areas away from Sensitive Receptors. The District's construction specification shall require that the contractor select staging areas as far as feasibly possible from sensitive receptors.

Mitigation Measure NOI-3: Maintain Mufflers on Equipment. The District's construction specifications shall require the contractor to maintain all construction equipment with manufacturer's specified noise-muffling devices.

Mitigation Measure NOI-4: Idling Prohibition and Enforcement. The District shall prohibit and enforce unnecessary idling of internal combustion engines. In practice, this would mean turning off equipment if it will not be used for five or more minutes.

Mitigation Measure NOI-5: Equipment Location and Shielding. Locate all stationary noise-generating construction equipment such as air compressors as far as possible from homes and businesses.

With the incorporation of the above mitigation measures, noise impacts would be considered less-than-significant.

(b) **Less-than-Significant Impact with Mitigation.** Operation of the Proposed Project/Action would not result in exposing people to or generating excessive groundborne vibration or noise impacts. Construction of the Proposed Project/Action could likely result in minor and temporary increases in groundborne vibration or noise. However, construction activities would be temporary and is not considered to be significant. With the incorporation of **Mitigation Measures NOI-1 through NOI-5** impacts associated with the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels would be reduced to a less-than-significant level.

(c) **No Impact.** The operation of the Proposed Project/Action would not increase noise in and around the Project area. Once constructed, the operation of the pipeline facilities would not result in any noise. The Proposed Project/Action would not cause a permanent increase in ambient noise levels in the project vicinity above levels existing without the Project. Therefore, this impact is considered less-than-significant and no mitigation is required.

(d) **Less-than-Significant Impact with Mitigation.** Project construction activities may lead to a temporary increase in ambient noise levels in the project vicinity above levels existing without the project. With the implementation of **Mitigation Measures NOI-1 through NOI-5** impacts resulting in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project would be reduced to a less-than-significant level.

(e) **Less-than-Significant Impact.** The Proposed Project/Action is located within two miles of the Napa County Airport. However, construction and/or operation of the Proposed Project/Action would not adversely affect an airport or airport operations, including, noise, take-offs, landings, flight patterns, safety, light, navigation, or communications between aircraft and the control tower within the Project area. The Proposed Project/Action would not expose people residing or working in the Project area to excessive noise levels. Any potential impacts are considered to be less than significant. No specific mitigation is required.

(f) **Less-than-Significant Impact.** The Proposed Project/Action is located within two miles of the Napa County Airport. In addition, there might be private airstrips in the vicinity of the Proposed Project/Action. However, construction and/or operation of the Proposed Project/Action would not adversely affect an airport or airport operations, including, noise, take-offs, landings, flight patterns, safety, light, navigation, or communications between aircraft and the control tower within the Project area. The Proposed Project/Action would not expose people residing or working in the Project area to excessive noise levels. Any potential impacts are considered to be less than significant. No specific mitigation is required.

3.12 Population and Housing

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion

(a) **No Impact.** The Proposed Project/Action would not induce population growth either directly or indirectly. The Proposed Project/Action would be to serve the District with approximately 1,300 afy of non-potable tertiary treated water for irrigation purposes. This would help supplement the District's current groundwater supplies, but would not be a sufficient supply to induce urban growth in the area. In addition, construction, operation, and maintenance would not result in any substantial increase in numbers of permanent workers/employees. Therefore, no impacts are anticipated and no mitigation is required.

(b) **No Impact.** The Proposed Project/Action would not result in displacing substantial numbers of existing housing or necessitating the construction of replacement housing elsewhere. The Proposed Project/Action would be constructed within existing roadways and/or utility corridors within commercial, industrial, and residential zonings within the District. Construction of the Proposed Project/Action would avoid the need to demolish any existing houses and would not affect any other housing structures. As a result, the Proposed Project/Action would not displace existing housing, and therefore, no impacts are anticipated.

(c) **No Impact.** The Proposed Project/Action would not displace substantial numbers of people necessitating the construction of replacement housing elsewhere. The Proposed would be constructed within existing roadways within the District. Construction of the Proposed Project/Action would avoid the need to demolish existing housing and other housing structures. As a result, the Proposed Project/Action is not expected to displace people from their homes. Therefore, no impacts are anticipated.

3.13 Public Services

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Discussion

(a) **No Impact.** The Proposed Project/Action will not generate population growth and the operation and maintenance of the Proposed Project/Action would not be labor intensive. In addition, the Proposed Project/Action would not increase the demand for the kinds of public services that would support new residents, such as schools, parks, fire, police, or other public facilities. As a result, no impacts are anticipated and no mitigation is required.

3.14 Recreation

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion

(a) **No Impact.** The Proposed Project/Action will not contribute to population growth. Therefore, the Proposed Project/Action will not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. As a result, no impact is expected and no mitigation is required.

(b) **No Impact.** The Proposed Project/Action does not include or require construction or expansion of recreational facilities. Furthermore, as discussed in (a), the Proposed Project/Action will not increase the demand for recreational facilities. As a result, no impact is expected and no mitigation is required.

3.15 Socioeconomics

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project/Action:				
a) Result in any adverse socioeconomic effects?	☐	☐	☐	☒
b) Conflict with Executive Order 12898 (Environmental Justice) policies?	☐	☐	☐	☒
c) Affect Indian Trust Assets?	☐	☐	☐	☒

Discussion

(a) **No Impact.** The Proposed Project/Action would not have any adverse socioeconomic effects. The Proposed Project/Action would involve the construction and operation of a recycled water system to supplement the Districts surface and groundwater supplies. This would ensure a reliable, long-term water supply that would help support the existing and future agricultural activities within the District and which would be considered a beneficial socioeconomic effect. The Proposed Project/Action would result in a land-based assessment throughout the District that could have a negative socioeconomic effect within the District. However, the development of this water supply could have a beneficial impact to future water service fees by reducing the need to pursue more expensive future water supplies. In addition, the District would have to go through a Proposition 218 process where landowners would have to cast ballots before any additional assessments can be levied. The District is pursuing several funding mechanisms that would include applying for state and federal grants and loans to help reduce the cost of the project. In addition, the District would repay any loans by charging a fee to users for the use of the recycled water. It is assumed that the project costs would result in an increase in costs. However, the additional project costs would not adversely affect any minority or low-income populations and/or adversely alter the socioeconomic conditions of populations that reside within the District. As a result, the Proposed Project/Action would not have any adverse socioeconomic effects.

(b) **No Impact.** Executive 12898 requires each federal agency to achieve environmental justice as part of its mission, by identifying and addressing disproportionately high and adverse human health on environmental effects, including social and economic effects of its programs, policies, and activities on minority populations and low-income populations of the United States. The Proposed Project/Action would involve the construction and operation of a recycled water system to deliver supplemental water to the region to help protect and enhance the existing agricultural practices within the District. The Proposed Project/Action would primarily occur in existing roadways in a sparsely populated rural agricultural area. The Proposed Project/Action does not propose any features that would result in disproportionate adverse human health or environmental effects, have any physical effects on minority or low-income populations, and/or alter socioeconomic conditions of populations that reside or work within the District and vicinity.

(c) **No Impact.** The Proposed Project/Action would not have any adverse effects on Indian Trust Assets (ITA). ITAs are legal interests in property or rights held by the United States for Indian Tribes or individuals. Trust status originates from rights imparted by treaties, statutes, or executive orders. Examples of ITAs are lands, including reservations and public domain allotments, minerals, water rights, hunting and fishing rights, or other natural resources, money or claims. Assets can be real property, physical assets, or intangible property rights. ITAs cannot be sold, leased, or otherwise alienated without federal approval. ITAs do not include things in which a tribe or individuals have no legal interest such as off-reservation sacred lands or archaeological sites in which a tribe has no legal property interest. No ITAs have been identified within the District and in the construction areas of the Proposed Project/Action. As a result, the Proposed/Action would have no adverse effects on ITAs.

3.16 Traffic and Transportation

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action:				
a) Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	☐	☒	☐	☐
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☒	☐	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location which results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☒	☐	☐
f) Result in inadequate parking capacity?	☐	☐	☒	☐
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☒	☐

Discussion

(a) **Less-than-Significant Impact with Mitigation.** The Proposed Project/Action would be primarily constructed within existing roadways within the District. Construction would temporarily disrupt transportation and circulation patterns in the vicinity of the project thus disrupting local vehicle, bicycle, and pedestrian traffic along the haul route. Although construction-generated traffic would be temporary during peak excavation and earthwork activities, average daily truck trips would be 40 round-trip truck trips per day. The primary impacts from the movement of trucks would include short-term and intermittent lessening of roadway capacities due to slower movements and larger turning radii of the trucks compared to passenger vehicles. The following mitigation measures are proposed:

Mitigation Measure TRA-1: Prepare and Implement Traffic Control Plan. As is consistent with existing policy, the District shall require the contractor to prepare and implement effective traffic control plans to show specific methods for maintaining traffic flows. Examples of traffic control measures to be considered include: 1) use of flaggers to maintain alternating one-way traffic while working on one-half of the street; 2) use of advance construction signs and other public notices to alert drivers of activity in the area; 3) use of "positive guidance" detour signing on alternate access streets to minimize inconvenience to the driving public; 4) provisions for emergency access and passage; and 5) designated areas for construction worker parking.

Mitigation Measure TRA-2: Return Roads to Pre-construction Condition. Following construction, the District shall ensure that road surfaces that are damaged during construction are returned to their pre-construction condition or better.

With the incorporation of the above mitigation measures, potential temporary impacts are considered to be less-than-significant.

(b) **Less-than-Significant Impact with Mitigation.** As discussed above in (a), construction activities of the Proposed Project/Action may result in increased vehicle trips. This could temporarily exceed, either individually or cumulatively, existing level of service standards. However, the Proposed Project/Action would not result in any long-term degradation in operating conditions or level of service on any project roadways. With the implementation of **Mitigation Measure TRA-1** impacts associated with exceeding level of service standards would be reduced to a less-than-significant level.

(c) **No Impact.** The Proposed Project/Action does not involve use of air transit, nor is it expected to cause any change in air traffic patterns. No impact is expected and no mitigation is required.

(d) **No Impact.** The Proposed Project/Action does not propose to make changes to roadways that would create road hazards or alter design features developed to mitigate such hazards. No impacts are expected and no mitigation is required.

(e) **Less-than-Significant Impact with Mitigation.** The Proposed Project/Action would have temporary effects on traffic flow, due to added truck traffic during construction which could result in delays for emergency vehicle access in the vicinity of the project. Implementation of **Mitigation Measure TRA-1** would require the contractor to establish methods for maintaining traffic flow in the project vicinity and minimizing disruption to emergency vehicle access to land uses along the truck route. Implementation of **Mitigation Measure TRA-1** would also ensure potential impacts associated with temporary effects on emergency access would be mitigated to a less-than-significant level.

(f) **Less-than-Significant Impact.** Project-related construction activities would require additional parking for workers and equipment on a temporary basis. However, sufficient space exists within the construction easement to accommodate parking needs for construction workers and equipment. As a result, no impacts are anticipated and no mitigation is required.

(g) **Less-than-Significant Impact.** The construction activities associated with the Proposed Project/Action would be short term and would not conflict with adopted policies, plans, or programs supporting alternative transportation. Also once constructed, the Proposed Project/Action would not conflict with adopted policies, plans, or programs supporting alternative transportation. Any short-term effects would be considered less than significant.

3.17 Utilities and Service Systems

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action:				
a) Exceed waste water treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or waste water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
e) Result in a determination by the waste water treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion

(a) **No Impact.** The Proposed Project/Action would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. Therefore, no impacts are anticipated and no mitigation is required.

(b) **Less-than-Significant Impact.** The Proposed Project/Action would involve the construction of a water recycling system to serve the District. NSD's existing Soscol WWTP has the necessary capacity to serve this Proposed Project and therefore would not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities.

Any impacts associated with the construction and/or operations are considered to be less than significant and no additional mitigation is required.

(c) **No Impact.** The Proposed Project/Action would not require or result in the construction of additional off-site storm water drainage facilities. Therefore, no impacts are expected and no mitigation is required.

(d) **Less-than-Significant Impact.** Under the Proposed Project/Action the District will be receiving tertiary treated water from NSD's existing Soscol WWTP. This would be a new water supply and would require the District purchasing this new water supply from NSD. However, any impacts are considered to be less than significant and no mitigation is required.

(e) **Less-than-significant Impact.** Under the Proposed Project/Action, the District will be receiving tertiary treated water from NSD's existing Soscol WWTP. This would require upgrading NSD's tertiary filtration system. However, any impacts are considered to be less than significant and no mitigation is required.

(f) **No Impact.** Construction and operation of the Proposed Project/Action would not generate a significant amount of solid wastes. Solid waste from Napa is primarily landfilled at four facilities in the region, Keller Canyon, Clover Flat, Potrero Hills, and Redwood Sanitary. As of May 2010, the four landfills collectively have more than 87 million cubic yards of remaining capacity. No impacts are expected to existing landfills and no mitigation is required.

(g) **No Impact.** The Proposed Project/Action would comply with all relevant federal, state, and local statutes and regulations related to solid waste. Therefore, there are no anticipated impacts and no mitigation is required.

3.17 Mandatory Findings of Significance

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Proposed Project/Action:				
a) Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Have impacts that would be individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☒	☐	☐
c) Have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Discussion

(a) Less-than-Significant Impact with Mitigation. With the incorporation of the previously identified mitigation measures, the Proposed Project/Action will not substantially degrade the quality of the environment, reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory. Any impacts from the Proposed Project/Action in these areas are considered here to be less-than-significant with the implementation and incorporation of the above mentioned mitigation measures.

(b) Less-than-Significant Impact with Mitigation. In accordance with CEQA Guidelines Section 15183, the environmental analysis in this Initial Study was conducted to determine if there were any project-specific effects as a result of the Proposed Project/Action. No direct project-specific significant effects were identified that could not be mitigated to a less-than-significant level. Mitigation Measures incorporated herein mitigate any potential contribution to cumulative (as well

as direct) impacts associated with these environmental issues. Therefore, the Proposed Project/Action does not have impacts that are individually limited, but cumulatively considerable.

(c) **Less-than-Significant Impact with Mitigation**. As a result of mitigation included in this environmental document, the Proposed Project/Action would not result in substantial adverse effects to humans, either directly or indirectly.

Chapter 4 Determination:

On the basis of this initial evaluation for the Los Carneros Recycled Water Pipeline Project:

☐ I find that the Proposed Project/Action COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the Proposed Project/Action could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the District. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the Proposed Project/Action MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the Proposed Project/Action MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the Proposed Project/Action could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the Proposed Project/Action, nothing further is required.

Signature	Date
John Stewart	LCWD, District President
Printed Name	Title

Chapter 5 Bibliography

Detailed below are the sources referenced during the preparation of this environmental document.

- City of Napa. *St. Regis Napa Valley Project – Environmental Impact Report.* May 2010.
- North Bay Water Reuse Authority. *North Bay Water Reuse Program Environmental Impact Report/Environmental Impact Statement.* May 2009.
- Los Carneros Water District. *Recycled Water Feasibility Study.* August 2010.
- State Water Resources Control Board. *Staff Report and Certified Regulatory Program Environmental Analysis for the State Water Resources Control Board's Recycled Water Policy.* 2009.
- County of Napa. *General Plan.* June 2008.
- City of Napa. *General Plan.* December 1998 and as amended in May 2010.
- Napa Sanitation District. *Los Carneros Recycled Water Irrigation Pipeline - Initial Study/Negative Declaration.* January 1995.
- California Natural Diversity Database, February 2011
- California Department of Toxic Substances. *Envirostor database and GIS System*. July 2011
- California Department of Forestry and Fire Protection. *Fire Severity Mapping*. July 2011
- Napa Sanitation District. *Strategic Plan for Recycled Water Use in the Year 2020.* July 2011.
- Federal Register. 2006.

Appendix A

Air Quality Emissions Calculations

Road Construction Emissions Model, Version 6.3.2

Emission Estimates for -> Los Carneros Recycled Water Pipeline Project Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	9.9	39.2	47.0	12.8	2.8	10.0	4.6	2.5	2.1	6,298.8
Grading/Excavation	11.7	58.6	58.4	13.5	3.5	10.0	5.2	3.1	2.1	8,674.8
Drainage/Utilities/Sub-Grade	9.9	39.4	44.7	13.0	3.0	10.0	4.8	2.7	2.1	6,069.5
Paving	8.6	33.8	31.7	2.7	2.7	-	2.4	2.4	-	4,288.5
Maximum (pounds/day)	11.7	58.6	58.4	13.5	3.5	10.0	5.2	3.1	2.1	8,674.8
Total (tons/construction project)	1.4	6.0	6.3	1.5	0.4	1.1	0.6	0.4	0.2	897.8

Notes:	
Project Start Year ->	2014
Project Length (months) ->	12
Total Project Area (acres) ->	6
Maximum Area Disturbed/Day (acres) ->	1
Total Soil Imported/Exported (yd^3/day)->	310

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Los Carneros Recycled Water Pipeline Project Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	4.5	17.8	21.4	5.8	1.3	4.5	2.1	1.2	0.9	2,863.1
Grading/Excavation	5.3	26.6	26.5	6.1	1.6	4.5	2.3	1.4	0.9	3,943.1
Drainage/Utilities/Sub-Grade	4.5	17.9	20.3	5.9	1.4	4.5	2.2	1.2	0.9	2,758.9
Paving	3.9	15.3	14.4	1.2	1.2	-	1.1	1.1	-	1,949.3
Maximum (kilograms/day)	5.3	26.6	26.5	6.1	1.6	4.5	2.3	1.4	0.9	3,943.1
Total (megagrams/construction project)	1.2	5.5	5.7	1.4	0.4	1.0	0.5	0.3	0.2	814.4

Notes:	
Project Start Year ->	2014
Project Length (months) ->	12
Total Project Area (hectares) ->	2
Maximum Area Disturbed/Day (hectares) ->	0
Total Soil Imported/Exported ($meters^3$/day)->	237

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

Appendix B

Federal Biological Resources Analysis Report

Document Bound Separately

Appendix C

Cultural Resources Investigation Report

Document Bound Separately

Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline

1. Brown & Caldwell, 2009. Technical Memorandum - Recycled Water Treatment Alternatives, City of Sunnyvale WPCP Strategic Infrastructure Plan, October 10.
2. City of Sunnyvale, 2013a. 2012 Recycled Water Annual Report, March 15.
3. City of Sunnyvale, 2013b. Mitigated Negative Declaration – Wolfe Road Recycled Water Project. September 24, 2013.
4. City of Sunnyvale, 2014a. 2013 Recycled Water Annual Report, March 14.
5. City of Sunnyvale, 2014b. 2013 Annual NPDES Report, City of Sunnyvale Water Pollution Control Plant, February 1.
6. City of Sunnyvale, 2014c. Nutrient 13267 Study Data, July 2012 – March 2014.
7. HDR, 2013. Technical Memorandum - Simultaneous Production of Recycled Water, City of Sunnyvale Water Pollution Control Plant, Sodium Hypochlorite Disinfection Project, July 19.
8. HydroScience, 2013. City of Sunnyvale Feasibility Study for Recycled Water Expansion Report, June.
9. San Francisco Bay Regional Water Quality Control Board (RWQCB), 2014. Order No. R2-2014-0014, Nutrients from Municipal Wastewater Discharges to San Francisco Bay, NPDES Permit No. CA003887.
10. Santa Clara Valley Water District (SCVWD), 2010. Urban Water Management Plan.
11. SCVWD, 2011. Board Agenda Memorandum, Water Supply and Infrastructure Master Plan Update, meeting date December 13, 2011.
12. SCVWD, 2012a. 2012 Groundwater Management Plan.
13. SCVWD, 2012b. SCVWD 2012 Water Supply and Infrastructure Master Plan, October.
14. SCVWD, 2014a. Neighborhood Update – May 2014, Reservoir and local stream conditions.
15. SCVWD, 2014b. May 2014 Water Tracker.
16. SCVWD, 2014c. Supplemental Board Agenda Memorandum, Update on 2014 Water Supply and Drought Response, meeting date March 25, 2014.
17. SCVWD and City of Sunnyvale. 2014a. Primary Benefit Calculations: Cost per Acre Foot.
18. SCVWD and City of Sunnyvale, 2014b. Tertiary Benefit Calculations: Effluent CBOD and TSS.
19. SCVWD and City of Sunnyvale, 2014c. Tertiary Benefit Calculations: Total Nitrogen.

Reference 1

BROWN AND CALDWELL

Technical Memorandum

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Prepared for: City of Sunnyvale, Sunnyvale, CA

Project Title: WPCP Strategic Infrastructure Plan

Project No: 135083

Technical Memorandum

Subject: Recycled Water Treatment Alternatives

Date: October 10, 2009

To: Lorrie B. Gervin, P.E., City of Sunnyvale

From: Lloyd A. Slezak, Project Manager, Brown and Caldwell

Prepared by: _____

Rion Merlo, Ph.D., P.E., Principal Engineer

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Professional Civil Engineer, California - License No. C61492 Exp. 06/30/2011

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1. EXECUTIVE SUMMARY

The existing tertiary treatment system at the Sunnyvale Water Pollution Control Plant (WPCP) is used to produce both recycled water, which must have a turbidity less than 2 nephelometric turbidity units (NTU), and treated effluent for Bay discharge, which must have a turbidity less than 10 NTU. Switching between operation modes presents significant operational and compliance monitoring challenges. Under recycled water production operation, polymer dose is approximately 1.8 times greater than during Bay discharge mode. In addition, the dual media filters (DMF) are backwashed more frequently. We have evaluated a parallel recycled water system that would produce 4 million gallons per day (mgd) of recycled water (8 mgd, ultimate). A treatment capacity of 4 mgd (8 mgd, ultimate) is in line with the most recent recycled water master plan performed in 2000. We performed this evaluation for both the plant replacement and the plant rehabilitation scenarios. We identified several Title 22 approved filtration technologies and evaluated them on relative life cycle cost, energy consumption, footprint requirement, process maturity and resource consumption. Using these criteria, we selected DMF, cloth media filtration and membrane filtration for detailed evaluation which included planning level cost estimates. For the plant rehabilitation scenario, we recommend planning for new dissolved air flotation (DAF) units followed by DMF. This alternative has a higher present worth value than DAF followed by cloth media filters, however we do not recommend assuming that a cloth media system downstream of the oxidation pond will be feasible due to uncertainty regarding technology performance. Ultimately, pilot testing of this uncertain configuration could lead to a successful execution of the lower cost approach but, for prudent planning at this juncture, the cost and consequences of the DMF based system should be assumed. In addition, we recommend that the City pilot test DMF filtration (using chemical addition) downstream of DAF operating under Bay discharge mode (10-NTU). If successful, this would significantly reduce the capital cost by eliminating the need for dedicated DAF units. For the plant replacement scenario, where conventional activated sludge treatment could precede cloth filters and result in a proven treatment technology configuration, we recommend cloth media filtration, which had the lowest cost (capital and operating) of all alternatives. For the plant rehabilitation scenario, two new chlorine contact tanks (CCTs) would be required at 4-mgd recycled water capacity; four new CCTs would be required at 8-mgd recycled water capacity. For the plant replacement, we assumed that a new ultraviolet light (UV) disinfection system would be constructed.

2. INTRODUCTION

The tertiary treatment system at the Sunnyvale WPCP consists of: DAF and DMF, followed by disinfection. Currently, the fixed growth reactors (FGRs) are upstream of the DAF units, however we recommend operating them downstream of the DAF units to promote more stable operation as shown in Figure 2-1 (see "Nitrification Process Improvements TM"). Tertiary treatment is required for effluent disposal to the San Francisco Bay (Bay). During Bay discharge, the effluent turbidity cannot exceed 10 NTU on an instantaneous basis. The tertiary treatment system is also used to produce recycled water. During recycled water production, turbidity prior to disinfection cannot exceed 2 NTU on a daily average basis. Thus, the tertiary treatment system is operated in two distinct operational modes: 1) Bay discharge (or 10 NTU) and 2) recycled water (or 2 NTU). To meet the more stringent recycled water treatment requirements, polymer dose to the DAF and the chlorine dose to disinfection must be increased. Switching between these two operational modes has resulted in significant operational challenges for WPCP operations staff.

The purpose of this technical memorandum (TM) is to summarize the existing tertiary treatment system at the WPCP, discuss challenges with current operations, and investigate viable alternatives to increase recycled water production to meet future demand. Since recycled water demand is much less than Bay discharge, it

6.2.3 Cost Analysis – Plant Rehabilitation Scenario

Planning level cost estimates were determined to estimate capital and selected operating costs. The cost estimate was performed assuming the DMF, DAF and cloth media filters would be constructed with concrete tanks; membrane filter equipment would be located on a concrete pad. These costs are meant to be used to compare technologies and should not be used to estimate actual project costs. Table 6-3 presents the capital costs associated with each alternative.[9] Alternative 3 had the highest capital cost ($5.5 million) followed by Alternative 1 ($4.8 million) and Alternative 2 ($3.6 million).

Table 6-3. Comparable Capital Costs for 4-mgd Recycled Water System for the Plant Rehabilitation Scenario

Parameter	Alternative 1 DAF Followed by DMF	Alternative 2 DAF followed by Cloth Media	Alternative 3 Membrane Filters
DAF	$1,928,000	$1,928,000	---
Filtration	$2,864,000	$1,715,000	$5,495,000
Total	$4,792,000	$3,643,000	$5,495,000

Selected operating costs were determined assuming that 730 million gallons of recycled water would be produced per year (or 4-mgd production for 6 months per year which represents projected near-term operating condition) (Table 6-4). All alternatives include DAF; therefore, DAF operating costs were not included (with the exception of polymer use). The difference in operational costs between the alternatives will be determined by the polymer cost, electrical cost, chemical cost for membrane cleaning, and replacement cost. The difference in the polymer costs between alternatives is due to the difference in dose; Alternatives 1 and 2 require a higher dose than Alternative 3. Electrical costs were calculated assuming $0.20/kWhr.[10] All alternatives have a replacement cost. We assumed 10-year replacement for the membranes; 7-year replacement for the cloth media; and 10-year replacement for the granular media. Replacement costs represent installed costs, but do not include costs associated with disposal of spent equipment. Maintenance costs and parts replacement were not included.

Alternative 2 has the lowest operation cost ($177,000/yr) due to the low electrical cost and replacement cost associated with the cloth media filtration. Alternative 1 operation costs are higher ($206,000/yr) and are due to the higher replacement costs associated with the granular media. We assumed a 10-year replacement cycle. In reality, this replacement may be less frequent; the existing DMF media is over 20 years old. Alternative 3 has the highest operating cost ($215,000/yr) because of the chemical requirements and replacement costs

[9] Table 6-3 does not include costs for startup, contingency, insurance or bonds. There is no significant civil work included (i.e. piles, cut and/or fill, yard piping, demo, landscape, etc.). Allowances were made for above-ground interconnecting piping as required.

[10] Electrical costs were determined by estimating the additional natural gas that would be required to operate equipment. Current gas costs $1.04/Therm. Assuming a 30 percent efficiency for the engines, this equates to $0.12/kWhr. Increase to $0.20/kWhr to account for costs associated with equipment operation and maintenance and to impose additional burden on alternatives requiring more electric power, reflecting a Level of Service objective to minimize power use.

$$Cost = \frac{\$1.04}{Therm} * \frac{1 Therm}{100{,}000 BTU} * \frac{3412 BTU}{kWhr} * \frac{1}{0.3}$$

$$Cost = \frac{\$0.12}{kWhr}$$

Reference 2

City of Sunnyvale

2012 Recycled Water Annual Report

March 15, 2013

Prepared by:

`

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ATTACHMENTS

Attachment A-1 List of Water Usage at Recycled Water Sites
Attachment A-2 Summary of Recycled Water Use by Reuse Application Category
Attachment B Summary of Recycled Water Deliveries

Attachment B
Summary of Recycled Water System Deliveries and Use at WPCP

Month	Recycled Water Produced (gallons)	Potable Water Added at WPCP (gallons)	Potable Water Added at San Lucar Storage Tank (gallons)	Total Volume Into Recycled Water System[1] (gallons)	WPCP Internal Usage[2] (gallons)
Jan-2012	0	25,920	14,603,040	14,628,960	17,258,400
Feb-2012	0	1,440	14,220,000	14,221,440	19,844,600
Mar-2012	0	0	16,452,000	16,452,000	19,713,600
Apr-2012	0	83,520	24,569,280	24,652,800	15,775,200
May-2012	0	499,680	53,179,200	53,678,880	15,883,200
Jun-2012	0	669,600	60,406,560	61,076,160	17,609,800
Jul-2012	0	249,120	59,016,960	59,266,080	18,259,200
Aug-2012	0	312,480	59,459,040	59,771,520	15,828,500
Sep-2012	0	57,600	46,306,080	46,363,680	17,009,300
Oct-2012	0	41,760	30,283,200	30,324,960	18,502,600
Nov-2012	0	144,000	12,322,080	12,466,080	16,876,800
Dec-2012	0	453,600	4,063,680	4,517,280	17,340,500
Total	**0**	**2,538,720**	**394,881,120**	**397,419,840**	**209,901,700**

1. All water delivered through the recycled water system in 2012 was potable water.
3. Disinfected secondary recycled water diverted for WPCP process use prior to RW distribution system. Recycled water used for irrigation at the WPCP comes from the RW distribution system and is included in the tabulation of user sites (Attachment B-1).

Reference 3

Environmental Services Department
City of Sunnyvale
P.O. Box 3707
Sunnyvale, California 94088-3707

MITIGATED NEGATIVE DECLARATION

The Director of Environmental Services Department has reviewed the proposed project described below to determine whether it could have a significant effect on the environment as a result of project completion. "Significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.

NAME OF PROJECT: Wolfe Road Recycled Water Project

PROJECT DESCRIPTION: The project consists of improvements to the existing San Lucar Pump Station and the construction of a new recycled water pipeline down Wolfe Road to Homestead Road, approximately 13,500 linear feet.

PROJECT LOCATION & ASSESSORS PARCEL NO.: The project would be located along Wolfe Road, from the San Lucar Pump Station (approximately 0.25 miles south of Central Expressway) to Homestead Road.

APPLICANT CONTACT INFORMATION: Mansour Nasser, P.E., Environmental Services Department, 456 W. Olive Ave, Sunnyvale, CA 94086. Phone (408) 730-7578.

FINDING

The Director of Environmental Services Department finds the project described above will not have a significant effect on the environment in that the attached initial study identifies one or more potentially significant effects on the environment for which the project applicant, before public release of this draft Mitigated Negative Declaration, has made or agrees to make project revisions that clearly mitigate the effects to a less than significant level.

MITIGATION MEASURES INCLUDED IN THE PROJECT TO REDUCE POTENTIALLY SIGNIFICANT EFFECTS TO A LESS THAN SIGNIFICANT LEVEL

I. **AESTHETICS** – The project will not have a significant impact on this resource, therefore no mitigation is required.

II. **AGRICULTURE RESOURCES** – The project will not have a significant impact on this resource, therefore no mitigation is required.

III. **AIR QUALITY** – The project will not have a significant impact on this resource, therefore no mitigation is required.

IV. **BIOLOGICAL RESOURCES** – Due to the presence of potential migratory bird nesting habitat in the vicinity of the project area, the mitigation measure below will be implemented to avoid any direct and indirect effects to migratory birds during construction.

To minimize and avoid potential direct and indirect impacts to migratory bird species and in conformance with the Migratory Bird Treaty Act, pre-construction nesting bird surveys shall be conducted for all construction activity occurring within the nesting season (generally extending from February 1st to August 31st). Surveys shall be conducted no more than 7 days prior to any construction activity in areas within or directly adjacent to the construction disturbance area. All surveys shall be done by a qualified biologist in conformance with CDFG survey protocol for migratory birds. If ground-disturbing activities are delayed for more than 30 days after the pre-construction survey, the site must be re-surveyed

V. **CULTURAL RESOURCES** – The project will not have a significant impact on this resource, therefore no mitigation is required.

VI. **GEOLOGY AND SOILS** – The project will not have a significant impact on this resource, therefore no mitigation is required.

VII. **HAZARDS AND HAZARDOUS MATERIALS** – Due to the presence of potential hazardous materials in the vicinity of the project area, the mitigation measures below will be implemented to help ensure avoidance of any potential direct and indirect effects to the community causes by disturbances to these materials.

Prior to any construction activities, the construction contractor shall conduct an initial site investigation to help confirm the absence of contaminated soil or groundwater that may exist within the area to be excavated. Additional investigations may be required based on the results of the initial investigation. Regardless of the results of the investigation, any hazardous materials that are found during construction of the pipeline would be handled in compliance with applicable laws and regulations regarding transport, handling, disposal, and storage. All federal, state, and local reporting requirements would be followed regarding the use and handling of hazardous and non-hazardous materials at the project site.

VIII. **HYDROLOGY AND WATER QUALITY** – The project will not have a significant impact on this resource, therefore no mitigation is required.

IX. **LAND USE AND PLANNING** – The project will not have a significant impact on this resource, therefore no mitigation is required.

X. **MINERAL RESOURCES** – The project will not have a significant impact on this resource, therefore no mitigation is required.

XI. **NOISE** – The project will not have a significant impact on this resource, therefore no mitigation is required.

XII. **POPULATION AND HOUSING** – The project will not have a significant impact on this resource, therefore no mitigation is required.

XIII. **PUBLIC SERVICES** – The project will not have a significant impact on this resource, therefore no mitigation is required.

XIV. **RECREATION** – The project will not have a significant impact on this resource, therefore no mitigation is required.

XV. TRANSPORTATION / TRAFFIC – The project will not have a significant impact on this resource, therefore no mitigation is required.

XVI. UTILITIES AND SERVICE SYSTEMS – The project will not have a significant impact on this resource, therefore no mitigation is required.

XVII. MANDATORY FINDINGS OF SIGNIFICANCE – The project will not substantially reduce the habitat of a fish or wildlife species, be cumulatively considerable, or have a substantial adverse effect on human beings, therefore no additional mitigation is required.

PUBLIC REVIEW PERIOD

Before 5:00 p.m. on November 7, 2012, any person may:

1. Review the Draft Mitigated Negative Declaration (MND) as an informational document only; or

2. Submit written comments regarding the information, analysis, and mitigation measures in the Draft MND. Before the MND is adopted, staff will prepare written responses to any comments, and revise the Draft MND, if necessary, to reflect any concerns raised during the public review period. All written comments will be included as part of the Final MND.

_____, Director
Environmental Services Department

Circulated on: October 19, 2012

Adopted on: September 24, 2013

Reference 4

City of Sunnyvale

2013 Recycled Water Annual Report

March 14, 2014

Prepared by:

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Attachment B
Summary of 2013 Recycled Water System Deliveries and Use at WPCP

Month	Recycled Water Produced (gallons)	Potable Water Added at WPCP (gallons)	Potable Water Added at San Lucar Storage Tank (gallons)	Total Volume Into Recycled Water System[1] (gallons)	WPCP Internal Usage[2] (gallons)
Jan-2013	0	2,880	7,574,400	7,577,280	18,951,800
Feb-2013	0	303,840	12,198,240	12,502,080	17,128,800
Mar-2013	0	0	26,542,080	26,542,080	20,021,800
Apr-2013	0	285,120	41,320,800	41,605,920	19,461,600
May-2013	0	745,920	57,049,920	57,795,840	16,611,800
Jun-2013	0	0	61,070,400	61,070,400	17,458,600
Jul-2013	0	0	64,709,280	64,709,280	20,448,000
Aug-2013	0	59,040	58,390,560	58,449,600	18,709,900
Sep-2013	0	262,080	47,013,120	47,275,200	17,989,900
Oct-2013	0	138,240	39,139,200	39,277,440	17,648,600
Nov-2013	0	250,560	19,830,240	20,080,800	17,249,800
Dec-2013	0	43,200	15,284,160	15,327,360	17,340,500
Total	**0**	**2,090,880**	**450,122,400**	**452,213,280**	**219,021,100**

1. All water delivered through the recycled water system in 2013 was potable water.
3. Disinfected secondary recycled water diverted for WPCP process use prior to RW distribution system. Recycled water used for irrigation at the WPCP comes from the RW distribution system and is included in the tabulation of user sites (Attachment B-1).

Reference 5

City of Sunnyvale

Water Pollution Control Plant

2013 Annual NPDES Report

February 1, 2014

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Attachment D. List of Approved Analysis
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	Influent Flow (MGD)				Effluent Flow (MGD)			
	Average	Min	Max	# of Samples	Average	Min	Max	# of Samples
January	14.0	13.0	14.6	31	15.3	7.2	18.9	31
February	13.5	10.2	15.8	28	12.3	0.0	22.7	28
March	13.7	12.9	18.4	31	13.8	8.1	22.0	31
April	13.3	12.7	14.4	30	10.5	5.4	12.4	30
May	13.0	12.1	13.5	31	7.0	0.0	11.2	31
June	12.9	12.3	13.4	30	9.3	0.0	18.5	30
July	12.8	11.9	13.4	31	9.6	5.8	19.8	31
August	13.1	12.3	14.1	31	9.3	4.3	10.9	31
September	12.9	12.0	14.2	30	10.6	0.0	18.6	30
October	12.7	11.7	13.5	31	10.6	0.0	18.7	31
November	12.7	10.9	14.5	30	11.6	0.0	18.5	30
December	12.4	11.0	13.1	31	13.6	6.3	19.0	31
2013	13.1	10.2	18.4	365	11.1	0	22.7	365

	TSS, Influent (mg/L)				TSS, Effluent (mg/L)			
	Average	Min	Max	# of Samples	Average	Min	Max	# of Samples
January	223	138	310	13	10.4	6.1	12.2	13
February	226	88	309	8	12.8	10.5	16.0	8
March	208	105	264	7	12.2	10.6	13.7	7
April	279	229	344	8	9.8	8.1	12.5	9
May	271	153	419	8	8.8	7.1	9.6	9
June	332	185	402	8	9.1	7.0	10.8	8
July	254	120	307	10	8.4	6.8	10.0	10
August	281	212	398	8	10.8	7.2	15.1	8
September	252	151	492	10	8.8	7.1	10.5	11
October	248	196	304	8	8.4	7.1	9.8	8
November	263	205	296	8	9.0	7.5	10.6	8
December	280	148	373	10	9.8	7.0	10.9	10
2013	260	88	492	106	9.9	6.1	16.0	109

	Turbidity, Effluent (NTU)			
	Average	Min	Max	# of Samples
January	8.5	6.5	9.7	31
February	8.1	5.3	9.3	27
March	8.3	7.3	8.9	31
April	7.8	3.1	8.9	30
May	8.1	6.3	9.2	30
June	8.0	6.5	8.8	28
July	7.9	6.6	9.0	31
August	7.9	6.4	8.8	31
September	7.6	6.2	8.6	26
October	8.0	5.4	9.3	28
November	8.1	5.7	9.1	27
December	8.5	7.8	9.6	31
2013	8.1	3.1	9.7	351

	CBOD5 (mg/L), Influent				CBOD5 (mg/L), Effluent			
	Average	Min	Max	# of Samples	Average	Min	Max	# of Samples
January	226	168	278	13	4.5	2.5	5.9	13
February	207	161	271	4	5.3	2.7	7.6	4
March	250	175	353	8	3.7	2.9	5.2	8
April	242	153	304	6	4.2	2.6	5.4	6
May	184	116	290	5	5.2	2.7	9.6	5
June	209	179	236	7	5.2	4.1	7.4	7
July	208	142	272	13	4.7	2.4	6.6	13
August	197	115	270	10	4.5	3.8	5.3	10
September	232	161	348	10	5.4	4.3	6.5	11
October	216	164	257	11	6.7	4.1	8.4	11
November	242	205	270	8	6.0	4.2	8.3	8
December	237	133	276	10	7.5	4.9	10.1	10
2013	221	115	353	105	5.2	2.4	10.1	106

	pH, Effluent (pH unit)			
	Average	Min	Max	# of Samples
January	7.3	6.9	7.4	31
February	7.1	6.7	7.3	27
March	7.0	6.8	7.3	31
April	7.1	6.9	7.5	30
May	7.1	6.9	7.2	30
June	7.2	7.0	7.3	28
July	7.3	7.2	7.4	31
August	7.3	7.2	7.8	31
September	7.2	7.1	7.5	26
October	7.2	6.9	7.4	28
November	7.2	6.9	7.5	27
December	7.1	6.8	7.5	31
2013	7.2	6.7	7.8	351

	Enterococcus Bacteria, Effluent (MPN/100 mL)					Enterococcus 30-day Geometric Mean (MPN/100ml)			
	Geomean		Min	Max	# of Samples	Average	Min	Max	# of Samples
January	2.4	<	1.0	43.5	26	--	2.4	4.1	31
February	1.0	<	1.0	1.0	21	--	1.0	2.3	28
March	1.4	<	1.0	14.8	26	--	1.0	1.4	31
April	1.5	<	1.0	4.1	26	--	1.3	1.5	30
May	1.4	<	1.0	27.2	26	--	1.1	1.5	31
June	5.6	<	1.0	24.9	24	--	1.4	5.6	30
July	2.7	<	1.0	13.4	27	--	2.2	6.3	31
August	2.2	<	1.0	9.3	26	--	2.1	3.2	31
September	2.5	<	1.0	21.3	23	--	1.7	2.6	30
October	4.1		1.0	10.9	25	--	2.6	4.5	31
November	4.1	<	1.0	20.1	22	--	4.0	5.1	30
December	3.3	<	1.0	31.8	27	--	2.1	4.0	31
2013			1.0	43.5	299	--	1.0	6.3	365

Reference 6

Effluent Concentrations (mg/l)

City of Sunnyvale
Alo Kauravlla, Lab Manager, 408-730-7704, akauravlla@sunnyvale.ca.gov

Quarter of Year (Q1, Q2, Q3, Q4 YYYY)	Date (mm/dd/yyyy)	Peak Flow Event (Y/N)	Flow (MGD) Ave Daily	Flow (MGD) Peak	TN (mg/L) TKN+NO3+NO2	TDN (mg/L) SKN+NO3+NO2	TKN (mg/L)	SKN (mg/L)	NO3 (mg/L)	NO2 (mg/L)	Total NH3 (mg/L)	Urea* (mg/L)	TP (mg/L)	TDP (mg/L)	DRP** (mg/L) Grab or composite	pH (s.u.) Min	pH (s.u.) Max	Temp (°C) Min	Temp (°C) Max	TSS (mg/L)
Q3 2012	7/12/2012	N	7.64	11.2	20.8	20.1	3.3	2.6	17.5	0.017	0.27		5.48	5.38	5.3	7.11	7.11	22.5	22.5	8.34
Q3 2012	7/24/2012	N	5.81	7.4	25.5	24.7	3	2.2	22.5	0.01	0.182		9.22	9.03	11	7.01	7.01	22.5	22.5	5.16
Q3 2012	8/9/2012	N	6.82	7.7	26.1	25.3	3.1	2.3	23	0.034	0.452		8.5	8	7.3	7.17	7.17	22	22	5.58
Q3 2012	8/27/2012	N	6.26	9.7	25.3	25.0	2.5	2.2	22.8	0.039	0.248		7.7	7.5	6.6	7.04	7.04	20.5	20.5	13.4
Q3 2012	9/6/2012	N	10.3	11	25.5	24.6	3.2	2.3	22	0.277	1.19		8.4	8.2	7.4	6.87	6.87	20	20	13.2
Q3 2012	9/16/2012	N	9.41	9.9	26.1	25.4	3.3	2.6	22.5	0.328	1.63		8.4	8.3	7.9	6.98	6.98	21	21	6.58
Q4 2012	10/18/2012	N	9.21	9.71	32.0	31.0	9.2	8.2	21.6	1.15	7		7.4	7.7	7.2	7.04	7.04	19.5	19.5	7.67
Q4 2012	10/25/2012	N	15.99	19.3	34.2	52.2	21	39	11.5	1.7	19.6		7.1	6.8	6.8	7.32	7.32	15.5	15.5	6.92
Q4 2012	11/8/2012	N	12.59	18	33.4	32.4	19	18	12.3	2.05	18.4		6	6.1	6.6	7.26	7.26	16	16	9.59
Q4 2012	11/20/2012	N	11.19	11.98	32.8	31.8	15	14	15.8	2.02	13.3		5.7	5.7	5.3	7.14	7.14	14.5	14.5	10.7
Q4 2012	12/6/2012	N	6.27	15.92	29.4	29.5	6.8	6.9	21.1	1.53	6.51		4.8	4.7	4.8	6.89	6.89	14.5	14.5	9.59
Q4 2012	12/16/2012	N	19.02	20.07	30.2	29.2	21	20	7.56	1.68	18		4.7	4.4	4.2	7.43	7.43	8.5	8.5	10.4
Q1 2013	1/10/2013	N	18.1	23.7	29.7	26.7	20	17	8.3	1.35	21.6		4.4	3.8	3.6	7.37	7.37	9	9	8.75
Q1 2013	1/15/2013	N	9.33	10.3	28.1	29.1	11	12	15.6	1.49	10.2		4.1	3.7	3.7	7.17	7.17	6	6	11.8
Q1 2013	1/24/2013	Y	18.7	19.4	28.2	28.2	17	17	9.9	1.3	15.1		4.4	4.1	3.5	7.29	7.29	11	11	9.62
Q1 2013	2/7/2013	N	5.72	11.1	32.0	27.9	6.7	2.6	24.3	1.02	4.9		4	4.4	4.1	6.83	6.83	10.5	10.5	10.5
Q1 2013	2/14/2013	Y	18.3	23.8	28.1	26.1	14	12	12.2	1.86	13		4.1	3.9	3.7	7.27	7.27	11	11	13.9
Q1 2013	2/26/2013	N	6.18	6.8	29.3	28.4	1.9	0.94	27.4	0.044	0.11		4.1	3.9	3.4	6.94	6.94	11.5	11.5	11.3
Q1 2013	3/21/2013	N	12.3	17.2	26.6	24.9	5.4	3.7	18.2	2.99	3.57		4.1	3.8	3.5	6.98	6.98	13.5	13.5	12.9
Q1 2013	3/26/2013	N	10.3	15.8	26.6	26.5	1.4	1.3	24.9	0.314	0.17		3.7	3.5	3.5	7.03	7.03	14	14	13.7
Q2 2013	4/11/2013	N	11.7	11.8	26.317	25.6	2.1	1.4	24	0.217	0.12		2.4	2.3	2.3	6.93	6.93	18	18	8.12
Q2 2013	4/16/2013	N	9.48	11.8	20.9	19.9	3.7	2.7	16	1.2	1.46		2.3	2.2	1.9	7.07	7.07	13.5	13.5	9
Q2 2013	5/5/2013	N	6.87	9.3	24.6	23.3	6.2	4.9	17.8	0.6	2.73		5.7	5.7	5.6	7.12	7.12	21.5	21.5	9.62
Q2 2013	5/19/2013	N	7.2	7.9	18.014	16.3	3.3	1.6	14.7	0.014	0.18		5.9	5.7	5.5	7.11	7.11	20	20	7.12
Q2 2013	6/13/2013	N	8.82	8.9	16.909	14.3	2.8	0.22	14.1	0.009	0.092		6.6	6.5	6.3	7.16	7.16	20.5	20.5	9.25
Q2 2013	6/20/2013	N	9.67	9.9	17.417	15.9	4.2	2.7	13.2	0.017	0.21		6	5.6	5.7	7.11	7.11	18.5	18.5	9.38
Q3 2013	7/9/2013	N	5.77	9.6	15.209	13.8	3.7	2.3	11.5	0.009	0.114		6.1	6.1	6.2	7.33	7.33	22.1	22.1	8.62
Q3 2013	7/23/2013	N	8.6	9.4	13.964	11.7	4.5	2.2	9.39	0.074	0.269		4.8	4.6	4.6	7.23	7.23	21.6	21.6	10
Q3 2013	8/8/2013	N	8.77	9.73	10.802	8.90	4.2	2.3	6.57	0.032	0.302		4.3	4	3.9	7.34	7.34	21.1	21.1	10.2
Q3 2013	8/20/2013	N	9.69	11	8.911	7.61	3.3	2	5.6	0.011	0.18		6.9	7	3.4	7.21	7.21	23.6	23.6	12
Q3 2013	9/8/2013	N	7.51	11.3	10.076	8.68	3.8	2.4	6.24	0.036	0.245		3.8	3.6	3.5	7.22	7.22	23.1	23.1	7.08
Q3 2013	9/19/2013	N	17.3	20.1	11.262	9.06	4.5	2.3	6.56	0.202	0.71		3.9	3.5	3.6	7.31	7.31	20.1	20.1	9.33
Q4 2013	10/10/2013	N	6.73	14.9	12.48	10.3	4.6	2.4	7.52	0.36	0.72		4.2	3.8	3.8	7.27	7.27	17.5	17.5	9.75
Q4 2013	10/20/2013	N	17.4	25	15.34	14.7	6.1	5.5	8.55	0.69	1.5		5.3	5	4.5	7.13	7.13	18.5	18.5	7.42
Q4 2013	11/14/2013	N	11.2	23.8	21.4	18.7	6.6	3.9	13.6	1.2	3.21		7.6	7.2	6.2	7.11	7.11	16.5	16.5	9.2
Q4 2013	11/17/2013	N	13.2	13.9	21.1	19.3	6.6	4.8	13.1	1.4	4.54		7.1	6.8	6.2	7.08	7.08	14	14	9.4
Q4 2013	12/1/2013	N	7.58	8.49	21.167	20.9	0.35	0.07	20.8	0.017	0.1		6.4	6.5	5.8	6.98	6.98	13	13	7
Q4 2013	12/19/2013	N	8.65	19	25.2	24.1	3	1.9	21.2	1	3.12		5.2	4.8	4.4	7.04	7.04	10.5	10.5	5.5
Q1 2014	1/9/2014	N	10.1	10.7	26.7	24.3	4.1	1.7	20.8	1.8	2.1		5.5	5.1	4.7	6.86	6.86	12	12	9.9
Q1 2014	1/14/2014	Y	14.5	25.3	24.28	23.48	3.2	2.4	18.9	2.18	3.64		5.8	5.6	5	6.85	6.85	12	12	15
Q1 2014	1/26/2014	N	9.37	10.1	29.55	26.75	4.3	1.5	23.4	1.85	2.34		5.8	5.8	5.3	6.81	6.81	12.5	12.5	12.3
Q1 2014	2/4/2014	N	18.4	19.1	30.33	25.93	12	7.6	16	2.33	12		5.2	4.3	1.8	7.1	7.1	12	12	13.6
Q1 2014	2/9/2014	Y	11.1	20	29.5	27.8	5.8	4.1	21.8	1.9	5.46		5	4.7	4.4	6.86	6.86	13	13	10.7
Q1 2014	2/18/2014	N	10.3	11	28.02	26.35	2.2	0.53	23.9	1.92	2.08		4.9	4.7	4.4	6.73	6.73	13.5	13.5	7.2
Q1 2014	3/13/2014	N	9.71	10.9	21.3	21	2.9	2.6	16.6	1.8	2.79		3.6	3.7	3.6	6.93	6.93	15.5	15.5	9.8
Q1 2014	3/20/2014	N	13.7	26	20.195	19.88	0.67	0.35	19.3	0.225	0.52		3.7	3.4	3.6	6.79	6.79	17	17	10.6

Footnotes for Table

* Urea monitoring is only required for the five largest POTWs: CCCSD, EBDA, EBMUD, SF Southeast, SJSC

**Collect DRP sample as a grab or composite in accordance with your agency's Sample Analysis Plan

How to report non-detected (ND) /DNQ results

For NDs, i.e., <MDL, report MDL in the cell, insert a comment

For DNQ or J flagged value, report the estimated value, insert a comment

(Select the cell, right click the mouse, choose " insert comment", type "ND" or "DNQ" in the comment box)

Reference 7

City of Sunnyvale
Water Pollution Control Plant
Sodium Hypochlorite Disinfection Project

Technical Memorandum
Simultaneous Production of Recycled Water
Draft

July 2013

HDR

Technical Memorandum

Simultaneous Production of Recycled Water

City of Sunnyvale
Water Pollution Control Plant
Sodium Hypochlorite Disinfection Project

Draft

July 19, 2013

HDR
2365 Iron Point Road, Suite 300
Folsom, CA 95630

TM - SIMULTANEOUS PRODUCTION OF RECYCLED WATER

City of Sunnyvale ***Draft***
Water Pollution Control Plant ***July 19, 2013***
Sodium Hypochlorite Disinfection Project

Reviewed by: Dave Reardon, P.E.

Prepared by: Malar Perinpanayagam, P.E.

Background and Purpose

The City of Sunnyvale (City) Water Pollution Control Plant (WPCP) is currently using gaseous chlorine to disinfect wastewater and then sodium bisulfite to neutralize chlorine prior to Bay discharge. The City has decided to replace the gaseous chlorine system with sodium hypochlorite. The new sodium hypochlorite disinfection system will consist of hypochlorite storage tanks, metering pumps, induction units, and chemical piping to convey 12.5 percent hypochlorite solution to chlorine contact tanks (CCTs).

In conjunction with the hypochlorite disinfection project, the City is investigating the feasibility of simultaneous recycled water (RW) production and Bay discharge. The WPCP is producing approximately 5 millions of gallons per day (MGD) RW to fill offsite storage tank while meeting customers' demand in dry season, and 3 MGD RW as needed in wet season. Until 2005 the discharge requirement was targeted at total coliform 2.2, and all wastewater was treated to RW quality and then discharged to the outfall. In 2005 the discharge requirements were changed to total coliform 2.2 for RW and Enterococcus 35 for discharge to outfall. This change resulted in reduced chlorine dosage. Though the chlorine requirements are different for Bay discharge and RW production, same CCTs are being used in both processes. Therefore the plant operates in batch mode and uses two CCTs to produce RW.

In addition to the difference in chlorine dosages for Bay discharge and RW, the RW system requires reduction in water turbidity. Normal operation of the WPCP produces filtered water with turbidity higher than 2 NTU. To meet Title 22 requirement of 2 NTU or less, wastewater flow rate from oxidation ponds is reduced to 6 MGD and polymer dosage to dissolved air floatation tanks (DAFTs) is increased.

Currently, the operators alternate between Bay discharge and RW production daily. This process is inefficient and difficult to control. Moreover, the operation requires addition of chemicals to the

entire flow when RW is produced. The City is looking for feasible alternatives that would allow for simultaneous RW production.

Description of Alternatives

Two alternatives for concurrent RW production are described in the original contract:

1. Segregating one trickling filter, one DAFT, one filter cell, and one CCT to serve a separate RW treatment train.

2. Segregating one trickling filter, one DAFT, and one CCT; and adding a new filter better suited to separate RW treatment train.

Since segregating one trickling filter is not required for simultaneous RW production, another alternative was proposed at the kick-off meeting. This alternative, which is further described in this technical memorandum (TM) would segregate one DAFT, one filter basin, and one CCT, and would modify process piping as needed.

Process Description

The distribution structure for DAFs has two chambers: one chamber collects Trickling/attached growth filters effluent and distributes it to four DAFTs, and other chamber collects DAFT effluent and sends it to Filters. For the simultaneous RW production, DAFT No. 4 will be segregated, and the RW flow will be measured and controlled by installing a flowmeter and a control valve in the influent line. A new 12-inch connection to existing 30-inch influent line will divert the flow through a flowmeter and back to the existing line. DAFT No. 4 effluent pipe (30-inch) will be isolated from distribution structure, and a new 18-inch pipe will convey the flow to Filter No. 1. The remaining DAFTs effluent will be collected at the distribution structure and sent to Filters No. 2 through 4.

The existing filter influent pipe (48-inch) connects from DAFT distribution structure to filter influent channel closer to Filter No. 1. A separation wall will be constructed in the influent channel to isolate Filter No.1 influent from rest of the filters. The existing 48-inch influent will be rerouted to feed Filters No. 2 through 4. Filter No. 1 effluent will be isolated from rest of the filters effluent, and a new 24-inch pipe will convey filtered water from Filter No.1 to filtered water pump station.

Two out of five filtered water pumps will be segregated for RW production by constructing a wall in the pump station. CCT No. 1 will be used to disinfect RW flow. A new pipe will penetrate through CCT No. 1 to exit end to collect RW and will connect to the existing RW pipe. There will be no modification to backwash supply to Filter No. 1.

Figure 1 shows the process flow diagram for simultaneous RW production. See Attachment A for diagrams illustrating piping modification to concurrently produce RW.

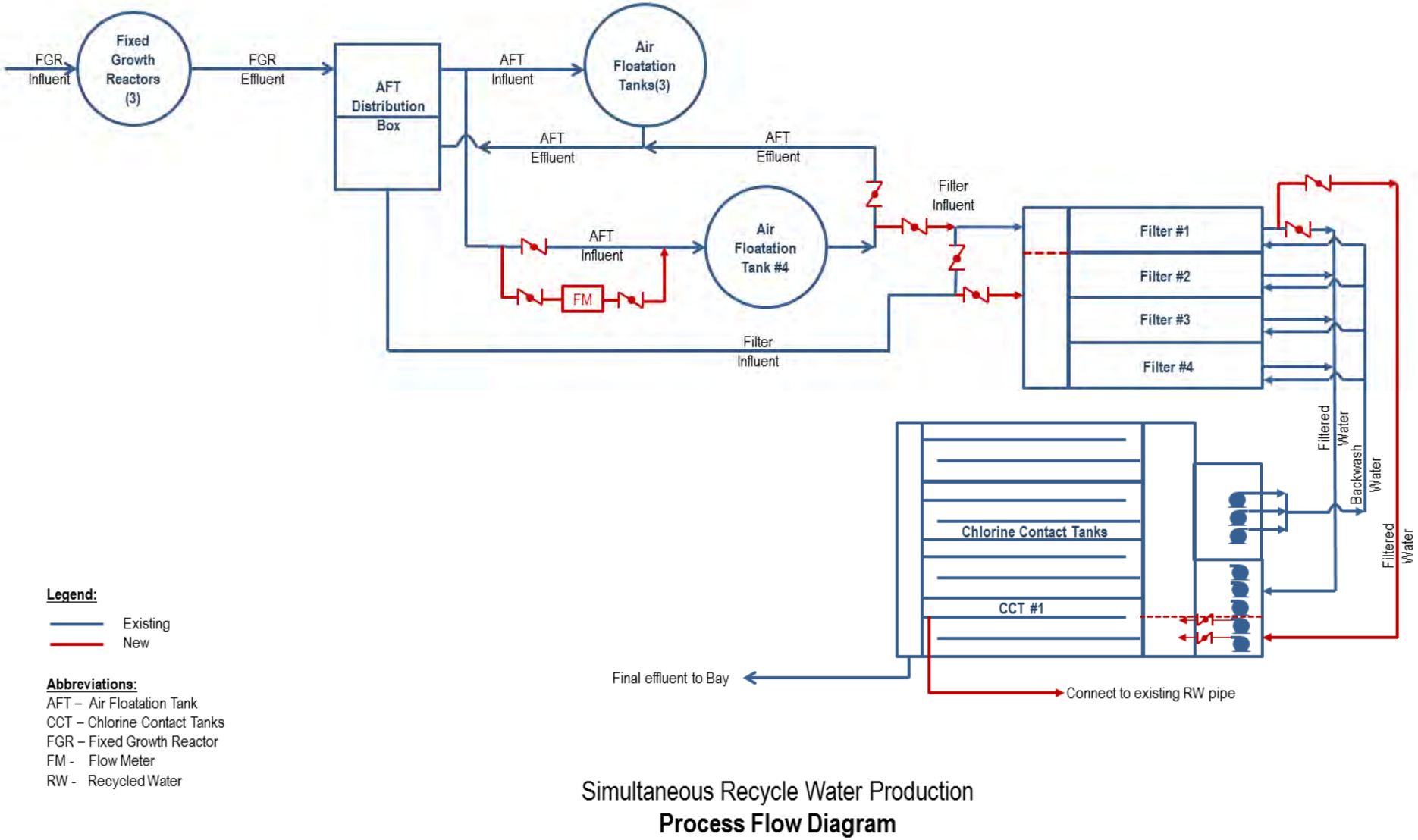


Figure 1. Process flow diagram for simultaneous RW production

Advantages:

1. Simultaneous RW production with no flow reduction from oxidation ponds.
2. Using existing facilities to create a separate train for simultaneous RW production.
3. Less expensive compared to a new treatment facility.
4. Possibly lower chemical costs than existing RW operation.

Disadvantages:

1. Complicated and disruptive modification of existing piping and processes.
2. Reduced operational flexibility and redundancy.
3. High cost. Isolating one filter cell is expensive. This will leave three filters for Bay discharge and take away the redundancy, flexibility, and additional capacity.
4. Backwash issues. No separate backwash system to RW producing filter which will be backwashed with non-Title 22 effluent. When the filter goes back to service, it may not produce good quality water for RW production. CDPH approval may be required to divert filter to waste flow to Bay discharge portion.
5. Increased flow to DAFTs. DAFTs No. 1 through 3 will receive increased flow during backwashing the Filter No.1 which is segregated for concurrent RW production.
6. Reduced redundancy. Using existing filtered water pump will reduce standby pumping capacity from the Bay discharge portion of the CCT pumping operation.
7. The City is expecting plant upgrade in near future. Modifying existing facilities for simultaneous RW production would not be practical.
8. Actual production of RW from only one filter cell is limited.
9. O&M complexity is not reduced.

Opinion of Probable Construction Cost. .

Table 1 provides the probable construction cost opinion by Construction Specifications Institute (CSI) Divisions 1 through 16 for simultaneous RW production by segregating one DAF, one filter, and one CCT. Detailed cost estimate is provided in Attachment B.

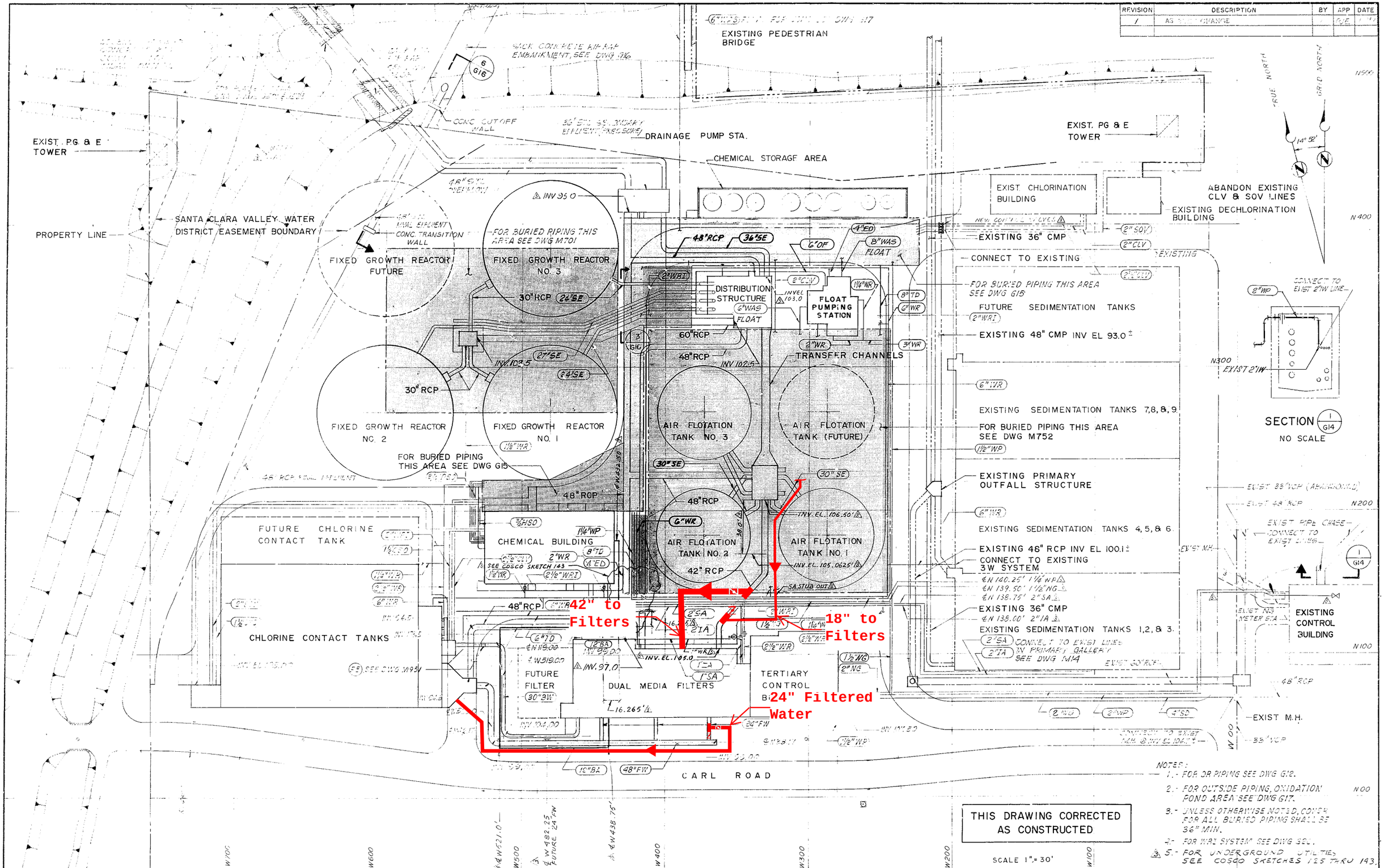
Table 1. Opinion of probable construction cost by CSI divisions

Division	Cost
Div 1 – General Requirements	$212,847
Div 2 – Site Work	$92,480
Div 3 – Concrete	$35,000
Div 5 – Metals	$7,500
Div 9 – Finishes	$5,000
Div 11 – Equipment	$75,000
Div 13 – Special Construction	$75,000
Div 15 – Mechanical	$1,024,000
Div 16 – Electrical	$105,000
Field Construction Cost	$1,631,827
Construction Contingency (30% of field construction cost)	$489,548
Estimated Construction Cost	$2,121,375
Contractor's Overhead and Profit (10% of estimated construction cost)	$212,138
Project Construction Cost (Rounded)	**$2,334,000**

Conclusion

This alternative to simultaneously produce RW was discussed with the City in consecutive progress meetings. Engineering cost estimate and diagrams were presented to the City on July 9, 2013. Due to the complexity and reduced operational flexibility, the City decided that this alternative is not viable and that further analysis and development are not necessary.

Attachment A



NOTES:
1.- FOR DR PIPING SEE DWG G12.
2.- FOR OUTSIDE PIPING, OXIDATION POND AREA SEE DWG G17.
3.- UNLESS OTHERWISE NOTED, COVER FOR ALL BURIED PIPING SHALL BE 36" MIN.
4.- FOR WRI SYSTEM SEE DWG G20.
5.- FOR UNDERGROUND UTILITIES SEE COSCO SKETCHES 125 THRU 143.

REVISION	DESCRIPTION	BY	APP	DATE
1	AS BUILT CHANGE			

DRAWN H.W. WEINGARTEN DESIGNED [signature] CHECKED [signature] SUBMITTED R.B. Chinn

APPROVED D.H. Caldwell JULY 1975 Date
APPROVED J.A. Cotterel Jr. JULY 1975 Date

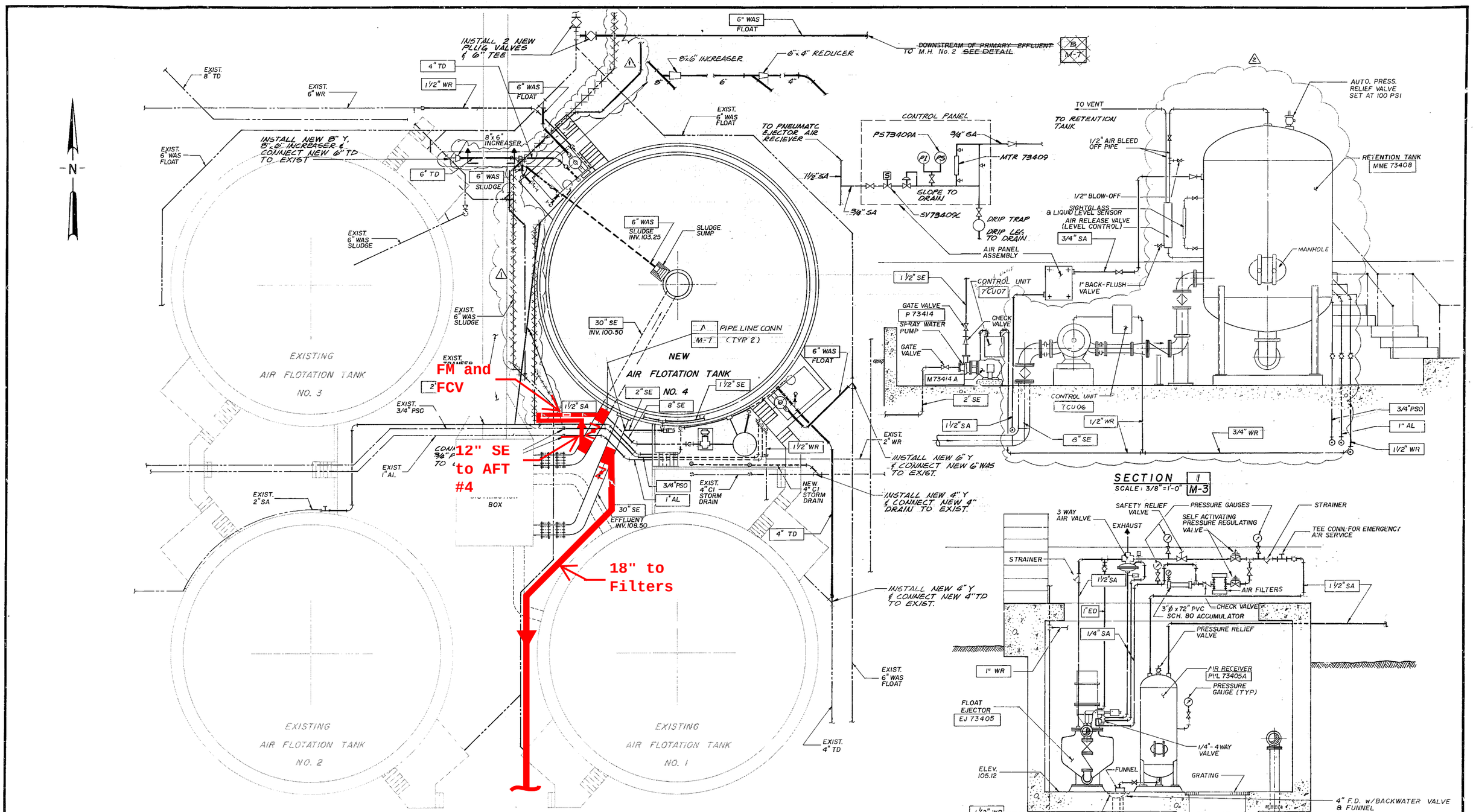
BROWN AND CALDWELL CONSULTING ENGINEERS WALNUT CREEK, CALIFORNIA PASADENA, CALIF. • EUGENE, ORE.

FILE F379J
DATE JULY 1975

CITY OF SUNNYVALE, CALIFORNIA
WATER POLLUTION CONTROL PLANT
TERTIARY FACILITIES

GENERAL
OUTSIDE PIPING PLAN
TERTIARY FACILITY AREA

SHEET NUMBER 14 OF 193
DRAWING NUMBER G14



AIR FLOTATION TANKS PLAN

SCALE: 3/32" = 1'-0"

SWANSON - OSWALD ASSOCIATES, INC.
FORMERLY CSO INTERNATIONAL, INC.
CIVIL, SANITARY & OCEAN ENGINEERING
594 HOWARD STREET · SAN FRANCISCO, CALIFORNIA 94105

CONFORMS TO RECORD DOCUMENTS
DATE: 4/85

REV	DATE	BY	DESCRIPTION
2	4-85	KB	REVISED PER CONTRACTOR'S NOTES
1	11/8/84	ELP	RECORD DWG

SCALE: AS SHOWN

DESIGNED S.O.A.
DRAWN S.L.S.
CHECKED L.E.S.

SUBMITTED
PROJECT ENGINEER — 30055 R.C.E. NO. — 4-15-82 DATE

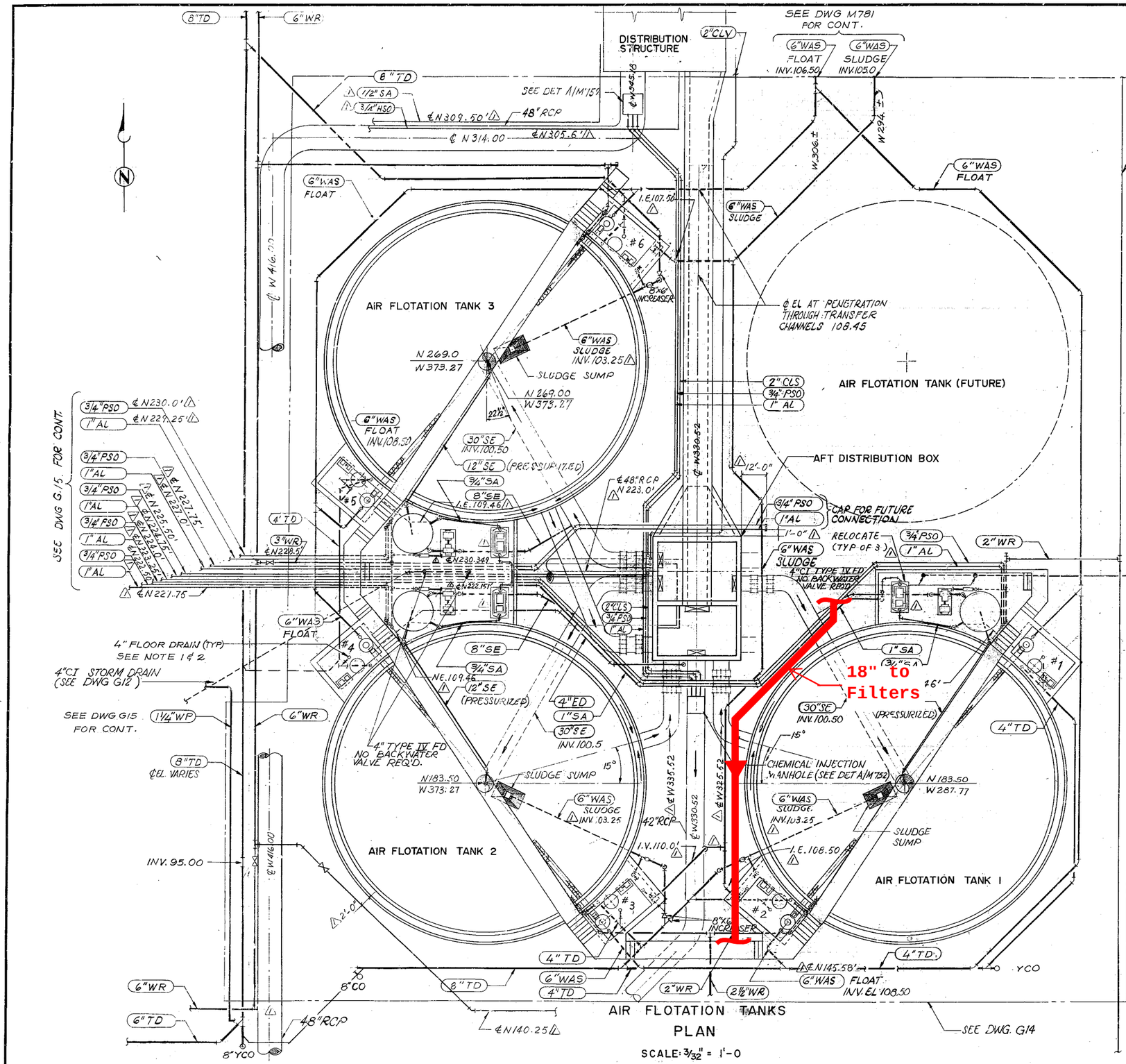
RECOMMENDED
JAMES M. MONTGOMERY CONSULTING ENGINEERS, INC. — 20179 R.C.E. NO. — 4-15-82 DATE

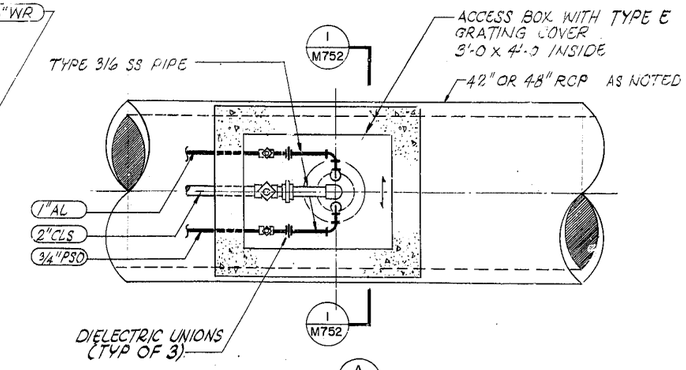
JAMES M. MONTGOMERY CONSULTING ENGINEERS, INC.
2255 YGNACIO VALLEY ROAD, WALNUT CREEK, CALIFORNIA 94598

APPROVED — DATE
APPROVED — DATE

CITY OF SUNNYVALE, CALIFORNIA
WPCP CAPACITY EXPANSION AND PROCESS IMPROVEMENTS - CONTRACT C-1
AIR FLOTATION TANK NO. 4 - OUTSIDE PIPING PLAN AND DETAILS

SHEET M-2 OF SHEETS



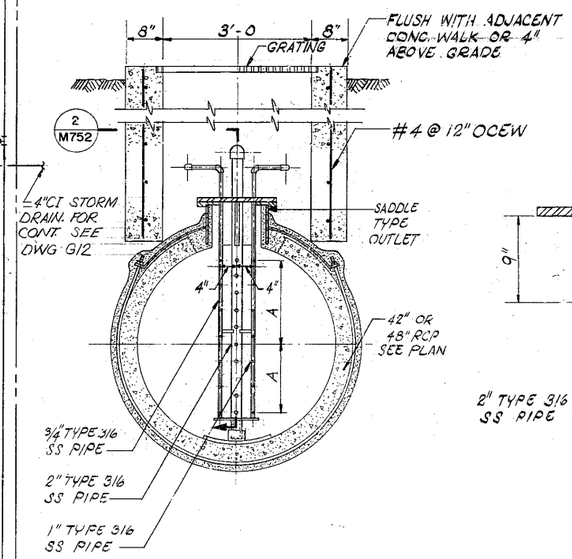


DETAIL A/M752

SCALE: 1/2" = 1'-0

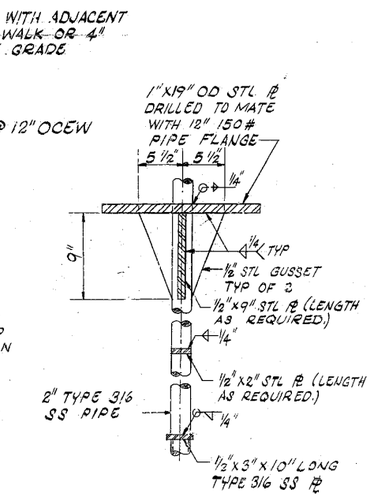
RCP PIPE SIZE	DIM. "A"	PIPING SYSTEM	ORIFICE DIA.	NUMBER OF *ORIFICES
42"	14"	AL	1/8"	6
48"	16"	AL	1/8"	6
42"	14"	CLS	5/16"	9
48"	16"	CLS	5/16"	9
42"	14"	PSO	1/8"	6
48"	16"	PSO	1/8"	6

*SPACE ORIFICES EQUALLY ABOUT ℄ OF RCP



SECTION 1/M752

NOT TO SCALE



SECTION 2/M752

NOT TO SCALE

THIS DRAWING CORRECTED AS CONSTRUCTED

NOTES:

1. FLOOR DRAINS IN THIS AREA SHALL BE TYPE VI EQUIPPED WITH BACKWATER CHECKVALVES UNLESS OTHERWISE NOTED.
2. DRAINS AT SLUDGE SAMPLERS OR WHERE NOTED BE FITTED WITH FUNNELS 9" LONG x 3 1/2" WIDE x 3 3/4" HIGH.
3. ALL WALL FLANGES SHALL BE TANGENT TO FLOTATION TANK WALLS.

REVISION	DESCRIPTION	BY	APP	DATE
1	AS BUILT CHANGE	LMY	PJE	7-16-79

DRAWN CESAR RAMIN | DESIGNED John T Boulz | APPROVED D.H. Caldwell | JULY 1975 Date
CHECKED JTP | SUBMITTED Richard B. Chinn | APPROVED J. A. Cittal Jr. | JULY 1975 Date

BROWN AND CALDWELL
CONSULTING ENGINEERS
WALNUT CREEK, CALIFORNIA
PASADENA, CALIF. " EUGENE, ORE.

FILE F379J
DATE JULY, 1975

CITY OF SUNNYVALE, CALIFORNIA
WATER POLLUTION CONTROL PLANT
TERTIARY FACILITIES

AIR FLOTATION TANKS
OUTSIDE PIPING PLAN

SHEET NUMBER 116 OF 193
DRAWING NUMBER M752

PRINTED ON DIEPO NO. 1026 CLEARPRINT

REVISION	DESCRIPTION	BY	APP	DATE
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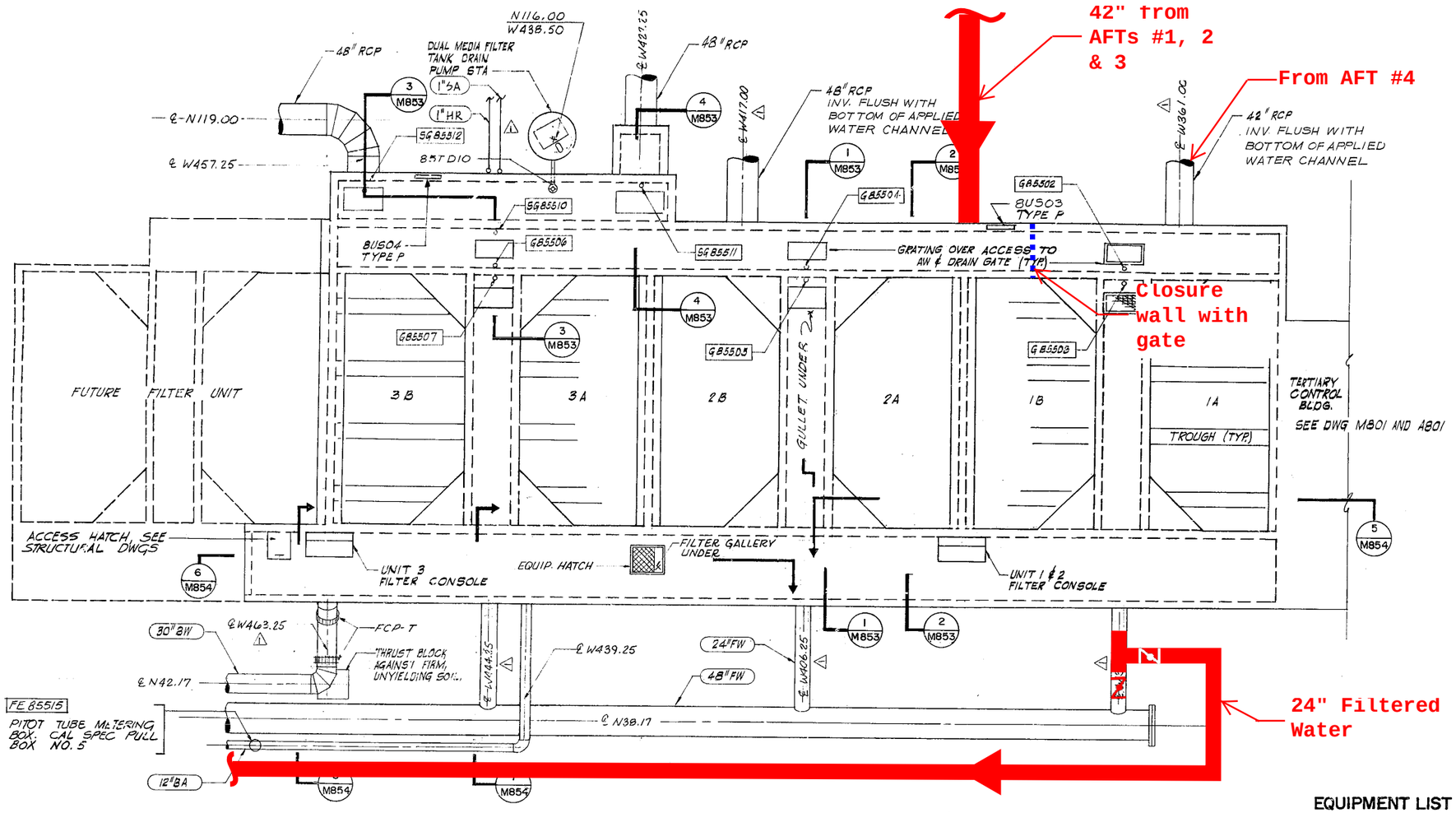

NOTE:
BURIED PIPING SHOWN WITH UNBROKEN LINE WORK FOR ADDED CLARITY. SEE STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR CANOPY, RAILING GRATES AND DIMENSIONS ON CONCRETE WORK.

TOP PLAN

NO SCALE

THIS DRAWING CORRECTED AS CONSTRUCTED

EQUIPMENT LIST

CV	85101	FLOW RATE CONTROL VALVE 1A
FE	85101A	FLOW ELEMENT
MME	85101B	D/P CELL
CV	85102	FLOW RATE CONTROL VALVE 1B
FE	85102A	FLOW ELEMENT
MME	85102B	D/P CELL
MTR	85103	DMF TURBIDIMETER 1
CV	85104	BW CONTROL VALVE 1A
POP	85104A	PNEUMATIC OPERATOR
SV	85104B	SOLENOID VALVE
CV	85105	BW CONTROL VALVE 1B
POP	85105A	PNEUMATIC OPERATOR
SV	85105B	SOLENOID VALVE
CV	85106	BA CONTROL VALVE 1A
POP	85106A	PNEUMATIC OPERATOR
SV	85106B	SOLENOID VALVE
CV	85107	BA CONTROL VALVE 1B
POP	85107A	PNEUMATIC OPERATOR
SV	85107B	SOLENOID VALVE
CV	85201	FLOW RATE CONTROL VALVE 2A
FE	85201A	FLOW ELEMENT
MME	85201B	D/P CELL
CV	85202	FLOW RATE CONTROL VALVE 2B
FE	85202A	FLOW ELEMENT
MME	35202B	D/P CELL
MTR	85203	DMF TURBIDIMETER 2

CV	85204	BW CONTROL VALVE 2A
POP	85204A	PNEUMATIC OPERATOR
SV	85204B	SOLENOID VALVE
CV	85205	BW CONTROL VALVE 2B
POP	85205A	PNEUMATIC OPERATOR
SV	85205B	SOLENOID VALVE
CV	85206	BA CONTROL VALVE 2A
POP	85206A	PNEUMATIC OPERATOR
SV	85206B	SOLENOID VALVE
CV	85207	BA CONTROL VALVE 2B
POP	85207A	PNEUMATIC OPERATOR
SV	85207B	SOLENOID VALVE
CV	85301	FLOW RATE CONTROL VALVE 3A
FE	85301A	FLOW ELEMENT
MME	85301B	D/P CELL
CV	85302	FLOW RATE CONTROL VALVE 3B
FE	85302A	FLOW ELEMENT
MME	85302B	D/P CELL
MTR	85303	DMF TURBIDIMETER 3
CV	85304	BW CONTROL VALVE 3A
POP	85304A	PNEUMATIC OPERATOR
SV	85304B	SOLENOID VALVE
CV	85305	BW CONTROL VALVE 3B
POP	85305A	PNEUMATIC OPERATOR
SV	85305B	SOLENOID VALVE
CV	85306	BA CONTROL VALVE 3A
POP	85306A	PNEUMATIC OPERATOR
SV	85306B	SOLENOID VALVE

CV	85307	BA CONTROL VALVE 3B
POP	85307A	PNEUMATIC OPERATOR
SV	85307B	SOLENOID VALVE
G	85502	APPLIED WATER SLUICE GATE 1
MOP	85502A	ELECTRIC ROTORK OPERATOR
G	85503	DRAIN GATE 1
MOP	85503A	ELECTRIC ROTORK OPERATOR
G	85504	APPLIED WATER SLUICE GATE 2
MOP	85504A	ELECTRIC ROTORK OPERATOR
G	85505	DRAIN GATE 2
MOP	85505A	ELECTRIC ROTORK OPERATOR
G	85506	APPLIED WATER SLUICE GATE 3
MOP	85506A	ELECTRIC ROTORK OPERATOR
G	85507	DRAIN GATE 3
MOP	85507A	ELECTRIC ROTORK OPERATOR
SG	85510	APPLIED WATER DRAIN GATE
SG	85511	OVERFLOW BOX DRAIN GATE
SG	85512	FILTER BYPASS GATE
P	85513	DMF SUMP PUMP 1
P	85514	DMF SUMP PUMP 2
FE	85515	BA FLOW ELEMENT
FLP	85601	FLUID POWER UNIT
UH	85602	UNIT HEATER 1
UH	85603	UNIT HEATER 2
EF	85604	EXHAUST FAN

DRAWN R.S. LEONARDO	DESIGNED	APPROVED D.S. Caldwell	JULY 1975 Date	BROWN AND CALDWELL CONSULTING ENGINEERS WALNUT CREEK, CALIFORNIA PASADENA, CALIF. • EUGENE, ORE.	FILE F 379 J	CITY OF SUNNYVALE, CALIFORNIA WATER POLLUTION CONTROL PLANT TERTIARY FACILITIES	DUAL MEDIA FILTERS PLAN AND EQUIPMENT LIST	SHEET NUMBER 134 OF 193	DRAWING NUMBER M851
CHECKED H.G.A.	SUBMITTED Richard B. Chinn	APPROVED J.A. Cooper Jr.	JULY 1975 Date		DATE JULY 1975				

PRINTED ON DIEPO NO. 1020 CLEARPRINT

REVISION	DESCRIPTION	BY	APP	DATE
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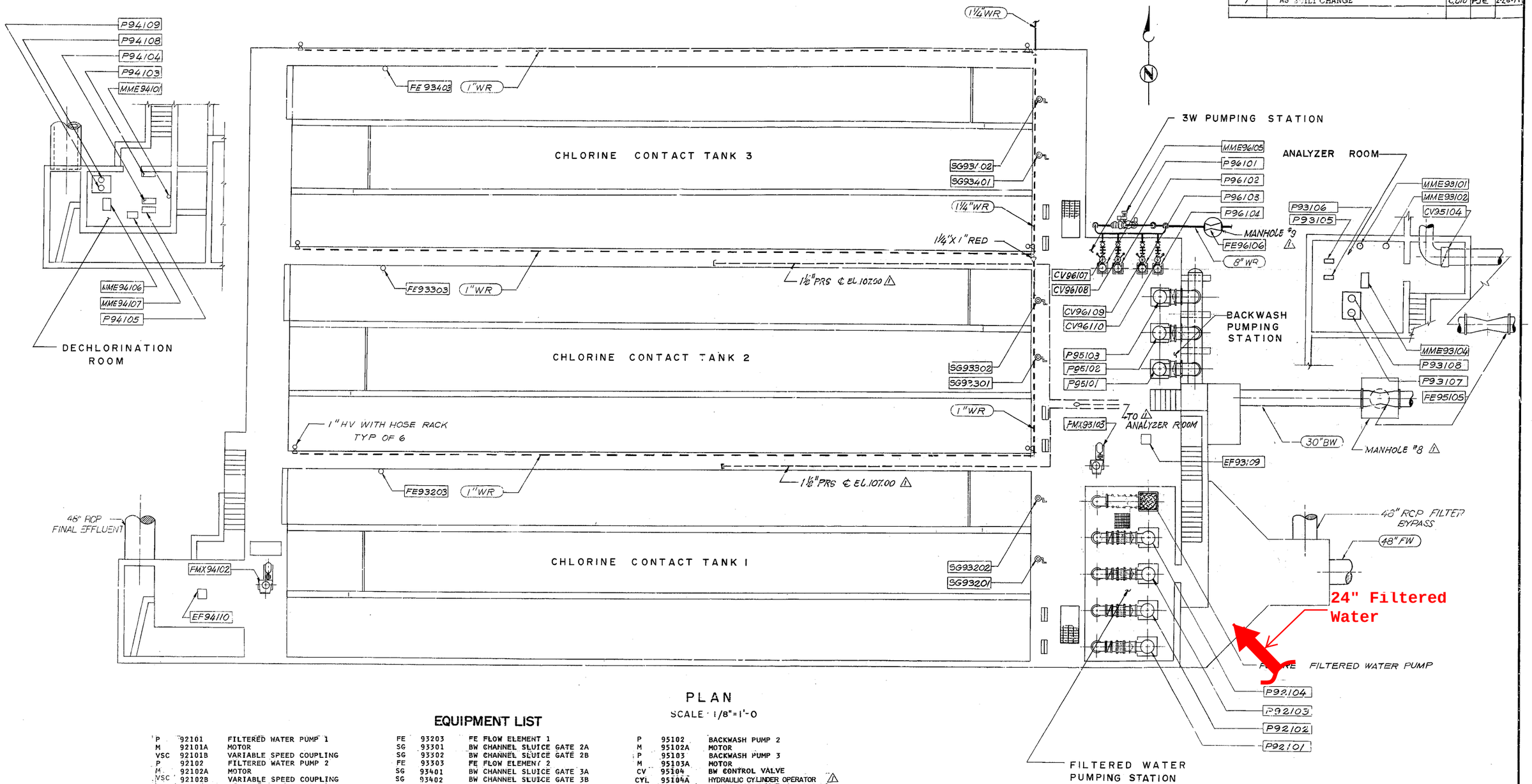

PLAN

SCALE: 1/8"=1'-0

EQUIPMENT LIST

	P 92101	FILTERED WATER PUMP 1
	M 92101A	MOTOR
	VSC 92101B	VARIABLE SPEED COUPLING
	P 92102	FILTERED WATER PUMP 2
	M 92102A	MOTOR
	VSC 92102B	VARIABLE SPEED COUPLING
	P 92103	FILTERED WATER PUMP 3
	M 92103A	MOTOR
	P 92104	FILTERED WATER PUMP 4
	M 92104A	MOTOR
*	MME 93101	POSTCHLORINATION INJECTOR 1
	MTR 93101A	ROTAMETER WITH ORIFICE PLATE
*	MME 93102	POSTCHLORINATION INJECTOR 2
	MTR 93102A	ROTAMETER WITH ORIFICE PLATE
	FMX 93103	CHLORINE FLASH MIXER
	MME 93104	CHLORINE RESIDUAL ANALYZER
	P 93105	CHLORINATED FW SAMPLE PUMP 1
	P 93106	CHLORINATED FW SAMPLE PUMP 2
	P 93107	CHLORINE ANAL RM SUMP PUMP 1
	P 93108	CHLORINE ANAL RM SUMP PUMP 2
	EF 93109	EXHAUST FAN
	SG 93201	BW CHANNEL SLUICE GATE 1A
	SG 93202	BW CHANNEL SLUICE GATE 1B

	FE 93203	FE FLOW ELEMENT 1
	SG 93301	BW CHANNEL SLUICE GATE 2A
	SG 93302	BW CHANNEL SLUICE GATE 2B
	FE 93303	FE FLOW ELEMENT 2
	SG 93401	BW CHANNEL SLUICE GATE 3A
	SG 93402	BW CHANNEL SLUICE GATE 3B
	FE 93403	FE FLOW ELEMENT 3
*	MME 94101	SULFUR DIOXIDE INJECTOR
	MTR 94101A	ROTAMETER WITH ORIFICE PLATE
	FMX 94102	SO_2 FLASH MIXER
	P 94103	DECHLORINATION SAMPLE PUMP
	P 94104	FINAL EFFLUENT SAMPLE PUMP 1
	P 94105	FINAL EFFLUENT SAMPLE PUMP 2
	MME 94106	CL_2 RESIDUAL ANALYZER
	MME 94107	FINAL EFFLUENT SAMPLER
	P 94108	DECHLOR ROOM SUMP PUMP 1
	P 94109	DECHLOR ROOM SUMP PUMP 2
	EF 94110	EXHAUST FAN
	SV 94111	SOLENOID VALVE
	SV 94112	SOLENOID VALVE
	P 95101	BACKWASH PUMP 1
	M 95101A	MOTOR

	P 95102	BACKWASH PUMP 2
	M 95102A	MOTOR
	P 95103	BACKWASH PUMP 3
	M 95103A	MOTOR
	CV 95104	BW CONTROL VALVE
	CYL 95104A	HYDRAULIC CYLINDER OPERATOR ⚠
	FE 95105	BW FLOW ELEMENT
	MME 95105A	D/P CELL
	P 96101	3W PUMP 1
	M 96101A	MOTOR
	P 96102	3W PUMP 2
	M 96102A	MOTOR
	P 96103	3W PUMP 3
	M 96103A	MOTOR
	P 96104	3W PUMP 4
	M 96104A	MOTOR
	MME 96105	3W MOTORIZED STRAINER
	FE 96106	3W FLOW ELEMENT
	CV 96107	3W PUMP 1 CONTROL VALVE
	SV 96107A	SOLENOID VALVE
	CV 96108	3W PUMP 2 CONTROL VALVE
	SV 96108A	SOLENOID VALVE
	CV 96109	3W PUMP 3 CONTROL VALVE
	SV 96109A	SOLENOID VALVE
	CV 96110	3W PUMP 4 CONTROL VALVE
	SV 96110A	SOLENOID VALVE

* FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.

THIS DRAWING CORRECTED AS CONSTRUCTED

DRAWN D KO	DESIGNED Carson O. Pierce	APPROVED D. H. Caldwell	JULY 1975 Date	BROWN AND CALDWELL CONSULTING ENGINEERS WALNUT CREEK, CALIFORNIA PASADENA, CALIF. • EUGENE, ORE.	FILE F379J	CITY OF SUNNYVALE, CALIFORNIA WATER POLLUTION CONTROL PLANT TERTIARY FACILITIES	CHLORINE CONTACT TANKS GENERAL PLAN AND EQUIPMENT LIST	SHEET NUMBER 148 OF 193	DRAWING NUMBER M951
CHECKED R.A. Pierce	SUBMITTED Richard B. Chin	APPROVED Jack Cartwright Jr.	JULY 1975 Date		DATE JULY 1975				

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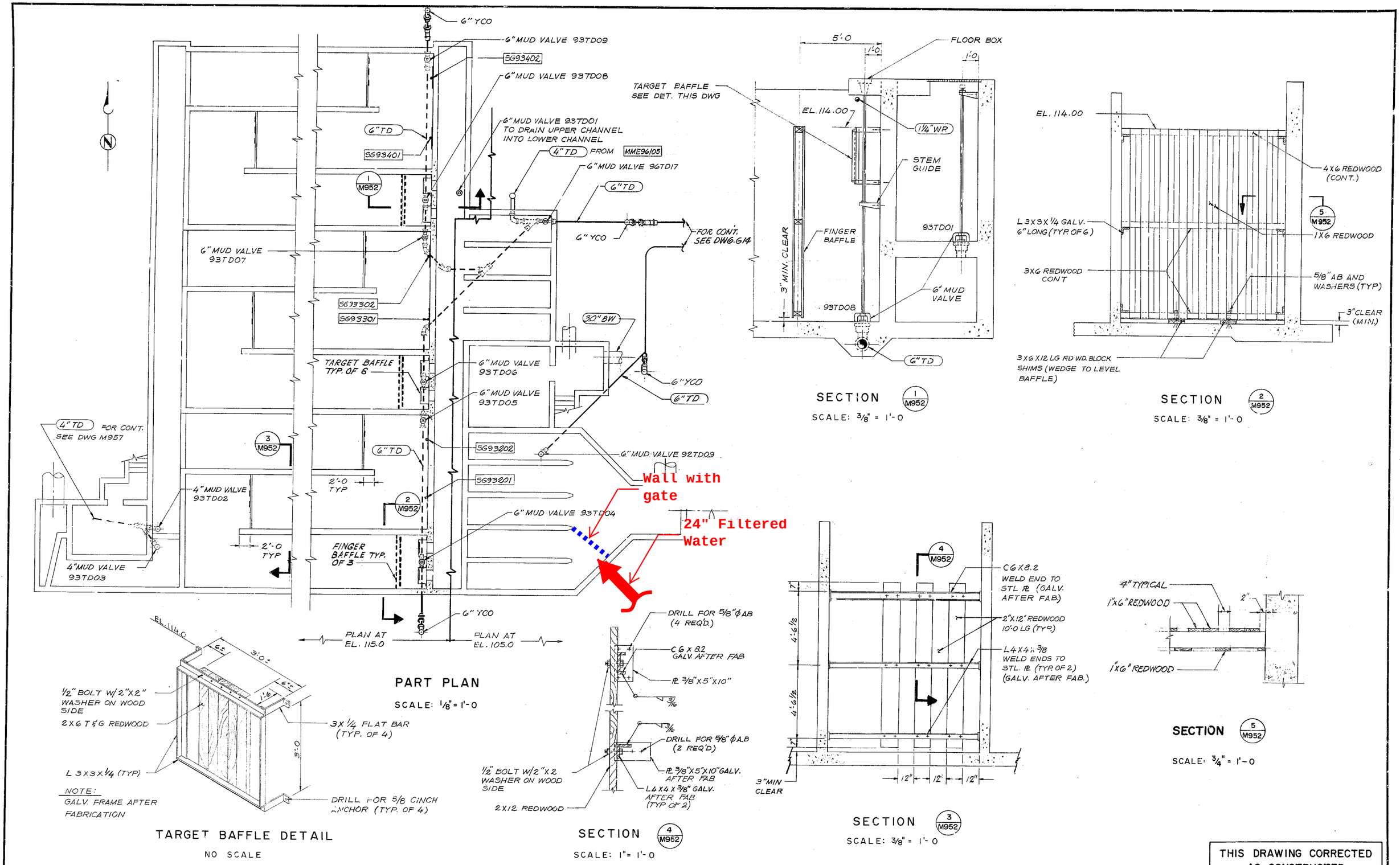

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DRAWN S. marcelo CHECKED R.A. Pierce	DESIGNED [signature] SUBMITTED Richard B. Chinn	APPROVED D.H. Caldwell JULY 1975 Date APPROVED J.A. Cottrell JULY 1975 Date	BROWN AND CALDWELL CONSULTING ENGINEERS WALNUT CREEK, CALIFORNIA PASADENA, CALIF. • EUGENE, ORE.	FILE F379J DATE JULY 1975	CITY OF SUNNYVALE, CALIFORNIA WATER POLLUTION CONTROL PLANT TERTIARY FACILITIES	CHLORINE CONTACT TANKS CONTACT TANKS PART PLAN, SECTIONS AND DETAILS	SHEET NUMBER 149 OF 193 / DRAWING NUMBER M952

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REVISION	DESCRIPTION	BY	APP	DATE
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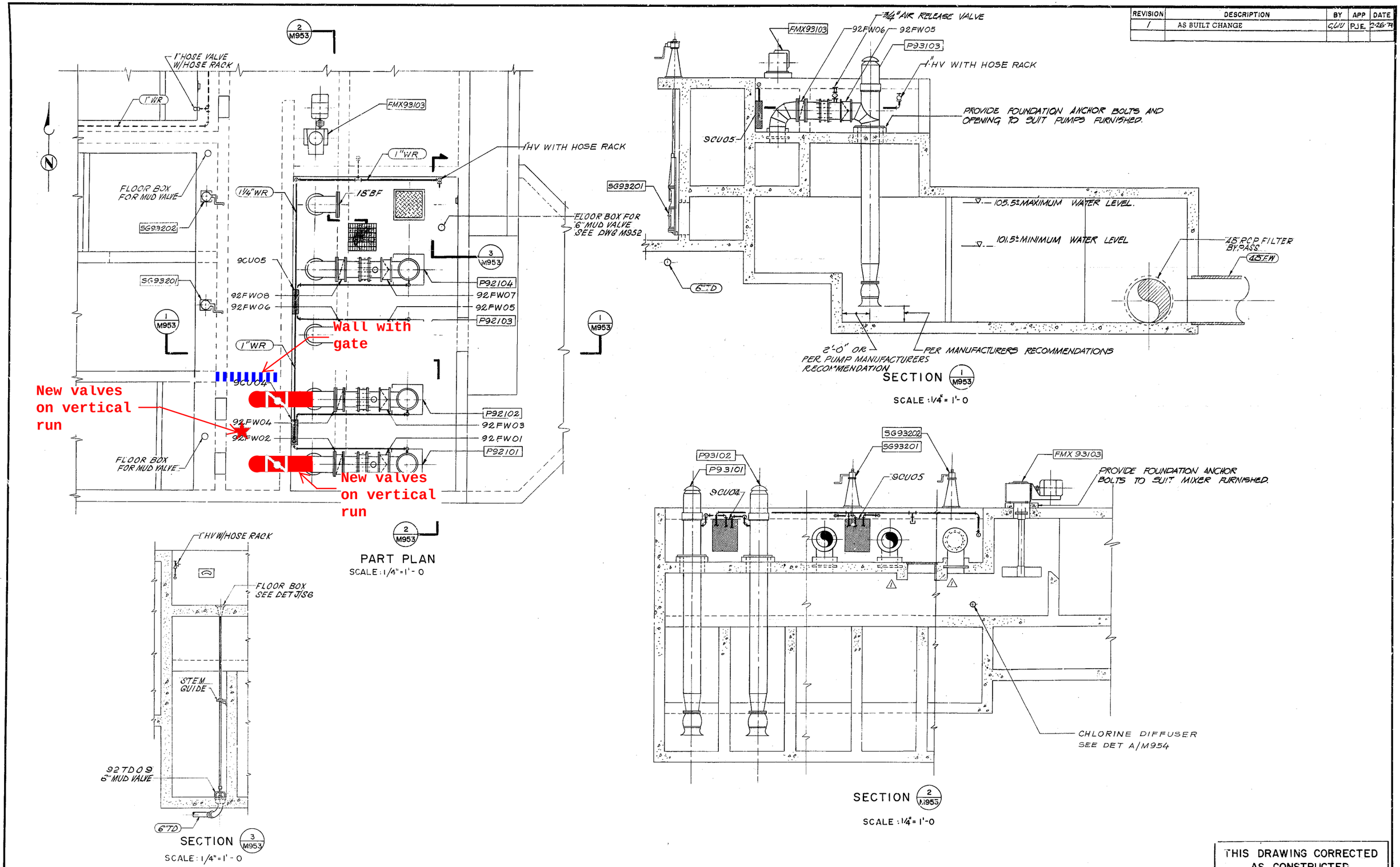

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Attachment B

Job No.			Calc. No.	
Computation				
Project:	Sodium Hypochlorite Disinfection Project at the Water Pollution Control Plant			
Subject:	SimultaneousProduction of Recycled Water		***Prepared By:***	Malar P., PE
Task:	Opinion of Probable Construction Cost - Concept Feasibility Study		***Reviewed by:***	Dave Reardon, P.E.
File Name:			***Date:***	7/19/2013

DESCRIPTION	QUANTITY	UNITS	UNIT COST	TOTAL COST
DIVISION 01 - GENERAL REQUIREMENTS				
Mobilization, Insurance, and Bonds (5% of Construction Subtotal)	1	LS	$70,949	$70,949
General Conditions, Bidding (10% of Construction Subtotal)	1	LS	$141,898	$141,898
SUBTOTAL				**$212,847**
DIVISION 02 - SITE WORK				
Structural Excavation	27	LS		$2,500
Non-trench Shoring (15 feet deep)	1,200	SF	$10	$12,000
Utilities Relocation	1	LS	$50,000	$50,000
Misc Civil Site Work	1	LS	$20,000	$20,000
AC Pavement Remove/Replace	1,140	SF	$7	$7,980
SUBTOTAL				**$92,480**
DIVISION 03 - CONCRETE				
Control Valve Vault	6	CY	$2,000	$11,000
Channel Closure Walls	6	CY	$4,000	$24,000
18" Concrete Wall Pipe Penetrations (passing through)	2	EA	$2,500	$5,000
Temporary Bulkheads for Closure Wall Construction	3	EA	$15,000	$45,000
SUBTOTAL				**$35,000**
DIVISION 05 - METALS				
Miscellaneous Metals	1	LS	$7,500	$7,500
SUBTOTAL				**$7,500**
DIVISION 09 - FINISHES				
Industrial Coatings				
Paint Exposed Piping	1	LS	$5,000	$5,000
SUBTOTAL				**$5,000**
DIVISION 11 - EQUIPMENT				
Chlorine Induction Unit	1	EA	$35,000	$35,000
Metering Pump Skid	1	EA	$40,000	$40,000
SUBTOTAL				**$75,000**
DIVISION 13 - SPECIAL CONSTRUCTION				
16" Magnetic Flow Meter	1	EA	$40,000	$40,000
PLC Control Panel Modifications/PLC Programming/SCADA screens	1	LS	$35,000	$35,000
SUBTOTAL				**$75,000**
DIVISION 15 - MECHANICAL				
Pipe				
18" Buried Pipe (8 to 10 ' deep)	400	LF	$270	$108,000
30" Buried Pipe (10' deep)	40	LF	$500	$20,000
Valves				
18" BF Valve with electric acuator (in vault)	1	EA	$35,000	$35,000
18" BF Isolation Valves with handwheel	6	EA	$15,000	$90,000
18" buried BF Valves with electric acuator	2	EA	$35,000	$70,000
18" buried BF Valves with manual square nut riser	2	EA	$14,500	$29,000
30" Buried BF Valve with electric acuator	1	EA	$50,000	$50,000
30" Buried BF Valve with manual square nut riser	3	EA	$30,000	$90,000
Gates				
2' Square Cast Iron Sluice Gate with pedistal	3	EA	$25,000	$75,000
Special Piping Connections				
18" Fitting Connections to 30 inch Concrete Cylinder Pipe (Buried)	3	EA	$60,000	$180,000
18" Fitting Connections to 42" Reinforced Cylinder Pipe (Buried)	1	EA	$70,000	$70,000
42" Fitting Connections to 42" Reinforced Cylinder Pipe (Buried)	1	EA	$75,000	$75,000
Piping Connections to Structures				
18" Pipe Connection to CCT Structure (Buried)	1	EA	$25,000	$25,000
30" Pipe Connection to Filter Structure (Buried)	1	EA	$35,000	$35,000
Fittings				
18" 45 Degree Fitting (Buried)	2	EA	$3,000	$6,000
18" 90 Degree Fitting (Buried)	8	EA	$3,500	$28,000
18" Tee Fitting Connection (Buried)	2	EA	$4,500	$9,000
18" Tee Fitting (Exposed)	2	EA	$4,500	$9,000
42" 90 Degree Fitting (Buried)	1	EA	$20,000	$20,000
SUBTOTAL				**$1,024,000**

DESCRIPTION	QUANTITY	UNITS	UNIT COST	TOTAL COST
DIVISION 16 - ELECTRICAL				
Electrical/Intrumentation	1	LS	$105,000	$105,000
SUBTOTAL				**$105,000**
	Construction Subtotal (Div 2 - Div 16)			**$1,418,980**
	Field Construction Cost (Div 1 - Div 16)			**$1,631,827**
	Construction Contingency (30%)			**$489,548**
		Estimated Construction Cost		**$2,121,375**
Contractors Overhead and Profit (10% of Estimate Construction Cost)				**$212,138**
Opinion of Project Construction Costs (rounded)				**$2,334,000**

HDR
2365 Iron Point Road
Suite 300
Folsom, CA 95630

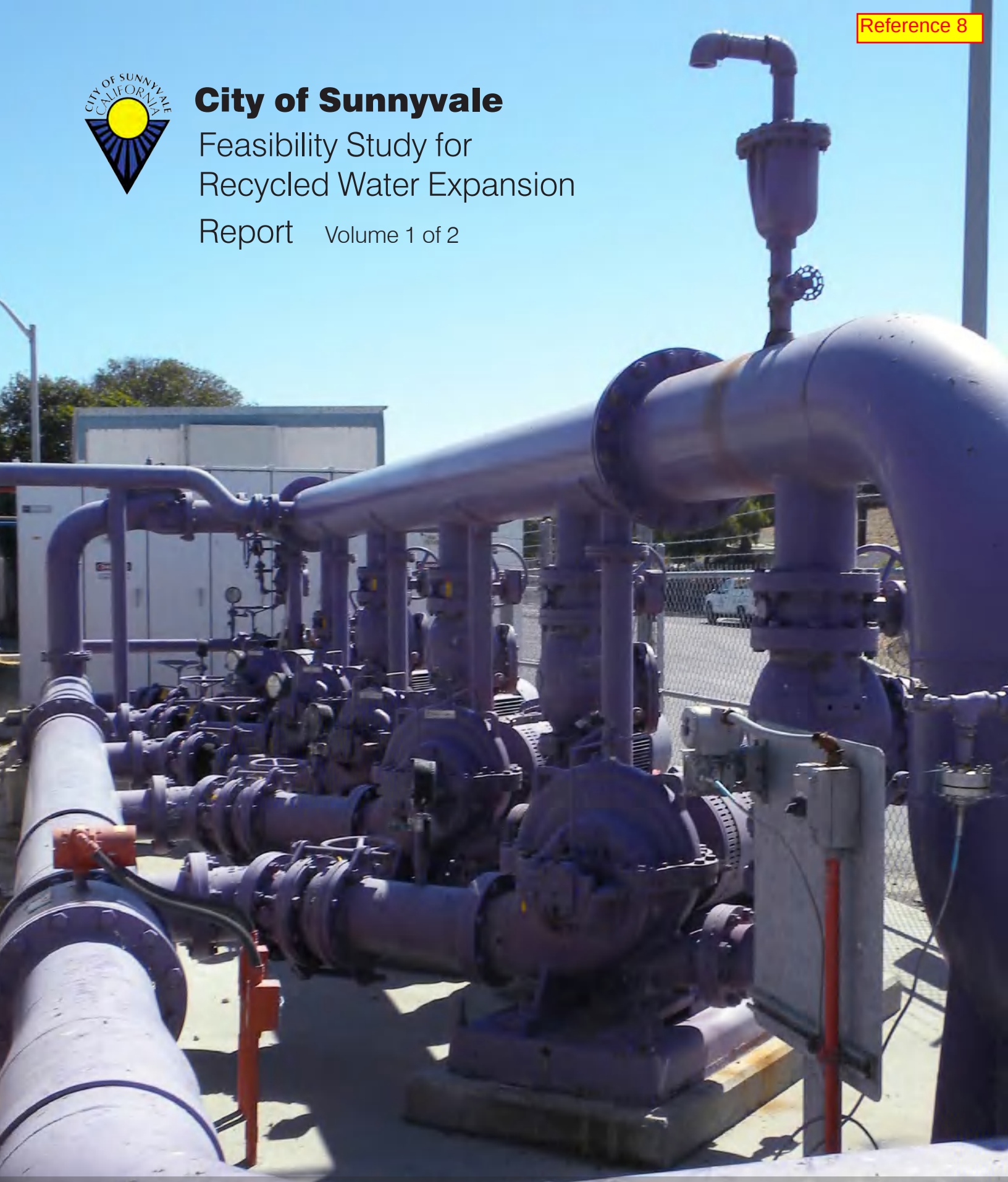
www.hdrinc.com

Reference 8

City of Sunnyvale

Feasibility Study for Recycled Water Expansion Report

Volume 1 of 2



June 2013

HydroScience

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City of Sunnyvale

Feasibility Study for Recycled Water Expansion Report Volume 1 of 2

June 2013

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ES.2 Existing Recycled Water Supply and System

The City has developed a recycled water program, which today serves parks, golf courses, and the landscaping needs of diverse industries. A wastewater reclamation program was developed in 1991 when the City first identified short-term goals of recycling 20% to 30% of effluent from the Sunnyvale WPCP. The long-term goal of the City is to reuse 100% of all wastewater (15 MGD) generated from the WPCP to reduce or eliminate discharges to the South San Francisco Bay, as stated in the 2000 RWMP. This goal, if attained, would involve the export of recycled water outside the City limits in addition to serving recycled water customers within the City limits.

The recycled water system consists of the WPCP pump station, the San Lucar tank and pump station, the Sunnyvale Golf Course pump station, and approximately 18 miles of recycled water pipelines ranging in diameter from 6- to 36-inches. The recycled water infrastructure is a network of pipelines running along the primary roadway arteries within the northern section of Sunnyvale as well as Moffett Park Specific Plan area providing irrigation water to 120 services including industrial customers Lockheed-Martin and Yahoo. Other major customers include the Sunnyvale Golf Course, Baylands Park, and the Twin Creeks Sports Complex. Together, typical annual recycled water demands for these existing customers total approximately 1,062 AFY. Each pump station is described below:

WPCP Pump Station: The WPCP pump station is located adjacent to the WPCP's chlorine contact tanks (CCTs) and consists of six pumps with a rated firm capacity of 3,750 gpm with the largest pump out-of-service. Theses pumps currently feed the San Lucar Tank.

- **San Lucar Tank and Pump Station:** The San Lucar site is home to a 2.0 MG storage tank. This storage is comprised of a 1.5 MG recycled water storage tank and a 0.5 MG surge tank. The storage tank was built in 2000 to increase the reliability and capacity of the City to deliver recycled water. Recycled water stored in this tank is pumped into the recycled water distribution system. The pump station consists of five pumps capable of delivering 5,500 gpm with the largest pump out-of-service.
- **Sunnyvale Golf Course Pump Station:** This pump station consists of two variable speed pumps with a rated firm capacity of 1,800 gpm with the largest pump out-of-service. This pump station serves the Sunnyvale Golf Course.

Figure ES1-2 presents the location of the Sunnyvale WPCP, the existing recycled water distribution system, and the existing recycled water use area. The recycled water supply has some water quality concerns regarding total dissolved solids and color. These concerns are discussed in the follow.

ES.3 Existing Wastewater Treatment and Recycled Water Production

The City treats its wastewater and produces recycled water at the Sunnyvale Water Pollution Control Plant (WPCP) located at 1444 Borregas Avenue. The WPCP is permitted for an average dry weather flow capacity of 29.5 MGD with a 40 MGD peak wet weather flow capacity; though current influent flows to the plant average approximately 15 MGD. The WPCP receives wastewater from the sanitary sewer collection system, which must be treated before it can be discharged to the Bay. The amount of influent wastewater handled by the WPCP varies with the time of day and with the seasonal changes in demand.

Table 11-1: Proposed Distribution System Alignments, Ranks, and Phases [1]

Alignment	Demand (AFY)	Total Project Cost [2]	Rank ($/AFY)	Priority (A, B, or C) [3]
Phase 1				
Wolfe Road Main	345	$7,239,000	10	A
Iris Avenue	55	$634,000	3	B
Dartshire Way	65	$1,369,000	9	B
Marion Way	30	$648,000	11	B
Phase 1 Totals	**495**	**$9,890,000**		
Phase 2				
Infill Sites	335	$2,675,000	2	B
Duane Avenue	429	$5,621,000	4	B
Phase 2 Totals	**764**	**$8,296,000**		
Phase 3				
Kifer Road West	54	$781,000	5	B
Lakehaven Drive	86	$1,406,000	7	B
Kifer Road East	51	$1,332,000	13	C
Maude Avenue	36	$1,362,000	15	C
Phase 3 Totals	**227**	**$4,881,000**		
Phase 4				
Main Loop	335	$15,914,000	17	A
Manet Drive	86	$445,000	1	B
Gail Avenue	39	$578,000	6	B
Old San Francisco Road	26	$450,000	8	B
Carson Drive	16	$370,000	12	C
Remington Drive	59	$1,751,000	14	C
Sunnyvale-Saratoga Road	14	$595,000	16	C
Phase 4 Totals	**575**	**$20,103,000**		

Notes:
1. Data originally presented as **Table 9-3** in **Section 9.5**.
2. Total project cost includes construction, design, permitting, construction management, and contingency of both the pipeline and associated customer retrofits.
3. Projects are further ranked as Critical Path (A) Projects, Supplemental (B) Projects, and Optional (C) Projects.

A breakdown of the phases by alignment and criticality provides the City with a plan for focusing funds and reduces dependencies between projects. This allows other projects to move forward if problems arise on higher priority projects. Also, preventing stranded assets by constructing alignments that will realize recycled water delivery can be accomplished following this model since it can allow the City to remove or postpone an alignment in a phase and still realize the benefits of the previously constructed system.

Reference 9

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

San Francisco Bay Regional Water Quality Control Board

ORDER No. R2-2014-0014
NPDES No. CA0038873

WASTE DISCHARGE REQUIREMENTS FOR NUTRIENTS FROM MUNICIPAL WASTEWATER DISCHARGES TO SAN FRANCISCO BAY

The following dischargers are subject to waste discharge requirements (WDRs) set forth in this Order, for the purpose of regulating nutrient discharges to San Francisco Bay and its contiguous bay segments:

Table 1. Discharger Information

Discharger	Facility Name	Facility Address	Minor/ Major
American Canyon, City of	Wastewater Treatment and Reclamation Facility	151 Mezzetta Court American Canyon, CA 94503 Napa County	Major
Benicia, City of	Benicia Wastewater Treatment Plant	614 East Fifth Street Benicia, CA 94510 Solano County	Major
Burlingame, City of	Burlingame Wastewater Treatment Plant	1103 Airport Boulevard Burlingame, CA 94010 San Mateo County	Major
Central Contra Costa Sanitary District	Central Contra Costa Sanitary District Wastewater Treatment Plant	5019 Imhoff Place Martinez, CA 94553 Contra Costa County	Major
Central Marin Sanitation Agency	Central Marin Sanitation Agency Wastewater Treatment Plant	1301 Andersen Drive San Rafael, CA 94901 Marin County	Major
Crockett Community Services District	Port Costa Wastewater Treatment Plant	End of Canyon Lake Drive Port Costa, CA 94569 Contra Costa County	Minor
Delta Diablo	Wastewater Treatment Plant	2500 Pittsburg-Antioch Highway Antioch, CA 94509 Contra Costa County	Major
East Bay Dischargers Authority (EBDA), City of Hayward, City of San Leandro, Oro Loma Sanitary District, Castro Valley Sanitary District, Union Sanitary District, Livermore-Amador Valley Water Management Agency, Dublin San Ramon Services District, and City of Livermore	EBDA Common Outfall	EBDA Common Outfall 14150 Monarch Bay Drive San Leandro, CA 94577 Alameda County	Major
	Hayward Water Pollution Control Facility		
	San Leandro Water Pollution Control Plant		
	Oro Loma/Castro Valley Sanitary Districts Water Pollution Control Plant		
	Raymond A. Boege Alvarado Wastewater Treatment Plant		
	Livermore-Amador Valley Water Management Agency Export and Storage Facilities		

Discharger	Facility Name	Facility Address	Minor/ Major
	Dublin San Ramon Services District Wastewater Treatment Plant		
	City of Livermore Water Reclamation Plant		
East Bay Municipal Utility District	East Bay Municipal Utility District, Special District No. 1 Wastewater Treatment Plant	2020 Wake Avenue Oakland, CA 94607 Alameda County	Major
Fairfield-Suisun Sewer District	Fairfield-Suisun Wastewater Treatment Plant	1010 Chadbourne Road Fairfield, CA 94534 Solano County	Major
Las Gallinas Valley Sanitary District	Las Gallinas Valley Sanitary District Sewage Treatment Plant	300 Smith Ranch Road San Rafael, CA 94903 Marin County	Major
Marin County (Paradise Cove), Sanitary District No. 5 of	Paradise Cove Treatment Plant	3700 Paradise Drive Tiburon, CA 94920 Marin County	Minor
Marin County (Tiburon), Sanitary District No. 5 of	Wastewater Treatment Plant	2001 Paradise Drive Tiburon, CA 94920 Marin County	Minor
Millbrae, City of	Water Pollution Control Plant	400 East Millbrae Avenue Millbrae, CA 94030 San Mateo County	Major
Mt. View Sanitary District	Mt. View Sanitary District Wastewater Treatment Plant	3800 Arthur Road Martinez, CA 94553 Contra Costa County	Major
Napa Sanitation District	Soscol Water Recycling Facility	1515 Soscol Ferry Road Napa, CA 94558 Napa County	Major
Novato Sanitary District	Novato Sanitary District Wastewater Treatment Plant	500 Davidson Street Novato, CA 94945 Marin County	Major
Palo Alto, City of	Palo Alto Regional Water Quality Control Plant	2501 Embarcadero Way Palo Alto, CA 94303 Santa Clara County	Major
Petaluma, City of	Ellis Creek Water Recycling Facility	3890 Cypress Drive Petaluma, CA 94954 Sonoma County	Major
Pinole, City of	Pinole-Hercules Water Pollution Control Plant	11 Tennent Avenue Pinole, CA, 94564 Contra Costa County	Major
Rodeo Sanitary District	Rodeo Sanitary District Water Pollution Control Facility	800 San Pablo Avenue Rodeo, CA 94572 Contra Costa County	Major
San Francisco (San Francisco International Airport), City and County of	Mel Leong Treatment Plant, Sanitary Plant	918 Clearwater Drive San Francisco International Airport San Francisco, CA 94128 San Mateo County	Major
San Francisco (Southeast Plant), City and County of	Southeast Water Pollution Control Plant	750 Phelps Street San Francisco, CA 94124 San Francisco County	Major

Discharger	Facility Name	Facility Address	Minor/ Major
San Jose/Santa Clara Water Pollution Control Plant and Cities of San Jose and Santa Clara	San Jose/Santa Clara Water Pollution Control Plant	4245 Zanker Road San Jose, CA 95134 Santa Clara County	Major
San Mateo, City of	City of San Mateo Wastewater Treatment Plant	2050 Detroit Drive San Mateo, CA 94404 San Mateo County	Major
Sausalito-Marin City Sanitary District	Sausalito-Marin City Sanitary District Wastewater Treatment Plant	#1 Fort Baker Road Sausalito, CA 94965 Marin County	Major
Sewerage Agency of Southern Marin	Wastewater Treatment Plant	450 Sycamore Avenue Mill Valley, CA 94941 Marin County	Major
Sonoma Valley County Sanitary District	Municipal Wastewater Treatment Plant	22675 8th Street East Sonoma, CA 95476 Sonoma County	Major
South Bayside System Authority	South Bayside System Authority Wastewater Treatment Plant	1400 Radio Road Redwood City, CA 94065 San Mateo County	Major
South San Francisco and San Bruno, Cities of	South San Francisco and San Bruno Water Quality Control Plant	195 Belle Air Road South San Francisco, CA 94080 San Mateo County	Major
Sunnyvale, City of	Sunnyvale Water Pollution Control Plant	1444 Borregas Avenue, Sunnyvale, CA 94089 Santa Clara County	Major
U.S. Department of Navy (Treasure Island)	Wastewater Treatment Plant	681 Avenue M, Treasure island San Francisco, CA 94130-1807 San Francisco County	Major
Vallejo Sanitation and Flood Control District	Vallejo Sanitation and Flood Control District Wastewater Treatment Plant	450 Ryder Street Vallejo, CA 94590 Solano County	Major
West County Agency (West County Wastewater District and City of Richmond Municipal Sewer District)	West County Agency Combined Outfall	601 Canal Blvd. Richmond, CA 94804 Contra Costa County	Major

Table 2. Discharge Locations

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
Discharge locations are specified in individual NPDES permits listed in Attachment B.				

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	**April 9, 2014**
This Order shall become effective on:	**July 1, 2014**
This Order shall expire on:	**June 30, 2019**

I, Bruce H. Wolfe, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of the Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on the date indicated above.

Digitally signed by Bruce H. Wolfe
DN: cn=Bruce H. Wolfe, o=SWRCB, ou=Region 2, email=bwolfe@waterboards.ca.gov, c=US
Date: 2014.04.14 11:08:33 -07'00'

Bruce H. Wolfe, Executive Officer

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Attachment B – Individual Order and NPDES Permit Numbers B-1
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I. FACILITY INFORMATION

Information describing the facilities subject to this Order is summarized in Table 1 and in Fact Sheet (Attachment F) sections I and II.

II. FINDINGS

The California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board), finds:

A. Legal Authorities. This Order serves as WDRs pursuant to California Water Code article 4, chapter 4, division 7 (commencing with § 13260). This Order is also issued pursuant to federal Clean Water Act (CWA) section 402 and implementing regulations adopted by U.S. EPA, and Water Code chapter 5.5, division 7 (commencing with § 13370). It shall serve as an NPDES permit for point source discharges from the Dischargers' facilities to surface waters.

B. Background and Rationale for Requirements. The Regional Water Board developed the requirements in this Order based on information the Dischargers submitted, information obtained through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F) contains background information and rationale for the requirements in this Order and is hereby incorporated into and constitutes findings for this Order. Attachments B, C, and E are also incorporated into this Order.

C. Provisions and Requirements Implementing State Law. No provisions or requirements in this Order are included to implement State law only.

D. Notification of Interested Parties. The Regional Water Board notified the Dischargers and interested agencies and persons of its intent to prescribe these WDRs and provided an opportunity to submit written comments and recommendations. The Fact Sheet provides details regarding the notification.

E. Consideration of Public Comment. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharges. The Fact Sheet provides details regarding the public hearing.

THREFORE, IT IS HEREBY ORDERED that, in order to meet the provisions of Water Code division 7 (commencing with § 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations and guidelines adopted thereunder, the Dischargers shall comply with the requirements in this Order. This Order supersedes nutrient-related requirements in the individual NPDES permits listed in Attachment B, with the exception of effluent limitations for ammonia as well as special studies the Central Contra Costa Sanitary District is to conduct pursuant to Order No. R2-2012-0016 (Provision C.5c).

III. DISCHARGE PROHIBITIONS

This Order does not establish additional discharge prohibitions.

IV. DISCHARGE SPECIFICATIONS

This Order does not establish additional discharge specifications.

V. RECEIVING WATER LIMITATIONS

This Order continues receiving water limitations that are applicable to nutrients that are specified in the individual NPDES permits listed in Attachment B.

VI. PROVISIONS

A. Federal and Regional Standard Provisions

Federal and Regional Standard Provisions are specified in Attachments D and G in, and as modified by, each Discharger's individual NPDES Permits (see Attachment B).

B. Monitoring and Reporting Program Requirements

Dischargers shall comply with the Monitoring and Reporting Program (MRP), and future revisions thereto, in Attachment E of this Order.

C. Special Provisions

1. Evaluation of Potential Nutrient Discharge Reduction by Treatment Optimization and Side-stream Treatment

The major Dischargers listed in Table 1 shall, individually or in collaboration with other Dischargers, evaluate options and costs for nutrient discharge reduction by optimization of current treatment works. The evaluation shall include the following:

- Describe the treatment plant, treatment plant process, and service area;
- Evaluate site-specific alternatives, along with associated nitrogen and phosphorus removal levels, to reduce nutrient discharges through methods such as operational adjustments to existing treatment systems, process changes, or minor upgrades;
- Evaluate side-stream treatment opportunities along with associated nitrogen and phosphorus removal levels;
- Describe where optimization, minor upgrades, and sidestream treatment have already been implemented;
- Evaluate beneficial and adverse ancillary impacts associated with each optimization proposal, such as changes in the treatment plant's energy usage, greenhouse gas emissions, or sludge and biosolids treatment or disposal;
- Identify planning level costs of each option evaluated; and

- Evaluate the impact on nutrient loads due to treatment plant optimization implemented in response to other regulations or requirements.

Dischargers that have recently completed optimization evaluations may use previously completed reports.

a. Submit and Implement Scoping and Evaluation Plans

By December 1, 2014, the major Dischargers listed in Table 1 shall, individually or in collaboration with other Dischargers, submit a Scoping Plan that defines the level of work for the proposed optimization evaluation. The Scoping Plan shall be acceptable to the Executive Officer.

By July 1, 2015, the major Dischargers listed in Table 1 shall, individually or in collaboration with other Dischargers, submit an Evaluation Plan that includes a schedule describing how they will conduct the evaluation of potential nutrient discharge reduction by treatment optimization. The Evaluation Plan shall include sampling, as necessary, to support proposed optimization studies. The Evaluation Plan shall be acceptable to the Executive Officer.

The Dischargers shall proceed with implementation of the Evaluation Plan within 45 days of submittal.

b. Submit Status Report

By July 1, 2016, and subsequently by July 1, 2017, major Dischargers listed in Table 1 shall submit, or cause to be submitted, a report describing the tasks completed, preliminary findings, and tasks to be completed, highlighting any adaptive changes to be made to the Evaluation Plan submitted in accordance with task a, above.

c. Submit Final Report

By July 1, 2018, the major Dischargers listed in Table 1 shall submit, or cause to be submitted, the results of their evaluations with planning level cost estimates for each optimization option studied.

2. Evaluation of Potential Nutrient Discharge Reduction by Treatment Upgrades or Other Means

The major Dischargers listed in Table 1 shall, individually or in collaboration with other Dischargers, conduct an evaluation to identify options and costs for potential treatment upgrades for nutrient removal.

The evaluation shall be conducted for each Discharger's treatment works or categories of like treatment works (e.g., high purity oxygen plants, conventional activated sludge plants, plants without anaerobic digestion). The evaluation must estimate nutrient reductions from treatment upgrades and, at a minimum, shall entail the following:

- Describe the treatment plant, treatment plant process, and service area;

- Identify potential upgrade technologies for each treatment plant category along with associated nitrogen and phosphorous removal levels;
- Identify site-specific constraints or circumstances that may cause implementation challenges or eliminate any specific technologies from consideration;
- Include planning level capital and operating cost estimates associated with the upgrades and for different levels of nutrient reduction, applying correction factors associated with site-specific challenges and constraints;
- Describe where Dischargers have already upgraded existing treatment systems or implemented pilot studies for nutrient removal. As part of this description, document the level of nutrient removal the upgrade or pilot study is achieving for total nitrogen and phosphorus;
- Evaluate the impact on nutrient loads due to treatment plant upgrades implemented in response to other regulations and requirements; and
- Evaluate beneficial and adverse ancillary impacts associated with each upgrade, such as changes in the treatment plant's energy use, changes in greenhouse gas emissions, changes in sludge and biosolids treatment or disposal, and reduction of other pollutants (e.g., pharmaceuticals) through advanced treatment.

Dischargers that have recently completed upgrade evaluations may use previously completed reports.

Dischargers who have planned or are implementing facility upgrades or modifications to address the impacts of sea level rise and climate change alone, or as part of infrastructure renewal, shall also include in its nutrient removal evaluation consideration of the impacts of sea level rise and climate change on identified nutrient upgrade options.

In addition to the above upgrade evaluation, Dischargers may evaluate ways to reduce nutrient loading through alternative discharge scenarios, such as water recycling or use of wetlands, in combination with, or in-lieu of, the upgrades to achieve similar levels of nutrient load reductions. This evaluation shall identify any institutional barriers to water recycling along with proposals for overcoming such barriers and include ancillary benefits and adverse impacts associated with such alternative discharge scenarios such as the following:

- Reduction in potable water use through enhanced reclamation;
- Creation of additional wetland or upland habitat;
- Changes in energy use, greenhouse gas emissions, sludge and biosolids quality and quantities;
- Reduction of other pollutant discharges;
- Impacts to existing permit requirements related to alternative discharge scenarios; and
- Implications related to discharge of brine or other side-streams associated with advanced recycling technologies.

a. Submit and Implement Scoping and Evaluation Plans

By December 1, 2014, the major Dischargers listed in Table 1 shall, individually or in collaboration with other Dischargers, submit a Scoping Plan that defines the

level of work for the proposed upgrade evaluation. The Scoping Plan shall be acceptable to the Executive Officer.

By July 1, 2015, the major Dischargers listed in Table 1 shall, individually or in collaboration with other Dischargers, submit an Evaluation Plan and schedule describing how they will conduct the evaluation of potential nutrient discharge reduction by treatment upgrades or other means. The Evaluation Plan shall define the categories of treatment works that will be evaluated to support potential upgrades and alternative discharge scenarios. The Evaluation Plan shall be acceptable to the Executive Officer.

The Dischargers shall proceed with implementation of the Evaluation Plan within 45 days of submittal.

b. Submit Status Report
By July 1, 2016, and subsequently by July 1, 2017, major Dischargers listed in Table 1 shall submit, or cause to be submitted, a report describing the tasks completed, preliminary findings, and tasks to be completed, highlighting any adaptive changes to be made to the Evaluation Plan submitted in accordance with task a, above.

c. Submit Final Report
By July 1, 2018, major Dischargers listed in Table 1 shall submit, or cause to be submitted, the results of their evaluations with planning level cost estimates for each upgrade option studied.

3. Monitoring, Modeling, and Embayment Studies

Each Discharger shall conduct, or cause to be conducted, studies to address the potential adverse impacts of nutrients on San Francisco Bay beneficial uses. The studies shall include efforts described below:

a. Support Science Plan Development and Implementation
The Dischargers shall collaborate with other regional stakeholders to support development and implementation of a science plan of necessary studies to implement the San Francisco Bay Nutrient Management Strategy and support consideration of future management actions, including the development of nutrient water quality objectives, both informed through modeling. The science plan shall include studies necessary for San Francisco Bay as a whole and also on issues identified for specific subembayments.

By February 1, 2015, the Dischargers shall cause to be submitted an implementation plan and schedule for proposed studies acceptable to the Executive Officer and update and revise it as necessary annually by February 1 of each subsequent year.

b. Support Receiving Water Monitoring for Nutrients

The Dischargers shall collaborate with other regional stakeholders to support receiving water monitoring for nutrients, as necessary, that go beyond the monitoring already provided by the Regional Monitoring Program and others, by providing the following:

i. A network of nutrient monitoring locations to track nutrient concentrations, dissolved oxygen, and phytoplankton biomass in San Francisco Bay;
ii. Adequate data to support modeling of nutrient fate and transport in San Francisco Bay; and
iii. Studies furthering the understanding of harmful algae bloom development, including, at a minimum, monitoring for algae species and toxins.

4. Reopener Provisions

The Regional Water Board may modify or reopen this Order prior to its expiration date in any of the following circumstances as allowed by law:

a. If the discharges governed by this Order have or will have a reasonable potential to cause or contribute to, or will cease to have, adverse impacts on water quality or beneficial uses of the receiving waters;

b. If new or revised water quality objectives or total maximum daily loads (TMDLs) come into effect for San Francisco Bay and contiguous water bodies (whether statewide, regional, or site-specific);

c. If State Water Board precedential decisions, new policies, new laws, or new regulations are adopted;

d. If an administrative or judicial decision on a separate NPDES permit or WDRs addresses requirements similar to those in this Order; or

f. As otherwise authorized by law.

Any Discharger may request a permit modification based on any of the circumstances above. With any such request, the Discharger shall include antidegradation and anti-backsliding analyses.

ATTACHMENT B – INDIVIDUAL ORDER AND NPDES PERMIT NUMBERS

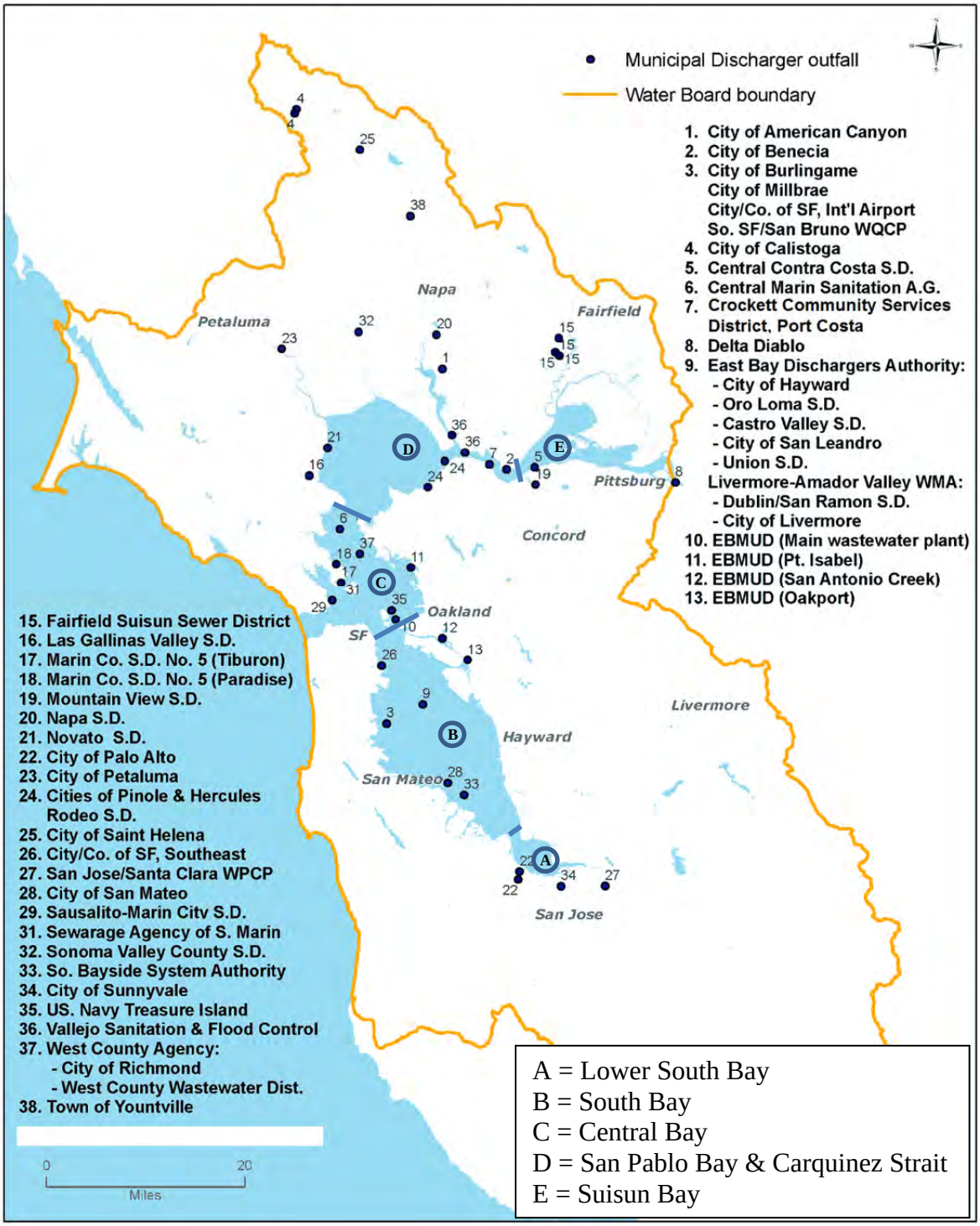
Municipal Dischargers:

Discharger	NPDES Permit No.	Existing Order No.[1]	Existing Order Adoption Date	Existing Order Expiration Date
American Canyon, City of	CA0038768	R2-2011-0046	7/13/11	8/31/16
Benicia, City of	CA0038091	R2-2008-0014	3/12/08	5/30/13
Burlingame, City of	CA0037788	R2-2013-0015	5/08/13	6/30/18
Central Contra Costa Sanitary District	CA0037648	R2-2012-0016	2/08/12	3/31/17
Central Marin Sanitation Agency	CA0038628	R2-2012-0051	6/13/12	7/31/17
Crockett Community Services District, Port Costa Sanitary Dept.	CA0037885	R2-2013-0035	10/09/13	11/30/18
Delta Diablo	CA0038547	R2-2009-0018	3/11/09	4/30/14
East Bay Dischargers Authority	CA0037869	R2-2012-0004	1/18/12	2/28/17
Union S.D. Wet Weather Outfall	CA0038733	R2-2010-0097	7/14/10	8/31/15
Dublin San Ramon Services District	CA0037613	R2-2012-0005	1/18/12	2/28/17
City of Livermore	CA0038008	R2-2012-0006	1/18/12	2/28/17
LAVWMA Wet Weather Outfall	CA0038679	R2-2011-0028	5/11/11	6/30/16
East Bay Municipal Utility Dist. WWTP	CA0037702	R2-2010-0060	3/10/10	4/30/15
Fairfield-Suisun Sewer District	CA0038024	R2-2009-0039	4/08/09	5/31/14
Las Gallinas Valley Sanitary District	CA0037851	R2-2009-0070	10/14/09	11/30/14
Marin County (Paradise Cove), Sanitary District No. 5 of	CA0037427	R2-2011-0016	4/13/11	5/31/16
Marin County (Tiburon), Sanitary District No. 5 of	CA0037753	R2-2013-0027	8/14/13	9/30/18
Millbrae, City of	CA0037532	R2-2013-0037	12/11/13	1/31/19
Mt. View Sanitary District	CA0037770	R2-2010-0114	11/10/10	12/31/15
Napa Sanitation District	CA0037575	R2-2011-0007	2/09/11	3/31/16
Novato Sanitary District	CA0037958	R2-2010-0074	5/12/10	6/30/15
Palo Alto, City of	CA0037834	R2-2009-0032	4/08/09	5/31/14
Petaluma, City of	CA0037810	R2-2011-0003	1/12/11	2/28/16
Pinole, City of	CA0037796	R2-2012-0059	8/08/12	9/30/17
Rodeo Sanitary District	CA0037826	R2-2012-0027	4/11/12	5/31/17
San Francisco, City and County of, San Francisco International Airport	CA0038318	R2-2013-0011	5/08/13	6/30/18
San Francisco (Southeast Plant), City and County of	CA0037664	R2-2013-0029	8/14/13	9/30/18
San Jose/Santa Clara Water Pollution Control Plant and Cities of San Jose and Santa Clara	CA0037842	R2-2009-0038	4/08/09	5/31/14
San Mateo, City of	CA0037541	R2-2013-0006	3/13/13	4/30/18
Sausalito-Marin City Sanitary District	CA0038067	R2-2012-0083	11/14/12	12/31/17
Sewerage Agency of Southern Marin	CA0037711	R2-2012-0094	12/12/12	1/31/18
Sonoma Valley County Sanitary District	CA0037800	R2-2008-0090	10/08/08	11/30/13
South Bayside System Authority	CA0038369	R2-2012-0062	8/08/12	9/30/17
South San Francisco and San Bruno, Cities of	CA0038130	R2-2008-0094	11/12/08	12/31/13
Sunnyvale, City of	CA0037621	R2-2009-0061	8/12/09	9/30/14
US Department of Navy, Treasure Island	CA0110116	R2-2010-0001	1/13/10	2/28/15
Vallejo Sanitation and Flood Control District	CA0037699	R2-2012-0017	2/08/12	3/31/17
West County Agency (West County Wastewater District and City of Richmond Municipal Sewer District)	CA0038539	R2-2013-0016	5/08/13	6/30/18

[1] The orders shown are for the primary permit reissuance and do not include permit amendments.

ATTACHMENT C – DISCHARGER LOCATION MAP

Municipal Discharger outfall locations



ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations (40 C.F.R. § 122.48) requires that all NPDES permits specify monitoring and reporting requirements. Water Code section 13383 also authorizes the Regional Water Board to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements that implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. Dischargers shall comply with this MRP and all requirements contained in the Regional Standard Provisions (Attachment G of individual permits). The Executive Officer may amend this MRP pursuant to 40 C.F.R. sections 122.62, 122.63, and 124.5. If any discrepancies exist between this MRP and the Regional Standard Provisions, this MRP shall prevail.

B. Sampling is required during the entire year when discharging. The Discharger shall conduct all monitoring in accordance with the Federal Standard Provisions (Attachment D of individual permits), as supplemented by Attachment G. Equivalent test methods must be more sensitive than those specified in 40 C.F.R. section 136 and must be specified in this permit.

II. MONITORING LOCATIONS

Dischargers shall establish the following monitoring locations to characterize loads and comply with other requirements in this Order:

Table E-1. Monitoring Station Locations

Discharge Point Name	Monitoring Location Description
Effluent sampling shall be at the compliance monitoring location for ammonia specified in the Discharger's NPDES permit. For San Francisco (Southeast Plant) this shall be E-001.	Monitoring locations are described in individual NPDES permits.

III. EFFLUENT MONITORING REQUIREMENTS

Dischargers shall monitor effluent for nutrients as shown in Tables E-2 and E-3 below and report as described in the next section:

Table E-2. Effluent Monitoring Requirements

Parameter	Units	Sample Type[1]
Ammonia	mg/L and kg/day as N	C-24
Total Kjeldahl Nitrogen	mg/L and kg/day as N	C-24
Nitrate-Nitrite	mg/L and kg/day as N	C-24
Total Phosphorus	mg/L and kg/day as P	C-24
Soluble Reactive Phosphorus	mg/L and kg/day as P	C-24
Total Nitrogen	mg/L and kg/day as N	Calculated

Unit Abbreviations:

mg/L = milligrams per liter
kg/day as N = kilograms per day as nitrogen
kg/day as P = kilograms per day as phosphorus

Sample Type:

C-24 = 24-hour composite sample

Footnote:

(1) 24-hour composite samples (C-24) may be made up of a minimum of four discrete grab samples, collected over the course of 24 hours, and volumetrically or mathematically flow-weighted. During a 24-hour period, the samples may be collected only when the plant is staffed, if necessary.

Table E-3. Minimum Sampling Frequency

Discharger Type	Minimum Sampling Frequency[1,2,3]
Major municipal discharger (Flow ≥ 10 mgd)	Twice per month
Major municipal discharger (Flow < 10 mgd)	Once per month
Minor municipal discharger (Flow < 1 mgd)	Twice per year

Footnotes:

[1] Samples need only be collected when discharging (i.e., seasonal dischargers shall collect samples only during the discharge season).

[2] After two years of data collection, the Discharger may reduce or eliminate the frequency for parameters specified in Table E.2 if it has collected adequate data for modeling and load characterization. The Discharger must request and then obtain written approval from the Executive Officer prior to monitoring reduction.

[3] For municipal wastewater treatment plants that discharge via the EBDA outfall, individual treatment plant monitoring shall occur twice per year.

IV. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

Dischargers shall comply with all Federal Standard Provisions (Attachment D) and Regional Standard Provisions (Attachment G) related to monitoring, reporting, and recordkeeping, as modified in individual permits.

B. Individual Reporting in Self-Monitoring Reports (SMRs)

1. Reporting of Nutrients Data

a. Routine SMRs

Dischargers shall submit nutrients data collected as part of this Order in the regular monthly or quarterly SMRs required in each Discharger's individual permit. If a Discharger monitors nutrients more frequently than required by this Order at the monitoring location described in Table E-1, the Discharger shall include the results of this monitoring in the calculations and reporting for the SMR.

b. Annual Nutrients Report

Starting in 2015, by September 1 of each year, each Discharger shall provide its nutrient information in a separate annual report or state that it is participating in a group report that will be submitted by the Bay Area Clean Water Agencies (BACWA) under section B.1.c below. Each Discharger shall submit the following:

i. Documentation that it is complying with Provision C.3. Or if group annual reporting pursuant to B.1.c, below, then certification that each Discharger

has provided adequate support or contributed its portion of the required contribution under Provision C.3.

ii. Summary tables depicting the Discharger's annual and monthly flows, nutrient concentrations, and nutrient mass loads, calculated as described in Section VIII.1 Arithmetic Calculations of Standard Provisions (Attachment G of individual permits) covering July 1 through June 30 of the preceding year. Each individual Discharger shall document its nutrient loads relative to other facilities covered by this Order that discharge to the same subembayment, i.e., Suisun Bay, San Pablo Bay, Central Bay, South Bay, and Lower South Bay. Nutrient information from other Dischargers may be obtained from the State Water Board's California Integrated Water Quality System (CIWQS) Program website (http://www.waterboards.ca.gov/ciwqs/index.html).

iii. An analysis of nutrient trends, load variability, and an assessment as to whether or not nutrient mass discharges are increasing or decreasing.

iv. If trend analysis shows a significant change in load, the Discharger shall investigate the cause and shall report its results, or status, or plans for investigation, in the annual report or in subsequent annual reports. This investigation shall include, at a minimum, whether treatment process changes have reduced or increased nutrient discharges, changes in nutrient loads related to water reclamation (increasing or decreasing), and changes in total influent flow related to water conservation, population growth, transient work community, new industry, and/or changes in wet weather flows.

c. Optional Group Report for Annual Nutrients Report

As an alternative to submitting an individual Annual Nutrients Report, each Discharger may instead be part of a group report provided by BACWA. Starting 2015, by October 1 of each year, the Annual Group Nutrients Report shall include the information detailed in B.1.b above.

2. **Monitoring Periods**

Monitoring periods for all required monitoring shall be completed according to the following schedule:

Table E-4. Monitoring Periods

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period
Monthly	First day of calendar month following permit effective date or on permit effective date if on first day of month	First day of calendar month through last day of calendar month
Quarterly	Closest January 1, April 1, July 1, or October 1 following (or on) permit effective date	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31

Twice per year	Closest May 1 or November 1 following (or on) permit effective date	November 1 through April 30 May 1 through October 31
Annually	As specified in EO concurrence describe in section III.	January 1 through December 31

C. Discharge Monitoring Reports (DMRs)

1. At any time during the term of this Order, the State Water Board or Regional Water Board may notify the Discharger to electronically submit DMRs. Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.
2. Once notified by the State Water Board or Regional Water Board, the Discharger shall submit hard copy DMRs. The Discharger shall sign and certify DMRs as Attachment D requires. The Discharger shall submit original DMRs to one of the addresses listed below:

Standard Mail	**FedEx/UPS/ Other Private Carriers**
State Water Resources Control Board Division of Water Quality c/o DMR Processing Center PO Box 100 Sacramento, CA 95812-1000	State Water Resources Control Board Division of Water Quality c/o DMR Processing Center 1001 I Street, 15th Floor Sacramento, CA 95814

3. All discharge monitoring results must be reported on the official U.S. EPA pre-printed DMR forms (EPA Form 3320-1) or self-generated forms that follow the exact same format of EPA Form 3320-1.

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

This Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order. As described in section II.B of the Order, the Regional Water Board incorporates this Fact Sheet as its findings supporting the issuance of the Order.

I. PERMIT INFORMATION

The following tables summarize administrative information related to the facility:

Table F-1. Facility Information

Discharger	Facility Contact, Title, and Phone Number	Mailing Address	Effluent Description	Facility Design Flow (mgd)
American Canyon, City of	Peter Lee Wastewater Systems Manager (707) 647-4525	Same as Facility Address	Advanced Secondary	2.5
Benicia, City of	Jeff Gregory Wastewater Treatment Plant Superintendent (707) 746- 4790	Same as Facility Address	Secondary	4.5
Burlingame, City of	William Toci Plant Manager (650) 342-3727	501 Primrose Burlingame, CA 94010	Secondary	5.5
Central Contra Costa Sanitary District	Curt Swanson Director of Operations (925) 229-7336	Same as Facility Address	Secondary	53.8
Central Marin Sanitation Agency	Robert Cole Environmental Services Manager (415) 459-1455	Same as Facility Address	Secondary	10
Crockett Community Services District	Michael Kirker Port Costa Dept. Manager (510) 787-2992	Crockett Community Services District, Port Costa Sanitary Department P.O. Box 578 Crockett, CA 94525	Secondary	0.033
Delta Diablo	Gary W. Darling General Manager (925) 756-1920	Same as Facility Address	Secondary	16.5
East Bay Dischargers Authority: EBDA Common Outfall	Michael S. Connor General Manager (510) 278-5910	2651 Grant Avenue San Lorenzo, CA 94580	Secondary	107.8
Hayward Water Pollution Control Facility				
San Leandro Water Pollution Control Plant				
Oro Loma/Castro Valley Sanitary Districts Water Pollution Control Plant				
Raymond A. Boege Alvarado Wastewater Treatment Plant				

Discharger	Facility Contact, Title, and Phone Number	Mailing Address	Effluent Description	Facility Design Flow (mgd)
Livermore-Amador Valley Water Management Agency (LAVWMA) Export and Storage Facilities				
Dublin San Ramon Services District Wastewater Treatment Plant				
City of Livermore Water Reclamation Plant				
East Bay Municipal Utility District Main Wastewater Treatment Plant	Kurt H. Haunschild Manager of Wastewater Treatment (510) 287-1407	EBMUD WW Treatment P.O. Box 24055, MS 59 Oakland, CA 94623	Secondary	120
Fairfield-Suisun Sewer District	Greg Baatrup General Manager (707) 429-8930	Same as Facility Address	Advanced Secondary	23.7
Las Gallinas Valley Sanitary District	Mark Williams District Manager (415) 472-1734	300 Smith Ranch Rd San Rafael, CA 94903-1929	Secondary	2.92
Marin County (Paradise Cove), Sanitary District No. 5 of	Tony Rubio Chief Plant Operator (415) 435-1501	P.O. Box 227 Tiburon, CA 94920	Secondary	0.04
Marin County (Tiburon), Sanitary District No. 5 of	Tony Rubio Chief Plant Operator (415) 435-1501	2001 Paradise Drive Tiburon, CA 94920	Secondary	0.98
Millbrae, City of	Joseph Magner Superintendent (650) 259-2388	621 Magnolia Avenue Millbrae, CA 94030	Secondary	3
Mt. View Sanitary District	Michael D. Roe District Manager (925) 228-5635 ext. 32	P. O. Box 2757 Martinez, CA 94553	Advanced Secondary	3.2
Napa Sanitation District	Tim Healy General Manager (707) 258-6000	P.O. Box 2480 Napa, CA 94558	Secondary	15.4
Novato Sanitary District	Beverly James Manager-Engineer (415) 892-1694 x111	500 Davidson Street Novato, CA 94945	Secondary	7.05
Palo Alto, City of	Ken Torke Environmental Compliance Manager (650) 329-2243	2501 Embarcadero Way, Palo Alto, CA 94303	Advanced Secondary	39
Petaluma, City of	Leah Walker Environmental Services Manager (707) 776-3777	3890 Cypress Drive Petaluma, CA 94954	Secondary	6.7
Pinole, City of	Ron Tobey Plant Manager (510) 724-8963	2131 Pear Street, Pinole, CA 94564	Secondary	4.06
Rodeo Sanitary District	Steven S. Beall Engineer-Manager (510) 799-2970	Same as Facility Address	Secondary	1.14

Discharger	Facility Contact, Title, and Phone Number	Mailing Address	Effluent Description	Facility Design Flow (mgd)
San Francisco (San Francisco International Airport), City and County of	Mark Costanzo Utilities Manager (650) 821-7809	P.O. Box 8097 San Francisco, CA 94128	Secondary	2.2
San Francisco (Southeast Plant), City and County of	Tommy Moala Assistant General Manager of Wastewater (415) 554-2465	1155 Market St., 11th Floor San Francisco, CA 94103	Secondary	150
San Jose/Santa Clara, Cities of	James Ervin Acting Environmental Compliance Officer (408) 945-5124	700 Los Esteros Road San Jose, CA 95134	Advanced Secondary	167
San Mateo, City of	Ramon Towne Interim Director of Public Works (650) 522-7300	330 West 20th Avenue San Mateo, CA 94403	Secondary	15.7
Sausalito-Marin City Sanitary District	Craig Justice General Manager (415) 332-0244	P.O. Box 39 Sausalito, CA 94966-0039	Secondary	1.8
Sewerage Agency of Southern Marin	Mark Grushayev General Manager (415) 388-2402	26 Corte Madera Ave. Mill Valley, CA 94941	Secondary	3.6
Sonoma Valley County Sanitary District	Pam Jeane Deputy Chief Engineer (707) 521-1864	Sonoma County Water Agency 404 Aviation Blvd. Santa Rosa, CA 95403	Secondary	3
South Bayside System Authority	Daniel Child Manager (650) 591-7121	Same as Facility Address	Secondary	29
South San Francisco and San Bruno, Cities of	Brian Schumacker Plant Superintendent (650) 877-8555	South San Francisco-San Bruno Water Pollution Control Plant 195 Belle Air Road South San Francisco, CA 94080	Secondary	13
Sunnyvale, City of	Melody Tovar Division Manager (408) 730-7808	Sunnyvale Water Pollution Control Plant P.O. Box 3707 Sunnyvale, CA 94088-3707	Advanced Secondary	29.5
U.S. Department of Navy (Treasure Island)	Patricia A. McFadden BRAC Field Team Leader San Francisco Bay Area (415) 743-4720	Navy BRAC PMOW 410 Palm Avenue, Bldg 1, Suite 161 Treasure Island, San Francisco, CA 94130-1807	Secondary	2
Vallejo Sanitation and Flood Control District	Melissa Morton District Manager (707) 644-8949 X211	Same as Facility Address	Secondary	15.5
West County Agency (West County Wastewater District and City of Richmond Municipal Sewer District)	E.J. Shalaby District Manager (510) 222-6700	2910 Hilltop Drive Richmond, CA 94806	Secondary	28.5

Table F-2. Additional Facility Information

Discharger	Authorized Person to Sign and Submit Reports	Billing Address (if different from mailing address)	Pretreatment Program	Receiving Water Type
American Canyon, City of	Same as Contact	Same as mailing address	Y	Estuarine
Benicia, City of	Same as Contact	Same as mailing address	Y	Estuarine
Burlingame, City of	Same as contact	Same as mailing address	Y	Marine
Central Contra Costa Sanitary District	Same as contact	Same as mailing address	Y	Estuarine
Central Marin Sanitation Agency	Same as contact	Same as mailing address	Y	Estuarine
Crockett Community Services District	Same as contact	Same as mailing address	N	Estuarine
Delta Diablo	Steve Dominguez Plant Manager (925) 756-1967	Same as mailing address	Y	Estuarine
East Bay Dischargers Authority	Same as contact	Same as mailing address	Y	Estuarine
Hayward Water Pollution Control Facility				
San Leandro Water Pollution Control Plant				
Oro Loma/Castro Valley Sanitary Districts Water Pollution Control Plant				
Raymond A. Boege Alvarado Wastewater Treatment Plant				
LAVWMA Export and Storage Facilities				
Dublin San Ramon Services District Wastewater Treatment Plant				
City of Livermore Water Reclamation Plant				
East Bay Municipal Utility District	Ben Horenstein Director of Wastewater (510) 287-1846	EBMUD Accounts Payable P.O. Box 24055, MS #5 Oakland, CA 94623-2306	Y	Marine
Fairfield-Suisun Sewer District	Same as contact	Same as mailing address	Y	Estuarine
Las Gallinas Valley Sanitary District	Same as contact	Same as mailing address	N	Estuarine
Marin County (Paradise Cove), Sanitary District No. 5 of	Same as contact	Same as mailing address	N	Marine
Marin County (Tiburon), Sanitary District No. 5 of	Same as contact	Same as mailing address	N	Marine
Millbrae, City of	Same as contact	Same as mailing address	N	Marine
Mt. View Sanitary District	Same as contact	Same as mailing address	N	Estuarine
Napa Sanitation District	James Keller Plant Manager (707) 258-6020	Same as mailing address	Y	Estuarine
Novato Sanitary District	Same as contact	Same as mailing address	Y	Estuarine
Palo Alto, City of	Same as contact	Same as mailing address	Y	Estuarine

Discharger	Authorized Person to Sign and Submit Reports	Billing Address (if different from mailing address)	Pretreatment Program	Receiving Water Type
Petaluma, City of	Matthew Pierce Operations Supervisor (707) 776-3777	Same as mailing address	Y	Estuarine
Pinole, City of	Same as contact	Same as mailing address	N	Marine
Rodeo Sanitary District	Same as contact	Same as mailing address	N	Estuarine
San Francisco (San Francisco International Airport), City and County of	Peter Acton Deputy Airport Director (650) 821-5000	Same as mailing address	Y	Marine
San Francisco (Southeast Plant), City and County of	George Engel Superintendent (415) 920-4944	Same as mailing address	Y	Marine
San Jose/Santa Clara Water Pollution Control Plant and Cities of San Jose and Santa Clara	Joanna De Sa Acting Deputy Director (408) 535-8560	Same as mailing address	Y	Estuarine
San Mateo, City of	Same as contact	Same as mailing address	Y	Marine
Sausalito-Marin City Sanitary District	Same as contact	Same as mailing address	N	Marine
Sewerage Agency of Southern Marin	Same as contact	Same as mailing address	N	Marine
Sonoma Valley County Sanitary District	Brian Anderson Operations Coordinator (707) 526-5370	Same as mailing address	N	Estuarine
South Bayside System Authority	Same as contact	Same as mailing address	Y	Marine
South San Francisco and San Bruno, Cities of	Same as contact	Same as mailing address	Y	Marine
Sunnyvale, City of	Same as contact	Same as mailing address	Y	Estuarine
U.S. Department of Navy (Treasure Island)	Same as contact	Same as mailing address	N	Marine
Vallejo Sanitation and Flood Control District	Same as contact	Same as mailing address	Y	Estuarine
West County Agency (West County Wastewater District and City of Richmond Municipal Sewer District)	E.J. Shalaby District Manager (510) 222-6700	Same as mailing address	Y	Estuarine

A. The Dischargers listed in Table 1 of the Order own and operate secondary and advanced secondary wastewater treatment facilities as described in their individual permits. Wastewater is discharged to San Francisco Bay and its tributaries, which are waters of the United States within the San Francisco Bay watershed. Attachment C shows a map of the Dischargers subject to this Order.

This Order supersedes nutrient-related requirements in the individual NPDES permits listed in Attachment B, with the exception of effluent limitations for ammonia as well as special studies the Central Contra Costa Sanitary District is to conduct pursuant to Order No. R2-2012-0016 (Provision C.5c). For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and State laws, regulations, plans, or policy are held to be equivalent to references to the Dischargers herein.

B. The San Francisco Bay estuary has long been recognized as nutrient-enriched. Despite this, the abundance of phytoplankton in the estuary is lower than would be expected due to a number of factors, including strong tidal mixing; high turbidity, which limits light penetration; and high filtration by clams. However, recent data indicate an increase in phytoplankton biomass and a small decline in dissolved oxygen concentrations in many areas of the estuary, suggesting that its historic resilience to the effects of nutrient enrichment may be weakening. The contributing factors for this include (1) natural oceanic oscillations that have increased benthic predators, thus reducing South San Francisco Bay's clam population and clam grazing; and (2) decreases in suspended sediment that have resulted in a less turbid environment and increased light penetration.

South San Francisco Bay's clam population filters phytoplankton biomass. However, beginning in the late 1990s, gross primary production in the South San Francisco Bay has increased sharply.[1] This increase appears to be due to a decrease in bivalve grazing because predators (fish, shrimp, and crabs) of benthic feeders have increased significantly. The increase in predator abundance has been attributed to a change in natural oceanic oscillations that is bringing colder waters to San Francisco Bay and has allowed these predators to feed on bivalves.

San Francisco Bay is turbid due to high suspended sediment concentrations. However, recent studies show that the Bay may be clearing, with Bay-wide decreases in turbidity. In certain areas (e.g., Suisun Bay) decreases in turbidity of up to 50% have occurred since 1975.[2] The reasons appear to be related to decreases in (1) sediment loads from the Sierra Nevada Mountains and Central Valley, and (2) the amount of erodible material within San Francisco Bay. Even with a significant decrease in turbidity, phytoplankton biomass production continues to be suppressed in Suisun Bay. This needs to be further studied as described on page F-16.

[1] Cloern, J. E., and A. D. Jassby (2012), "Drivers of change in estuarine-coastal ecosystems: Discoveries from four decades of study in San Francisco Bay," *Reviews of Geophysics,* 50, RG4001, page 21.
[2] San Francisco Estuary Institute (SFEI), Nutrient Conceptual Model Draft, May 1, 2013, page 14.

Spring phytoplankton blooms are relatively frequent in San Francisco Bay, and fall blooms have been occurring with increased frequency. The reasons are unknown, but the increase could be the result of a less turbid environment and lower grazing pressure from clams. San Francisco Bay experiences strong tidal mixing, which breaks down stratification in the water column.[3] However, there are two periods each year (March/April and September/October) that are low points for tidal energy. During these low-energy periods, stratification develops if there are sufficient freshwater inputs (salinity stratification is more typical in the spring) or calm clear days (temperature stratification is more typical in the fall). Under these conditions, phytoplankton can remain in the light-rich zone and grow rapidly. Typically, these blooms are short-lived, lasting 10 to 14 days, with blooms ending when increased tidal energy re-mixes the water column.

Under current conditions, phytoplankton growth and biomass accumulation are limited much of the time by lack of light, and biomass accumulation is further controlled by clam grazing. If these constraints continue to shift, increases in phytoplankton biomass could follow. Under this scenario, it may be necessary to limit the availability of essential nutrients. This Order establishes new information collection requirements because municipal wastewater treatment plants are a significant source of nutrients to San Francisco Bay. Municipal wastewater treatment plants account for about 63 percent of the annual average total nitrogen load to San Francisco Bay. Their contribution varies, depending on embayment, as shown in the table below:

Table F-3. Annual Average Loads for Dissolved Inorganic Nitrogen, kg/day

Embayment	Municipal	Refinery	Stormwater	Delta	Total	POTW %
Lower South Bay	6,805	n/a	539	n/a	7,344	93
South Bay	19,401	n/a	670	n/a	20,071	97
Central Bay	11,667	n/a	159	n/a	11,826	99
San Pablo Bay & Carquinez Strait	2,721	842	7,484	n/a	11,047	25
Suisun Bay	5,618	130	1,968	15,930	23,646	24
Baywide	46,212	972	10,820	15,930	73,934	63

SFEI, External Nutrient Loads to San Francisco Bay, Table 6, Draft, April 9, 2013.

C. Several years may be needed to determine an appropriate level of nutrient control and to identify management actions necessary to protect San Francisco Bay beneficial uses. This Order is the first phase of what the Regional Water Board expects to be a multi-permit effort. It sets forth a regional framework to facilitate collaboration on studies that will inform future management decisions and regulatory strategies. The overall purpose of this phase is to track and evaluate treatment plant performance, fund nutrient monitoring programs, support load response modeling, and conduct treatment plant optimization and upgrade studies for nutrient removal. These studies will increase the understanding of external nutrient loads, improve load response models, support development of nutrient objectives, and increase the certainty that any required nutrient removal at treatment plants will produce the desired outcome. In the 2019 permit

[3] SFEI, Nutrient Conceptual Model Draft, May 1, 2013, page 14.

reissuance, the Regional Water Board anticipates considering establishment of performance-based effluent limits for nutrients and may require implementation of treatment optimization or other means to reduce loads or increase assimilative capacity if scientific studies show results that warrant such activities. The Regional Water Board will also consider load offsets between Dischargers within and between subembayments if permissible. The 2019 permit reissuance will also continue efforts to evaluate control measure scenarios as informed by load response modeling. In the 2024 and 2029 permit reissuances, the Regional Water Board anticipates using the information from studies conducted under earlier orders and the Nutrient Management Strategy to require implementation of additional management actions, as needed, and may allow load offsets as appropriate.

II. FACILITIES DESCRIPTION

A. Description of Wastewater Treatment

Municipal wastewater treatment plants provide secondary treatment, which includes screening, skimming, settling, and biological treatment. Some plants also provide advanced treatment that “nitrifies” ammonia to make nitrate-nitrogen. Municipal wastewater treatment plants generally remove around 20 to 30 percent of the total nitrogen load in their influent. The primary source of nutrients in municipal wastewater is human waste; therefore, most dischargers have no practical way of controlling influent nutrient levels.

B. Discharge Points and Receiving Waters

Discharge points and receiving waters are identified in the individual permits listed in Attachment B.

C. Existing Nutrient Discharge Data

Dischargers have been collecting nutrient data since the Executive Officer of the Regional Water Board issued a Water Code section 13267 order on March 2, 2012. These data show that about 90 percent of municipal wastewater treatment plant nutrient discharges are from facilities that have a permitted design flow of 10 mgd or greater. These data are summarized below:

Table F-4. Nutrient Loads (July 2012 to June 2013)

Discharger	Average Annual Total Nitrogen Load (kg/day)	Average Annual Total Phosphorus Load (kg/day)	Design Flow (mgd)
American Canyon, City of	66	26	2.5
Benicia, City of	223	27	4.5
Burlingame, City of	459	95	5.5
Calistoga, City of	58	6.6	0.84
Central Contra Costa Sanitary District	4187	138	53.8
Central Marin Sanitation Agency	903	89	10
Crockett Community Services District			0.033
Delta Diablo	1725	33	16.5

Discharger	Average Annual Total Nitrogen Load (kg/day)	Average Annual Total Phosphorus Load (kg/day)	Design Flow (mgd)
East Bay Dischargers Authority, including City of Hayward, City of San Leandro, Oro Loma Sanitary District, Castro Valley Sanitary District, Union Sanitary District, Livermore-Amador Valley Water Management Agency, Dublin San Ramon Services District, and City of Livermore	8641	555	107.8
East Bay Municipal Utility District	10583	973	120
Fairfield-Suisun Sewer District	1327	196	23.7
Las Gallinas Valley Sanitary District	261	40	2.92
Marin County (Paradise Cove), Sanitary District No. 5 of	2.1	0.27	0.04
Marin County (Tiburon), Sanitary District No. 5 of	61	8.2	0.98
Millbrae, City of	251	16	3
Mt. View Sanitary District	134	18	3.2
Napa Sanitation District	509	48	15.4
Novato Sanitary District	253	23	7.05
Palo Alto, City of	2341	336	39
Petaluma, City of	71	50	5.2
Pinole, City of	347	34	4.06
Rodeo Sanitary District	41	9.3	1.14
Saint Helena, City of	114	36	0.5
San Francisco (San Francisco International Airport), City and County of	236	15	2.2
San Francisco (Southeast Plant), City and County of	8307	101	150
San Jose/Santa Clara WPCP	5233	332	167
San Mateo, City of	1501	124	15.7
Sausalito-Marin City Sanitary District	158	25	1.8
Sewerage Agency of Southern Marin	241	42	3.6
Sonoma Valley County Sanitary District	119	40	3.0
South Bayside System Authority	2118	171	29
South San Francisco and San Bruno, Cities of	1165	153	13
Sunnyvale, City of	1086	213	29.5
U.S. Department of Navy (Treasure Island)	13	1.8	2.0
Vallejo Sanitation and Flood Control District	845	128	15.5
West County Agency (West County Wastewater District and City of Richmond Municipal Sewer District)	850	57	28.5
Yountville, Town of	23	3.8	0.55
Aggregate Mass Load (kg/day)	**54,500[4]**	**4,160**	
Load from design flow ≥ 10 mgd	**51,300 (94%)**	**3,650 (88%)**	

[4] The aggregate nitrogen loads in Table F-4 are about 20% higher than those noted in Table F-3. This is because Table F-4 represents total nitrogen whereas Table F-3 only represents the dissolved inorganic form.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements in the Order are based on the requirements and authorities described below:

A. Legal Authorities

This Order serves as WDRs pursuant to California Water Code article 4, chapter 4, division 7 (commencing with § 13260). This Order is also issued pursuant to federal Clean Water Act (CWA) section 402 and its implementing regulations adopted by U.S. EPA and Water Code chapter 5.5, division 7 (commencing with § 13370). It shall serve as an NPDES permit for point source discharges from the named facilities to surface waters.

B. California Environmental Quality Act (CEQA)

Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act, Public Resources Code division 13, chapter 3 (commencing with § 21100).

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plan.** The Regional Water Board adopted the *Water Quality Control Plan for the San Francisco Bay Basin* (Basin Plan), which designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. The Basin Plan specifies numeric and narrative water quality objectives. The narrative biostimulatory substances objective states, “Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.” Requirements in this Order implement the Basin Plan.

   This Order is consistent with State Water Board Resolution No. 88-63, which established State policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses for the discharges’ receiving waters are listed below:

Table F-5. Basin Plan Beneficial Uses

Receiving Water	Beneficial Uses
San Francisco Bay and its Tidally-Influenced Tributaries	Ocean, Commercial, and Sport Fishing (COMM) Estuarine habitat (EST) Industrial Service Supply (IND) Marine Habitat (MAR), Fish Migration (MIGR) Navigation (NAV) Preservation of Rare and Endangered Species (RARE) Water Contact Recreation (REC1) Noncontact Water Recreation (REC2) Shellfish Harvesting (SHELL) Fish Spawning (SPWN) Wildlife Habitat (WILD)

2. **Anti-Backsliding Requirements.** CWA sections 402(o) and 303(d)(4) and 40 C.F.R. section 122.44(l) restrict backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed.

3. **Antidegradation Policy.** Federal regulations at 40 C.F.R. section 131.12 requires that state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy through State Water Board Resolution 68-16, which is deemed to incorporate the federal antidegradation policy where the federal policy applies under federal law. Resolution 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. Permitted discharges must be consistent with the antidegradation provisions of 40 C.F.R. section 131.12 and State Water Board Resolution 68-16.

4. **Endangered Species Act Requirements.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code §§ 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. §§ 1531 to 1544). This Order contains requirements to protect the beneficial uses of waters of the State, including protecting rare, threatened, or endangered species. Each Discharger is responsible for meeting all applicable endangered species act requirements.

D. Impaired Waters on CWA 303(d) List

In October 2011, U.S. EPA approved a revised list of impaired waters prepared pursuant to CWA section 303(d), which requires identification of specific water bodies where it is expected that water quality standards will not be met after implementation of technology-based effluent limitations on point sources. Where it has not done so already, the Regional Water Board plans to adopt Total Maximum Daily Loads (TMDLs) for pollutants on the 303(d) list. TMDLs establish wasteload allocations for point sources

and load allocations for non-point sources, and are established to achieve the water quality standards for the impaired waters. San Francisco Bay is not listed as impaired by nutrients.

IV. RATIONALE FOR DISCHARGE PROHIBITIONS AND SPECIFICATIONS

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants discharged into waters of the United States. The control of pollutants discharged is established through NPDES permit requirements. There are two principal bases for effluent limitations: 40 C.F.R. section 122.44(a) requires that permits include applicable technology-based limitations and standards; and 40 C.F.R. section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of receiving waters.

This Order continues the receiving water limits that apply to biostimulatory substances from the individual NPDES permits listed in Attachment B. At this time, the Regional Water Board has determined that there is insufficient evidence to conclude that nutrients cause or contribute to excursions of the narrative water quality objective for biostimulatory substances. Therefore, this Order does not include water quality-based effluent limits for nutrients. The individual NPDES permits listed in Attachment B contain other discharge prohibitions, technology-based limitations, and water quality-based specifications, including ammonia effluent limitations.

A. Anti-backsliding

This Order does not backslide because existing permits do not include effluent limitations for nutrients based on the narrative biostimulatory substances water quality objective.

B. Antidegradation

Federal regulations at 40 C.F.R. section 131.12 require that state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy through State Water Board Resolution No. 68-16. This Order covers existing discharges, all of which have been covered by individual NPDES permits adopted in accordance with antidegradation policies. According to a State Water Board guidance memorandum (William Attwater, Chief Counsel, October 7, 1987), "…the federal antidegradation policy ordinarily does not apply to consideration of existing discharges, even if exceptions or variances from other applicable water quality objectives or effluent guidelines are required to permit the discharge to continue." According to the memorandum, considerations in determining whether to perform an antidegradation analysis include the following:

1. whether there are new discharges or an expansion of existing facilities,
2. whether there would be a reduction in the level of treatment of an existing discharge,
3. whether an existing outfall has been relocated,

4. whether there has been a substantial increase in mass emissions, and
5. whether there has been a change in water quality from a point source or non-point source discharge or water diversion.

None of these conditions apply to this Order.

Moreover, no antidegradation analysis is required when the Regional Water Board has no reason to believe that baseline water quality will be reduced. Baseline quality is the best quality of the receiving water that has existed since 1968 when considering Resolution 68-16, or since 1975 under the federal policy, unless subsequent lowering was due to regulatory action consistent with State and federal antidegradation policies. If poorer water quality was permitted, the most recent water quality resulting from permitted action is the baseline water quality to be considered in any antidegradation analysis.

Because all the individual NPDES permits were adopted in accordance with the antidegradation policies, the baseline for evaluating antidegradation is the existing water quality resulting from the individual permits. This Order does not allow for any increase in permitted design flow or allow for any reduction in treatment; therefore, no increase in nutrient discharge beyond the discharges already taking place are foreseeable, and no findings justifying degradation are necessary.

C. Stringency of Requirements for Individual Pollutants

This Order's discharge specifications are no more stringent than required to implement CWA requirements.

V. RATIONALE FOR RECEIVING WATER LIMITS

This Order continues receiving water limits that apply to biostimulatory substances from the individual NPDES permits listed in Attachment B. These limits are based on the Basin Plan water quality objectives. This continuance is necessary, because this Order supercedes nutrient-related requirements in the individual NPDES permits. No other additional limitations are necessary.

VI. RATIONALE FOR PROVISIONS

A. Standard Provisions

The individual NPDES permits listed in Attachment B contain all standard provisions.

B. Monitoring and Reporting Program

Pursuant to 40 C.F.R. section 122.48, NPDES permits must specify requirements for recording and reporting monitoring results. Water Code section 13383, and 40 C.F.R. sections 122.41(h) and (j), authorize the Regional Water Board to require technical and monitoring reports. This Order establishes monitoring and reporting requirements, contained in the Monitoring and Reporting Program (Attachment E), that implement

federal and State requirements. For more background regarding these requirements, see section VII of this Fact Sheet.

C. Special Provisions

1. Evaluation of Potential Nutrient Discharge Reduction by Treatment Optimization and Side-Stream Treatment

This Order requires major Dischargers to study how existing treatment can be optimized and how much it would cost to optimize and implement minor upgrades to their existing treatment systems to reduce nutrient loads to San Francisco Bay. This information is necessary to understand the extent that Dischargers can maximize existing treatment systems for nutrient removal to reduce the risk of impairment of San Francisco Bay. This Order also requires evaluation for side-stream treatment opportunities. Implementing side-stream treatment can be a capital intensive upgrade, but it is included in the optimization evaluation since opportunities for side-stream treatment are site-specific.

Major facilities are those with a design flow greater than or equal to 1 million gallons per day (mgd). While most of the nutrient loads to San Francisco Bay are from municipal wastewater treatment facilities with design flows greater than 10 mgd, this Order requires other major facilities to evaluate the potential to optimize their treatment and to evaluate the costs of upgrades because there is uncertainty concerning nutrient cycling within in San Francisco Bay. It is possible that all nutrient sources may contribute significantly to nutrient impacts and that many Dischargers will need to optimize treatment.

For Dischargers that implement minor upgrades or treatment plant optimization, the Regional Water Board intends to recognize early actions and encourage early nutrient removal where opportunities exist. As part of Dischargers' actions to implement minor upgrades or treatment plant optimization, Dischargers should also consider how such actions may be consistent with or contrary to actions Dischargers plan to address the impacts of sea level rise and climate change.

This provision is authorized by Clean Water Act section 1318(a) and Water Code section 13383. Section 1318(a) authorizes the collection of information necessary to carry out the objectives of the Clean Water Act, including but not limited to developing or assisting in the development of any effluent limitation, other limitation, prohibition, effluent standard, pretreatment standard or standard of performance. The Regional Water Board implements this requirement through Water Code section 13383.

2. Evaluation of Potential Nutrient Discharge Reduction by Treatment Plant Upgrades or Other Means

This Order requires major Dischargers to study how existing treatment plants can be upgraded and how much it could cost to upgrade their existing treatment systems to reduce nutrient loads to San Francisco Bay and its tributaries. This information is

necessary to understand measures the Dischargers could need to implement to significantly reduce nutrient discharges should the need arise to reduce the risk of impairment of San Francisco Bay.

This requirement is consistent with U.S. EPA's NPDES Permit Writers' Manual, which states:

> Treatability studies are applicable when treatability information is lacking for a pollutant or pollutants that would prohibit a permit writer from developing defensible technology-based effluent limits. Treatability studies can also be required if the permit writer suspects that a facility may not be able to comply with an effluent limit.[5]

This Order requires major Dischargers to evaluate options for upgrading their treatment plants because nutrient load reductions from their facilities could be important in reducing potential nutrient-related impacts in San Francisco Bay.

The intent of the requirement to address sea level rise and climate change as part of the nutrient upgrade evaluation is to avoid identifying nutrient removal options that turn out to be infeasible because of actions implemented or planned to address sea level rise or climate change.

Additionally, this provision highlights that major Dischargers can evaluate other means for reducing nutrient loads that may have positive ancillary benefits. For example, Dischargers could consider increasing water recycling to reduce nutrient loads and potable water use. It may also be possible to use wetlands or other treatment upgrades to remove nutrients while also providing habitat, including habitat for endangered species; protecting against sea level rise; and removing constituents of emerging concern, such as pharmaceuticals. This evaluation should also consider how upgrades that reduce nutrient loads may be consistent with or contrary to upgrades Dischargers plan to address the impacts of sea level rise and climate change.

This provision is authorized by Clean Water Act section 1318(a) and Water Code section 13383. Section 1318(a) authorizes the collection of information necessary to carry out the objectives of the Clean Water Act, including but not limited to developing or assisting in the development of any effluent limitation, other limitation, prohibition, effluent standard, pretreatment standard or standard of performance. The Regional Water Board implements this requirement through Water Code section 13383.

Also, this Order requires Dischargers to evaluate the impact on nutrient loads due to treatment plant optimization and upgrades implemented in response to other regulations or requirements. The Regional Water Board understands reductions in nutrient loads may impact the loads of other pollutants in the effluent as well as biosolids quality, and vice versa. For example, an upgrade from biosolids

[5] *U.S. EPA NPDES Permit Writers' Manual*, Publication Number EPA-833-B-96-003, December 1996, page 139.

incineration to anaerobic digestion will result in an increase in nutrient loading to the POTW effluent. This requirement will allow Dischargers to show how nutrient loads will increase or decrease after process changes are made in response to other regulations and requirements and will help elucidate the balance of competing environmental benefits.

3. Monitoring, Modeling, and Embayment Studies

This Order requires the Dischargers to conduct, or to collaborate on, studies to address the potential impacts of nutrients on San Francisco Bay beneficial uses. The Regional Water Board recognizes there are great efficiencies from collaborating on large scale study efforts. The Bay Area Clean Water Agencies (BACWA) has identified $880,000[6] each permit year as a collective level of effort from the Dischargers. The Regional Water Board finds this amount to be an appropriate level of effort initially to support science plan development and implementation and receiving water monitoring for nutrients identified in this provision. If the Dischargers and BACWA are successful in securing additional outside resources, such as from grants or other agencies for nutrient monitoring or studies identified in the science plan, the outside funding and work would not be requirements under this Order, nor would the outside funding count towards the Dischargers' level of effort under this provision.

The Regional Water Board notes that Dischargers have contributed over a million dollars directly and through the RMP to fund scientific studies examining the impact of nutrients on San Francisco Bay and have conducted facility nutrient monitoring since July 2012. Dischargers are also collaborating with other regional stakeholders on the development of a science plan and governance structure to guide scientific research on nutrient impacts.

Support for modeling will inform the development of Nutrient Numeric Endpoints (NNEs) that the Regional and State Water Boards are developing. The NNE framework aims to establish a suite of numeric endpoints based on the ecological response of a waterbody to nutrient over-enrichment and eutrophication (e.g., excessive algal blooms leading to decreased dissolved oxygen). In addition to numeric endpoints for response indicators, the NNE framework will include models that link the response indicators to nutrient loads and other management control**s** for a range of potential future conditions in the Bay. The NNE framework is intended to serve as numeric guidance to translate the Basin Plan's narrative objective for biostimulatory substances. The modeling efforts will enable a mechanistic (cause and effect) approach that bases management endpoints on ecological response. In this way, the model may be used to link nutrient loads with co-factors (e.g., strength of tides, residence time, clam grazing, increase/decreases in turbidity) and, therefore, provide more accurate information on the relative importance of reducing nutrient loads from certain Dischargers.

[6] The $880,000 identified by BACWA does not include costs to comply with other provisions of this Order or funds Dischargers contribute to the Regional Monitoring Program.

On the subembayment level, there is a need to coordinate studies, such as those in Suisun Bay, to better understand why phytoplankton biomass is suppressed in this bay segment. In Suisun Bay, extremely low phytoplankton biomass and a highly-altered phytoplankton community composition have characterized the system since 1987, when the invasive clam *Corubula amurensis* became widely established. Studies suggest that elevated levels of ammonium or an altered ratio in nitrogen to phosphorus may be contributing to low phytoplankton biomass and changes in phytoplankton species composition.[7] Additionally, there is also a need to coordinate studies for the Lower South Bay because it is enriched with nitrogen and phosphorus. The median dissolved inorganic nitrogen concentrations in South San Francisco Bay are almost ten times higher than those in estuaries that do not have direct municipal wastewater treatment plant discharges.[8] Trends in chlorophyll (a) suggest that this portion of the estuary may be starting to lose some of its historic resilience to high nutrient loads.

This provision is authorized by Clean Water Act section 1318(a) and Water Code section 13383. Section 1318(a) authorizes the collection of information necessary to carry out the objectives of the Clean Water Act, including but not limited to developing or assisting in the development of any effluent limitation, other limitation, prohibition, effluent standard, pretreatment standard or standard of performance. The Regional Water Board implements this requirement through Water Code section 13383.

4. Reopener Provisions

These provisions are based on 40 C.F.R. sections 122.62 and 122.63 and allow modification of this Order as necessary in response to updated water quality standards, regulations, or other new and relevant information that may become available in the future, and other circumstances as allowed by law.

VII. RATIONALE FOR MONITORING AND REPORTING PROGRAM (MRP)

Attachment E contains the MRP for this Order. It specifies pollutants to be monitored, monitoring frequencies, and reporting requirements. The following provides the rationale for the MRP requirements.

Consistent with the Regional Water Board's March 2, 2012, Water Code section 13267 order to collect nutrient data, this Order requires Dischargers to report nitrogen and phosphorus discharge levels and trends. The monitoring frequencies specified depend on each Discharger's nutrient loads and its resources to conduct the monitoring. For example, those with larger flows are required to monitor more frequently.

This Order requires the Dischargers to support receiving water monitoring to enable load/response modeling, track nutrient trends over time, and identify harmful algae blooms

[7] SFEI, Nutrient Conceptual Model Draft, May 1, 2013, page 6.
[8] Cloern, J. E., and A. D. Jassby (2012), "Drivers of change in estuarine-coastal ecosystems: Discoveries from four decades of study in San Francisco Bay," *Reviews of Geophysics,* 50, RG4001, page 14.

and associated toxins. These requirements are necessary because San Francisco Bay may be becoming less resistant to nutrient discharges, municipal wastewater treatment facilities are the primary source of nutrient loadings to San Francisco Bay, and the need for future controls can be informed by an improved understanding of the fate and transport of nutrients in San Francisco Bay.

Finally, this Order requires Dischargers to submit an annual report, either individually or as a group. The annual report is to include a summary of monitoring data and an evaluation of nutrient load and concentration trends. This information is necessary to establish baseline loads. The requirement for a trend analysis is to ensure that Dischargers investigate the causes of any changes in nutrient discharges from their treatment plants. This will allow for a better understanding of why nutrient loads may change and help identify controllable measures for maintaining levels of treatment. Additionally, this Order requires that Dischargers report nutrient loads from all municipal treatment plants in their respective subembayments. This is to establish baseline loads by subembayment and the potential for nutrient load trading.

VIII. PUBLIC PARTICIPATION

The Regional Water Board considered the issuance of WDRs that will serve as an NPDES permit for the Dischargers' facilities. As a step in the WDR adoption process, Regional Water Board staff developed tentative WDRs and encouraged public participation in the WDR adoption process.

A. Notification of Interested Parties. The Regional Water Board notified the Dischargers and interested agencies and persons of its intent to prescribe WDRs for the discharge and provided an opportunity to submit written comments and recommendations. Notification was provided by transmitting electronic copies of tentative WDRs to the Dischargers and other interested parties and by publishing a notice in the Oakland Tribune. The public had access to the agenda and any changes in dates and locations through the Regional Water Board's website at www.waterboards.ca.gov/sanfranciscobay.

B. Written Comments. Interested persons were invited to submit written comments concerning the tentative WDRs as explained through the notification process. Comments were due either in person or by mail at the Regional Water Board office at 1515 Clay Street, Suite 1400, Oakland, California 94612, to the attention of **Robert Schlipf**. For full staff response and Regional Water Board consideration, the written comments were due at the Regional Water Board office by **5:00 p.m.** on Monday, **March 10, 2014**.

C. Public Hearing. The Regional Water Board held a public hearing on the tentative WDRs during its regular meeting at the following date and time, and at the following location:

Date: **April 9, 2014**
Time: 9:00 a.m.
Location: Elihu Harris State Office Building

1515 Clay Street, 1st Floor Auditorium
Oakland, CA 94612

Contact: Robert Schlipf, (510) 622-2478, robert.schlipf@waterboards.ca.gov

Interested persons were invited to attend. At the public hearing, the Regional Water Board heard testimony pertinent to the discharge, WDRs, and permit. For accuracy of the record, important testimony was requested to be in writing.

Dates and venues change. The Regional Water Board web address is http://www.waterboards.ca.gov/sanfranciscobay, where one could access the current agenda for changes in dates and locations.

D. Reconsideration of Waste Discharge Requirements. Any aggrieved person may petition the State Water Board to review the Regional Water Board decision regarding the final WDRs. The State Water Board must receive the petition at the following address within 30 calendar days of the Regional Water Board action:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

For instructions on how to file a petition for review, see http://www.waterboards.ca.gov/public_notices/petitions/water_quality/wqpetition_instr.shtml.

E. Information and Copying. Supporting documents, and comments received are on file and may be inspected at the address above at any time between 9:00 a.m. and 5:00 p.m., Monday through Friday. Copying of documents may be arranged by calling (510) 622-2300.

F. Register of Interested Persons. Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Regional Water Board, reference the Facility, and provide a name, address, and phone number.

G. Additional Information. Requests for additional information or questions regarding this Order should be directed to Robert Schlipf at (510) 622-2478 or RSchlipf@waterboards.ca.gov.

Reference 10

Santa Clara Valley Water District

Urban Water Management Plan

2010

Sections

1 Introduction
2 Service area and Water Supply System
3 Water Supply Sources
4 Historical Water Use and Demand Projections
5 Demand Management Measures
6 Water Shortage Contingency Planning
7 Water Recycling
8 Water Quality
9 Addressing Threats to Supply Reliability
10 Water Supply Reliability
11 Appendices

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6 2010 URBAN WATER MANAGEMENT PLAN

Chapter 6.0 | Water Shortage Contingency Planning

This chapter describes the development, actions and implementation of the District's water shortage contingency plan. In addition, information related to a three dry year scenario, mandatory prohibitions, penalties or charges for excessive use, revenue and expenditure impacts, mechanisms to determine reductions in water use and catastrophic interruption planning is provided. Information in this chapter is intended to satisfy the requirements related to DWR UWMP Checklist items 37 through 42.

6.1 Water Supply Strategy

Overall, the District manages water supplies and programs to maximize storage of wet period supplies for use during dry periods when other sources of supply are deficient. Because the groundwater basins are able to store the largest amount of local reserves, the District depends on maintaining adequate storage in the basins to get through extended dry periods.

In addition to working with retailers and cities to manage water use during shortages, the District augments supplies by investing in supplemental supply sources. The District has a long term agreement with Semitropic Water Storage District in Kern County that allows the District to store up to 350,000 AF of imported water supplies in Semitropic's groundwater basins for District use in dry years. During prolonged dry periods, the Semitropic banking program provides a significant supplemental supply to draw upon. Other options may be available in any given year such as transfers, exchanges, spot markets, and the State Drought Bank. The decision on when and in which sequence supply will be utilized during different stages is managed by annual operations and planning and includes consideration of availability and cost.

6.2 Water Shortage Contingency Plan Objectives

The water shortage contingency plan stages and water use reduction targets were developed by the District consistent with water supply objective 2.1.1 "…maintain the groundwater basins for reliability" and in consideration of the following water shortage management objectives:

- Minimize economic, social, and environmental hardships to the community caused by water shortages. As water becomes more scarce and the community is faced with increasing cutbacks, the costs of shortage rise and the risk of lasting damages to residences, businesses and the environment increases. Taking this into consideration, the timing and stages of shortage actions are designed to limit and to avoid having to call for more than a 20 percent reduction in water use in any given year of an extended dry period.

- Establish water use reduction targets, manage supplies and work closely with retailers and cities in developing efficient and effective demand reduction measures that concentrate on eliminating non-essential uses first.

- Maintain and safeguard essential water supplies for public health and safety needs. The water shortage contingency plan anticipates and accounts for water supply shortages due to acute catastrophic events. The District's water supply system is vulnerable to several disaster scenarios including a loss of imported supplies due to a Delta levee outage, an interruption of San Francisco's regional water system deliveries to Santa Clara County, and/or a major earthquake.

6.3 Water Shortage Contingency Plan

This section describes the District's contingency planning for actions that can be taken should water shortages occur, including up to a 50 percent reduction in water supplies. The plan provides a strategy for early water shortage detection, shortage stages, shortage response actions, and a public outreach and communication plan. A water shortage occurs when water supplies available to the District are insufficient to meet water demands. Water supply shortages can occur for a variety of reasons including droughts (hydrologic or regulatory), loss in ability to capture, divert, store, or utilize local supplies, and/or facility outages.

The purpose of contingency planning is to be prepared ahead of time and to establish actions and procedures for managing water supplies and demands during water supply reductions and water shortages. An important component of meaningful shortage response is the ability to recognize a pending shortage before it occurs, early enough so that several options remain available and before supplies that may be crucial later have not been depleted.

In any given year many factors and events can and do affect water supply availability. Staff has determined that projected end-of-year groundwater storage serves as an early warning sign and a good indicator of potential water shortages since this value also accounts for surface water supplies as these supplies either directly or indirectly contribute to total projected groundwater storage.

While the District manages the groundwater basin, groundwater in the county is pumped by others including major water retailers, private well owners, and agricultural users. The District can influence groundwater pumping through financial and management practices, but it does not directly control the amount of groundwater pumped. Therefore, to execute effective responses to a water shortage, the District works closely with groundwater users, cities, and water retailers to plan and coordinate water shortage contingency activities. A key part of developing the water shortage contingency plan was the engagement of water retailers, cities, and District advisory committees.

6.3.1 Water Shortage Actions

This section describes the five-stage approach and overall strategy for dealing with water shortages. The water shortage contingency actions are summarized in Table 6-1. When water supplies available to the District are insufficient to meet current demands, the District considers augmenting supplies based on available options. When the District Board calls for short-term water conservation, the cities and water retailers consider the implementation of their water contingency plan actions identified in their Urban Water Management Plans in order to achieve the necessary shortage response. Water shortage resolutions passed by the District Board in 2009 and 2010 are included in Appendix L. Implementation actions to achieve the desired shortage response may be different for each city/water retailer depending on service area composition (commercial, industrial, residential) and source of water supplies. However, some actions are common to several of the cities/water retailers, providing for more consistent implementation and messaging.

Reducing water consumption during a water shortage is generally achieved through increased education leading to behavioral changes (e.g., shutting off the water while brushing one's teeth) and water use restrictions (e.g., yard irrigation only allowed two days a week). These water savings are considered short term water conservation and are distinct from long term on-going conservation programs.

Stage 1

In Stage 1, the District continues ongoing outreach strategies aimed toward achieving long-term water conservation goals. Messages at this stage focus on services and rebate programs the District provides to facilitate water use efficiency for residents, agricultural operations and businesses. While the other stages are more urgent, the need for successful outcomes in Stage 1 is vital to achieving long-term water use reduction goals.

Stage 2

Communication tactics that are employed in Stage 1 may be augmented with additional funding to reach more people with an increased frequency and urgency. Additional communication tools can be employed to further broaden awareness and promote immediate behavioral changes. Specific implementation plans will be developed when a worsening of the water shortage condition has occurred. Supplemental funding may be identified to augment budgeted efforts, which normally will be set based on an assumption that the county is in Stage 1. Based on historical hydrology and management and operations of District supplies, it is estimated that groundwater storage would be in Stage 2 one out of every ten years.

Stage 3

As the severity of a water shortage increases, the intensity of communications efforts may also increase. Messages are modified to reflect the more dire circumstances. The messages conveyed change to correspond to the call for immediate actions to save water. Based on historical hydrology and management and operations of District supplies, it is estimated that in one out of every 15 years groundwater storage would be in Stage 3.

Stage 4

In this stage and retailers and cities would be encouraged to enforce their water shortage plans which could include fines for repeated violations. Stage 4 strengthens and expands the Stage 3 activities including further expansion of outreach efforts and opening a drought information center.

Stage 5

Stage 5 of the water shortage contingency plan designates and reserves up to 150,000 AF in surface and groundwater storage for emergency conditions to ensure availability of water to meet essential public health safety requirements.

Table 6-1 Water Shortage Contingency Plan

Stage	Stage Title	Projected GW Reserves	Response	Suggested Reduction in Water Use[1]	Communication and outreach effort
Stage 1	Normal	Above 300,000 AF	Continue regular outreach activities in this stage to promote ongoing implementation of conservation and implementation of BMPs.		• Maintain public information and outreach focused on long term, ongoing conservation actions (e.g., water saving appliances, repairing leaks, and low-water use landscaping).
Stage 2	Alert	250,000 to 300,000 AF	This stage is meant to warn customers that current water use is tapping into groundwater reserves – a signal that groundwater levels are dropping to meet demands. Communications are needed to set the tone for the onset of shortages. Request water users to reduce water use by as much as 10%. Coordinate ordinances with cities and warn and prepare for a stage 3 situation.	0-10% demand reduction	• Expand on Stage 1 efforts • Intensify public information and advertising campaign • Focus messages on shortage situation and immediate behavioral changes
Stage 3	Severe	200,000 to 250,000 AF	Shortage conditions are worsening, requiring close coordination with retailers and cities to enact ordinances and water use restrictions. Requires significant effort and behavioral change by water users. Increase outreach campaign to save water.	10-20% demand reduction	• Expand and intensify Stage 2 activities • Further expand outreach efforts • Modify messages to reflect more severe shortage condition and need for immediate behavioral changes
Stage 4	Critical	150,000 to 200,000 AF	This is the most severe stage in a multiyear drought. Encourage retailers and cities to enforce their plans which could include fines for repeated violations.	20-40% demand reduction	• Strengthen and expand Stage 3 activities • Further expand outreach efforts • Open drought information center
Stage 5	Emergency	Below 150,000 AF	This last stage is meant to address a more immediate crisis such as a major infrastructure failure. Water supply would be available only to meet health and safety needs.	Up to 50% demand reduction	• Daily updates on water shortage emergency (media briefings, web update, social media outlets) • Activate EOC

Notes:

(1) When the District Board calls for short-term water conservation, the cities and water retailers will consider the implemention of water contingency plan actions identified in their Urban Water Management Plans in order to achieve the necessary shortage response. The District works with the water retailers and cities to help coordinate these activities.

6.4 Three Dry Years Scenario

This section presents an estimate of the water supply available during each of the next three years (2011 – 2013), assuming a repeat of the driest three-year historical hydrologic sequence. Minimum total available supplies (including both local and imported supplies) for a consecutive three year sequence occurred in the years 1988 through 1990. Table 6-2 summarizes the water supply that could be expected in a repeat of those three years.

Year-to-year decision making is accomplished through annual operations planning activities, which include evaluating annual transfer opportunities, allocating imported water deliveries, setting carryover storage targets, and scheduling facilities maintenance decisions. Developing a resource strategy that balances both cost and risk requires a combination of core and flexible supplies. Examples of flexible supplies include water transfers, banking, and storage.

As Table 6-2 shows, the District would need to draw down carryover storage by approximately 194,900 AF in order to meet full demands over the next three years assuming the next three years were a repeat of the driest three-year historical hydrologic sequence. Based on current groundwater conditions at the start of 2011, a 10% demand reductions for each of the next three years would be recommended.

Table 6-2 Water Supply Estimates for the Driest Three-Year Sequence (acre-feet)

Water Supply Sources	Year 1 Hydrologic Year 1988	Year 2 Hydrologic Year 1989	Year 3 Hydrologic Year 1990
Imported Water			
SWP[1]	47,400	58,800	26,300
CVP[1]	69,000	105,900	76,100
Semitropic take & transfers	39,700	34,000	39,700
SFPUC to common retailers[2]	52,600	52,600	45,700
Subtotal:	208,700	251,300	187,800
Local Supplies			
Natural groundwater yield	44,100	45,500	51,000
Surface supplies	29,000	21,600	19,400
Other local	3,400	6,900	4,400
Recycled water	15,000	16,500	18,000
Subtotal:	91,500	90,500	92,800
Total Supply:	300,200	341,800	280,600
Estimated demand	370,000	372,500	375,000
Annual decrease in carryover storage[3]	69,800	30,700	94,400
		Total decrease in carryover storage:	194,900

Notes:
(1) Includes supply allocation transfer/exchange, rescheduled and carry-over storage
(2) Based on "Procedure for Pro-Rata Reduction of Wholesale Customers' Individual Supply Guarantees" under 2010 demand conditions and Tier Two Allocations calculation spreadsheet provided by BAWSCA.
(3) Initial conditions set to end of calendar year 2010

6.5 Mandatory Prohibitions and Penalties for Excessive Use

As an on-going practice, the District collaborates with cities, the county, retail water suppliers and stakeholders in developing and implementing water management programs to conserve and prevent waste.

The District Board of Directors has the authority to adopt resolutions and ordinances as formal procedures to take action on matters of significance. For instance, the District may take action to prevent the waste of water as part of the overall effort to protect and manage water resources for beneficial uses. It is a misdemeanor for any person to violate any District ordinances. Violations are punishable by fine or imprisonment or both.

6.6 Revenue and Expenditure Impacts

Under a water shortage scenario, District expenses are anticipated to increase as a result of actions to augment water supply and reduce use. Revenue would decrease as a result of reduction in water sales. The District maintains supplemental funds in its financial reserves to help pay for increased expenditures to remedy shortages. These funds need to be replenished in subsequent years however, through groundwater production charges and treated water charges. The FY 2011 budget for the supplemental waters supply reserve is $7.7M and is projected to grow to roughly $11.7M by FY 2021. The minimum for this reserve is 20 percent of the annual water purchase budget. The District may decide to impose or adjust its adopted groundwater production charges mid-way through the fiscal year. This allows the District to react to unanticipated changes in expenditures or revenue in a timely fashion.

6.7 Mechanism to Determine Actual Reduction in Water Use

In times of shortage, staff will intensify its monitoring and evaluation of the following activities:

- Monthly and season-to-date rainfall at four rainfall stations within the county
- Reservoir storages
- Monthly recycled water deliveries
- Monthly and year-to-date water use for each major water retailer in the county
- Groundwater basin conditions
- Current retailer water use compared to a desired decrease in use

Note that not all water use data is available on a monthly basis. For example, many small well owners report their water usage on a 6 month cycle. In some cases there is a two-month time-lag from when the water is used and reported. Not all water use is metered and estimates are used in these situations. Finally, the District does not have access to individual water use account data that would enable it to determine the reductions by

customer class or by customer unit (per household, for example). This data is only available at the retailer level.

6.8 Catastrophic Interruption Planning

6.8.1 Water Infrastructure Reliability Project

In 2003, the District initiated the Water Utility Infrastructure Reliability Project (IRP) to determine the current reliability of its water supply infrastructure (pipes, pump stations, treatment plants) and to appropriately balance level of service with cost. The project measured the baseline performance of critical District facilities in emergency events and identified system vulnerabilities. The study concluded that the District's water supply system could suffer up to a 60-day outage if a major event, such as a 7.9 magnitude earthquake on the San Andreas Fault, were to occur. Less severe hazards, such as other earthquakes, flooding and regional power outages had less of an impact on the District, with outage times ranging from one to 45 days.

The level of service goal identified for the IRP was "Potable water service at average winter flow rates available to a minimum of one turnout per retailer within seven days, with periodic one day interruptions for repairs." In order to meet this level of service goal, the project developed seven portfolios to mitigate the identified system risks, and identified a recommended portfolio for implementation. As a result, the District has been implementing the recommended portfolio of reliability improvement projects (Portfolio 2). The cost to implement Portfolio 2 is estimated to be approximately $175 Million. Portfolio 2 is expected to reduce the post-earthquake outage period from 45-60 days to 7-14 days.

In 2007, the District created a stockpile of emergency pipeline repair materials including large diameter spare pipe, internal pipeline joint seals, valves, and appurtenances. The stockpile marks a significant increase in reliability of the District's water supply system, as it helps to reduce outage time following a large earthquake from approximately 60 to 30 days. The District still needs to complete several other emergency planning projects to meet the goal of reducing outage time to 30 days. These include developing a post-disaster recovery plan, developing mutual aid agreements or expanding participation in CalWARN, setting up contractor, welder, and equipment rental company retainer agreements, and setting up post-earthquake pipeline inspection teams.

The addition of groundwater wells and line valves to the District's system will further reduce outage time following a large earthquake, from 30 days down to 14 days. The wells will allow the District to convey 72 MGD of supplies from the groundwater basin to the treated water pipelines following a hazard event. 72 MGD represents the average winter demand of the treated water retailers, and is the quantity needed to meet the project's level of service goal. The line valves will allow the District to isolate damaged portions of pipelines. The well field project is the most costly of the Portfolio 2 projects, estimated at $116 million. The District's Board recently approved cutting the project budget to $80 million. Staff has not determined the impacts of this cut on

the program and outage time estimates.

6.8.2 Office of Emergency Services

Office of Emergency Services (OES) coordinates emergency response and recovery for the District. During any emergency, the District continues the primary missions of providing clean, safe water and flood protection to the people of Santa Clara County. OES ensures that critical services are maintained and emergency response is centralized. OES maintains a full-time professional emergency management staff trained and equipped to respond quickly at any time of day or night to support and coordinate more than 170 Santa Clara Valley Water District Emergency Operations Center (EOC) and field responders. Over 150 members of the water District staff have completed the specialized California Standardized Emergency Management System/National Incident Management System (SEMS/NIMS) training. More than 100 of those individuals have taken advanced EOC action planning training.

6.8.3 Emergency Operations Center

The Emergency Operations Center (EOC) is connected to other agencies and jurisdictions by an array of telecommunications, two-way radio, satellite telephone, and wireless messaging systems. In addition, two response vehicles with many of the same communications capabilities of the EOC enable staff to establish mobile emergency command posts just about anywhere field operations may require.

OES maintains communications with local, state and national emergency management organizations and allied disaster preparedness and response agencies.

OES partners include the following:

- Emergency management offices of Campbell, Cupertino, Gilroy, Los Altos, Los Altos Hills, Los Gatos, Saratoga, Milpitas, Monte Sereno, Morgan Hill, San José, Santa Clara, Mountain View, Palo Alto, and Sunnyvale.
- County offices of emergency services including Santa Clara, Monterey, San Benito, Santa Cruz and San Mateo.
- State emergency management organizations including the Governor's Office of Emergency Services, California Office of Safety Dams and California Department of Water Resources.

Reference 11

Santa Clara Valley Water District

FC 1025 (08/17/11)

Meeting Date:	12/13/11
Agenda Item:	4.2
Unclassified Manager:	J. Fiedler
Extension:	2736
Director(s):	All

BOARD AGENDA MEMO

SUBJECT: Water Supply and Infrastructure Master Plan Update

RECOMMENDATION:

A. Receive an update on the Water Supply and Infrastructure Master Plan project;
B. Provide input to staff on potential water supply projects and strategies; and
C. Direct staff to continue development of the Water Supply and Infrastructure Master Plan.

SUMMARY:

The Board was last provided with an update on the development of the Water Supply and Infrastructure Master Plan (Water Master Plan) on January 25, 2011. At that time, staff described the purpose of the Water Master Plan and presented an update on work that had been completed to date. Information was provided on the evaluation of the existing water supply and infrastructure system, an assessment of potential climate change conditions and impacts, planning objectives and assessment criteria, and stakeholder input. Since that time, staff has completed the long-term water supply outlook, developed potential projects and programs for inclusion in the Water Master Plan, and identified alternative water supply strategies for addressing long-term water supply needs. Staff also continued stakeholder engagement efforts. The purpose of this item is update the Board on stakeholder input on the Water Master Plan, the long-term water supply outlook, and progress toward identifying a preferred water supply strategy for meeting future water supply needs. The Water Master Plan is scheduled to be completed in August 2012.

Water Master Plan Purpose and Linkage to Board Governance Policy

The purpose of the Water Master Plan is to establish a multi-objective plan for guiding investment of public funds in securing an adequate supply of high-quality water to satisfy Board Governance Policy E-2.1, which states “current and future water supply for municipalities, industries, agriculture and the environment is reliable.” The Water Master Plan will: 1) articulate the District’s long-term water supply strategy; and 2) identify the water supply sources and facilities that will be needed to ensure future water supply reliability. Thus, the Water Master Plan will inform the Five-Year Capital Improvement Program and annual budget development processes. This will improve efficiency and effectiveness of water supply planning by linking existing and future planning efforts and providing a financial investment strategy for securing water supply reliability through year 2035.

FINANCIAL IMPACT:

None, this is a discussion item.

CEQA:

None, this is a discussion item.

ATTACHMENTS:

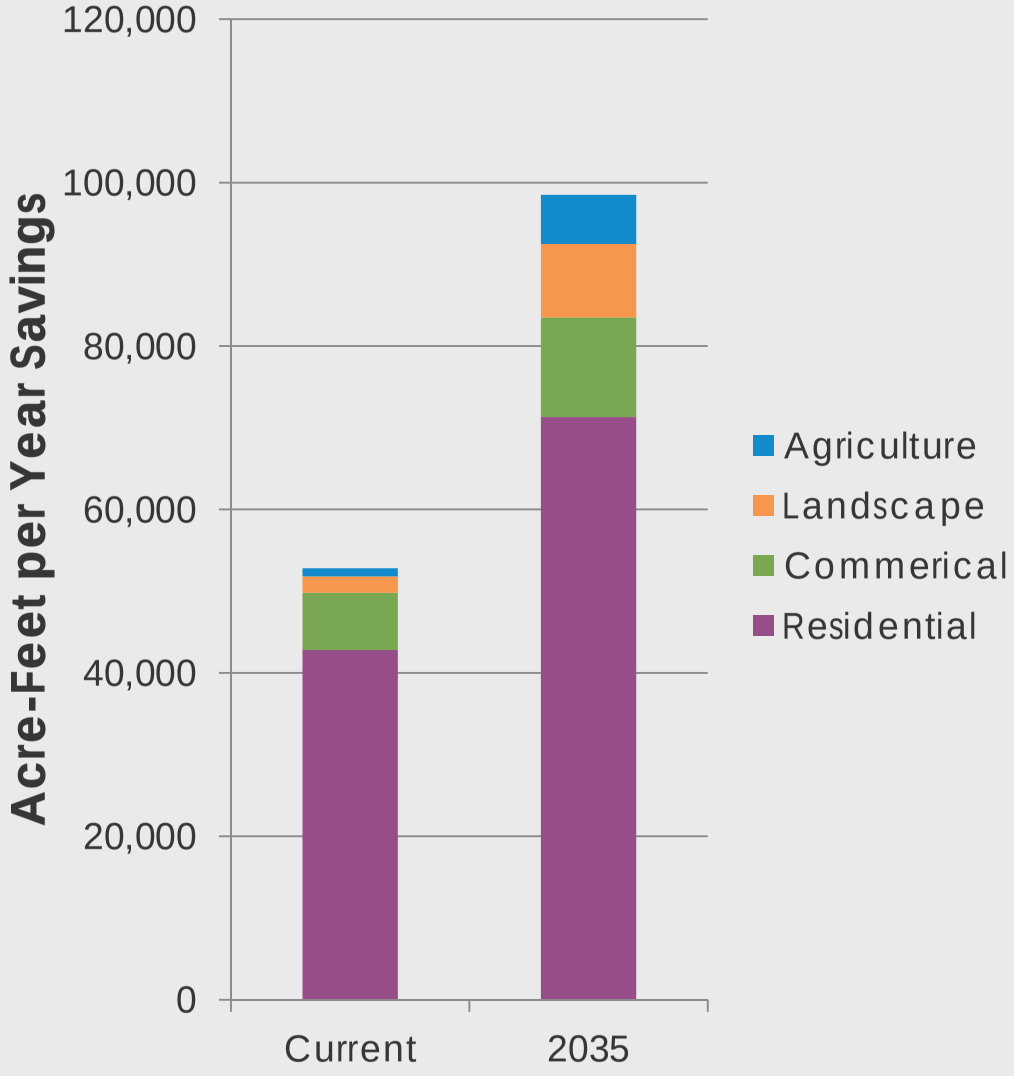
1. Water Supply and Infrastructure Master Plan Planning Objectives Summary
2. PowerPoint Presentation: Water Supply and Infrastructure Master Plan Update

Water Supply and Infrastructure Master Plan Update

Tracy Hemmeter
Senior Project Manager

1. Additional Water Conservation

300 acre-feet per year in addition to 98,500 acre-feet per achieved as part of the Core Elements

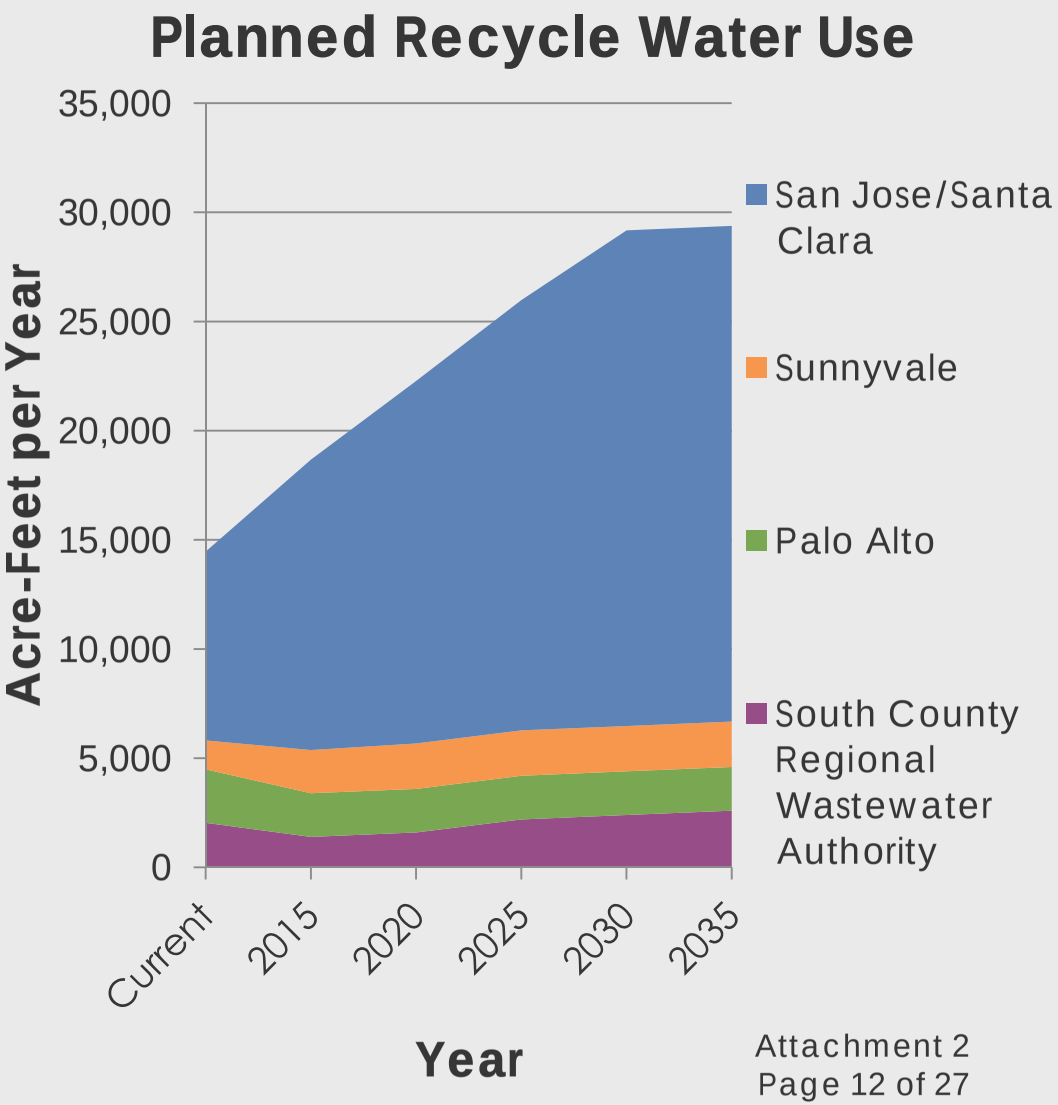


- Gray water use is currently feasible(300 acre-feet per year)
- Will continue to evaluate new conservation opportunities
- Conservation savings included in core elements
- Strong working relationship with retailers

2. Additional Non-Potable Recycling

240 - 700 acre-feet per year in additional to 29,000 acre-feet achieved as part of the Core Elements

- Regional connectors and pipeline extensions
- Local and regional recycled water master plans underway
- Regional partnerships and collaboration



3. Indirect Potable Reuse

3,000 – 20,000 acre-feet per year

- New local supply
- All-weather supply
- Builds on existing partnerships and systems
- High cost for treatment and conveyance
- Requires public and regulatory acceptance

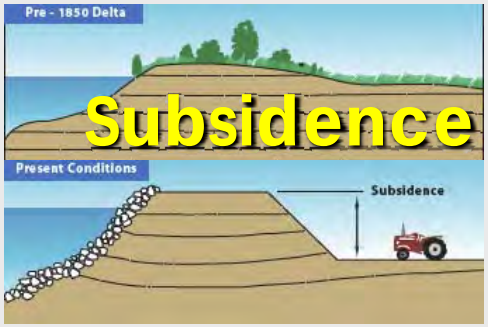
4. New Groundwater Recharge Ponds

2,000 – 8,000 acre-feet per year

- Better when combined with other projects that include new supply development
- Potential locations in Guadalupe, West Valley, and Llagas watersheds
- Benefits groundwater quantity and quality
- More efficient use of existing supplies
- Relatively low cost

5. Imported Water Agreements

Up to 30,000 acre-feet per year



- Includes new contracts, dry year transfer options, and exchanges
- Provides dry year supplies to meet potable needs
- Subject to pumping restrictions and outages in Delta facilities
- Efforts underway to restore imported water reliability

6. Regional Desalination

2,000 acre-feet per year

- Transfer water in dry years
- Regional partnerships
- Pilot testing completed in 2010
- Technical studies underway
- Highest per unit cost of water

7. Pipelines between Reservoirs and Raw Water System

900 – 3,000 acre-feet per year

- Connects additional reservoirs to the raw water system
- Uses wet weather flows to help maintain water supply reserves
- Builds on existing water supply system

8. Reservoir Expansion

Up to 15,000 acre-feet per year

- Storage is good for managing risks such as imported water outages and climate change
- Additional recreation benefits
- Potential adverse environmental impacts

Water supply strategies are combinations of projects to meet future water needs

Strategies meet reliability goal to avoid calls for short-term water use reductions greater than 20 percent

Water Supply Strategy	Estimated Present Value Cost	Risk Factors
1. Local Supply Development (Indirect Potable Reuse)	$600M - $700M	•Public and regulatory acceptance
2. System Flexibility (Reservoir Expansion & Pipelines)	$400M - $600M	•Public and regulatory acceptance •Supplemental supplies may be subject to outages
5. Minimize Costs (Dry Year Options)	$100M	•Subject to Delta outages and pumping restrictions

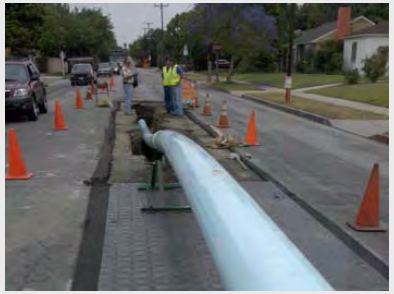
Strategy: Local Supply Development

Estimated Present Value Cost = $600M - $700M

Includes advanced treatment of recycled water, conveyance pipelines, and groundwater recharge

- Provides a local supply that is reliable in all types of year
- Builds on existing facilities
- Helps maintain reservoir supplies for meeting fishery needs
- Reduces freshwater flows to saltwater habitat in South San Francisco Bay
- Public outreach and regulatory acceptance critical to successful implementation

Reverse Osmosis Treatment

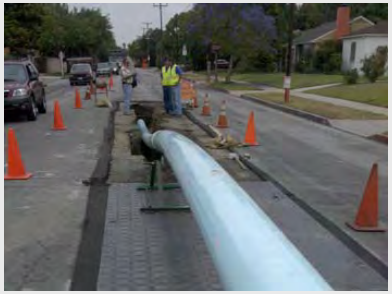


New Pipelines

Groundwater Recharge

Strategy: System Flexibility

Estimated Present Value Cost = $400 M - $600 M



New Pipelines

Reservoirs

Imported Water

Includes new pipelines and reservoir expansion or retrofits

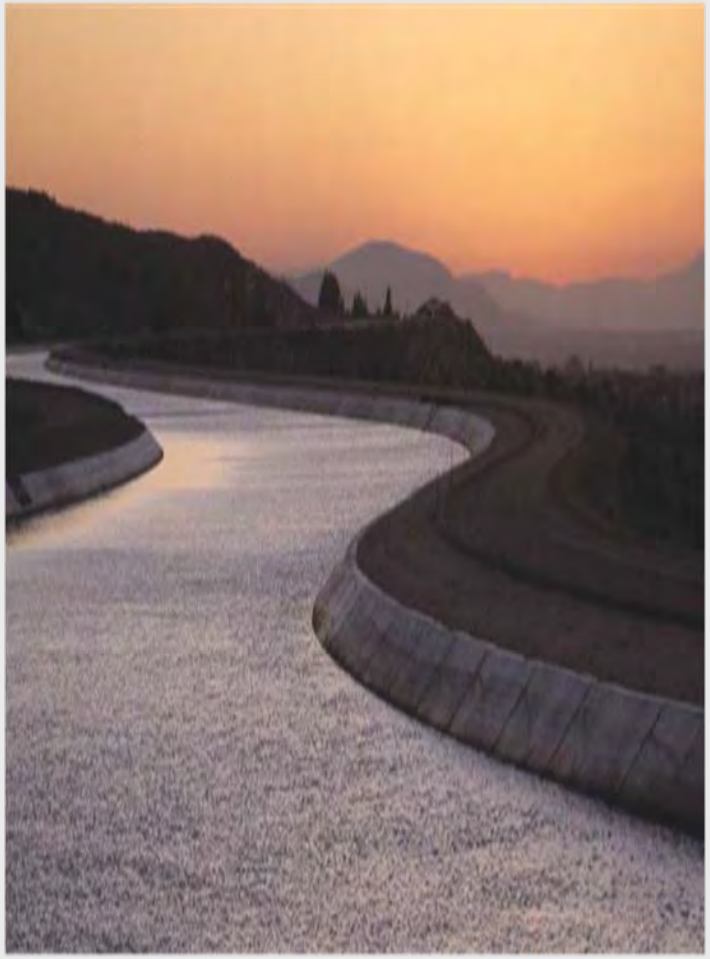
- Puts high flows to use or into storage
- Increases recreation opportunities
- Storage is good for managing risks such as imported water outages and climate change
- Multiple environmental impacts (habitat, roads, etc)
- Requires supplemental drought supplies

Strategy: Low Cost

Estimated Present Value Cost = $100M

Options include dry year option agreements, 2:1 exchange agreements, new contract supplies, and participation in a regional desalination project

- Develops supplies for when they are most needed
- Supplies from the Delta are subject to infrastructure failure and/or regulatory restrictions
- Regional desalination project is more reliable, but more costly



Imported Water

Stakeholder committee meets at least quarterly

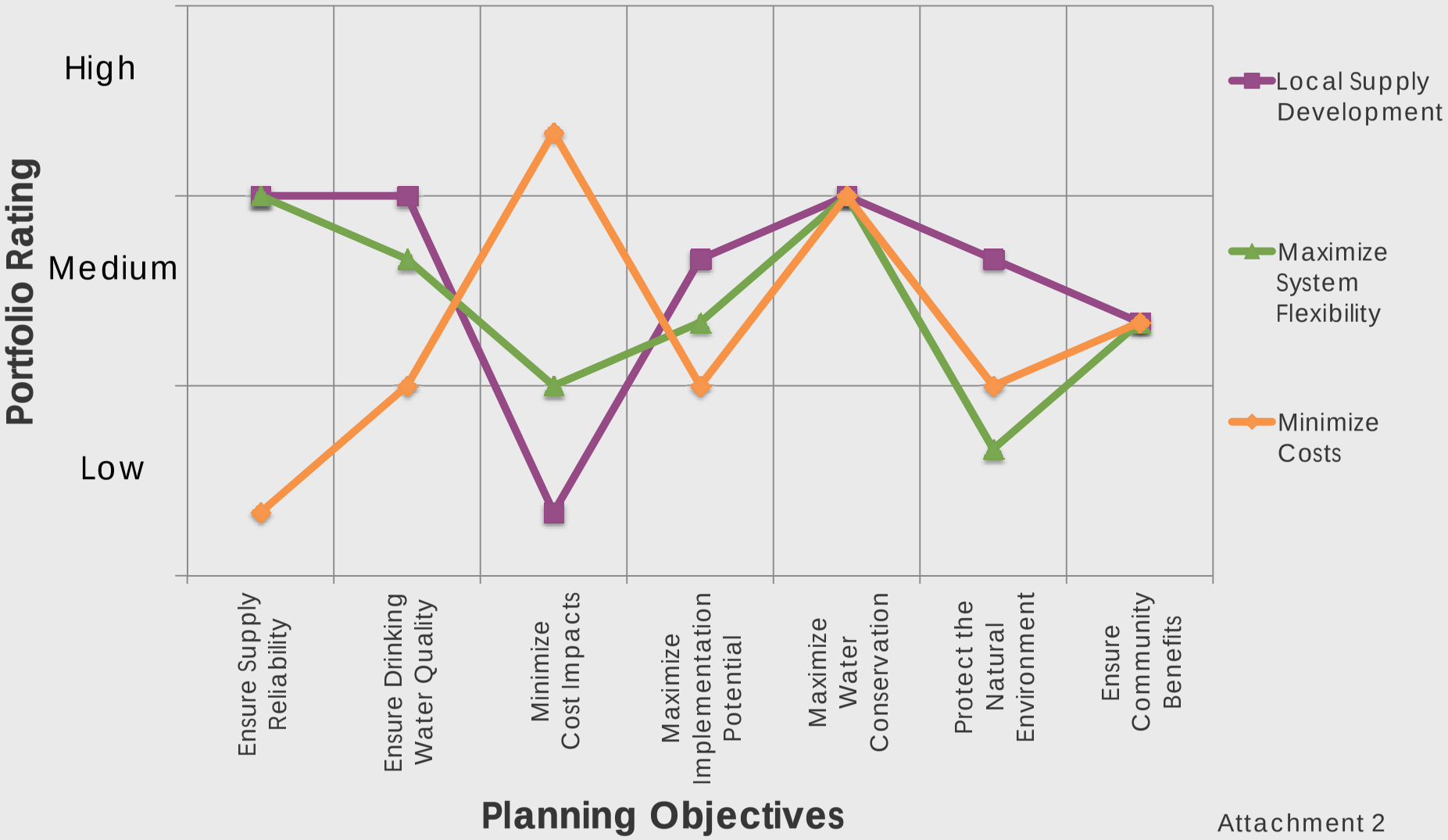
Approximately 14 regular participants in the stakeholder committee

- Business and Industry
  - Santa Clara County Farm Bureau
  - Building Industry Association of Bay Area
  - Silicon Valley Leadership Group
- Cities
  - Milpitas
  - Morgan Hill
  - Palo Alto
  - San Jose
  - Santa Clara
- Environmental and Community Advocates
  - Clean South Bay
  - Santa Clara Valley Audubon Society
  - United Neighborhoods of Santa Clara County
  - League of Women Voters
- Wastewater Agencies
- Water Retailers and Wholesalers

Stakeholders have provided valuable input

- Maintain water supply reliability
- Plan for population increases and climate change
- Continue an aggressive level of water conservation programs
- Evaluate regional recycled water projects
- Consider indirect potable reuse projects
- Be aware of concerns about local reservoir expansion
- Investigate regional projects such as Los Vaqueros Reservoir Expansion
- Address concerns about the reliability of imported supplies from the Delta

Stakeholders rated the three strategies on meeting the various planning objectives

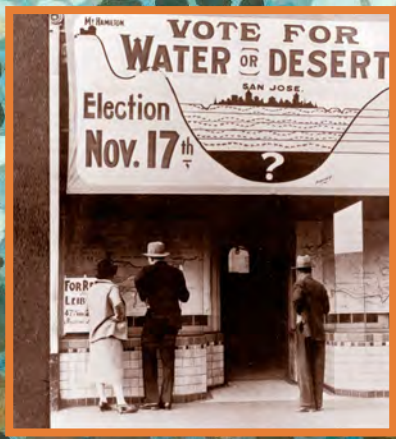


Reference 12

Santa Clara Valley Water District

2012

Groundwater Management Plan



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2012
Groundwater Management Plan

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2 2012 GROUNDWATER MANAGEMENT PLAN
Water Supply Overview

The District carefully manages groundwater as part of a comprehensive water management network that includes various supplies and management tools. Groundwater management is not an isolated activity, but rather an integrated part of the District's overall water resources management system.

This chapter provides an overview of the county's water supply system and management, and describes the Santa Clara and Llagas Subbasins. The overview presented in this chapter provides important information to understand the basin management objectives, strategies, and related programs that are presented in later chapters.

2.1 WATER SUPPLY SOURCES

In order to meet the county's water needs while maintaining maximum efficiency and flexibility, the District utilizes a variety of water supply sources. The District's water supply system is comprised of storage, conveyance, recharge, treatment, and distribution facilities that include local reservoirs, groundwater subbasins, out-of-county groundwater banking, groundwater recharge facilities, treatment plants, imported supply, and raw and treated water conveyance facilities. Santa Clara County's diverse water supplies include locally developed and managed water, imported water, and recycled water.

Local Supplies

The District captures rainfall and runoff in 10 local reservoirs and has numerous water rights to divert and store local surface water from creeks and streams. Captured local surface water is used to replenish the groundwater subbasins through an actively managed recharge program and provides supply for the District's drinking water treatment plants. Appendix C contains more detailed information on District reservoirs and recharge facilities. Several water retailers also maintain local surface water rights.

Local groundwater subbasins provide some water supply from the deep infiltration of rainfall, but the amount of groundwater pumped far exceeds this natural groundwater yield. The county's groundwater subbasins serve several important functions in that they transmit, filter, and store water. Water from the District's managed recharge program and rainfall enters the subbasins through recharge areas and undergoes natural filtration as it is transmitted into deeper aquifers. This recharge replaces water pumped by groundwater users and helps avoid land subsidence. Storing surplus water in the groundwater subbasins enables part of the county's supply to be carried over from wet years to dry years. Because the groundwater subbasins are able to store the largest amount of local reserves, the District depends on maintaining adequate groundwater to get through extended dry periods or other outages[1].

A small, but important and growing source of water is recycled water, which is used for non-potable uses including irrigation, industry, and agriculture. Using recycled water helps conserve drinking water supplies, provides a drought-proof, locally-controlled water supply and reduces dependency on imported water and groundwater. The District has established partnerships with the four recycled water producers in the county to expand recycled water use.

[1] Santa Clara Valley Water District, Urban Water Management Plan, 2010.

Imported Supplies

Half of the county's water supply comes from hundreds of miles away - first as snow or rain in the Sierra Nevada range, then as water in rivers that flow into the Sacramento-San Joaquin Delta or directly to water conveyance systems. Imported water is brought into the county through the complex infrastructure of the State Water Project (SWP), the federal Central Valley Project (CVP), and San Francisco's Hetch Hetchy system. The District purchases water under long-term contracts, short-term water transfers, and water exchanges. The most significant imported water contracts include those with the SWP and CVP. The District also has a long-term agreement with the Semitropic Groundwater Storage Program to store water in the Kern County groundwater basin for future use. This out-of-county banking provides the District with additional flexibility to divert some of its imported supplies in wet years for use in years when it is needed, such as during multi-year droughts or other supply shortages. The Semitropic Water Bank is an exchange program, meaning that the District does not take groundwater directly from the groundwater basin at Semitropic. Rather, the District receives its water by exchanging its banked water with other SWP water pumped from the Delta. Imported water is sent to the District's three water treatment plants, directly to the recharge ponds or creeks, or to local reservoirs for later release to supplement groundwater recharge.

Eight local water retailers in the northern portions of the county receive imported water directly from the San Francisco Public Utility Commission (SFPUC) Hetch Hetchy system: Milpitas, San Jose Municipal Water System, Santa Clara, Sunnyvale, Palo Alto, Mountain View, Stanford, and the Purissima Hills Water District (serving Los Altos Hills). The District and SFPUC have also constructed an intertie that allows for the exchange of water between the two systems in the event of a facility failure or outage in either system, either planned or unplanned.

Average water supply use and supplies for both North County and South County are shown below in Figures 2-1 and 2-2, respectively. As shown in Figure 2-1, Hetch Hetchy imports account for nearly 20 percent of the water supply in North County. Water imported by the District through the SWP and CVP and used for groundwater recharge provides 36% of North County groundwater used. The District's imported water supplies also provide 86% of the water used at water treatment plants. In South County, the District's imported supplies provide 26% of the groundwater water used. An interruption or outage of Hetch Hetchy or other imported supplies could have significant impacts on the county's water supply reliability.

2.2 CONJUNCTIVE USE

Nearly half of the water used in Santa Clara County is pumped from groundwater, one of the county's greatest natural resources. The District was initially formed to stop groundwater overdraft and land subsidence and preventing the recurrence of these conditions remains a key driver for water supply management. Since the 1930s, the District's water supply strategy has been to maximize conjunctive use, the coordinated management of surface and groundwater supplies, to enhance water supply reliability. Local groundwater resources make up the foundation of the county's water supply, but they need to be augmented by the District's comprehensive water supply management activities in order to reliably meet the needs of county residents, businesses, agriculture and the environment. These activities include the managed recharge of imported and local supplies, in-lieu groundwater recharge through the provision of treated surface water and acquisition of supplemental water supplies, and programs to protect, manage and sustain water resources.

Managed Recharge

The District's managed recharge program uses both runoff captured in local reservoirs and imported water delivered by the raw water conveyance system to recharge groundwater through more than 390 acres of recharge ponds and over 90 miles of local creeks. Between 2009 and 2011, the District recharged an average of 100,000 AF of local and

imported water each year[2]. As shown in Figures 2-1 and 2-2, the managed recharge of District imported water and water stored in local reservoirs accounts for the majority of groundwater used in the county. The District's managed recharge facilities are shown in Figure 2-3 and a more detailed description of the District's managed recharge facilities can be found in Appendix C.

Recharge capacity can be viewed as processing capacity, meaning that surface water recharged through surface spreading is filtered by the soils and distributed to groundwater extraction facilities through the groundwater subbasins; much like water is treated by water treatment plants and distributed to the retailers through the District's distribution pipelines.

Maintaining the District's active managed recharge program requires ongoing operational planning for the distribution of local and imported water to recharge facilities; maintenance and operation of reservoirs, diversion facilities, distribution systems, and recharge ponds; and the maintenance of water supply contracts, water rights, and relevant environmental permits.

[2] Santa Clara Valley Water District, Protection and Augmentation of Water Supplies Report, February 2012.

Figure 2-1 North County Water Supply and Use (2006-2010)

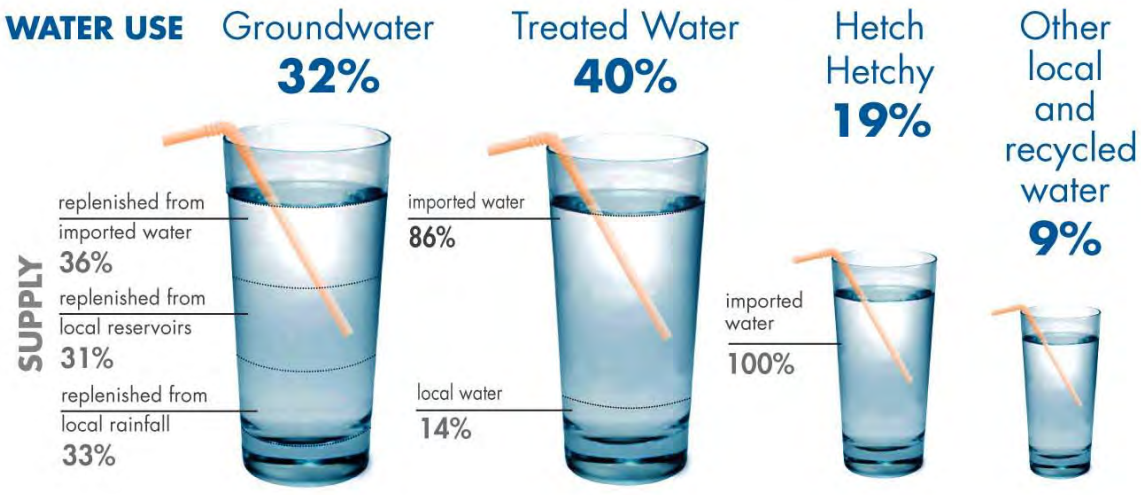


Figure 2-2 South County Water Supply and Use (2006-2010)

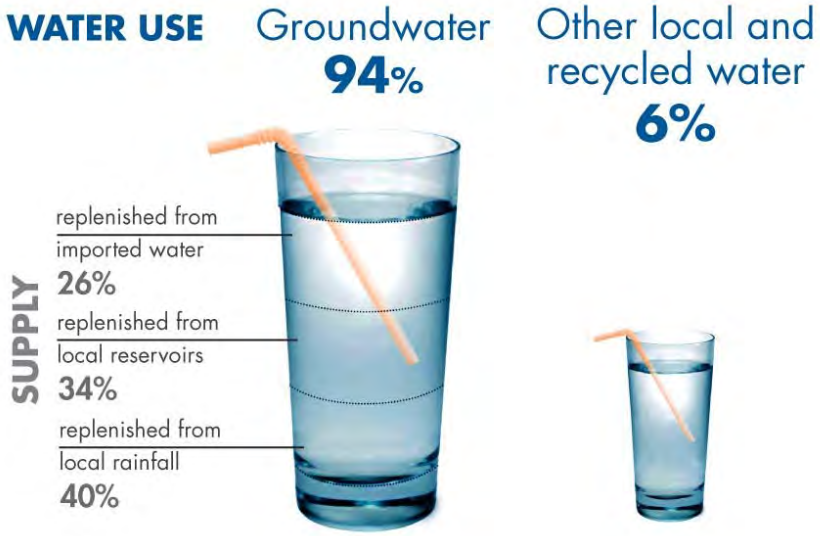
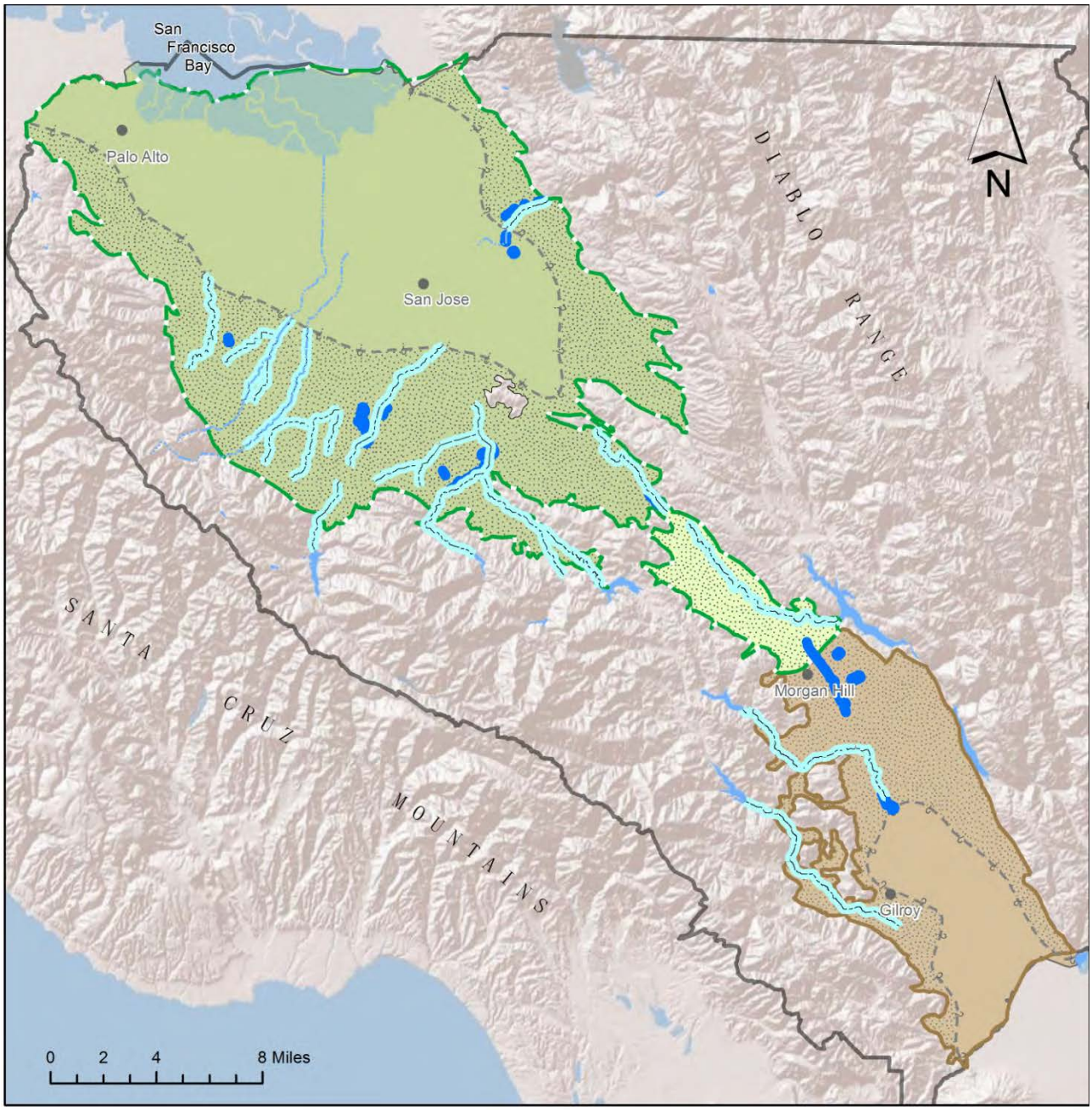


Figure 2-3 District Managed Recharge Facilities



Legend

- District Recharge Pond or Facility
- Instream Recharge
- District Reservoir
- Santa Clara Subbasin (DWR Basin 2-9.02)
- Santa Clara Plain Confined Area
- Santa Clara Plain Recharge Area
- Coyote Valley Recharge Area
- Approximate Extent Confined Area
- Llagas Confined Area
- Llagas Recharge Area
- Santa Clara County
- Llagas Subbasin (DWR Basin 3-3.01)

In-Lieu Recharge

Just as important as managed recharge are the District's in-lieu recharge programs, including treated water deliveries, water recycling, and water conservation. These activities indirectly help keep groundwater supplies from diminishing and the land from subsiding by reducing demands on the groundwater subbasins. By meeting demands that would otherwise be met by groundwater, these programs provide in-lieu recharge as if the groundwater subbasins had been recharged by that amount.

The District owns and operates three water treatment plants and distributes the treated surface and imported water to 7 of the 13 water retailers through the District's treated water distribution system. These treatment plants have a combined treatment processing rate of over 200 million gallons per day, reducing groundwater pumping needs in the northern Santa Clara Valley.

The District encourages recycled water development in the county through partnerships with the local wastewater agencies and through financial incentives and technical assistance. An estimated 15,000 AF of recycled water was used in 2011, offsetting demands that might otherwise have been met through other potable supplies such as additional groundwater pumping. Similarly, in fiscal year 2011, the District's water conservation program saved an estimated 52,500 AF of water.

Benefits of Conjunctive Use Programs

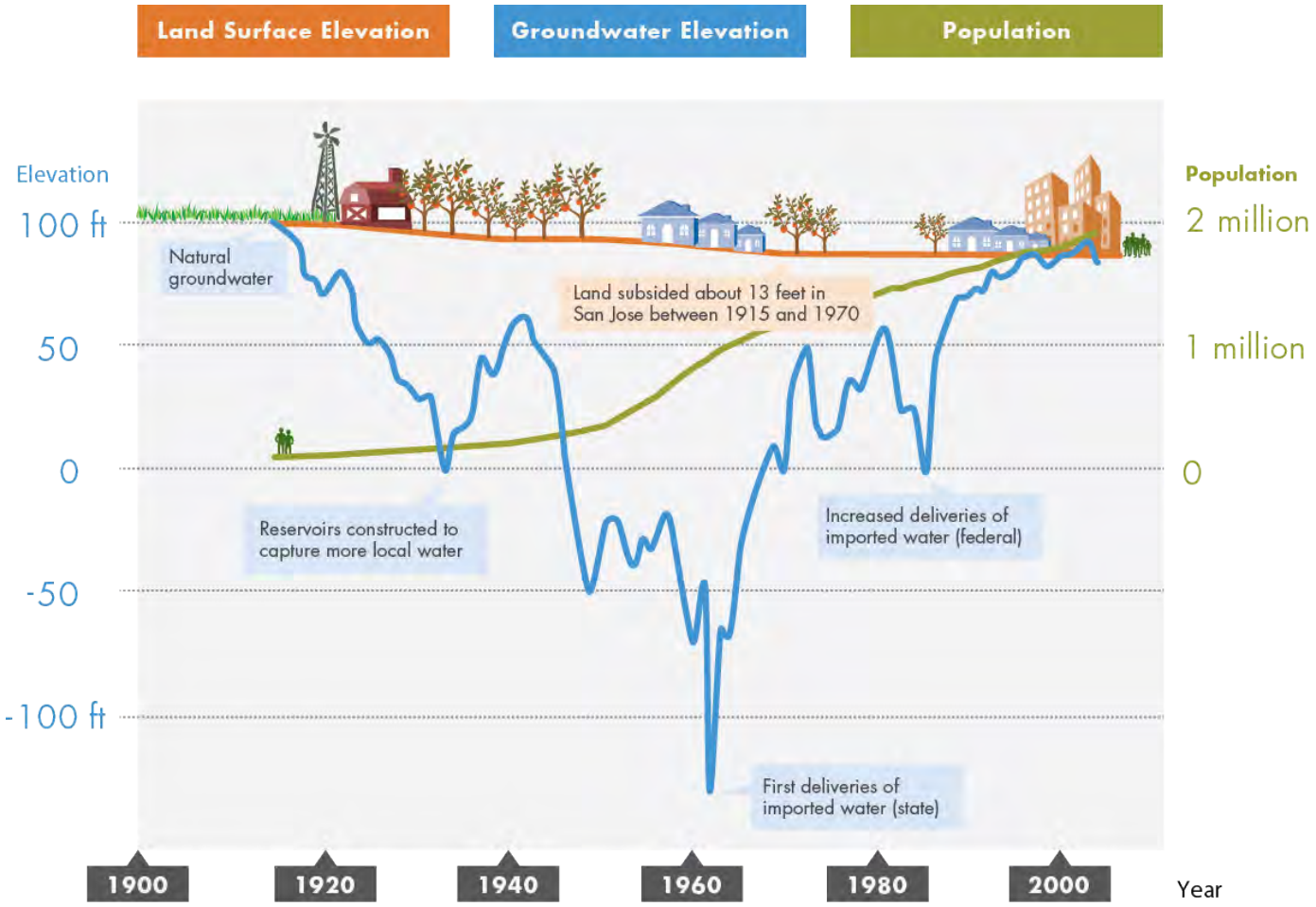
Without the District's conjunctive use programs, groundwater elevations would be considerably lower than they are today, reducing water supply reliability and increasing the risks of continued land subsidence and salt water intrusion. Figure 2-4 illustrates the history of groundwater elevations and land subsidence in Santa Clara County and the role of District water management programs in maintaining groundwater elevations and reducing the rate of land subsidence. This figure shows several time periods with steep declines in groundwater levels due to significant increases in population and overreliance on groundwater. However, the construction of reservoirs for groundwater recharge and the importation of water resulted in the significant recovery of groundwater levels following these actions. The figure also depicts the long-term and permanent effects of land subsidence.

2.3 GROUNDWATER SUBBASINS

This section provides an overview of the Santa Clara and Llagas Subbasins. A more detailed description can be found in Appendix D.

The groundwater subbasins provide multiple benefits to residents and businesses in Santa Clara County. As shown in Figures 2-1 and 2-2, most of the groundwater pumped is a result of District recharge programs using imported water and water stored in District reservoirs. The subbasins also provide some groundwater supply resulting from the percolation of rainfall in the recharge areas and natural seepage through local creeks and streams. In addition, the groundwater subbasins serve as an extensive conveyance network, allowing water to move from the recharge areas to individual groundwater wells. The groundwater subbasins also provide some natural filtration of surface water as it percolates through the soil and rock. Unlike surface water, most groundwater in the county can be used for drinking water without additional treatment. Lastly, the groundwater subbasins provide water storage, allowing water to be carried over from the wet season to the dry season and even from wet years to dry years.

Figure 2-4 History of Groundwater Elevations and Land Subsidence in Santa Clara County



Santa Clara County includes portions of two groundwater basins as defined by the California Department of Water Resources (DWR)[3]: the Santa Clara Valley Basin (Basin 2-9) and the Gilroy-Hollister Valley Basin (Basin 3-3). This plan covers only the groundwater subbasins within Santa Clara County managed by the District: the Santa Clara Subbasin (Subbasin 2-9.02) and the Llagas Subbasin (Subbasin 3-3.01), which cover a surface area of approximately 385 square miles (Figure 2-5). Due to different land use and management characteristics, the District further delineates the Santa Clara Subbasin into two management areas: the Santa Clara Plain and the Coyote Valley. As shown in Figure 2-5, there are some minor discrepancies in the subbasin boundaries as shown by DWR and the District. District staff is working with DWR to resolve these minor differences and update the subbasin boundaries for the county to reflect the most current knowledge of the subbasins.

Both the Santa Clara and Llagas Subbasins are divided into confined and recharge areas. Within confined areas, laterally extensive low permeability clays and silts (confining units or aquitards) divide upper and lower aquifers. The District refers to these as the shallow and principal aquifers, with the latter defined as aquifer materials greater than 150 feet below ground surface. Confining units impede the vertical flow of groundwater, causing principal aquifers to be under pressure. By restricting the movement of contaminants, confining units also provide some natural protection to principal aquifers. Recharge areas are primarily comprised of high permeability aquifer materials like sands and gravels that allow surface water to infiltrate into the aquifers. Most groundwater recharge occurs in these areas through the infiltration of precipitation and the District's managed recharge to augment groundwater supplies.

[3] California Department of Water Resources, Bulletin 118, 2003.

Reference 13

OCTOBER 2012

2012 Water Supply and Infrastructure Master Plan

Santa Clara Valley Water District

Santa Clara Valley Water District 2012 Water Supply and Infrastructure Master Plan

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Beau Goldie, Chief Executive Officer

October 2012

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Acknowledgments

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City of Morgan Hill – Tony Eulo, Jimmy Forbis
City of Palo Alto - Nico Procos
City of Santa Clara – Chris DeGroot
City of Sunnyvale – Mansour Nasser
Farm Bureau of Santa Clara County - Jennifer Williams
League of Women Voters – Sue Graham, Karen Sundback
San Francisco Public Utilities Commission – Molly Petrick
San Jose Water Company – George Belhumeur
Santa Clara Basin Watershed Management Initiative – Trish Mulvey
Santa Clara Valley Audubon Society – Shani Kleinhaus
Silicon Valley Leadership Group – Sai Amath
United Neighborhoods of Santa Clara County – Ken Kelly

Water Supply and Infrastructure Master Plan Summary

A reliable supply of clean water is necessary for the social, economic, and environmental well-being of Santa Clara County. This is reflected in the Santa Clara Valley Water District (District) Act that states one of the purposes of the District is "to do any and every lawful act necessary to be done that sufficient water may be available for any present or future beneficial use or uses of the lands or inhabitants within the District." Furthermore, Board Policy states that "there is a reliable, clean water supply for current and future generations."

Additional water supply investments will be needed in the future to meet the county's water needs. The Water Supply and Infrastructure Master Plan (Water Master Plan) presents the Santa Clara Valley Water District's strategy for meeting those future needs. The activities and projects to carry out this strategy have to be funded or committed to by the District, and may be influenced by other factors beyond the scope of this Water Master Plan. However, the Water Master Plan does provide a water supply strategy for planning these activities and projects, and provides a roadmap for future District investments in water supply reliability.

The Water Master Plan is the District's strategy for providing a reliable and sustainable future water supply for Santa Clara County and ensuring new water supply investments are effective and efficient.

The District's Ensure Sustainability water supply strategy has three key elements: 1) secure existing supplies and infrastructure, 2) optimize the use of existing supplies and infrastructure, and 3) increase recycling and conservation. The District must secure existing supplies and facilities for future generations because they are, and will continue to be, the foundation of our water supply system. In addition, the District has opportunities to make more effective use of its existing assets. Finally, the District is committed to working with the community to meet Silicon Valley's future increases in water demand through conservation and recycling.

The Water Master Plan strategy is phased to ensure timely, appropriate investment decisions. Over the next five years, the District will continue work on securing and restoring existing supplies and infrastructure, and begin foundational work on developing future supplies. This foundational work includes participating in regional recycled water strategic planning, conducting public outreach on indirect potable reuse (IPR), identifying additional testing or demonstration activities that would be required to proceed with IPR, developing groundwater protection guidelines for graywater reuse, developing partnership agreements for dry-year water options, and participating in the development of regulations and policies. These activities are critical to successful project implementation, and once completed, the District can begin project-specific planning, design, and construction of new facilities.

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The Water Supply Strategy Ensures Sustainability

To provide a reliable supply of water to meet needs through 2035 the District's Ensure Sustainability water supply strategy relies on the following three elements:

1. secure baseline supplies and infrastructure,
2. optimize the use of existing supplies and infrastructure, and
3. increase recycling and water conservation to meet future increases in demands.

This strategy ensures sustainability because it meets future increases in demands with conservation and recycling, builds on the existing baseline system, and manages risks to water supply reliability from climate changes and reduced imported water supplies. The strategy is also consistent with District policies and stakeholder interests.

The Elements of the Ensure Sustainability Water Supply Strategy Work Together

The three elements of the Ensure Sustainability water supply strategy work together. The baseline water supply system will continue to support most of the county's future water needs. Optimizing the use of existing supplies and infrastructure leverages the investments the District has already made in water supply reliability and increases the system's flexibility. Additional recycling and conservation will bridge the gap between existing system capability and future demands, as well as manage risks from climate change and imported water reductions. Each of the water supply strategy elements is discussed below.

1. Secure Baseline Water Supplies and Infrastructure

The baseline water supply system is the most critical element of the water supply strategy, because it will provide the most water supplies and is the foundation of future water supply investments. The baseline water supply system is comprised of the existing and already planned water supplies and infrastructure. The Water Master Plan is built on the assumption that the baseline system will be available through the planning horizon of 2035. Baseline water supplies are expected to increase from the current average of about 398,000 AFY to an average of 421,000 AFY in 2035. The

Baseline Water Supply System

- Existing natural groundwater recharge
- Existing local surface water supplies
- Recycled water use increasing from about 15,000 AFY in 2010 to about 30,000 AFY in 2035
- Existing imported water supplies
- Conservation savings increasing from about 51,000 AFY in 2010 to about 99,000 AFY in 2035
- Dam seismic retrofits and other improvements to remove operating restrictions
- Rinconada Water Treatment Plant capacity of 100 million gallons per day
- Main and Madrone Pipeline repairs

increase in baseline supplies is due to removal of operating restrictions on existing reservoirs and increased non-potable water recycling. Baseline conservation savings are projected to increase from about 53,000 acre-feet (AF) in 2011 to about 99,000 AFY by 2030. These savings reduce demands on the water supply system and the need for more capital-intensive improvements. Ensuring adequate investment in the existing system is critical to reliability because, without the baseline system, future water supply shortages could be severe.

2. Optimize the use of Existing Supplies and Infrastructure

Groundwater Recharge

To fully utilize additional supplies that could be developed under the Ensure Sustainability strategy, new groundwater recharge ponds will increase the District's groundwater recharge capacity. The yield from the new ponds is about 3,300 AFY on average. The recharge ponds could be located on the west side of the valley, along Saratoga Creek near Highway 85. Additional groundwater recharge ponds provide additional capacity to process wet-weather flows and help maintain groundwater levels, both of which help manage risks due to climate change and supply interruptions. The estimated present value cost of new groundwater recharge ponds is about $14 million.

Reservoir Pipeline

Pipelines transport water and add flexibility to water supply system operations.

A connection between Lexington Reservoir and the raw water system will provide greater flexibility in using existing local water supplies. The reservoir pipeline will allow surface water from Lexington Reservoir to be put to beneficial use elsewhere in the county, especially when combined with the indirect potable reuse project described below. In addition, the pipeline will enable the District to capture some wet-weather flows that would otherwise flow to the Bay. The pipeline is expected to provide an average annual yield of 1,500 acre-feet. The estimated present value cost of the reservoir pipeline is about $10 million.

Imported Water Reoperations

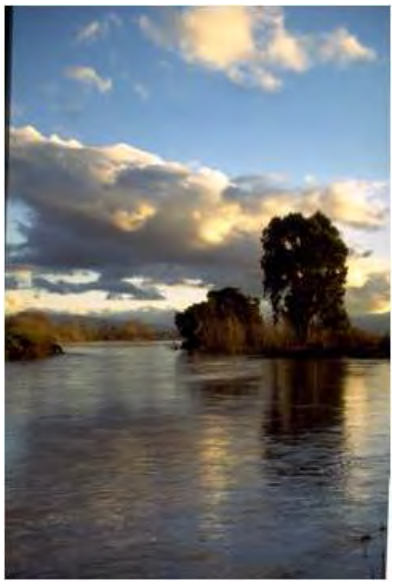
The District would reoperate the Semitropic Groundwater Bank when it is nearly full and the District water supply needs are otherwise met to sell or exchange up to 50,000 AFY of stored water. This would create additional space in the Semitropic Groundwater Bank for carryover of supplies during wetter years, maximize the value of the District's existing assets (imported water contracts and investment in the Semitropic Groundwater Bank), and potentially help fund investments in infrastructure and additional local supplies. The estimated present value benefit of imported water operations is about $74 million.

3. Increase Recycling and Conservation

Indirect Potable Reuse

Indirect potable reuse is a high-quality, local drought-proof supply that is resistant to climate change impacts and independent of the Delta. It will provide a new local supply for recharge, which will help maintain reservoir supplies that are used to meet flow and temperature requirements for fish in local creeks. Indirect potable reuse would also reduce discharges to South San Francisco Bay from the wastewater treatment plants. Using advanced treated recycled water for recharge also provides groundwater quality benefits, in that advanced treatment removes nearly all the salts from the water that is used for recharge, resulting in high quality water being recharged into the groundwater basin.

The Ensure Sustainability strategy relies upon development of indirect potable reuse to provide most of the new water supply to meet future water needs. The Water Master Plan assumes that at least 20,000 AFY of advanced treated recycled water will be available for groundwater recharge by 2030. A number of potential projects are being identified, and future development will be influenced by strategic planning currently underway in partnership with South Bay Water Recycling and others. For purpose of the Water Master Plan analysis, a project was assumed to use water that would be advanced treated at a facility at the San Jose/Santa Clara Water Pollution Control Plant and then pumped to existing recharge ponds in the Los Gatos Recharge System.



Indirect potable reuse includes delivering advance treated recycled water to groundwater recharge ponds

One challenge to indirect potable reuse will be overcoming some people's concerns about the quality of advanced treated recycled water. New regulations could also affect the benefits of indirect potable reuse. When State regulations move toward permitting direct potable reuse (putting advanced treated recycled water directly into pipelines that supply drinking water treatment plants), the District may want to consider that option as it adds flexibility, reduces costs, and potentially reduces energy use. The water supply strategy is to support indirect potable reuse by 1) conducting technical studies, 2) increasing public awareness, 3) monitoring regulatory development, and 4) participating in and conducting regional recycled water master planning. The estimated present value cost of indirect potable reuse is about $339 million.

Graywater reuse provides a sustainable supply of water for irrigation

Graywater Reuse Rebate Program

The graywater reuse rebate program will provide financial incentives to customers who install graywater reuse systems. This would result in about 300 AFY in water savings, at a relatively low cost. The program could be expanded to increase water savings, depending upon resolution of public agency concerns about groundwater quality, permitting, and public health issues. The estimated present value cost of a graywater reuse rebate program is about $3 million.

Water Supply Reliability Improvements Meet the Level of Service Goal

The District Board approved a long-term water supply reliability level of service goal on June 12, 2012. The goal is to develop supplies to meet at least 100 percent of average annual water demand identified in the District's Urban Water Management Plan during non-drought years and at least 90 percent of average annual water demand in drought years. This level of service is consistent with recommendations from the Stakeholder Review Committee. Figure 9 and Table 4 show water supply availability during an extended drought like the one that occurred from 1987 to 1992 with the Ensure Sustainability water supply strategy in place and the 2035 demand level.

Figure 9. Proposed Water Supplies during an Extended Drought with 2035 Demands

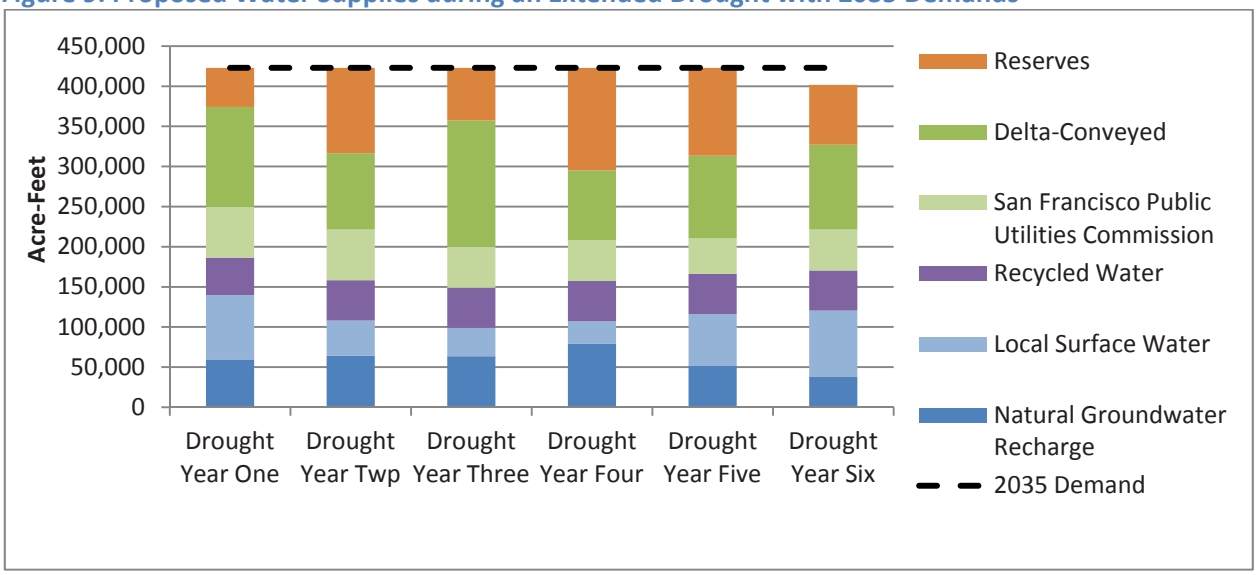
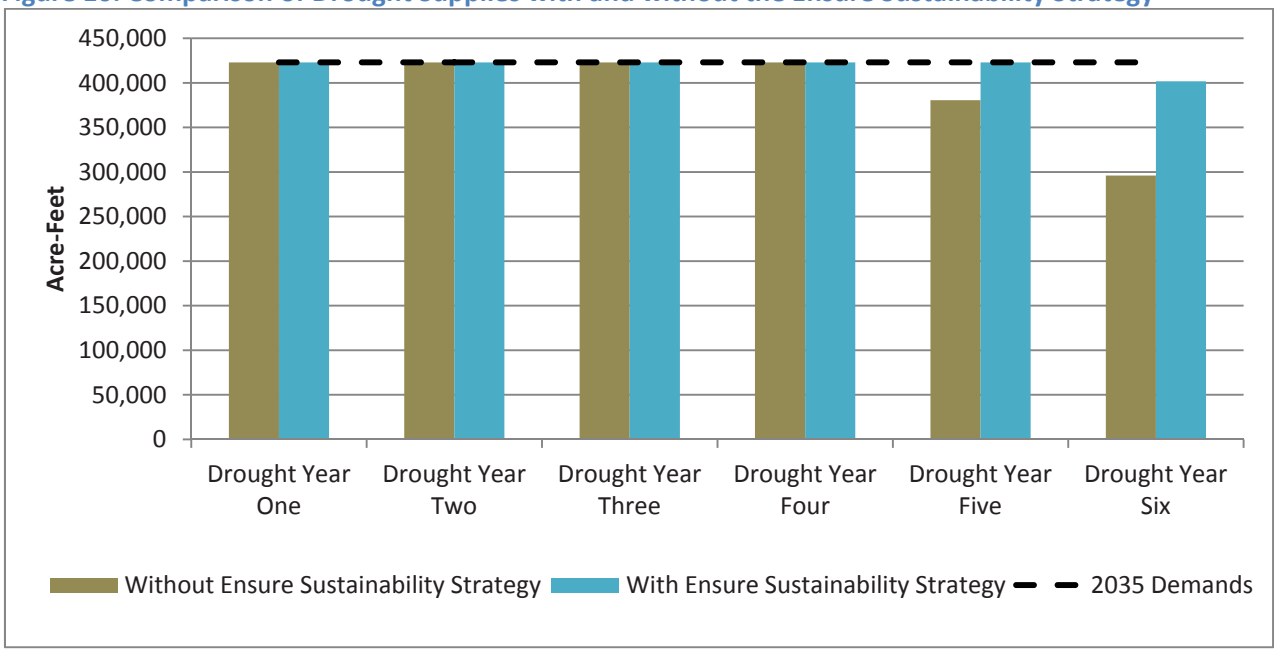


Table 4. Proposed Water Supplies during an Extended Drought with 2035 Demands

Source of Supply (Acre-Feet)	Drought Year One	Drought Year Two	Drought Year Three	Drought Year Four	Drought Year Five	Drought Year Six
Natural Groundwater Recharge	60,000	64,000	64,000	79,000	51,000	38,000
Local Surface Water	80,000	43,000	35,000	28,000	64,000	83,000
Recycled Water	47,000	50,000	50,000	50,000	50,000	50,000
SFPUC	63,000	63,000	51,000	51,000	44,000	49,000
Delta-Conveyed	125,000	95,000	157,000	87,000	103,000	106,000
Reserves	49,000	106,000	66,000	128,000	110,000	75,000
Shortfall (Acre-Feet)	0	0	0	0	0	22,000

With the Ensure Sustainability Strategy in place, supplies are sufficient to meet 100 percent of demand during the first five years of drought and more than 90 percent of demands during the sixth year of an extended drought. This is consistent with the supply reliability level of service goal. Further, this is an improvement over the baseline projection, where existing supplies could only meet about 70 percent of demands during the sixth year of extended drought. Figure 10 compares baseline water supplies to proposed water supplies during an extended drought.

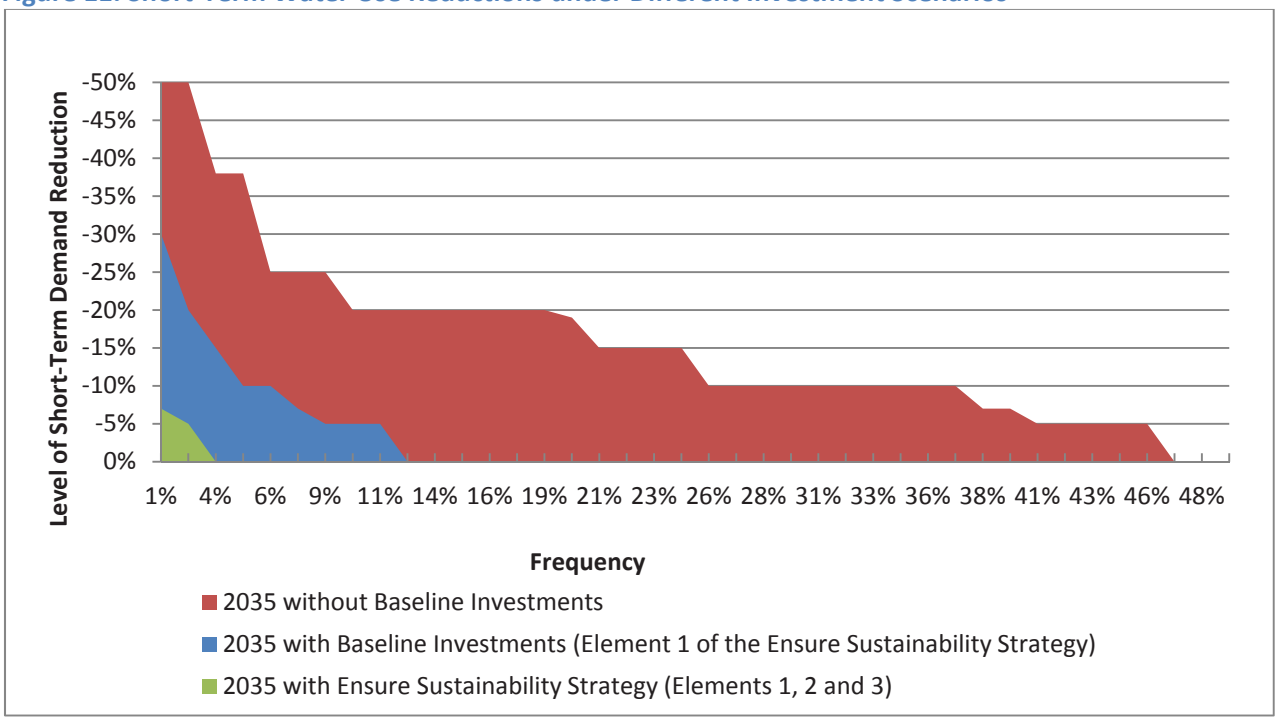
Figure 10. Comparison of Drought Supplies with and without the Ensure Sustainability Strategy



Implementation of the Ensure Sustainability water supply strategy would reduce the frequency and magnitude of short-term water use reductions under 2035 demands. Figure 11 shows shortages with different investment strategies. The small green area in Figure 11 shows that, with will full

implementation of all elements of the water supply strategy, short-term water use reductions would occur only two percent of the time and the level of short-term water use reductions would be less than 10 percent. If only baseline investments are made consistent with Element 1 of the Ensure Sustainability Strategy, which is illustrated by the blue area in Figure 11, the model predicts that water use reductions would occur more often and the level of short-term water reductions could be as high as 30 percent. Water use reductions this high would necessitate water use restrictions and impact the local economy. Finally, the red area in Figure 11 shows short-term water use reductions without investments in the baseline system. Water use reductions would be needed almost half the time and in some years water supply would only be available to meet health and safety needs. This scenario does not take into account likely additional imported water reductions that would occur if investments are not made in restoring the Delta ecosystem and reliable Delta conveyance, in which case there is a risk that greater water use reductions would be needed.

Figure 11. Short-Term Water Use Reductions under Different Investment Scenarios



The Water Supply Strategy Supports Other Important Public Benefits

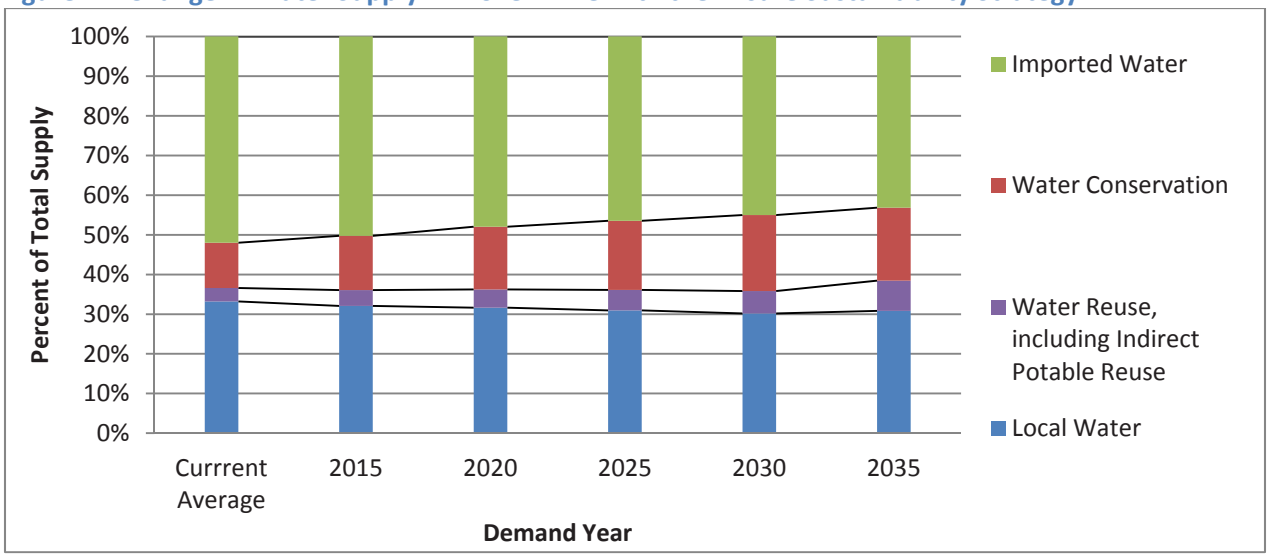
The key benefit of the Ensure Sustainability strategy is that it develops a new local drought-proof supply to achieve the District's strategy to develop supplies to meet at least 90 percent of demands during drought years. The strategy provides other benefits too. Some of these benefits are mentioned above, including helping to maintain reservoir supplies that are used to meet flow and temperature requirements for fish in local creeks, reducing wastewater discharges to South San Francisco Bay, and improving groundwater quality. The strategy builds on existing agreements with the City of San Jose and South Bay Water Recycling by developing indirect potable reuse. The additional groundwater

recharge ponds and reservoir pipeline provide additional capacity to process wet-weather flows and help maintain groundwater levels, both of which help manage risks due to climate change and supply interruptions.

The Ensure Sustainability strategy includes imported water reoperations, which provides the benefit of maximizing the economic value of existing assets (imported water contracts and investment in the Semitropic Groundwater Bank) and helping fund investments into infrastructure and additional local supplies. Indirect potable reuse provides supply in every year, while the District's future shortages are primarily in extended droughts. Reoperations would also help create sufficient space in the Semitropic Groundwater Bank for carryover of supplies during wetter years.

Another important benefit of the Ensure Sustainability strategy is that it would reduce reliance on imported water supplies and increase water use efficiency, consistent with State policy to reduce reliance on imported water supplies for meeting future water demands. With the strategy in place, water use efficiency would increase from about 15 percent to about 26 percent. Figure 12 illustrates how the mix of countywide supplies and long-term conservation savings would change between now and 2035.

Figure 12. Change in Water Supply Mix over Time with the Ensure Sustainability Strategy



The Ensure Sustainability Strategy is Consistent with Stakeholder Input

The water supply strategy incorporates stakeholder input. The Stakeholder Review Committee (SRC) provided input and feedback on key Water Master Plan decisions and approaches throughout the planning process and concurred with the strategy. District Board Advisory Committees had opportunities to provide input during the Water Master Plan process. Staff also made presentations to the Water Retailers Committee, Water Retailer Subcommittees, and other agencies and organizations.

Stakeholders provided the following input on the Water Master Plan strategy and other water supply options:

- Maintain water supply reliability,
- Plan for population increases and climate change,
- Continue an aggressive level of water conservation programs,
- Evaluate regional recycled water projects,
- Consider indirect potable reuse projects and pursue direct potable reuse,
- Be aware of concerns about local reservoir expansion,
- Investigate regional projects such as the Regional Desalination Project or Los Vaqueros Reservoir Expansion that may provide dry-year options, and
- Address concerns about the reliability of imported supplies conveyed through the Delta.

Other Water Supply Options Are Not Recommended at This Time

The District considered a variety of water supply options for the Water Master Plan. Water supply options that stakeholders requested be included in the Water Master Plan, but are not recommended at this time, are discussed below.

Local Reservoir Expansion

Expanding Anderson Reservoir was one of the options considered for the Water Master Plan

A number of stakeholders expressed concerns about local reservoir expansion, while a number of stakeholders saw value in the increased storage provided by reservoir expansion. Staff analysis indicated that even an expansion project that would add 100,000 AF of storage would not significantly improve the ability to provide water through an entire drought, which is the primary challenge the Water Master Plan addresses. Storage would be depleted by about the fourth year of drought. Consequently, the water supply strategy does not include reservoir expansion. However, the District will re-evaluate reservoir expansion in the future as understanding of local climate change impacts improves, or in considering broader operational and water management needs such as emergency storage.

Direct Potable Reuse

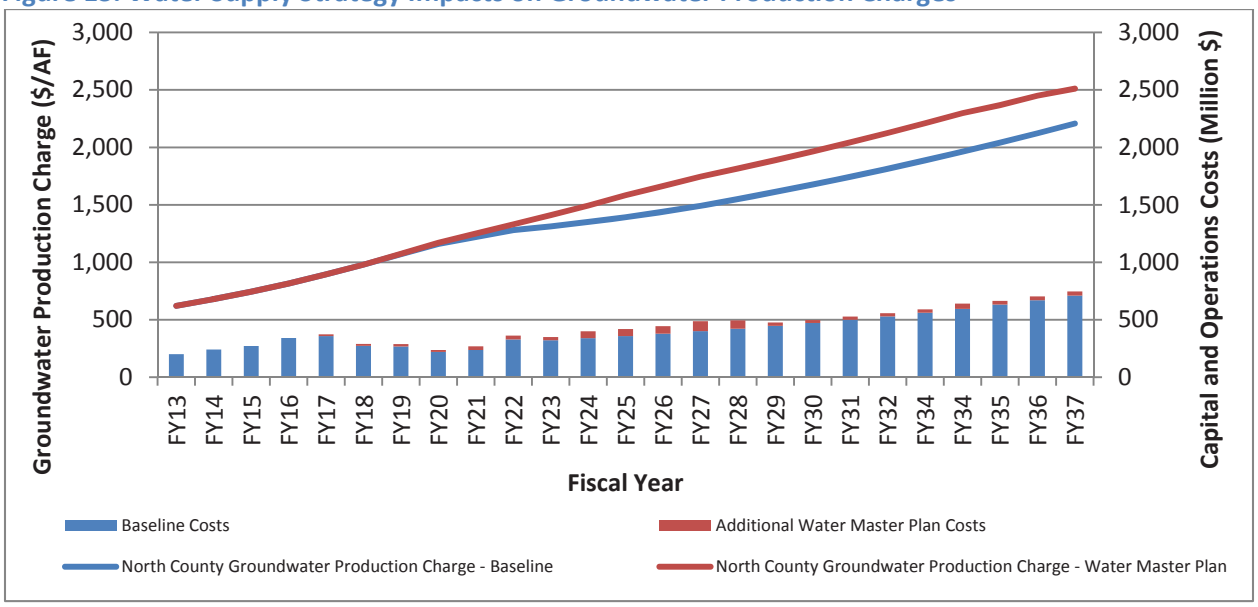
Several stakeholders expressed an interest in the District implementing a direct potable reuse project, in which advanced treated water is added to the District raw water system and can be sent directly to drinking water treatment plants. At this time, California does not allow direct potable reuse. The California Department of Public Health (DPH) is required by law to determine the feasibility of

Water Supply Costs Will Also Be Phased

Stakeholders value water supply reliability and most are willing to pay for it. The Stakeholder Review Committee was almost unanimous in their support of the Ensure Sustainability water supply strategy, even though it costs much more than other water supply options. The economic analysis found that the benefits of the water supply strategy are more than double the costs. The present value cost of the water supply strategy, excluding securing the baseline water supply system, is about $440 million. This does not include a potential present value benefit of about $70 million from imported water reoperations. The estimated impacts on groundwater production charges in Zone W-2 in northern Santa Clara County range from no incremental change up to a peak increase of about $335/AF in 2034. By that time, the groundwater production charge for the baseline water supply system is projected to be about $1,960/AF, based on the District's future investments that are necessary to maintain the baseline water supply system. The Ensure Sustainability strategy, as laid out in this plan, will have minimal effects on groundwater production charges in Zone W-5 in southern Santa Clara County, because most of the new investments benefit Zone W-2. Figure 13 shows the anticipated impacts of the water supply strategy on groundwater production charges in Zone W-2 (North County).

"I would rather answer calls about water rate increases than have to tell someone I can't deliver water to them."
– Stakeholder Review Committee Member

Figure 13. Water Supply Strategy Impacts on Groundwater Production Charges



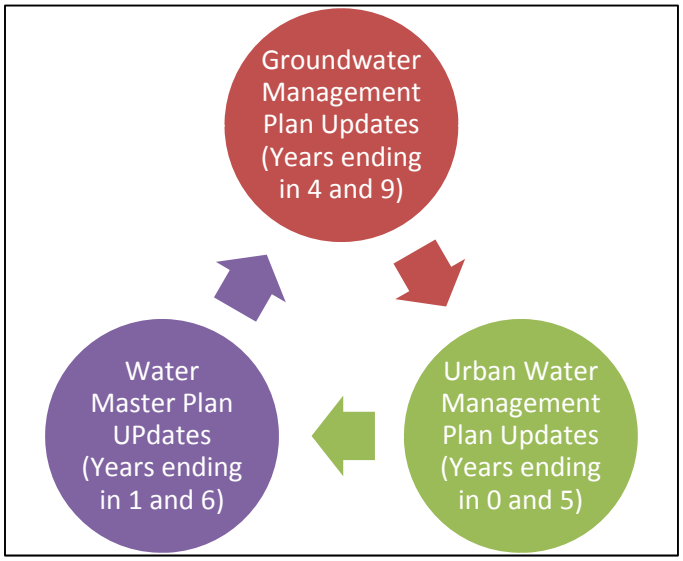
The District may be able to reduce costs for the water supply strategy if the following opportunities become available in the future:

- Direct potable reuse is permitted and accepted by the community and regulatory agencies;
- Advanced treatment technologies become less expensive, more efficient, or both; and
- Partners are willing to enter into imported water exchange agreements.

The Water Master Plan Will Be Monitored and Updated

The Water Master Plan recognizes that baseline supplies and infrastructure are subject to change. Therefore, the long-term strategy will be updated every five years following preparation of the Urban Water Management Plan to capture updated supply and demand projections, as well as changes in groundwater basin management objectives. This water management planning cycle is illustrated in Figure 14. The implementation plan will be reviewed annually over the next five years to ensure that the recommendations are still valid, and to ensure that all Water Master Plan projects and programs are budgeted, planned, and completed at the appropriate times. The District will report on progress annually, and will measure success using performance measures and milestones.

Figure 14. Water Resources Planning Cycle



The Water Master Plan recognizes that completion of baseline projects and programs such as the BDCP and FAHCE implementation, and many other circumstances such as water reuse regulations, can significantly affect the Water Master Plan strategy. Additionally, new issues will likely arise over the planning horizon. The plan will be updated every five years to address any changed and new circumstances. Periodic plan updates will allow the District to address any new or changed circumstances and to adjust its water supply strategy to fit the needs of the county in the future.

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www.valleywater.org

Reference 14

Neighborhood Update - May 2014

Reservoir and local stream conditions

Santa Clara Valley Water District

Los Capitancillos groundwater recharge ponds in South San Jose are at its lowest level in years.

Lack of rainfall continues to affect creeks and reservoirs

To conserve water in the midst of one of the driest seasons on record, the Santa Clara Valley Water District is modifying its operations. Because of the lack of local rainfall and cut backs in water imported from state and federal water projects, groundwater recharge operations in ponds and creeks have been cut back to conserve drinking water supplies for use this summer.

A priority of the water district is continued delivery of safe, clean water from its drinking water treatment plants to local water providers and municipalities. Imported water typically provides more than 85 percent of the supply for the water district's three drinking water treatment plants. In dry and critically dry years, when local water is limited, up to 99 percent of treated water is from imported water sources.

To ensure adequate drinking water supplies through the summer, imported and local water is being stored in Anderson, Coyote and Calero reservoirs. Despite the few spring storms there has been little local runoff, and all other district reservoirs continue to drop to minimum storage levels. As a result water releases to creeks and ponds are being curtailed.

Reservoir and creek conditions in your area

Cupertino/Saratoga/Los Gatos area:

- Releases from Stevens Creek Reservoir will provide limited flows in Stevens Creek until reservoir water levels fall below intake structures later in the year.
- Rodeo, Regnart, Calabazas and Saratoga creeks will remain dry until significant rainfall occurs.
- Los Gatos Creek flows will be reduced as water levels in Lexington Reservoir fall.
- McClellan, Page, Sunnyoaks, Budd, McGlincy, Oka and Camden ponds will go dry during the spring and are scheduled for maintenance this summer.

South San Jose/Almaden area:

- Alamitos and Calero creeks will remain dry until significant rainfall occurs.
- Almaden Lake's elevation will continue to fall over the summer and water quality will decline in the lake.
- Los Capitancillos, Alamitos and Guadalupe ponds will likely be dry by May and are scheduled for maintenance in May and June.

East San Jose area:

- Upper Penitencia Creek and most adjacent recharge ponds will remain dry until significant rainfall occurs.
- Piedmont, Capitol and Helmsley ponds will dry back this summer. Ponds at Penitencia Creek Park (City of San José), Penitencia Creek County Park (County of Santa Clara), and Overfelt Garden Park (City of San José) will not be supplied with water until drought conditions end.

Gilroy/Morgan Hill/South San Jose area:

- Releases of imported water to Coyote Creek and Madrone Channel are expected to continue at the current rate, but may be further reduced depending on water supply conditions.
- Releases of local water from Uvas and Chesbro dams will provide limited flows in Uvas and Llagas creeks, but expect drying creeks as the water in the reservoir is exhausted this summer.
- Main Avenue and San Pedro ponds will be dry by June and are scheduled for maintenance this summer.

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Wildlife impacts

Throughout the drought, the water district has worked closely with California Department of Fish and Wildlife (CDFW) to address fish and wildlife impacted by the drought. CDFW is the state agency that is responsible for managing local fish and wildlife resources and issuing appropriate permits to allow work in habitat areas and to rescue or relocate species when warranted.

In normal rainfall years, water supply operations in local streams and recharge ponds provide water and aquatic habitat for native and non-native species alike. It is district policy to conduct its water supply operations and maintenance activities in an environmentally sensitive manner, including reservoir releases, stream and pond recharge operations and maintenance.

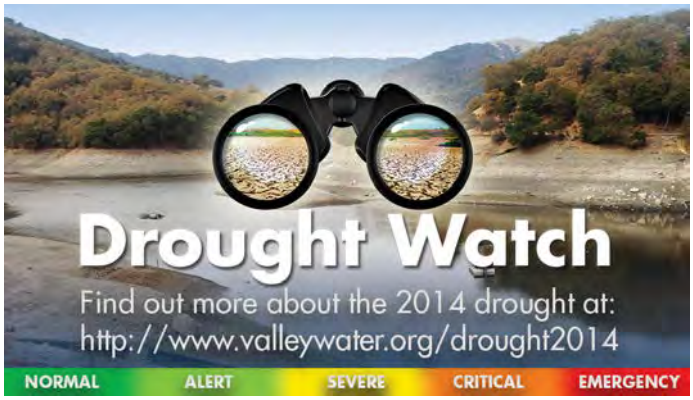
When water is lacking, aquatic habitats are impacted first and more severely than other habitats, causing migration, behavior changes and die-off of some animals. Lack of water means wildlife become concentrated in any remaining suitable habitat, increasing competition for remaining resources and increasing the chances for disease outbreaks due to close contact.

The widespread nature of the drought has made relocation of any native species difficult to support and, as a result, CDFW has developed a policy that severely limits the instances where rescue or relocation of fish species can be approved.

Operations and recharge pond maintenance will not include rescue or relocation of wildlife from streams or ponds. There are many non-native species that have colonized local streams and reservoirs. The loss of non-native species will likely have a long term benefit to the local fish and wildlife that have evolved to withstand the climate extremes of their native habitat.

Unfortunately, these dry creek and pond conditions are occurring statewide. The water district will continue to coordinate with CDFW staff in addressing the drought effects on native and non-native species.

Guadalupe Creek during the week of March 17, 2014.



CONTACT US

For more information, contact the **Drought Hotline** at **(408) 630-2000**, or visit our website at valleywater.org and use our **Access Valley Water** customer request and information system. With three easy steps, you can use this service to find out the latest information on district projects or to submit questions, complaints or compliments directly to a district staff person.

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To get eNews, email info@valleywater.org

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Reference 15

May 2014

Water Tracker

Santa Clara Valley Water District

A monthly assessment of trends in water supply and use for Santa Clara County, California

Outlook as of May 1, 2014

Severe drought conditions continue throughout California. With very little local watershed runoff, many of the District's 10 reservoirs are at less than 40% of their 20-year average storage. Many creeks and recharge ponds are drying as a result of the lack of surface water available. Anderson Reservoir is currently being filled with imported water to ensure adequate treatment plant supplies this summer and is expected to reach the maximum storage limit on May 5th. Both the federal Central Valley Project and State Water Project continue to face regulatory and water quality challenges due to limited Central Valley runoff, and this will continue to affect imported water deliveries to the county in coming months. On February 25th, the Board passed a resolution calling for retail water agencies, municipalities, and the county to implement mandatory measures as needed to reach a 20% water use reduction target in 2014. Achieving the 20% target will avoid groundwater dropping to the "Severe" range and ensure adequate reserves for 2015.

Weather

Rainfall in San Jose

- Month of April = 0.67 inch
- Total-to-date = 6.10 inches or 44% of average to date
  (Rainfall year is July 1 to June 30)

May 1 Northern Sierra snowpack water content is about 7% of average for this date

Local Reservoirs

- Total May 1 storage = 82,824 acre-feet*
  - » 67% of 20-year average for this date
  - » 49% of total capacity
  - » 67% of restricted capacity storage (169,009 acre-feet total storage capacity limited by seismic restrictions to 122,924 acre-feet)
- Low storage levels in Chesbro, Guadalupe, Uvas, and Stevens Creek reservoirs at 9%, 12%, 13%, and 15% of their total capacities, respectively

*Total includes approximately 34% imported water, including 13,200 acre-feet stored in April

Imported Water

- 2014 State Water Project (SWP) and Central Valley Project (CVP) allocations:
  - » SWP allocation: 5% = 5,000 acre-feet (increased from Zero% to 5% on April 18)
  - » CVP allocations: 50% for Municipal and Industrial uses and Zero% for Irrigation for an approximate total of 65,000 acre-feet
- 2013 SWP and CVP estimated carryover supplies available for 2014: 31,227 acre-feet
- Reservoir storage information, as of May 1, 2014:
  - » Shasta Reservoir at 53% of capacity (61% of average for this date)
  - » Oroville Reservoir at 53% of capacity (65% of average for this date)
  - » San Luis Reservoir at 47% of capacity (52% of average for this date)
- Semitropic groundwater bank reserves: approximately 262,665 acre-feet as of May 1. Withdrawal of banked reserves may be limited by SWP operational constraints, with the available quantity to be determined
- Exchanges and transfers executed in FY14: continuing to pursue several potential agreements; one small transaction completed in April to support San Joaquin River flows
- Estimated Hetch Hetchy deliveries to Santa Clara County:
  - » Month of April = 2,900 acre-feet
  - » 2014 Total = 12,300 acre-feet, or 98% of the five-year average
  - » 2014 preliminary reduction = 10% announced by SFPUC on January 31

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Treated Water

- Below average demands of 6,500 acre-feet delivered in April
- This total is 74% of the five-year average for April
- Estimated year-to-date = 25,600 acre-feet or 87% of the five-year average

Groundwater

- Groundwater Storage: Total storage at the end of 2014 is projected to be 208,000 acre-feet, which falls within Stage 3 (Severe) of the Water Shortage Contingency Plan. If the 20% water use reduction target set by the Board on February 25 is achieved, 2014 end-of-year storage will be within the range of Stage 2 (Alert) and near Stage 1 (normal)
- Santa Clara Plain:
  - » The April managed recharge estimate is 600 acre-feet. The year-to-date managed recharge estimate is 7,100 acre-feet, or 44% of the five-year average
  - » The April groundwater pumping estimate is 13,100 acre-feet. The year-to-date groundwater pumping estimate is 37,300 acre-feet, or 190% of the five-year average
  - » The groundwater level in Santa Clara Plain (San Jose) is about 22 feet lower than last year and 21 feet lower than the five-year average
- Coyote Valley:
  - » The April managed recharge estimate is 540 acre-feet. The year-to-date managed recharge estimate is 2,700 acre-feet, or 76% of the five-year average
  - » The April groundwater pumping estimate is 930 acre-feet. The year-to-date groundwater pumping estimate is 3,200 acre-feet, or 95% of the five-year average
  - » The groundwater level in Coyote Valley is about 3 feet lower than last year and 8 feet lower than the five-year average
- Llagas Subbasin:
  - » The April managed recharge estimate is 520 acre-feet. The year-to-date managed recharge estimate is 3,200 acre-feet, or 42% of the five-year average
  - » The April groundwater pumping estimate is 3,400 acre-feet. The year-to-date groundwater pumping estimate is 13,400 acre-feet, or 155% of the five-year average
  - » The groundwater level in Llagas Subbasin (San Martin) is about 21 feet lower than last year and 27 feet lower than the five-year average

Conserved Water

- Saved 56,000 acre-feet in FY13 from long-term program (baseline year is 1992)
- Long-term program goal is to save nearly 60,000 acre-feet in FY14
- Based on the District's Water Shortage Contingency Plan, the Board set a 2014 water use reduction target of 20%, in addition to long-term program savings
- District will be reporting on progress towards meeting the call for 20%, starting in May

Recycled Water

- Estimated April 2014 production = 1,800 acre-feet (billed semi-annually)
- Estimated year-to-date = 5,700 acre-feet or 167% of the five-year average
- Silicon Valley Advanced Water Purification Center was completed and began delivery of high quality treated recycled water for blending with existing nonpotable water on March 25, 2014

CONTACT US

For more information, contact **Customer relations** at **(408) 630-2880**, or visit our website at valleywater.org and use our **Access Valley Water** customer request and information system. With three easy steps, you can use this service to find out the latest information on district projects or to submit questions, complaints or compliments directly to a district staff person.

Follow us on: /scvwd /valleywater /valleywater

To get eNews, email info@valleywater.org

Water Tracker

Weather - Rain

May 2014

Santa Clara Valley Water District

Historical ALERT Precipitation Gage Information

These data readings are Preliminary. Most data relayed by telemetry have received little or no review. Inaccuracies in the data may be present because of instrument malfunctions and/or physical changes at the measurement site. Subsequent review may result in significant revisions to the data.

Pacific Standard Time (Note: Gage clock may be different from current time)

Historic Data From: 05/01/2014 at 12:00:00 AM PST

Northwest Watershed									
Alert ID	Description	15 min. (in.)	30 min. (in.)	1 hour (in.)	3 hours (in.)	6 hours (in.)	12 hours (in.)	24 hours (in.)	Season to date (in.)
2096	Dahl Ranch RF 24	----	----	----	----	----	----	----	----
1510	Stevens Creek RF 100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.59
1522	Maryknoll RF 53	----	----	----	----	----	----	----	----
1500	Rancho San Antonio RF 140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.22
1521	Sunnyvale WTP RF 48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.18
1515	Mtn. View Corp Yard RF 121	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.91
2099	Palo Alto RF 129	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.22
North Central Watershed									
Alert ID	Description	15 min. (in.)	30 min. (in.)	1 hour (in.)	3 hours (in.)	6 hours (in.)	12 hours (in.)	24 hours (in.)	Season to date (in.)
1509	Valley Christian RF 77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.77
1511	West Yard RF 108	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.10
2053	Guadalupe Slough RF 16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.18
Guadalupe River Watershed									
Alert ID	Description	15 min. (in.)	30 min. (in.)	1 hour (in.)	3 hours (in.)	6 hours (in.)	12 hours (in.)	24 hours (in.)	Season to date (in.)
2081	Mt Umunhum RF 69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.89
2068	Lexington Reservoir RF 138	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.32
2072	Loma Prieta RF 44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.31
1526	Guadalupe Watershed RF 123	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.33
2080	Almaden Watershed RF 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.03
1513	Calero RF 128	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.66
2066	Johnson Ranch RF 36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.29
1524	Rinconada WTP RF 79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.52
1527	Vasona Pump Station RF 125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.36
2065	Alamitos RF 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.94
1453	City of San Jose RF 131	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.10
Coyote Creek Watershed									
Alert ID	Description	15 min. (in.)	30 min. (in.)	1 hour (in.)	3 hours (in.)	6 hours (in.)	12 hours (in.)	24 hours (in.)	Season to date (in.)
2070	Penitencia WTP RF99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.83
2079	Coe Park RF 17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.42
2071	Cow Ridge RF 127	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.20
1512	Mt. Hamilton RF 67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.59
2075	Coyote Reservoir RF 21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.87
2067	U.T.C. RF 102	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.62
2073	Anderson RF 41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.54
1520	Laguna Seca RF 37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.98
1516	Evergreen RF 132	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.70
2069	Haskins Ranch RF 34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.77
1514	Curtner Ranch RF 23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86
Pajaro River Watershed									
Alert		15 min.	30 min.	1 hour	3 hours	6 hours	12 hours	24 hours	Season to date

Santa Clara Valley Water District

Historical ALERT Precipitation Gage Information

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Pacific Standard Time (Note: Gage clock may be different from current time)

ID	Description	(in.)	(in.)	(in.)	(in.)	(in.)	(in.)	(in.)	(in.)
2072	Loma Prieta RF 44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.31
1530	Uvas Canyon Park RF135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.21
2057	Uvas Res RF 104	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.68
1508	Castro Valley RF 15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.18
1503	Morgan Hill RF 136	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.99
1529	Church Ave. Per. Ponds RF134	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.49
1528	W. Little Llagas RF 139	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.62
Far Eastern Santa Clara County Watershed									
Alert ID	Description	15 min. (in.)	30 min. (in.)	1 hour (in.)	3 hours (in.)	6 hours (in.)	12 hours (in.)	24 hours (in.)	Season to date (in.)
1519	Coit Ranch RF 18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.44
1517	Biel Ranch RF 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.91
1512	Mt. Hamilton RF 67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.59
1518	Shanti Ashrama RF 98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.25

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Water Tracker

Local Reservoir **May 2014**

Historical ALERT Reservoir Gage Information

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Pacific Standard Time (Note: Gage clock may be different from current time)

Historic Data From: 05/01/2014 at 12:00:00 AM PST

Stevens Creek Watershed							
Alert ID	Description	Date & Time (pst)	Reservoir Elevation (feet)	Spillway Elevation (feet)	Reservoir Storage (acre-feet)	Reservoir Capacity (acre-feet)	% of Reservoir Capacity
1464	Stevens Creek	04/30/2014 11:16:31 PM	490.6	535.0	460.6	3,138	14.7
Guadalupe River Watershed							
Alert ID	Description	Date & Time (pst)	Reservoir Elevation (feet)	Spillway Elevation (feet)	Reservoir Storage (acre-feet)	Reservoir Capacity (acre-feet)	% of Reservoir Capacity
2090	Almaden	04/30/2014 11:22:16 PM	585.4	608.8	580.9	1,586	36.6
2094	Calero	04/30/2014 11:08:09 PM	462.0	483.5	4,108.4	9,934	41.4
2092	Guadalupe	04/30/2014 11:10:38 PM	552.2	617.3	405.5	3,415	11.9
1466	Lexington	04/30/2014 11:13:42 PM	602.8	649.9	5,190.9	19,044	27.3
1468	Vasona	04/30/2014 10:20:15 PM	293.7	294.8	436.8	495	88.2
Coyote Creek Watershed							
Alert ID	Description	Date & Time (pst)	Reservoir Elevation (feet)	Spillway Elevation (feet)	Reservoir Storage (acre-feet)	Reservoir Capacity (acre-feet)	% of Reservoir Capacity
2074	Coyote	04/30/2014 07:41:23 PM	751.7	777.2	9,621.0	23,244	41.4
1480	Anderson	04/30/2014 10:59:37 PM	597.6	625.0	59,971.1	90,373	66.4
Pajaro River Watershed							
Alert ID	Description	Date & Time (pst)	Reservoir Elevation (feet)	Spillway Elevation (feet)	Reservoir Storage (acre-feet)	Reservoir Capacity (acre-feet)	% of Reservoir Capacity
1470	Chesbro	04/30/2014 11:50:05 PM	480.3	525.0	686.8	7,945	8.6
1472	Uvas	04/30/2014 11:03:10 PM	438.8	487.5	1,276.1	9,835	13.0
District Totals:					82,738	169,009	49.0

Providing stream stewardship, wholesale water supply and flood protection for Santa Clara County.

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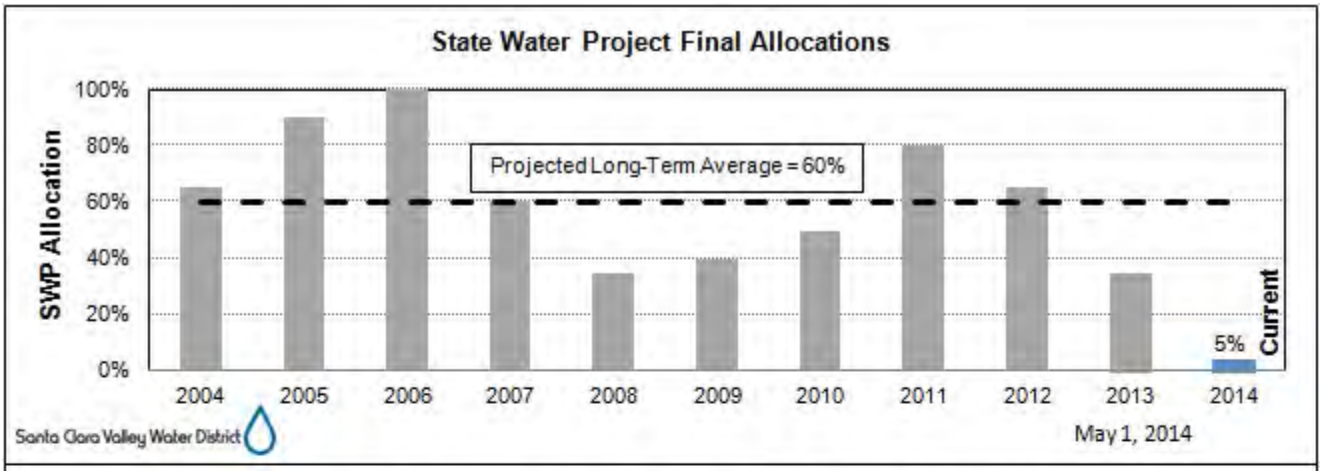
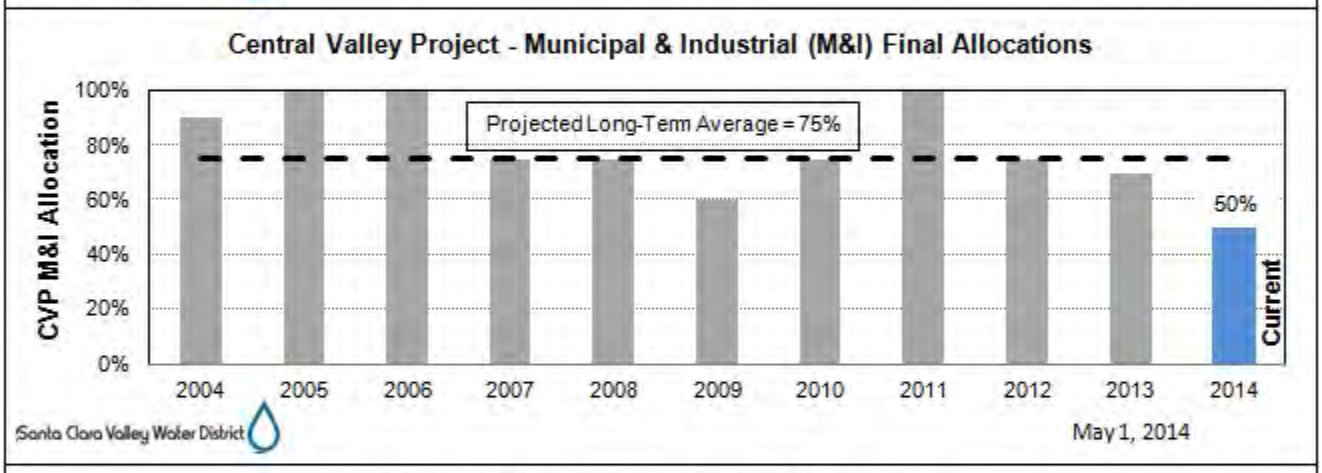
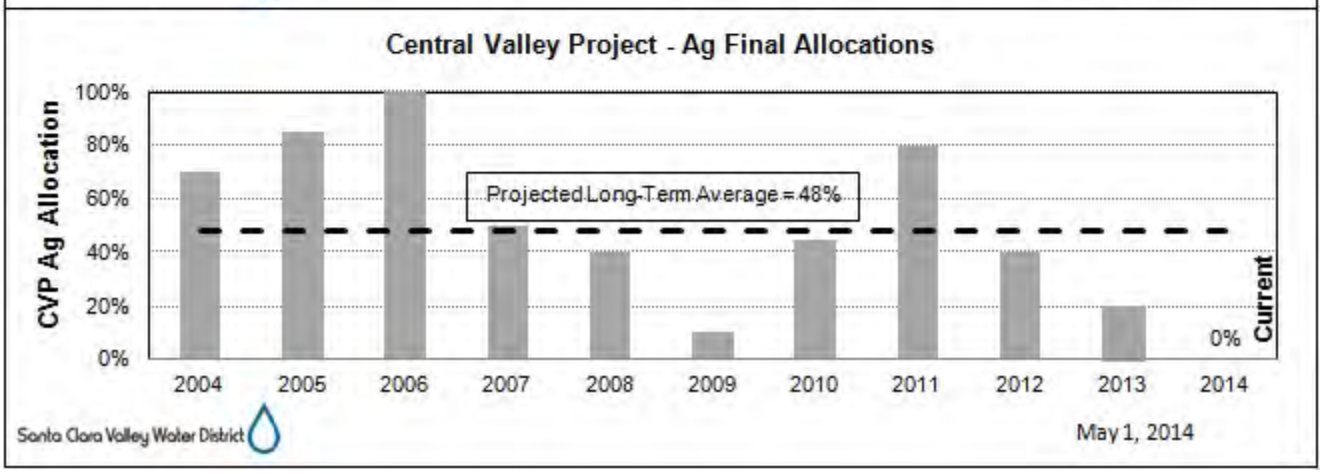
Water Tracker

Imported Water – State Water Project & Central Valley Project Allocations **May 2014**







Santa Clara Valley Water District

State of California | DEPARTMENT OF WATER RESOURCES
CALIFORNIA STATE WATER PROJECT | California Natural Resources Agency

NOTICE TO STATE WATER PROJECT CONTRACTORS

Date: APR 1 8 2014

Number: **14-07**

Subject: 2014 State Water Project Allocation Increase back to 5 Percent

From:
Carl A. Torgersen
Deputy Director
Department of Water Resources

The Department of Water Resources (DWR) is increasing the allocation of 2014 State Water Project (SWP) water for long-term contractors from 0 acre-feet to 208,628 acre-feet. Based on recent precipitation, runoff, and current water supply conditions, SWP supplies are projected to meet 5% of SWP contractors' requests for Table A water, which totals 4,172,536 acre-feet. A condition of this Allocation is that SWP contractors take delivery of this water after September 1, 2014. Attached is the modified 2014 SWP allocation table.

The 2014 Initial Allocation made on 11/19/13 was 5%, but was later reduced to Zero on 1/31/14 when hydrologic conditions turned historically dry. Although this increase from Zero back to 5% will provide much needed relief in meeting critical water needs in 2014, it remains the lowest overall allocation in SWP history. DWR is taking prudent steps in preparing for continued drought conditions should they persist into 2015.

If you have any questions or need additional information, please contact Robert Cooke, Chief of DWR's State Water Project Analysis Office, at (916) 653-4313.

Attachment

DWR 9625 (Rev. 3/12) | Page 1 of 1

Santa Clara Valley Water District

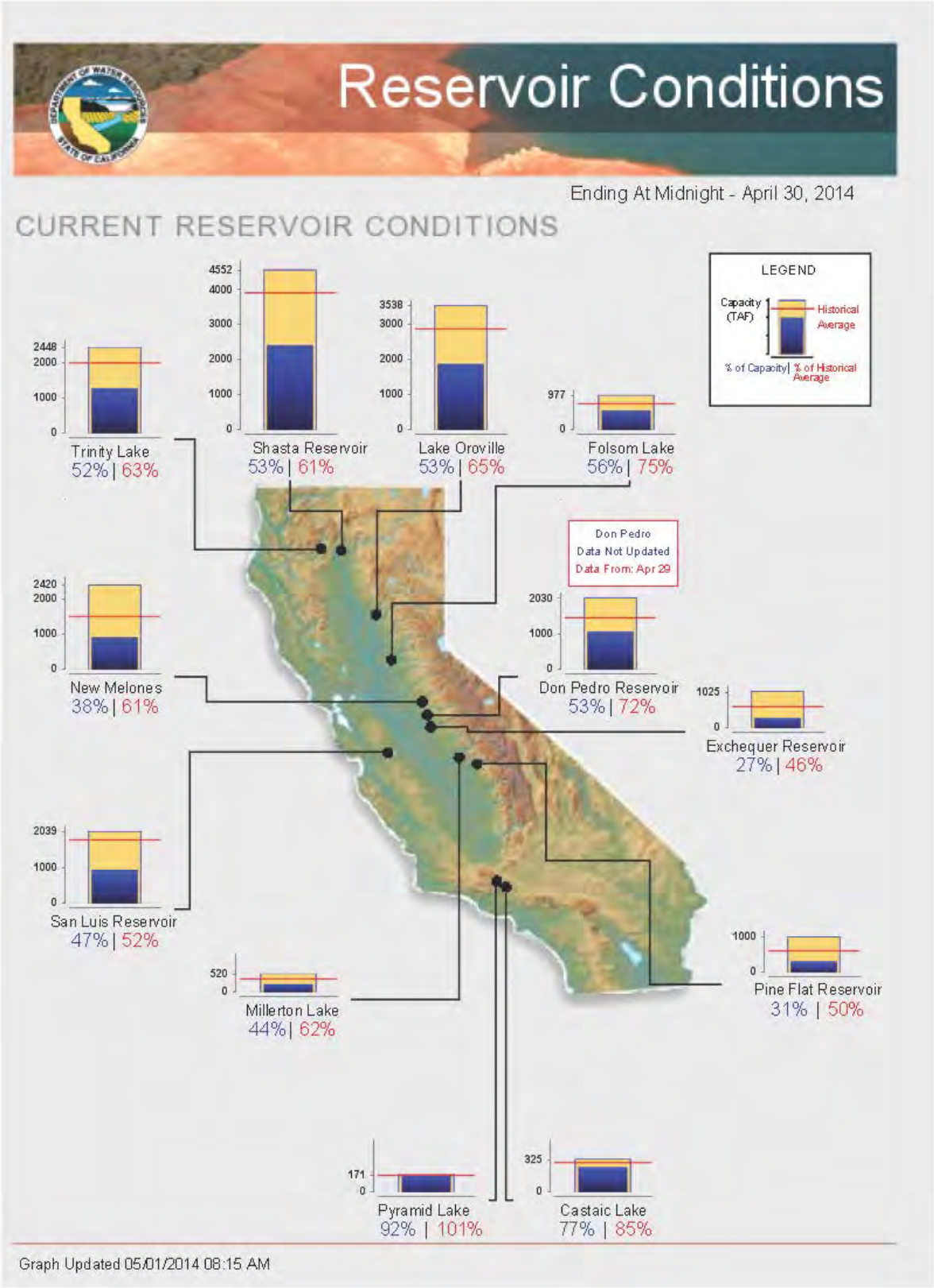
2014 STATE WATER PROJECT ALLOCATION
(ACRE-FEET)

SWP CONTRACTORS	TABLE A (1)	INITIAL REQUEST (2)	APPROVED ALLOCATION (3)	PERCENT INITIAL REQUEST APPROVED (3)/(2) (4)
FEATHER RIVER				
County of Butte	27,500	27,500	1,375	5%
Plumas County FC&WCD	2,500	2,500	125	5%
City of Yuba City	9,600	9,600	480	5%
Subtotal	**39,600**	**39,600**	**1,980**	
NORTH BAY				
Napa County FC&WCD	29,025	29,025	1,451	5%
Solano County WA	47,706	47,706	2,385	5%
Subtotal	**76,731**	**76,731**	**3,836**	
SOUTH BAY				
Alameda County FC&WCD, Zone 7	80,619	80,619	4,031	5%
Alameda County WD	42,000	42,000	2,100	5%
Santa Clara Valley WD	100,000	100,000	5,000	5%
Subtotal	**222,619**	**222,619**	**11,131**	
SAN JOAQUIN VALLEY				
Oak Flat WD	5,700	5,700	285	5%
County of Kings	9,305	9,305	465	5%
Dudley Ridge WD	48,350	48,350	2,418	5%
Empire West Side ID	3,000	3,000	150	5%
Kern County WA	982,730	982,730	49,137	5%
Tulare Lake Basin WSD	87,471	87,471	4,374	5%
Subtotal	**1,136,556**	**1,136,556**	**56,829**	
CENTRAL COASTAL				
San Luis Obispo County FC&WCD	25,000	25,000	1,250	5%
Santa Barbara County FC&WCD	45,486	45,486	2,274	5%
Subtotal	**70,486**	**70,486**	**3,524**	
SOUTHERN CALIFORNIA				
Antelope Valley-East Kern WA	144,844	144,844	7,242	5%
Castaic Lake WA	95,200	95,200	4,760	5%
Coachella Valley WD	138,350	138,350	6,918	5%
Crestline-Lake Arrowhead WA	5,800	5,800	290	5%
Desert WA	55,750	55,750	2,788	5%
Littlerock Creek ID	2,300	2,300	115	5%
Metropolitan WDSC	1,911,500	1,911,500	95,575	5%
Mojave WA	82,800	82,800	4,140	5%
Palmdale WD	21,300	21,300	1,065	5%
San Bernardino Valley MWD	102,600	102,600	5,130	5%
San Gabriel Valley MWD	28,800	28,800	1,440	5%
San Gorgonio Pass WA	17,300	17,300	865	5%
Ventura County WPD	20,000	20,000	1,000	5%
Subtotal	**2,626,544**	**2,626,544**	**131,328**	
TOTAL	**4,172,536**	**4,172,536**	**208,628**	

SWPAO
4/16/2014

Water Tracker

Imported Water – State Reservoirs **May 2014**



Santa Clara Valley Water District

DEPARTMENT OF WATER RESOURCES
California Data Exchange Center

Daily Reservoir Storage Summary

ENDING AT MIDNIGHT - 04/30/2014

FOR SELECTED RESERVOIRS IN NORTHERN AND SOUTHERN CALIFORNIA

Report generated: 05/01/2014 05:02

Reservoir Name	StaID	Capacity (AF)	Elevation (FT)	Water Storage Storage (AF)	Storage Change	% of Capacity	Average Storage	% of Average	Outflow (CFS)	Inflow (CFS)	Storage - Year Ago This Date
TRINITY RIVER											
TRINITY LAKE	CLE	2,447,650	2,283.96	1,281,245	-15,494	52	2,019,716	63	1,400	----	2,142,189
WHISKEYTOWN	WHI	241,100	1,208.88	237,514	-445	99	232,776	102	204	-9	234,528
LEWISTON	LEW	14,660	1,901.61	14,367	-30	98	13,846	104	1,545	1,535	14,584
RUSSIAN RIVER											
SONOMA(WARM SPRINGS)	WRS	381,000	426.38	185,569	-88	49	231,401	80	----	----	231,046
MENDOCINO (COYOTE)	COY	122,400	725.76	49,784	105	41	81,988	61	----	----	60,002
SACRAMENTO RIVER											
SHASTA	SHA	4,552,000	979.63	2,408,810	-390	53	3,923,556	61	3,828	3,763	3,788,352
KESWICK	KES	23,772	577.52	18,149	-526	76	21,995	83	4,142	3,881	20,411
FEATHER RIVER											
OROVILLE	ORO	3,537,577	770.50	1,876,551	-1,110	53	2,877,158	65	2,115	1,654	3,040,407
ANTELOPE	ANT	22,566	5,001.89	22,462	-19	100	21,824	103	----	----	22,853
FRENCHMAN	FRD	55,477	5,566.82	27,975	-41	50	43,138	65	----	----	38,691
LAKE DAVIS	DAV	83,000	5,767.20	56,099	-65	68	66,846	84	----	----	69,016
YUBA RIVER											
BULLARDS BAR	BUL	969,600	1,886.93	670,503	-416	69	767,055	87	----	----	835,960
ENGLEBRIGHT	ENG	70,000	521.63	65,689	426	94	67,044	98	----	----	62,572
AMERICAN RIVER											
FOLSOM	FOL	977,000	422.25	546,617	3,092	56	729,491	75	778	2,382	681,715
UNION VALLEY	UNV	230,000	4,843.65	196,908	1,464	86	191,446	103	----	----	248,987
LOON LAKE	LON	76,500	6,402.23	58,825	194	77	37,019	159	----	----	52,850
ICH HOUSE	ICH	37,120	5,442.30	38,460	165	104	27,771	138	----	----	39,934
NIMBUS	NAT	9,000	123.27	7,918	-258	88	8,123	97	840	712	8,153
CACHE CREEK											
INDIAN VALLEY	INV	300,000	----	----	----	----	197,910	----	----	----	87,920
STONY CREEK											
BLACK BUTTE	BLB	143,700	458.34	78,251	724	54	102,959	76	----	----	47,187
CALAVERAS RIVER											
NEW HOGAN	NHG	317,000	644.39	97,523	-264	31	177,961	55	----	----	159,700
MOKELUMNE RIVER											
CAMANCHE	CMN	417,120	196.05	173,884	-486	42	268,422	65	325	0	331,190
PARDEE	PAR	210,000	551.11	163,303	63	78	182,929	89	217	217	183,660
STANISLAUS RIVER											
DONNELL'S	DON	56,893	----	45,023	862	79	28,051	161	110	----	15,327
BEARDSLEY	BRD	77,600	----	27,876	129	36	64,024	44	139	----	56,004
TULLOCH	TUL	68,400	505.34	61,307	306	90	61,352	100	3,601	3,766	61,577
NEW MELONES	NML	2,400,000	930.62	917,188	-5,879	38	1,505,307	61	3,728	826	1,457,437
TUOLUMNE RIVER											
DON PEDRO	DNP	2,030,000	----	----	----	----	1,487,118	----	----	----	1,471,223
HETCH HETCHY	HTH	360,000	----	----	----	----	175,001	----	----	----	281,400
CHERRY VALLEY	CHV	273,500	----	----	----	----	134,711	----	----	----	250,888
MERCED RIVER											
MC CLURE (EXCHEQUER)	EXC	1,032,000	706.13	----	----	----	606,968	----	----	----	542,871
CHOWCHILLA RIVER											
EASTMAN (BUCHANAN)	BUC	150,000	472.72	13,699	0	9	89,072	15	----	----	50,019
FRESNO RIVER											
HENSLEY (HIDDEN)	HID	90,000	458.31	8,484	32	9	50,717	17	----	----	31,692

DEPARTMENT OF WATER RESOURCES
California Data Exchange Center

SAN JOAQUIN RIVER											
MILLERTON (FRIANT)	MIL	520,500	----	----	----	----	365,863	----	----	----	330,322
SAN LUIS CREEK											
SAN LUIS	SNL	2,041,000	448.33	955,758	493	47	1,821,675	52	----	----	1,109,961
KINGS RIVER											
PINE FLAT	PNF	1,000,000	797.08	306,434	4,805	31	613,175	50	----	----	434,936
KAWEAH RIVER											
KAWEAH (TERMINUS)	TRM	185,600	637.19	53,807	1,454	29	76,020	71	----	----	77,779
TULE RIVER											
SUCCESS	SCC	82,300	600.00	12,902	109	16	44,234	29	----	----	29,028
KERN RIVER											
ISABELLA	ISB	568,000	2,537.22	65,730	341	12	231,044	28	----	----	96,231
TRUCKEE RIVER											
STAMPEDE	STP	226,500	5,897.51	89,600	-700	40	146,344	61	----	----	163,800
INDEPENDENCE LAKE	INP	17,295	6,948.50	16,949	42	98	15,072	112	----	----	15,742
DONNER LAKE	DNN	9,700	5,934.85	8,706	85	90	6,563	133	----	----	7,499
SANTA YNEZ RIVER											
CACHUMA LAKE	CCH	190,500	700.13	74,718	-65	39	172,099	43	58	24	124,653
SOUTH COAST											
PYRAMID	PYM	180,000	2,574.31	165,181	-38	92	162,991	101	----	----	166,847
CASTAIC	CAS	325,000	1,479.50	249,928	-1,546	77	294,185	85	----	----	284,201

Total Storage (AF) 11,349,696 **Total Average Storage** 17,476,389 **Total % Group Average** 64.94%

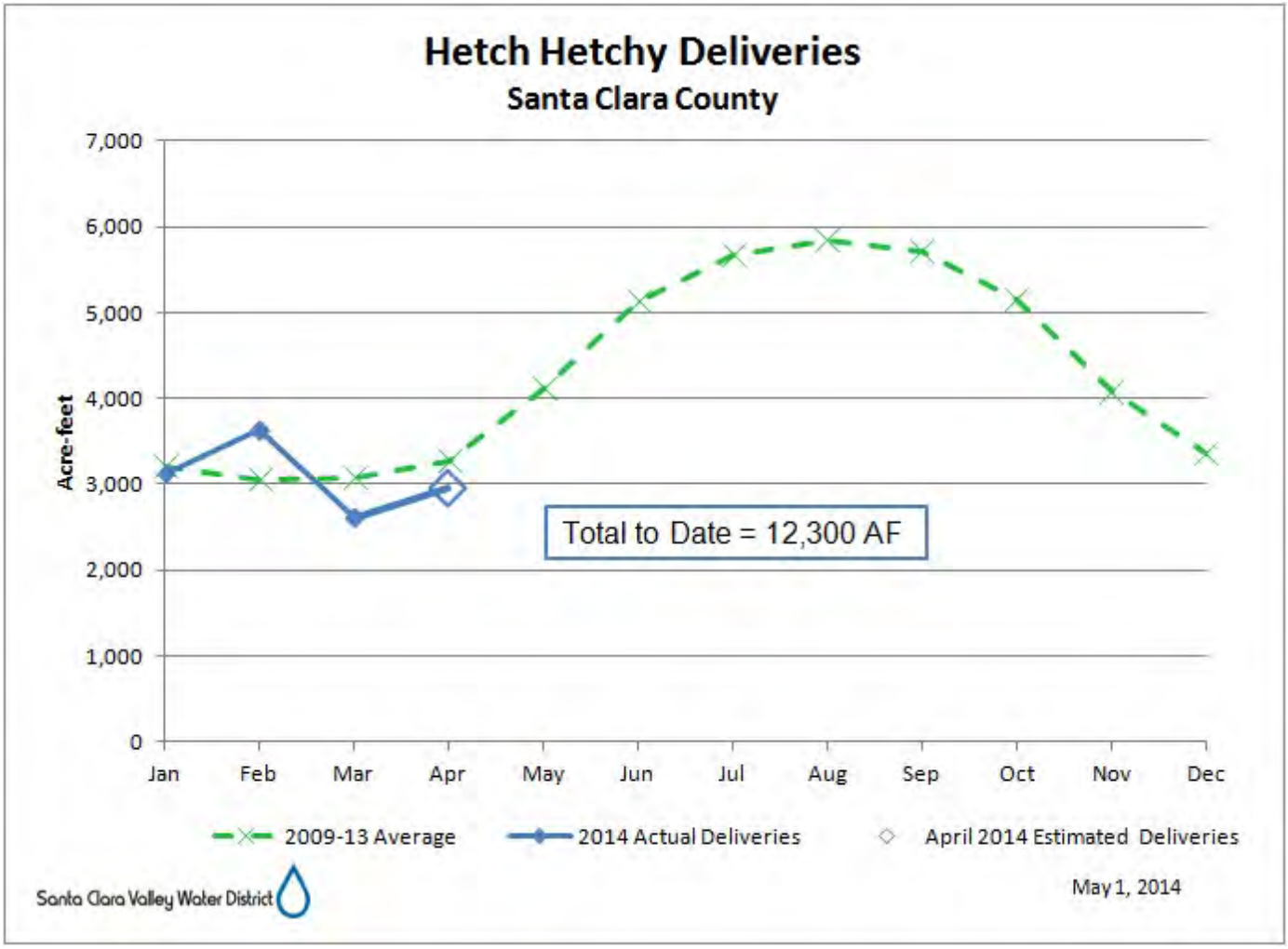
AF - Acre Feet CFS - Cubic Feet per Second

Note: Reservoir Flows are daily averages.

FY 2013-2014 Imported Water Management Agreements		
Date Executed	**Party / Parties**	**Purpose of Agreement**
07/09/2013	San Luis & Delta-Mendota Water Authority	Agreement to provide for delivery of additional CVP supply resulting from fish flow releases by Oakdale Irrigation District and South San Joaquin Irrigation District
07/09/2013	San Benito County Water District	Agreement providing for transfer of up to 5,000 acre-feet of CVP supply to San Benito County Water District
07/12/2013	Department of Water Resources, Dudley Ridge Water District	Multi-year agreement providing for annual conveyance of up to 3,100 acre-feet of non-SWP water through 2025
07/12/2013	U.S. Bureau of Reclamation	Multi-year agreement providing for annual conveyance and storage of up to 1,600 acre-feet of non-CVP water through mid-2018
12/31/2013	Patterson Irrigation District	Amendment to water transfer agreement providing for transfer of up to 22,000 acre-feet of supplies from Patterson Irrigation District over six years
01/06/2014	State Water Contractors	Agreement to participate in 2014 Dry Year Transfer Program to pursue water transfer supplies in 2014
02/14/2014	U.S. Bureau of Reclamation, Pajaro Valley Water Management Agency, Westlands Water District	Two-year interim renewal contract that allows for up to 6,260 acre-feet of additional CVP irrigation water supply annually from Mercy Springs Water District
04/24/2014	Merced Irrigation District	Agreement providing for transfer of 5,000 acre-feet from Merced Irrigation District
04/24/2014	Department of Water Resources, Merced Irrigation District	Agreement providing for conveyance and storage of 5,000 acre-feet of non-SWP water from Merced Irrigation District

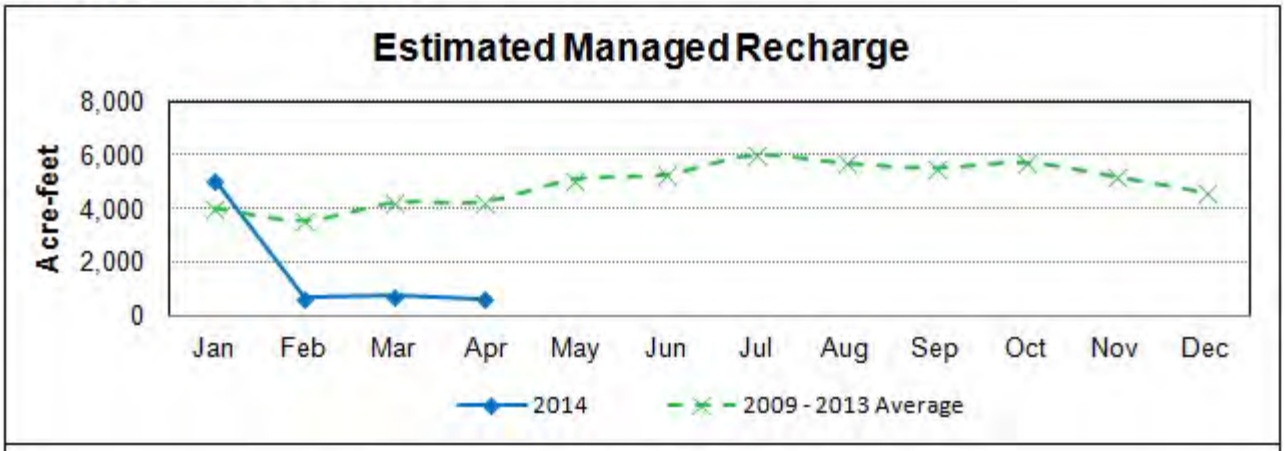
Water Tracker

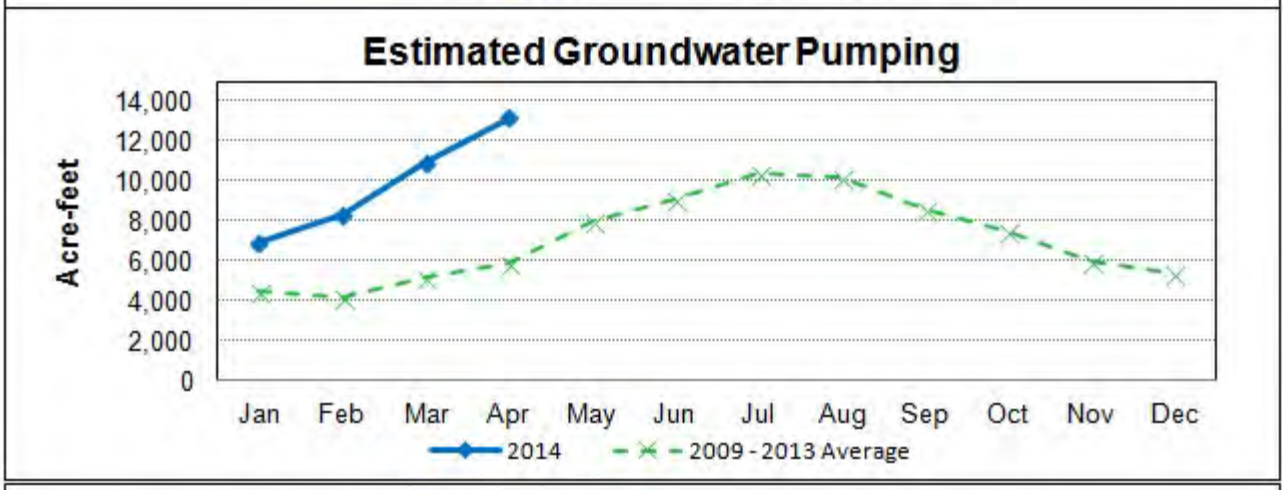
Imported Water – Hetch Hetchy **May 2014**

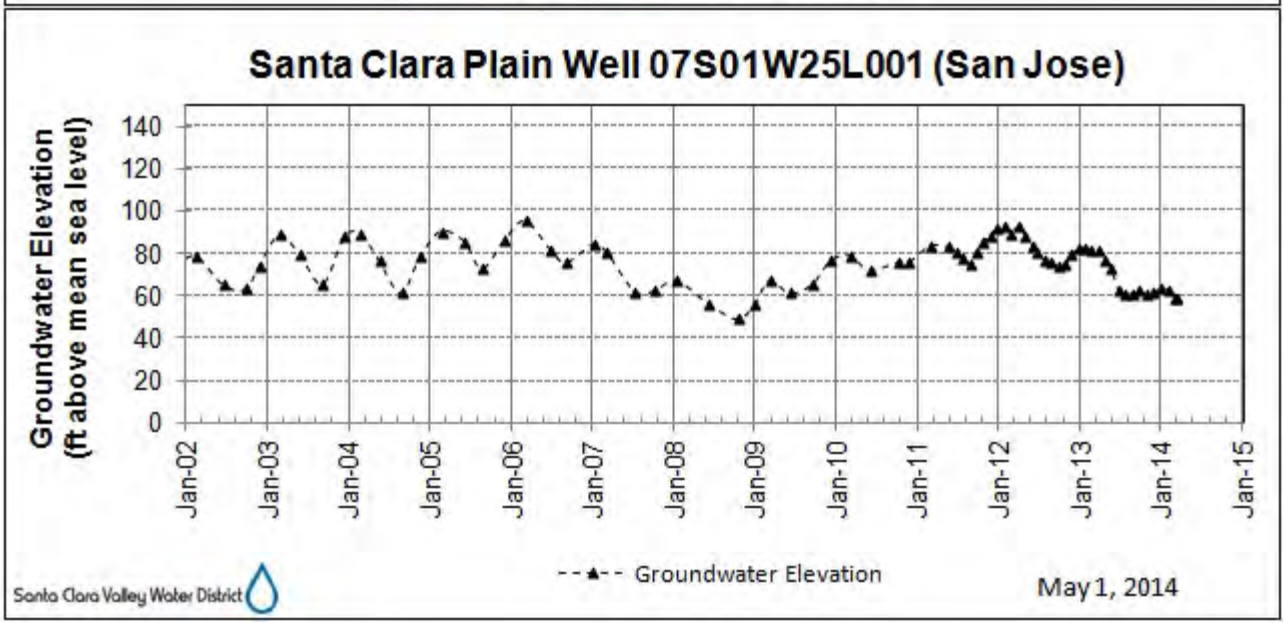


Santa Clara Valley Water District

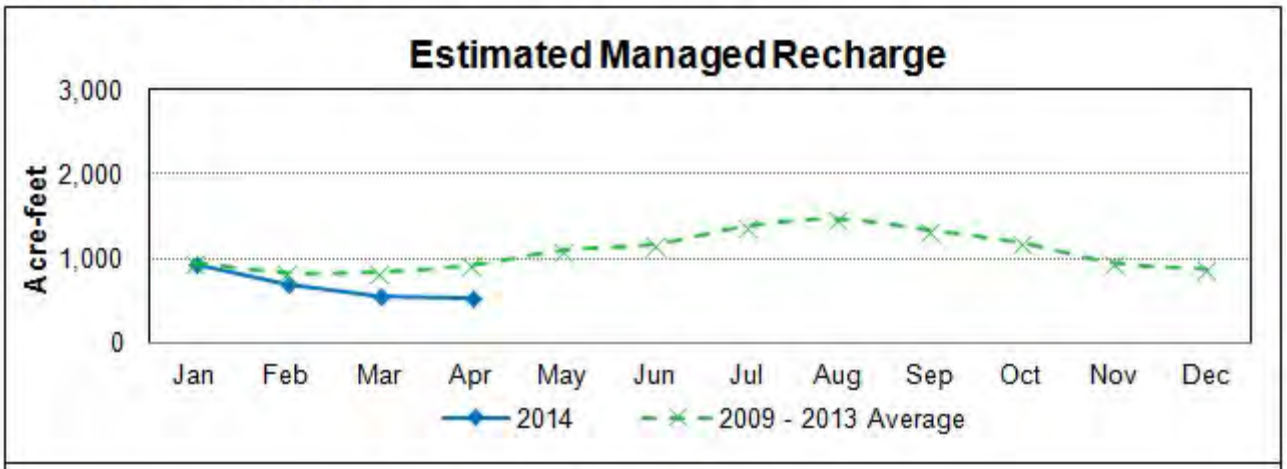
Santa Clara Plain

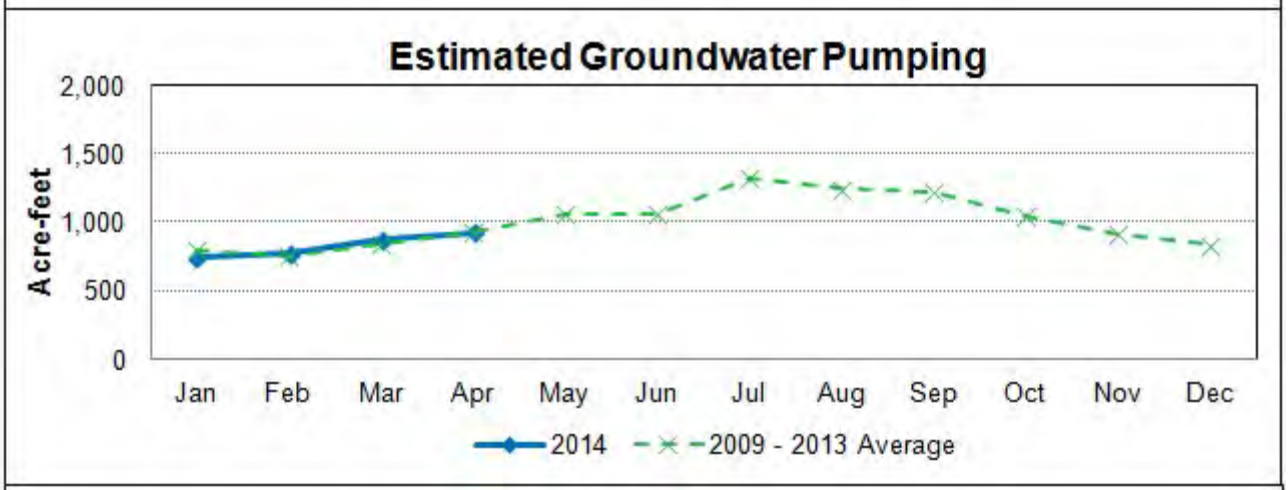


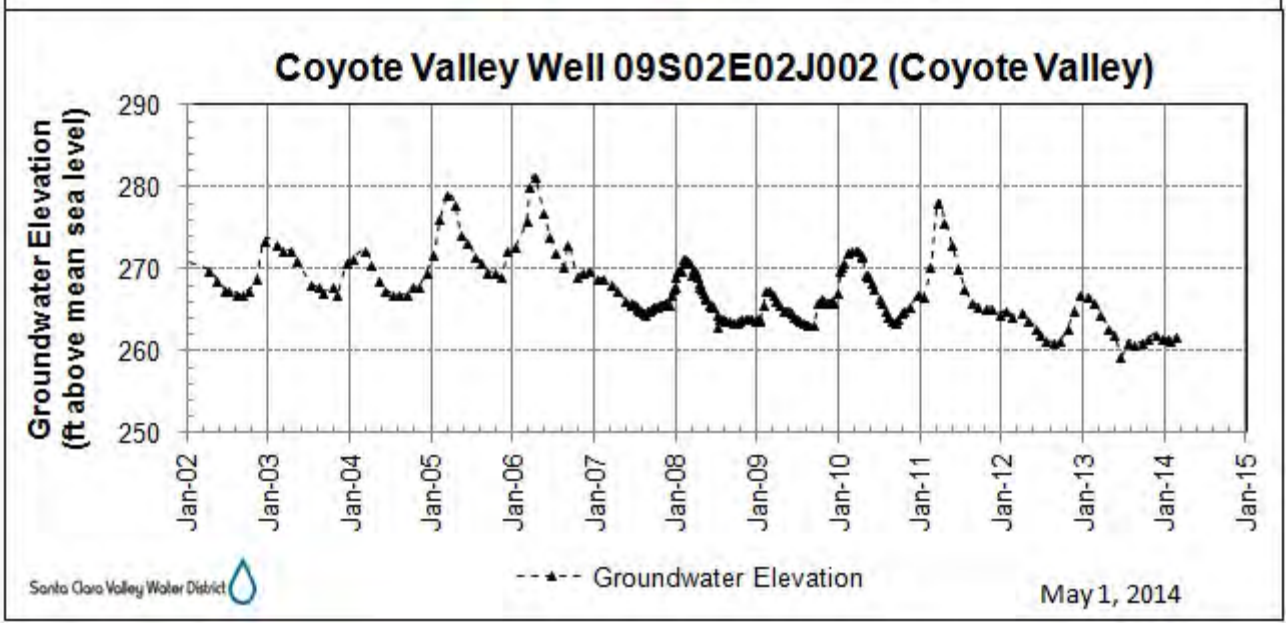




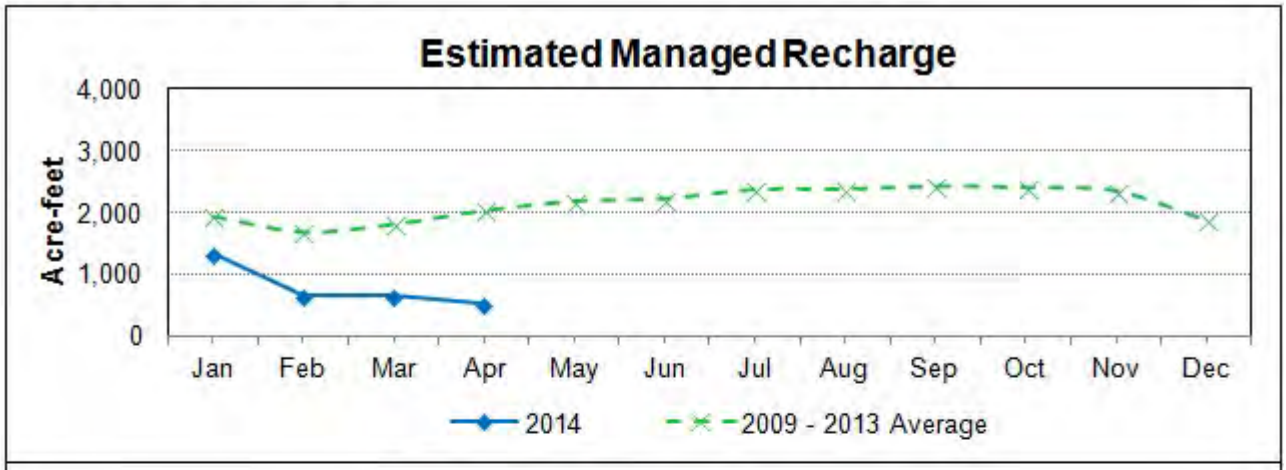
Coyote Valley

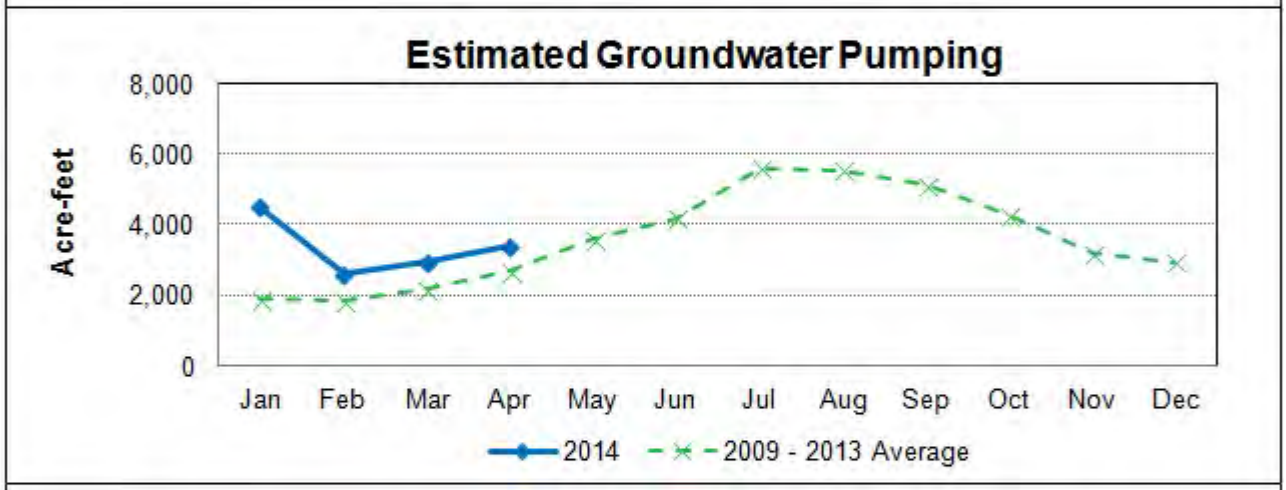


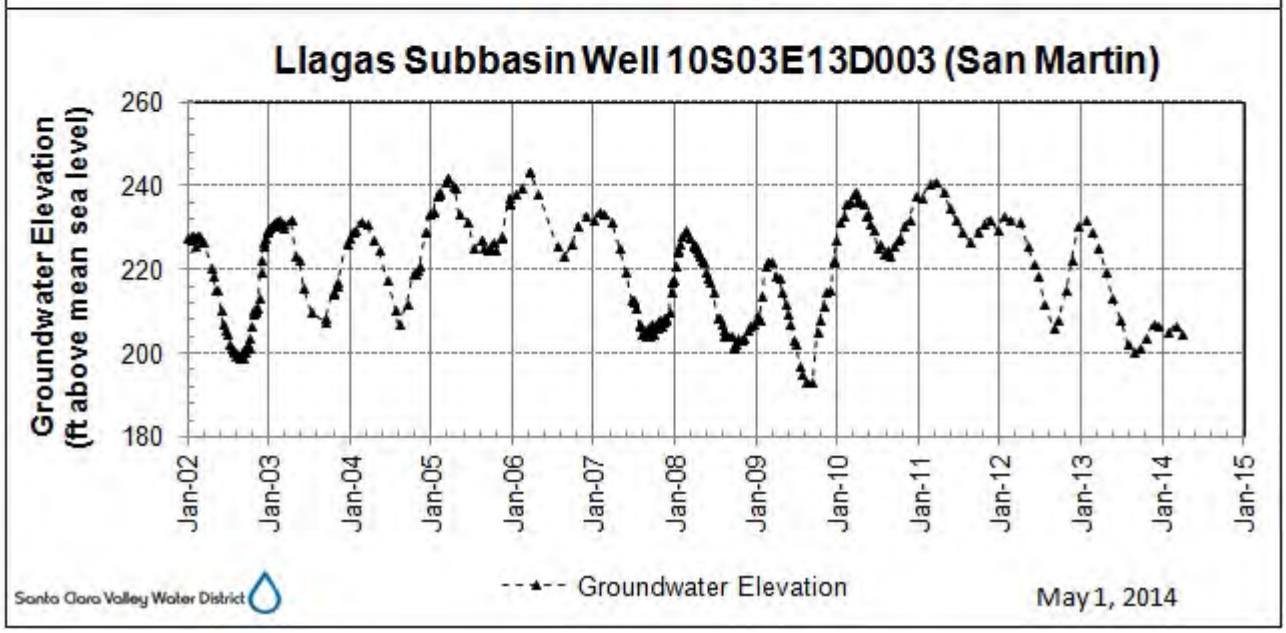




Llagas Subbasin



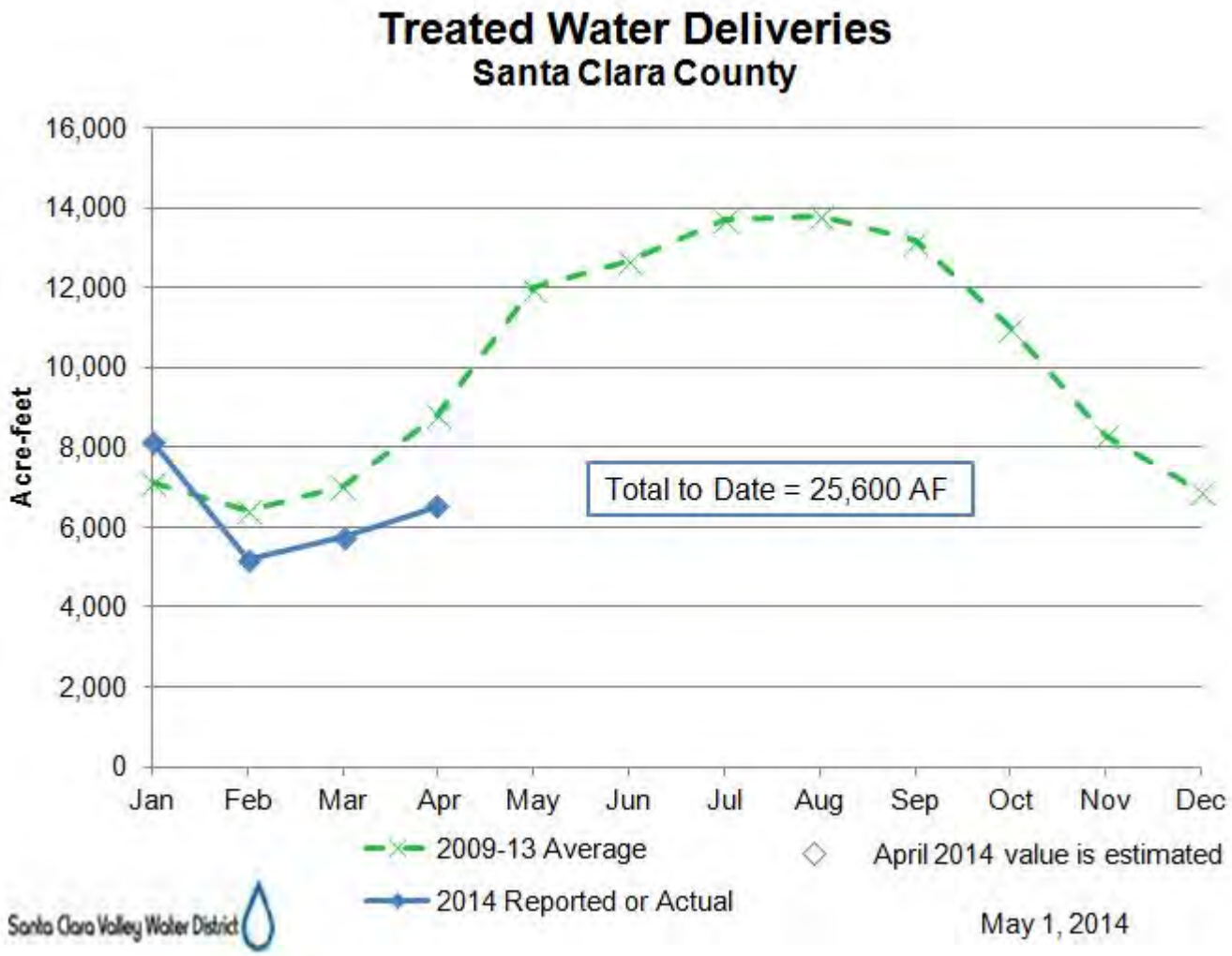




Water Tracker

Treated Water

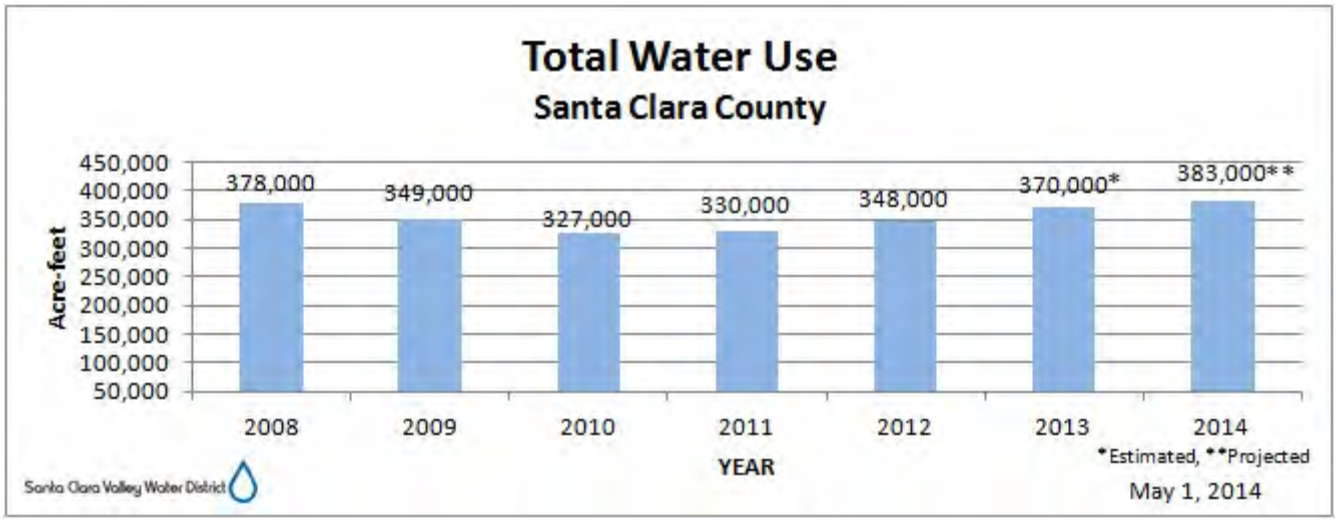
May 2014



Santa Clara Valley Water District

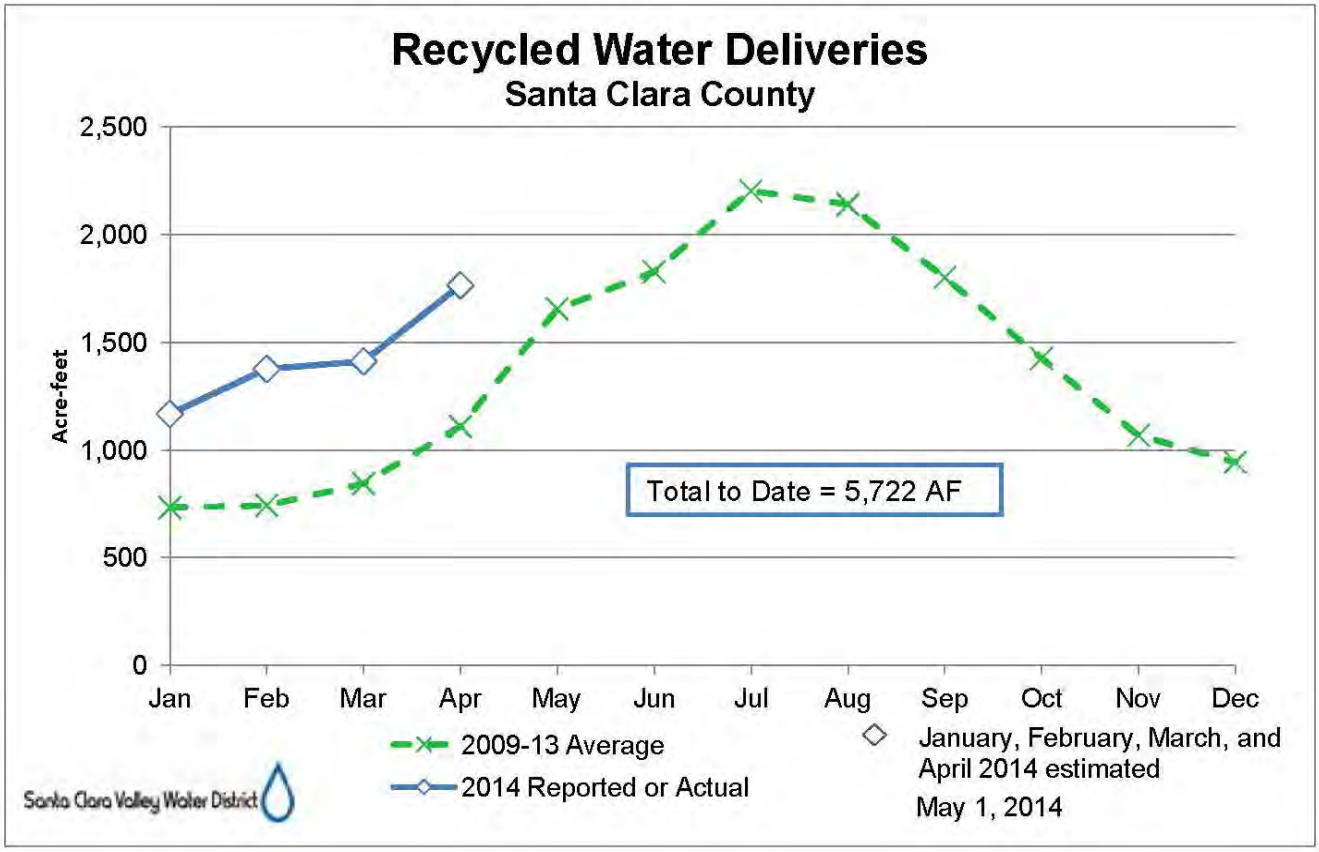
Water Tracker

Conserved Water – Total Water Use **May 2014**



Water Tracker

Recycled Water Deliveries **May 2014**



Santa Clara Valley Water District

Reference 16

Santa Clara Valley Water District

FC 1703 (08-17-11)

Meeting Date:	3/25/14
Agenda Item No.:	4.1
Manager:	J. Maher
Extension:	2073
Director:	All

SUPPLEMENTAL BOARD AGENDA MEMORANDUM

SUBJECT: Update on 2014 Water Supply and Drought Response

REASON FOR SUPPLEMENTAL MEMORANDUM:

To allow for inclusion of the most current water supply information.

RECOMMENDATION:

Receive, review, and discuss updated information on 2014 water supply and drought response.

SUMMARY:

Severe drought continues to impact both statewide and local water supply conditions. On February 25, the Board approved a resolution setting a county-wide water use reduction target equal to 20 percent of 2013 water use, or approximately 72,000 acre-feet, and recommending that retail water agencies, municipalities and the county implement mandatory measures as needed to accomplish the target. This action was based on the District's Water Shortage Contingency Plan[1] and estimated 2014 water supply conditions that showed groundwater reserves could reach the Stage 3 ("Severe") level by the end of the year if water use reduction measures are not implemented. Updated information on 2014 water supply and operations is presented, along with an update on the District's drought response strategies.

A. Update on 2014 Water Supply and Operations

Despite some precipitation since the last update on February 25, water supply conditions statewide and locally have not measurably improved. Table 1 shows updated estimates of 2014 water supply and use in Santa Clara County. End-of-year groundwater storage is still projected to drop to the Stage 3 "Severe" range (200,000 to 250,000 acre-feet) if the 20 percent water use reduction target is not achieved.

1. Imported Water Supply

In this update, District imported water supplies have been reduced by 5,420 acre-feet to reflect more conservative estimates of 2013 State Water Project (SWP) carryover deliveries and supplemental water. The Bureau of Reclamation's (Reclamation's) February announcement of 2014 Central Valley Project (CVP) allocations provided 50% of "historic use" for municipal and industrial water service, confirmed by letter to equal 65,000 acre-feet for the District. However, the unprecedented allocations of only 40% to senior water rights holders and wildlife refuges, along with the State Water Resources Control Board's

[1] Santa Clara Valley Water District's 2010 Urban Water Management Plan, http://www.valleywater.org/Services/WaterSupplyPlanning.aspx

adjustments will be needed to reduce other operating costs and delay projects in the Water Utility Capital Improvement Program.

CEQA:

The recommended action does not constitute a project under CEQA because it does not have a potential for resulting in direct or reasonably foreseeable indirect change in the physical environment.

ATTACHMENTS:

Attachment 1, Staff Presentation
Attachment 2, Neighborhood Update, March 2014: Reservoir and creek dry back conditions
Attachment 3, Santa Clara County Retailer Drought Response Actions 2014
Attachment 4, City of Morgan Hill Drought Ordinance
Attachment 5, Santa Clara Valley Water District, Summary of Drought Communication and Outreach Efforts
Attachment 6, Summary of Federal Legislation for California Storage Projects (Costa)

Update on 2014 Water Supply Outlook

February 25, 2014

Santa Clara Valley Water District

Water Shortage Contingency Plan

From District's 2010 Urban Water Management Plan

Stage	Title	Projected End-of-Year Groundwater Storage (AF)	Suggested Short-Term Reduction in Water Use
1	Normal	Above 300,000 AF	None
2	Alert	250,000 AF to 300,000 AF	0 – 10%
3	Severe	200,000 AF to 250,000 AF	10 – 20%
4	Critical	150,000 AF to 200,000 AF	20 – 40%
5	Emergency	Less than 150,000 AF	Up to 50%

Reference 17

Primary Benefit Calculations: Cost per Acre-Foot

Project Component	Project Cost	Interest Rate	Component Lifetime years	AFY	Annualized Project Cost	$/AF
Production Facilities	$ 3,280,000	5.70%	50	1680	$199,435	$118.71
New Distribution Pipeline	$ 17,500,000	5.70%	50	560	$1,064,061	$1,900.11
Total Project				1680	$1,263,496	$752.08

Reference 18

Tertiary Benefit Calculations: Effluent CBOD and TSS

Source: 2013 City of Sunnyvale NPDES Report

Summary Tables

	CBOD5 (mg/L), Influent				CBOD5 (mg/L), Effluent			
	Average	**Min**	**Max**	**# of Samples**	**Average**	**Min**	**Max**	**# of Samples**
January	226	168	278	13	4.5	2.5	5.9	13
February	207	161	271	4	5.3	2.7	7.6	4
March	250	175	353	8	3.7	2.9	5.2	8
April	242	153	304	6	4.2	2.6	5.4	6
May	184	116	290	5	5.2	2.7	9.6	5
June	209	179	236	7	5.2	4.1	7.4	7
July	208	142	272	13	4.7	2.4	6.6	13
August	197	115	270	10	4.5	3.8	5.3	10
September	232	161	348	10	5.4	4.3	6.5	11
October	216	164	257	11	6.7	4.1	8.4	11
November	242	205	270	8	6.0	4.2	8.3	8
December	237	133	276	10	7.5	4.9	10.1	10
2013	221	115	353	105	5.2	2.4	10.1	106

Project Benefit Calculation - Effluent CBOD and TSS diverted from San Francisco Bay discharge via recycling

Average Effluent CBOD (mg/L)	Diverted flow: 2016-2026 (MGD)	Average Effluent CBOD (lb/d)	Average Effluent CBOD (kg/d)	Average Effluent CBOD (kg/yr)	Average Effluent CBOD Rounded (kg/yr)
5.2	1.5	65.59	30	10,859.69	10,900

Average Effluent TSS (mg/L)	Diverted flow: 2016-2026 (MGD)	Average Effluent TSS (lb/d)	Average Effluent TSS (kg/d)	Average Effluent TSS (kg/yr)	Average Effluent TSS Rounded (kg/yr)
9.9	1.5	123.27	56	20,409.10	20,400

Tertiary Benefit Calculations: Effluent CBOD and TSS

Source: 2013 City of Sunnyvale NPDES Report

	TSS, Influent (mg/L)				TSS, Effluent (mg/L)			
	Average	**Min**	**Max**	**# of Samples**	**Average**	**Min**	**Max**	**# of Samples**
January	223	138	310	13	10.4	6.1	12.2	13
February	226	88	309	8	12.8	10.5	16.0	8
March	208	105	264	7	12.2	10.6	13.7	7
April	279	229	344	8	9.8	8.1	12.5	9
May	271	153	419	8	8.8	7.1	9.6	9
June	332	185	402	8	9.1	7.0	10.8	8
July	254	120	307	10	8.4	6.8	10.0	10
August	281	212	398	8	10.8	7.2	15.1	8
September	252	151	492	10	8.8	7.1	10.5	11
October	248	196	304	8	8.4	7.1	9.8	8
November	263	205	296	8	9.0	7.5	10.6	8
December	280	148	373	10	9.8	7.0	10.9	10
2013	260	88	492	106	9.9	6.1	16.0	109

Reference 19

Tertiary Benefit Calculations: Total Nitrogen

Source: City of Sunnyvale Nutrient 13267 Study Data, July 2012 - March 2014

Secondary Benefit Calculation

Note: points equally averaged, benefit reported at bottom of table

Quarter of Year (Q1, Q2, Q3, Q4 YYYY)	Effluent Total Nitrogen (mg/L)	Diverted flow: 2016-2066 (MGD)	Effluent Total Nitrogen (lb/d)	Effluent Total Nitrogen (kg/d)	Effluent Total Nitrogen (kg/yr)	Number of Data Points
Q3 2012	20.817	1.5	260.4207	118.1247	43,116	1
Q3 2012	25.51	1.5	319.1301	144.7549	52,836	2
Q3 2012	26.134	1.5	326.9363	148.2957	54,128	3
Q3 2012	25.339	1.5	316.9909	143.7845	52,481	4
Q3 2012	25.477	1.5	318.7173	144.5676	52,767	5
Q3 2012	26.128	1.5	326.8613	148.2617	54,116	6
Q4 2012	31.95	1.5	399.6945	181.2982	66,174	7
Q4 2012	34.2	1.5	427.842	194.0657	70,834	8
Q4 2012	33.35	1.5	417.2085	189.2424	69,073	9
Q4 2012	32.82	1.5	410.5782	186.235	67,976	10
Q4 2012	29.43	1.5	368.1693	166.9986	60,955	11
Q4 2012	30.24	1.5	378.3024	171.5949	62,632	12
Q1 2013	29.65	1.5	370.9215	168.247	61,410	13
Q1 2013	28.09	1.5	351.4059	159.3949	58,179	14
Q1 2013	28.2	1.5	352.782	160.0191	58,407	15
Q1 2013	32.02	1.5	400.5702	181.6954	66,319	16
Q1 2013	28.06	1.5	351.0306	159.2247	58,117	17
Q1 2013	29.344	1.5	367.0934	166.5106	60,776	18
Q1 2013	26.59	1.5	332.6409	150.8833	55,072	19
Q1 2013	26.614	1.5	332.9411	151.0194	55,122	20
Q2 2013	26.317	1.5	329.2257	149.3341	54,507	21
Q2 2013	20.9	1.5	261.459	118.5957	43,287	22
Q2 2013	24.6	1.5	307.746	139.5911	50,951	23
Q2 2013	18.014	1.5	225.3551	102.2193	37,310	24
Q2 2013	16.909	1.5	211.5316	95.94904	35,021	25
Q2 2013	17.417	1.5	217.8867	98.83165	36,074	26
Q3 2013	15.209	1.5	190.2646	86.3025	31,500	27
Q3 2013	13.964	1.5	174.6896	79.23782	28,922	28
Q3 2013	10.802	1.5	135.133	61.29526	22,373	29
Q3 2013	8.911	1.5	111.4766	50.5649	18,456	30
Q3 2013	10.076	1.5	126.0508	57.17562	20,869	31
Q3 2013	11.262	1.5	140.8876	63.9055	23,326	32
Q4 2013	12.48	1.5	156.1248	70.81696	25,848	33
Q4 2013	15.34	1.5	191.9034	87.04585	31,772	34
Q4 2013	21.4	1.5	267.714	121.4329	44,323	35
Q4 2013	21.1	1.5	263.961	119.7306	43,702	36
Q4 2013	21.167	1.5	264.7992	120.1108	43,840	37
Q4 2013	25.2	1.5	315.252	142.9958	52,193	38
				SUM	1,824,764	
				Average	48,020.11	
				Average, rounded	48,000	

File 3 of 3: Project Benefits Documentation

Documents referenced in the project benefits discussions are provided in this section. Documentation is organized by project number as listed below. As requested, only pertinent pages referenced are provided.

Project 6: DERWA Phase 3 Recycled Water Expansion Project

Project 7: Calistoga Recycled Water Storage Facility

Project 8: Drought Relief for South Coast San Mateo County

Project 9: Stinson Beach Water Supply & Drought Preparedness Plan

Project 10: Bay Area Regional Drought Relief Conservation Program

Project 11: WaterSMART Irrigation with AMI/AMR

Project 6: DERWA Phase 3 Recycled Water Expansion Project

1. Carollo Engineers, 2013. Dublin-San Ramon Services District Dublin Recycled Water Expansion Project Title XVI Feasibility Study, Recycled Water Treatment and Distribution System Analysis, September.
2. CDM, 2003. "Modeling Results for DERWA Task 7A-New EBMUD Customer Base Hydraulic Modeling", May 14.
3. DSRSD-EBMUD Recycled Water Authority (DERWA), 1996a. SRVRWP Facilities Plan, Executive Summary, July.
4. DERWA, 1996b. Draft EIR for the San Ramon Valley Recycled Water Program, Chapter 5: Alternatives, August.
5. DERWA, 1996c. Notice of Determination for the San Ramon Recycled Water Program, filed December 18, 1996.
6. DERWA, 2013. Table 10, DERWA System: Treatment Electric Usage and Costs.
7. DERWA, 2014. DSRSD Energy Consumption Reduction – Calculations Table.
8. DSRSD and Zone 7, 1994. Contract between Zone 7 Water Agency and Dublin San Ramon Services District.
9. Dublin San Ramon Services District (DSRSD), 2004. Ordinance No. 301: Ordinance Formally Establishing Rules and Regulations Governing Use of Recycled Water Within the Dublin San Ramon Services District and Repealing Ordinance No. 280, 2004.
10. DSRSD, 2012. DSRSD 2010 Urban Water Management Plan, Chapters 3 and 4.
11. DSRSD, 2013. Effluent Pollutant Concentrations table.
12. DSRSD, 2014a. Resolution No. 26-14. Community Drought Emergency and Mandatory Rationing, adopted May 5, 2014.
13. DSRSD, 2014b. Stage 3 Water Supply Shortage (Reso. 27-14)
14. DSRSD, 2014c. Water Use Limitations (Reso. 333)
15. DSRSD, 2014d. Enforcement and Penalties (Ordinance No. 334)
16. DSRSD, DSRSD, 2014e. Report of Operations – LAVWMA System
17. East Bay Municipal Utility District (EBMUD), 2010. Urban Water Management Plan.
18. EBMUD, 2013. Non-Potable Water Policy 9.05, effective March 26.
19. EBMUD, 2014a. Board of Directors Request for 10% Voluntary Use Reduction and Use of Freeport Water
20. EBMUD, 2014b. DERWA Phase 3 Recycled Water Project – EBMUD San Ramon Valley Phase 2 Pipeline Anticipated Recycled Water Customer Demand table.
21. San Francisco Bay RWQCB, 2014. Order No. R2-2014-0014, Nutrients from Municipal Wastewater Discharges to San Francisco Bay, NPDES Permit No. CA003887.
22. State Water Resources Control Board (SWRCB), 2014. Notice of Unavailability of Water and Immediate Curtailment for Those Diverting Water in the Sacramento and San Joaquin River Watersheds with a Post-1914 Appropriative Right.
23. Whitley Burchett and Associates (WBA), 2013. Title XVI Feasibility Study for Dublin Recycled Water Expansion Project Market Survey, prepared by Whitley Burchett & Associates, September 11, 2013.

Reference 1

DUBLIN SAN RAMON SERVICES DISTRICT

DUBLIN RECYCLED WATER EXPANSION PROJECT
TITLE XVI FEASIBILITY STUDY

RECYCLED WATER TREATMENT AND DISTRIBUTION SYSTEM ANALYSIS

FINAL
September 2013

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DUBLIN RECYCLED WATER EXPANSION PROJECT
TITLE XVI FEASIBILITY STUDY

RECYCLED WATER TREATMENT AND DISTRIBUTION SYSTEM ANALYSIS

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Figure 11 24-Hour Reservoir R100 Volume 27

1.0 BACKGROUND

The Dublin San Ramon Services District (DSRSD) Dublin Recycled Water Expansion Project consists of two components. The first component is expansion of the DSRSD recycled water treatment plant to serve new DSRSD customers, and to produce recycled water for the DSRSD - East Bay Municipal Utility District (EBMUD) Recycled Water Authority (DERWA) to wholesale to the City of Pleasanton for Pleasanton's new recycled water project. The second component is expansion of DSRSD's recycled water distribution system to serve new customers in western and central Dublin. The District is applying for federal funding for the expansion through the Bureau of Reclamation's Title XVI Water Reclamation and Reuse Program. A requirement of the Title XVI program is the completion of a feasibility study report as outlined in the Bureau of Reclamation's Directives and Standards (D&S). This analysis provides the information requested in Sections 4(d), (e) and (f) of the D&S.

Section 2 of this report focuses on the treatment facilities and presents a description of the proposed project, alternative treatment technologies, and references, design data and assumptions. Section 3 presents similar information for the distribution system. Estimated costs are summarized in Section 4, and cost estimate details are included in Appendix A.

2.0 RECYCLED WATER TREATMENT

2.1 Recycled Water Demands and Treatment Plant Capacity

As described in Title XVI Feasibility Study for Dublin Recycled Water Expansion Project Water Reclamation and Reuse Opportunities, the projected recycled water demand is 16.5 million gallons per day (mgd).[1] DSRSD has two existing recycled water treatment facilities, a sand filtration and UV disinfection facility (SF/UV) built in 2005 and a microfiltration and UV disinfection facility (MF/UV) built in 1998. The SF/UV treatment facilities have a rated capacity of 9.7 mgd and were built to allow expansion. The MF/UV facility has a rated capacity of 3.0 mgd and was not designed to be expanded. The MF/UV system is used during low demand periods in the winter and as backup for the SF/UV system. The recycled water treatment system analysis evaluates the facilities and costs required to expand the SF/UV treatment capacity by 6.8 mgd from 9.7 to 16.5

[1] Title XVI Feasibility Study for Dublin Recycled Water Expansion Project Water Reclamation and Reuse Opportunities, prepared by Whitley Burchett & Associates for DSRSD, June 2013.

mgd. The MF/UV system would continue to be used during low demand periods in the winter and as backup for the SF/UV system.

2.2 Existing Treatment Plant and Expansion Needs

The existing SF/UV recycled water treatment facilities, shown in Figure 1, consist of a tertiary influent pump station, tertiary influent screening, coagulant addition facilities, flocculation basins, tertiary filters, UV disinfection, and Pump Station R1, which pumps the treated water to the distribution system. Table 1 summarizes design criteria for the existing recycled water treatment plant. The facilities required to expand the plant to 16.5 mgd are shown in Figure 2 and described in the following paragraphs. All work for the expansion would occur within the developed area of the existing treatment plant.

Table 1 Summary of Existing Tertiary Plant Design Criteria
Dublin Recycled Water Expansion Project Title XVI Feasibility Study
Dublin San Ramon Services District

Description	Criteria
Tertiary Influent Pump Station[2]	
Flow Range, gpm	1,700 to 7,080
Total Dynamic Head, feet	15 to 28
Number of Pumps, duty (standby)	2 (1)
Motor Horsepower, each	50
Tertiary Influent Screening[3]	
Number of Screens	1
Screen size, mm	2
Type	Band
Coagulant Addition Facilities[2]	
Number of Rapid Mix Tanks	2
Detention Time at 10.2 mgd, sec	16
Mixer Horsepower	15
Maximum Mixer Velocity Gradient, sec^{-1}	1,000
Flocculation Basins[2]	
Number of Basins	2
Detention Time at 10.2 mgd, min	10.6
Flocculator Horsepower	3
Maximum Flocculator Velocity Gradient, sec^{-1}	100

[2] Record Drawings for Tertiary Treatment Plant Contract Documents (CIP 23 DR11) Volume 4 of 4 Drawings, DSRSD 2006.

[3] RWTF Effluent Quality Improvements Contract Documents (CIP 07-6102) Volume 2 of 2 Drawings, DSRSD 2008.

Table 1 Summary of Existing Tertiary Plant Design Criteria Dublin Recycled Water Expansion Project Title XVI Feasibility Study Dublin San Ramon Services District	
Description	**Criteria**
Tertiary Filters[2]	
Number of Modules per Filter	6
Number of Filters	5
Filtration Area per Filter, square feet	300
Media Depth, inches	80
UV Disinfection[2]	
UV Dose, mJ/cm^2	100
Number of Channels	2
Number of Banks/Channel, duty (standby)	4 (1)
Number of Modules/Bank	6
Number of Lamps/Modules	20
Pump Station R1[2]	
Design Flow, gpm	6,730
Design Total Dynamic Head, feet	350
Number of Pumps, duty (standby)	2 (1)
Motor Horsepower, each	450

2.2.1 Tertiary Influent Pump Station

The Tertiary Influent Pump Station (TIPS) pumps secondary effluent from Holding Basin No. 4 to the tertiary treatment facilities. The pump station currently includes three 50 horsepower (HP) pumps, including two duty pumps and one standby pump, and has space for two additional pumps. The two duty pumps have a rated design capacity of 10.2 mgd. The rated capacity needs to be higher than the 9.7 mgd treatment plant capacity because part of the water sent to the treatment facilities is used to backwash the filters.

Assuming a filter backwash rate of 10 gpm per module, expansion of the recycled water treatment plant to 16.5 mgd would require a TIPS capacity of approximately 17.4 mgd. Based on the existing pump curves, this would require the addition of two 50 HP pumps and associated valves, variable frequency drives, wiring, and controls. For the purposes of this evaluation, it is assumed that two additional pumps are needed.

2.2.2 Tertiary Influent Screening

The tertiary influent pump station pumps to a bandscreen, which is designed to remove fruit labels and other items which can potentially pass through the tertiary filters and clog distribution system strainers. The existing band screen was designed for 16.5 plant capacity and therefore does not require any modifications.

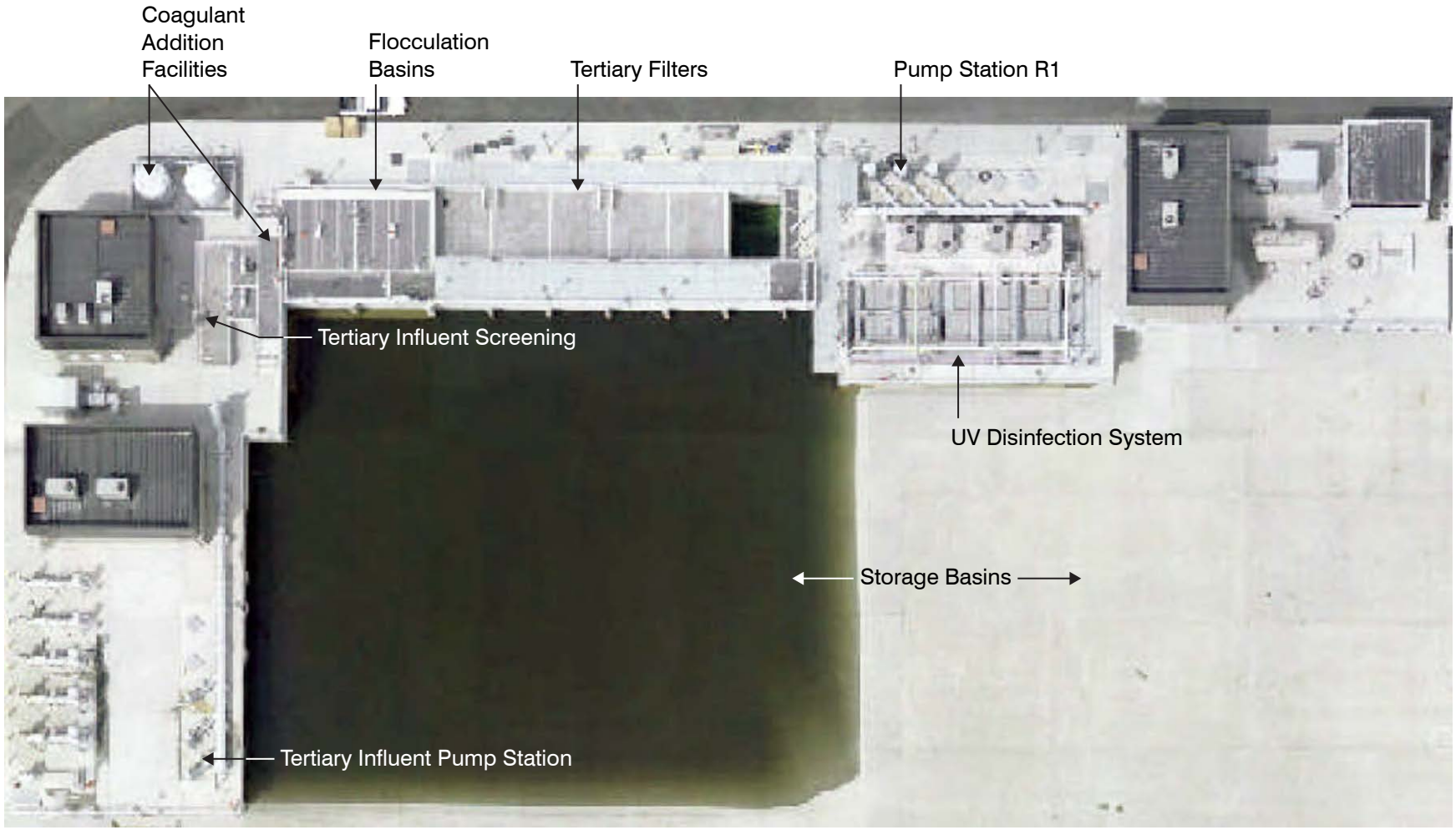

Figure 1
EXISTING SAND FILTRATION AND UV DISINFECTION RECYCLED WATER TREATMENT FACILITIES
RECYCLED WATER TREATMENT AND DISTRIBUTION SYSTEM ANALYSIS
DUBLIN RECYCLED WATER EXPANSION PROJECT
TITLE XVI FEASIBILITY STUDY
DUBLIN SAN RAMON SERVICES DISTRICT

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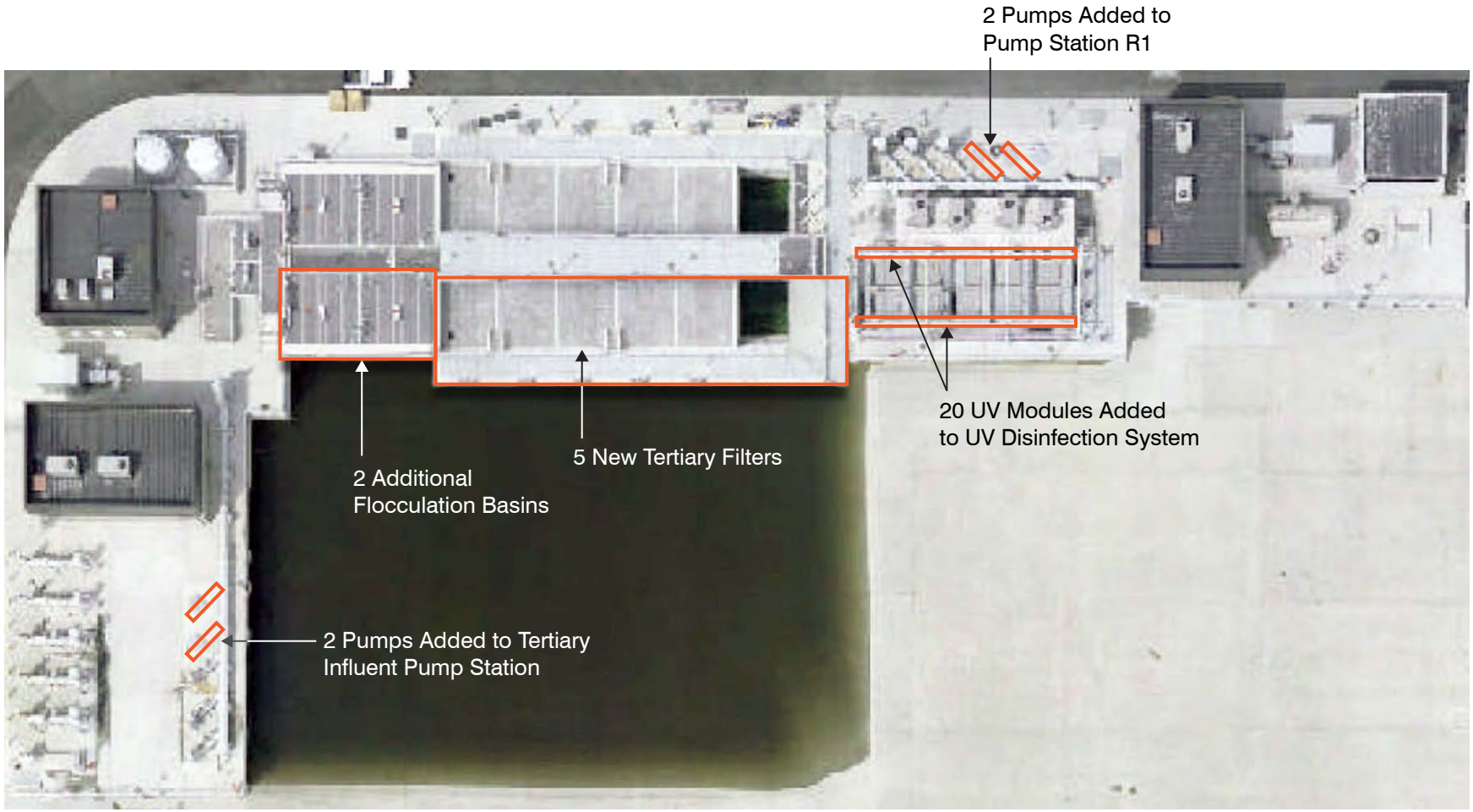

Figure 2
SAND FILTRATION AND UV DISINFECTION
TREATMENT PLANT EXPANSION TO 16.5 MGD
RECYCLED WATER TREATMENT AND DISTRIBUTION SYSTEM ANALYSIS
DUBLIN RECYCLED WATER EXPANSION PROJECT
TITLE XVI FEASIBILITY STUDY
DUBLIN SAN RAMON SERVICES DISTRICT

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2.2.3 Coagulant Addition Facilities

The treatment facilities include storage and feed equipment for coagulant, and rapid mix tanks for mixing coagulant with the secondary effluent. These facilities are sized for the ultimate plant capacity, and therefore do not require any modifications.

2.2.4 Flocculation Basins

The existing treatment facilities include two flocculation basins and have space allocated for two additional basins. The flocculation basins provide slow mixing to promote the formation of larger, more filterable solids. The basins provide approximately ten minutes of flocculation time at a flow of 10.2 mgd, which would drop to approximately six minutes at a plant capacity of 16.5 mgd. For the purposes of this evaluation, it is assumed that two additional flocculation basins would be constructed for the expanded recycled water treatment plant, which would give a detention time of approximately twelve minutes at the design flow rate.

2.2.5 Tertiary Filters

The existing recycled water filtration facilities consist of five continuous backwash filters with six modules per filter, and an empty basin for a future sixth filter. Space has been allocated for an identical additional structure holding six additional filters. For planning purposes, it is assumed that the maximum reliable loading rate for the continuous backwash filters is 4.0 gallons per minute per square foot (gpm/ft^2). Assuming a filter backwash rate of 10 gpm per module, the capacity of a single filter is approximately 1.65 mgd. Expansion of the recycled water treatment plant to 16.5 mgd would require a total of ten filters. The expansion would add an additional five filters with another empty basin for a future filter, as shown in Figure 1.[4]

2.2.6 UV Disinfection

The existing recycled water treatment facilities include two UV disinfection channels with four duty and one standby bank of UV lamps per channel (a total of ten banks). Each bank consists of six modules, and each module includes twenty lamps. The total number of lamps is 1,200 (10 banks x 6 modules/banks x 20 lamps/module = 1,200). Each channel is designed with removable walls so that two additional modules can be added to each bank to increase the total number of lamps to 1,600 (10 banks x 8 modules/banks x 20 lamps/module = 1,600).

The treatment capacity of the UV system is dependent on the water quality, measured by UV transmittance (UVT). A review of DSRSD UVT data for 2010 and 2011 indicates

[4] The entire structure for six additional filters would need to be built now to allow the filtered water to flow to the disinfection process; however, filter equipment for the sixth filter would be installed in a future project as needed for treatment capacity.

that the treatment capacity can be expanded to 16.5 mgd by adding two modules per bank. It is therefore assumed for the purposes of this evaluation that the UV system can be expanded to 16.5 mgd capacity by adding two UV modules per bank to both UV channels.

2.2.7 Pump Station R1

Pump Station R1 is located next to the UV disinfection system and pumps treated recycled water from the treatment plant to the distribution system. The pump station currently includes three 450 HP pumps, including two duty pumps and one standby pump, and has space for three additional 450 HP pumps. The two duty pumps have a combined rated design capacity of 9.7 mgd. Expansion of the recycled water treatment plant to 16.5 mgd would require the addition of two 450 HP pumps and associated valves, variable frequency drives, wiring, and controls. The capacity of the expanded pump station would be approximately 19 mgd.

2.2.8 Summary of Expansion Needs

Table 2 presents a summary of treatment plant expansion needs.

Table 2 Summary of Tertiary Plant Expansion Needs to 16.5 mgd
Dublin Recycled Water Expansion Project Title XVI Feasibility Study
Dublin San Ramon Services District

Description	Expansion Needs
Tertiary Influent Pump Station	
Number of Pumps (based on existing pump curves)	2
Motor Horsepower, each	50
Flocculation Basins	
Number of Basins	2
Tertiary Filters	
Number of Filters	5
Number of Modules per Filter	6
UV Disinfection	
Number of New Modules, per bank	2
Number of New Modules, total	10
Number of New Lamps	400
Pump Station R1	
Number of Pumps	2
Motor Horsepower, each	450

2.3 Alternative Treatment Technologies

2.3.1 Filtration

Dual media filtration is an alternative filtration technology which is approved for recycled water by the California Department of Public Health. Dual media filters include two layers

of filtration media, generally sand and anthracite. Dual media filters are backwashed periodically, either after the headloss through the filter reaches a specified level or after a specified filter runtime. Dual media filtration was considered for the original recycled water facility but was not selected due to the operational complexity of filter backwashing and large filter backwash pumps required.[5] Continuous backwash filtration was selected due to its simpler operation and lack of need for complicated backwash valving and pumping. Continuous backwash filtration will be used for the facility expansion to match the existing facilities.

2.3.2 Disinfection

Chlorination is an alternative disinfection technology which is approved for recycled water by the California Department of Public Health. Chlorination systems dose chlorine gas or sodium hypochlorite solution in the water and then provide sufficient contact time in a contact tank to allow adequate disinfection. For tertiary recycled water in California, the California Department of Public Health requires chlorination systems to provide a minimum contact time of 90 minutes. Chlorination is not feasible at the recycled water treatment plant because the space for a chlorine contact tank capable of providing a 90 minute contact time is not available.

2.4 Waste-stream Discharge Treatment and Disposal

There are no new waste-stream discharge treatment and disposal water quality requirements for the proposed Title XVI project. Waste-streams from the recycled water treatment process include screenings from the bandscreen and waste backwash from the tertiary filters. The screenings from the bandscreen consist of fruit labels and other items which can potentially pass through or clog the tertiary filters. The screenings removed by the bandscreen are a solid waste and are disposed of in a dumpster and subsequently sent to a landfill. The waste backwash from the tertiary filters contains suspended solids and coagulant. The waste backwash is sent to the plant influent sewer, and is subsequently treated in the primary and secondary treatment systems.

2.5 Proven Technologies and Conventional Systems

The proposed project neither includes nor requires any basic research needs. The recycled water treatment facilities to be constructed are the same as the existing facilities, and are established treatment technologies. The distribution system expansion will be constructed using established and conventional pipeline construction methods. All materials to be used and construction methods are proven technologies and will meet industry standards.

[5] San Ramon Valley Recycled Water Program Treatment Facilities Master Plan, prepared by Whitley Burchett & Associates for DSRSD, February 1999.

3.0 RECYCLED WATER DISTRIBUTION

3.1 Recycled Water Demands and Distribution System Capacity

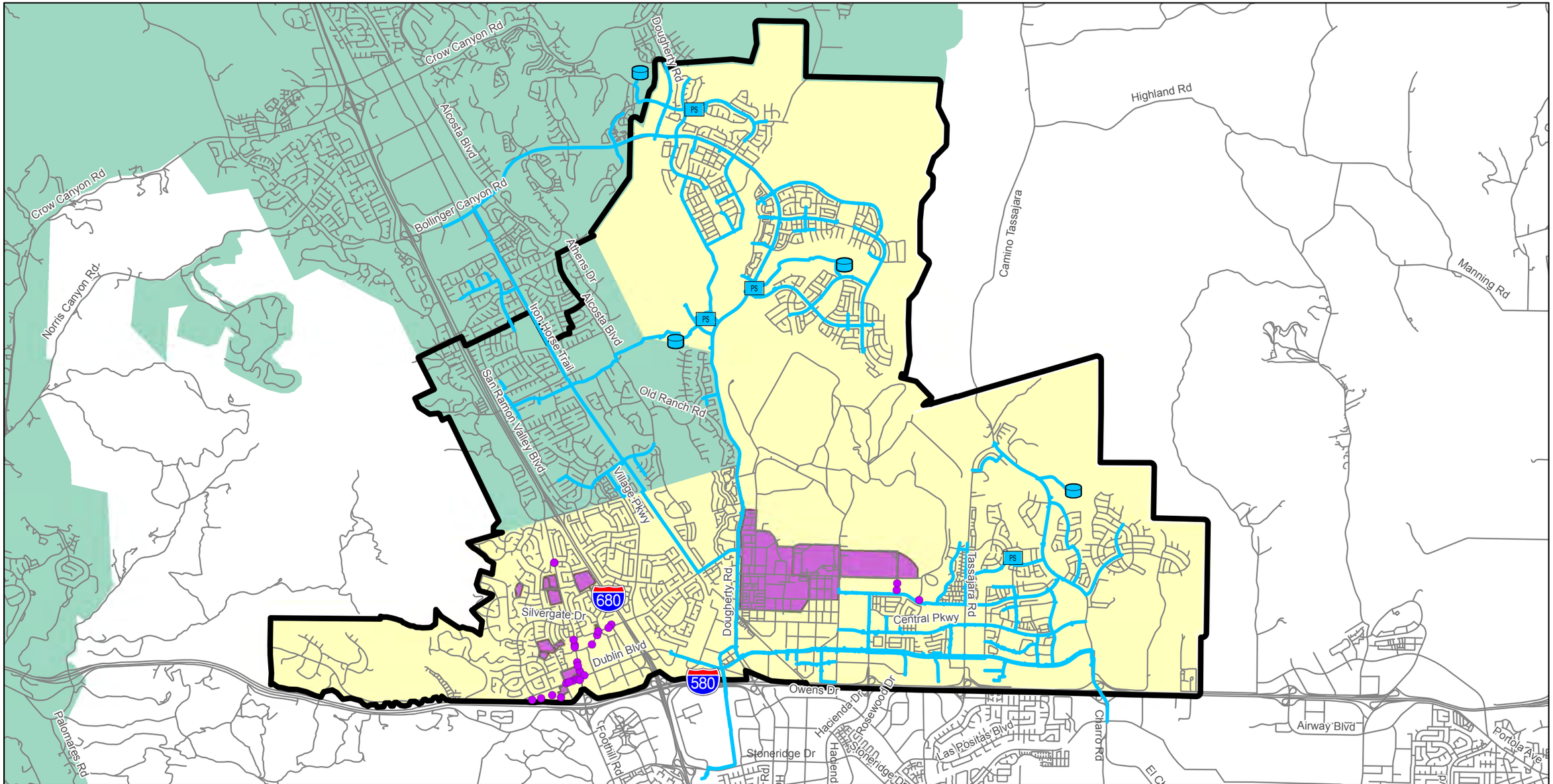
DSRSD currently distributes recycled water in its service area. Its existing recycled water distribution system extends out toward newly developed areas in eastern Dublin and Dougherty Valley. Approximately 55 miles of DSRSD recycled water distribution pipelines have been installed since 2000. The existing recycled water distribution system is shown on Figure 3.

DSRSD proposes to extend its recycled water distribution system to supply the customers identified in the Dublin Recycled Water Expansion Project Market Survey (Market Survey).[6] These customers are concentrated in two areas: western Dublin (west of Interstate 680 (I-680)) and central Dublin (east of Dougherty Road), as shown in Figures 3 and 4. All of these customers are located in DSRSD Pressure Zone R1.

The recycled water distribution analysis evaluates the impact of adding these new customers to DSRSD's distribution system, including pipeline routing and sizing, and determining if the existing pump stations and reservoirs can maintain adequate service to the expanded system.

The Market Survey identified the average day demands (ADD) for each customer, which were used in the analysis herein. The Market Survey determined the ADD for each user from available historical usage data from 2003 through 2011, as well as other factors (such as irrigable areas) when appropriate. Table 3 provides a summary of the new customers from the Market Survey and associated recycled water demands. For planning, a maximum day demand (MDD) is typically used for each customer, which represents the greatest average water demand during any 24-hour period over the course of a year. The MDD to ADD ratio used for the new customers from the Market Survey was developed from an average ratio based on historical DERWA monthly demand data from 2007 to 2011. Table 4 provides a summary of the recycled water demand data used to develop the 5-yr average MDD to ADD ratio.

[6] Title XVI Feasibility Study for Dublin Recycled Water Expansion Project Markey Survey, prepared by Whitley Burchett & Associates for DSRSD, September 2013.



Legend

Existing Recycled Water System

- Pump Station
- Reservoir
- Pipeline
- Streets
- DSRSD Boundary
- Potential RW Customer
- EBMUD Service Area
- DSRSD Service Area

N

0 4,000 8,000 Feet

FIGURE 3
EXISTING RECYCLED WATER SYSTEM AND DISTRIBUTION SYSTEM EXPANSION AREAS
RECYCLED WATER TREATMENT AND DISTRIBUTION SYSTEM ANALYSIS
DUBLIN RECYCLED WATER EXPANSION PROJECT
TITLE XVI FEASIBILITY STUDY
DUBLIN SAN RAMON SERVICES DISTRICT

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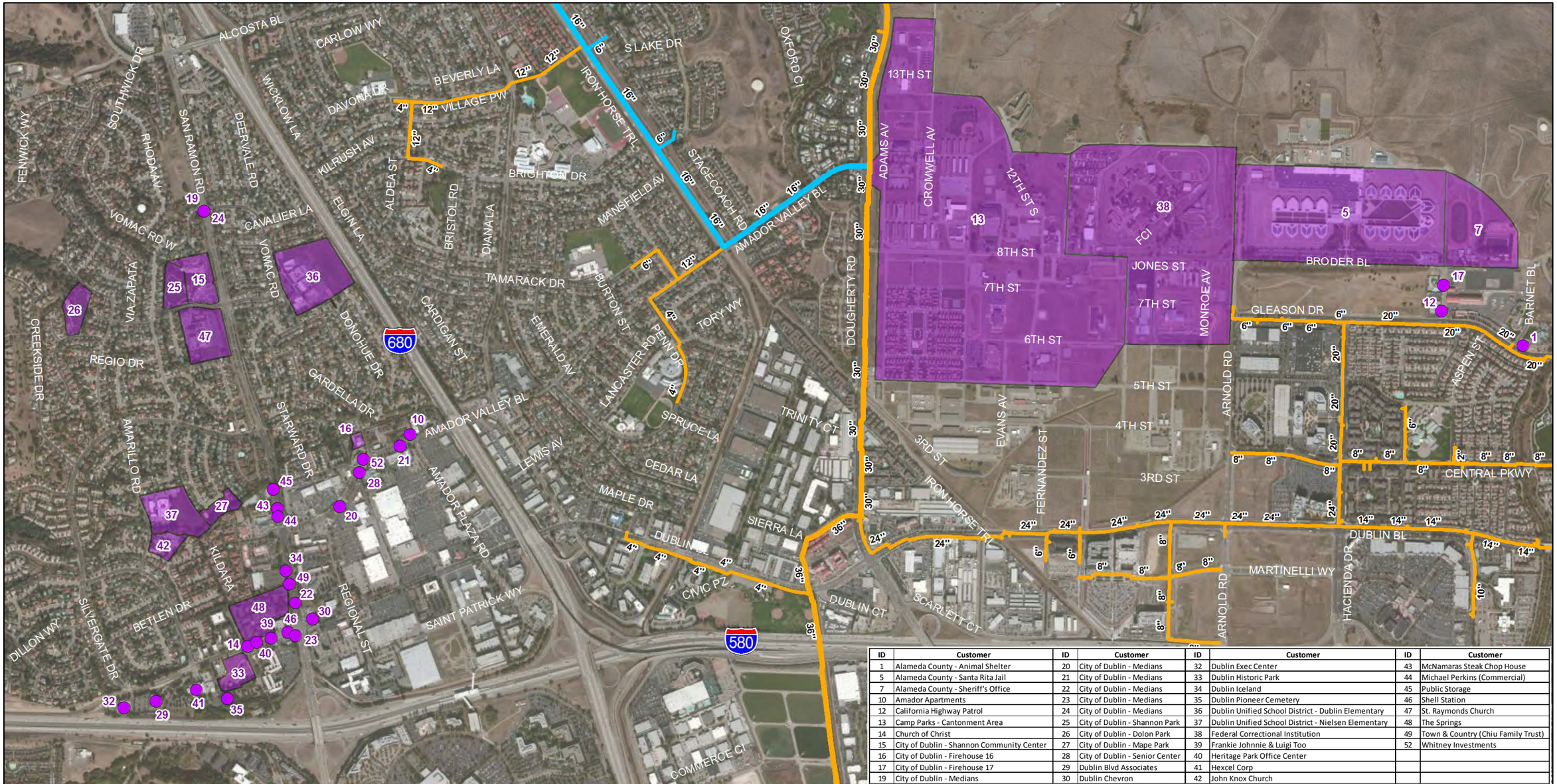


ID	Customer	ID	Customer	ID	Customer	ID	Customer
1	Alameda County - Animal Shelter	20	City of Dublin - Medians	32	Dublin Exec Center	43	McNamaras Steak Chop House
5	Alameda County - Santa Rita Jail	21	City of Dublin - Medians	33	Dublin Historic Park	44	Michael Perkins (Commercial)
7	Alameda County - Sheriff's Office	22	City of Dublin - Medians	34	Dublin Iceland	45	Public Storage
10	Amador Apartments	23	City of Dublin - Medians	35	Dublin Pioneer Cemetery	46	Shell Station
12	California Highway Patrol	24	City of Dublin - Medians	36	Dublin Unified School District - Dublin Elementary	47	St. Raymonds Church
13	Camp Parks - Cantonment Area	25	City of Dublin - Shannon Park	37	Dublin Unified School District - Nielsen Elementary	48	The Springs
14	Church of Christ	26	City of Dublin - Dolon Park	38	Federal Correctional Institution	49	Town & Country (Chiu Family Trust)
15	City of Dublin - Shannon Community Center	27	City of Dublin - Mape Park	39	Frankie Johnnie & Luigi Too	52	Whitney Investments
16	City of Dublin - Firehouse 16	28	City of Dublin - Senior Center	40	Heritage Park Office Center		
17	City of Dublin - Firehouse 17	29	Dublin Blvd Associates	41	Hexcel Corp		
19	City of Dublin - Medians	30	Dublin Chevron	42	John Knox Church		

Legend

- Potential Customers
- Existing Pipeline
- Pressure Zone R1 (DSRSD)
- Pressure Zone R1 (EBMUD)

N

0 1,250 2,500 Feet

FIGURE 4
CUSTOMER LOCATIONS FOR DISTRIBUTION SYSTEM EXPANSION
RECYCLED WATER TREATMENT AND DISTRIBUTION SYSTEM ANALYSIS
DUBLIN RECYCLED WATER EXPANSION PROJECT
TITLE XI FEASIBILITY STUDY
DUBLIN SAN RAMON SERVICES DISTRICT

Table 3 Market Survey Customers and Demands
Dublin Recycled Water Expansion Project Title XVI Feasibility Study
Dublin San Ramon Services District

Customer	ID	Average Day Demand[1] (AFY)	Average Day Demand[1] (gpm)	Max Day Demand[2] (gpm)
Customers West of I-680				
Amador Apartments	10	6.0	3.7	9.7
Church of Christ	14	1.0	0.6	1.6
City of Dublin Shannon Community Center	15	1.5	0.9	2.4
City of Dublin Firehouse 16	16	0.7	0.4	1.1
City of Dublin Median	19	5.0	3.1	8.1
City of Dublin Median	20	0.3	0.2	0.5
City of Dublin Median	21	0.3	0.2	0.5
City of Dublin Median	22	2.7	1.7	4.4
City of Dublin Median	23	1.8	1.1	2.9
City of Dublin Median	24	6.0	3.7	9.7
City of Dublin Shannon Park	25	13.5	8.4	21.8
City of Dublin Dolan Park	26	12.0	7.4	19.3
City of Dublin Mape Park	27	4.7	2.9	7.6
City of Dublin Senior Center	28	2.0	1.2	3.2
Dublin Blvd Associates	29	6.6	4.1	10.6
Dublin Chevron	30	0.7	0.4	1.1
Dublin Exec Center	32	1.4	0.9	2.3
Dublin Historic Park	33	0.8	0.5	1.3
Dublin Iceland	34	2.2	1.4	3.5
Dublin Pioneer Cemetery	35	9.7	6.0	15.6
Dublin Unified School District - Dublin Elementary	36	19.9	12.3	32.1
Dublin Unified School District - Nielsen Elementary	37	13.8	8.6	22.2
Frankie Johnnie & Luigi Too	39	1.0	0.6	1.6
Heritage Park Office Center	40	6.3	3.9	10.2

Table 3 Market Survey Customers and Demands
Dublin Recycled Water Expansion Project Title XVI Feasibility Study
Dublin San Ramon Services District

Customer	ID	Average Day Demand[1] (AFY)	Average Day Demand[1] (gpm)	Max Day Demand[2] (gpm)
Hexcel Corp	41	6.0	3.7	9.7
John Knox Church	42	1.7	1.1	2.7
McNamara's Steak Shop House	43	1.2	0.7	1.9
Michael Perkins (Commercial)	44	0.6	0.4	1.0
Public Storage	45	1.8	1.1	2.9
Shell Station	46	1.1	0.7	1.8
St. Raymond's Church	47	8.0	5.0	12.9
The Springs	48	8.2	5.1	13.2
Town & Country	49	4.9	3.0	7.9
Whitney Investments	52	1.1	0.7	1.8
	Subtotal	154	95	249
Customers East of Dougherty Road				
Alameda County Animal Shelter	1	4.4	2.7	7.1
Alameda County Santa Rita Jail	5	60	37.2	96.7
Alameda County Sheriff's Office	7	17	10.5	27.4
California Highway Patrol	12	0.9	0.6	1.5
Camp Parks Cantonment Area	13	150	93.0	241.8
City of Dublin Firehouse 17	17	2.6	1.6	4.2
Federal Correctional Institution	38	66.1	41.0	106.5
	Subtotal	301	187	485
	Total	**455**	**282**	**734**

Notes:
(1) Average annual demands are based demands developed in the Title XVI Feasibility Study for Dublin Recycled Water Expansion Project Markey Survey by Whitley Burchett & Associates.
(2) Maximum day demands (MDD) are based on a peaking factor derived from historical monthly DERWA demand data between 2007 and 2011 (max day demand = average annual demand x 2.6).

Table 4	Historical Monthly Recycled Water Demand Data Dublin Recycled Water Expansion Project Title XVI Feasibility Study Dublin San Ramon Services District					
Month/Item	**Year**					**5-Yr Average (2007-2011)**
	2007	**2008**	**2009**	**2010**	**2011**	
January	0.3	0.2	0.3	0.2	0.2	0.2
February	0.3	0.2	0.3	0.1	0.3	0.3
March	1.0	1.1	0.8	0.4	0.2	0.7
April	1.9	2.5	2.3	0.5	1.4	1.7
May	2.8	3.4	2.9	2.2	3.2	2.9
June	3.7	4.0	3.5	3.8	3.4	3.7
July	4.0	4.2	4.2	4.5	4.7	4.3
August	3.7	4.1	3.7	4.3	5.0	4.2
September	2.9	3.5	3.3	3.7	4.7	3.6
October	1.5	2.2	1.4	2.0	2.0	1.8
November	1.0	0.7	1.1	0.5	0.8	0.8
December	0.3	0.3	0.3	0.2	0.8	0.4
Average Day	**2.0**	**2.2**	**2.0**	**1.9**	**2.2**	**2.1**
Max Day	**4.5**	**5.1**	**5.3**	**5.5**	**6.0**	**5.3**
Max Day/Avg Day Ratio	**2.3**	**2.3**	**2.7**	**2.9**	**2.7**	**2.6**

Note:
(1) Source: Historical recycled water monthly demand data, provided by DERWA.
(2) Values are in mgd unless otherwise noted.

3.2 Hydraulic Model and Development Scenario

The existing DSRSD/EBMUD Recycled Water Authority (DERWA) system hydraulic model was used to simulate the system conditions described in this analysis. The hydraulic model includes both near-term and intermediate-term customer demands, based on the development scenarios established in the DERWA Recycled Water Model and Operations Plan Update TM No. 1 (Operations Plan TM No. 1) prepared by Carollo Engineers in February 2010. Therefore, the results herein represent the known build-out conditions of the recycled water system to date, inclusive of existing-, near-, and intermediate-term demands and the new customers from the Market Survey.

The daily diurnal pattern used for the analysis was a DERWA system-wide diurnal, developed as an average of the pressure zone diurnal patterns in Operations Plan TM No. 1. The diurnal demand pattern represents the temporal distribution of recycled water demands throughout the day. In the hydraulic model, the diurnal demand pattern is applied to the MDD, which ultimately provides the peak hour flows used for design. Figure 5 provides the system-wide diurnal applied to the new customers.

3.3 System Routing and Sizing

Pipeline routes to serve the customers from the Market Survey were identified through an iterative process, which considered the following:

- Proximity to customer locations,
- Feasibility of implementation,
- High traffic vs. low traffic considerations,
- Existence of DSRSD-owned easements, and
- DSRSD staff input.

Proposed pipeline diameters were developed using the hydraulic model. The primary planning criteria for pipeline diameters was to maintain 40 psi at all delivery locations during peak use hours, but also included consideration of peak hour velocities and head losses. Desired peak hour velocities were less than 6 feet per second (ft/s), and desired peak hour head losses were under 10 feet per 1,000 feet of pipeline (ft/1,000 ft). Table 5 summarizes the planning criteria used for the proposed pipelines. New pipelines were assumed to be polyvinyl chloride (PVC), with a roughness coefficient of 135. Minor losses were assumed to be negligible.

Table 5 Planning Criteria for New Pipelines
Dublin Recycled Water Expansion Project Title XVI Feasibility Study
Dublin San Ramon Services District

Delivery Pressure(1)	Velocity(2)	Head Loss(3)
≥ 40 psi	< 6 ft/s	<10 ft per 1000 ft

Notes:
(1) Delivery pressure is the minimum delivery pressure at each customer node in the hydraulic model, which typically occurs at the peak hour demand for each customer.
(2) Velocity is the maximum velocity acceptable in a pipeline at any time.
(3) Head loss is the maximum head loss acceptable per 1000 ft of pipeline at any time.

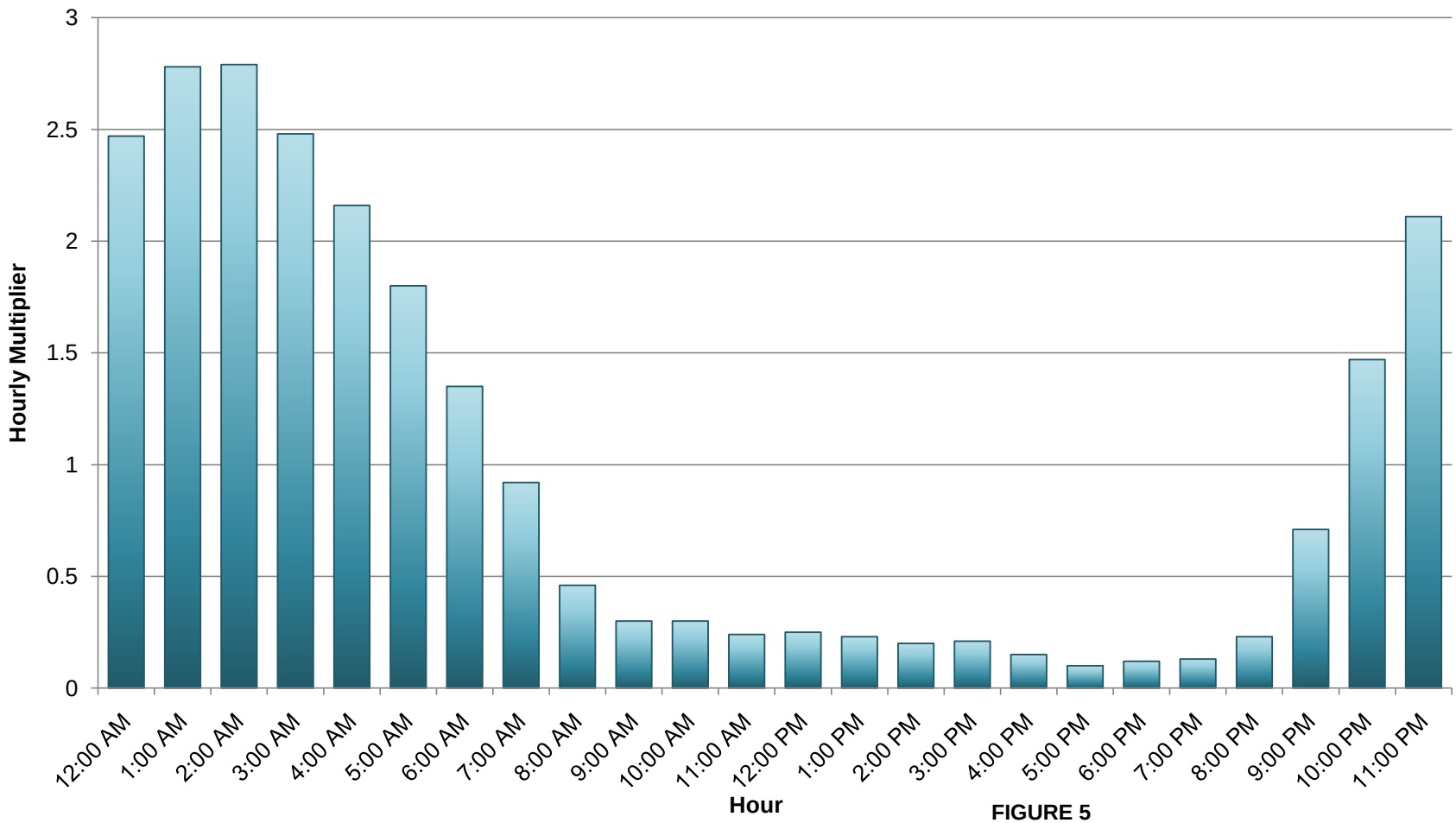


FIGURE 5
DERWA SYSTEM-WIDE RECYCLED WATER DIURNAL PATTERN
RECYCLED WATER TREATMENT AND DISTRIBUTION SYSTEM ANALYSIS
DUBLIN RECYCLED WATER EXPANSION PROJECT
TITLE XI FEASIBILITY STUDY
DUBLIN SAN RAMON SERVICES DISTRICT

3.3.1 Users West of Interstate 680

For the customers located west of I-680, three alternative delivery routes were evaluated. The following sections describe the characteristics of each alternative, which are shown in Tables 6 and 7 and Figures 6, 7 and 8.

Alternative 1

The first route (hereafter "Alternative 1") takes advantage of a DSRSD-owned easement under I-680. Figure 6 shows Alternative 1 and proposed pipeline diameters required to meet the planning criteria. With Alternative 1, Market Survey customers west of I-680 are served from a pipeline traveling southwest from the easement (just north of Dublin Elementary, Customer #36) to San Ramon Road. Alternative 1 would require boring under I-680 within the DSRSD easement, underneath an existing potable water main. Alternative 1 includes construction along relatively low-traffic streets.

The diameters associated with Alternative 1 range from 4 inches to 8 inches, and are sized primarily based on delivery pressure to Dolan Park (Customer #26, high elevation), the western end of Dublin Blvd (high elevation), and system head losses. The length of the Alternative 1 pipelines is approximately 3.5 miles.

Alternative 2

The second potential route (hereafter "Alternative 2") to serve Market Survey customers west of I-680 is along Amador Valley Blvd. Figure 7 shows Alternative 2 and proposed pipeline diameters required to meet the planning criteria. The pipeline would pass under I-680 along Amador Valley Blvd., extending under the highway overpass to San Ramon Road. Amador Valley Blvd. is a relatively high-traffic thoroughfare. The diameters associated with Alternative 2 range from 4 inches to 8 inches, and are sized primarily based on delivery pressure to Dolan Park and system head losses. The length of the Alternative 2 pipelines is approximately 3.6 miles.

Table 6	Estimated Minimum Delivery Pressures for Market Survey Customers West of I-680 Dublin Recycled Water Expansion Project Title XVI Feasibility Study Dublin San Ramon Services District			
		Minimum Pressure[1] (psi)		
Customer	**ID**	**Alternative 1**	**Alternative 2**	**Alternative 3**
Amador Apartments	10	91	100	111
Church of Christ	14	76	77	92
City of Dublin Shannon Community Center	15	66	60	71
City of Dublin Firehouse 16	16	90	98	109
City of Dublin Median	19	72	66	78
City of Dublin Median	20	86	91	104
City of Dublin Median	21	93	103	112
City of Dublin Median	22	79	80	95
City of Dublin Median	23	80	81	96
City of Dublin Median	24	72	66	78
City of Dublin Shannon Park	25	66	60	71
City of Dublin Dolan Park	26	46	40	52
City of Dublin Mape Park	27	79	80	95
City of Dublin Senior Center	28	90	97	108
Dublin Blvd Associates	29	44	43	58
Dublin Chevron	30	80	81	96
Dublin Exec Center	32	44	43	58
Dublin Historic Park	33	76	77	92
Dublin Iceland	34	80	81	96
Dublin Pioneer Cemetery	35	76	77	92
Dublin Unified School District - Dublin Elementary	36	88	77	92
Dublin Unified School District - Nielsen Elementary	37	75	76	91
Frankie Johnnie & Luigi Too	39	76	77	92
Heritage Park Office Center	40	76	77	92
Hexcel Corp	41	44	43	58
John Knox Church	42	75	76	91
McNamara's Steak Shop House	43	81	81	97

Table 6 Estimated Minimum Delivery Pressures for Market Survey Customers West of I-680
Dublin Recycled Water Expansion Project Title XVI Feasibility Study
Dublin San Ramon Services District

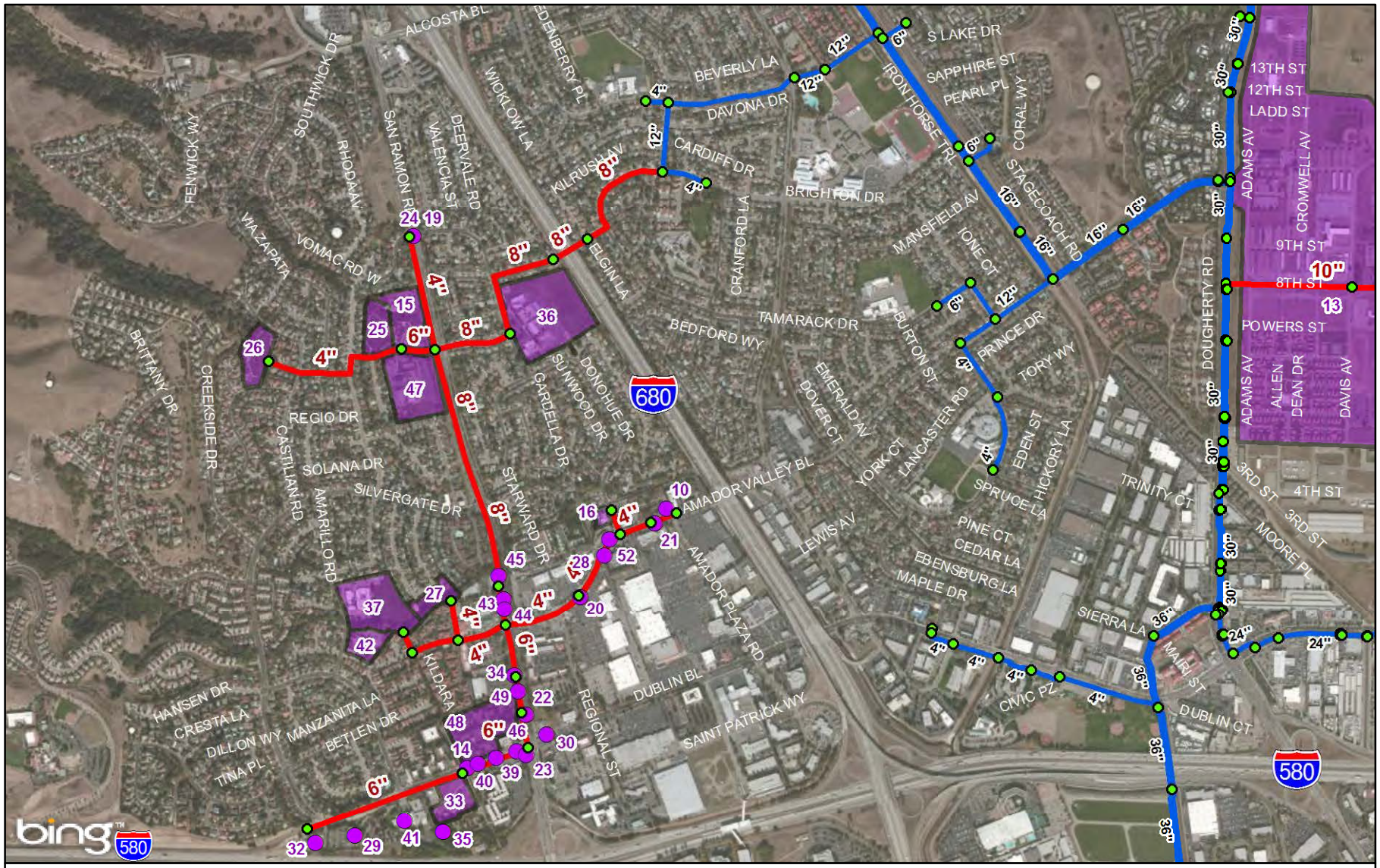
Customer	ID	Minimum Pressure[1] (psi)		
		Alternative 1	Alternative 2	Alternative 3
Michael Perkins (Commercial)	44	81	81	97
Public Storage	45	81	81	97
Shell Station	46	80	81	96
St. Raymond's Church	47	66	60	71
The Springs	48	79	80	95
Town & Country	49	80	81	96
Whitney Investments	52	90	97	108

Note:
(1) Minimum pressure represents delivery pressure during peak hour demands for the MDD condition.

Table 7 Estimated Minimum Delivery Pressures for Market Survey Customers East of Dougherty Road
Dublin Recycled Water Expansion Project Title XVI Feasibility Study
Dublin San Ramon Services District

Customer	ID	Minimum Pressure[1] (psi)		
		Alternative 1	Alternative 2	Alternative 3
Alameda County Animal Shelter	1	98	98	98
Alameda County Santa Rita Jail	5	93	93	96
Alameda County Sheriff’s Office	7	92	92	92
California Highway Patrol	12	100	100	100
Camp Parks Cantonment Area	13	103	103	102
City of Dublin Firehouse 17	17	92	92	92
Federal Correctional Institution	38	104	104	107

Note:
(1) Minimum pressure represents delivery pressure during peak hour demands for the MDD condition.



Legend

- Model Node
- Potential Customers

Recycled Pipelines

- Existing
- Proposed

N

0 800 1,600 Feet

FIGURE 6
PIPELINE ROUTING AND SIZING - USERS WEST OF INTERSTATE 680 (ALTERNATIVE 1)
RECYCLED WATER TREATMENT AND DISTRIBUTION SYSTEM ANALYSIS
DUBLIN RECYCLED WATER EXPANSION PROJECT
TITLE XI FEASIBILITY STUDY
DUBLIN SAN RAMON SERVICES DISTRICT

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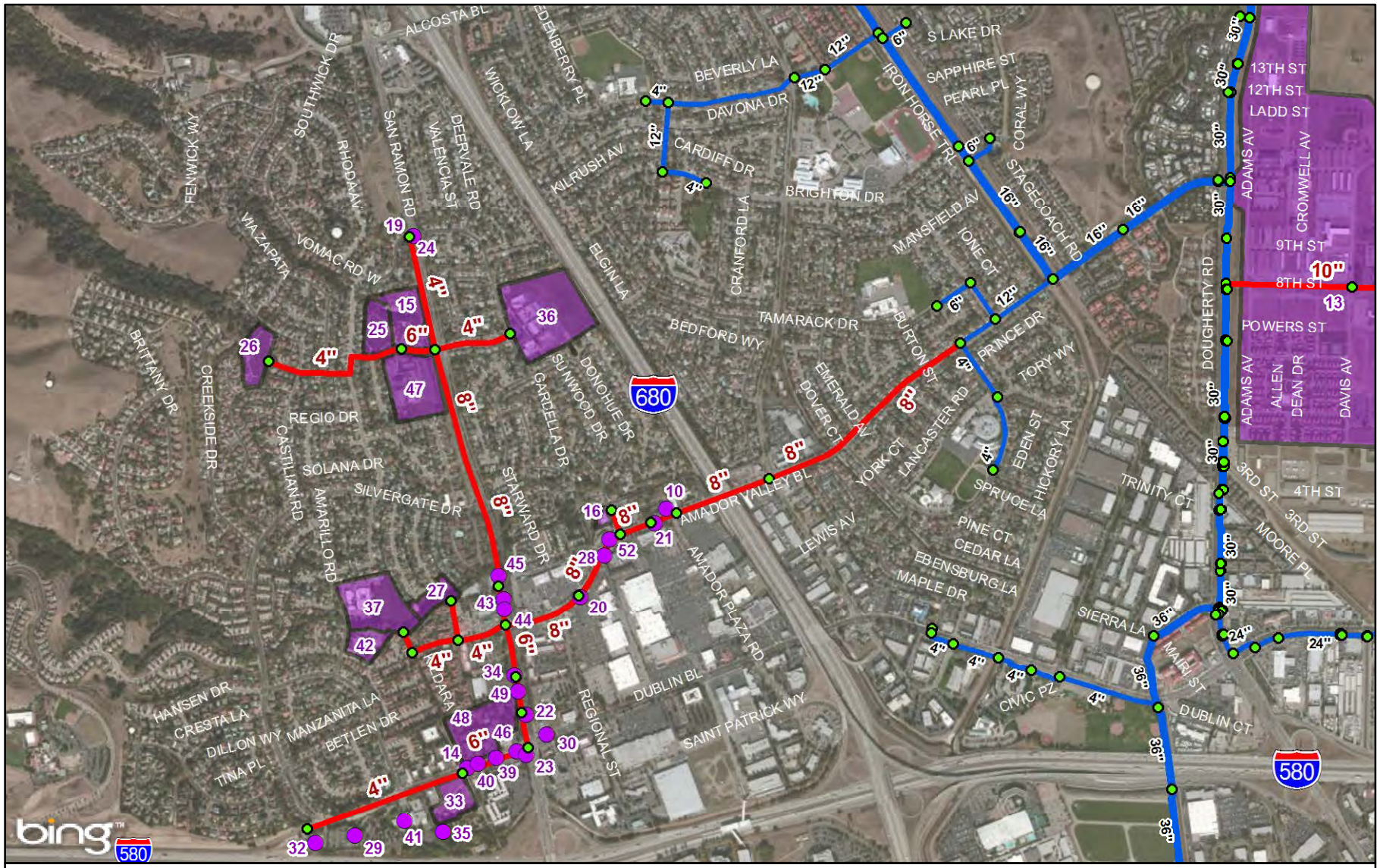

Legend

- Model Node
- Potential Customers

Recycled Pipelines

- Existing
- Proposed

N

0 800 1,600 Feet

FIGURE 7
PIPELINE ROUTING AND SIZING - USERS WEST OF INTERSTATE 680 (ALTERNATIVE 2)
RECYCLED WATER TREATMENT AND DISTRIBUTION SYSTEM ANALYSIS
DUBLIN RECYCLED WATER EXPANSION PROJECT
TITLE XI FEASIBILITY STUDY
DUBLIN SAN RAMON SERVICES DISTRICT

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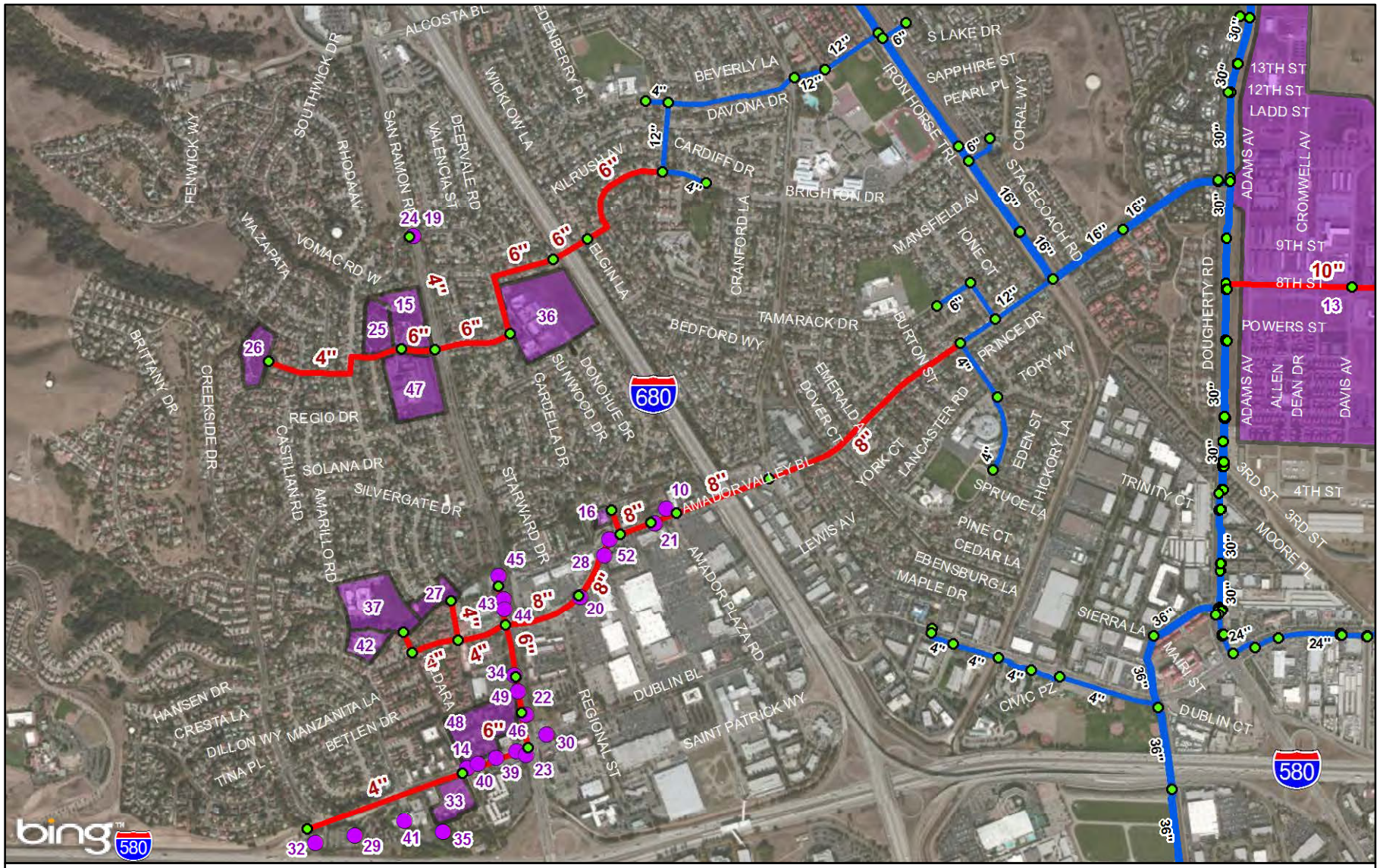

Legend

- Model Node
- Potential Customers

Recycled Pipelines

- Existing
- Proposed

N

0 800 1,600 Feet

FIGURE 8
PIPELINE ROUTING AND SIZING - USERS WEST OF INTERSTATE 680 (ALTERNATIVE 3)
RECYCLED WATER TREATMENT AND DISTRIBUTION SYSTEM ANALYSIS
DUBLIN RECYCLED WATER EXPANSION PROJECT
TITLE XI FEASIBILITY STUDY
DUBLIN SAN RAMON SERVICES DISTRICT

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Alternative 3

The third route (hereafter "Alternative 3") is a combination of Alternative 1 and Alternative 2, but removes a section of proposed pipeline along San Ramon Road. The District has noted that San Ramon Road was built with a thick concrete-treated base, as it once served as a major highway before I-680 was built (Figure 8). The District expects that constructing a significant length of pipeline along San Ramon Road may add significant expense to the project. Therefore, Alternative 3 has two separate branches to serve customers west of I-680. The northern branch takes advantage of the DSRSD-owned easement under I-680. The southern branch utilizes Amador Valley Blvd. The diameters associated with Alternative 3 range from 4- to 8-inches, and are sized primarily based on system head losses. The length of the Alternative 3 pipelines is approximately 3.7 miles.

3.3.2 Users East of Dougherty Road

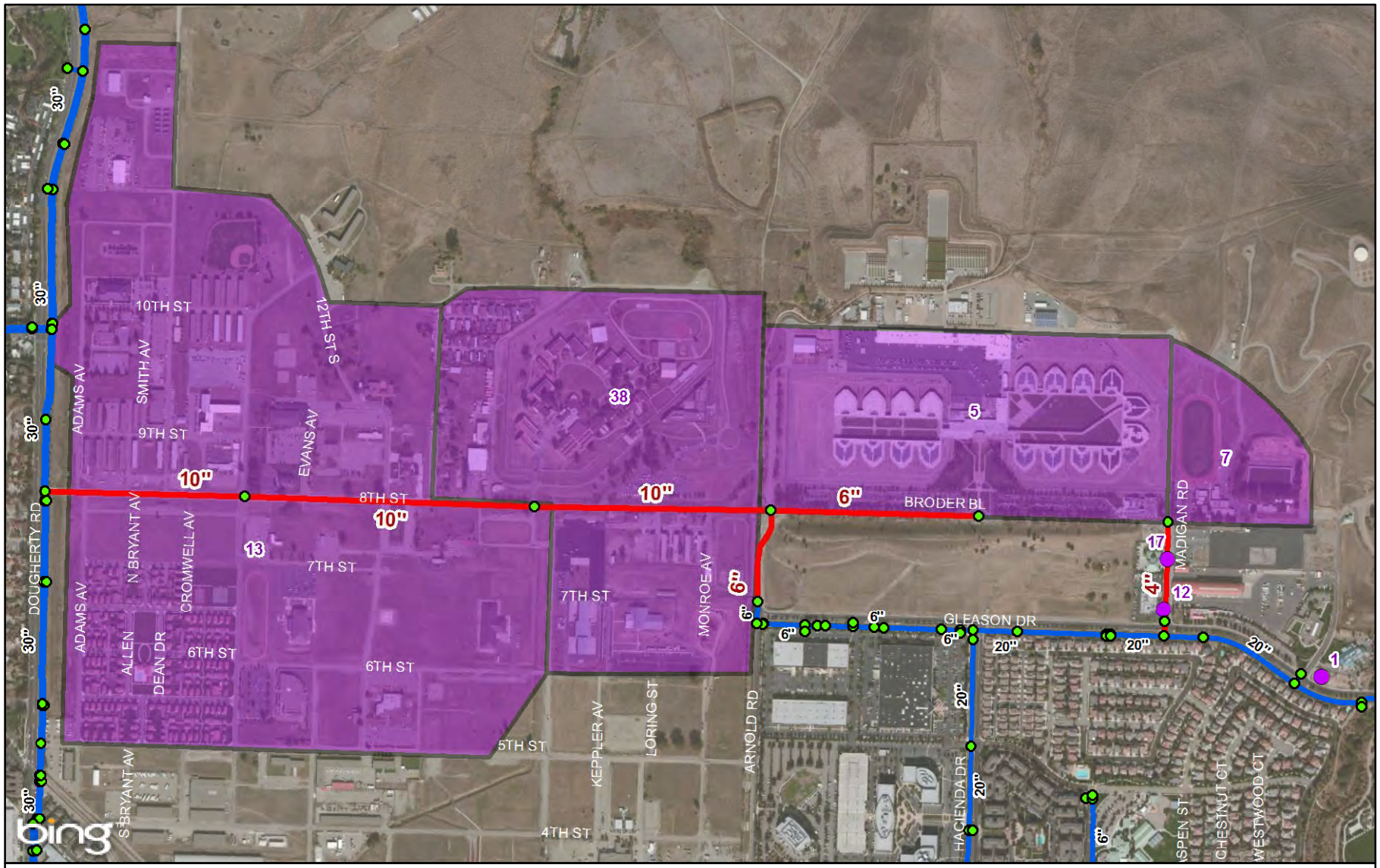
The pipelines associated with recycled water delivery to Market Survey customers east of Dougherty Road consist primarily of a new main along 8th Street and Broder Blvd, as shown in Figure 9.

The proposed pipelines along this route would serve the Camp Parks development, the Federal Correctional Institution (FCI) Loop, Santa Rita Jail, and other smaller users. Based on proximity to existing infrastructure, the new pipelines would connect to the existing system in three locations: Dougherty Road and 8th Street, Broder Blvd and Arnold Road, and Madigan Road and Gleason Drive. Connecting the new pipes to the system at two locations creates a loop, which reduces the head loss, velocity, and the required size of the new pipes.

The additional users east of Dougherty Road will be served by a small branch along Madigan Road extending north from Gleason Drive. The diameters associated with recycled water delivery to eastern Market Survey customers range from 4- to 10-inches, and were determined by conforming to the planning criteria for velocity and head loss. The length of pipeline associated with eastern Market Survey customers is approximately 1.5 miles. The portion of the new pipeline along 8th Street from the western edge of FCI to Arnold Road was upsized from 6-inch to 10-inch diameter at the District's request to allow more flexibility for future users.

3.4 Hydraulic Model Results

The DERWA recycled water system hydraulic model was used to simulate delivery pressures at each customer node, the head losses and velocities experienced in the pipelines, and the operation of system pump stations and reservoirs. The following



Legend

- Model Node
- Potential Customers

Recycled Pipelines

- Existing
- Proposed

N

0 500 1,000 Feet

FIGURE 9
PIPELINE ROUTING AND SIZING - CAMP PARKS AND FEDERAL INSTITUTIONS
RECYCLED WATER TREATMENT AND DISTRIBUTION SYSTEM ANALYSIS
DUBLIN RECYCLED WATER EXPANSION PROJECT
TITLE XI FEASIBILITY STUDY
DUBLIN SAN RAMON SERVICES DISTRICT

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sections provide a discussion of the hydraulic model results for the system routing described in Section 3.3.

3.4.1 Delivery Pressures

The delivery pressure criterion for the DERWA system is to provide a minimum 40 psi. Typically, the minimum pressure at any given delivery point corresponds with the period of highest demand (the peak hour demand) in the system. The minimum pressure experienced by each customer varies based on distance from the pump station/reservoir, pipe sizes, and elevation.

Delivery pressures during peak hour demands were well above the 40-psi requirement for the majority of proposed Market Survey customers. However, due to elevation, the delivery pressures at Dolan Park and at the western end of Dublin Blvd were constraining factors in determining pipeline sizes for both Alternative 1 and Alternative 2 for the system west of I-680. As a result, several pipelines were increased in size to reduce system head loss and provide higher delivery pressures at Dolan Park and the west end of Dublin Blvd. Tables 5 and 6 provide the estimated minimum delivery pressure for the new users west of I-680 and east of Dougherty Road, respectively, based on the pipeline sizes proposed in Section 3.3.

3.4.2 Pipeline Velocity and Head Loss

While minimum delivery pressure was an important factor in determining pipeline sizes, maximum velocities and head losses were also monitored to ensure that these values fell within acceptable ranges. The proposed pipelines were sized to result in a peak hour velocity of less than 6 ft/s and peak hour head loss of less than 10 ft/1,000 ft. The following is a summary of analysis performed with regard to velocity and head loss for the system.

Market Survey Customers West of Interstate 680

Head loss was typically the determining factor in determining pipe size for a particular pipe segment, coupled with the delivery pressures at Dolan Park and the west end of Dublin Blvd. For Alternative 1, pipelines under the District's I-680 easement were sized to be 8 inches to reduce head loss below 10 ft/1000 ft. Reducing the head loss in upstream parts of the system also helped maintain peak hour delivery pressures at greater than 40 psi. For Alternative 2, pipelines along Amador Valley Blvd and San Ramon Road were sized to be 8 inches for the same reason. For Alternative 3, the pipes along Amador Valley Blvd were sized to be 8 inches to meet the head loss and velocity criteria in that segment. Only 4- and 6-inch pipes were required for the northern section of Alternative 3 to meet the planning criteria.

The sizing of pipelines to maintain reasonable head losses resulted in meeting the maximum velocity criteria of less than 6 ft/s as well, with most pipes experiencing

velocities between 1 ft/s and 4 ft/s for all three alternatives. These velocities are relatively low compared to industry standards (i.e., between 4 ft/s and 6 ft/s). Depending on the ultimate design criteria, DSRSD may choose to decrease pipeline sizes, resulting in higher system head losses and higher velocities. If pipeline diameters are decreased, it will be important to check resultant delivery pressures to ensure that greater than 40 psi is maintained for customers at all times.

Market Survey Customers East of Dougherty Road

For the users east of Dougherty Road, the pipeline velocities and head losses fell within the planning criteria with reasonable pipe diameters. One segment of pipe, stemming from the 30-inch trunk on Dougherty Road, was sized to be 10 inches to have the capacity for Camp Parks' demands and to maintain the head loss within the planning criteria. The remaining pipes were sized to be 4 to 6 inches to meet the planning criteria with the associated customer demands.

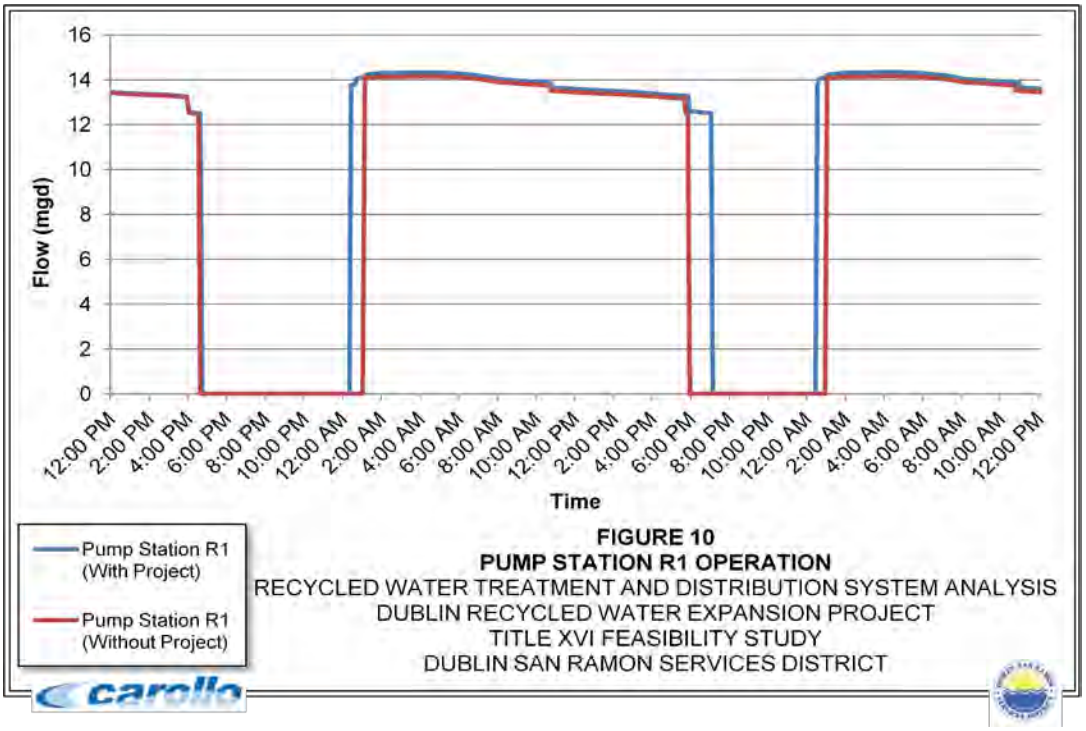
3.5 Pump Station and Reservoir Operation

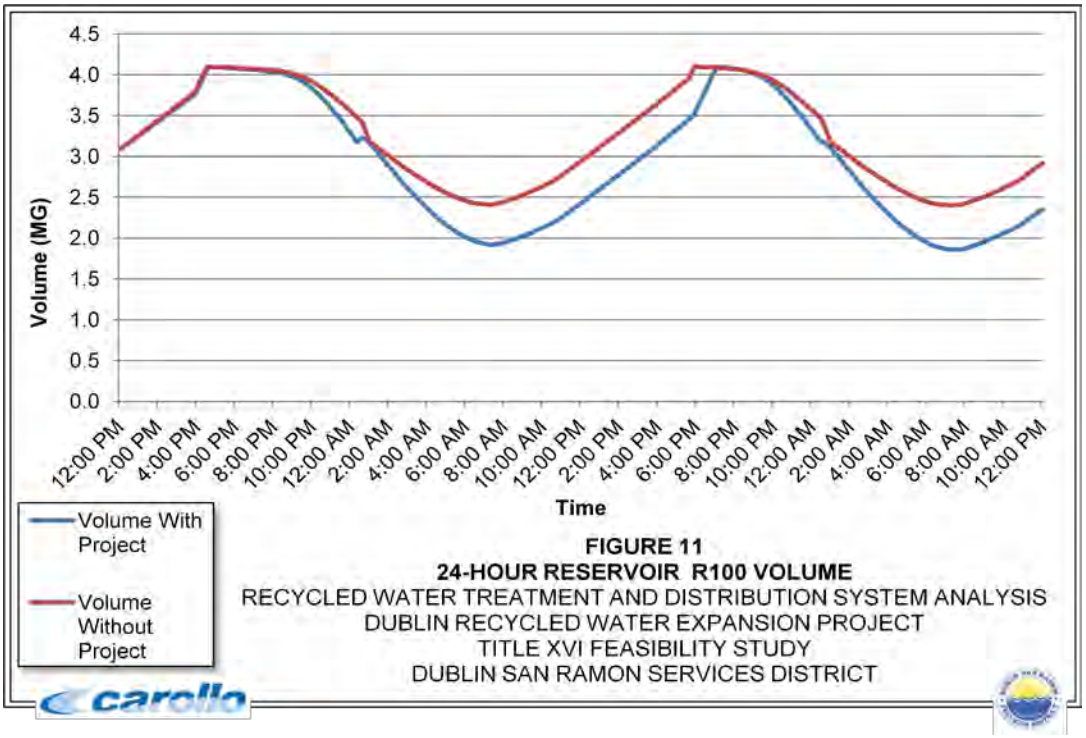
The addition of the Market Survey customer demands to the existing recycled water system affects operation of pump stations and reservoirs connected to Pressure Zone R1. Primarily, the additional demand from the Market Survey customers within Pressure Zone R1 increases the time of operation of the pumps at Pump Station R1 (located at the treatment plant,) and results in a lower reservoir levels in Reservoir R100 during the maximum day demand condition. The following discussion is based on a 48-hour simulation with two consecutive days of maximum day user demands. In this scenario, it was assumed that Pump Station R1 has been upgraded as described in Section 2.2.

Figure 10 shows the difference in Pump Station R1 operation. As indicated, the Pump Station R1 has a longer operation time with the addition of the Market Survey customers compared to without the additional users. With the Market Survey customers, the 48-hour run times for Pump Station R1 were 35 hours (13 hours off). Without the Market Survey customers, the 48-hour run time was 32 hours (16 hours off). While the Market Survey customers increase the pump station operational time, with the additional pumps described in Section 2.2, the available capacity at Pump Station R1 is sufficient to supply the additional demand.

Addition of the Market Survey customers in Pressure Zone R1 reduces the volume of recycled water stored in Reservoir R100 during peak demand periods. Figure 11 shows the 48-hour volume in Reservoir R100 with and without the Market Survey customer demands. With the Market Survey customer demands, the minimum Reservoir R100 volume over the 48-hour simulation was approximately 2.0 mgd at 7:30 AM. Without the demands, the minimum R100 reservoir volume was approximately 2.4 mgd. However, Pressure Zone R1 has the capacity to provide enough flow to allow Reservoir R100 to

recover to the high set point of 32 feet, or approximately 4.0 mgd, during low-demand hours.





3.5.1 Low System Pressures

Several locations in the existing DERWA system were identified in the DERWA Recycled Water Model and Operations Plan Update as having system delivery pressures less than 40 psi due to the service elevation of the respective location. A similar review of system pressures was performed for the intermediate-term and Market Survey customer demands. The purpose of this review was to determine if the addition of the Market Survey customers created any new locations in the existing pipelines where delivery pressures were less than 40 psi, compared to the intermediate-term system without the Market Survey customer demands. The results of the model scenario indicated that the addition of the Market Survey customer demands did not create any new locations where delivery pressures were below 40 psi.

3.5.2 Discussion of Distribution System Alternatives

For Market Survey customers west of I-680, Alternative 1, Alternative 2, and Alternative 3 provide three feasible options with varying benefits and challenges. All three alternatives serve the same customers and the same demands. The difference between the alternatives is the pipeline routing. Alternatives 1 and 2 require similar total length of pipeline (26,900 ft and 27,100 ft, respectively), while Alternative 3 requires the most length of pipeline (approximately 28,000 ft). Each route can provide delivery pressures greater than 40 psi to customers. Alternative 1 utilizes an existing DSRSD-owned easement beneath I-680, limits construction along Amador Valley Road, and includes relatively low-traffic streets for the remainder of the route. Alternative 1 also requires the jack-and-bore installation of a pipeline to bypass under I-680. Alternative 2 utilizes relatively higher traffic thoroughfares including construction along a greater segment of Amador Valley Road, but does not require the jack-and-bore construction. Alternative 3 combines aspects of Alternative 1 and Alternative 2, and avoids construction along San Ramon Road where a thick road section is expected. Alternative 3 includes the jack-and-bore construction and construction along Amador Valley Road, a relatively high traffic thoroughfare. The District has not selected a preferred alternative at this time and will determine which alternative pipeline routing to construct prior to detailed design based on project phasing and coordination with the City of Dublin. The environmental review prepared for the Title XVI Feasibility Study for Dublin Recycled Water Expansion Project evaluates all three alternatives to an equal level of analysis.

4.0 ESTIMATED COSTS

4.1 Cost Estimating Classification and Assumptions

Planning level cost estimates were developed for the facilities described above needed to expand the treatment plant to 16.5 mgd capacity and to expand the distribution system to serve the new Market Survey customers in western and central Dublin. The cost estimates were prepared for feasibility study purposes and for guidance in project

evaluation and implementation. The Association for the Advancement of Cost Engineering (AACE) defines five different class estimate categories as summarized in Table 8. The costs developed in this study are considered to be a Class 4 Detailed Planning Level Estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, actual site conditions, final project scope, implementation schedule, and other factors.

Table 8 Cost Estimating Categories
Dublin Recycled Water Expansion Project Title XVI Feasibility Study
Dublin San Ramon Services District

		Accuracy Range	
Class	**Status of Design**	**Low Side**	**High Side**
5	N/A	-20% to -50%	+30% to +100%
4	1% to 5%	-15% to -30%	+20% to +50%
3	10% to 40%	-10% to -20%	+10% to +30%
2	30% to 70%	-5% to -15%	+5% to +20%
1	80% to 100%	-3% to -10%	+3% to +15%
5	Rough Order-of-Magnitude Planning Estimate		
4	Detailed Planning Level Estimate		
3	Project Budget Estimate		
2	Detailed Project Control Estimate		
1	Bid Check Estimate		

Note:
Percentages are based on the construction cost value and not on an incremental subtotal after each percentage category.

For the development of project costs, a construction cost contingency, an escalation to construction mid-point, and markups to account for costs of engineering, administration, and legal efforts associated with implementing the project were added to the construction cost as indicated in Table 9. It should be noted that the construction contingency, escalation to construction mid-point, and markups are applied incrementally; that is, the percentage for each component is applied to the previous subtotal.

Table 9	Cost Estimating Assumptions Dublin Recycled Water Expansion Project Title XVI Feasibility Study Dublin San Ramon Services District
Description	**Percent of Construction Cost[(1)]**
Construction Cost	100%
Construction Cost Contingency	30%
Escalation to Assumed Construction Mid-Point (5 years @ 3%)	16%
Construction Cost + Contingency + Escalation	**151%**
Engineering, Legal & Administration	30%
Total Project Cost [(2)]	**196%**
Treatment Plant Useful Life, years	20
Distribution Pipeline Useful Life, years	50

Notes:

(1) Percentages are based on the construction cost value and an incremental subtotal after each category for contingencies and total markup cost. Total Project Cost = Construction Cost x (1 + Construction Cost Contingency) x (1+ Escalation) x (1 + Engineering, Legal & Administration).

(2) An additional 20% is added to the distribution system costs for environmental documentation.

4.2 Treatment System

4.2.1 Capital Costs

The estimated capital cost for expanding the recycled water treatment facilities from 9.7 mgd to 16.5 mgd capacity is $14.6 million, as shown in Table 10. The cost equates to approximately $2.1 million per mgd of additional capacity. The costs used to develop the estimate are based on costs for the original recycled water treatment plant escalated to an assumed 2018 construction mid-point, and quotes from equipment vendors. Additional cost breakdown is included in Appendix A.

Table 10	Estimated Recycled Water Treatment Plant Expansion Capital Costs Dublin Recycled Water Expansion Project Title XVI Feasibility Study Dublin San Ramon Services District	
Description		**Planning Level Estimated Cost**
Tertiary Influent Pump Station		$476,000
Flocculation Basins		$645,000
Continuous Backwash Filtration		$3,039,000
UV Disinfection		$795,000
Pump Station R1		$837,000
Total Direct Cost		**$5,790,000**
Contingency (30%)		$1,737,000
	Subtotal	**$7,527,000**
General Contractor Overhead & Profit (12%)		$903,000
	Subtotal	**$8,430,000**
Escalation to Mid-Point (5 years at 3%)		$1,349,000
	Subtotal	**$9,779,000**
Sales Tax on 50% of direct cost (8.75%)		$253,000
	Subtotal	**$10,032,000**
General Conditions (12%)		$1,204,000
Total Estimated Construction Cost		**$11,200,000**
Engineering, Legal & Administration (30%)		$3,360,000
Total Estimated Capital Cost		**$14,600,000**
Increased System Capacity, mgd		6.8
Estimated Capital Cost per mgd of capacity		$2,100,000

4.2.2 O&M and Life Cycle Costs

Operation and maintenance cost estimates developed for the expanded 16.5 mgd treatment system are summarized in Table 11. Estimated maintenance costs include replacement costs during the assumed 20 year equipment life. Table 11 also includes an estimated life cycle treatment cost per million gallons (MG) and per acre-foot (AF) of recycled water produced. Additional cost breakdown is included in Appendix A, including unit prices and other assumptions.

Table 11	**Estimated Recycled Water Treatment Plant O&M Costs Dublin Recycled Water Expansion Project Title XVI Feasibility Study Dublin San Ramon Services District**
Description	**Planning Level Estimated Cost (1)**
Electric Power	$262,000
Chemicals	$82,000
Operating Labor	$242,000
Maintenance	$174,000
Total Annual O&M Cost	**$760,000**
Capital Cost (expansion from 9.7 to 16.5 mgd)	$14,600,000
Annualized Capital Cost (I=5%, n=20)	$ 1,170,000
Annualized Capital Cost + Annual O&M Cost	$1,930,000
Annual Recycled Water Produced, mgd	2.6(2)
Treatment Life Cycle Cost, $/MG	**$ 2,020**
Annual Recycled Water Produced, AFY	2,900(2)
Treatment Life Cycle Cost, $/AF	**$ 670**

Notes:
(1) O&M costs are prorated for the recycled water produced by the treatment plant expansion.
(2) Annual recycled water produced is based on added max day capacity of 6.8 mgd divided by the max day/avg day peaking factor of 2.6 (see Table 4).
6.8 mgd ÷ 2.6 = 2.6 mgd.
2.6 mgd x 1120 AFY/mgd = 2,900 AFY

4.3 Distribution System

4.3.1 Capital Costs

Distribution system capital costs were estimated based on the pipeline sizes and routes identified in the hydraulic model. The unit costs used to develop the estimate are based on cost estimates from similar recycled water projects in the Bay Area escalated to an assumed 2018 construction mid-point, and include general conditions, sales tax, and contractor overhead & profit. An additional 10 percent contingency was included for construction in San Ramon Road due to the thicker road section, and an additional 5 percent contingency was included for construction in high-traffic areas. User retrofit costs are covered in the construction contingency. Retrofit costs include onsite piping and valving, signage, and testing.

Cost estimates were prepared separately for the proposed Alternative 1, Alternative 2, and Alternative 3 distribution system for users west of I-680. Table 12 provides a summary of estimated distribution system capital costs. Total construction costs include the Alternative 1, Alternative 2, or Alternative 3 system plus the cost of pipelines associated with users east of Dougherty Road. Additional cost breakdown is included in Appendix A.

Table 12 Estimated Recycled Water Distribution System Capital Costs Dublin Recycled Water Expansion Project Title XVI Feasibility Study Dublin San Ramon Services District

Description	Planning Level Estimated Cost
Base Construction Cost West of I-680	
Alternative 1	$2,420,000
Alternative 2	$2,160,000
Alternative 3	$2,470,000
Base Construction Cost East of Dougherty Road	$ 980,000
Combined Base Construction Cost	
Alternative 1 (West of I-680 + East of Dougherty Road)	$3,400,000
Alternative 2 (West of I-680 + East of Dougherty Road)	$3,140,000
Alternative 3 (West of I-680 + East of Dougherty Road)	$3,450,000
Total Estimated Construction Cost (includes 30% construction contingency and 5 years @ 3% escalation to mid-point)	
Alternative 1 (West of I-680 + East of Dougherty Road)	$5,130,000
Alternative 2 (West of I-680 + East of Dougherty Road)	$4,730,000
Alternative 3 (West of I-680 + East of Dougherty Road)	$5,210,000
Total Estimated Capital Cost (includes 30% for engineering, legal, administration and 20% for environmental documentation)	
Alternative 1 (West of I-680 + East of Dougherty Road)	$8,000,000
Alternative 2 (West of I-680 + East of Dougherty Road)	$7,400,000
Alternative 3 (West of I-680 + East of Dougherty Road)	$8,100,000
Estimated Increased System Max Day Capacity, mgd	1.1 (1)
Estimated Capital Cost per mgd of Max Day Capacity	
Alternative 1 (West of I-680 + East of Dougherty Road)	$7,300,000
Alternative 2 (West of I-680 + East of Dougherty Road)	$6,700,000
Alternative 3 (West of I-680 + East of Dougherty Road)	$7,400,000

Note:
(1) Max day from Table 3 above. 1 mgd = 694 gpm.

The pipeline infrastructure required for Alternative 1 and Alternative 2 is similar; the primary difference between the two routing options is the construction of a jack-and-bore crossing within the City's easement under I-680 for Alternative 1. The estimated length of the bore-and-jack crossing was 400 ft at an estimated cost of $1,000 per linear foot of bore. Alternative 3 also includes the bore-and-jack crossing, and therefore has a similar cost to Alternative 1. Alternative 2 results in the lowest estimated capital cost.

4.3.2 O&M and Life Cycle Costs

Operation and maintenance cost estimates developed for the distribution system are summarized in Table 13. Table 13 also includes an estimation of the present worth of distribution system capital and O&M costs, and an estimated cost per acre-foot (AF) of recycled water delivered. Table 13 also includes an estimated life cycle distribution cost per million gallons (MG) and per acre-foot (AF) of recycled water delivered.

The estimated cost of the delivered water ranges from approximately $920/AF to $990/AF. Alternative 2 results in the lowest estimated life cycle cost. As discussed above, The District has not selected a preferred alternative at this time and will determine which alternative pipeline routing to construct prior to detailed design based on project phasing and coordination with the City of Dublin.

Table 13	Estimated Recycled Water Distribution System O&M Costs Dublin Recycled Water Expansion Project Title XVI Feasibility Study Dublin San Ramon Services District
Description	**Planning Level Estimated Cost (1,2)**
Annual O&M Cost	
Alternative 1 (West of I-680 + East of Dougherty Road)	$10,000
Alternative 2 (West of I-680 + East of Dougherty Road)	$9,000
Alternative 3 (West of I-680 + East of Dougherty Road)	$10,000
Capital Cost	
Alternative 1 (West of I-680 + East of Dougherty Road)	$ 8,000,000
Alternative 2 (West of I-680 + East of Dougherty Road)	$ 7,400,000
Alternative 3 (West of I-680 + East of Dougherty Road)	$8,100,000
Annualized Capital Cost (I=5%, n=50)	
Alternative 1 (West of I-680 + East of Dougherty Road)	$440,000
Alternative 2 (West of I-680 + East of Dougherty Road)	$410,000
Alternative 3 (West of I-680 + East of Dougherty Road)	$440,000
Annualized Capital Cost + O&M Cost	
Alternative 1 (West of I-680 + East of Dougherty Road)	$449,000
Alternative 2 (West of I-680 + East of Dougherty Road)	$419,000
Alternative 3 (West of I-680 + East of Dougherty Road)	$450,000
Annual Recycled Water Delivered(3)	
Acre Feet per Year	455
Million Gallons per Day	0.41
Distribution Life Cycle Cost, $/MG	
Alternative 1 (West of I-680 + East of Dougherty Road)	$3,000
Alternative 2 (West of I-680 + East of Dougherty Road)	$2,800
Alternative 3 (West of I-680 + East of Dougherty Road)	$3,010
Distribution Life Cycle Cost, $/AF	
Alternative 1 (West of I-680 + East of Dougherty Road)	$990
Alternative 2 (West of I-680 + East of Dougherty Road)	$920
Alternative 3 (West of I-680 + East of Dougherty Road)	$990

Notes:
(1) Pipeline O&M and replacement costs are estimated at 0.1% of construction cost per year for labor, and 0.1% of construction cost per year for materials and outside services.
(2) Pumping costs are included in the treatment plant O&M costs.
(3) Annual recycled water delivered from Table 3 above. 1 mgd = 694 gpm.

4.4 Total Project Costs

Total project capital and O&M costs are summarized in Table 14.

Table 14	**Estimated Total Project Capital and O&M Costs Dublin Recycled Water Expansion Project Title XVI Feasibility Study Dublin San Ramon Services District**
Description	**Planning Level Estimated Cost**
Capital Cost	
Alternative 1 (West of I-680 + East of Dougherty Road) + Treatment	$ 22,600,000
Alternative 2 (West of I-680 + East of Dougherty Road) + Treatment	$ 22,000,000
Alternative 3 (West of I-680 + East of Dougherty Road) + Treatment	$22,700,000
Annual O&M Cost	
Alternative 1 (West of I-680 + East of Dougherty Road) + Treatment	$769,000
Alternative 2 (West of I-680 + East of Dougherty Road) + Treatment	$769,000
Alternative 3 (West of I-680 + East of Dougherty Road) + Treatment	$770,000

APPENDIX A – COST ESTIMATES

TREATMENT CAPITAL COST ESTIMATE SUMMARY

Project:	**Dublin Recycled Water Expansion Project Treatment and Distribution System Analysis**		
Job #:	**7947F.00**	**Estimate Class:**	**4**
Location:	**Pleasanton, CA**	**Date:**	**February 13, 2013**
Zip Code:	**94588**	**By:**	**PF**
Description:	**Expansion to 16.5 mgd**	**Reviewed:**	**TC**

NO.	DESCRIPTION			TOTAL
01	Tertiary Effluent Pump Station			$476,000
02	Flocculation Basins			$645,000
03	Continuous Backwash Filtration			$3,039,000
04	UV Disinfection			$795,000
05	Pump Station R1			$837,000
	TOTAL DIRECT COST			**$5,790,000**
	Contingency		30%	$1,737,000
		Subtotal		**$7,527,000**
	General Contractor Overhead & Profit		12%	$903,000
		Subtotal		**$8,430,000**
	Escalation to Mid-Point (Based on 5 years at 3% interest rate)		16%	$1,349,000
		Subtotal		**$9,779,000**
	Sales Tax on 50% of direct cost		8.75%	$253,000
		Subtotal		**$10,032,000**
	General Conditions		12%	$1,204,000
	TOTAL ESTIMATED CONSTRUCTION COST			**$11,200,000**
	Engineering, Legal & Admin.		30%	$3,360,000
	TOTAL ESTIMATED CAPITAL COST			**$14,600,000**

Project:	**Dublin Recycled Water Expansion Project Treatment and Distribution System Analysis**		
Job #:	**7947F.00**	**Date :**	**February 13, 2013**
Location:	**Pleasanton, CA**	**By :**	**PF**
Element:	**Tertiary Effluent Pump Station**	**Reviewed:**	**TC**

NO.	DESCRIPTION	Quantity	Unit	TOTAL
1A	Pump	2	$105,000	$210,000
1B	Valves	2	$7,500	$15,000
1C	Piping	1	LS	$10,000
1D	Modifications to existing pumps (bearings and impellers)	3	$40,000	$120,000
1E	Mechanical installation @ 20%	1	LS	$71,000
1F	E&IC	1	LS	$50,000
	Total			**$476,000**

Notes

1. Assumes new pump matches existing pumps.

Project:	**Dublin Recycled Water Expansion Project Treatment and Distribution System Analysis**		
Job #:	**7947F.00**	**Date :**	**February 13, 2013**
Location:	**Pleasanton, CA**	**By :**	**PF**
Element:	**Flocculation Basins**	**Reviewed:**	**TC**

NO.	DESCRIPTION	Quantity	Unit	TOTAL
2A	Cast in place concrete	1	LS	$400,000
2B	Miscellaneous metals	1	LS	$69,000
2C	Mechanical	1	LS	$121,000
2D	Electrical	1	LS	$55,000
	Total			**$645,000**

Notes:

1. Costs based on escalation of original floc basin costs to December 2012 with general conditions (12%), tax (8,75% on half direct cost), and contractor O&P (12%) removed.
2. Concrete cost reduced by 25% due to existing walls and stubs.

Project:	**Dublin Recycled Water Expansion Project Treatment and Distribution System Analysis**		
Job #:	**7947F.00**	**Date :**	**February 13, 2013**
Location:	**Pleasanton, CA**	**By :**	**PF**
Element:	**Continuous Backwash Filtration**	**Reviewed:**	**TC**

NO.	DESCRIPTION	Quantity	Unit	TOTAL
3A	Cast in place concrete	1	LS	$765,000
3B	Miscellaneous metals	1	LS	$133,000
3C	Sealants	1	LS	$26,000
3D	Mechanical	5	$390,000	$1,950,000
3E	Electrical	1	LS	$165,000
	Total			**$3,039,000**

Notes:

1. Costs based on escalation of original filter costs to December 2012 with general conditions (12%), tax (8,75% on half direct cost), and contractor O&P (12%) removed.
2. Concrete cost reduced by 25% due to existing walls and stubs.

Project:	**Dublin Recycled Water Expansion Project Treatment and Distribution System Analysis**		
Job #:	**7947F.00**	**Date :**	**February 13, 2013**
Location:	**Pleasanton, CA**	**By :**	**PF**
Element:	**UV Disinfection**	**Reviewed:**	**TC**

NO.	DESCRIPTION	Quantity	Unit	TOTAL
4A	UV equipment	20	$29,750	$595,000
4B	UV system wall removal & equipment installation	2	$100,000	$200,000
	Total			**$795,000**

Notes

1. Costs assume installation of 2 additional modules per bank for both UV channels.

Project: Dublin Recycled Water Expansion Project Treatment and Distribution System Analysis
Job #: 7947F.00 **Date :** February 13, 2013
Location: Pleasanton, CA **By :** PF
Element: Pump Station R1 **Reviewed:** TC

NO.	DESCRIPTION	Quantity	Unit	TOTAL
5A	Pump	2	$120,000	$240,000
5B	Valves	2	$15,000	$30,000
5C	Piping	1	LS	$20,000
5D	Surge tank	1	$99,000	$99,000
5E	Mechanical installation @ 20%	1	LS	$77,800
5F	E&IC	1	LS	$370,000
	Total			**$837,000**

TREATMENT O&M COST SUMMARY

Project: **Dublin Recycled Water Expansion Project Treatment and Distribution System Analysis**

Job #: **7947F.00**
Location: **Pleasanton**
Zip Code: **94588**
Description **16.5 mgd capacity, 6.3 mgd annual average flow**

NO.	DESCRIPTION	16.5 MGD CAPACITY TREATMENT PLANT	EXPANSION FROM 9.7 TO 16.5 MGD CAPACITY
01	Electrical power	$635,000	$262,000
02	Chemicals	$200,000	$82,000
03	Operating Labor	$588,000	$242,000
04	Maintenance	$423,000	$174,000
	ANNUAL O&M COST	**$1,850,000**	**$760,000**
	Capital Cost (expansion from 9.7 to 16.5 mgd)		$14,600,000
	Annualized Capital Cost (I=5%,n=20)		$1,170,000
	Recycled water produced, mgd (assumes max day/avg day ratio = 2.6)	6.3	2.6
	Recycled water produced, AFY (assumes max day/avg day ratio = 2.6)	7,100	2,900
	TREATMENT LIFE CYCLE COST, $/MG		**$2,020**
	TREATMENT LIFE CYCLE COST, $/AF		**$670**

TIPS, Flocculation, Filtration Annual O&M Costs

DESIGN CRITERIA

Max day flow (filter product)	16.5	mgd	Loading rate, all filters in service	3.8	gpm/ft^2
Backwash percentage	6%		Loading rate, one cell out of servic	4.2	gpm/ft^2
Max day flow (filter feed)	17.6	mgd	Air consumption @ 15-25 psi	281	sft3/m
Avg annual flow (filter product)	6.3	mgd	Air pressure	20	psig
Avg annual flow (filter feed)	6.8	mgd	Pressure drop	18-24	inches
Filter area per module	50	ft^2	Design pressure drop	36	inches
Modules per filter	6		Pumping head	20	ft
Filter area per filter cell	300	ft^2	Average electricity cost	$0.12	/kWh
Number of filters	10		Motor efficiency	90%	
Total filter area	3000	ft^2			

ANNUAL O&M COSTS

Electric power									
TIPS	6.8	mgd @	80%	efficiency =		214,994	kWh/year	$25,799	/year
Air compressors	281	cfm	25	psig		4	kW	$4,378	/year
Floc mixers	12	HP				78,420	kWh/year	$9,410	/year
Chemicals									
PACL	2.75	mg/l	155	lb/day		2	$/lb	$113,033	/year
Other costs									
Maintenance	2%	of equipment cost						$100,000	/year
Sand cleaning & replacement	1%	of equipment cost						$50,000	/year
Operating labor cost	120	hour/week			$50	/hr		$312,000	/year
TOTAL								$615,000	/year

UV Disinfection Annual O&M Costs

DESIGN CRITERIA

Type of UV system	Medium-pressure, high-intensity		UV lamp power usage	330	watts/lamp
Average annual flow	6.3	mgd	UV lamp life	10000	hours
Peak month & day flow	16.5	mgd	UV lamp replacement cost	300	$/lamp
Number of UV channels	2		Average power usage	162	kW
Banks per channel	5		UV cleanings per year	2	
Modules per bank	8		Staff hours to clean entire channel	80	each
Lamps per module	20		Average electricity cost	$0.12	/kwh
Total number of lamps	1600		Motor efficiency	90%	
Design transmittance	61%				

ANNUAL O & M COST

UV lamp power	6.3	mgd	162	kW			$170,780	/year
Labor to clean lamps	320	staff-hours	$50	/hour			$16,000	/year
Lamp replacement	4,312,615	lamp hrs/year, replace			431	lamp/year	$129,378	/year
Chlorination	14	mg/l	593	gal/day @	$0.40	/gal	$86,546	/year
Maintenance	2%	of equipment cost	+		20	min/lamp	$87,188	/year
Operating labor cost	90	hr/week			$50	/hr	$234,000	/year
TOTAL							$724,000	/year

PSR1 Annual O&M Costs

DESIGN CRITERIA

Average annual flow	6.3	mgd
Peak month & day flow	16.5	mgd
Average electricity cost	$0.12	/kwh
Pumping head	350	ft
Required TIP HP at 16.5 annual flow	160	HP
Motor efficiency	90%	

ANNUAL O & M COST

Pump power	6.3	mgd @	80%	efficiency =	3,536,651	kWh/year	$424,398 /year
Maintenance	2%	of equipment cost					$40,000 /year
Operating labor cost	16	hr/week			$50	/hr	$41,600 /year
TOTAL							$506,000 /year

DISTRIBUTION SYSTEM CAPITAL COST ESTIMATE

Project: **Dublin Recycled Water Expansion Project Treatment and Distribution System Analysis**

Job #: **7947F.00** **Estimate Class:** **4**

Location: **Dublin, CA** **Date:** **November 16, 2012**

Zip Code: **94568** **By:** **MD**

Description: **Distribution System Expansion to Serve Market Survey Customers** **Reviewed:** **PF**

		DESCRIPTION	LENGTH, FT	UNIT COST, $/LF	TOTAL
West of Interstate 680 Distribution Pipelines (Three Alternatives)[1]					
	A1	Alternative 1			
		4-inches in Diameter	7,300	81	$593,000
		6-inches in Diameter	4,300	102	$439,000
		8-inches in Diameter	7,100	139	$990,000
		Jack-and-Bore Crossing	400	1,000	$400,000
		A1 Subtotal			*$2,420,000*
	A2	Alternative 2			
		4-inches in Diameter	7,600	80	$606,000
		6-inches in Diameter	2,500	105	$263,000
		8-inches in Diameter	9,200	141	$1,293,000
		A2 Subtotal			*$2,160,000*
	A3	Alternative 3			
		4-inches in Diameter	6,800	79	$540,000
		6-inches in Diameter	6,900	102	$702,000
		8-inches in Diameter	6,100	135	$826,000
		Jack-and-Bore Crossing	400	1,000	$400,000
		A3 Subtotal			*$2,470,000*
East of Doughery Road Distribution Pipelines					
		4-inches in Diameter	700	79	$55,000
		6-inches in Diameter	2,100	98	$206,000
		10-inches in Diameter	5,000	143	$715,000

		Subtotal			*$980,000*
		Base Construction Cost		**A1**	**$3,400,000**
				A2	**$3,140,000**
				A3	**$3,450,000**
Construction Contingency					
		Construction Contingency	30%	A1	$1,020,000
				A2	$940,000
				A3	$1,040,000
		Escalation of Mid-Point (5 years @ 3%)	*16%*	A1	$710,000
				A2	$650,000
				A3	$720,000
		Total Construction Cost w/ Contingency and Escalation		**A1**	**$5,130,000**
				A2	**$4,730,000**
				A3	**$5,210,000**
Non-Construction Costs					
		Engineering, Legal, Administration, and Construction Management	30%	A1	$1,540,000
				A2	$1,420,000
				A3	$1,560,000
		Environmental Documentation	20%	A1	$1,330,000
				A2	$1,230,000
				A3	$1,350,000
		TOTAL ESTIMATED CAPITAL COST		**A1**	**$8,000,000**
				A2	**$7,400,000**
				A3	**$8,100,000**
		ANNUALIZED CAPITAL COST		A1	$440,000
	5%			A2	$410,000
	50	years		A3	$440,000
Estimated Increased Max Day Capacity, mgd					1.1
		ESTIMATED CAPITAL COST PER MGD OF MAX DAY CAPACITY		A1	$7,300,000
				A2	$6,700,000
				A3	$7,400,000

Notes:

1. Pipeline construction costs include contingencies for pipes in high traffic areas (5 percent contingency) and for pipes along San Ramon Road due to the thickness of existing concrete (10 percent contingency).

Reference 2

CDM

Draft Technical Memorandum

To: *Linda Hu and Wesley Morrison, EBMUD*

CC: *Robert Baker, DERWA*

From: *Jeff Sellberg, CDM*

Date: *May 14, 2003*

Subject: *Modeling Results for DERWA Task 7A – New EBMUD Customer Base Hydraulic Modeling*

Summary

CDM has completed hydraulic modeling and sizing of transmission and distribution system facilities to serve the new EBMUD customer base for the San Ramon Valley Recycled Water Program. Modeling indicates that the 16-inch pipeline currently under design for the Iron Horse Trail will adequately serve the initial and ultimate customer base for the program. Some upsizing of future facilities in Zone 2 is required to serve the new customer base as discussed below. Figure 1 summarizes pipeline sizes required for the program.

Hydraulic Modeling and Facility Sizing to Serve the New EBMUD Customer Base

Hydraulic modeling was initiated to size transmission and distribution system facilities to serve the new EBMUD customer base. Alternative customers to be included in the program were evaluated and presented in the *Draft Technical Memorandum – Potential EBMUD Customer Base Evaluation, February 26, 2003*. The new customer base includes customers EBMUD now wishes to serve in the program in lieu of providing service to the San Ramon Royal Vista Golf Course. Figure 2 summarizes the location of customers included in the program database. New customers are depicted in yellow and are located in both Zones 1 and 2. The revised customer list for EBMUD is included in Attachment A.

The existing H2O Net hydraulic model was updated to include customers in the new EBMUD customer base. Several model runs were completed for both pressure Zones 1 and 2 to evaluate and size transmission and distribution system facilities. Table 1 summarizes the modeling results. A brief discussion of the modeling work is included below.

Table 1
Hydraulic Modeling Results

	Pressure Zone	Demand and Infrastructure	Purpose	Result
Baseline	Zone 1 and 2	■ Predesign Customer Base including SR Royal Vista Golf Course (SRRV GC)	Baseline to compare other runs	Minimum pressure of 39 psi
Run 1	Zone 1	■ Zone 1 initial maximum hour demand excluding SRRV GC; temporary service to EBMUD customers in the Bishop Ranch area. ■ Transmission pipeline sizes currently under design. ■ Facilities operating at initial installed capacity.	Determine adequacy of distribution system to serve new EBMUD customer base.	Minimum pressure of 38 psi maintained in zone.
Run 2	Zone 1	■ Zone 1 initial maximum hour demand including SRRV GC. ■ Transmission pipeline sizes currently under design. ■ Facilities operating at initial installed capacity.	Determine adequacy of distribution system to serve new EBMUD customer base and SRRV GC in the future.	Minimum pressure of 38 psi maintained in zone.
Run 3	Zone 1	■ Zone 1 buildout maximum hour demand excluding SRRV GC. ■ Transmission pipeline sizes currently under design. ■ Facilities operating at buildout capacity.	Determine adequacy of distribution system to serve new EBMUD customer base.	Minimum pressure of 38 psi maintained in zone.
Run 4	Zone 1	■ Zone 1 buildout maximum hour demand including SRRV GC. ■ Transmission pipeline sizes currently under design. ■ Facilities operating at buildout capacity.	Determine adequacy of distribution system to serve new EBMUD customer base and SRRV GC in the future.	Minimum pressure of 38 psi maintained in zone.
Run 5	Zone 2	■ Zone 2 buildout maximum hour demand. ■ Facilities operating at buildout capacity.	Determine adequacy of distribution system to serve new EBMUD customer base.	Minimum pressure of 40 psi maintained in zone. [1]

[1] Pressure was allowed to drop below the 40 psi minimum for customers with their own booster pump stations.

Model Runs 1 though 4 were completed to evaluate service to the new customer base within pressure zone 1. Scenarios were completed assuming transmission pipeline sizes currently under design, with and without service to the San Ramon Royal Vista Golf Course in the future. Modeling results indicate that residual pressure in the distribution system drops slightly below pressure in the baseline run and slightly below the minimum pressure criteria of 40 psi established by DERWA. However, this pressure drop is so small it is unlikely to affect customer service.

Run 5 was completed to evaluate service to the new customer base within Zone 2. Modeling indicates that transmission pipeline sizes currently under design will be sufficient to serve the new customer base. Some upsizing of future pipelines is required to serve the new customer base as shown in Figure 1. It is also required to upsize the nominal capacity of Pump Station 2A from 2200 to 2600 gpm.

It should be noted that several customers within the Gale Ranch Phase 1 development area were identified who own small booster pump stations. Some of these customers are above the maximum service elevation for Zone 2 (580 feet). For this analysis it was assumed that these customers could be successfully served, provided that pressure in excess of 15 psi could be supplied upstream of the meter. EBMUD should confirm that these pump stations serve all of the respective customers' irrigation systems prior to connecting the customer to the system.

Potential Future Phase Customers and Current Modeling Work

Future phase customers currently in the database include a mix of users such as schools, parks, and home owners associations. The total estimated EBMUD annual demand served for the program is 2.4 mgd at system buildout. However, there is additional market potential in close proximity to currently planned transmission and distribution pipelines that is not currently included in the customer database. Some potential customers identified are listed in Table 2 and include recently constructed offices in the Bishop Ranch area. EBMUD may want to consider connecting these customers to the system in the future. Some of the customers listed in Table 2 may be more feasible and economic to connect to the system than future customers currently in the database. Offices in the Bishop Ranch area, for example, may be easier and more economic to connect to the system than homeowners associations, which have been found to be challenging to connect to the Phase 1 project. Offices may also be easier and more cost effective to retrofit. Customers listed in Table 2, along with other irrigation customers in the area, provide EBMUD flexibility in progressively developing the customer base it wishes to serve in the future.

Table 2

Additional Potential Customers Identified within Service Area

Customer Name	Customer ID	Customer Address
San Ramon Regional Medical Center	5011297 5011298 5011296	5101 Norris Canyon Road 7777 Norris Canyon Road 6000 Norris Canyon Road
Foothills HOA Foothills HOA Foothills HOA Sandview Inc	04752092 04749322 04749082 50137862	167 Norris Canyon Ter 177 Norris Canyon Ter 115 Norris Canyon Pl 301 Norris Canyon Ter
Bishop Ranch 1 Bishop Ranch 3 Bishop Ranch 9 Bishop Ranch 15	Unk Unk Unk Unk Unk	6101 – 6121 Bollinger Canyon Road 2603 – 2633 Camino Ramon 2409 Camino Ramon 12667 – 12677 Alcosta Blvd 12647 – 12657 Alcosta Blvd
The Shops at Bishop Ranch Retail Center	Unk	Sunset Drive
Acorn Learning Center Church of Jesus Christ of Latter Day Saints	Unk Unk	5075 Crow Canyon Road 5025 Crow Canyon Road
City of San Ramon (Serve from Zone 3)	5043324	4348 Sweet Gale Drive
Town of Danville	50180051	3390 Center Ct
Vestrella Owners Assoc	50364862	1 Indian Rice Road
City of San Ramon	50096202	4945 Crow Canyon Road
	50007382	2000 Crow Canyon Place
S&W Plaza	04745123	3160 Crow Canyon Road
City of San Ramon	50291711	3200 Fostoria Way
Crow Canyon CC Estates Crow Canyon Est Comm Assn Crow Canyon Estates Town of Danville Town of Danville	04724132, 04724082, 04724142, 04724152, 04724162, 04743032 04743322 31729352 04720103 04720113	Near El Capitan Near El Capitan Near El Capitan Near El Capitan Near El Capitan
Customers along Camino Tassajara west of Crow Canyon Road	Varies	Varies

Recycled water demand included in the hydraulic model is an estimate based on metered potable water use data provided to CDM, EBMUD's recycled water use factors, and engineering judgment. Data available to CDM was summarized in the *Draft Technical Memorandum – Potential EBMUD Customer Base Evaluation, February 26, 2003*. Where data was not available, demand was estimated based on a similar customer type. The actual recycled water demand of customers connected to the system may be different than the demand estimate in the database, with resulting differences in hydraulic performance of the distribution system. Future phase customers served as part of the project can be adjusted as the actual metered recycled water demand is determined through operating experience with Phase 1 customers.

This modeling work and previous work should be considered "planning level." The work did not evaluate extensively the feasibility and cost effectiveness of connecting individual customers to the system. Site visits and customer interviews should be conducted prior to finalizing the customer database for the future phase project and before beginning preliminary design of future phase facilities. It should also be recognized that the customer base is evolutionary – businesses come and go, property and land use changes, and potential customers change their minds. The customer base needs to be periodically updated and can be adjusted based on economic and other feasibility considerations involved in connecting customers to the system.

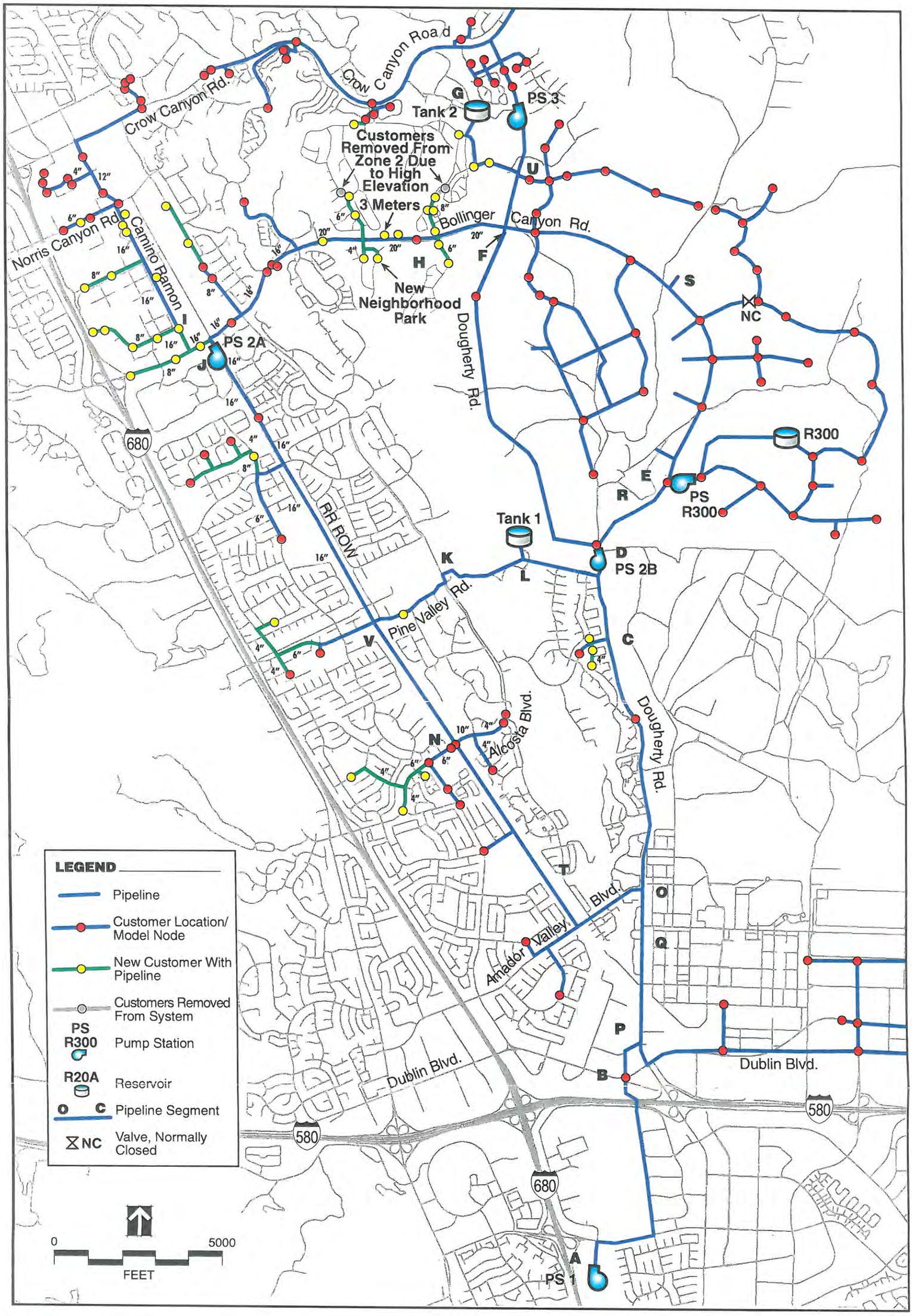


Figure 1
Pipeline Sizes To Serve New Customer Base
July 15, 2003

CDM Camp Dresser & McKee Inc.

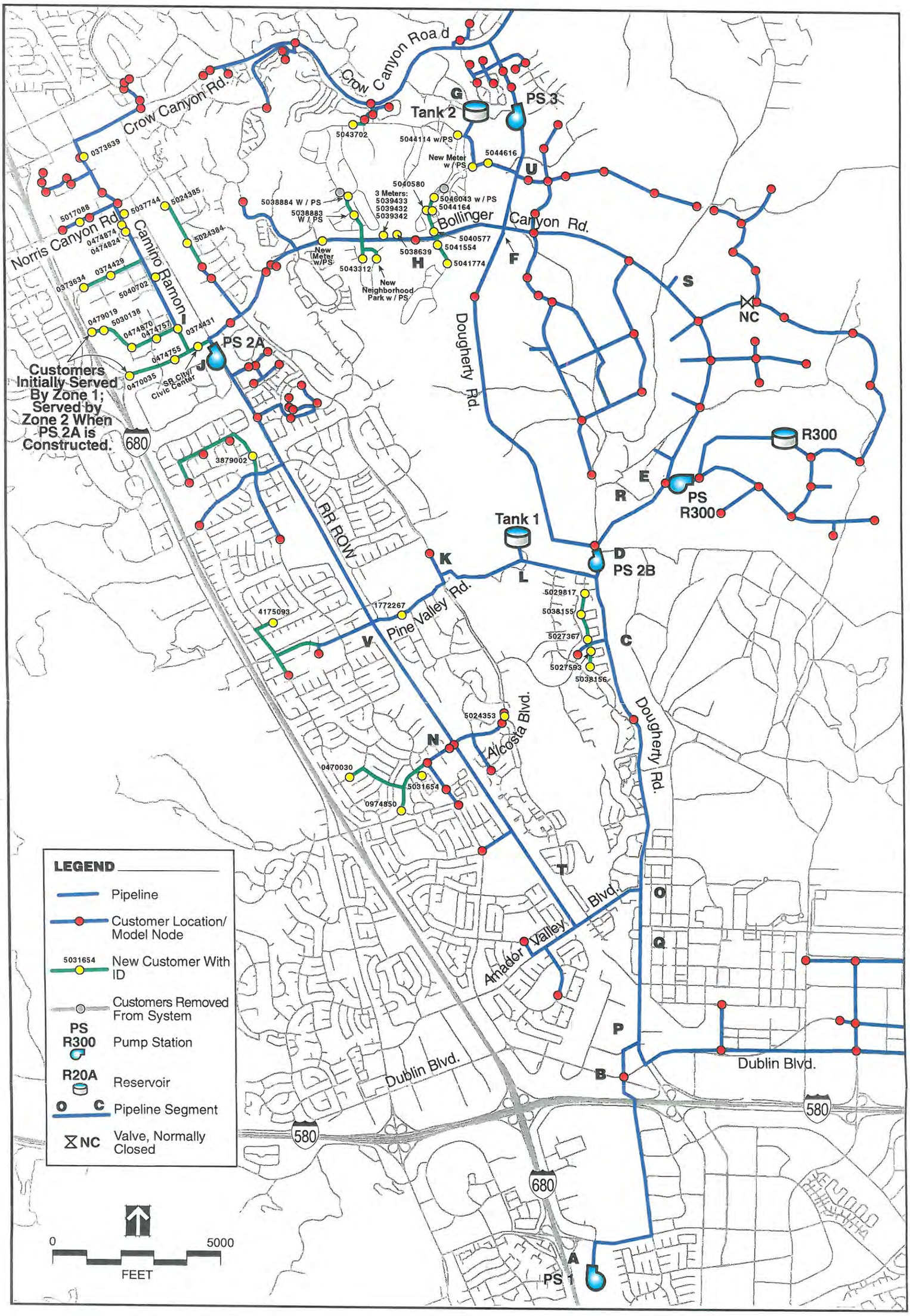


Figure 2
New Customer Locations
May 14, 2003

CDM Camp Dresser & McKee Inc.

Attachment A

Summary of EBMUD Customers and DSRSD Retrofit Customers

ID	DESCRIPTION	CUSTOMER ADDRESS	BCC	PERCENT RECYCLE	ESTIMATED ANNUAL RW DEMAND (AF)
03736451	CITY OF SAN RAMON	12555 ALCOSTA BL	7990	70	40.0
03736562	BHI DOVER FUND #6	3145 CROW CANYON PL	7950	100	11.3
03736722	CRANBROOK RLTY INVST FUND	3150 CROW CANYON PL	7950	100	6.7
03737141	COMMONS OFFICE PARK ASSN	2228 CAMINO RAMON # A	7950	100	12.3
03737203	2300 CR ASSOCIATES LLC	2350 CAMINO RAMON	7950	100	16.7
03737261	GRANADA SALES INC	2301 CAMINO RAMON	7950	100	11.3
04700171	CROW CANYON COUNTRY CLUB	881 SILVER LAKE DR	7990	100, NOTE A	70.2
04700232	CITY OF SAN RAMON	2985 MONTEVIDEO DR	7990	100, NOTE A	38.4
04700252	CROW CANYON COUNTRY CLUB	3900 CROW CANYON RD	7990	100, NOTE A	112.0
04700271	SAN RAMON VLY SCHOOL DIST	3000 PINE VALLEY RD	7950	100	34.9
04700361	TOYOTA MOTOR DISTRIB INC	2451 BISHOP DR	7950	100	57.0
04700371	BLACKHAWK COUNTRY CLUB	5340 BLACKHAWK DR	7990	100, NOTE A	93.4
04720123	TOWN OF DANVILLE	2101 EL CAPITAN DR	7950	100	3.3
04720213	TOWN OF DANVILLE	2151 EL CAPITAN DR	7950	100	2.8
04720222	CROW CANYON CC ESTATES	901 SILVER LAKE DR	7950	100	3.2
04730153	CITY OF SAN RAMON	3585 CROW CANYON RD	7950	100	2.4
04743313	CITY OF SAN RAMON	3835 CROW CANYON RD	7950	100	1.6
04744813	BHI DOVER FUND #6	3114 CROW CANYON PL	7950	100	9.1
04745064	CITY OF SAN RAMON	13990 ALCOSTA BL	7950	100	5.2
04747142	COMMONS OFFICE PARK ASSN	2256 CAMINO RAMON # A	7950	100	5.8
04747843	BHI DOVER FUND #6	3126 CROW CANYON PL	7950	100	14.2
04753881	COBBLESTONE HOA	3590 CROW CANYON RD	7950	100	18.4
09748382	TANGERINE COURT HOA	9290 ALCOSTA BL	7950	100	3.4
22742742	ARDENWOOD DEV ASSOCIATES	356 COUNTRY BROOK LP	7950	100	8.0
22742752	ARDENWOOD DEV ASSOCIATES	130 COUNTRY BROOK LP	7950	100	8.4
22742762	ARDENWOOD DEV ASSOCIATES	301 COUNTRY BROOK LP	7950	100	3.0
22742772	ARDENWOOD DEV ASSOCIATES	612 COUNTRY BROOK LP	7950	100	7.6
22742782	ARDENWOOD DEV ASSOCIATES	461 COUNTRY BROOK LP	7950	100	14.6
22742792	ARDENWOOD DEV ASSOCIATES	452 COUNTRY BROOK LP	7950	100	8.5
22743002	CITY OF SAN RAMON	7301 BOLLINGER CANYON RD	7950	100	20.4
22747281	CALIF KOSAIDO INC	7300 BOLLINGER CANYON RD	7950	100	64.7
22747291	CALIF KOSAIDO INC	7300 BOLLINGER CANYON RD	7950	100	75.7

Summary of EBMUD Customers and DSRSD Retrofit Customers

ID	DESCRIPTION	CUSTOMER ADDRESS	BCC	PERCENT RECYCLE	ESTIMATED ANNUAL RW DEMAND (AF)
22747351	CALIF KOSAIDO INC	2900 LAKEMONT DR	7950	100	58.0
22747361	CALIF KOSAIDO INC	1995 CANYON LAKES DR	7950	100	90.5
22752651	CITY OF SAN RAMON	5510 CANYON CREST DR	7950	100	26.4
22754951	CITY OF SAN RAMON	5010 SHORELINE DR	7950	100	15.5
32723032	CITY OF SAN RAMON	9714 DAVONA DR	7990	100, NOTE A	14.7
34718154	BLACKHAWK COMM OWNRS ASSO	3875 BLACKHAWK RD	7950	100	12.4
34743011	COUNTRY CLUB IMPROV ASSOC	4502 KINGSWOOD DR	7950	100	11.2
34745981	BLACKHAWK COUNTRY CLUB	5426 BLACKHAWK DR	7950	100	84.1
34748521	COUNTRY CLUB IMPROV ASSOC	3855 BLACKHAWK RD	7950	100	9.6
34790081	BLACKHAWK COUNTRY CLUB	3505 DEER CREST DR	7950	100	74.6
38716743	CITY OF SAN RAMON	2961 ASCOT DR	7950	100	3.6
38718043	CITY OF SAN RAMON	555 BURNS CIR	7950	100	3.1
38719744	CITY OF SAN RAMON	625 LOMOND CIR	7950	100	6.9
41731981	SAN RAMON VLY SCHOOL DIST	9870 BROADMOOR DR	7950	100	33.8
50006372	KINGSWOOD HOA	128 KINGSWOOD CIR	7950	100	3.4
50015822	THE LAKE ASSOC	110 LAKERIDGE LN	7950	100	42.7
50018613	ESSEX PROPERTY TRUST INC	2000 SHORELINE DR	7950	100	9.5
50019523	ESSEX PROPERTY TRUST INC	155 SHORELINE CIR	7950	100	13.5
50019563	ESSEX PROPERTY TRUST INC	2086 SHORELINE DR	7950	100	14.0
50024732	PROPERTY TRUST OF AMERICA	130 REFLECTIONS DR	7950	100	7.3
50026582	PROPERTY TRUST OF AMERICA	285 REFLECTIONS DR	7950	100	9.7
50026602	PROPERTY TRUST OF AMERICA	215 REFLECTIONS DR	7950	100	6.3
50030472	PROPERTY TRUST OF AMERICA	425 REFLECTIONS CIR	7950	100	5.3
50031412	PROPERTY TRUST OF AMERICA	325 REFLECTIONS CIR	7950	100	8.5
50036412	KINGSWOOD HOA	4510 KINGSWOOD DR	7950	100	4.4
50045232	BLACKHAWK COMM OWNRS ASSO	4125 BLACKHAWK PLAZA CIR	7950	100	20.6
50071532	CASTLE SHORES HOA	2001 ECHO PL	7950	100	3.9
50105682	CITY OF SAN RAMON	3600 DOUGHERTY RD	7950	100	8.0
50123274	C C C DEPT PUB WORKS	4101 CAMINO TASSAJARA	7950	100	8.6
50129412	TASSAJARA CREEK	94 RASSANI DR	7950	100	3.3
50143421	SHAPELL INDUSTRIES	2110 GOLDENROD LN	7950	100	6.3
50149222	CITY OF SAN RAMON	515 SUMMERWOOD LP	7950	100	4.0

Summary of EBMUD Customers and DSRSD Retrofit Customers

ID	DESCRIPTION	CUSTOMER ADDRESS	BCC	PERCENT RECYCLE	ESTIMATED ANNUAL RW DEMAND (AF)
50149232	CITY OF SAN RAMON	581 FALLEN LEAF CIR	7950	100	3.4
50150802	CITY OF SAN RAMON	3451 DOUGHERTY RD	7950	100	7.2
50156572	CITY OF SAN RAMON	190 RED WILLOW RD	7950	100	9.4
50170282	HERITAGE DANVILLE HOA	134 HERITAGE PARK DR	7950	100	3.7
50170291	DAVIDON HOMES	162 HERITAGE PARK DR	7950	100	4.7
50170302	HERITAGE PARK HOA	333 HERITAGE PARK DR	7950	100	5.5
50177352	PACIFIC RETAIL TRUST	3474 CAMINO TASSAJARA	7950	100	4.0
50179951	TOWN OF DANVILLE	1000 TASSAJARA RANCH DR	7950	100	34.4
50180001	TOWN OF DANVILLE	1001 TASSAJARA RANCH DR	7950	100	9.6
50180761	TOWN OF DANVILLE	600 CENTER WAY	7950	100	9.4
50181551	BLACKHAWK COMM OWNRS ASSO	4170 BLACKHAWK PLAZA CIR	7950	100	7.4
50187573	CONTRA COSTA PUB WORKS	3800 BUCKINGHAM DR	7950	100	10.2
50192462	2300 CR ASSOCIATES LLC	2300 CAMINO RAMON	7950	100	9.2
50194422	CITY OF SAN RAMON	5940 DOUGHERTY RD	7950	100	7.3
50194452	CITY OF SAN RAMON	465 OLD RANCH RD	7950	100	6.4
50197031	CITY OF SAN RAMON	9887 ALCOSTA BL	7950	100	3.8
50200933	K B FUND III	3400 BLACKHAWK PLAZA CIR	7950	100	16.1
50204361	SHAPELL INDUSTRIES	300 MAVERICK CT	7950	100	9.7
50213661	KINGSWOOD HOA	150 KINGSWOOD CIR	7950	100	2.1
50232191	CITY OF SAN RAMON	9101 ALCOSTA BL	7950	100	2.7
50232201	CITY OF SAN RAMON	9275 ALCOSTA BL	7950	100	4.5
50248471	VILLA SAN RAMON LP - C	9199 FIRCREST LN	7950	100	4.0
50272202	MIRAVILLA AT GALE RANCH	420 S CLOVERCREST LN	7950	100	14.7
50277852	PACIFIC RETAIL TRUST	3436 CAMINO TASSAJARA	7950	100	11.1
50280062	CITY OF SAN RAMON	120 BARBERRY LN	7950	100	2.4
50292772	C C C DEPT PUB WORKS	3000 MANSFIELD DR	7950	100	2.7
50297392	MIRAVILLA AT GALE RANCH	700 S BLACKBRUSH LN	7950	100	14.5
50304682	PACIFIC RETAIL TRUST	9142 ALCOSTA BL	7950	100	6.5
50321562	CITY OF SAN RAMON	232 TRIANA WAY	7950	100	15.7
50322671	PONDEROSA HOMES	296 SHAVANO WAY	7950	100	5.8
50328062	EASTHAMPTON HOA	9098 ALCOSTA BL	7950	100	2.2
50330941	CITY OF SAN RAMON	12501 ALCOSTA BL	7950	100	14.7
50343592	TASSAJARA HOA	308 JASMINE WAY	7950	100	1.7
50346492	TREVARI	412 FUCHSIA LN	7950	100	5.2

Summary of EBMUD Customers and DSRSD Retrofit Customers

ID	DESCRIPTION	CUSTOMER ADDRESS	BCC	PERCENT RECYCLE	ESTIMATED ANNUAL RW DEMAND (AF)
50347172	TREVARI	107 PEARLGRASS CT	7950	100	5.8
50348712	VESTRELLA OWNERS ASSOC	224 PLUMPOINTE LN	7950	100	4.9
	DUBLIN JOINT SCHOOL DIST	6800 PENN DR/CRONIN PARK			23.5
	DUBLIN JOINT SCHOOL DIST	7243 TAMARACK DR			24.0
	CITY OF DUBLIN/DUBLIN JOINT SCHOOL DIST	COMMUNITY SWIM CENTER/8151 VILLAGE PKWY			96.1
	CITY OF DUBLIN	100 CIVIC PLAZA/6800 DUBLIN BLVD			78.6
	CAMP PARKS				450.0

Notes

A. Assumed to be 100% irrigation usage based on seasonal water use pattern and user type.

Summary of EBMUD Customers and DSRSD Retrofit Customers

CUST NO.	SER NO.	CUSTOMER NAME	CUSTOMER ADDRESS	BCC	PERCENT RECYCLE	ESTIMATED ANNUAL RW DEMAND (AF)
03736341		GRANADA SALES INC	3000 EXECUTIVE PKY	6800	50	11.4
03736392		P G & E	3301 CROW CANYON RD	8200	N/A, NOTE 1	20.6
03744291		GRANADA SALES INC	3080 EXECUTIVE PKY	7950	100	11.4
03744311		GRANADA SALES INC	2665 CAMINO RAMON	7950	100	12.7
04700301		COUNTRY CLUB PARK SCH	7534 BLUE FOX WAY	8200	N/A, NOTE 1	11.5
04700352		CHEVRON	6001 BOLLINGER CANYON RD	6800	50	87.4
04747551		SUNSET DEVELOPMENT CO	2682 BISHOP DR	6800	50	8.0
04747571		SUNSET DEVELOPMENT CO	2680 BISHOP DR	6800	50	6.2
04748241		SUNSET DEVELOPMENT CO	2420 CAMINO RAMON	6800	50	9.7
04748703		KEENAN BARITEAU BSHP RNCH	148 SUNSET DR	7950	100	6.3
04748741		ANNALUL INVEST CO	2410 CAMINO RAMON	6800	50	9.2
04790191		MARRIOTT CORPORATION	2600 BISHOP DR	7000	10	5.0
17722671		SAN RAMON VLY SCHOOL DIST	3250 PINE VALLEY RD	8200	N/A, NOTE 1	6.6
38790021		SAN RAMON VLY SCHOOL DIST	13000 BROADMOOR DR	8200	N/A, NOTE 1	16.0
41750931		SAN RAMON VLY SCHOOL DIST	2849 CALAIS DR	8200	N/A, NOTE 1	13.7
50170881		VALACAL COMPANY	4500 NORRIS CANYON RD	4700	20	8.0
50243842		SAN RAMON VLY SCHOOL DIST	12617 ALCOSTA BL	8200	N/A, NOTE 1	24.0
50243851		SUNSET DEVELOPMENT	12677 ALCOSTA BL	6800	50	20.8
50301381		TARGET #949	2610 BISHOP DR	7950	100	9.7
50377441		ANNABEL INVESTMENT CO	2409 CAMINO RAMON	6800	50	4.9
50316542		EASTHAMPTON HOA	2 ELMWOOD DR	7950	100	4.0
50298172		CITY OF SAN RAMON	4200 SUMMIT VIEW DR	7950	100	5.5
50381552		CITY OF SAN RAMON	3022 SUMMIT VIEW DR	7950	100	3.8
50381562		CITY OF SAN RAMON	1042 STONEY CREEK DR	7950	100	3.6
50273672		CITY OF SAN RAMON	4000 SUMMIT VIEW DR	7950	100	4.4
50275932		CITY OF SAN RAMON	700 STONEY CREEK DR	7950	100	4.7
09748501		VINTNER HOA	9005 ALCOSTA BL	7950	100	9.8
	5024353	CITY OF SAN RAMON, SR. CENTER	9300 ALCOSTA	7900	20	1.4

Summary of EBMUD Customers and DSRSD Retrofit Customers

CUST NO.	SER NO.	CUSTOMER NAME	CUSTOMER ADDRESS	BCC	PERCENT RECYCLE	ESTIMATED ANNUAL RW DEMAND (AF)
	5040702	Sunset Development	2603 Camino Ramon	6800	50	22.0
	5038639	CITY OF SAN RAMON	10001 BOLLINGER CANYON RD	7950	100	19.8
	5039342	CITY OF SAN RAMON	10501 BOLLINGER CANYON RD	7950	100	17.2
	5039432	SHAPPELL INDUST	10505 BOLLINGER CANYON RD	7950	100	183.4
	5039433	SHAPELL INDUSTRIES	10503 BOLLINGER CANYON RD	7950	100	167.0
	5040577	CITY OF SAN RAMON	8998 N GALE RIDGE RD	7950	100	6.4
	5040580	CITY OF SAN RAMON	8988 N GALE RIDGE RD	7950	100	4.6
	5041554	SHAPPELL INDUST	9002 S GALE RIDGE RD	7950	100	8.3
	5041774	SHAPPELL INDUST	9021 S GALE RIDGE RD	7950	100	33.8
	5043312	SHAPPELL INDUST	90 ALISMA CT	7950	100	4.1
	5044114	SHAPPELL INDUST	5101 LILAC RIDGE RD	7950	100	13.4
	5044164	SHAPPELL INDUST	401 COPPERSET RD	7950	100	6.6
	5044616	SAN RAMON VAL SCH	8700 N GALE RIDGE RD	7950	100	24.1
	5046043	CEDAR BRIDGE HOA	8901 N GALE RIDGE RD	7950	100	3.4
	5038884	SHAPELL INDUSTRIES	3100 N CHANTERELLA DR	7950	100	13.7
	5038883	SHAPELL INDUSTRIES	3073 N CHANTERELLA DR	7950	100	7.0
		NEW SCHOOL IN GR PH 1	N. GALE RIDGE RD			20.0
		NEW CHURCH IN GR PH 1	BOLLINGER CANYON RD			4.0
		NEW IRRIGATION METER	N. GALE RIDGE RD			5.0
		NEW IRRIGATION METER	BOLLINGER CANYON RD			10.0
		NEW NEIGHBORHOOD PARK	USTILAGO DR			3.0
		SR CITY/CIVIC CENTER	BOLLINGER CANYON RD			8.0
	5043702	SHAPPELL INDUST	4433 LILAC RIDGE RD	7950	100	8.0
50180712		CITY OF SAN RAMON	4361 REEDLAND CIR	7950	100	17.0
50145581		SHAPELL INDUSTRIES	4249 REEDLAND CIR	7950	100	15.7
50140741		SAN RAMON VLY SCHOOL DIST	5025 CANYON CREST DR	8200	N/A, NOTE 1	6.6

NOTES

1. IRRIGABLE PERCENTAGE VARIES BY CUSTOMER AND WAS ESTIMATED BASED ON AN ASSUMED BASELINE DOMESTIC WATER USAGE. SEE DRAFT TECHNICAL MEMORANDUM - POTENTIAL EBMUD CUSTOMER BASE EVALUATION, FEBRUARY 26, 2003 FOR MORE INFORMATION.

Reference 3

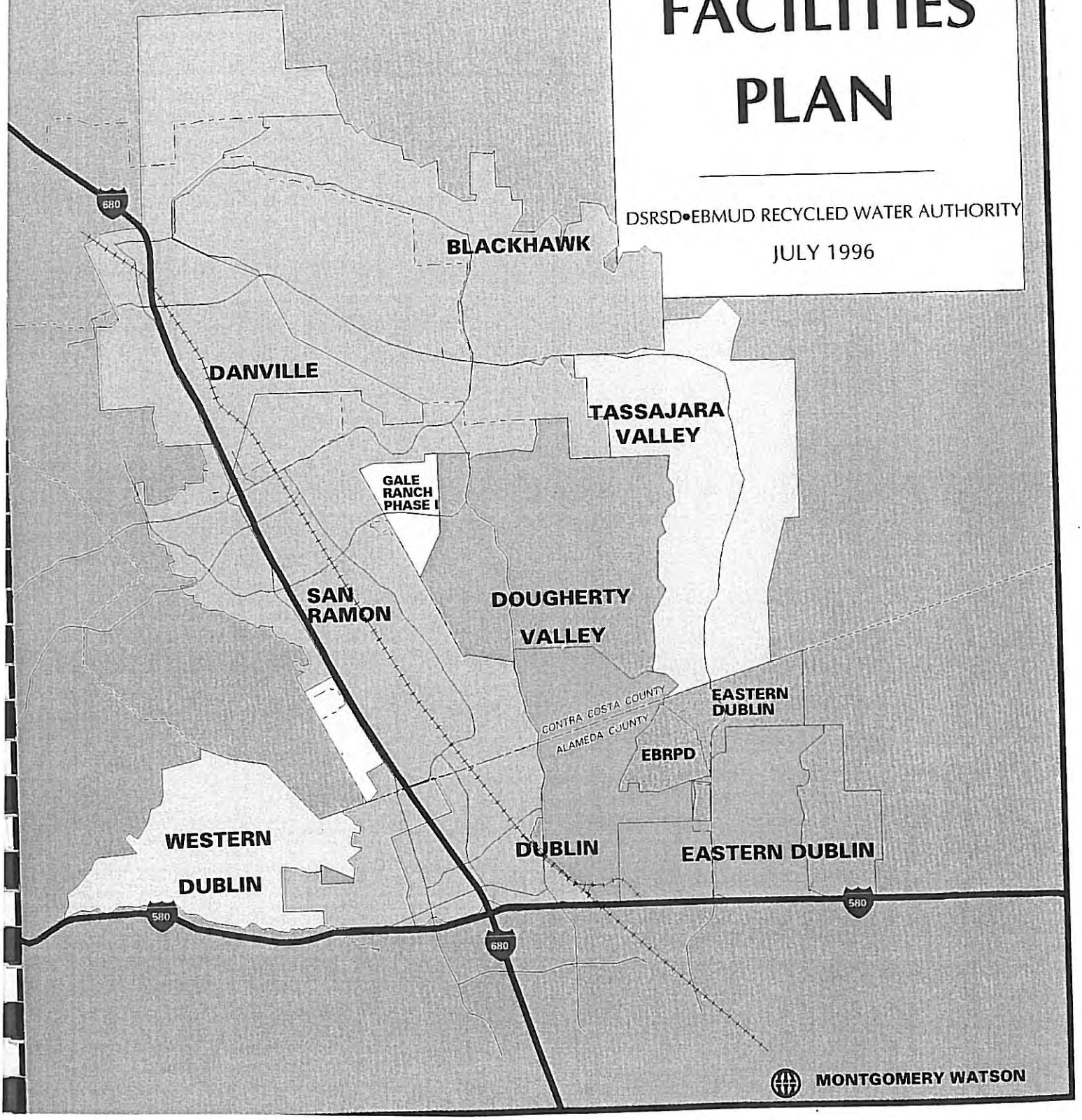
SAN RAMON VALLEY RECYCLED WATER PROGRAM

A JOINT EFFORT OF THE DUBLIN SAN RAMON SERVICES DISTRICT AND THE EAST BAY MUNICIPAL UTILITY DISTRICT

FACILITIES PLAN

DSRSD•EBMUD RECYCLED WATER AUTHORITY

JULY 1996



MONTGOMERY WATSON

EXECUTIVE SUMMARY

INTRODUCTION

In a joint effort, the Dublin San Ramon Services District (DSRSD) and the East Bay Municipal Utility District (EBMUD) are developing the San Ramon Valley Recycled Water Program (Project), a project intended to provide recycled water service to irrigation customers in the San Ramon Valley vicinity. The two agencies have formed the DSRSD•EBMUD Recycled Water Authority (DERWA), a Joint Powers Authority (JPA), to implement the program

Overview and Background

After individually studying separate recycled water projects since 1990, the two agencies formed the DSRSD•EBMUD Recycled Water Authority (DERWA), a Joint Powers Authority (JPA), in June 1995 to implement the joint program. The purpose of DERWA, as stated in its Joint Exercise of Powers Agreement, is as follows:

> "The purpose of the Authority [DERWA] is to maximize the amount of Recycled Water delivered while recovering its costs. The Authority shall implement and may expand the joint Recycled Water Program. Consistent with this effort, the Authority may select a Project or Projects implementing or expanding such Program, perform necessary environmental reviews, develop public information, arrange required financing, acquire property, design and construct a Project or Projects, and provide for management, operation, and maintenance of such Project or Projects."

DERWA and its member agencies are developing policies regarding specific responsibilities for and demarcation of facilities and recycled water ownership. However, each of DERWA's member agencies, i.e. DSRSD and EBMUD, are responsible for marketing recycled water to their respective customers.

Project Purpose and Objectives

The purpose of the San Ramon Valley Recycled Water Program is to provide recycled water that meets Title 22 requirements for unrestricted use to irrigation customers of EBMUD and DSRSD in the Dublin, San Ramon, Danville, and Blackhawk areas of Alameda and Contra Costa Counties. The recycled water is to be used in lieu of either existing or potential future use of potable water. EBMUD has adopted a non-potable water policy and DSRSD is developing a similar policy, both of which will serve as the basis for sales of recycled water to both existing and future customers in each agency's service area.

The objective of this Facilities Plan is to develop and compare Project options and facility configurations to serve recycled water to the largest area that is economically feasible, given the recycled water supply options available to the Project and the issues associated with future development. Each Project option includes transmission, seasonal storage, operational storage, pumping, distribution, and retrofit facilities required to deliver recycled water to the identified customers. An evaluation of seasonal storage using the Bishop and Dublin ground water sub-basins (also referred to as fringe basins) for seasonal storage of recycled water is also included in the Facilities Plan. The Project options were evaluated from technical, economical and risk perspectives to arrive a preferred Project option.

The wastewater treatment plant (WWTP) improvements required to produce recycled water that meets Title 22 requirements are not evaluated in this study, but have been evaluated by others[1]. The required treatment plant improvements have been studied by DSRSD. The cost of the improvements required at the DSRSD wastewater treatment plant have been included in this planning study because they are needed to present total Project costs.

AUTHORIZATION

In November 1995, DERWA authorized Montgomery Watson to prepare this Facilities Plan and the associated Environmental Impact Report (EIR). The EIR is presented in a separate document.

RECOMMENDED PROJECT

The most attractive option for implementation on this project is Customer Service Option 2 because of its economies of scale and inclusion of all of Eastern Dublin and Dougherty Valley. The second best apparent option is Option 5B, which has slightly less economies of scale, but can be implemented using a DSRSD-only supply and an ASR component.

Based upon results presented in this Facilities Plan the best pipeline alignment and source of supply for Project Option 2 is the SPRR - Bollinger pipeline alignment and a recycled water supply using DSRSD and City of Pleasanton wastewater flows with little or no ASR. The project facilities for Option 2 are illustrated on Figure ES-1.

FACILITIES PLANNING

The facilities planning process for the San Ramon Valley Recycled Water Program is described in the following paragraphs.

Study Area Boundaries and Customer Service Options

The Study Area, as shown on Figure ES-2, includes all of the Dublin San Ramon Services District water service area, the southeastern portion of the East Bay Municipal Utility District water service area, and areas outside but adjacent to each agency's service area where development is either approved or where it is presently under planning and review and where recycled water could be utilized for irrigation. These areas are generally known as:

- City of Dublin;
- City of San Ramon;
- Portion of the Town of Danville;
- Blackhawk;
- Dougherty Valley;
- Eastern Dublin;
- Western Dublin; and
- Tassajara Valley.

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[1] Dublin San Ramon Services District Wastewater Filtration and Disinfection System Evaluation Final Report, Brown and Caldwell, June 1994.

Reference 4

Draft Environmental Impact Report

for the

San Ramon Valley Recycled Water Program

A joint effort of the
Dublin San Ramon Services District
and the
East Bay Municipal Utility District

State Clearinghouse No. 96013028

Lead Agency:

DSRSD•EBMUD Recycled Water Authority (DERWA)

7051 Dublin Boulevard

Dublin, California 94568

August 1996

CHAPTER 5

Alternatives Evaluated

Section 15126(d) of the State CEQA Guidelines requires that an EIR describe a range of reasonable alternatives to a project, or to the location of a project, which could feasibly attain the basic objectives of the project, and provide an evaluation of the comparative merits of the alternatives. For any EIR, CEQA requires that the alternative of "No Project" be evaluated. The identification and evaluation of other alternatives developed specifically for a given EIR should be performed according to the following criteria:

- The discussion of alternatives should focus on alternatives capable of eliminating any significant adverse environmental effects or reducing them to a level of insignificance, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.
- The potentially significant effects of the alternatives must be discussed, but in less detail than the significant effects of the project as proposed.
- The range of alternatives required in an EIR is governed by the "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice.
- The discussion of alternatives should foster informed decision-making and informed public participation.
- An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative.

5.1 Approach to Alternatives Evaluation

As indicated in Section 2.4 of this EIR, several customer service options exist for implementation of the Recycled Water Program. These options, and their related facilities, were developed through an extensive facilities planning process; they represent the culmination of the consideration of multitude of service area configurations, water supply scenarios, and facilities alternatives.

To provide the greatest level in decision-making flexibility, DERWA determined early in the environmental review process to evaluate all of the customer service options at an equal level of detail in this EIR. In addition, the four alternative transmission alignments, and alternative sites for some pump stations and storage tanks are also evaluated at an equal level of detail in this document. Consequently, project alternatives that would normally be included in this section of an EIR (i.e., alternative locations for facilities, alternative component configurations, etc.) are <u>not</u> included here because they are evaluated as part of the Program in the main body of the EIR text (Chapter 3). This alternatives chapter focuses, therefore, on the following alternatives:

- No Project Alternative
- Environmentally Superior Alternative

5.2 No Project Alternative

Under this alternative, the proposed DERWA Water Recycling Program would not be implemented. The DSRSD plant would continue to discharge treated wastewater to the San Francisco Bay according to the conditions of its wastewater discharge permit. None of the existing or future customers for recycled water use would be provided an alternative to potable water, and none of the project components (pipelines, pump stations, tanks, ASR weils, etc.) would be constructed.

Potential Significant Effects of No Project Alternative

Under the No Project Alternative, none of the potentially significant impacts identified as resulting from the proposed project would occur. Specifically, there would be no impacts related to soils and vegetation (from total dissolved solids [TDS] in the recycled water), hydrology/surface water quality, groundwater quality, biological resources, traffic/circulation, cultural resources, or aesthetics. Even so, all of these potentially significant impacts could be mitigated to less-than-significant levels as detailed in this EIR, and implementation of the No Project Alternative would not yield substantial environmental benefits relative to the proposed Water Recycling Program because none of the beneficial impacts from the project would occur.

Advantages/Disadvantages of the Alternative

Because the Water Recycling Program would not be implemented under this alternative, the beneficial effects of the project, including the reduced use of potable water for non-drinking water uses and the provision of a more reliable water resource during drought-imposed irrigation reduction, would not be attained. For these reasons, the No Project Alternative would not meet the objectives of the project.

5.3 Environmentally Superior Alternative

Section 15126(d)(2) of the State CEQA Guidelines states that if the environmentally superior alternative is the "No Project" alternative, the EIR must also identify an environmentally superior alternative among the other alternatives. For the proposed DERWA Water Recycling Program, the No Project Alternative would be considered the environmentally superior alternative only from a short-term impact perspective, because none of the construction-related impacts of the Program would occur.

From a long-term, regional, and environmentally beneficial perspective, the Water Recycling Program as proposed represents the environmentally superior alternative. The project would reduce the withdrawal of potable water from fresh water sources for landscape irrigation and other uses that would be better served by recycled water. In addition, the Water Recycling Program would not result in significant, unmitigable environmental impacts. Because the proposed project would maximize the potential for long-term

environmental benefits, and would not result in significant adverse environmental impacts, therefore, it represents the environmentally superior alternative.

Reference 5

FINANCIAL ASSISTANCE APPLICATION Attachment 6.c

NOTICE OF DETERMINATION

TO: _X_ County Clerk
County of Alameda
1225 Fallon, First Floor
Oakland, CA 94612

_X_ County Clerk
County of Contra Costa
651 Pine Street
Martinez, CA 94553

FROM: DSRSD•EBMUD Recycled Water Authority
7051 Dublin Blvd.
Dublin, CA 94568

_X_ Office of Planning & Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

FILED
ALAMEDA COUNTY
DEC 18 1996
PATRICK O'CONNELL, County Clerk
By T. [illegible], Deputy

SUBJECT: Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code, and Section 15096 of the Calif. Code of Regulations

Project Title:
San Ramon Valley Recycled Water Program State Clearinghouse #96013028

Contact Person: Bruce Webb
Area Code/Number/Extension (510) 828-0515 ext. 110

Project Location:
City of Dublin, City of San Ramon, Town of Danville, Blackhawk, Dougherty Valley, Eastern Dublin, and Schaefer Ranch.

Project Description:
The Recycled Water Program is a recycled water supply project consisting of the treatment, distribution, storage, and use of highly-treated recycled wastewater for landscape irrigation within the study area. Principal users are expected to be city parks, schools, golf courses, commercial and office park areas, homeowner association areas, and road medians.

This is to advise that the Board of Directors has considered the Final Environmental Impact Report, Findings, Statement of Overriding Considerations, and Mitigation Monitoring Program and has approved the above described project on December 16, 1996, and has made the following determinations regarding the above described project:

1. The project may have a significant effect on the environment.
2. An Environmental Impact Report was prepared and certified for this project pursuant to the provisions of CEQA.
3. Mitigation measures were made a condition of the approval of the project, and findings were made pursuant to Sec. 15091 of Title 14, Calif. Code of Regulations.
4. A statement of Overriding Considerations was adopted for this project.

This is to certify that the Findings of the Board of Directors and record of project approval is available to the General Public at: 7051 Dublin Boulevard, Dublin, CA 94568

Signature: Bert Michalczyk Authority Manager Date: 12/17/96
Bert L. Michalcyzk Title

CLERK'S CERTIFICATE OF POSTING: Pub Res 21152 certify that a copy of this document was posted at the Courthouse Oakland, CA., for the period described by law
Executed at Oakland, Ca. COUNTY CLERK
Date 12-18-96 By T. [illegible] Deputy

whitley

*ENVIRONMENTAL DECLARATION
(CALIF. FISH AND GAME CODE SEC. 711.4)

NAME AND ADDRESS OF APPLICANT
OR LEAD AGENCY:

DSRSD•EBMUD Recycled Water Authority

7051 Dublin Blvd.

Dublin, California 94568
(San Ramon Valley Recycled Water Project)
(CIP # 96CH258)

FOR COURT USE ONLY
FILED
ALAMEDA COUNTY

DEC 18 1996

PATRICK O'CONNELL, County Clerk
By T. Chung, Deputy

FILING NO.
558-96

CLASSIFICATION OF ENVIRONMENTAL DOCUMENT:

	CLERK USE ONLY
1. NOTICE OF EXEMPTION/STATEMENT OF EXEMPTION	PLU 117
[ ] A - STATUTORILY OR CATEGORICALLY EXEMPT $25.00 (Twenty-five Dollars) - CLERK'S FEE	
[ ] B - DE MINIMUS IMPACT - CERTIFICATE OF FEE EXEMPTION REQUIRED $25.00 (Twenty-five Dollars) - CLERK'S FEE	PLU 117
2. NOTICE OF DETERMINATION - FEE REQUIRED	
[ ] A - NEGATIVE DECLARATION $1,250.00 (Twelve Hundred Fifty Dollars) - STATE FILING FEE $25.00 (Twenty-five Dollars) - CLERK'S FEE	PLU 116
[X] B - ENVIRONMENTAL IMPACT REPORT $850.00 (Eight Hundred Fifty Dollars) - STATE FILING FEE $25.00 (Twenty-five Dollars) - CLERK'S FEE	PLU 115
3. [ ] OTHER (Specify)_____ $25.00 (Twenty-five Dollars) - CLERK'S FEE	PLU 117

*THIS FORM MUST BE COMPLETED AND SUBMITTED WITH ALL ENVIRONMENTAL DOCUMENTS FILED WITH THE ALAMEDA COUNTY CLERK'S OFFICE.

FOUR COPIES OF ALL NECESSARY DOCUMENTATION ARE REQUIRED FOR FILING PURPOSES.

APPLICABLE FEES MUST BE PAID AT THE TIME OF FILING AN ENVIRONMENTAL DOCUMENT WITH THE ALAMEDA COUNTY CLERK'S OFFICE.

MAKE CHECK PAYABLE TO: ALAMEDA COUNTY CLERK

Rev. 1/15/91-1056C

Reference 6

TABLE 10
DERWA System: Treatment Electric Usage and Costs

	TREATMENT SYSTEM							
Month	SFUV kWh	MF-UV kWh	Total kWh	kWh $	Demand $	Total $	Total kWh/AF	Total $/AF
---	---	---	---	---	---	---	---	---
Jan-13	7,503	19,278	26,782	$2,084	$0	$2,084	1,332	$104
Feb-13	7,318	43,917	51,235	$4,107	$1,418	$5,525	921	$99
Mar-13	81,768	51,364	133,132	$10,616	$0	$10,616	792	$63
Apr-13	144,918	22,693	167,611	$13,407	$0	$13,407	610	$49
May-13	209,229	6,843	216,072	$18,572	$0	$18,572	545	$47
Jun-13	240,402	31,464	271,866	$23,392	$0	$23,392	609	$52
Jul-13	252,269	7,626	259,895	$22,373	$0	$22,373	495	$43
Aug-13	242,460	7,388	249,848	$21,489	$0	$21,489	553	$48
Sep-13	199,422	7,675	207,097	$17,635	$0	$17,635	607	$52
Oct-13	193,004	7,880	200,883	$17,457	$0	$17,457	675	$59
Nov-13	106,237	19,873	126,110	$10,102	$0	$10,102	930	$74
Dec-13	13,531	41,812	55,344	$4,516	$1,692	$6,208	949	$106
Average	141,505	22,318	163,823	$13,813	$259	$14,072	751	$53
Total	1,698,062	267,813	1,965,875	$165,750	$3,111	$168,861		
Minimum	7,318	6,843	26,782	$2,084	$0	$2,084	495	$43
Maximum	252,269	51,364	271,866	$23,392	$1,692	$23,392	1,332	$106

Note: Electric usage and costs are for total recycled water production using both SF-UV and MF-UV combined.

Reference 7

DERWA Phase 3 Recycled Water Expansion Project
DSRSD Energy Consumption Reduction - Calculations

Year of Delivery	Recycled Water Deliveries			Zone 7 Water Treatment Enegy Consumption[a]	Reduction of Pumping Imported Water Supply (DSRSD only) Avoided Energy Consumption[b]	Reduction of Pumping DSRSD Wastewater Discharge through LAVWMA Avoided Energy Consumption[c]	Recycled Water Production Energy Consumption[d]	Total Avoided Energy Consumption Avoided Energy Consumption
	DSRSD	EBMUD	DERWA					
	AF	AF	AF	kWh	kWh	kWh	kWh	kWh
2015	230	0	230	25,300	267,950	158,700	172,730	279,220
2016	390	477	867	42,900	454,350	598,230	651,117	444,363

DSRSD Energy Consumption for Zone 7 Water Supply[b] =	1,165	kWh/AF
Energy Consumption for Wastewater Discharge[c] =	690	kWh/AF
RW Treatment[d]	751	kWh/AF
Z7 PW Treatment[a]	110	kWh/AF

References:

[a] DSRSD Operating Costs, DSRSD Communications, June 2014.

[b] Zone 7, 12-month Average Internal tracking, Zone 7, Zone 7 Communications A. Flores, June 2014.

[c] DSRSD, Report of Operations 2014, Table 1

[d] DERWA Report of Operations 2013, Table 10

Reference 8

A94-34-DSR

A94-18
P.1-48

CONTRACT BETWEEN

ZONE 7 WATER AGENCY

AND

DUBLIN SAN RAMON SERVICES DISTRICT

FOR A MUNICIPAL & INDUSTRIAL WATER SUPPLY

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CONTRACT BETWEEN
ZONE 7 OF ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT AND DUBLIN SAN RAMON SERVICES DISTRICT FOR A MUNICIPAL & INDUSTRIAL WATER SUPPLY

THIS CONTRACT, made and entered into this 23rd day of August, 1994, by and between ZONE 7 OF ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, commonly known as the Zone 7 Water Agency, hereinafter referred to as "Zone 7" and the DUBLIN SAN RAMON SERVICES DISTRICT, hereinafter referred to as "Contractor."

W I T N E S S E T H:

For and in consideration of the terms and conditions herein contained, Zone 7 agrees to furnish and provide a water supply to Contractor, and Contractor agrees to purchase and accept such water supply consistent with the provisions herein.

A. INTRODUCTORY PROVISIONS

1. Definitions

When used in this contract, the following terms shall have the meanings hereinafter set forth:

a. "Board" shall mean the Board of Directors of Zone 7 of Alameda County Flood Control and Water Conservation District.

b. "Each Contractor" or "Other Contractor" shall mean any entity, public or private, contracting with Zone 7 for a Municipal & Industrial Water Supply.

c. "Extract," "Extraction" or "Extracting" shall mean obtaining groundwater, by pumping or any other means, from wells, shafts, tunnels, excavations or other sources of such groundwater, for domestic, municipal, irrigation, industrial or other use.

d. "Groundwater Pumping Quota" shall mean that quantity of water that the Contractor is entitled to extract from the Main Basin without paying a recharge fee to Zone 7.

e. "In-Lieu Treated Water" shall mean that quantity of treated water delivered from Zone 7 in exchange for an equal reduction in Contractor's extraction of its Groundwater Pumping Quota.

f. "Main Basin" shall mean that part of the Livermore-Amador Valley groundwater basin located essentially within the valley floor sections of the Castle, Bernal, Amador and Mocho (II) Subbasins as defined in Bulletin No. 118-2, Evaluation of Groundwater Resources: Livermore and Sunol Valleys, State of California, Department of Water Resources and shown in Exhibit A attached.

g. "Municipal & Industrial Water Supply" shall mean a supply of water from Zone 7 to Each Contractor regardless of the source of said water or Contractor's use of said water.

h. "Other Sources" shall mean a water source from any person, corporation or entity, whether public or private, other than from Zone 7.

i. "Recharge" or "Recharged" shall mean managed replenishment of the Main Basin including but not limited to spreading on natural or improved channels or basins or well injection with imported, locally developed, or recycled water, or through In-Lieu Treated Water. Applied irrigation water percolation shall not be considered recharge.

j. "Recycled Water" shall mean wastewater treated for reuse as permitted by the California Department of Health Services, the Regional Water Quality Control Board and other agencies that from time to time may have jurisdiction.

k. "Safe Yield" shall mean the quantity of water that can be successfully extracted from the Main Basin on an annual basis over an extended number of years without reducing groundwater storage. Such safe yield is the net quantity of groundwater added to the Main Basin by stream percolation (including percolation from stream releases required for prior water rights), rainfall percolation, applied irrigation water percolation, and net subsurface inflow.

l. "Treated Water" shall mean water that is processed as necessary to comply with drinking water requirements of the California Department of Health Services, the United States Environmental Protection Agency and other agencies that from time to time may have jurisdiction.

m. "Turnout Facilities" shall mean the facilities required to provide treated water deliveries from Zone 7's water system to the Contractor's water system. See Exhibit B for a schematic of a typical turnout facility.

n. "Zone 7 Boundary" shall mean the boundary of Zone 7 as shown on Exhibit C and as may be revised from time to time.

2. Term of Contract

This contract shall become fully effective upon execution of the duly authorized signatures of the parties hereto and shall remain in effect for a period of thirty (30) years from

the date hereof, unless terminated or extended prior to expiration of term by mutual agreement at an earlier date.

B. WATER SERVICE PROVISIONS

3. Quantity of Water

Contractor shall purchase from Zone 7 all water required by Contractor for use within Contractor's service area as defined in Section 6 except that Contractor may extract groundwater as provided in the Groundwater Extraction Provisions herein or obtain water from Other Sources under the conditions in Section 5. No quantity of water purchased from Zone 7 or extracted as part of Contractor's Groundwater Pumping Quota shall be delivered by or provided from Contractor to any area other than Contractor's service area, except for short-term emergency and/or public health purposes.

4. Quality of Water

All treated water to be delivered by Zone 7 to Contractor shall be of a quality that complies with the Requirements for Drinking Water of the California Department of Health Services and the United States Environmental Protection Agency or their successor regulatory agencies. Zone 7 will endeavor to provide treated water that is aesthetically acceptable to the Contractor's customers. Zone 7 will blend its different sources of water within its operational capabilities to provide water of approximately equal quality to Each Contractor.

5. Water from Other Sources

In order to protect Zone 7's financial interest, Contractor shall not contract for, purchase or receive, with or without compensation, either directly or indirectly, any water for use in its service area from any source other than by

extraction of its Groundwater Pumping Quota or from purchase from Zone 7, except for any one or more of the following:

(a) The water received is for fire flow or fire storage requirements or other emergency purposes;

(b) The water delivered through Zone 7's turnout facility does not comply with drinking water requirements of California Department of Health Services, United States Environmental Protection Agency, or successor regulatory agencies. The quantity of water obtained shall be limited to that necessary to meet Contractor's treated water needs as a result of Zone 7's non-compliance with said drinking water requirements;

(c) Zone 7 is unable to deliver the quantity of treated water necessary to satisfy the requirements of Contractor. Zone 7 shall specify the quantity of treated water that it cannot deliver and the time period for which it cannot satisfy the Contractor's requirements. Contractor is otherwise obligated to secure all water from Zone 7 to the extent Zone 7 can provide it;

(d) Zone 7 is able to meet Contractor's water delivery request, and Contractor has paid Zone 7 for obligated fixed costs of Zone 7 associated with the quantity of water the Contractor will obtain from Other Sources. These obligated fixed costs shall include but are not limited to water facility improvements, water contract obligations, and debt service thereto incurred by Zone 7 in supplying water that would have gone to the Contractor, and for which said costs would have been recovered through the sale of said water to Contractor. The Contractor shall obtain the prior written approval from the Board which approval shall not be unreasonably withheld;

(e) The source of water is groundwater extracted within Zone 7's boundary but outside the Main Basin provided said extraction does not cause an adverse impact on the Main Basin; or

(f) The source of water is recycled water from Contractor's or Other Contractors' treated wastewater.

6. Contractor's Service Area

As used herein, the Contractor's service area shall include all areas presently served water by Contractor. Contractor's service area shall also include any future areas to be served by the Contractor within the boundaries of Zone 7 subject to Subsection 32c. Contractor may include any future areas outside the boundaries of Zone 7 upon a finding of the Board that providing water to said area is in the best interests of Zone 7 and after written modification of this contract providing for said service area. The Contractor's present service area is designated on the map attached hereto as Exhibit D. Contractor shall promptly notify Zone 7 of changes in its service area, as may occur from time to time, by furnishing a map to Zone 7 showing any change in said service area so that Zone 7 can maintain a map indicating the most recent Zone 7 water service area. Said changes in service area shall be in accordance with the requirements of the Local Agency Formation Commission, Public Utility Commission or other agency having authority to set service areas.

Any future areas outside Zone 7 boundaries to be served by Contractor which receive water from sources other than Zone 7 or the Main Basin shall not be considered part of the Contractor's service area under the terms of this contract.

7. Turnout Facilities

a. Turnout facilities shall be constructed at the general location requested by Contractor. The exact location shall be determined by Zone 7 after consultation with Contractor. Turnout facilities shall be designed and/or constructed either by Zone 7 or by Contractor (upon the written approval of Zone 7) based on the ranges of flow set forth in Section 9. Turnout facilities shall include the necessary valves, piping, meter and recording equipment, vaults, telemetry equipment and any other appurtenances necessary to meet the standards and operational needs of Zone 7. Zone 7 shall submit its design of new turnout facilities to contractor for review and written approval.

b. Contractor shall reimburse Zone 7 for all costs incurred by Zone 7 related to the new turnout facilities including but not limited to design, engineering, design review, construction, right-of-way and acquisition thereof, inspection, and contract administration. Contractor shall also pay all costs for the installation of all associated landscaping and recognizes that Zone 7 shall not be responsible for maintenance of landscaping under the terms and conditions of this contract. Contractor further agrees to grant or cause to be granted to Zone 7 the necessary permanent right-of-way and right of ingress thereto and egress therefrom, as determined by Zone 7, for the purposes of constructing, operating and maintaining said turnout facilities.

c. Zone 7 shall install the nozzle outlet portion of all turnout facilities requested by Contractor prior to the construction of the transmission pipeline. For turnout facilities requested by Contractor subsequent to the construction of Zone 7's transmission pipeline, Contractor shall pay for the nozzle outlet portion of the

turnout facility, and all costs set forth in subsection b. above. Ownership of turnout facility, including the shut off valve downstream of the turnout facility, shall be with Zone 7, and Contractor shall have no obligation to operate, maintain, repair, replace or relocate the same.

8. Measurement of Treated Water Deliveries

At any time or times, Contractor may, upon request, inspect said turnout facilities (in the presence of a Zone 7 representative), and the measurements and records taken therefrom. Zone 7 shall test and calibrate the instrumentation at each turnout meter at least annually and furnish such results to the Contractor. When requested by the Contractor, Zone 7 shall test and calibrate any meter through which treated water is served to Contractor. The Contractor shall have the right to be represented by a qualified observer at and during any instrumentation and/or meter tests and/or calibration. Whenever testing and/or calibration of the instrumentation and/or the meter is requested by Contractor, and in the event that any such test shall disclose an error exceeding two percent (2.0%), an adjustment shall be made in charges against the Contractor covering the known or estimated period of duration of such error, but in no event exceeding six (6) months, and the expenses of such test shall be borne by Zone 7; otherwise, such expenses shall be borne by Contractor requesting such tests.

9. Ranges of Flow

a. It is recognized that the range of flow rates of water through a turnout facility may vary considerably over the contract term. A normal range of flow rates for a turnout facility is hereby established as from ten percent (10%) to one hundred percent (100%) of a maximum design flow rate. Contractor shall provide Zone 7 with

the following information for each turnout facility prior to the design of such facilities:

(1) Anticipated ultimate (future) maximum flow rate,

(2) Anticipated present design range of flow rates. (The maximum design flow rate shall not exceed ten (10) times the minimum design flow rate for this range in normal installations.)

(3) Anticipated pressure ranges for (1) and (2) above on the Contractor's side of the turnout facility.

b. Zone 7 shall design the metering and/or recording installation for the range set forth in accordance with Subsections (2) and (3) above with provisions for future modifications in accordance with a range based on Subsections (1) and (3) above.

c. Contractor shall regulate the flow demands through the turnout facility such that the range of flow rates set forth in accordance with Subsection b above will be maintained insofar as such regulation is reasonable and practicable. Zone 7 shall make modification of the metering and/or recording equipment upon request of Contractor or at such time that the actual flow rate exceeds the maximum design flow rate or is less than the minimum design flow rate; provided, however, that flow rates resulting from emergencies shall not apply to such requirement for modification. Said modification will be at the expense of the Contractor and payment thereof shall be in accordance with Section 27.

10. <u>Delivery Schedule of Municipal & Industrial Water</u>

Each year, the Contractor shall submit in writing to Zone 7 a preliminary water delivery schedule on a form provided by Zone 7 indicating the anticipated quantity of treated water and groundwater in excess of its Groundwater Pumping Quota required by Contractor during each month of the succeeding

five (5) calendar years and the anticipated peak day treated water demand from Zone 7 for each such year. Zone 7 shall review such schedule, and after consultation with Contractor, shall approve such schedule in a timely manner or make such revisions in the same as may, in the judgment of Zone 7, be necessary to make such deliveries. To the extent water is available to Zone 7, Zone 7 will approve in writing, a delivery schedule each year for delivery to Contractor during the next succeeding calendar year of an amount of water not less than the amount of water set forth in the approved schedule for the then-current calendar year. The amount of water set forth in the approved delivery schedule for the next succeeding calendar year shall be the basis for which Zone 7 shall contract with the State of California or other entity for delivery to Zone 7. Zone 7 shall identify the reason for any revisions or disapproval of Contractor's delivery request. Zone 7 shall only revise or disapprove Contractor's delivery request for the reasons set forth in Sections 12, 13, 14 or 15.

11. Reporting Use of Water

The Contractor shall report to Zone 7 on or before the tenth day of each month the total volume, in acre-feet, of groundwater extracted from the Main Basin and any water obtained from Other Sources (including any water recharged to the Main Basin) for the preceding month. The report shall become the basis for which water charge determinations and hydrologic inventory calculations of the Main Basin are made by Zone 7. Said report shall be made on a form or forms provided by or acceptable to Zone 7. The measurement and recordation of such flows shall be subject to the same provisions for inspection and testing of meters and instrumentation by Zone 7 as is provided to Contractor in Section 8.

12. Peak Demands

The Zone 7 system is not designed to serve all Contractor's peak demands. As water demands increase, it may be necessary to curtail peak deliveries to conform to Zone 7 system capacity as it exists from time to time. However, so long as water and line capacity are available, Zone 7 will endeavor to meet all reasonable demands for peak deliveries and will use reasonable diligence to provide a regular and uninterrupted supply of water from its turnout facility, but shall not be liable to Contractor for damages, breach of contract, or otherwise, for failure, suspension, diminution, or other variations of service occasioned by any cause beyond the control of, or without the fault or negligence of Zone 7. Such causes may include, but are not restricted to, acts of God, acts of war, or criminal acts of others, acts of Contractor or Other Contractors, water shortages, fires, floods, earthquakes, epidemics, quarantine restrictions, strikes, or failure or breakdown of transmission or other facilities.

13. Curtailment of Delivery During Maintenance Periods

Zone 7 will make all reasonable effort to provide continuous service to Contractor but may schedule to temporarily discontinue or reduce the delivery of water to Contractor for the purpose of necessary investigation, inspection, maintenance, repair or replacement of any of the facilities necessary for the delivery of treated water to Contractor. Zone 7 shall notify Contractor as far in advance as possible of any scheduled discontinuance or reduction and the estimated duration of such discontinuance or reduction. Recognizing that Contractor may rely on Zone 7 for deliveries of water with minimal interruption, particularly during the high water consumption months, Zone 7 shall use its best efforts to make any such discontinuance or reduction in the delivery of water only during the period of November through March. In the event of any discontinuance or reduction in

delivery of water, Contractor may elect to receive the amount of water that otherwise would have been delivered to it during such period under the approved water delivery schedule at other times during the year, consistent with Zone 7's delivery ability considering the then current delivery schedules of all Other Contractors.

14. Availability of Water

In any year in which a shortage occurs due to drought or other cause in the supply of water available for delivery to Each Contractor such that the supply to Zone 7 is less than the total amount included in the approved delivery schedule of Each Contractor for that year, Zone 7 shall reduce deliveries to Each Contractor in an amount that results in a reduction of total water used within Contractor's service area that is equal to the percent reduction for total water used within Zone 7's service area for that year, all as determined by Zone 7; provided, that Zone 7 may apportion on another basis if such is required to meet minimum demands for domestic supply, fire protection, or public health during the year.

The amount of water available under this contract and Zone 7's obligation to supply water shall be subject to the terms and conditions of the contract between Zone 7 and the State of California for water service via the South Bay Aqueduct and any other contracts Zone 7 may enter into for water supply; provided, further, that wherever the provisions of the contract with the State of California or other entity as to the availability of water conflict with the provisions of this contract, the terms and provisions of this contract shall prevail. Zone 7 shall give Contractor written notice as far in advance as possible of any reduction in deliveries that would be necessary because of a shortage in water supply. Neither Zone 7 nor any of its officers, agents, or employees shall be liable for any damage, direct or indirect,

arising from this contract caused by drought, regulatory constraints, operation of area of origin statutes, or any other cause beyond the control or without the negligence of Zone 7.

15. Suspension of Service

In the event that Contractor shall be delinquent in the payment for water for more than ninety (90) days after the due date (as said due date is defined in Section 28), such delinquency shall be called to the attention of the Board and the Board may, in its discretion and after giving Contractor an opportunity to be heard, order the suspension or reduction of service to Contractor.

C. GROUNDWATER EXTRACTION PROVISIONS

16. Groundwater Pumping from the Main Basin

Zone 7 acknowledges Contractor's right to extract groundwater based on Contractor's historical groundwater extractions and based on the mutually agreed upon limitations in Contractor's original water supply contract with Zone 7. Contractor acknowledges that Zone 7 manages the Main Basin and that Zone 7 recharges, stores, and extracts from the Main Basin as necessary to supply water to Each Contractor. Accordingly, Contractor shall not extract under this agreement, more than 645 acre-feet (210 million gallons), its Groundwater Pumping Quota, from the Main Basin in any calendar year except as follows:

(a) The Contractor pays Zone 7 a recharge fee for recharging the Main Basin as set forth in Section 17;

(b) The groundwater extracted is Contractor's accumulated carry-over of its Groundwater Pumping Quota from prior years as provided in Section 18; or

(c) The source of the groundwater extracted is from Other Sources obtained by Contractor pursuant to 5(c), 5(d), and 5(f) herein and the Contractor has previously recharged said groundwater into the Main Basin. Said recharged water shall not adversely impact Zone 7's use of the Main Basin, including the recharge, storage or extraction thereof.

17. Recharge Water

In any calendar year, if Contractor should extract groundwater from the Main Basin in an amount in excess of its Groundwater Pumping Quota plus any accumulated carry-over and any groundwater recharged by Contractor per 16 (c), Contractor shall pay Zone 7, in addition to other payments required by this contract, a recharge fee as set forth in the rate schedule and Sections 23 and 24 herein, for each acre-foot of water (or portion thereof) in excess of said amount. In express consideration of Contractor's agreement to pay such recharge fee, as aforesaid, Zone 7 shall recharge the Main Basin in an amount aggregating the quantity of such excess water.

Because said recharge fee would be in the nature of an assessment fee upon annual extractions in excess of the Groundwater Pumping Quota, if Zone 7 (or any other public body or agency) shall impose a valid replenishment assessment fee or other charge upon or measured by the pumping or extraction of water for use in Contractor's service area, then the provisions of this Section shall be superseded accordingly, except as to any payment attributable to a period prior to the effective date of any such assessment fee or other charge.

18. Carry-over of Groundwater Pumping Quota

If, in any calendar year, Contractor does not extract its entire Groundwater Pumping Quota from the Main Basin,

Contractor may carry-over from that calendar year the unextracted portion of Groundwater Pumping Quota for extraction from the Main Basin during subsequent calendar years. Said carry-over or accumulated carry-over shall not exceed 20 percent of the Contractor's Groundwater Pumping Quota. Said carry-over shall not include any Groundwater Pumping Quota waived under the In-Lieu Treated Water provision of Section 19.

19. In-Lieu Treated Water

During periods when sufficient water is available to Zone 7 at reasonable cost and Zone 7 desires to raise or maintain groundwater levels, Zone 7 will offer delivery of treated water at a cost that is less than treated water rates to Contractor in lieu of Contractor extracting groundwater per its Groundwater Pumping Quota. The amount of In-Lieu Treated Water that Contractor may receive shall not exceed its Groundwater Pumping Quota plus any accumulated carry-over or its operational capability to extract said Groundwater Pumping Quota and accumulated carry-over. Zone 7's offer to deliver In-Lieu Treated Water for a given calendar year will be made on or about May 1 of that year, however, said rates may be retroactive for the entire calendar year or other mutually agreed upon portion thereof. Credit or payment for In-Lieu Treated Water will be as provided for under Section 25. Contractor is not required to take or purchase any In-Lieu Treated Water.

Contractor acknowledges that any credits or payments received under Section 25 are received in-lieu of the Contractor's right to extract its Groundwater Pumping Quota, and Contractor agrees that its Groundwater Pumping Quota and any accumulated carry-over shall be reduced by an amount equivalent to the amount of In-Lieu Treated Water delivered by Zone 7 to Contractor for the year in which the delivery is made.

20. Water Delivery Shortage Emergency Extractions
During a water supply emergency, as declared by the Board, in which Zone 7 is unable to deliver the quantity of treated water as approved on the delivery schedule, the Contractor may extract water from the Main Basin in excess of the Contractor's Groundwater Pumping Quota at a reduced recharge rate. Said rate shall be the same as the In-Lieu Treated Water rate.

21. Transfer of Groundwater Pumping Quota
Temporary or permanent transfer of Contractor's Groundwater Pumping Quota outside of the Zone 7 boundary shall not be permitted. Temporary or permanent transfer of Contractor's Groundwater Pumping Quota within Zone 7's boundary shall be permitted provided that it is transferred to an Other Contractor. Said transfer of Contractor's Groundwater Pumping Quota shall be permitted upon written notification to Zone 7 from each contractor that is a party to the transfer.

22. Changes in Contractor's Groundwater Pumping Quota
The annual Safe Yield of the Main Basin, estimated as approximately 13,200 acre-feet per year in 1993, is essentially the same as the long-term average extraction by existing groundwater producers. The Board shall not increase any Other Contractor's Groundwater Pumping Quota unless such increase in Groundwater Pumping Quota is acceptable to Each Contractor with a Groundwater Pumping Quota.

Neither Contractor nor Zone 7 waives any rights to pursue a court adjudication of the safe yield of the Main Basin or any other court action on extraction of groundwater from the Main Basin that may change Contractor's Groundwater Pumping Quota. Furthermore, Zone 7 reserves its authority to levy a replenishment assessment on the extraction of any groundwater, including Contractor's Groundwater Pumping Quota

(excluding any adjudication of the safe yield), as necessary to protect the water supplies for users within Zone 7.

D. CHARGE AND PAYMENT PROVISIONS

23. Rate Schedule

Zone 7 shall charge for water in accordance with a rate schedule for water service, as such rate schedule is established or amended by the Board. The Board shall review the rate schedule and establish a rate schedule for each calendar year period in accordance with the most recent costs and revenues of Zone 7. The Board shall review the rate schedule at the September regular meeting and endeavor to establish the rate schedule at the November regular meeting prior to January 1 of the following calendar year for which the rate schedule is to be effective. The rates, including but not limited to the treated water, in-lieu treated water, meter fee, and recharge fee, to be so established, shall be based on the cost of providing service, and shall not be unreasonable, arbitrary, or discriminatory. In the event the Board fails, in conformity to the preceding schedule, to establish a new rate schedule for any calendar year the rate schedule in effect for the prior calendar year shall be continued in full force and effect until otherwise modified by the Board.

24. Recharge Fee

The recharge fee shall be charged to Contractor in accordance with the rates included in the rate schedule. Contractor shall be invoiced by Zone 7 in accordance with Section 26 at the time in which Contractor exceeds its Groundwater Pumping Quota as provided in Section 17. Section 28 herein shall apply to said charges. The recharge fee shall be based upon Zone 7's costs including but not limited to the cost to purchase or develop the water, as well as the cost to construct, maintain, and operate the facilities needed to

import, distribute, store, treat and recharge said water into the Main Basin for the benefit of Each Contractor.

25. In-Lieu Treated Water Credit

In any calendar year in which the Contractor has foregone pumping of its Groundwater Pumping Quota, plus accumulated carry-over, as set forth in Section 19, Zone 7 shall determine the amount of delivered treated water that should be charged at the In-Lieu Treated Water rate, and shall credit or make payment to the Contractor the difference between the treated water rate and the In-Lieu Treated Water rate.

26. Time for Payment

Contractor shall be invoiced on a calendar month basis for charges. Contractor shall pay promptly all charges invoiced by Zone 7, such invoices to be rendered on or about the 5th day of each month for charges incurred in the preceding month and to become due and payable within 30 days from date of invoice. In the event that Contractor in good faith contests the accuracy of any invoices submitted to it pursuant to this Section, it shall give Zone 7 notice thereof at least ten (10) days prior to the day upon which payment of the stated amount is due. To the extent that Zone 7 finds Contractor's contentions regarding the statement to be correct, it shall revise the statement accordingly and Contractor shall make payment of the revised amounts on or before the due date. To the extent that Zone 7 does not find Contractor's contentions to be correct or where time is not available for a review of such contentions prior to the due date, Contractor shall make payment of the invoiced amount on or before the due date and make the contested part of such payment under protest and seek to recover the amount thereof from Zone 7.

27. Payment for Turnout Facilities

Prior to commencing with the design of a turnout facility, Contractor shall deposit with Zone 7 an amount of money estimated by Zone 7 to cover all costs to be incurred by Zone 7 for designing said turnout facility or shall request in writing to be invoiced for such design in accordance with Section 26. The option of invoicing Contractor shall be at the sole discretion of Zone 7. Prior to constructing said turnout facility, Contractor shall deposit with Zone 7 an amount of money estimated by Zone 7 to cover all costs to be incurred by Zone 7 for completion of turnout facility or request to be invoiced for such construction in accordance with Section 26. Following completion of the construction of the turnout facility, Zone 7 shall submit to Contractor a statement for the actual costs incurred for completion of the design and construction of said turnout facility as provided in Section 7. The deposit shall be applied to the actual costs incurred by Zone 7, and the appropriate refund or invoicing to Contractor will be made. Contractor shall make payment of any such invoicing to Zone 7 within thirty (30) days of submission of said statement. Zone 7 shall refund any deposit in excess of actual cost within thirty days of Zone 7's determination of said cost. Contractor shall have the right to audit the records of Zone 7 for the purpose of verifying actual costs.

28. Delinquent Payments

In the event that Contractor is delinquent in the payment of invoiced charges for more than thirty (30) days after the due date, delinquent amounts shall accrue at the legal rate of interest commencing on the due date and continuing each month thereafter until payment of both the principal amount of such charges and the interest thereon is paid in full insofar as permitted by law. Unless otherwise determined by law, the legal rate of interest shall be the combined per annum

discount rate of the Federal Reserve Bank of San Francisco on the 25th day of the current month and five percent (5%).

E. GENERAL PROVISIONS

29. Remedies

By reason of the specialized nature of the water service rendered, and for the further reason that the extent of any damage caused to either party by the other by reason of any breach of this contract or agreement may be extremely difficult to determine, it is agreed by the parties hereto that an action for damages is an inadequate remedy for any breach, and that specific performance, without precluding any other remedy available in equity or law, will be necessary to furnish either party hereto with an adequate remedy for the breach thereof.

30. Assignment

This contract is not for the benefit of any person, corporation or other entity, other than the parties hereto, and no person, corporation or other entity except the parties hereto, shall have any rights or interest in or under this contract unless otherwise specifically provided herein. Contractor shall not assign or transfer any rights or privileges under this contract, either in whole or in part, without the prior written consent of Zone 7, which consent shall not be unreasonably withheld, or make any transfer of all or any part of its water system, or allow the use thereof, in any manner whereby any provisions of this contract will not continue to be binding on it, its assignee or transferee, or such user of the system. This contract and the rights and responsibilities provided for herein shall be binding on the successors and assigns of the parties hereto.

31. Contract Modification

This contract may be amended or modified any time only by mutual written agreement of the parties.

A94-18

32. Liabilities

a. Zone 7 and/or any of its officers, agents or employees shall not be liable for the control, carriage, handling, use, disposal, or distribution of treated water supplied to Contractor by Zone 7, after such water has passed through the turnout facility or for claims of damage of any nature whatsoever, including but not limited to property damage, personal injury or death, arising out of or connected with the control, carriage, handling, use, disposal or distribution of such water beyond said turnout facility. Contractor shall indemnify, save and hold harmless Zone 7 and its officers, agents, and employees from any such damages or claims of damages. Contractor shall further reimburse Zone 7 for costs of repair of Zone 7's facilities and other damages resulting from the operations of Contractor.

b. Contractor and/or any of its officers, agents, or employees shall not be liable for the control, carriage, handling, use, disposal, or distribution of water prior to such water being delivered through the turnout facility or for claims of damage of any nature whatsoever, including but not limited to property damage, personal injury or death, arising out of or connected with the control, carriage, handling, use, disposal, or distribution of such water prior to its delivery to Contractor, excepting, however, claims by Zone 7 for costs of repair to Zone 7's facilities and other damages resulting from the operations of the Contractor. Zone 7 shall indemnify, save and hold harmless the Contractor and its officers, agents, and employees from any such damages or claims of damages, except claims by Zone 7 for costs of repair of Zone 7's facilities and other damages resulting from the operations of Contractor.

c. Zone 7 needs to be protected from any obligation to supply water to projects or consumers which the contractor has supplied from sources other than what has been directly purchased from Zone 7. Accordingly, any other provision herein notwithstanding, Zone 7 shall not be obligated nor liable to provide, without exception, that quantity of water obtained by Contractor pursuant to Subsections 5a-f, to Contractor or any customer of Contractor regardless of purpose. Accordingly, Contractor shall indemnify, save and hold harmless Zone 7 from any and all obligations, liability, responsibility, costs, expenses, or fees associated in any way with any claims, demands, requests, suits, causes of action of whatever type or nature concerning the provision of any quantity of water obtained by Contractor pursuant to Subsections 5a-f herein.

d. Likewise, if pursuant to Section 3 herein, Contractor is instructed by Zone 7 to acquire water from Zone 7 which has been previously acquired from third parties pursuant to Subsections 5a-f herein, Zone 7 shall save and hold harmless Contractor from any and all obligations, liability, responsibility, costs, expenses, or fees that may arise from such third parties.

33. Renewability

At the expiration of the thirty (30) year term of this contract, said contract may be renewed upon the mutual consent of the parties hereto. If no such renewal shall take place and in the absence of any new contract, Zone 7 shall nevertheless continue delivery to Contractor in accordance with this contract, that quantity of water set forth in the approved delivery schedule for the last full calendar year before the expiration of the term of this contract. However, if a new contract is not entered into within two (2) years from the date of expiration of this contract, then the Board

may, at its option, set the terms and conditions for a Municipal & Industrial Water Supply.

34. Notices

All notices or other writings in this contract provided to be given or made or sent, or which may be given or made or sent, by one party hereto to another, shall be deemed to have been fully given or made or sent when made in writing and deposited in the United States mail, registered, certified or first class, postage prepaid, and addressed as follows:

To Zone 7: General Manager
Zone 7 Water Agency
5997 Parkside Drive
Pleasanton, CA 94588

To Contractor: General Manager
Dublin San Ramon Services District
7051 Dublin Boulevard
Dublin, CA 94568

The address to which any notice or other writing may be given or made or sent to any party may be changed upon written notice given by such party as provided above.

35. Severability

If any one or more of the terms or conditions set forth in this contract to be performed on the part of Zone 7 or Contractor, or either of them, should be contrary to any provisions of law or contrary to the policy of law to such an extent as to be unenforceable in any court of competent jurisdiction, then such terms or conditions, shall be null and void and shall be deemed severable from the remaining terms or conditions and shall not affect the validity of the remaining provisions of this contract.

36. Section Headings

Section headings in this contract are for convenience only and are not to be construed as a part of this contract or in any way limiting or amplifying the provisions hereof.

37. Waiver

None of these terms or conditions herein contained can be waived except by mutual written consent.

38. Water Conservation

In order to increase water supply by demand reduction or to comply with regulatory requirements, Zone 7 will undertake and support water conservation programs. To that end, Zone 7 will develop, implement or participate in such programs and enter into agreements with Other Contractors, and other entities to make more efficient use of water supplies through water conservation programs so long as such agreements serve a beneficial purpose to the residents of Zone 7.

39. Contracts to be Substantially Similar

Zone 7 agrees that each contract for a Municipal & Industrial Water Supply hereafter entered into by Zone 7 with any Other Contractor shall contain provisions substantially similar to those herein set forth and shall not contain any provisions of a material nature more favorable to the Other Contractor than the provisions herein applicable to Contractor. This section shall not restrict Zone 7 from considering other terms and conditions for subsequent Municipal & Industrial Water Supply contracts provided that if such other terms and conditions are not substantially similar, Zone 7 shall notify all Other Contractors and offer such other terms and conditions in accordance with Section 31 to Each Contractor. This section shall not limit Zone 7 from entering into other contracts for services not provided for under the terms and conditions of this contract.

IN WITNESS WHEREOF, the parties hereto and have executed this contract on the date and year first above written.

DUBLIN SAN RAMON SERVICES DISTRICT

BY Georgean M. Vonheeder
President, Board of Directors

ATTEST:

BY Nancy Gamble
Secretary

ZONE 7 WATER AGENCY

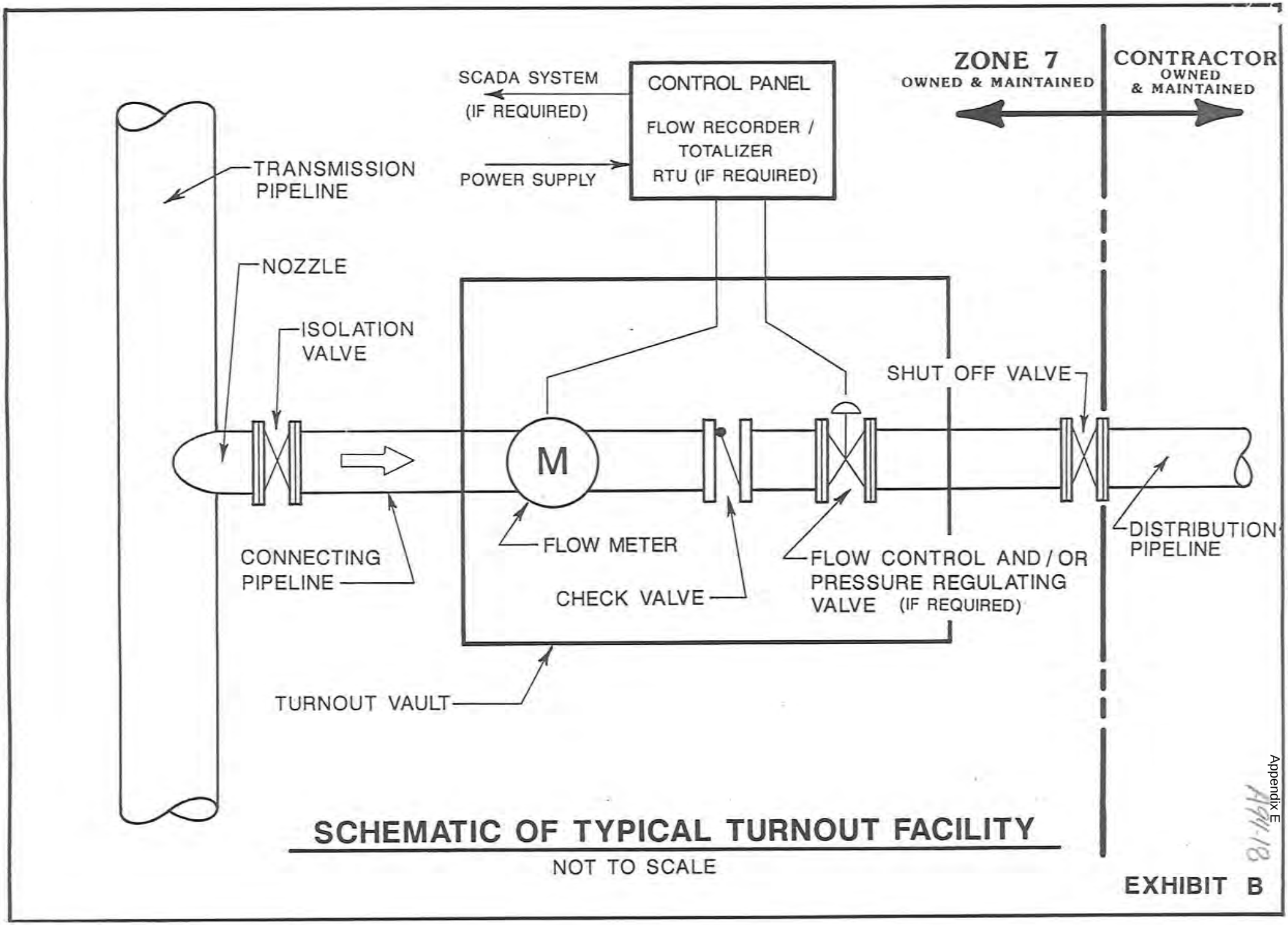
BY David W. Layton
Chairman, Board of Directors

ATTEST:

BY Jim Dixon
Secretary

APPROVED AS TO FORM:
KELVIN H. BOOTY, JR.,
COUNTY COUNSEL

BY [signature]
Deputy County Counsel


ZONE 7
OWNED & MAINTAINED
CONTRACTOR
OWNED
& MAINTAINED
SCADA SYSTEM
(IF REQUIRED)
CONTROL PANEL
FLOW RECORDER /
TOTALIZER
RTU (IF REQUIRED)
POWER SUPPLY
TRANSMISSION
PIPELINE
NOZZLE
ISOLATION
VALVE
SHUT OFF VALVE
M
FLOW METER
CONNECTING
PIPELINE
CHECK VALVE
FLOW CONTROL AND / OR
PRESSURE REGULATING
VALVE (IF REQUIRED)
DISTRIBUTION
PIPELINE
TURNOUT VAULT
SCHEMATIC OF TYPICAL TURNOUT FACILITY
NOT TO SCALE
EXHIBIT B

A94-18

ZONE 7 BOUNDARY

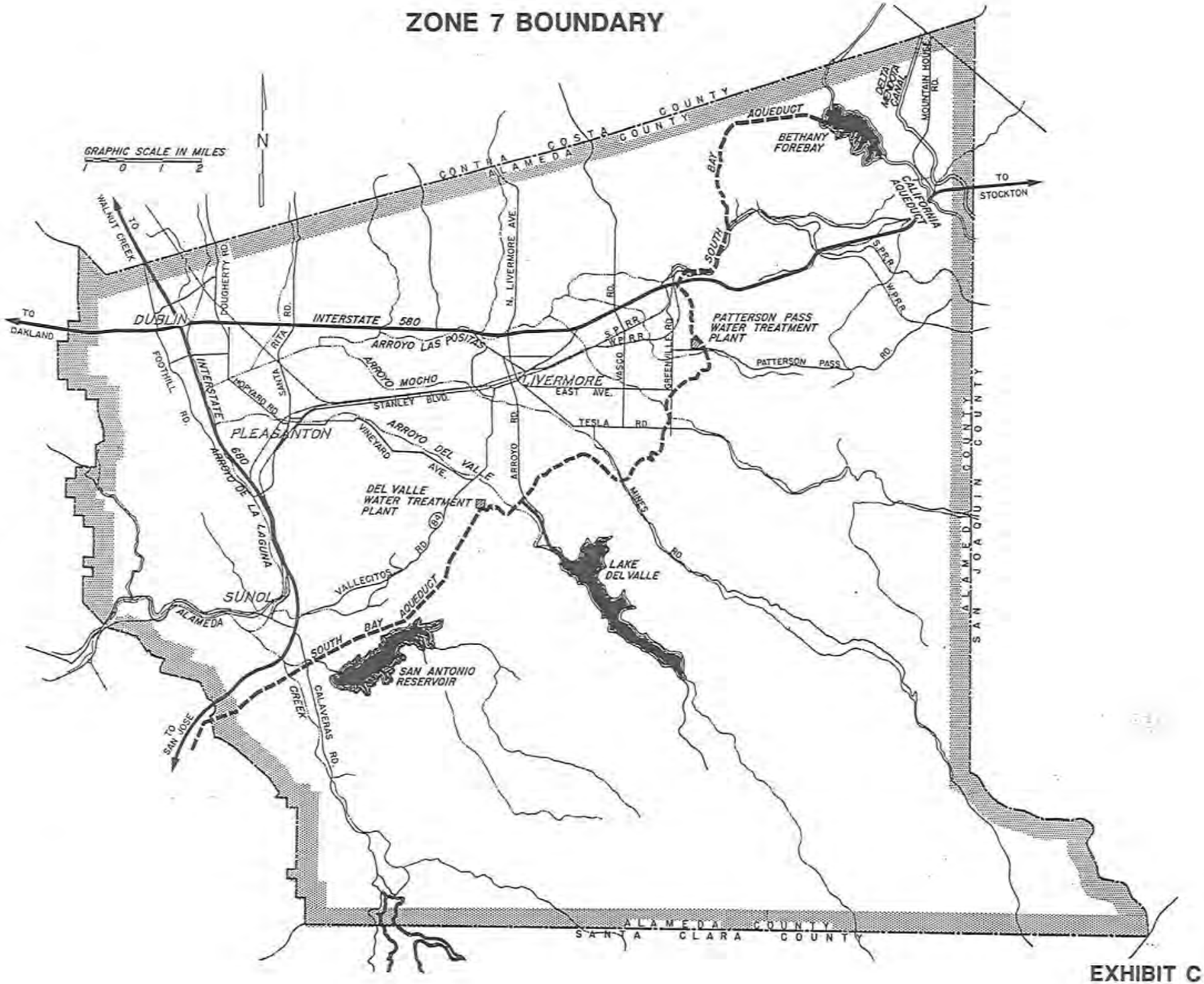


EXHIBIT C

Appendix E

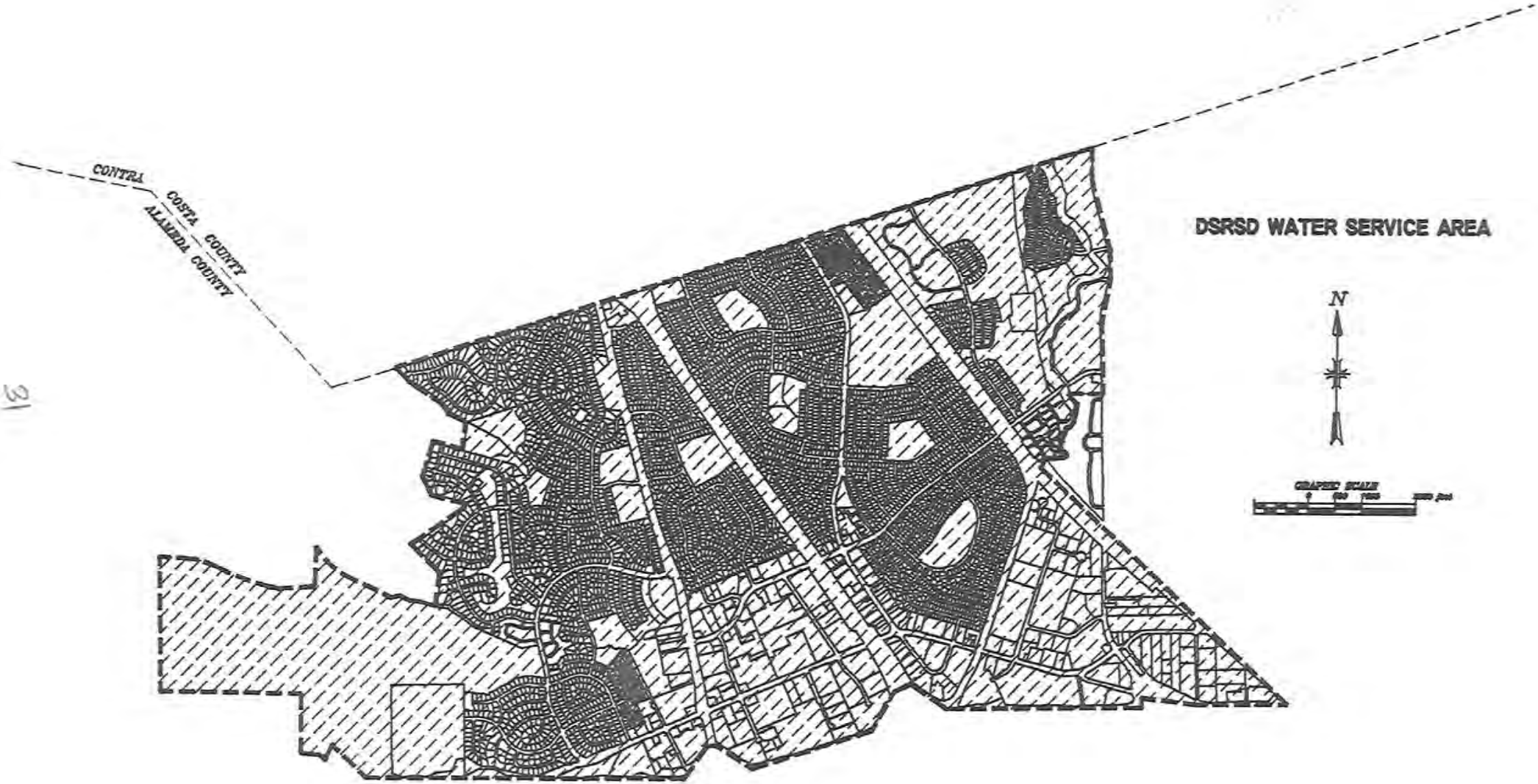
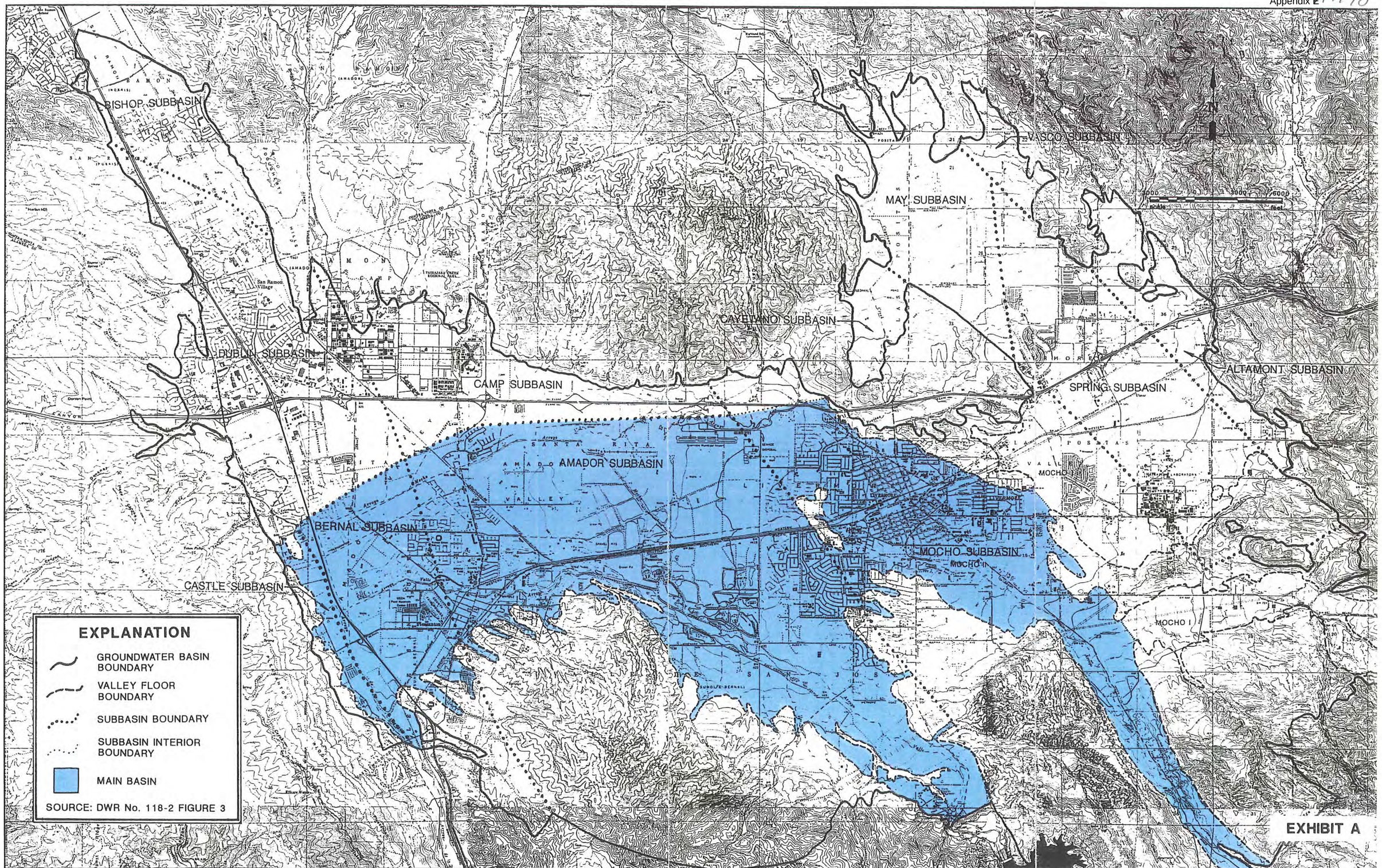


EXHIBIT D

A94-18



REVISIONS				
7				
6				
5				
4				
3				
2				
1				
NUMBER	DESCRIPTION	BY	DATE	APVD

ZONE 7 WATER AGENCY
5997 PARKSIDE DRIVE PLEASANTON CA 94588

DRAWN
DESIGNED
CHECKED
APPROVED

WATER RESOURCES ENGINEERING

LIVERMORE VALLEY GROUNDWATER BASIN BOUNDARIES

SCALE 1"=6,000'
DATE 12 MAY 1994
FILE NO. M-321
SHEET GW OF SHEETS

AMENDMENT NO. 1 TO CONTRACT BETWEEN ZONE 7 WATER AGENCY AND DUBLIN SAN RAMON SERVICES DISTRICT FOR A MUNICIPAL & INDUSTRIAL WATER SUPPLY

This Amendment No. 1 to Contract Between Zone 7 Water Agency and Dublin San Ramon Services District for a Municipal & Industrial Water Supply (the "**Amendment**") is entered into as of 2/7/2000, 1998, (the "**Effective Date**") by and between ZONE 7 OF ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, commonly known as the Zone 7 Water Agency ("**Zone 7**"), and DUBLIN SAN RAMON SERVICES DISTRICT ("**Contractor**").

RECITALS

A. Zone 7 and Contractor have entered into that certain Contract between Zone 7 of Alameda Flood Control and Water Conservation District and Dublin San Ramon Services District for a Municipal & Industrial Water Supply, dated as of August 23, 1994 (the "**Water Supply Contract**"). Pursuant to and as more fully set forth in the Water Supply Contract, Zone 7 has agreed to furnish and provide to Contractor, and Contractor agreed to purchase and accept, a water supply for municipal and industrial uses.

B. Pursuant to Section 6 of the Water Supply Contract, Contractor has requested Zone 7's approval of an expansion of Contractor's "Service Area" under the Water Supply Contract to include approximately 4,400 acres of real property located outside of the boundaries of Zone 7 as shown on **Figure 1** attached hereto (the "**Dougherty Valley Service Area**"). The County of Contra Costa has adopted plans and permits authorizing the development, within the Dougherty Valley Service Area, of a mixed-use community including up to 9784 residential dwelling units and associated commercial, civic and other uses. Contra Costa County's plans designate Contractor as the primary provider of treated water to the Dougherty Valley Service Area and the owners of property of said Area, Windemere Ranch Partners ("**Windemere**") and Shapell Industries, Inc. ("**Shapell**"), have requested Contractor to provide such service.

C. The property in the Dougherty Valley Service Area owned by Windemere has been annexed to Contractor and is within Contractor's sphere of influence; the property in the Dougherty Valley Service Area owned by Shapell is within Contractor's sphere of influence.

D. On September 13, 1994, Contractor and the Berrenda Mesa Water District ("BMWD") entered into an agreement for Contractor to purchase BMWD rights for 7,000 acre-feet of firm water entitlement from State Water Project for use in the Dougherty Valley Service Area with an option to purchase an additional 5,000 acre-feet.

E. Instead of using the aforementioned agreement between Contractor and BMWD for the water supply for Dougherty Valley Service Area, Zone 7 is concurrently herewith entering into an agreement with BMWD ("the Water Purchase Agreement") to purchase 7,000 acre feet annually of firm water entitlement from the State Water Project (**the "Water Entitlement"**) to

provide water for the Dougherty Valley Service Area. Concurrently with this agreement, Contractor and BMWD are terminating their Water Purchase Agreement, dated September 13, 1994, with the exception of the provision of that agreement providing Contractor with an option to purchase 5,000 acre-feet of water from BMWD.

F. Zone 7 concurrently herewith is entering into an agreement with the Semitropic Water Storage District ("**Semitropic**") pursuant to which Semitropic will agree to store water for Zone 7 so that Zone 7 may supplement the water available from the Water Entitlement to maintain the reliability of the service to the Dougherty Valley Service Area and enhance Zone 7's ability to serve its existing customers and future customers within Zone 7.

G. Zone 7 and Contractor desire to amend the Water Supply Contract to expand Contractor's service area and to establish certain terms and conditions pursuant to which Zone 7 will furnish and provide water to Contractor for delivery to the Dougherty Valley Service Area.

AMENDMENT NO. 1 TO THE WATER SUPPLY CONTRACT

NOW, THEREFORE, Zone 7 and Contractor hereby mutually agree to amend the Water Supply Contract as follows:

1. Contractor's Service Area. The Dougherty Valley Service Area, as delineated in Figure 1, is hereby added to the Contractor's Service Area as defined in and pursuant to Section 6 of the Water Supply Contract.

2. Special Provisions for Water Supplied to Contractor for Use in the Dougherty Valley Service Area. Those certain terms and conditions described more fully in **Appendix 1**, attached hereto, are hereby appended to and incorporated into the Water Supply Contract and shall govern the provision of services to the Dougherty Valley Service Area.

3. Ratification of Water Supply Contract. Except as modified by this Amendment, the Water Supply Contract and all provisions contained therein shall remain unchanged.

4. Counterparts. This Amendment may be executed in one or more counterparts, each of which shall be deemed an original, but all of which taken together shall constitute one and the same document.

5. Effective Date. This amendment shall not become effective until the close of escrow pursuant to the Water Service Escrow Agreement entered into concurrently herewith.

6. Interpretation. To the extent any provisions of this Amendment and/or **Appendix 1** are inconsistent with any provisions of the Water Supply Contract, the provisions of this Amendment and/or **Appendix 1** shall control with respect to the Dougherty Valley Service Area. Otherwise, the terms of the Water Supply Contract, as amended by this Amendment, shall remain in full force and effect.

IN WITNESS WHEREOF, this Amendment has been executed as of the day and year first above written.

ZONE 7:

ZONE 7 OF ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

By: _____
Its: President, Board of Directors

ATTEST:

By: _____
Its: Secretary

APPROVED AS TO FORM:

DOUGLAS HICKLING
COUNTY COUNSEL

By: _____
Deputy County Counsel

Contractor:

DUBLIN SAN RAMON SERVICES DISTRICT

By: _____
Its: President, Board of Directors

ATTEST:

By: Nancy Hamble
Its: Secretary

APPROVED AS TO FORM:

By: _____
DSRSD Special Counsel

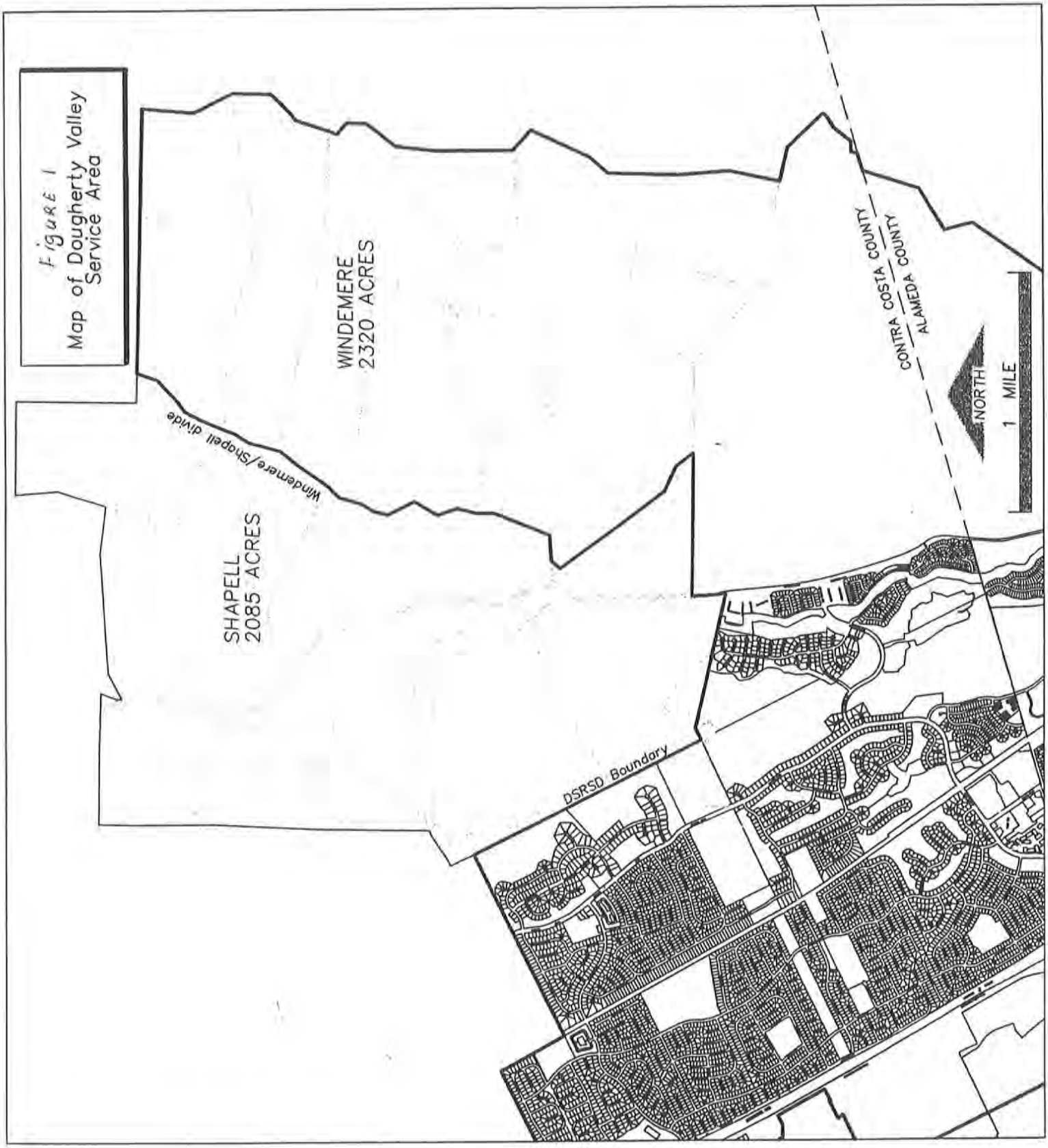


Figure 1
Map of Dougherty Valley
Service Area
WINDEMERE
2320 ACRES
SHAPELL
2085 ACRES
Windemere/Shapell divide
DSRSD Boundary
CONTRA COSTA COUNTY
ALAMEDA COUNTY
NORTH
1 MILE

APPENDIX I

SPECIAL PROVISIONS FOR WATER SUPPLIED TO CONTRACTOR FOR USE IN THE DOUGHERTY VALLEY SERVICE AREA

A. DEFINITIONS

"Adjustment Index" for the year in which the adjustment is being made shall mean a fraction, the numerator of which is the Construction Costs Index, 20-City Average, published by the Engineering News Record (the "Construction Costs Index") of the calendar year immediately preceding the calendar year when the adjustment is being made, and the denominator of which shall be 5,858.3 (20-City Average as of December 1997). If publication of the Construction Cost Index ceases or if the basis for the index is substantially modified, Zone 7 and Contractor shall mutually agree on an alternative index.

"Amendment" shall mean this Amendment No. 1 to the Water Supply Contract.

"Annual Water Supply Report" shall mean that certain annual report required to be delivered by Contractor to Zone 7 pursuant to Section C of this Appendix.

"Dougherty Valley Service Area" shall mean, as delineated in Figure 1 of the Amendment, that geographic area added to Contractor's Service Area under the Water Supply Contract pursuant to this Amendment

"Dougherty Valley Service Area Allotment" equals the Water Entitlement multiplied by a factor based on the Department of Water Resources' latest estimate of long-term State Water Project annual yield, as determined and used by Zone 7 for water supply planning purposes. This factor is currently 75%. The factor will be the same for water conveyed to DSRSD for delivery to the Dougherty Valley Service Area as it will be for State Water Project water being delivered within Zone 7's boundaries. Zone 7 and Contractor recognize that the long-term State Water Project yield is based on hydrological records and applicable regulatory requirements that are subject to change over time. Zone 7 will meet and confer with Contractor prior to changing the yield estimate. The current Dougherty Valley Service Area Allotment is: 7,000 acre feet (the Water Entitlement, defined below) x .75 (the current factor for the long-term State Water Project yield) = 5,250 acre feet per year.

"DWR" shall mean State of California Department of Water Resources.

"DWR/Zone 7 Agreement" shall mean the Contract between the State of California Department of Water Resources and Alameda County Flood Control and Water

Conservation District for a Water Supply for Zone No. 7, dated November 21, 1961, as amended.

"DWR/Zone 7 Amendment No. 19" shall mean the amendment to the DWR/Zone 7 Agreement whereby DWR agrees to convey the Water Entitlement to Zone 7.

"New Connection" shall mean any new metered water service within the Dougherty Valley Service Area that will furnish water from a water supply system that is connected to the Zone 7 water supply system or to the Livermore-Amador Valley Main Groundwater Basin (as defined in the Water Supply Contract), including but not limited to water services that are part of any new development to be constructed.

"Semitropic" shall mean the following public entities: Semitropic Water Storage District, Semitropic Improvement District, Buttonwillow Improvement District and the Pond-Poso Improvement District of the Semitropic Water Storage District, collectively.

"Semitropic Agreement" shall mean the agreement between Zone 7 and Semitropic, entered concurrently herewith, whereby Semitropic agrees to provide groundwater storage space for Zone 7's use.

"Tax Override Charges" shall mean those certain State Water Project expenses that Zone 7 pays for through an ad valorem tax levied on property owners within Zone 7 (denoted as "Flood Zone 7 State Water" on the property tax bill) as authorized under Section 36 of the California Water Code, Appendix 55 ("the District Act") and other applicable state laws. Zone 7 currently determines the Tax Override Charges based on the following State Water Project charges as invoiced by DWR: 1) Water System Revenue Bond Surcharge; 2) Capital Cost Component -- Transportation Charge; 3) Minimum Operating Maintenance, Power and Replacement Component -- Transportation Charge; and 4) Off-Aqueduct Power Facilities. Zone 7 may include other DWR charges as Tax Override Charges in accordance with applicable law, as long as such other charges are prospective in nature and charged as Tax Override Charges on property owners within Zone 7.

"Water Connection Charge Program" shall mean Zone 7's Water Connection Charge Program, as updated from time to time.

"Water Entitlement" shall mean that certain 7,000 acre feet of firm water entitlements that Zone 7 has agreed to purchase concurrently herewith from the Berrenda Mesa Water District ("BMWD") as set forth in the Water Purchase Agreement.

"Water Purchase Agreement" shall mean that certain agreement between Zone 7 and BMWD pursuant to which Zone 7 has agreed concurrently herewith to purchase, and BMWD agreed to sell, the Water Entitlement.

B. DELIVERY

1. Water Supply. Subject to, and as set forth in, the terms and conditions of this Amendment, Zone 7 shall provide Contractor with a supply of treated water for the Dougherty Valley Service Area.

2. Preliminary Water Delivery Schedule. Section 10 of the Water Supply Contract requires Contractor, on an annual basis, to submit to Zone 7 a preliminary water delivery schedule indicating the quantity of water anticipated by Contractor to be required for Contractor's service area during each month of the succeeding five (5) calendar years. Each such preliminary water delivery schedule shall hereafter include a separate itemization of water anticipated by Contractor to be required for the Dougherty Valley Service Area during such five-year period and be accompanied by the **"Annual Water Supply Report"** described in Section C below.

3. Review and Approval by Zone 7. Zone 7 shall review the Preliminary Water Delivery Schedule in accordance with Section 10 of the Water Supply Contract. Zone 7 may only revise or disapprove contractor's delivery request for the Dougherty Valley Service Area for the reasons set forth in Sections 12 (Peak Demands), 13 (Curtailment of Delivery During Maintenance Periods), 14 (Availability of Water), or 15 (Suspension of Service) of the Water Supply Contract, or as described in Section B4, B5 and D1 below.

4. Limitations on Deliveries. Notwithstanding any other provision of this Amendment, Zone 7 shall have no obligation under this Amendment, in any year, to deliver water to the Dougherty Valley Service Area in excess of the Dougherty Valley Service Area Allotment.

5. Shortfalls. If a delivery schedule submitted to Zone 7 for the Dougherty Valley Service Area pursuant to paragraph B.2 above exceeds the Dougherty Valley Service Area Allotment for any year covered by the preliminary water delivery schedule, Zone 7 shall immediately deliver notice to Contractor of the shortfall, and Contractor, shall either (i) use its best efforts to secure additional water supplies adequate to eliminate such projected shortfall prior to its occurrence, or (ii) submit a revised delivery schedule that does not result in a shortfall. Zone 7 is under no obligation pursuant to this Amendment to seek additional water supplies for the Dougherty Valley Service Area if Contractor's request exceeds the Dougherty Valley Service Area Allotment in any year. Zone 7 shall use its best efforts to facilitate the transfer and use of any additional water supplies obtained through the efforts of the Contractor.

C. REPORTS

1. Annual Water Supply Report. Contractor shall measure and report to Zone 7 annually on treated water usage within the Dougherty Valley Service Area. Contractor's annual report to Zone 7 (the "Annual Water Supply Report") shall include a description of, among other things, (i) water deliveries by month for the past year; (ii) number and size of current service connections; and (iii) number and size of New Connections established over the preceding

year. The measurement and recordation of such water deliveries shall be subject to the same provisions for inspection and testing of meters and instrumentation by Zone 7 as is provided to Contractor in Section 8 of the Water Supply Contract. The Annual Water Supply Report shall be prepared and submitted by Contractor in a form acceptable to Zone 7 and due by March 1 of the following year.

2. Monthly Water Delivery Report. Section 11 of the Water Supply Contract requires Contractor to report to Zone 7 on or before the tenth day of each month the total volume, in acre-feet, of groundwater extracted from the Main Basin and any water obtained from "Other Sources" (as defined in the Water Supply Contract) for the preceding month. This report shall be expanded to include water supplied by Contractor to the Dougherty Valley Service Area from all sources during such preceding month, based on all metered flows to the Dougherty Valley Service Area (the **"Monthly Water Delivery Report"**).

D. PAYMENTS

1. Treated Water Rate. Contractor shall pay Zone 7 for water delivered by Zone 7 to Contractor for the Dougherty Valley Service Area in accordance with the provisions of Section D of the Water Supply Contract. If any payments required under the provisions of Section D of this Appendix are not received by the due date, Contractor shall be subject to suspension of service and the accrual of interest as provided in the Water Supply Contract under Sections 15 and 28 respectively. Zone 7 shall not be obligated to provide water for any demands resulting from New Connections for which Contractor has not made Water Connection Payments or Facility Use Payments pursuant to Sections D.2 and D.3, below.

2. Water Connection Payments. Contractor shall make payments to Zone 7 to compensate Zone 7 for the Dougherty Valley Service Area's share of Zone 7's Capital Expansion Program. For each New Connection in the Dougherty Valley Service Area, Contractor shall pay Zone 7 an amount, established by the Zone 7 Board by resolution, to Zone 7's Capital Expansion Program. The amount due for each New Connection will equal the connection charges within the Zone 7 boundaries less the sums included in the Zone 7 connection charge for obtaining additional water entitlements and additional storage, as Contractor has already provided the Water Entitlement and storage for the Dougherty Valley Service Area. Payments to Zone 7 shall be due within 30 days from the date upon which the building permit for the property receiving the New Connection was issued or 30 days from the date that the New Connection is made, whichever is earlier.

3. Facility Use Payments. Contractor agrees to compensate Zone 7 for use of Zone 7's existing facilities in providing water to the Dougherty Valley Service Area. Contractor shall make payments to Zone 7, hereinafter referred to as Facility Use Payments, as Contractor permits New Connections in the Dougherty Valley Service Area. The Facility Use Payments shall be $1,850 per New Connection of the basic connection size, 5/8" meter. The amount of said Facility Use Payments are based on the pro rata share of the current value of Zone

7's capital assets. The Facility Use Payments for New Connections of other sizes shall be adjusted by the "fee factor" contained in the Zone 7 Water Connection Charge Ordinance, Section III.

Zone 7 shall adjust the Facility Use Payments at the times specified in this section by multiplying $1,850 by the Adjustment Index. The first adjustment to the Facility Use Payments shall go into effect no earlier than five years following issuance of the first building permit for development in the Dougherty Valley Service Area. Subsequent adjustments shall occur at five (5) year intervals thereafter. Payments to Zone 7 under this section shall be collected in the same manner and be due at the same time as payments due under Section D.2 (above).

4. Capital Expansion Water Facilities. Zone 7 shall keep Contractor apprised of Zone 7's progress in developing and constructing any capital water facilities that are necessary to provide service to Contractor for ultimate use in the Dougherty Valley Service Area. If Contractor determines, and Zone 7 concurs, that capital facilities required by Zone 7 to provide water to Contractor pursuant to this Amendment will not be available in time for Zone 7 to make requested deliveries under this Amendment, Contractor may elect to design and construct such capital facilities, and Zone 7 will reduce future connection payments pursuant to Paragraph D.2 (above) by the costs incurred by Contractor.

5. Surcharge for Water Service for Dougherty Valley Service Area. Contractor shall pay Zone 7 a surcharge for water service for the Dougherty Valley Service Area to compensate Zone 7 for additional State Water Project charges incurred by Zone 7 as a result of providing water to the Dougherty Valley Service Area. The surcharge shall equal the Dougherty Valley Service Area's proportionate share of the total Tax Override Charges, calculated as follows: (6,080 (the estimated amount of water entitlement necessary to supply the Dougherty Valley Service Area with 4,560 acre-feet of water per year given a State Water Project long-term yield of 75%)/Zone 7's total State Water Project entitlement) multiplied by the total Tax Override Charges.

$$\frac{\left(4{,}560\right) \times \left(\frac{1}{\text{factor used to determine SWP long-term yield}}\right)}{\text{Zone 7's Total State Water Project entitlement (in acre-feet)}} \times \left(\text{Total Tax Override Charges}\right) = \text{Annual surcharge per this paragraph}$$

Zone 7 receives a statement of charges from DWR on or about July 1st of the preceding calendar year for which the charges are payable. Zone 7 shall invoice the Contractor on or

about September 1st preceding the November 1st for which the surcharge shall be due. DWR may make subsequent adjustments to its statement of charges. Accordingly, Zone 7 will make revisions to said invoice by issuing an additional invoice or refund as appropriate.

If, at some future date, the Dougherty Valley Service Area is annexed to Zone 7 and Zone 7 levies the Tax Override Charges directly on Contractor's customers in the Dougherty Valley Service Area, the aforementioned surcharge shall automatically terminate and be of no further force and effect.

6. Other Charges. Zone 7 and Contractor acknowledge and agree that from time to time there may arise a need for the imposition of additional payments to ensure that the Dougherty Valley Service Area bears all costs associated with the provision of treated water thereto under this Amendment. However, Zone 7 shall not impose upon Contractor any payments or charges not imposed upon Zone 7's Other Contractors for any purposes other than to recover costs associated with delivering water to the Dougherty Valley Service Area pursuant to this Amendment.

E. ALTERNATIVE DELIVERY METHODS

If a court of competent jurisdiction determines, in a judgment that cannot be appealed, that Zone 7 cannot participate in water delivery to the Dougherty Valley Service Area pursuant to the terms of this Amendment, Zone 7 and Contractor agree to use their best efforts to negotiate a contract, pursuant to which Zone 7 can convey water to Contractor for service to the Dougherty Valley Service Area. To limit the possibility of any interruption of service to the Dougherty Valley Service Area, either Zone 7 or Contractor may request such negotiations to commence prior to the conclusion of any such litigation. Zone 7 and Contractor agree to negotiate the contract in accordance with the principles listed below:

1. Insofar as possible, the contract shall contain all of the same terms and condition as this Amendment, except that Zone 7 would transfer to Contractor (i) ownership the 6,080 acre-feet of water entitlement, (ii) the Zone 7's rights and obligations pursuant to the Semitropic Water Storage District contract, (iii) water in storage in Semitropic, (iv) Zone 7's interest in any security instrument relating to the provision of water to the Dougherty Valley Service Area and (v) any remaining funds paid to Zone 7 by Contractor for the purpose of Zone 7 making payments to Semitropic.

2. Upon such transfer, Contractor would become solely responsible for all costs and other obligations associated with the entitlements, storage rights and service to the Dougherty Valley Service Area.

3. The parties agree to cooperate in good faith to obtain all administrative and regulatory approvals necessary for the transfer, and Contractor would pay all costs incurred by both parties in executing such a transfer.

4. Contractor would contract with Zone 7 to provide the services of water wheeling, treatment, seasonal storage and distribution through the Zone 7 system at a mutually agreeable price.

5. Contractor would not increase its use of the Main Groundwater Basin in excess of 1,400 AF of seasonal storage without the prior approval of Zone 7.

6. Contractor, upon consulting with Zone 7, would have the authority to determine the size of Semitropic Storage required for service to the Dougherty Valley Service Area.

7. Zone 7 would administer the DWR State Water Project contracts on behalf of DSRSD, as well as operations and conveyance of Semitropic Storage and the Water Entitlements.

8. Contractor will neither seek to materially alter its contractual relationship with Zone 7 nor terminate its Water Supply Contract with Zone 7 for the purposes of becoming an independent water purveyor for 30 years or until the specific termination date

contained in the existing Water Supply Contract between Zone 7 and DSRSD, whichever is longer.

Reference 9

ORDINANCE NO. 301

ORDINANCE FORMALLY ESTABLISHING RULES AND REGULATIONS GOVERNING THE USE OF RECYCLED WATER WITHIN THE DUBLIN SAN RAMON SERVICES DISTRICT, AND REPEALING ORDINANCE NO. 280

The Board of Directors ("Board") of the Dublin San Ramon Services District ("District"), a political subdivision of the State of California, in the Counties of Alameda and Contra Costa, does ordain as follows:

SECTION 1. FINDINGS

This Board finds that:

A. The people of the State of California ("State") have a primary interest in the development of facilities to recycle wastewater to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the State (California Water Code, Section 13510);

B. Conservation of all available water resources requires the maximum reuse of wastewater for beneficial uses of water (California Water Code, Section 461);

C. Continued use of potable water for irrigation of greenbelt areas and other non-potable uses may be an unreasonable use of such water where recycled water is available (California Water Code, Section 13550);

D. Resolution No. 42-92 adopted on August 4, 1992, established policies for the use, promotion, and priorities for recycled water service within and outside the District's water service boundaries;

E. Ordinance No. 280 established a Recycled Water Use Zone within the District, consisting of all areas currently served by potable water services of the District and those additional

areas designated for such service by the pertinent Local Agency Formation Commission pursuant to the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (Government Code Section 56000 et seq.);

F. The State policies described in previous findings apply within the District. The District is highly dependent on limited imported water for domestic, agricultural and industrial uses, and the reliability of the supply of imported water is uncertain. Developing and utilizing recycled water can reduce the need for additional imported water. Moreover, recycled water is more readily available in seasons of drought when the supply of potable water for nonessential uses may be uncertain. In light of these circumstances, within the Recycled Water Use Zone as confirmed herein, certain uses of potable water may be considered unreasonable pursuant to Section 3 of this Ordinance.

G. The environmental impacts of numerous development projects within the Recycled Water Use Zone have been examined in depth by various land use jurisdictions with the respective responsibility therefor, and for each such development project, the respective land use jurisdictions have adopted mitigation measures that require the use of recycled water for landscape irrigation on certain land use types to reduce the respective environmental impacts of the project under consideration. Accordingly, the respective land use jurisdictions have approved those development projects on the condition that recycled water is used for landscape irrigation. Among the major development projects of this type are the following:

1. The Schaefer Ranch project within the City of Dublin was approved by said City under the Schaefer Ranch General Plan Amendment in conjunction with a Final Environmental Impact Report (FEIR) therefor in May 1996, and the territory

comprising the Schaefer Ranch project was annexed to the District effective December 23, 1997;

2. The Dougherty Valley area in Contra Costa County was approved by said County under the Dougherty Valley Specific Plan in conjunction with an FEIR in November 1996, and, subsequently, Eastern Dougherty Valley (Windemere Ranch) was annexed to the District effective October 20, 1997;

3. Portions of eastern Dublin have been approved by the City under the Eastern Dublin Specific Plan and General Plan Amendment in conjunction with an FEIR for the Eastern Dublin Specific Plan and General Plan Amendment on May 10, 1993, as amended;

H. The District has planned for, and made a commitment to, the provision of recycled water for approved uses within its potable water service area by forming the DSRSD·EBMUD Recycled Water Authority (DERWA), a public agency established by joint exercise of powers agreement between East Bay Municipal Utility District (EBMUD), and this District, and DERWA has certified an FEIR and approved a project that includes the service of recycled water in District's potable water service area;

I District has prepared a Water Master Plan dated September 2000 to define facilities needed for providing recycled water service within the Recycled Water Use Zone;

J. District has prepared Recycled Water Use Guidelines and a Recycled Water Section of the Standard Procedures, Specifications and Drawings ("Standards") which comprise a compilation of the criteria by which the planning, design, construction, operation, maintenance, and use of recycled water are administered by the District;

K. In consideration of the foregoing and to protect the common water supply of the region that is vital to public health and safety and to prevent endangerment of public and private property, requirements for the use of recycled water within the potable water service area of the District shall be, and hereby are, established as set forth this Ordinance.

SECTION 2. RECYCLED WATER USE ZONE

All areas designated for or currently served by potable water services of the District, from and after the effective date hereof, shall be, and hereby are, included within the Recycled Water Use Zone of the District, which zone is hereby established. Designation for potable water services shall mean that certain designation made by the Local Agency Formation Commission under the requirements of Government Code Section 56000 et seq.

SECTION 3. REQUIREMENT TO USE RECYCLED WATER AND RULES AND REGULATIONS GOVERNING SUCH USE

A. **Mandatory Use of Recycled Water**

1. It is the policy of the District that recycled water determined to be available pursuant to Section 13550 of the California Water Code shall be used for non-potable irrigation uses within the designated Recycled Water Use Zone wherever there is not an alternative higher or better use for the recycled water, its use is economically justified, financially and technically feasible, and consistent with legal requirements, preservation of public health, safety and welfare, and the environment.

Accordingly, unless otherwise provided hereunder, all new development within the Recycled Water Use Zone shall be required to use recycled water for appropriate landscape irrigation. Planning, design and construction in such new development shall incorporate recycled water facilities in conformity with District

Standards, and such facilities shall be connected to and use District recycled water services. The District's determination of appropriate landscape irrigation uses shall be based on Standards and/or requirements for water of unrestricted use quality contained in Title 22 of the California Code of Regulations, as said provisions may from time to time be amended, and applicable requirements of the Department of Health Services for recycled water distribution operations.

2. Compliance with the requirements of this Ordinance shall be a condition precedent to the District's provision of new potable water services within the Recycled Water Use Zone.

3. New development within the Recycled Water Use Zone which the District Engineer or his or her designee determines meets at least one of the following criteria, shall be exempt from the requirements of this Ordinance:

a. Residential development that will contain no landscape areas owned in common requiring irrigation.

b. Development of single-family, detached residences for which no homeowners' or similar association or entity will have responsibility for irrigation system maintenance and operations.

c. Development of single-family, detached residences for which a homeowners' or similar association or entity will have responsibility for irrigation and maintenance operations, but only for individual parcels corresponding to each single-family detached residence ownership.

d. Development for which recycled water service is determined by the District Engineer or his or her designee not to be economical because of its distance from available or planned recycled water sources; and/or because irrigation demands within such development are very slight relative to overall water demands; and/or inadequate recycled water supply is available to serve the demand. Recycled water service that is not economical, as used herein, shall be determined by the District Engineer or his or her designee using such tests as he or she deems appropriate, and nothing in this Ordinance shall be construed to require that the District Engineer or his or her designee hold a hearing or take any evidence.

4. Existing potable water customers within the Recycled Water Use Zone shall be exempt from the requirements of this Ordinance except as set forth in subsections "a" or "b" below.

a. Landscape irrigation for property located within the area described in the Eastern Dublin General Plan Amendment, adopted by the City of Dublin May 10, 1993, shall not be exempt.

b. Any customers who received either a potable water connection or a construction permit (or both) containing conditions requiring use of recycled water or construction of recycled water facilities shall not be exempt.

5. Nothing in this Ordinance shall be construed to prohibit any existing customer from voluntarily applying for recycled water service. The District shall have the right to deny such application if the District Engineer or his or her designee determines that such recycled water service would not be economical because of its

distance from available or planned recycled water sources; and/or because anticipated irrigation demands served through that connection would be very slight relative to overall water demands; and/or because inadequate recycled water supply is available to serve the demand. Recycled water service that is not economical, as used herein, shall be determined by the District Engineer or his or her designee using such tests as he or she deems appropriate, and nothing in this Ordinance shall be construed to require that the District Engineer or his or her designee hold a hearing or take any evidence.

6. Procedures following determination

a. Each applicant or customer shall be notified in writing of any determination made under the preceding paragraphs (3, 4 or 5) and of the basis therefor. The notice, including any proposed conditions and time schedule for compliance, and, if applicable, a recycled water permit application, shall be sent to the applicant or customer by certified mail. The determination shall be final if the applicant or customer does not file a written notice of appeal in compliance with paragraph d within thirty (30) days after receipt of the notice of determination.

b. The applicant or customer may file a written notice of appeal with the District Secretary within thirty (30) days after any notice of determination to comply is delivered or mailed to the applicant or customer, and may request the Board to reconsider the determination or to modify the proposed conditions or schedule for conversion. The notice of appeal must specify

each ground of the appeal. The Board will act on the appeal after reviewing the record of the District Engineer's determination and the written notice of appeal, and such other information that the Board believes is necessary to review the District Engineer's determination. Nothing in this Ordinance shall be construed to require that the Board hold a hearing or take any evidence.

B. **Rules and Regulations Governing Use of Recycled Water**

1. **Purpose.** The purpose of these rules and regulations is to establish the requirements for the planning, design, construction, operation, and maintenance of customer-owned recycled water systems in compliance with District Standards and the requirements of other regulatory agencies, including the California Department of Health Services (DHS), San Francisco Bay Regional Water Quality Control Board (RWQCB) and the County Environmental Management Department (EMD).

2. **Recycled Water Use Guidelines.** The District Engineer shall prepare, maintain and update from time to time the Recycled Water Use Guidelines to implement these rules and regulations and to establish requirements and standards for the planning, design, construction, operation, and maintenance of customer-owned recycled water systems. Compliance with the Recycled Water Use Guidelines is a requirement of these rules and regulations. In the event of any conflicts between the Recycled Water Use Guidelines and these rules and regulations, these rules and regulations shall prevail.

3. **Need for Site Approval.** In addition, each recycled water use site must be reviewed and approved by the DHS

4. **Land Use Authorities.** Compliance with these rules and regulations will not excuse any requirements for approvals from land use authorities, which may include the submission of plans for the project to city or county departments, agencies, or districts, that have the authority to issue permits and requirements such as: plumbing, permits, building requirements, and planning criteria.

5. **Protection of Public Health.** Notwithstanding compliance with these rules and regulations, the District reserves the right to take any action necessary with respect to the operation of the customer's recycled water system to safeguard the public health. If at any time during construction or operation of the recycled water system, real or potential hazards are evidenced, such as cross connections with the potable system, improper tagging, signing, or marking, or unapproved/prohibited uses, the District reserves the right and has the authority to terminate immediately, without notice, recycled water service in the interest of protecting the public health.

6. **Recycled Water Use License.** The California Regional Water Quality Control Board requires that the District establish permitting, tracking, record keeping, monitoring, and inspection procedures for all water recycling. The Recycled Water Use License and referenced documents serve as this permit. The Recycled Water Use License constitutes permission for the customer to use recycled water in conformance with all District Standards, Codes, Ordinances, policies and these guidelines including any special site-specific requirements that may be identified. A standard form Recycled Water Use License and required referenced documents shall be included in the Recycled Water Use Guidelines.

7. **Recycled Water Systems Application Process.** Applicant, whether or not an existing potable water customer, shall prepare and submit a general Application for Services that includes a Recycled Water Service – Application/Supplemental Information in the form defined in the Recycled Water Use Guidelines.

8. **General Design Requirements.** To assure the protection of the public and those operating and maintaining the recycled water irrigation system, design of the customer-owned recycled water irrigation facilities is required to meet standards established by the California State Department of Health Services, and the District Engineer shall prepare, maintain and update from time to time the Standards.

9. **Design & Construction of Recycled Water Systems.** Applicant, whether or not an existing potable water customer, shall prepare and submit the construction plans for the required District-owned facilities and the customer-owned facilities in compliance with the requirements set forth in the Recycled Water Use Guidelines and the Standards. Upon approval of the design by the District Engineer, the applicant shall obtain all required permits and construct the recycled water facilities, subject to inspection by the City, County and the District, and shall arrange for testing of backflow prevention devices, testing for cross connections, and coverage testing, all in compliance with the requirements set forth in the Recycled Water Use Guidelines.

10. **On-Site Supervisor of Customer Facilities.** Each recycled water customer is required to designate, in compliance with the Recycled Water Use Guidelines, an On-site Supervisor who is knowledgeable about all facets of the system, and who

shall be responsible for the safe and efficient operation of the customer's recycled water system.

11. **Operation and Maintenance of Recycled Water Systems.** The customer, through the On-site Supervisor, shall operate and maintain the customer's recycled water system in compliance with the requirements set forth in the Recycled Water Use Guidelines.

12. **Emergency Procedures.** In case of a major earthquake, flood, fire, tornado, structural failure, or other incident, which could likely damage the recycled or potable water systems, the customer, through the On-site Supervisor, shall comply with of the emergency procedures' requirements of the Recycled Water Use Guidelines.

13. **Emergency Cross-Connection Response Plan.** In the event that a backflow incident or cross connection is suspected or occurs, the customer shall immediately implement the procedures set forth in the emergency cross-connection response plan of the Recycled Water Use Guidelines.

C. **Payment for Recycled Water Facilities**

Facilities required for provision of recycled water services shall be constructed and financed in conformance with the District Major Infrastructure Policy (Resolution No. 55-97), as said policy provides as of the effective date hereof or as it may from time to time be amended.

SECTION 4. DEFINITIONS

The following terms are defined for purposes of this Ordinance:

A. **Alameda County Environmental Management Department** (Alameda County EMD) - This agency is the local health protection agency for most areas of Alameda County.

B. **Applicant** - Any person or entity that applies for recycled water service under the terms of the appropriate regulations. The approved customer may be a different party than the applicant but must be specified in the Recycled Water Use License.

C. **Approved Use** - An application of recycled water in a manner, and for a purpose, designed in a Recycled Water Use License issued by the District and in compliance with all applicable regulatory agency requirements.

D. **Contra Costa County Environmental Management Department** (Contra Costa County EMD) - This agency is the local health protection agency for most areas of Contra Costa County.

E. **Cross Connection** - Any physical connection between any part of a water system used or intended to supply water for drinking purposes and any source or system containing water or substance that is not or cannot be approved as safe, wholesome and potable for human consumption. This includes direct piping between the two systems, regardless of the presence of valves, backflow prevention devices, or other appurtenances.

F. **Customer** - A person furnished recycled water service by the District.

G. **Customer Facilities** - Designates or relates to facilities owned or operated by a customer, downstream of the water meter, and typically consists of distribution and irrigation lines and appurtenances such as pumps, control valves and sprinklers. All customer system/facilities are the property of the user, and are to be maintained and operated by the user and/or their employees.

H. **Development** - (1) The placement or erection of any structure or other improvements and all alterations of the land and construction incident thereto for the purpose of changing the type, density, or intensity of use of land, which use(s) will (2) require one or more new potable water connections.

I. **District** - The Dublin San Ramon Services District

J. **Greenbelt Areas** - A greenbelt area includes, but is not limited to, golf courses, cemeteries, parks and landscaping.

K. **On-Site Supervisor** - The customer shall designate an On-site Supervisor to provide liaison with the District. This person shall be available to the District at all times, shall have the authority to carry out any requirements of the District, and shall be responsible for the installation, operation and maintenance of the recycled and potable water systems and also prevention of potential hazards.

L. **Point of Connection** - This is the point where the customer's system ties to the District's system. This is usually at the outlet of the water meter.

M. **Potable Water** - Water of a quality suitable for human consumption as defined in the State Safe Drinking Water Act, Health & Safety Code, Section 116275, Subdivision (e), as it may be amended from time to time.

N. **Potable Water Customer** - A person furnished potable water service by the District.

O. **Recycled Water** - Water produced by further treatment of secondary effluent and of a quality suitable for unrestricted irrigation as defined in Title 22, California Code of Regulations, Division 4, Environmental Health, Chapter 3, Reclamation Criteria, as it may be amended from time to time.

P. **Recycled Water Use License** - A license issued by the District to the customer, which outlines monitoring, self-inspection, reporting, and site-specific requirements. This license is required by the California Regional Water Quality Control Board. This license allows the customer to use recycled water in accordance with District Standards, Codes, Ordinances, policies and these guidelines and all applicable regulatory agency requirements.

Q. **Secondary Effluent** - Wastewater treated that meets the requirements of the District NPDES discharge permit governing wastewater disposal, as it may be amended from time to time.

R. **State of California Department of Health Services** (State DHS) – Refers to the State of California Department of Health Services, Drinking Water Field Operations Branch – San Francisco District.

S. **Water** - All water delivered to a customer by the District.

SECTION 5. FINDINGS IN CONFORMANCE WITH CEQA

This Board hereby finds, in its independent judgment, that the environmental impacts of the adoption of this Ordinance are adequately examined and described in the Final Environmental Impact Report for the City of Dublin Schaefer Ranch General Plan Amendment, the Contra Costa County Final Environmental Impact Report for Dougherty Valley Specific Plan and General Plan Amendment, and the DSRSD·EBMUD Recycled Water Authority Final Environmental Impact Report for the San Ramon Valley Recycled Water Program.

SECTION 6. EFFECTIVE DATE

This Ordinance shall be effective thirty (30) days after its adoption.

SECTION 7. REPEALER

Ordinance No. 280, entitled "Ordinance Implementing the Dublin San Ramon Services District Recycled Water Policy (Resolution No. 42-92), Establishing a Recycled Water Use Zone Corresponding to the Potable Water Service Area of the District, and Repealing Ordinance No. 276," adopted April 7, 1998, is hereby repealed.

Ord. No. 301

ADOPTED by the Board of Directors of the Dublin San Ramon Services District at its regular meeting held on the 6th day of April, 2004, passed by the following vote:

AYES: 5 – Directors Jeffrey G. Hansen, Thomas W. Ford, G.T. (Tom) McCormick, Richard W. Rose, Daniel J. Scannell

NOES: 0

ABSENT: 0

Daniel J. Scannell, President

ATTEST:

Nancy G. Hatfield, District Secretary

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3.0 Past, Present and Projected Water Demands

DSRSD's urban water system demands are described in this section. In conformance with the Water Conservation Act of 2009, baseline (base daily per capita) water use and interim and urban water use targets are included. Current water system demands are quantified by customer category and are projected over the planning horizon of the UWMP. These projections include system water losses and water use target compliance. Water sales to other agencies are not discussed because DSRSD does not sell water to other water agencies.

This section includes a detailed description of how DSRSD calculated its baseline and targets, following the technical methods and methodologies described in "Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use," published by DWR as Part II, Section M of the *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan* (Guidebook). DSRSD's approach and criteria for developing the required baselines and targets conform to Part II, Section D of the Guidebook, "Baseline and Target Determination."

3.1 Baselines and Targets

Water Code Section 10608.20(e)

In November 2009, SBx7_7, the Water Conservation Act of 2009 (Act), was enacted as part of a comprehensive water legislation package and subsequently incorporated into Division 6 of the California Water Code, commencing with Section 10608 of Part 2.55. The Act addresses both urban and agricultural water conservation. Urban provisions include the "20 x 2020 Water Conservation Plan," which sets a goal of reducing urban per capita water use by 20 percent statewide and directs urban retail water suppliers to set 2020 urban water use targets. DWR developed technical methodologies and criteria to ensure consistent implementation of the Act and to guide urban retail water suppliers in calculating baseline and compliance levels of water use. The technical methodologies and criteria are included in "Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use," (Methodologies) published by DWR as Part II, Section M of the *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan* (Guidebook). DSRSD followed these technical methodologies and criteria in developing its baseline and water conservation targets. Although DSRSD conducts water conservation efforts regionally with Zone 7 and the other retailers in the Livermore-Amador Valley, DSRSD is complying individually with the Act.

3.1.1 Baseline Water Use

Water Code Section 10608.20(e)

DSRSD is required to define a 10- to 15-year base (or baseline) period that will be used to develop its target levels of per capita water use by 2020. DSRSD must also calculate water use for a 5-year baseline period and use that value to determine a minimum required reduction in per capita water use by 2020.

The baseline is defined as the average gross water use per capita per day over a continuous 10-year period ending between December 31, 2004 and December 31, 2010. If DSRSD supplied at least 10 percent of its 2008 water demand with recycled water, an additional five years may be included in the baseline period, still ending between December 31, 2004 and December 31, 2010.[12] As shown in Table 3-1, 15 percent of the District's water demand in 2008 was met with recycled water. Therefore, DSRSD may select a range of 10 to 15 years for its base period. ***For baseline calculations, DSRSD selected the continuous 10-year period ending December 2005.***

The minimum water use reduction target to be achieved by 2020 is 95 percent (5 percent reduction) of a water supplier's "average gross water use," during a continuous 5-year period ending between December 31, 2007 and December 31, 2010.[13] ***For calculating the minimum required reduction in water use by 2020, DSRSD selected the continuous 5-year base period ending December 31, 2007.***

DSRSD's baseline determination is discussed below. Supporting data and calculations are included in Appendix F.

3.1.1.1 Gross Water Use

Water Code Section 10608.12(g)

DSRSD calculated gross water use in accordance with Methodology 1 of the Methodologies.[14] DSRSD's potable water distribution system is described in Section 2.2.3. DSRSD's gross water use is defined as the total volume of water entering DSRSD's potable water distribution system through five metered Zone 7 (DSRSD's sole water supplier) turnouts (shown on Figure 2-2d), over the course of a calendar year beginning January 1 and ending December 31. DSRSD's recycled water production and deliveries are not included in gross water use. Gross water use calculations for calendar years 1996 to 2005 are shown in Table F-1 in Appendix F, for the continuous 10-year base period ending December 31, 2005. Calculations for calendar years 2003 to 2007 are shown in Table F-2 in Appendix F, for the continuous 5-year period ending December 31, 2007.

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[12] Water Code Section 10608.12.(b).

[13] Water Code Sections 10608.22 and 10608.12.(b).(3).

[14] DWR, "Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan," Section M, p. 14-23.

3.1.1.2 Service Area Population

Water Code Section 10608.20(f)

DSRSD determined service area population in accordance with Methodology 2 of the Methodologies.[15] DSRSD's water service area boundary is shown in Figure 2-1 and its service area population is described in Section 2.3. DSRSD's water service area includes both the City of Dublin and the Dougherty Valley portion of San Ramon. Historical population in DSRSD's water service area is shown in Table F-3 in Appendix F.

In Alameda County, DSRSD's water service area is coterminous with the City of Dublin. In accordance with Methodology 2, DSRSD is a Category 1 water provider to the City of Dublin. The City of Dublin includes Camp Parks, the Federal Correctional Institution, and the Alameda County Santa Rita Jail. DSRSD's population estimates for the City of Dublin are consistent with the Department of Finance's population estimates.[16]

In Contra Costa County, DSRSD's water service area is the Dougherty Valley area. Prior to 2003, DSRSD did not provide water to Dougherty Valley. In the late 1990s and early 2000s, two developers, Shapell Industries of Northern California (Shapell) and Windemere BLC (Windemere), began building a master planned community in the area. Contra Costa County was the lead planning agency. Upon completion of infrastructure and occupancy of buildings, neighborhoods in Dougherty Valley were annexed to the City of San Ramon. In

Table 3-1. Base Period Ranges (DWR Table 13)

Base	Parameter	Value	Units
10- to 15-year base period	2008 total water deliveries	3939.23	MG
	2008 total volume of delivered recycled water	595.19	MG
	2008 recycled water as a percent of total deliveries	15%	percent
	Number of years in base period[1]	10	years
	Year beginning base period range	1996	
	Year ending base period range[2]	2005	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2003	
	Year ending base period range[3]	2007	

[1] *If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.*

[2] *The ending year must be between December 31, 2004 and December 31, 2010.*

[3] *The ending year must be between December 31, 2007 and December 31, 2010.*

15. Ibid, p. 24-29.

16. State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark. Sacramento, California, May 2010 for the City of Dublin.

accordance with Methodology 2 of the Methodologies, DSRSD is a Category 2 water provider to the Dougherty Valley portion of San Ramon.[17] Historical population estimates are based on residential units incorporated by the City of San Ramon and the census (2000) density factors of 3.02 persons per owner-occupied unit and 2.71 persons per renter-occupied unit for census tract 3551.04 for Contra Costa County. Historical population calculations for Dougherty Valley are shown in Table F-4 in Appendix F.

3.1.1.3 Base Daily Per Capita Use for 20 Percent by 2020 Baseline

Water Code Section 10608.20

Base daily per capita water use is defined as average gross water use, expressed in gallons per capita per day (GPCD), for a continuous, multiyear base period. DSRSD calculated its base daily per capita water use in accordance with Methodology 3 of the Methodologies.[18] Under Water Code Section 10608.20, DSRSD must select a 10- to 15-year continuous period, ending between December 31, 2004 and December 31, 2010, as the baseline for a 20 percent reduction in urban per capita water use. ***DSRSD selected the continuous 10-year period ending December 2005 as its base period.*** This selection excludes years when voluntary water reductions were requested by DSRSD. Therefore, DSRSD customers, who have successfully implemented water conservation measures in recent years, are not penalized.

Table 3-2. DSRSD Base Daily Per Capita Water Use - 10 Year Range for Baseline (DWR Table 14)

Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (GPCD)
Sequence Year	Calendar Year			
Year 1	1996	24,829	3.8084	160
Year 2	1997	23,928	4.1433	173
Year 3	1998	24,506	4.2518	174
Year 4	1999	25,045	5.8607	234
Year 5	2000	28,540	6.5779	230
Year 6	2001	32,740	7.8691	240
Year 7	2002	34,596	7.7915	225
Year 8	2003	38,547	8.0674	209
Year 9	2004	43,654	9.8000	224
Year 10	2005	51,339	8.5933	167
			Base Daily Per Capita Water Use	**204**

17. DWR, "Guidebook," p. 24-29.

18. Ibid, p. 30-35.

Table 3-3. DSRSD Base Daily Per Capita Water Use - 5 Year Range for Minimum Reduction Baseline (DWR Table 15)				
Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (GPCD)
Sequence Year	Calendar Year			
Year 1	2003	38,545	8.0674	209
Year 2	2004	43,654	9.8000	224
Year 3	2005	51,340	8.5933	167
Year 4	2006	55,598	8.7714	158
Year 5	2007	59,002	9.7172	165
			Base Daily Per Capita Water Use	**185**

DSRSD's calculation for base daily per capita water use is shown in Table 3-2. Gross water use and service area population were determined as indicated above. Supporting data is included in Appendix F. ***For DSRSD, base daily per capita water use is 204 GPCD***.

3.1.1.4 Base Daily Per Capita Use for Minimum Water Use Reduction Baseline

Water Code Section 10608.22

Under Water Code Section 10608.22, DSRSD must select a 5-year continuous base period, ending between December 31, 2007 and December 31, 2010, to use in calculating a minimum water use reduction by 2020. ***DSRSD selected the continuous 5-year period ending December 31, 2007.***

DSRSD's calculation for the minimum reduction baseline is shown in Table 3-3. Gross water use and service area population were determined as indicated above. Supporting data is included in Appendix F. ***For DSRSD, base daily per capita water use for the purpose of calculating minimum water use reduction is 185 GPCD.***

3.1.2 Water Use Targets

Water Code Section 10608.20(e)

DSRSD must set a 2020 water use target and a 2015 interim target using one of these four methods described in Water Code Section 10608.20(b):

- Method 1: 80 percent of the water supplier's baseline per capita water use; or,
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use, landscaped area water use, and CII uses; or,
- Method 3: 95 percent of the applicable state hydrologic region target as stated in the State's April 30, 2009, draft 20x2020 Water Conservation Plan; or,
- Method 4: Total potential water savings (a provisional method).

Regardless of the target method selected, DSRSD may need to adjust its 2020 target to achieve a minimum reduction in water use. If the calculated 2020 urban water use target is

higher than the minimum required reduction target, DSRSD must use the minimum required reduction target.

DSRSD will need to compare its actual water use in 2020 with its calculated targets to assess compliance. DSRSD will need to report interim compliance in 2015 as compared to an interim target, which is generally halfway between the baseline water use and the 2020 target level. The years 2015 and 2020 are referred to in the methodologies as compliance years. All baseline, target, and compliance-year water use will be calculated and reported in gallons per capita per day (GPCD).

DSRSD may set its water use target and comply individually, or as part of a regional alliance. ***DSRSD has elected to comply individually with the Water Conservation Act of 2009.*** In its 2015 or 2020 UWMP, DSRSD may revise its water use target. It may also change the method it uses to set its water use target and report it in a 2010 amended plan or in its 2015 UWMP. However, after submitting its 2015 UWMP, DSRSD will not be permitted to change target methods or its target for 2020.

In sum, DSRSD must comply by establishing 2015 and 2020 water use targets, demonstrate that its water use is in compliance with its targets, and report water use baselines, targets, compliance year water use, and supporting data in its UWMP. Water Code Section 10608.56 (a) states that a water supplier not in compliance will not be eligible for water grants or loans that may be administered by DWR or other state agencies. DSRSD is seeking state funding for its recycled water projects and intends to comply with these requirements.

3.1.2.1 Method Used to Determine Interim and Urban Water Use Targets

DSRSD has selected Method 1[19] to determine its interim and urban (2020) water use targets. DSRSD staff has conducted calculations using the methods listed above and found that Method 1 is most appropriate for the DSRSD service area. The method yields a reachable and maintainable target for DSRSD customers, without further hardship.

As described in Section 6, DSRSD has been aggressive in implementing water conservation measures in its service area. In June 2007, the DSRSD requested 10percent voluntary water conservation from its customers due to drought conditions and Delta pumping restrictions. In July 2009, DSRSD increased the voluntary reduction to 20 percent due to ongoing drought conditions and Delta pumping restrictions. These requests resulted in sharp decreases in per capita demand. DSRSD intends to maintain aggressive water conservation measures. However, implementing increasingly more restrictive water conservation efforts may place undue hardship on the communities that DSRSD serves.

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19. Water Code Section 10608.20(b)(1).

Table 3-4. DSRSD Interim and Urban Water Use Targets		
Method 1	**Compliance Year**	**Target (GPCD)**
Interim Target	2015	183
Urban Water Use Target	2020	163
Minimum Water Use Target	2020	175

3.1.2.2 Water Use Targets

Under Method 1, the urban water use target is 80 percent of the baseline shown in Table 3-2. DSRSD must meet this urban water use target by 2020. The interim target is halfway between the baseline and 80 percent of the baseline—90 percent of the baseline shown in Table 3-2. DSRSD must meet this interim target by 2015. Regardless of the target method selected, these targets may need to be adjusted further to achieve a minimum reduction in water use of 5 percent of the baseline shown in Table 3-3.

DSRSD's interim (2015) and urban (2020) water use targets and minimum water use target requirement are shown in Table 3-4. Because the minimum water use target is greater than the urban water use target calculated using Method 1, DSRSD's urban water use target does not need to be adjusted.

On May 17, 2011, at its regularly scheduled board meeting, the DSRSD Board of Directors will hold a public hearing to discuss compliance with the Water Conservation Act of 2009. The following points will be discussed:

- baseline determination and base daily per capita use,
- baseline for minimum water use reduction,
- method used to determine interim and urban water use targets,
- interim and urban water use targets,
- minimum water use reduction target,
- implementation plan for complying with the Water Conservation Act of 2009, and
- impacts to the communities that DSRSD serves.

The general public will have the opportunity to comment at this public hearing. Comments will be collected and addressed in the finalized 2010 UWMP, which will be presented for adoption at the June 7, 2011 regularly scheduled DSRSD Board of Directors meeting. At that time, the DSRSD Board of Directors will adopt a resolution to adopt the method used for determining water use targets. A copy of the resolution will be included in Appendix D.

3.2 DSRSD Water Demands

Water Code Sections 10631(e)(1) and (2), and 10631.1(a)

3.2.1 Metered Projections

DSRSD's past, current, and projected potable water and recycled water deliveries are shown in five-year increments, from 2005 to 2035, in Table 3-5 and Figure 3-1. All DSRSD water deliveries are metered. DSRSD provides potable water services to the following sectors: single family residential, multifamily, commercial, industrial, institutional and governmental, and landscape irrigation. As discussed in Section 4.5, recycled water use in DSRSD's service area is primarily for landscape irrigation, with some incidental use at construction sites in the developing areas of Dublin. The processes by which DSRSD projects demand and its future number of accounts are described in Sections 3.2.1.1 and 3.2.1.2, respectively.

Water entering the DSRSD potable water distribution system is metered at the Zone 7 water turnouts, shown in Figure 2-1. Turnouts 1, 2, 4, and 5 operate continuously under normal conditions. Turnout 3 is normally held in reserve for emergency conditions. All the turnouts have Zone 7-owned magnetic meters installed that record water purchases by DSRSD. Turnouts 1, 2, 4, and 5 also contain meters operated by DSRSD to double-check the Zone 7-owned meters. Zone 7's meters are considered the meters of record. All meters are calibrated quarterly by independent third parties and witnessed by DSRSD field operations personnel. The meters are calibrated by comparing the electronic response of the metering elements to established standards. These meters are not calibrated volumetrically. Generally, calibrations have indicated only very small discrepancies between the measured values of the metering elements and the published standards for those meters. If the meters require adjustment, the adjustments are made at the time of the meter calibrations.

Water distributed to DSRSD customers is metered at the points of connection. Typically, single family residential, multifamily, commercial, industrial, institutional, and governmental water uses are metered in hundred cubic feet increments using magnetic drive positive displacement or compound water meters. Irrigation water uses are typically metered in hundred cubic feet increments using magnetic drive turbine meters. Actual meters are selected based on the flow range required for the use while providing maximum accuracy. Meter readings are taken on a bimonthly basis. To ensure accuracy of water meters, DSRSD maintains a meter replacement program. Water meters are replaced when they approach the end of their warranty period—either by age (15 years for 5/8-inch water meters or 10 years for larger meters) or by the volume of water passed through the meter.

Table 3-5. DSRSD Actual and Projected Metered Water Deliveries[1] (AFA) (DWR Tables 3, 4, 5, 6 and 7)														
	Actual 2005		Actual 2010		2015		2020		2025		2030		2035	
Water Use Sectors	# of accounts	Volume	# of accounts	Volume	# of accounts	Volume	# of accounts	Volume	# of accounts	Volume	# of accounts	Volume	# of accounts	Volume
Potable Water														
Single family	10,050	5,084	13,642	4,566	15,834	5,300	19,793	6,625	21,405	7,164	22,217	7,436	22,565	7,553
Multifamily	1,751	998	2,019	1,226	2,563	1,556	3,805	2,311	4,046	2,457	4,336	2,633	4,404	2,675
Commercial	947	1,576	1,218	835	1,982	1,359	2,166	1,485	2,415	1,655	2,527	1,732	2,569	1,761
Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Institutional/ governmental	69	763	106	798	232	1,747	274	2,064	304	2,291	307	2,310	311	2,340
Landscape	453	1,206	686	1,376	1,120	2,247	1,338	2,683	1,504	3,017	1,587	3,183	1,613	3,235
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potable Water Subtotal	***13,270***	***9,627***	***17,671***	***8,801***	***21,731***	***12,209***	***27,375***	***15,167***	***29,674***	***16,584***	***30,973***	***17,294***	***31,463***	***17,564***
Recycled Water	***2***	***423***	***283***	***1,264***	***452***	***2,017***	***732***	***3,271***	***860***	***3,841***	***885***	***3,952***	***910***	***4,064***
Total	**13,272**	**10,050**	**17,954**	**10,065**	**22,183**	**14,226**	**28,108**	**18,438**	**30,534**	**20,425**	**31,858**	**21,246**	**32,373**	**21,628**

[1] *All of DSRSD's water deliveries are metered. There are no unmetered water deliveries in DSRSD's service area.*

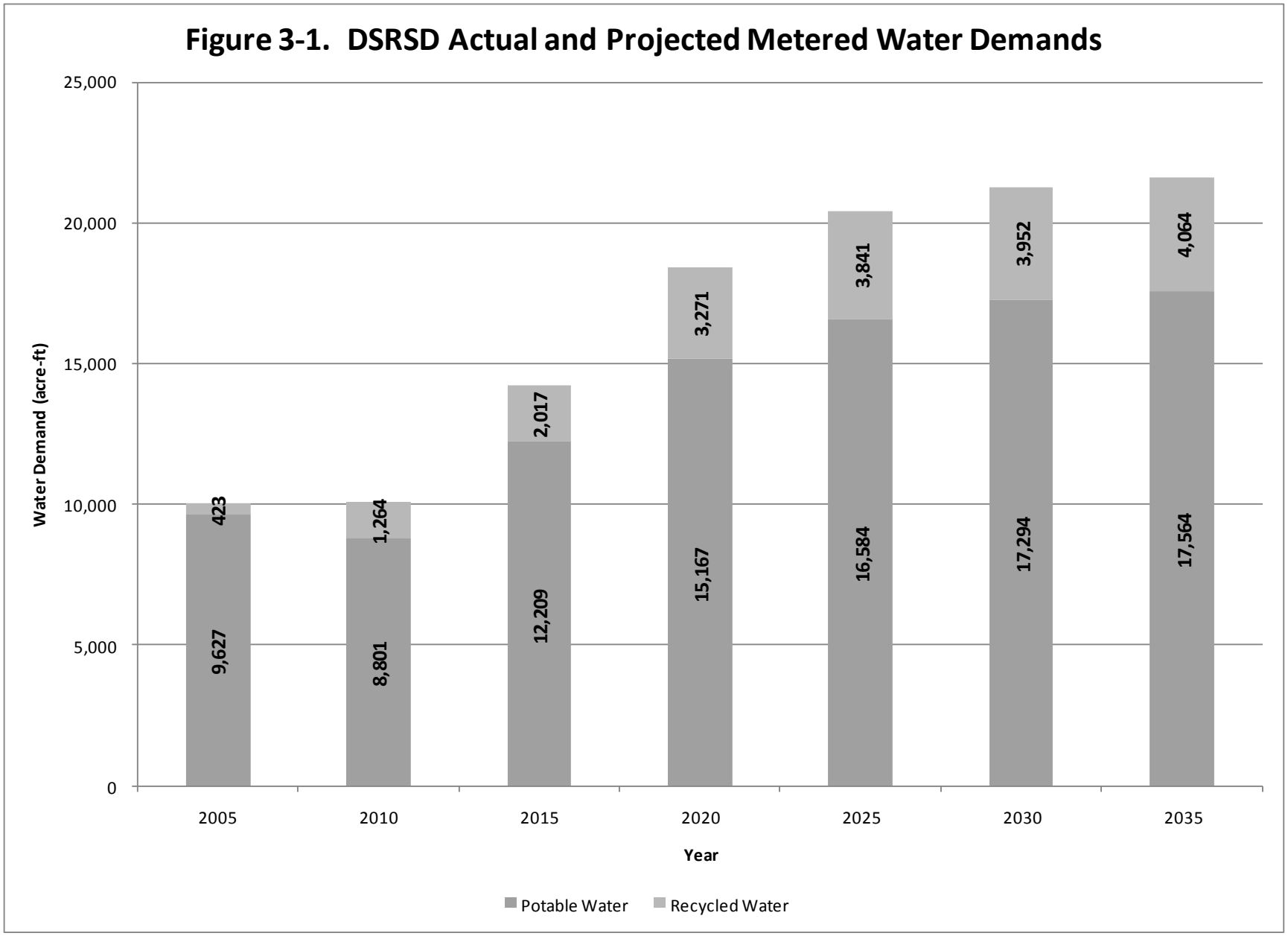
Figure 3-1. DSRSD Actual and Projected Metered Water Demands
25,000
20,000
15,000
10,000
5,000
0
Water Demand (acre-ft)
9,627
423
8,801
1,264
12,209
2,017
15,167
3,271
16,584
3,841
17,294
3,952
17,564
4,064
2005
2010
2015
2020
2025
2030
2035
Year
Potable Water
Recycled Water

3.2.1.1 Development of Water Demand Projections

DSRSD projects water demand based on the land uses in the general plans adopted by the cities and counties in its service area. Existing land uses are the starting point for DSRSD projections. The approved general plans of the City of San Ramon and the City of Dublin detail land uses at buildout in those cities, and DSRSD uses these projections as its endpoint. To fill in the land uses of the as-yet undeveloped areas, DSRD uses the most recent schedule from the developer or the city planning departments. For some distant future projects, the schedule for development is based on the best judgment of DSRSD's Planning Division. In this way, the complete schedule for future land uses is incorporated into water demand projections; and, as development plans for individual parcels change, those changes are incorporated into the buildout demands.

In its *2005 Water System Master Plan*, DSRSD derived factors for water demand for various land uses in gallons per day per unit, or gallons per day per square foot. Thus, the water demand for each land use is the number of units for that specific land use times the water demand factor. The water demand for the development project is, thus, the sum of the water demand for the different land uses in that project. In March 2011, DSRSD began a review of those factors for residential land uses based on the changes seen since the DSRSD Board of Directors called for voluntary water conservation in 2007. Changes in the factors are used in this UWMP.

3.2.1.2 Development of the Number of Future Accounts

DSRSD's computerized water and sewer billing system is based on accounts for service. The billing system divides services into major divisions: potable water, recycled water and sanitary sewer services. The billing system also categorizes the potable water and recycled water accounts into type of water delivered (potable or recycled), various account types (single family, condominium, general commercial, school, irrigation, etc.), and the location (by city) of the account. For the purposes of this UWMP, DSRSD correlated these various account types with the water sectors listed in the DWR Guidebook: single family, multifamily, commercial, industrial, institutional/ governmental, landscape, agricultural, and other. DSRSD has no industrial or agricultural accounts. Water used by contractors during construction is sold through construction meters, which are classified in the commercial sector.

DSRSD tabulated and summed up the number of accounts in each UWMP water sector. Single family homes are individual accounts. However, the other categories do not have a one-to-one ratio for the number of accounts and the land use on the land parcel. For example, one account may serve several multifamily residences, or several accounts may be used for one institutional customer. DSRSD calculated the ratio of the number of accounts for the current water demand in each of the water sectors. The same ratio was applied to the future water demand to forecast the number of accounts in each water sector for any given year.

Table 3-6. Low-income Projected Water Demands (AFA) (DWR Table 8)					
Low Income Water Demands	**2015**	**2020**	**2025**	**2030**	**2035**
Single family residential	84	91	102	113	124
Multifamily residential	538	577	596	615	634
Total	**622**	**668**	**698**	**728**	**758**

3.2.2 Lower Income Households

The projections shown in Table 3-5 include water use for single family and multifamily residential housing needed for low-income households[20], as identified in the City of Dublin's and the City of San Ramon's *Housing Elements*. The number of low-income households in Dougherty Valley was obtained from the *Gale Ranch October 14, 2010 Annual Compliance Report* by Shapell Homes, and *Windemere October 15, 2010 Annual Compliance Report* by Windemere BLC. These annual compliance reports, prepared by the two major developers in Dougherty Valley, provide status reports on construction activities and discuss future efforts. In Table 3-6, the water use projections are shown for low-income households. At buildout, water demand for low-income households will account for less than four percent (758 acre-feet) of the total potable water demand in DSRSD's service area.

3.2.3 Water Sales to Other Agencies

DSRSD's past, current and projected water sales to other water agencies are listed in Table 3-7. ***DSRSD does not sell potable water to any other water agencies.*** As discussed in Section 4.5, DSRSD produces recycled water at its Recycled Water Treatment Facilities (RWTF) located at its regional wastewater treatment plant. Recycled water is produced and supplied to DERWA, the wholesale recycled water provider to both DSRSD and EBMUD customers. Recycled water delivered to EBMUD is shown in this table.

Table 3-7. DSRSD Sales to Other Water Agencies (AFA) (DWR Table 9)							
Water Distributed	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Potable Water	0	0	0	0	0	0	0
Recycled Water to DERWA for EBMUD	20	1,248	2,086	3,048	3,048	3,048	3,048
Total	**20**	**1,248**	**2,086**	**3,048**	**3,048**	**3,048**	**3,048**

20. Defined as 80 percent of median income, adjusted for family size.

Table 3-8. Additional DSRSD Water Uses and Losses (AFA) (DWR Table 10)							
Water Use[1]	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Saline Barriers	0	0	0	0	0	0	0
Groundwater Recharge	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0
Raw Water	0	0	0	0	0	0	0
Recycled Water[2]	465	465	465	465	465	465	465
Potable Water System Losses	507	463	643	798	873	910	924
Total	**972**	**928**	**1,108**	**1,263**	**1,338**	**1,375**	**1,389**

[1] *Any water accounted for in Table 3-1 are not included in this table.*

[2] *Recycled water used for internal WWTP landscape and water to facultative sludge lagoons to replace evaporation.*

3.2.4 Other DSRSD Water Use and Losses

Additional DSRSD water use and losses are shown in Table 3-8. DSRSD does not purchase nor sell raw water. No water use is delivered for agricultural, saline water intrusion barriers, groundwater recharge, or conjunctive use because these uses are not practiced in DSRSD's service area. No such uses are planned in the future. DSRSD uses recycled water at its wastewater treatment plant for landscape irrigation and to replace evaporation at the facultative sludge lagoons. This recycled water use has been historically constant and is expected to remain constant.

Potable water system loss projections also are included in Table 3-8. Water from DSRSD's wholesale supplier, Zone 7, is metered at five existing turnouts as it enters DSRSD's potable water distribution system. DSRSD meters water deliveries to its customers. The difference between the metered water at the turnouts and the metered water deliveries is the water losses (or unaccounted water). DSRSD tracks unaccounted water closely; historically it has remained at less than seven percent of total Zone 7 water deliveries. DSRSD anticipates unaccounted water to comprise five percent of total Zone 7 water deliveries over its planning period.

3.2.5 Total Water Demands

As discussed in Section 2.3, DSRSD's service area population is expected to increase by 50 percent between 2010 and its buildout in 2030 due to significant planned development. As shown in Table 3-9, DSRSD's total water demand is expected to increase by 113 percent between 2010 and 2035. The disparity between the two data parameters is because of a significant increase in the residential sector, and more significant increases in the commercial, institutional/governmental, and landscape irrigation sectors. Additionally, in water use in 2010 is lower than historical water use despite increase in the number of accounts because of DSRSD customers' water conservation efforts. In 2007, DSRSD requested voluntary water conservation due to the drought situation and because of limited

Table 3-9. DSRSD Total Water Demand Projections (AFA) (DWR Table 11)

Water Use	2005*	2010*	2015	2020	2025	2030	2035
POTABLE WATER							
Total potable water deliveries (from Table 3-5)	9,627	8,801	12,209	15,167	16,584	17,294	17,564
Potable water sales to other water agencies (from Table 3-7)	0	0	0	0	0	0	0
Additional potable water uses and losses (from Table 3-8)	507	463	643	798	873	910	924
Total Potable Water Demand	**10,134**	**9,264**	**12,851**	**15,965**	**17,457**	**18,204**	**18,488**
RECYCLED WATER							
Total recycled water deliveries (from Table 3-5)	423	1,264	2,017	3,271	3,841	3,952	4,064
Recycled water sales to other water agencies (from Table 3-	20	1,248	2,086	3,048	3,048	3,048	3,048
Additional recycled water uses and losses (from Table 3-8)	465	465	465	465	465	465	465
Total Recycled Water Demand	**908**	**2,977**	**4,568**	**6,784**	**7,354**	**7,465**	**7,577**
Total	**11,041**	**12,241**	**17,419**	**22,749**	**24,811**	**25,669**	**26,065**

**Actual Water Use*

deliveries from the Delta. DSRSD customers responded with a 21% water use reduction per account. DSRSD's historical and projected population and water demands are illustrated in Figure 3-2. From 2006 to 2010, DSRSD service area population increased while its total water demand decreased. DSRSD anticipates some rebound in its customers' water conservation efforts and has incorporated the rebound in its projections. As shown in Figure 3-2, the projected water demand curves are parallel to the projected population curve.

As shown in Table 3-9 and in Figure 3-2, DSRSD anticipates increases in its recycled water demands. A portion of the projected water demand, primarily landscape irrigation, will be met with recycled water. DSRSD's potable water demands will be met by water supply from Zone 7. DSRSD has shared these projections with Zone 7, its water wholesaler.

Figure 3-2. Historical and Projected Population and Water Demands

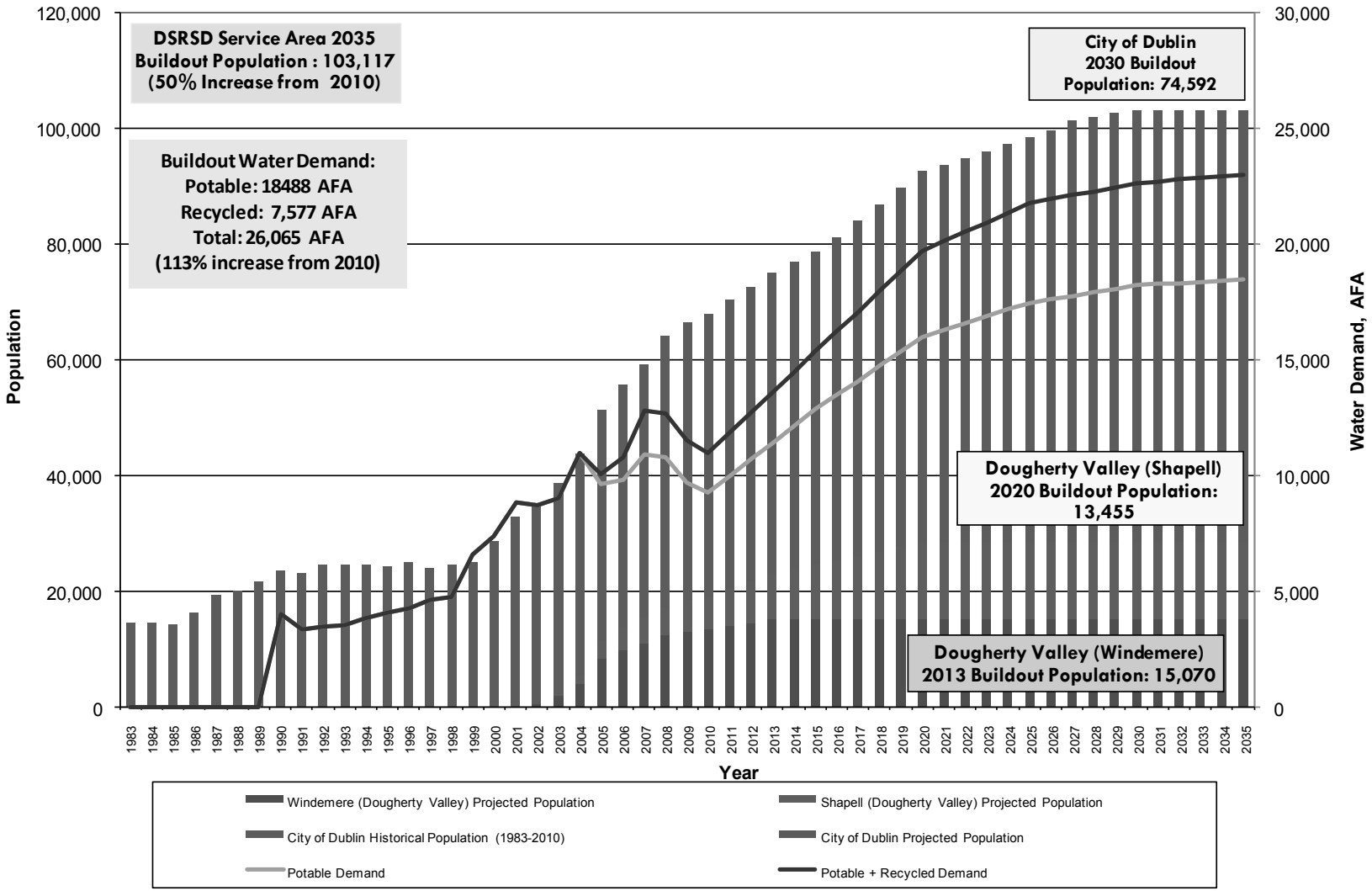

Table 3-10. Comparison of Projected Potable Gross Water Use to Targets		
	Year	
Parameter	2015	2020
Projected Gross Water Use		
Total Potable Water Demand from Table 3-5 (AF)	12,209	15,167
Potable Water System Losses from Table 3-8 (AF)	643	798
Total Projected Gross Water Use (AF)	12,851	15,965
Total Projected Gross Water Use (gpd)	11,472,827	14,252,742
Projected Population	78,637	92,564
Projected Potable Water Demand (GPCD)	**145.9**	**154.0**
Target (GPCD)	**183.4**	**163.0**
Meets or Surpasses Water Conservation Target?	**Yes**	**Yes**

3.2.6 Consistency of Projected Water Demands to Interim and Urban Water Use Targets

DSRSD's projected potable gross water use is compared to the interim and urban water use targets determined in Section 3.1.2 in Table 3-10. As defined in Section 3.1.1, gross water use is the total volume of water entering DSRSD's potable water distribution system through five metered Zone 7 (DSRSD's sole water supplier) turnouts. The gross water use is, therefore, the total metered potable water deliveries to DSRSD's customers shown in Table 3-5, plus the potable water system losses in Table 3-8. As shown in Table 3-10, DSRSD's projections for 2015 and 2020 are at or below the water conservation targets.

3.

3 Projected Wholesale Water Demands

Water Code Section 10631(k)

DSRSD provides projected water demands to Zone 7 annually, covering the next five years (in monthly increments) for water delivery and scheduling purposes. DSRSD also provides longer term projections for the subsequent five years (in annual increments) as part of Zone 7's rate study process and UWMP preparation.

DSRSD prepared its potable water demand projections in mid-2010 for incorporation in Zone 7's 2010 UWMP, which was adopted on December 15, 2010. DSRSD's mid-2010 projections are included in Table 9.4 of Zone 7's UWMP.

Table 3-11. DSRSD Demand Projections Provided to Wholesale Supplier (AFA) (DWR Table 12)

Wholesaler	Contracted Volume	2010	2015	2020	2025	2030	2035
Zone 7 Water Agency[1]	No Limit[2]	10,900	12,900	15,700	18,200	19,800	19,800
Zone 7 Water Agency[3]	No Limit[2]	9,300	12,900	16,000	17,500	18,300	18,500
DSRSD Recycled Water[4]	No Limit	1,800	2,500	3,800	4,400	4,500	4,600

[1] Provided to Zone 7 Water Agency February 2, 2010. Incorporated in Zone 7's 2010 UWMP, Table 9-4, adopted December 15, 2010. Rounded up to the nearest 100 acre-ft.

[2] DSRSD is required to provide Zone 7 five-year water demand projections annually.

[3] Revised DSRSD demand projections based on input from Cities and Counties in DSRSD Service Area during preparation of DSRSD's 2010 UWMP and implementation of Water Conservation Act requirements. Rounded up to the nearest 100 acre-ft.

[4] DSRSD treats recycled water at its RWTF. See Section 4.5 for discussion on recycled water production limitations, and efforts to expand recycled water production.

During the preparation of its own UWMP, DSRSD revisited its projections. DSRSD received input from the cities and counties in its jurisdiction and developers with active development projects in its service area. DSRSD also reviewed and revised water projection factors applied to land uses to reflect the results of the District's water conservation programs and the Water Conservation Act of 2009. DSRSD has revised its potable water demand projections to reflect these factors.

The projections provided by DSRSD to Zone 7 are shown in Table 3-11. The first row of projections was included in Zone 7's 2010 UWMP. The second row of projections shows the revised projections determined during the preparation of this UWMP. These revised projections were provided to Zone 7 prior to adoption of this UWMP.

DSRSD's projections for recycled water demand are also shown in Table 3-11.

3.4 Water Use Reduction Plan

Water Code Section 10608.26

DSRSD has a strong commitment to reducing potable water demand through conservation and use of recycled water. DSRSD has been a member of the California Urban Water Conservation Council (CUWCC) since 1991. It has pursued the development of a recycled water use program since the early 1990s.

To the fullest extent practical, DSRSD's water conservation program conforms to water conservation best management practices (BMP). In 2009, CUWCC restructured its BMPs to

correlate to the demand management measures (DMMs) identified in the UWMP Act, Water Code Section 10631(f). DSRSD's current water conservation policies and programs are described in Section 6.

Additionally, DSRSD has been delivering recycled water since 1999. In 2010, it met more than 15 percent of its total water demand with recycled water. DSRSD's recycled water program, along with future projected use, is discussed in Section 4.5.

DSRSD's current water conservation and recycled water use has been so successful that its customers' daily per capita water use in 2010 is well below the 2020 urban water use target. However, much of the conservation achieved may be due to short-term changes in behavior. DSRSD anticipates a rebound in demand as customers revert to some of their pre-drought water use habits. Recycled water continues to be part of DSRSD's plan to permanently reduce potable water demand. As described below, DSRSD has developed strategies and a water conservation program to ensure that it maintains compliance with the Water Conservation Act of 2009.

3.4.1 Implementation Plan For Water Conservation Act Of 2009

DSRSD's plan to implement and maintain the requirements of the Water Conservation Act of 2009 are part of its Strategic Plan and its Water Conservation Program.

3.4.1.1 Strategic Plan

DSRSD's strategy for complying with the Water Conservation Act of 2009 is woven into its *Strategic Plan FY 2010-2014, Second Edition*, a top level planning document that sets a clear direction over all operational aspects of the agency's mission and serves as a framework for decision making. DSRSD developed a five year Strategic Plan in 2008 and reviews and updates it annually. The DSRSD Board adopted the latest version of the Plan on March 16, 2010; relevant sections are included in Appendix G of this UWMP. In this plan, DSRSD identifies current and future actions, activities, and planning that are needed for continued success in operations and management. These elements are incorporated in DSRSD's programs and policies.

Strategic Element #3 addresses management of water supply and recycled water. The District's overall objective is to ensure sustainable supply by prudently managing all water and wastewater resources and by pursuing and securing new water sources.

DSRSD objectives under Strategic Element #3.1, "Water Supply," are to ensure that adequate water supplies of acceptable quality are available for existing and future customers and that these supplies are delivered to customers in an environmentally friendly manner while achieving the water use reduction mandates imposed by the State of California.

DSRSD established the goals listed below and developed work plans associated with these goals.[21]

- Goal 3.1.1: Assess the water supply and ability to serve.
- Goal 3.1.2: Optimize amount of deliverable water.
- Goal 3.1.3: Secure new water supplies.
- Goal 3.1.4: Improve water quality.
- Goal 3.1.5: Permanently reduce potable water demand and move toward achieving the mandated 20 percent reduction in water use by 2020.

DSRSD objectives under Strategic Element #3.3, "Recycled Water," is to maximize the beneficial use of recycled water resources, both within the District and throughout the region, in order to reduce demand for imported water and thereby increase the reliability of the overall water supply. DSRSD established the goals listed below and developed work plans associated with these goals.[22]

- Goal 3.3.1: Secure additional wastewater from other sources.
- Goal 3.3.2: Extend recycled water service.
- Goal 3.3.3: Promote regional cooperation of recycled water.

During the preparation of this UWMP, DSRSD has been developing an update to its *Strategic Plan FY 2010-2014, Second Edition*. DSRSD plans to revise Goal 3.1.5 in light of its customers' success in conserving water. Additionally, DSRSD plans to add the following goals to Strategic Elements #3.1 and #3.3.

- Goal 3.1.6: Provide adequate water supply.
- Goal 3.3.4: Seek financial assistance for recycled water projects.

The proposed revisions are shown in Appendix G.

As indicated by the goals, DSRSD is seeking to increase the overall reliability of its water systems and to lessen its reliance on imported water. When achieved, these goals will permanently reduce DSRSD's potable water demand, expand DSRSD's water supply, limit water supply reliance on the Delta, and meet the 2020 urban water use target.

3.4.1.2 Water Conservation Program

DSRSD's water conservation program includes the DMMs detailed in Section 6. Its current conservation efforts and its water conservation rates were established to address varying hydrological conditions, including droughts. DSRSD plans to maintain its current efforts. However, DSRSD must meet the Water Conservation Act of 2009's mandate to achieve a permanent reduction of 20 percent per capita by 2020. Furthermore, DSRSD is directly affected by the condition of the Delta, from which DSRSD's water supply must be pumped. The Delta has continued to deteriorate and DSRSD's water supply has become even less

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21. DSRSD, *Strategic Plan FY 2010-2014, Second Edition*, Updated March 2010, 20-23.

22. Ibid, p. 25-27.

reliable. Work is under way that is intended to correct the decline in the Delta ecosystem and that would restore water supply reliability to acceptable levels, but even the most optimistic water managers acknowledge that the time frame to implement such a fix is measured in decades. For all these reasons, it is important for DSRSD to investigate and implement, as appropriate, water conservation efforts that will lead to permanent water use reduction in its service area.

Currently, customers have reduced their water demand by 21.0 percent per account, compared to the average water use per account from July 2006 to June 2007, the 12 months prior to DSRSD's request for 10 percent voluntary water use reduction. In July 2009, DSRSD declared a Stage 1 water shortage and asked for 20 percent voluntary water use reduction in response to ongoing drought conditions and continued SWP pumping restrictions. Because of its customers' efforts, DSRSD currently meets and exceeds the 2020 urban water use target of 163 GPCD; DSRSD's 2010 potable water demand is 121 GPCD. If DSRSD were to back off its water conservation request at this time, much of the behavioral demand reductions that have been gained through the conservation efforts of the last few years may be negated. Accordingly, DSRSD plans to maintain the current level of conservation as the foundation of a comprehensive water conservation program and build on that foundation by investigating and implementing, as appropriate, permanent demand reduction programs that are shown to be effective and affordable.

DSRSD also plans to continue to connect future, planned development projects to recycled water in accordance with DSRSD Code Section 3.20.110, Duty to connect—Recycled water (included in Appendix H). With this combination, and prudent, incremental implementation of demand reduction programs listed below, DSRSD plans to meet and maintain its 2020 urban water use target through buildout.

WATER CONSERVATION PROGRAMS

History has shown that the public responds to every drought by using less water. However, history has also shown that usage rebounds after the drought is over. This indicates that much of the measured reduction during a drought is behavioral, not structural. It is unknown whether usage will again rebound after the most recent drought and how that will affect DSRSD's ability to continue meeting its 2020 urban water use target.

To address this uncertainty, DSRSD plans to continue to monitor the level of customer conservation and implement demand reduction measures in response to increasing demand. Even if conservation goals continue to be met, DSRSD will continue public outreach and education in order to minimize the effects of customer behavior on maintaining the 2020 urban water use target. Various possible demand reduction programs are discussed below, including some current programs. The intent is to consider this initial list of programs if it becomes necessary to reduce potable water demand. DSRSD will critically evaluate each program to determine risk, cost, and potential reduction and prioritize implementation based on these three parameters.

The following programs are in progress.

- Recycled Water *(structural system)*: DSRSD is seeking to expand its recycled water distribution system to established, developed areas of Dublin in accordance with Strategic Goal 3.3.3. DSRSD has included the Central Dublin Recycled Water Distribution and Retrofit Project in its Capital Improvement Program (CIP) as one of several projects created to meet this goal. This project is under design and staff is guardedly optimistic that a $1 million Proposition 84 Implementation Grant will be awarded in June 2011. While the federal grant has not been approved, the state grant will allow 40 percent of the project to be built, reducing demand by 95 acre feet per year (AFA). The remainder of the project, when built, will reduce demand by an additional 145 AFA.

  Several other recycled water distribution projects are planned in DSRSD's CIP. Staff recently submitted a planning grant application to the U.S. Bureau of Reclamation (USBR) to extend recycled water distribution to western Dublin and Camp Parks. The goal is to bring these projects in service by 2020. These projects represent another 245 AFA in demand reduction.

- Zone 7 Rebate Program *(structural customer)*: Zone 7 currently supports a number of rebate programs that the District advertises and manages within its service area. The current programs are as follows:
  - High efficiency toilet replacement in residential, multifamily, and commercial locations
  - High efficiency urinal replacement in commercial locations
  - High efficiency clothes washing machine replacement in residential locations
  - Large landscape irrigation equipment replacement for audited sites
  - Commercial Ecoblue Cube program

  District staff meets monthly with Zone 7 and the other retailers regarding water conservation. As a result of this collaboration, Zone 7 plans to launch the following new rebate programs on July 1, 2011:
  - Residential and commercial turf replacement
  - Commercial and residential smart irrigation controllers
  - Direct install high efficiency toilets and urinals for commercial locations
  - Direct install high efficiency toilets for residential locations
  - Residential and commercial replacement of spray irrigation with drip systems

- Smart Irrigation Controllers *(structural customer)*: The District has installed 17 smart irrigation controllers as a test program. While it will take some time to develop an adequate use history to fully evaluate the success, a 9 percent decrease in water use was documented between 2009 and 2010. The benefits of this program probably outweigh the risks associated with customer influence and Zone 7 is planning to add smart irrigation controllers to the rebate program.

- Efficient Urinals *(structural customer)*: District staff has been promoting one type of low water using urinal system as marketed by Ecoblue as a pilot test. Staff has

concluded that it is a low cost way to save water. The Ecoblue Cube product, and potentially other similar products, also provides a strong conservation message on a regular basis to the male population. Zone 7 also provides rebates for high efficiency urinals.

- Landscape Audits *(behavioral)*: District staff performs residential landscape audits when requested and Zone 7 funded two large landscape audits in the District service area. Residential landscape audits do not directly return a large water use reduction, but audits are excellent customer outreach opportunities for water conservation in general and should be undertaken to the limit of staff availability. The initial large landscape audits by Zone 7 were disappointing and Zone 7 is retooling the program for July 2011. Many of the large landscape irrigators already practice good demand management.

The following programs may be considered for implementation in the future.

- Turf Replacement *(structural customer)*: Review of turf replacement programs in the Bay Area indicates that they are a reasonably cost-effective way to reduce water use. Replacement would require water wise planting, mulching, and drip irrigation. While there is some customer influence (the turf could be replaced by the owner at some future date), the risk is low enough to consider this structural reduction in water use. The risk can be partially mitigated through recorded deed restrictions. Zone 7 is planning to launch a residential and commercial turf replacement rebate on July 1, 2011.

- City Ordinances *(structural system)*: The District may partner with the cities of Dublin and San Ramon to enact other water saving ordinances. One example is replacement of fixtures with high efficiency fixtures upon sale of property. Another is updating landscape ordinances to reduce demand, such as by minimizing turf, and requiring water wise planting, mulching, and drip irrigation.

- Water Budgets *(behavioral)*: One BMP is to establish water budgets for landscape accounts. Customers would be surcharged for exceeding their water budget, and any funds collected could be used to support other conservation activities.

- Residential Recycled Irrigation *(structural system)*: Irrigation of front landscaping with recycled water on residential lots can be permitted and is practiced in a few locations around the state. In general, unless recycled water is already adjacent to the neighborhood, the demand may not be adequate to justify the capital investment. However, where it is available, it is cost effective. It may be much more cost effective in retrofit areas of the District with larger lots. The FYE 2012 CIP budget contains funds to develop a pilot single family recycled water program.

- Graywater *(behavioral)*: Regulations and standards are in place for graywater systems and a number of companies now sell graywater systems for homes. These

systems are very expensive for the quantity of water saved. The systems are maintained by the homeowner; if maintenance is not done properly, the systems can become a health risk. Because of the high risk and low economic return, staff recommends that the District not invest in graywater systems. However, the District should make available information on the proper installation and maintenance of graywater systems to any interested customers.

- Rain Water Capture *(behavioral)*: A number of companies now install rain water capture systems. Given the local climate and cost of these systems, the unit cost of water is extremely high. These systems also need a high level of customer monitoring for proper operation. Because of the low economic return, staff recommends that the District not invest in rain water capture systems. However, the District should make available information regarding the proper installation and operation of rain water capture systems to any interested customers.

PUBLIC OUTREACH

Ongoing public outreach is critical to the water conservation program. The distribution of in-home water saving devices is primarily structural. Outreach is also beneficial in changing customer habits, which also become structural. Marketing the available rebate programs through outreach will also result in structural changes. Finally, an aggressive outreach program minimizes the risk of reduction measures being eroded over time by customer influence. The risk associated with both behavioral and customer influenced structural measures needs to be considered when allocating DSRSD funds to a particular measure. Even if conservation goals continue to be met, DSRSD will continue public outreach and education in order to minimize the effects of customer behavior on maintaining the 2020 urban water use target.

3.4.2 Economic Impacts

DSRSD's current water conservation program targets all customer sectors in various ways, and its recycled water program targets new development projects and high irrigation water uses. Funding for these programs is equitably allocated to those who benefit from them. In selecting new programs needed to maintain its 2020 urban water use target, DSRSD plans to continue its current policy of not placing a disproportionate burden on any customer sector.

Expanding DSRSD's recycled water distribution system to established areas of Dublin, which may reduce potable water demand by more than 500 AFA, is the most promising permanent reduction program. As discussed in Section 4.5.6, DSRSD plans to expand its recycled water distribution system to connect high demand landscape irrigation systems in the established areas in Dublin, home to federal facilities and Alameda County properties. Because construction will occur in existing streets and site retrofits are required, cost will be higher than for new construction. DSRSD is seeking funding assistance from stakeholders in the region and the state. Funding from these stakeholders will reduce cost for DSRSD customers, who will get the benefit of increased water supply reliability and reduced dependence on imported water. Possible funding sources are described below.

- Federal grants: Through the U.S. Bureau of Reclamation, the federal government is a stakeholder in California's water supply, including the Delta. DSRSD is seeking Title XVI federal grant funding from the U.S. Bureau of Reclamation for the expansion of the recycled water distribution system and the recycled water treatment facilities. The federal grant is limited to 25 percent of the total cost of the project.
- State grant: DSRSD is seeking a Proposition 84 Round 1 Implementation Grant for the extension of recycled water to the central Dublin area. DSRSD must match 25 percent of the grant.
- Zone 7: Removing existing water demand from DSRSD's potable water system extends Zone 7's water supply. DSRSD is negotiating with Zone 7 to allow the resale of the water meter capacities for existing sites that are retrofitted with recycled water. Resale income would finance the onsite retrofit work that is not an allowed cost under a state or federal grant.
- Cities of Dublin and San Ramon: Economic development of the cities in DSRSD's service area depends on DSRSD's ability to provide adequate water supply. DSRSD may collaborate with the cities to fund its water conservation program by implementing a water demand offset fee. This fee would fund structural improvements, including recycled water retrofit projects. The fee would be related to the water demand imposed by a proposed development or be incorporated in its rates as a way to increase reliability for current customers. The fee would be related to and proportional with the extent of water conservation incorporated into development project plans.

As discussed in Section 4, DSRSD is limited by its contract with Zone 7 in seeking other supplies. DSRSD may, however, expand the use of recycled water. Thus, DSRSD has been aggressive in encouraging and requiring the use of recycled water. New developments are required to use recycled water in accordance with DSRSD Code Section 3.20.110, Duty to connect—Recycled water. By doing so, the development community benefits because potable water supplies are extended for their projects. To avoid undue burden to the development community, DSRSD has implemented financial incentives, which are discussed in detail in Section 4.5.7. By connecting to recycled water, new development applicants achieve significant financial savings. They need smaller potable water meters—thereby reducing DSRSD and Zone 7 water connection fees—and are not required to pay Zone 7 connection fees for their recycled water meters. Additionally, recycled water rates are currently 11 percent less than potable water rates, providing further incentive for new and existing customers to use recycled water.

3.4.3 Impact to Federal Facilities

The U.S. Army Reserve Parks Reserve Forces Training Area (Camp Parks) and the Federal Bureau of Prisons Federal Correctional Institution in Dublin (FCI) are part of DSRSD's service area and are adjacent to each other. These facilities are subject to Executive Orders 13423 and 13514.

Executive Order (EO) 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, was signed by President Bush on January 24, 2007. EO 13423 instructs Federal agencies to conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. As part of EO 13423, a goal was set for water conservation.[23] The Department of Energy (DOE) prepared a supplemental guide for implementing EO 13423, *Establishing Baseline and Meeting Water Conservation Goals of Executive Order 13423* (see Appendix I). This guide was used as a reference for EO 13514.

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, was signed by President Obama on October 5, 2009. This EO expands on the energy reduction and environmental performance requirements for federal agencies identified in EO 13423. EO 13514 laid out a numerical target of 26 percent total reduction of potable water use by 2020 (based on federal fiscal year 2007 baseline water use) and a numerical target of 20 percent reduction of total industrial, landscaping, and agricultural water use (based on federal fiscal year 2010 baseline water use). Furthermore, it called for the implementation of water management strategies including the use of water-efficient and low-flow fixtures.[24]

Water conservation baselines and targets are based on annual potable water use divided by total gross square feet of the building or facility.[25] Federal agencies are encouraged to participate in local water utilities incentive programs.[26] Both the U.S. Army Reserve and the Federal Bureau of Prisons are eligible for various water conservation programs currently offered by DSRSD.

The Camp Parks area is currently undergoing redevelopment as funding is available. DSRSD and the U.S. Army Reserve representatives have coordinated in developing a master plan for the Camp Parks area, which includes planning for potable and recycled water facilities. Water demands for the buildout of Camp Parks facilities have been included in DSRSD's water demand projections. DSRSD's estimated demand for Camp Parks is based on efficient water use as required by EO 13423 and EO 13514. Still, overall water demand for Camp Parks is expected to increase because of expansion in accordance with its master plan. To assist the U.S. Army Reserve in meeting its goal to reduce potable water demand, DSRSD plans to extend its recycled water distribution system to Camp Parks.

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23. Bush, George W., Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, January 24, 2007.

24. Obama, Barack, Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, October 5, 2009.

25. Department of Energy, Federal Energy Management Program, *Establishing Baseline and Meeting Water Conservation Goals of Executive Order 13423*, January 2008, p.4.

26. Ibid, p. 9.

FCI water demand is also included in DSRSD projections. DSRSD does not expect significant expansion of the facilities and anticipates some reduction in FCI's water demand. Similarly, to assist FCI in meeting its goal to reduce potable water demand, DSRSD plans to extend its recycled water distribution system to FCI.

The schedule for the extension of recycled water facilities to Camp Parks and FCI and the retrofit of facilities are dependent on DSRSD's acquisition of funding as described above.

3.4.4 Overall Community Impact

Ensuring adequate water supply and reliability while minimizing cost for its customers is an important part of DSRSD's Strategic Plan. The communities that DSRSD serves have approved planned developments that will increase service area population by 50 percent between 2010 and 2030 (buildout), and increase total water demand by 113 percent between 2010 and 2035.

In response to the needs of approved planned development, DSRSD expanded its potable water and recycled water systems over the past 15 years. The expansion was funded by bonds and loans, to be paid by fees for future connections. If the water supply is inadequate, future planned developments will not be built and DSRSD will not receive adequate revenues from connection fees to retire the debt. Existing rate payers would end up paying for the debt if buildout as planned does not occur.

DSRSD recognizes this potential adverse economic impact to the communities it serves. By aggressively reducing potable water demand through conservation and use of recycled water, DSRSD is helping to minimize this risk of added economic impact on the communities it serves.

4.0 System Supplies

The sources of water available to DSRSD are described in this section, along with source limitations (physical or regulatory), water quality, and water exchange opportunities. The discussion covers the sources of water that DSRSD and Zone 7, DSRSD's water wholesaler, view as their water supply portfolio and planned future projects intended to increase water supply and reliability and improve water quality.

DSRSD receives its water supply from Zone 7. Under its agreement with Zone 7, DSRSD is limited in developing other water supply sources. DSRSD must defer to Zone 7 in maintaining its current water supplies and seeking water supply opportunities. Zone 7's discussion of water supply that was included in its UWMP (adopted December 15, 2010) is referenced in this UWMP, and applicable sections have been incorporated herein.

4.1 Water Sources

Water Code Section 10631(b)

DSRSD obtains its water supply from Zone 7. Zone 7 is a multi-purpose agency that oversees water-related issues in the Livermore-Amador Valley. Zone 7 is a State Water Project contractor that wholesales treated water to four retail water agencies (DSRSD, City of Livermore, City of Pleasanton, and California Water Service Company-Livermore), retails non-potable water supplies for irrigated agricultural use, retails treated water to several direct customers, provides and maintains flood control facilities, and manages groundwater and surface water supplies in its service area. DSRSD's water contract and supply from Zone 7 are discussed in Section 4.1.1. DSRSD has a groundwater pumping quota (GPQ) of 645 AFA in the Livermore Valley Main Groundwater Basin (Main Basin), which Zone 7 pumps on DSRSD's behalf as part of its water contract. This groundwater supply is discussed briefly in 4.1.3 and in detail in Section 4.2.

DSRSD's water supply is augmented with recycled water from its Recycled Water Treatment Facilities (RWTF). DSRSD owns and operates a wastewater treatment plant that treats wastewater from Dublin, South San Ramon, and Pleasanton. The wastewater treatment plant includes conventional secondary treatment facilities, as well as tertiary and advanced recycled water treatment facilities. The DSRSD-EBMUD Recycled Water Authority (DERWA) operates the San Ramon Valley Recycled Water Program (SRVRWP), a multi-

Table 4-1. Current and Projected Water Supplies (AFA) (DWR Table 16)							
Water Supply Sources							
Water purchased from:	Wholesaler supplied volume	2010	2015	2020	2025	2030	2035
Zone 7 Water Agency[1]	Yes	8,655	12,255	15,355	16,855	17,655	17,855
Zone 7 Water Agency - Groundwater[2]	Yes	645	645	645	645	645	645
DSRSD - Recycled Water[3]	Yes	1,729	2,481	3,735	4,305	4,417	4,529
	Total	**11,029**	**15,381**	**19,735**	**21,805**	**22,717**	**23,029**

[1] *Volumes shown are actual 2010 purchase and projected purchases in the future. Volumes do not include DSRSD's GPQ.*
[2] *DSRSD's GPQ, pumped by Zone 7 on DSRSD's behalf by contract.*
[3] *DSRSD 's RWTF provides recycled water supply and DERWA distributes recycled water to DSRSD and EBMUD. Recycled water supply listed herein is DSRSD's portion only.*

phased project which distributes recycled water from the RWTF to portions of DSRSD's and EBMUD's service areas. DSRSD's recycled water production and distribution is discussed briefly in Section 4.1.4 and in detail in Section 4.5.

DSRSD's current and projected water supply from the above mentioned sources are shown in Table 4-1. DSRSD provided Zone 7 with a potable water demand request for 2010 and water demand projections for future years. The water supply sources are discussed in more detail in the following sections.

4.1.1 DSRSD Water Supply from Zone 7

Zone 7 and DSRSD entered into the current contract for a Municipal and Industrial Water Supply on August 23, 1994. The contract has a 30-year term and is intended to ensure an equitable, reliable, and high quality water service for DSRSD's customers. It improved the water supply for existing DSRSD customers and set the stage upon which DSRSD would be able to provide service to future customers. The current contract is expected to be renewed beyond 2024 with substantially similar provisions. Some of the key provisions of the contract include the following:

- Service Area: DSRSD has sole discretion to expand its service area. However, Zone 7 water cannot be used outside of the Zone 7 territory unless Zone 7 finds that providing water to such areas is in its best interest.

- Water Supply: DSRSD shall purchase from Zone 7 all water required by DSRSD for use within DSRSD's service area, except that DSRSD may extract groundwater per

the contract provisions or obtain water from "Other Sources" as defined in the contract[27].

- Water Quality: Zone 7 will endeavor to provide water that is aesthetically acceptable to all retailers and will blend the different sources of water available to it within its operational capabilities so as to provide water of approximately equal quality to all customers.

- Groundwater Pumping: DSRSD's Groundwater Pumping Quota was maintained at 645 AFA of withdrawals from the Main Basin. Zone 7 pumps this groundwater from the Main Basin on DSRSD's behalf. Withdrawals from the fringe basin are unlimited and can be used at DSRSD's discretion.

- Carryover of Pumping Quota: The contract provides for a limited carryover of unused pumping quota from one year to another.

- Transfer of Pumping Quota: The four retailers served by Zone 7 can voluntarily transfer their pumping quotas between or among themselves.

- Recycled Water: Recycled water is considered to be an "Other Source" of water that DSRSD can use at will.

- Delivery Schedule: DSRSD shall submit in writing to Zone 7 a preliminary water delivery schedule indicating the anticipated quantity of treated water required by DSRSD during each month of the succeeding five calendar years and the anticipated peak day treated demand from Zone 7 for each such year. Zone 7 shall review such schedule, and after consultation with DSRSD, shall approve such schedule in a timely manner or make revisions as necessary to make such deliveries.

In February 2000, the contract was amended to expand DSRSD's service area to include the Dougherty Valley area and special provisions were added regarding supplying water to Dougherty Valley. A copy of the water supply contract and amendment is provided in Appendix E of this UWMP.

4.1.2 Zone 7 Water Supply Sources

Zone 7 uses a combination of water supplies and water storage facilities to meet its customers' water demands. These include the following:

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27. Water from "Other Sources" includes: a) water received for fire flow or fire storage requirements or other emergency purposes; b) water necessary to meet DSRSD's treated water needs as a result of Zone 7's non-compliance with state and federal drinking water requirements; c) water necessary to meet DSRSD's requirements should Zone 7 be unable to deliver the quantity of treated water necessary to satisfy the requirements of DSRSD; d) groundwater extracted within Zone 7's boundary, but outside the Main Basin, provided said extraction does not cause an adverse impact on the Main Basin; f) the source water is recycled water from DSRSD's or another contractor's treated wastewater.

- Imported surface water from the State Water Project (SWP);
- Imported surface water transferred from the Byron Bethany Irrigation District (BBID);
- Local surface water runoff captured in Del Valle Reservoir;
- Local groundwater extracted from the Livermore Valley Groundwater Main Basin;
- Local storage in the Chain-of-Lakes; and
- Non-local groundwater storage in the Semitropic Water Storage District and Cawelo Water District.

Zone 7's water supply sources and storage options are discussed in detail in Section 5 of its 2010 UWMP. Sections 4.1.2.1 through 4.1.2.4 are excerpted from Zone 7's 2010 UWMP, Section 5.

4.1.2.1 Imported Surface Water Supply[28]

Imported surface water is by far Zone 7's largest water source, providing over 80 percent of the treated water supplied to its customers on an annual basis. As described below, Zone 7 imports water from the State Water Project and surplus water from the Byron Bethany Irrigation District.

4.1.2.1.1 STATE WATER PROJECT

In November 1961, Zone 7 entered into a 75-year agreement with the Department of Water Resources (DWR) to receive water from the State Water Project (SWP). The SWP is the nation's largest publicly-built water storage and conveyance system and currently serves over 25 million people throughout California. SWP water originates within the Feather River watershed, is captured in and released from Lake Oroville, and flows through the Sacramento-San Joaquin Delta before it is conveyed by the South Bay Aqueduct (SBA) to Zone 7 or by the California Aqueduct to other south-of-Delta SWP contractors.

The SBA also delivers water to other water suppliers, namely Santa Clara Valley Water District and Alameda County Water District. Lake Del Valle is part of the SBA system and is used for storage of SWP water, as well as local runoff. At Zone 7, SWP water is used to meet treated water demands from municipal and industrial customers—both wholesale and retail—and untreated water demands from agricultural customers. It is also used to artificially recharge the local groundwater basin (as discussed below in Section 4.1.2.3 Local Storage) or to fill non-local storage.

Table A Allocation

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28. Zone 7 Water Agency, *2010 Urban Water Management Plan*, Section 5.1, pages 5-1 – 5-3.

The primary allocation agreement between DWR and its SWP contractors is recorded in Articles 12(a) and 18(a) of the agreements and is based on each contractor's annual water delivery request. Each contractor is limited to an annual contractual amount as specified in Article 6(c) and Table A. Zone 7's current agreement or contract with the DWR is for the delivery of up to 80,619 acre-feet annually (AFA). This contract expires in 2036 with an option to renew for 75 years. In practice, the actual amount of SWP water available to Zone 7 under the Table A allocation process varies from year to year due to hydrologic conditions, water demands of other contractors, SWP facility capacity, and environmental/regulatory requirements. In January 2010, DWR issued the *State Water Project Delivery Reliability Report for 2009*[29] that estimates a long-term average yield of 60 percent of Table A amounts, equivalent to 48,400 AFA for Zone 7. The SWP provides a median yield in a normal water year of 51,400 AFA (approximately 64 percent) to Zone 7.

As a SWP contractor, Zone 7 has the option to carry over unused Table A water from one year to the next when there is available storage in San Luis Reservoir. This "carryover" water is also called Article 12e and 56c water. Article 12e water must be taken by March 31 of the following year, but Article 56c water may be carried over as long as San Luis Reservoir storage is available. When possible, Zone 7 typically sets aside between 10,000 to 15,000 acre-feet (AF) of carryover water from its SWP Table A allocation.

Article 21 Water (Interruptible or Surplus Water)

Under Article 21 of Zone 7's contract with DWR, Zone 7 also has access to excess water supply from the SWP that is available only if: 1) it does not interfere with SWP operations or Table A allocations, 2) excess water is available in the Delta, and 3) it will not be stored in the SWP system. Per the *State Water Project Reliability Report for 2009*, the projected yield from Article 21 is very low and does not represent a significant water supply for Zone 7.

Article 56d Water (Turnback Pool Water)

Article 56d is a contract provision that allows SWP contractors with unused Table A water to sell their water to contractors who have water needs that exceed their allocation for the year. Historically, only a few SWP contractors have been in a position to make Turnback Pool water available for purchase, particularly in normal or dry years. Zone 7 currently does not anticipate a significant amount of water supply to be available under Article 56d until there is a resolution to the current Delta crisis.

Yuba Accord

In 2008, Zone 7 entered into a contract with DWR to purchase additional water under the Lower Yuba River Accord (Yuba Accord). The contract expires in 2025. There are four different types ("Components") of water available; Zone 7 has the option to purchase

29. DWR, *State Water Project Delivery Reliability Report for 2009*, 2010, http://baydeltaoffice.water.ca.gov/swpreliability/index.cfm.

Components 2 and 3 water during drought conditions, and Component 4 water when the Yuba County Water Agency has determined that it has water supply available to sell.

The annual amount of water supply available to Zone 7 during dry years under the Yuba Accord is relatively small: 159 AF in 2009 and approximately 1,000 AF in 2010. Zone 7 estimates average and median yields of 250 AFA and 145 AFA, respectively, under the Yuba Accord.

4.1.2.1.2 BYRON BETHANY IRRIGATION DISTRICT

The Byron Bethany Irrigation District (BBID) diverts water from the Sacramento-San Joaquin Delta (Delta) pursuant to a "Notice of Appropriation of Water" dated May 18, 1914.[30] Zone 7 entered into a 15-year contract with BBID, renewable every five years, for a minimum yield of 2,000 AFA and up to 5,000 AFA of water supply under this appropriation. Water purchased from BBID is delivered to Zone 7 via the SBA. The current contract was recently extended through 2030, with an option to extend through 2039. While Zone 7 has had a contract with BBID since 1998, Zone 7 has historically requested less than the full amount available; this will change in the future.

4.1.2.2 Local Surface Water Runoff[31]

Zone 7, along with Alameda County Water District (ACWD), has water right permits to divert flows from Arroyo del Valle.[32] Runoff from the Arroyo del Valle watershed above Lake Del Valle is stored in the lake, which is managed by DWR. As noted above, Lake Del Valle is also used to store imported surface water deliveries from the SWP. In late summer/early fall, DWR typically lowers lake levels in anticipation of runoff from winter storm events, and to provide flood control capacity. Water supply in Lake Del Valle is made available to Zone 7 via the SBA through operating agreements with DWR. Inflows to Lake Del Valle, after accounting for permit conditions, are equally divided between ACWD and Zone 7.

A review of historic runoff from Arroyo del Valle from 1913 to 2008[33] indicates that the median inflow available to Zone 7 is approximately 7,300 AFA.

4.1.2.3 Local Storage[34]

Zone 7 has three options for local storage: storage in Lake Del Valle, storage in the local groundwater basin and, in the future, surface storage in the Chain of Lakes. Each of these is described below.

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30. Mountain House Community Services District, *Mountain House Master Plan,* 1994.

31. Zone 7 Water Agency, *2010 Urban Water Management Plan*, Section 5.2, pages 5-3 – 5-4.

32. Permit 11319 (Application 17002).

33. Note that actual data is only available for the following years: 1912 (partial)-1930, 1942, 1944-1952, 1958–present. Data gaps were filled using correlations with local rainfall.

34. Zone 7 Water Agency, *2010 Urban Water Management Plan*, Section 5.3, pages 5-3 - 5-4.

LAKE DEL VALLE

As described above, Lake Del Valle is used to store runoff from the Arroyo del Valle watershed above the lake and also to store imported surface water deliveries from the SWP.

LIVERMORE VALLEY GROUNDWATER BASIN

Zone 7 overlies the Livermore Valley Groundwater Basin (Main Basin); the Main Basin is the portion of the Livermore Valley Groundwater Basin that contains high-yielding aquifers and good quality groundwater.[35] (The Main Basin is not adjudicated.) It has an estimated storage capacity of about 254,000 AF. Detailed descriptions of the Main Basin are available in Zone 7's Groundwater Management Plan (GMP)[36], which was included as a CD attachment in Zone 7's 2010 UWMP. Chapter 6 of Zone 7's 2010 UWMP provides more details on the Main Basin and its operation. *DWR has not identified the Main Basin (DWR Basin No. 2-10) as either a basin in overdraft or a basin expected to be in overdraft*.

For Zone 7, the Basin is considered a storage facility and not a long-term water supply because Zone 7 does not have a groundwater-pumping quota, and only pumps groundwater it artificially recharges using its surface water supplies. As part of its conjunctive use program, Zone 7's policy is to maintain groundwater levels above historic lows in the Main Basin through artificial recharge of SWP water or locally-stored runoff from Arroyo del Valle. Currently, this is accomplished by releasing water to the arroyos for subsequent percolation and replenishment of the aquifers.[37] Zone 7 established historic lows based on the lowest measured groundwater elevations in various wells in the Main Basin; historic lows correspond to a groundwater storage volume of about 128,000 AF.[38] In general, the difference between water surface elevations when the Main Basin is full and water surface elevations when the Main Basin is at historic lows defines Zone 7's operational storage. Operational storage is about 126,000 AF based on Zone 7's experience operating the Main Basin.

CHAIN OF LAKES – LAKE I AND COPE LAKE

The Chain of Lakes refers to a series of ten mined out or active gravel quarry pits that have been or will be transferred to Zone 7 for water resources applications. These might include surface storage of stormwater or other local runoff, surface storage of water from the SWP, and/or use as groundwater recharge basins once mining has been completed. The ten quarry pits or lakes are named Cope Lake and Lakes A through I.

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35. Zone 7 Water Agency, *Annual Report for the Groundwater Management Program – 2008 Water Year*. May 2009.

36. Jones & Stokes, 2005. *Groundwater Management Plan for Livermore-Amador Valley Groundwater Basin*.

37. Zone 7 Water Agency, *Annual Report for the Groundwater Management Program – 2008 Water Year*. May 2009.

38. Zone 7 Water Agency, *Annual Report for the Groundwater Management Program – 2009 Water Year*. May 2010.

Although the Chain of Lakes will ultimately cover approximately 2,000 acres and store approximately 100,000 AF of water, Zone 7 currently only owns Cope Lake and Lake I. Zone 7 expects to take ownership of Lake H sometime within the next five years, while the remaining lakes will be transferred to Zone 7 over the next 20 years.

The Chain of Lakes will be used to store water supplies in wet years for later use during droughts, recharge the groundwater basin, capture additional flow from Arroyo del Valle, and help control flooding along the Arroyo Mocho and Arroyo Las Positas.

4.1.2.4 Non-Local Storage[39]

In addition to local storage, Zone 7 also participates in the two non-local (also called "out of basin") groundwater-banking programs described below; both banks are located in Kern County. Note that while these banking programs provide a water source during drought years, they represent water previously stored from Zone 7's surface water supplies during wet years. Therefore, they do not have a net contribution to Zone 7's water supply over the long-term and in fact result in some operational losses as described below. Furthermore, this banked water supply is only available when the SBA is operational.

SEMITROPIC WATER STORAGE DISTRICT

Zone 7 originally acquired a storage capacity of 65,000 AF in the Semitropic Water Storage District (Semitropic) groundwater banking program in 1998. Subsequently, Zone 7 agreed to participate in Semitropic's Stored Water Recovery Unit, which increased pumpback capacity and allowed Zone 7 to contractually store an additional 13,000 AF. Zone 7 currently has a total of 78,000 AF of groundwater banking storage available to augment water supplies during drought conditions. During non-drought periods, Zone 7 can put up to 5,883 AFA into the Semitropic groundwater bank. Note that a 10 percent loss is associated with water put into Semitropic. During a drought year, Zone 7 has the ability to request up to 9,100 AF of pumpback and any amount between 0 to 8,645 AF of exchange water; the availability of exchange water depends on projected SWP allocation. Pumpback is water that is pumped out of the Semitropic aquifer and into the SWP system. Exchange water is water that is transferred between Zone 7 and Semitropic by adjusting the amounts of Table A water allocated between Zone 7 and Semitropic. The agreement is in effect through December 31, 2035.

CAWELO WATER DISTRICT

Similar to the arrangements with Semitropic, Zone 7 has 120,000 AF of groundwater banking storage available with the Cawelo Water District, as executed in an agreement in 2006. During non-drought periods, Zone 7 can put into storage up to 5,000 AFA in the

39. Zone 7 Water Agency, *2010 Urban Water Management Plan*, Section 5.4, pages 5-5 - 5-6.

bank.[40] During droughts, Zone 7 has the ability to request up to 10,000 AFA of pumpback (or exchange water) from Cawelo. The agreement is in effect through December 31, 2035.

4.1.2.5 Total Zone 7 Supply and Storage[41]

Zone 7's existing water supply sources and storage options are summarized in Tables 4-2 and Table 4-3. The quantities listed in Table 4-2 for water supply sources are median quantities in normal water years. Under dry, drought, or emergency conditions, the percentage distribution of sources used by Zone 7 to meet demands may shift; in particular, Zone 7 is likely to tap into water stored in the various storage facilities listed in Table 4-3.

Table 4-2. Wholesale Supplies — Zone 7 Water Agency Existing and Planned Sources of Water Supply in Normal Years (AFA)[1] (DWR Table 17)

Wholesale Sources	Contracted Volume	2015	2020	2025	2030	2035
Imported Surface Water						
SWP-Table A[2]	80,619	51,400	51,400	51,400	51,400	51,400
SWP - Yuba Accord[3]	No fixed cap	145	145	145	0	0
BBID[4]	5,000	4,500	4,500	4,500	4,500	4,500
Local Runoff						
Arroyo Del Valle[5]	30,000	7,100	7,100	7,100	7,100	7,100
Total Wholesale Water Supply		**63,145**	**63,145**	**63,145**	**63,000**	**63,000**

[1] Normal water years are defined as the median yield for Zone 7's 2010 UWMP. The table does not show groundwater pumping from the Main Basin as it represents water stored from the sources already listed above.

[2] The amount listed here is the projected median yield, after correcting for carryover, in the 2009 State Water Project Delivery Reliability Report.

[3] The Yuba Accord contract ends in 2025.

[4] Byron Bethany Irrigation District. Historical deliveries cannot be used to develop water supply yields. A review of cumulative rainfall in 2009 and 2010 indicates that both years were at or above the historic median rainfall. Deliveries from this contract were 4,500 and 5,000 AF in 2009 and 2010, respectively. A yield of 4,500 AF was assumed available during normal water years.

[5] Zone 7, along with Alameda County Water District (ACWD), has a water right permit [Permit 11319 (Application 17002)] to divert runoff from Arroyo del Valle. Inflows to Lake Del Valle, after accounting for permit conditions, are equally divided between Zone 7 and ACWD. The two agencies' diversions cannot exceed 60,000 AFA. Planned water source volume is based on inflow date (actual and estimated) and existing diversion or falility limitations. The median supply available is approximatly 7,100 AF.

40. Zone 7 only gets storage credit for 50percent of the water provided to Cawelo. Per the existing contract, Zone 7 can normally only send 10,000 AF in any given year to Cawelo; therefore, the maximum contractual credit is 5,000 AFA (10,000 AF divided by 2).

41. Zone 7 Water Agency, *2010 Urban Water Management Plan*, Section 5.5, pages 5-6 – 5-7.

In accordance with its reliability policy, which is included as Appendix J in this UWMP, Zone 7 continues to explore other options for acquiring additional future water supplies. These opportunities include water transfer opportunities, desalination, and other future projects. These future water supply opportunities are discussed in Sections 4.3, 4.4, and 4.6, respectively.

Table 4-3. Zone 7's Water Storage Options

Storage Option		Water in Storage through April 2010[1] (AF)	Total Storage Capacity (AF)
Local	Lake Del Valle	4,900	7,500
	Main Basin	74,000	126,000
Non-Local	Semitropic	78,100	78,000
	Cawelo	5,000	120,000
Total Storage		162,000	331,500

[1]*As presented in the May 2010 Annual Review of Sustainable Water Supply for Zone 7 Water Agency. Note that Zone 7 also has "carryover" water available in the SWP, amounting to 20,500 AF as of April 2010.*

4.1.3 DSRSD Groundwater Supply

Water Code Section 10631(b)

DSRSD does not itself extract groundwater as a water supply. In accordance with their water supply agreement, Zone 7 pumps DSRSD's groundwater supply from local storage, as described in Section 4.1.2.3.

Zone 7 administers oversight of the local groundwater basin, the Livermore Valley Groundwater Basin as part of its Groundwater Management Program. The Main Basin is the portion of the Livermore Valley Groundwater Basin that has high yields and good quality groundwater. DSRSD, the California Water Service Company-Livermore, and the cities of Livermore and Pleasanton, through agreements with Zone 7, have mutually agreed to limit their extraction from the Main Basin to a combined quantity of approximately 7,200 AFA, about 54 percent of the long-term sustainable yield of the Main Basin. This agreement, along with Zone 7's other groundwater management activities, keeps the groundwater budget essentially in balance under average hydrologic conditions.[42] Each of these retailers has a groundwater pumping quota (known as their GPQ). DSRSD's GPQ is 645 AFA. In accordance with its agreement with Zone 7, DSRSD may obtain groundwater in excess of its GPQ if it pays a recharge fee to Zone 7.

In Figure 4-1, the Main Basin and well field locations are shown relative to DSRSD's service area. Currently, the DSRSD groundwater supply (GPQ) is pumped by Zone 7 for DSRSD from a Zone 7 installed well in the Mocho well field, Mocho No. 4. This well was constructed on DSRSD property (previously Camp Parks property) under a 2002 agreement between DSRSD and Zone 7 whereby DSRSD provided Zone 7 with access, Zone 7 paid all of the costs for the well, pump and building, and DSRSD has the annual option of requesting that Zone 7 pump and provide DSRSD's GPQ at a cost of only power, chemical and some other incidental charges. Groundwater from Mocho No. 4 is blended with water from other Zone 7 water supplies and is delivered to DSRSD to meet its total water demand.

In addition to groundwater from the Main Basin, DSRSD may extract water above the 645 AFA Main Basin GPQ from areas outside the Main Basin (the fringe subbasin). Water can be pumped from the Fringe Basin as long as this groundwater extraction does not have adverse effects on the Main Basin. In the past, DSRSD pumped water from the fringe subbasin when it owned wells along Dublin Boulevard. However, pumping from the fringe subbasin was abandoned in 1980 due to water quality issues and pumping costs. Groundwater supply through Zone 7 is further discussed in Section 4.2.

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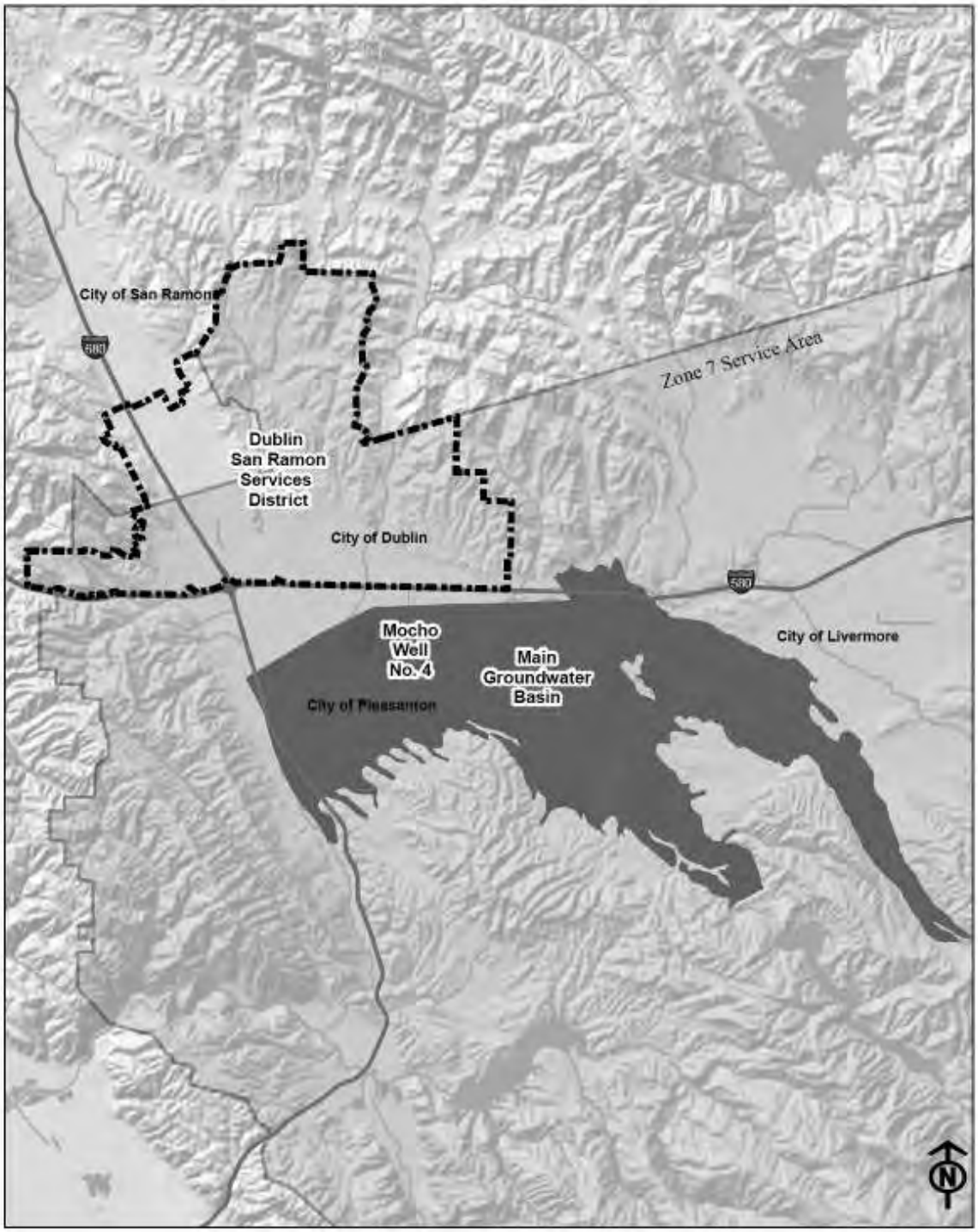
42. DWR *Bulletin 118, Livermore Valley Groundwater Basin Description*, last updated February 27, 2004.

Figure 4-1. Main Basin—DSRSD Groundwater Source



4.1.4 Recycled Water Supply

DSRSD currently treats and distributes recycled water to water customers in its service area. Recycled water is produced from DSRSD's regional wastewater treatment facilities. DSRSD's water recycling efforts are discussed in detail in Section 4.5.

DSRSD began its recycled water program in the early 1990's by adopting Resolution No. 42-92 in August 1992. The resolution set priorities and policies for the use and promotion of recycled water service within and outside DSRSD's water service area. The policies were intended to assist DSRSD achieve the following objectives:

- Promote, produce, sell and deliver recycled water to retail and wholesale customers;
- Manage the San Ramon Valley Recycled Water Program on an equitable and self-supporting basis;
- Work with others to develop ordinances and guidelines to encourage the use of recycled water;
- Develop local regulations and standards to ensure the safe and beneficial use of recycled water; and
- Conduct public information and customer service programs to ensure that the public has an appropriate understanding of recycled water, including the benefits of using recycled water.

DSRSD then adopted the "Water Recycling Business Plan Framework" in 1993, to establish the DSRSD Recycled Water Enterprise. Since that time, recycled water has been an important part of water planning at DSRSD. In that same year, the City of Dublin certified an environmental impact report (EIR) for the *Eastern Dublin General Plan Amendment and Specific Plan*. The DSRSD service plan for eastern Dublin is predicated upon the use of recycled water for landscape irrigation as summarized in the EIR and subsequent annexation documentation. Potable water supply requests to Zone 7 by DSRSD for Eastern Dublin under the "Contract between Zone 7 and DSRSD for a Municipal & Industrial Water Supply," are the net of the eastern Dublin total water demands less the recycled water to be provided by DSRSD.

DSRSD and EBMUD formed a joint powers authority, the DSRSD-EBMUD Recycled Water Authority (DERWA), in 1995. DERWA's mission is to provide a safe, reliable, and consistent supply of recycled water, and to maximize the amount of recycled water delivered for non-potable use. DERWA operates the San Ramon Valley Recycled Water Program (SRVRWP), a multi-phased project to supply recycled water from DSRSD's Recycled Water Treatment Facility (RWTF) to portions of DSRSD's and EBMUD's service areas. Additional discussion of DERWA is provided in Section 4.5.

In 1995, DSRSD also committed to providing water to Dougherty Valley. The DSRSD service plan for Dougherty Valley is also predicated upon the use of recycled water for

landscape irrigation. The amount of potable water purchased for Dougherty Valley is the net of the Dougherty Valley total water demands less the recycled water to be provided by DSRSD.

In April 1998, DSRSD adopted Ordinance No. 280 which established a Recycled Water Use Zone within DSRSD's service area, consisting of all areas then receiving potable water services and those additional areas designated for such service. In April 2004, this ordinance was repealed and replaced by Ordinance No. 301 which formally established the rules and regulations governing the use of recycled water within DSRSD's service area. See Section 4.5 for additional discussion of this ordinance. A copy of Ordinance No. 301 is provided in Appendix K. In November 2010, when DSRSD recodified its code, DSRSD incorporated Ordinance No. 301 into the DSRSD Code and added DSRSD Code Section 3.20.110, Duty to connect—Recycled water (included in Appendix H), which requires that new development in DSRSD's water service area connect to recycled water for appropriate irrigation uses.

In 2005, DSRSD adopted a Water Master Plan that established Board policy as to the quantity of recycled water the District was looking to develop and deliver to customers within the District's water service area. The total quantity of recycled water that DSRSD planned to deliver through buildout was estimated to be approximately 3,700 AFA (or 3.3 million gallons per day, mgd).

4.2 Groundwater

Water Code Section 10631(b)

As stated in Section 4.1.1, DSRSD's water supply contract with Zone 7 provides that DSRSD shall purchase from Zone 7 all water required by DSRSD for use within DSRSD's service area, except that DSRSD may extract groundwater per the contract provisions or obtain water from "Other Sources" as defined in the contract. ***DSRSD does not itself extract groundwater as a water supply.*** By contract, Zone 7 conducts this groundwater pumping operation as part of providing water supply services to DSRSD. This groundwater supply is then blended with water from Zone 7's other water supply sources and delivered to DSRSD.

The volume of groundwater pumped by Zone 7 for DSRSD from 2006 to 2010 is shown in Table 4-4. The volume of groundwater projected to be pumped by Zone 7 for future DSRSD water supply is shown in Table 4-5. Historically, DSRSD's groundwater supply demand has been constant.

Table 4-4. Groundwater — Volume Pumped by Zone 7 on DSRSD's Behalf (AFA) (DWR Table 18)						
Basin name	**Metered or Unmetered**	**2006**	**2007**	**2008**	**2009**	**2010**
Main Basin, Livermore Valley	Metered	645	645	645	645	645
Total groundwater pumped		**645**	**645**	**645**	**645**	**645**
Groundwater as a percent of total water supply		**5.7%**	**4.8%**	**4.8%**	**5.3%**	**5.5%**

In accordance with their water supply contract, DSRSD defers to Zone 7 in maintaining current groundwater resources and in developing future groundwater resources. Zone 7 administers oversight of the local groundwater basin, the Livermore Valley Groundwater Basin. The Main Basin portion contains high-yielding aquifers and good quality groundwater. Zone 7 uses the Main Basin as a storage facility and not as a supply. ***Zone 7 does not have a groundwater pumping quota and it can only pump groundwater it has recharged from its other supplies.*** The groundwater aquifer is naturally and artificially recharged using surface water, as described in Section 4.1.2.

Section 6 of Zone 7's 2010 UWMP provides more details on the Main Basin and its operation. The discussions below regarding the management of the local groundwater basin are directly excerpted from portions of Zone 7's 2010 UWMP, Section 6. Zone 7 submitted its *Groundwater Management Plan* (GMP) as part of its UWMP.

4.2.1 The Livermore Valley Groundwater Basin[43]

Water Code Section 10631(b)(2)

As defined in DWR Bulletin 118 update 2003 *(California's Groundwater)*, the Livermore Valley Groundwater Basin (DWR Basin 2-10) extends from the Pleasanton Ridge east to the Altamont Hills and from the Livermore Uplands north to the Tassajara Uplands. ***DWR has not identified Basin 2-10 as either in overdraft or expected to be in overdraft.*** Surface drainage features include Arroyo del Valle, Arroyo Mocho, and Arroyo Las Positas as principal streams, with Alamo Creek, South San Ramon Creek, and Tassajara Creek as minor streams. All streams converge on the west side of the basin to form Arroyo de la Laguna,

Table 4-5. Groundwater — Volume Projected to be Pumped by Zone 7 on DSRSD's Behalf (AFA) (DWR Table 19)					
Basin name(s)	**2015**	**2020**	**2025**	**2030**	**2035**
Main Basin, Livermore Valley	645	645	645	645	645
Total groundwater pumped	**645**	**645**	**645**	**645**	**645**
Percent of total water supply	**4.19%**	**3.27%**	**2.96%**	**2.84%**	**2.80%**

43. Zone 7 Water Agency, *2010 Urban Water Management Plan*, Section 6.1, page 6-1.

flowing south and joining Alameda Creek in Sunol Valley, and ultimately draining to the San Francisco Bay. Some geologic structures restrict the lateral movement of groundwater, but the general groundwater gradient is from east to west, towards Arroyo de la Laguna, and from north to south along South San Ramon Creek and Arroyo de la Laguna.

The entire floor of the Livermore Valley and portions of the upland areas on all sides of the valley overlie groundwater-bearing materials. The materials are mostly continental deposits from alluvial fans, outwash plains, and lakes. They include valley-fill materials, the Livermore Formation, and the Tassajara Formation. Under most conditions, the valley-fill and Livermore Formation yield adequate to large quantities of groundwater to all types of wells, with the larger supply wells being located in the Main Basin. The Main Basin is composed of the Castle, Bernal, Amador, and Mocho 2 sub-basins.

4.2.2 Groundwater Quantity[44]

Zone 7 routinely monitors groundwater levels within the Main Basin. Two independent methods are used to estimate groundwater storage: 1) Hydrologic Inventory and 2) Nodal Groundwater Elevation. The Main Basin is estimated to have a total storage capacity of 254,000 acre-feet (AF), of which approximately 126,000 AF are available for Zone 7 operational storage. Zone 7's goal is maintain 128,000 AF of groundwater at all times, as discussed below.

4.2.2.1 Artificial Recharge

Before the construction of the State Water Project (SWP) in the early 1960s, groundwater was the sole water source for the Livermore-Amador Valley. This resource has gone through several periods of extended withdrawal and subsequent recovery. In the 1960s, when approximately 110,000 AF of groundwater was extracted, the Main Basin reached its historic low of 128,000 AF. The Main Basin was allowed to recover from 1962 to 1983. It was during this era that Zone 7 first conducted a program of groundwater replenishment by recharging imported surface water via its streams ("in-stream recharge") for storage in the Main Basin, began supplying treated surface water to customers to augment groundwater supplies, and began regulating municipal pumping by contractually establishing GPQ as discussed further below.

Zone 7's operational policy is to maintain the balance between the combination of natural and artificial recharge and withdrawal. This ensures that groundwater levels do not drop below the historic level of 128,000 AF.

4.2.2.2 Current Sustainable Yield and Groundwater Pumping Quotas

Long-term natural sustainable yield is contractually defined as the average amount of groundwater annually replenished by natural recharge in the Main Basin—through percolation of rainfall, natural stream flow, and irrigation waters, and inflow of subsurface

44. Ibid, Section 6.2, page 6-2 – 6-5.

waters—and which can therefore be pumped without lowering the long-term average groundwater volume in storage. In contrast, "artificial recharge" is the aquifer replenishment that occurs from artificially induced or enhanced stream flow, as described in the previous section. With artificial recharge, more groundwater can be sustainably extracted from the Main Basin each year.

The natural sustainable yield of the Main Basin has been determined to be about 13,400 AFA, which is 10-11 percent of the total estimated useable groundwater storage. This long-term natural sustainable yield is based on over a century of hydrologic records and projections of future recharge conditions. Based on this sustainable yield value, California Water Service Company [Livermore District] (Cal Water), Dublin San Ramon Services District (DSRSD), the City of Livermore (Livermore), and the City of Pleasanton (Pleasanton) (collectively referred to as the Retailers) are permitted to pump 7,245 AFA. Each retailer has an established "Groundwater Pumping Quota" (GPQ), formerly referred to as the "Independent Quota" in the original Municipal and Industrial water supply contract between Zone 7 and each retailer**45**. Pleasanton and Cal Water pump their own GPQ; they are also permitted to pump groundwater in excess of their GPQ under a recharge fee paid to Zone 7. This fee covers the cost of importing and recharging additional water into the Main Basin. Zone 7 pumps DSRSD's GPQ.

Zone 7's groundwater extraction for its treated water system does not use the natural sustainable yield from the Main Basin; instead, ***Zone 7 pumps only water that has been recharged as part of its artificial recharge program using its surface water supplies***. During high demands, groundwater is used to supplement surface water supply delivered via the South Bay Aqueduct (SBA). Groundwater is also used when the SBA is out of service due to maintenance and improvements or when Zone 7's surface water treatment plants are operating under reduced capacity due to construction, repairs, etc. Finally, Zone 7 taps into its stored groundwater under emergency or drought conditions, when there may be insufficient surface water supply available. Zone 7 also pumps groundwater out of the Main Basin during normal water years to help reduce the salt loading in the Main Basin. As discussed in Section 4.2.3, to achieve additional salt removal, a demineralization facility has been in operation starting in 2009. Zone 7 plans to recharge 9,200 acre-feet annually on average, which means that Zone 7 can pump an equivalent 9,200 acre-feet annually on average from the Main Basin.

4.2.3 Groundwater Quality[46]

The Main Basin is characterized by relatively good quality groundwater that meets all state and federal drinking water standards; groundwater is chloraminated simply to match the disinfectant residual in the distribution system. However, there has been a slow degradation of groundwater quality as evidenced by rising Total Dissolved Solids (TDS) and hardness

45. The GPQs in acre-feet are as follows: Cal Water – 3,069, DSRSD – 645, Livermore – 31, and Pleasanton – 3,500.

46. Zone 7 Water Agency, *2010 Urban Water Management Plan*, Section 6.3, page 6-8.

levels over the last few decades. To address this problem, Zone 7 developed a Salt Management Plan (SMP)[47], which was approved by the Regional Water Quality Control Board in 2004 as a condition of the Master Waste Reuse Permit (for more details, see Chapter 14 of Zone 7's 2010 UWMP) and incorporated into Zone 7's GMP in 2005.

Zone 7 implements a wastewater and recycled water monitoring program as part of the GMP. In 2009, 20 percent of the recycled water produced in the service area was applied over the Main Basin[48]. Nitrates and salinity have historically been the primary water quality parameters of concern in recycled water, but nitrates have become less of a concern since 1995 when the City of Livermore Water Reclamation Plant—which, along with Dublin San Ramon Services District, is one of the two largest wastewater agencies in the area—stopped nitrifying its effluent. Salinity levels are being addressed through demineralization as described later in this section. In addition to recycled water application over the Main Basin, there are also approximately 80 septic tanks over the Main Basin that discharge their settled effluent but their use is not monitored.

To further manage the water quality in the Main Basin, Zone 7 also runs a Toxic Site Surveillance Program, documenting and tracking sites across the groundwater basin that pose a potential threat to drinking water supplies. Zone 7 works closely with the Regional Water Quality Control Board and Alameda County Environmental Health in these efforts. In general, there are two types of contamination threatening the Livermore Valley Groundwater Basin: petroleum-based fuel products and industrial chemical contaminants. In 2009, Zone 7 tracked the progress of 81 active sites where groundwater contamination has been detected or contamination is threatening groundwater. Eleven of the sites are designated as high priority because of their proximity to drinking water supply wells (none of Zone 7's wells is affected) and occurrence in the Main Basin. Affected water supply well owners are employing granular activated carbon to remove contamination prior to water consumption. More details on the affected sites and their remediation can be found in the *Annual Report for the Groundwater Management Program – 2009 Water Year*[49].

As part of its efforts to address salinity in the Main Basin, Zone 7 completed construction of a wellhead demineralization facility in 2009. Employing a reverse osmosis membrane-based treatment system, this facility simultaneously allows for the removal and export of concentrated minerals or salts[50] from the Main Basin and the delivery of treated water with reduced TDS and hardness levels to Zone 7's customers.

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47. Zone 7 Water Agency, *Salt Management Plan*, 2004.

48. Zone 7 Water Agency, *Groundwater Management Program – 2009 Water Year,* 2010.

49. Ibid.

50. The brine concentrate resulting from the treatment system is exported to the San Francisco Bay via a regional wastewater export pipeline.

4.2.4 Future Opportunities

Zone 7 plans to augment its current groundwater in-stream recharge capacity with off-stream recharge using the future Chain of Lakes facilities. Reclaimed gravel quarries located in the central portion of the Livermore-Amador Valley are to be used for capturing additional local runoff and imported surface water, and recharging the Main Basin. Ultimately, the Chain of Lakes could cover 2,000 acres and store approximately 100,000 AF of water as surface water. Zone 7 would store excess surface water during wet and/or normal years and use those supplies during dry years, thereby increasing annual groundwater replenishment capability.

Although full implementation of this plan would not occur until after 2030, there would likely be opportunities to use individual gravel quarries or lakes as they become available. The first of these, Lake I, located off Arroyo Mocho, was dedicated to Zone 7 in June 2003. Zone 7 expects to take ownership of Lake H within the next five years.

In addition to Lake I, Zone 7 also acquired Cope Lake, a 220-acre former mining pit that was used as a settling pond by the gravel operators. Although largely sealed from the aquifer, and not a part of the Chain of Lakes, Cope Lake does offer some potential for other uses such as flood detention, settling, and water storage.[51]

Additionally, Zone 7 has developed options to increase groundwater recharge capacity. At the time of preparation of this UWMP, Zone 7 is preparing its *2011 Water Supply Evaluation* (WSE) to be released mid-2011. In the WSE, Zone 7 has evaluated an extensive list of potential water supply options. A copy of this list is included as Appendix L. In addition to options in expanding its water supply, Zone 7 has developed options to increase groundwater recharge capacity as shown on Page 6 of Appendix L.[52]

4.3 Water Transfer Opportunities

Water Code Section 10631(d)

DSRSD does not plan to pursue water exchanges because, by contract with Zone 7, DSRSD may not pursue water transfers. In Table 4-6, DSRSD's opportunities for planned or potential future water exchanges are reflected. DSRSD defers to Zone 7 in maintaining its current water transfer supplies and seeking water transfer opportunities.

Zone 7's existing water transfer supply sources and non-local storage options are discussed in detail in Section 8 of Zone 7's 2010 UWMP. Zone 7's imported water supply sources are primarily based on existing water transfer agreements; these sources are described in Section

51. Zone 7 Water Agency, *2010 Urban Water Management Plan*, Section 6.2.1, page 6-3.

52. Zone 7 Water Agency, *2011 Water Supply Evaluation*, (2011, in progress), Table x.

Table 4-6. DSRSD Planned or Proposed Water Transfer Agreements (AFA) (DWR Table 20)			
Transfer agency	Transfer or exchange	Short term or long term	Proposed Volume
None	None	NA	0
Total	**0**	0	0

4.1.2. These sources include SWP Table A, Byron Bethany Irrigation District long term water transfer contact, and Yuba Accord water transfer.

In its 2011 WSE, Zone 7 considers water transfer opportunities as part of its potential water supply options—included in this UWMP as Appendix L, Pages 1 and 2.[53] One opportunity is a long-term or permanent transfer of non-State Water Project water. This transfer opportunity is discussed in Section 11.2.2 of Zone 7's 2010 UWMP. Zone 7 is investigating possible opportunities for permanent water transfers or long-term leases from a non-State Water Project (SWP) contractor. This transaction would be similar to the contract Zone 7 holds with the Byron Bethany Irrigation District, which is a 20-year contract, renewable every five years up to a total of 30 years. However, unlike the water from the BBID contract, which is delivered through the South Bay Aqueduct, Zone 7 would seek water that can be delivered via a new intertie with another major water agency. This would have the added benefit of diversifying Zone 7's portfolio.[54]

4.4 Desalinated Water Opportunities

Water Code Section 10631(i)

DSRSD does not plan to pursue opportunities to develop desalinated water supplies because, by contract with Zone 7, DSRSD may not do so. DSRSD defers to Zone 7 in pursuing desalinated water opportunities.

Zone 7 is exploring the feasibility of a regional desalination project in partnership with other San Francisco Bay Area water agencies, as described in Section 12 of Zone 7's 2010 UWMP. Zone 7 joined the Bay Area Regional Desalination Project (BARDP), a consortium of five agencies, in June 2010. As a partner in the BARDP, Zone 7 is evaluating the feasibility of receiving up to 5,600 AF every year, or only during normal/wet years.

Among other benefits, desalinated water provides a drought-resistant supply to Zone 7 and diversifying Zone 7's water supply portfolio, thereby, increasing system reliability—a significant benefit. The most likely scenario is that water would be wheeled through

53. Zone 7 Water Agency, WSE, Appendix E.

54. Zone 7 Water Agency, *2010 Urban Water Management Plan*, Section 11.2.2, page 11-3.

EBMUD's distribution system; Zone 7 would receive treated water at a proposed intertie in the western part of its service area.[55]

4.5 Recycled Water

Water Code Sections 10633(a-g)

DSRSD currently produces and distributes recycled water in its service area, as described in Section 4.1.4. DSRSD owns and operates a recycled water treatment facility (RWTF) at its wastewater treatment plant and participates with EBMUD in a joint powers authority, DERWA, that operates the San Ramon Valley Recycled Water Program (SRVRWP). DSRSD's recycled water program is discussed in further detail below.

4.5.1 Coordination of Recycled Water Use in DSRSD Service Area

Water Code Section 10633

In the early 1990's, DSRSD, the City of Livermore, and Zone 7 undertook a Tri-Valley recycled water study and conducted a series of public workshops as a part of that process. As a result of that effort, the State Water Resources Control Board (SWRCB) issued a Master Water Recycling Permit (Order No. 93-159) to DSRSD, Livermore, and Zone 7 in December 1993. The permit established the requirements for recycled water irrigation, groundwater recharge, and other Title 22 approved projects.

Recycled water is tertiary-treated wastewater and is a very reliable supply; however, the use of recycled water was discouraged in the past due to the potential of salt buildup in the Main Basin. Zone 7's Salt Management Plan, developed in 2004, now provides tools and strategies for preventing salt buildup in the Main Basin. Zone 7 reviews DSRSD's recycled water plans from two perspectives—water supply management and groundwater protection. At this time, Zone 7 is preparing to update its Groundwater Management Plan, which will also include an update of the Salt Management Plan.

Wastewater from Dublin, Pleasanton and the southern portion of San Ramon are treated at DSRSD's wastewater treatment plant. A portion of the secondary effluent is routed to DSRSD's RWTF for tertiary treatment and distribution through the DERWA facilities. A portion of the recycled water is distributed by DSRSD to non-potable users in Dublin, San Ramon and Contra Costa County; the remainder is distributed to EBMUD customers in the San Ramon Valley. DSRSD coordinates with the planning departments in the cities of Dublin and San Ramon, Alameda and Contra Costa counties, and the U.S. Army Reserve to ensure that recycled water is used where it is available. DSRSD and EBMUD also work together to manage recycled water supply demands.

55. Ibid, Section 11.2.3, page 11-3.

Since 1999, DSRSD has distributed recycled water for landscape irrigation and construction uses in eastern Dublin and Dougherty Valley as those areas developed. DSRSD monitors recycled water uses and files reports with regulatory agencies: the California Department of Public Health (DPH) and the San Francisco Bay Regional Water Quality Control Board (RWQCB), in conformance with DSRSD's General Water Reuse Order No. 96-011 (General Order). Current and potential uses of recycled water in DSRSD's service area are further detailed in Section 4.5.6 and Section 5.

4.5.2 Wastewater Collection, Treatment, and Disposal

Water Code Section 10633 (a) and 10633 (b)

DSRSD owns and operates a regional wastewater treatment plant (WWTP), which treats wastewater from Dublin, South San Ramon, and Pleasanton. The wastewater treatment plant includes conventional secondary treatment facilities, as well as tertiary and advanced recycled water treatment facilities.

Conventional secondary wastewater treatment facilities include primary sedimentation, activated sludge secondary treatment, secondary sedimentation, chlorine disinfection, and effluent pumping. The secondary treatment facilities currently have an average dry weather flow (ADWF) capacity of 17.0 mgd. At projected buildout, the secondary facilities will have an ADWF capacity of 20.7 mgd; 10.4 mgd of this influent is projected to originate from the DSRSD service area. The remaining 10.3 mgd of influent is projected to originate from Pleasanton. DSRSD treats Pleasanton influent by contract.

In DSRSD's RWTF, a portion of the secondary effluent from the WWTP is treated further to produce Title 22 disinfected tertiary recycled water. During the dry season when recycled water demands are high, recycled water is produced using sand filtration and ultraviolet disinfection facilities (SFUV). The SFUV facilities have a treatment capacity of 9.7 mgd.

DSRSD's RWTF also includes microfiltration and ultraviolet disinfection facilities (MFUV) with a treatment capacity of 3.0 mgd. These facilities currently act as backup facilities for the SFUV facilities and are used during times of low and high demands. The SFUV facilities have less flexible startup and shutdown requirements, whereas the MFUV facilities have a wide turndown range; therefore, they are used during low flow periods. During high demand periods, the MFUV and SFUV facilities may be operated in parallel to meet demand. The MFUV facilities also provide redundancy, increasing reliability when units in the SFUV facilities are undergoing maintenance, repair, or replacement.[56]

DSRSD's MFUV facilities were designed to produce recycled water suitable for both non-potable reuse and groundwater recharge, a potential future use that would replenish and improve local groundwater quality. MFUV construction was completed in 1999. The MFUV project is currently producing recycled water that meets California Title 22 requirements for unrestricted reuse and has received approval for groundwater recharge from the DPH and

56. Whitley Burchett & Associates, *2005 Wastewater Treatment Plant Master Plan Update*, Dec. 2005, p. 11-3.

RWQCB. Legal action by outside parties resulted in a requirement that the RWQCB reconsider permit approval. However, DSRSD has determined that it will not ask for RWQCB reconsideration or proceed with the injection of highly treated recycled water into the groundwater basin at this time.

The historical, current, and projected volumes of wastewater treated at DSRSD's WWTP and RWTF are shown in Table 4-7. Total wastewater volume includes influent from DSRSD's service area and the City of Pleasanton. Total recycled water volume includes DERWA deliveries to DSRSD and EBMUD. Wastewater from DSRSD's service area and recycled water deliveries to DSRSD's water service area also are shown.

Wastewater that is not recycled is discharged into the San Francisco Bay through a pipeline owned by the Livermore-Amador Valley Water Management Agency (LAVWMA), a joint powers agency created in 1974 by DSRSD and the cities of Livermore and Pleasanton. Operations began in September 1979, with an expansion in 2005, for a current design capacity of 41.2 mgd. The wastewater is conveyed via a 16-mile pipeline from Pleasanton to San Leandro and enters the East Bay Dischargers Authority (EBDA) system for dechlorination and discharge through a deepwater outfall to the San Francisco Bay.[57] In Table 4-8, current and projected volumes of wastewater effluent exported through the LAVWMA pipeline are shown.

Table 4-7. Volumes of Wastewater Collected & Treated and Recycled Water Treated (AFA) (DWR Table 21)

Type of Water	2005*	2010*	2015	2020	2025	2030	2035
Wastewater Treated in DSRSD's WWTP (DSRSD and Pleasanton)	13,576	16,309	18,807	20,633	21,664	22,112	22,336
Volume Treated per Title 22 Disinfected Tertiary Recycled Water (DERWA Deliveries and WWTP	908	2,977	4,567	6,783	7,353	7,465	7,577
Wastewater Collected & Treated in DSRSD Service Area Only	6,239	7,292	7,875	10,204	11,370	11,885	11,913
Volume Disinfected Tertiary Recycled Water Distributed in DSRSD	888	1,729	2,481	3,735	4,305	4,417	4,529

**Actual*

57. Whitley Burchett & Associates, *2005 Wastewater Treatment Plant Master Plan Update*, Dec. 2005, p. 1-2.

Table 4-8. Volume of Wastewater Effluent Disposed (AFA) (DWR Table 22)							
Method of disposal	**Treatment**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Pumped through LAVWMA Export	Secondary, Disinfected	13,332	14,240	13,850	14,311	14,647	14,759
	Total	**13,332**	**14,240**	**13,850**	**14,311**	**14,647**	**14,759**

4.5.3 Recycled Water Production Limitations

The capacity of DSRSD facilities limits the production of recycled water. Current recycled water production and delivery to both DSRSD and EBMUD is limited to 12.7 mgd, the combined capacity of the RWTF's SFUV (9.7 mgd) and MFUV (3.0 mgd) facilities. A planned future expansion will increase the SFUV capacity to 16.5 mgd. The timing of this expansion correlates directly with the projected recycled water demands discussed in Section 4.5.6.

Water rights also limit production of recycled water. In 2008, the SRVRWP's peak day demand for recycled water exceeded the amount of secondary effluent collected from the DSRSD wastewater collection system. DSRSD entered into an agreement with the City of Pleasanton in 2002 allowing utilization of up to 2.5 mgd of secondary effluent collected from the Pleasanton wastewater collection system. The agreement expires in December 2011.

DERWA and DSRSD are pursuing the following alternative water supplies starting the summer of 2012 through at least 2018:

- Extend the existing agreement with the City of Pleasanton;
- Divert secondary effluent from the LAVWMA pipeline that conveys the Livermore WWTP effluent to the LAVWMA pumping station;
- Install ground water wells in the fringe basin to meet peak irrigation demands;
- Utilize potable water to meet peak irrigation demands.

DSRSD has an agreement in place with Zone 7 to renovate an abandoned gravel quarry for recycled water storage to meet peak demands. Zone 7 anticipates obtaining ownership of the gravel quarry when mining is complete in the 2018 to 2020 time period.

4.5.4 Recycled Water Distribution

As discussed above, DSRSD and EBMUD formed a joint powers authority in 1995 to operate the SRVRWP, a multi-phased project to supply recycled water from DSRSD's RWTF to portions of DSRSD's and EBMUD's service areas. The SRVRWP operates a backbone recycled water distribution system that includes sixteen miles of transmission mains, two tanks, and four pump stations. DSRSD and EBMUD each constructed separate distribution systems within their respective areas to convey recycled water from the SRVRWP backbone to existing and new irrigation customers in portions of Dublin, San Ramon, Blackhawk and Danville. The program serves golf courses, parks, planted common areas managed by homeowner associations, roadway medians and greenbelts, and landscaped areas of schools and office complexes. The program is designed to provide up to 3,696 AFA

of recycled water to DSRSD customers and 2,688 AFA of recycled water to EBMUD customers. Deliveries began in 2005.[58]

Since 1998, DSRSD has installed approximately 55 miles of recycled water distribution pipelines off the SRVRWP backbone.[59] These pipelines currently deliver landscape irrigation water to DSRSD customers in the eastern portion of Dublin and the Dougherty Valley portion of San Ramon.

4.5.5 Current Recycled Water Use

Water Code Section 10633(c)

Prior to 1999, recycled water was used in the DSRSD water service area only for compaction, dust control, and sewer cleaning. In 1999, DSRSD began delivering recycled water to the Dublin Sports Grounds for landscape irrigation. Through subsequent connection to the SRVRWP backbone, DSRSD's recycled water distribution system expanded to serve newly developed areas in Dougherty Valley and the eastern portion of Dublin.

Current recycled water uses in DSRSD's service area are shown in Table 4-9. In 2010, recycled water production at the RWTF was 2,977 AF; of that amount, 2,194 AF was used in

Table 4-9. Current (2010) Recycled Water Use (AFA)

Use Type	Place	Quantity
Landscape irrigation[1]	Parks, medians, streetscapes, landscape areas in schools in eastern Dublin and	494.3
Commercial irrigation[2]	Landscape areas in multi-family and general commercial areas in eastern Dublin and Dougherty Valley; including DSRSD dual plumbed buildings at WWTP and Dougherty	968.4
Golf course irrigation	Dublin Ranch Golf Course, Dublin	212.8
Construction dust control/ grading/ sewer	Construction areas in eastern Dublin, Dougherty Valley	53.7
WWTP internal use	WWTP landscape, FSL evaporation make-up	465.0
Delivery to EBMUD	EBMUD service area	783
	Total	**2,977**

[1] *Includes parks, schools, streetscapes, churches, or other public facilities*

[2] *Includes multi-family residential and commercial building use such as landscaping and toilets, and other commercial uses (garbage can cleaning)*

58. Source: DERWA website www.derwa.org, February 24, 2009.

59. Source: DSRSD Website www.dsrsd.com, January 25, 2011.

DSRSD's service area and 783 AF was used in EBMUD's service area.

In 2010, DSRSD customers used recycled water primarily for landscape irrigation at a golf course and numerous commercial and multi-family residential complexes, streetscapes, parks, and schools. Approximately 76 percent of the 2,194 AF of recycled water delivered in 2010 was for landscape irrigation and incidental commercial use, including garbage can cleaning and toilet flushing; approximately 21 percent for landscape irrigation at DSRSD's WWTP and make-up water at its facultative sludge lagoons; and approximately 2 percent for construction uses, including grading, dust control, and sewer flushing.

Where recycled water distribution mains are adjacent to construction sites, DSRSD allows temporary connection to the distribution main so that construction contractors may obtain recycled water for construction use. DSRSD has also made recycled water available to customers at its recycled water treatment plant and through nine recycled water fire hydrants located throughout its service area.

Other minor uses include toilet flushing and garbage can cleaning. DSRSD owns two dual-plumbed buildings where recycled water is used to flush toilets: (1) a recycled water pump station in Dougherty Valley, and (2) a maintenance building in DSRSD's wastewater treatment plant. DSRSD provides recycled water to a commercial business that provides garbage can cleaning service to residences. Recycled water demand from this customer is minor, but the use is creative.

4.5.6 Projected Recycled Water Use

Water Code Section 10633(d), 10633(e), and 10633 (g)

In December 2005, DSRSD adopted its *2005 Water Master Plan Update,* which includes an update to its "Recycled Water System Master Plan" (attached as Appendix M of this UWMP). This adopted master plan established Board policy as to the amount of recycled water DSRSD plans to develop and deliver to customers at buildout of its water service area, and outlines the design and operational criteria of the District's recycled water distribution system. DSRSD plans to deliver a total of 3,700 AFA (3.3 mgd) of recycled water at buildout of its service area. This commitment directly offsets Zone 7's need to provide 3,700 AFA of potable water supplies. In turn, lower potable water demand and peaking factors also reduces the required capacities of transmission pipelines, pump stations, and other potable water system infrastructure.

In accordance with the 2005 "Recycled Water System Master Plan," dual distribution systems have been installed throughout the developing areas of eastern Dublin and Dougherty Valley. Construction of the entire recycled water backbone infrastructure is complete. DSRSD expects the recycled water distribution system to expand in parallel with its potable water distribution system as development continues in its service area. DSRSD is also seeking to install dual distribution systems in established areas of Dublin by extending recycled water mains to older portions of its service area. This would replace potable water irrigation with recycled water in the Camp Parks Reserve Forces Training Area, the Federal

Correctional Institution, the Santa Rita Jail, and various parks, schools, streetscapes, and multi-family residences in central and western Dublin.

DSRSD's 2005 UWMP included 2010 recycled water use projections from its *2005 Water Master Plan*. These projections are compared to actual 2010 recycled water use in Table 4-10. Actual use in 2010 exceeded projections made in 2005 by 277 AF or 10.26 percent. Aggressive development in DSRSD's service area between 2005 and 2010 contributed to this outcome. Additionally, DSRSD has proactively encouraged the use of recycled water in its service area as discussed in Section 4.5.7 and Section 6 (BMP 5) of this UWMP.

Anticipated continued development will increase the use of recycled water. DSRSD Code Section 3.20.110, "Duty to connect—Recycled water" (Appendix H), requires new development to use recycled water for irrigation except under specific conditions. Compliance is required if an applicant is to receive potable water service from DSRSD.

Current recycled water use is described in Section 4.5.5. Potential future uses are similar to current uses. DSRSD anticipates increased demand in most categories, as shown in Table 4-11. Quantities of recycled water for various user types are itemized and quantities are projected; feasibility for each type of potential use is identified below. In addition to continuing recycled water delivery to existing users, DSRSD expects potential recycled water use for landscape irrigation use in future developments in eastern Dublin and Dougherty Valley. Since construction is expected to continue in DSRSD's service area, recycled water is expected to be used for construction grading, dust control, and sewer flushing. DSRSD

Table 4-10. Actual 2010 Recycled Water Use vs. Projected 2010 Recycled Water Use from 2005 UWMP (AFA) (DWR Table 24)

Use Type	2010 Actual Use	2005 Projection for 2010
Agricultural irrigation	0	0
Landscape irrigation[1]	494	500
Commercial irrigation[2]	968	500
Golf course irrigation	213	235
Wildlife habitat	0	0
Wetlands	0	0
Industrial reuse	0	0
Groundwater recharge	0	0
Seawater barrier	0	0
Geothermal/energy	0	0
Indirect potable reuse	0	0
Construction use	53.7	0
WWTP internal use	465	465
Delivery to EBMUD	783	1,000
Total	**2,977**	**2,700**

[1] *Includes parks, schools, streetscapes, churches, or other public facilities*

[2] *Includes multi-family residential and commercial building use such as landscaping and toilets, and other commercial uses (garbage can cleaning)*

also sees potential recycled water use in established areas of Dublin by replacing potable water irrigation demands with recycled water, particularly in the Camp Parks Reserve Forces Training Area, the Federal Corrections Institution, the Santa Rita Jail, and various parks, schools, streetscapes, and multi-family residences in central and western Dublin.

The potential uses described for future development are technically and economically feasible: existing recycled water distribution mains are adjacent to and may be extended into undeveloped areas at incremental cost.

The potential uses described for established areas are technically feasible, but their economic feasibility is questionable without external funding assistance. Recycled water distribution mains will need to be extended from the DERWA facilities through established streets and neighborhoods. On-site irrigation facilities will need to be retrofitted for recycled water. Costs for construction through existing streets and conducting on-site retrofits are significantly greater than extending recycled water to developing areas. DSRSD's *Capital Improvement Program Ten Year Plan for Fiscal Years 2011 to 2020* includes projects that would expand DSRSD's RWTF and extend recycled water facilities to federal facilities and the older areas of Alameda County and Dublin. DSRSD is seeking both federal and state funding for its recycled water projects.

Recycled water use for agricultural irrigation and industrial reuse are not feasible because the cities that DSRSD serve do not have nor anticipate such uses. Recycled water use for

Table 4-11. Projected Future Recycled Water Use (acre-ft/year) (DWR Table 23)

User type	Feasibility[1]	2015	2020	2025	2030	2035
Agricultural irrigation	No	0	0	0	0	0
Landscape irrigation[2]	Yes	722	1,131	1,317	1,353	1,407
Commercial irrigation[3]	Yes	1,493	2,338	2,722	2,797	2,909
Golf course irrigation	Yes	213	213	213	213	213
Wildlife habitat	No	0	0	0	0	0
Wetlands	No	0	0	0	0	0
Industrial reuse	No	0	0	0	0	0
Groundwater recharge	No	0	0	0	0	0
Seawater barrier	No	0	0	0	0	0
Geothermal/Energy	No	0	0	0	0	0
Indirect potable reuse	No	0	0	0	0	0
Construction Use	Yes	54	54	54	54	0
WWTP Internal Use	Yes	465	465	465	465	465
Delivery to EBMUD	Yes	1,621	2,583	2,583	2,583	2,583
	Total	**4,568**	**6,784**	**7,354**	**7,465**	**7,577**

[1] *Technical and economic feasibility.*

[2] *Includes parks, schools, streetscapes, churches, or other public facilities*

[3] *Includes multi-family residential and commercial building use such as landscaping and toilets, and other commercial uses (garbage can cleaning)*

wildlife habitat, wetlands, groundwater recharge, seawater barrier, geothermal/energy, and indirect potable reuse are not feasible because such uses do not exist, nor are they planned, in DSRSD's service area.

4.5.7 Actions to Encourage Use of Recycled Water

Water Code Section 10633(f) and 10633(g)

DSRSD has been aggressive in encouraging and requiring the use of recycled water. In April 1998, DSRSD adopted Ordinance No. 280 implementing the DSRSD Recycled Water Policy. In April 2004, Ordinance No. 280 was repealed and replaced with Ordinance No. 301 which formally established the rules and regulations governing the use of recycled water within DSRSD's water service area. This ordinance requires, except for small isolated areas, all new irrigation systems serving parks, streetscapes, commercial landscaping and common area landscaping for multifamily complexes to use recycled water. A copy of Ordinance No. 301 is provided in Appendix K. When DSRSD recodified its code in November 2010, it added Section 3.20.110, "Duty to connect—Recycled water." This section requires new development to use recycled water for irrigation except under specific conditions. Compliance is required if an applicant is to receive potable water service from DSRSD.

DSRSD has undertaken a proactive outreach program to encourage public acceptance of recycled water. As described in Section 6 (BMP 2.1) of this UWMP, on-going outreach includes newsletters, videos, speakers, brochures, special events, school programs, and meetings with focus groups.

Furthermore, DSRSD policies related to recycled water use, including District Ordinance No. 301, include provisions that all new development areas must include dual distribution piping for recycled water deliveries, where feasible. The policy also includes provisions that would allow existing potable water irrigation customers to voluntarily convert to recycled water.

Table 4-12. Water Capacity Reserve in DSRSD Service Area (April 2010)[1]

Meter Size	Alameda County			Contra Costa County		
	DSRSD	Zone 7	Total	DSRSD	Zone 7	Total
5/8 d[2]	$6,993	$22,230	$29,223	$7,698	$23,270	$30,968
3/4 d	$10,489	$33,345	$43,834	$11,547	$34,905	$46,452
1 d	$17,481	$55,575	$73,056	$19,244	$58,176	$77,420
1 1/2 d	$34,963	$111,150	$146,113	$38,488	$116,352	$154,840
2 d	$55,941	$177,840	$233,781	$61,579	$186,163	$247,742
1 1/2 t[3]	$34,963	$266,760	$301,723	$38,488	$279,244	$317,732
2 t	$55,941	$355,680	$411,621	$61,579	$372,326	$433,905

[1] *DSRSD fees apply to both potable and recycled water connections. Zone 7 fees apply only to potable water connections.*

[2] *d = Positive Displacement Meter*

[3] *t = W Series Turbo Meter*

Table 4-13. Projected Result of Financial Incentives (AFA) (DWR Table 25)						
	Projected Results					
Actions	2010	2015	2020	2025	2030	2035
Connection Fee Savings	1,729	2,428	3,682	4,252	4,363	4,529
Water Rate Savings + Retrofit		250	350	610	610	610
Total	**1,729**	**2,678**	**4,032**	**4,862**	**4,973**	**5,139**

Recycled water is considered part of DSRSD's water enterprise for customer service and financial operations. New development applicants who use recycled water for irrigation realize significant savings in capacity reserve fees (formerly known as connection fees) because they do not pay Zone 7 fees for recycled water connections. Recycled water connections represent no potable water demand to Zone 7. These applicants also usually need smaller potable water meters, thereby reducing their DSRSD and Zone 7 water connection fees for potable water. DSRSD and Zone 7 water capacity reserve fees are shown in Table 4-12. Additionally, recycled water rates are 11 percent less than potable water rates, providing further incentive for new and existing customers to use recycled water.

As discussed in Section 4.5.6, DSRSD is planning to extend its recycled water distribution system to established areas of Dublin, particularly in the Camp Parks Reserve Forces Training Area, the Federal Corrections Institution, the Santa Rita Jail, and various parks, schools, streetscapes, and multifamily residences in central and western Dublin. DSRSD is providing incentives for these existing users to connect to recycled water by providing lower water rates for recycled water, financial assistance in retrofitting the existing sites, and offering irrigation water service reliability during droughts.

The above mentioned incentives are sufficient in encouraging customers use recycled water where they can. DSRSD are working with developers to explore different uses for recycled water including landscape irrigation, recirculating use for cooling systems, and toilet flushing. DSRSD anticipates that the financial incentives discussed above will result in significant increases in recycled water use in the future. In Table 4-13, the estimated amounts of additional recycled water use due to financial incentives are provided. These estimates are part of the recycled water projections included in Table 4-11.

4.6 Future Water Supply Projects

Water Code Section 10631(h)

As stated in Section 4.1, DSRSD's water supply contract with Zone 7 provides that DSRSD shall purchase from Zone 7 all water required by DSRSD for use within DSRSD's service area, except that DSRSD may extract groundwater per the contract provisions or obtain water from "Other Sources" as defined in the contract. DSRSD's Future Water Supply Projects are listed in Table 4-14. DSRSD does not plan to pursue opportunities for development of future water supply projects because, by contract with Zone 7, DSRSD may not do so. DSRSD therefore defers to Zone 7 in pursuing future water supply projects.

Table 4-14. DSRSD Future Water Supply Projects (AFA) (DWR Table 26)								
Project name	Projected start date	Projected completion date	Potential project constraints	Normal-year supply	Single-dry year supply	Multiple-dry year first year supply	Multiple-dry year second year supply	Multiple-dry year third year supply
None	NA	NA	NA	0	0	0	0	0
		Total	**0**	**0**	**0**	**0**	**0**	**0**

Table 4-15. Zone 7 Projected New Water Supply[60]			
		2020 to 2030	
Water Year Type	Base Year(s)	Yield, AF	% of Normal
Normal	1942	10,500	100%
Single Dry	1977	6,100	57%
Multiple Dry	Year 1 to 5 (1988 to 1992)	6,100	57%

Sections 11 and 12 of Zone 7's 2010 UWMP include potential programs and projects to increase Zone 7's water supply. A copy of this list is included as Appendix L. These projects include a long-term "Delta Fix", long-term or permanent water transfers, and desalination. Zone 7 is performing a detailed analysis of potential programs and projects to increase the reliability of its water supply in its *2011 Water Supply Evaluation* to be completed in mid-2011. Zone 7 anticipates that it can secure a new water supply to reliably meet projected demands in its service area. The amounts of these new water supplies are summarized in Table 4-15. As indicated in the table, 10,500 AF of new supply is projected to be available during normal water years, while 6,100 AF of new supply would only be available during dry years; these preliminary estimates were are based on projected demands to be met by Zone 7 under a 100% reliability policy. Base years were chosen to match those of the SWP.[61]

4.7 Water Supply Contracts

DSRSD's water supplies are obtained through various contracts. As stated in Section 4.1, DSRSD's potable water supply is through a contact with Zone 7. In turn, Zone 7's water supplies are obtained through contracts with DWR and Byron Bethany Irrigation District. DSRSD's recycled water supply is from its own WWTP and is distributed through DERWA by contract. Additionally, DSRSD's emergency water supplies through interties described in Section 2.2.4 have associated contracts.

As discussed in Section 4.5, DSRSD's recycled water supply is from DSRSD's WWTP which treats wastewater collected from its wastewater service area. During high recycled water demands, DSRSD makes use of City of Pleasanton's wastewater effluent that is also

60. Ibid, Table 11-1, p. 11.5.

61. Zone 7 Water Agency, 2010 Urban Water Management Plan, Pages 11-1 to 12-3.

treated at DSRSD's treatment plant by contract. DSRSD and the City of Pleasanton have a current contract in place for this supply for recycled water treatment.

These contacts and their associated contract amounts and expiration dates are listed in Table 4-16. These contracts are expected to be renewed beyond their expiration dates with substantially similar provisions.

Table 4-16. Water Supply Contracts for Various DSRSD Water Sources

Water Supply Source	Contracting Parties	Contract Amount	Termination Date
DSRSD POTABLE WATER			
Municipal Water Supply[1]	DSRSD/Zone 7	100% of Potable Water Demand	8/23/2024
ZONE 7 SURFACE WATER SUPPLY[2]			
Zone 7 State Water Project Allocation	Zone 7/DWR	46,000 AFA	11/20/2036
Additional SWP Allocation from Water Transfers			
Lost Hills Water District	Zone 7/DWR	15,000 AFA	11/20/2036
Berrenda Mesa Water District	Zone 7/DWR	7,000 AFA	11/20/2036
Belridge Water Storage District	Zone 7/DWR	12,219 AFA	11/20/2036
Tulare Lake Basin Water Storage District	Zone 7/DWR	400 AFA	11/20/2036
Byron Bethany Irrigation District	Zone 7/BBID	5,000 AFA	2030, option to extend to 2039
Lower Yuba River Accord (DWR)	Zone 7/DWR	No Fixed Cap	2025
ZONE 7 WATER STORAGE[3]			
Semitropic Water Storage District	Zone 7/Semitropic Water Storage District	5,883 AFA; 78,000 AF Capacity	12/31/2035
Cawelo Water District	Zone 7/ Cawelo Water District	5,000 AFA; 120,000 AF Capacity	12/31/2035
DSRSD RECYCLED WATER			
Pleasanton Wastewater[4]	DSRSD/ City of Pleasanton	2.5 mgd	12/31/2011
DSRSD EMERGENCY WATER INTERTIES			
Three Interties with EBMUD[5]	DSRSD/EBMUD	2,500 gpm Maximum	120 days notice
Two Interties with Pleasanton[6]	DSRSD/ City of Pleasanton	Based on availability from supplying agency	365 days notice

[1] *DSRSD/Zone 7's August 23, 1994 Municipal & Industrial Water Supply Contract, Appendix E.*

[2] *From Zone 7 2010 UWMP, Table 8-1.*

[3] *From Zone 7 2010 UWMP, Table 8-1 and Section 8.2, page 8-2.*

[4] *DSRSD/City of Pleasanton November 19, 2002 Third Supplemental Agreement and November 19, 2009 Fourth Supplemental Agreement to Agreement for Wastewater Disposal Services.*

[5] *DSRSD/EBMUD's June 19, 1990 Emergency Water Services Agreement; amended April 16, 2007.*

[6] *DSRSD/City of Pleasanton January 16, 1996 Emergency Water Services Agreement.*

Reference 11

DERWA Phase 3 Recycled Water Expansion Project
Effluent Pollutant Concentrations

Year	Recycled Water (AF)	Recycled Water (gal)	Avg. C-BOD (mg/yr)	Avg. C-BOD (kg/yr)	Avg. TSS (mg/yr)	Avg. TSS (kg/yr)	Avg. Total N (mg/yr)	Avg. Total N (kg/yr)
2015	230	74,945,500	1,087,400	1,087	1,891,130	1,891	10,212,104	10,212
2016	867	282,511,950	4,099,025	4,099	7,128,740	7,129	38,495,194	38,495

Reference 12

RESOLUTION NO. 26-14

RESOLUTION OF THE BOARD OF DIRECTORS OF DUBLIN SAN RAMON SERVICES DISTRICT TO UPDATE AND DECLARE A CONTINUING COMMUNITY DROUGHT EMERGENCY, AND RESCIND RESOLUTION NO. 10-14

WHEREAS, the State of California has and continues to experience record dry conditions, with 2013 being the driest year on record; and

WHEREAS, January 2014, normally a very wet month, was critically dry and is now the driest January on record; and

WHEREAS, meteorological and hydrological conditions improved somewhat since early February 2014, but 2014 remains a critically dry year as classified by the State of California; and

WHEREAS, on January 17, 2014 California Governor Edmund G. Brown issued a Proclamation of a State of Emergency, and encouraged all Californians to reduce their water usage by 20%; and

WHEREAS, the Zone 7 Water Agency issued a Proclamation of a Local Drought Emergency on January 29, 2014 and authorized their General Manager to "establish appropriate levels of conservation consistent with the California State of Drought Emergency and local conditions;" and

WHEREAS, in conformance with the January 29, 2014 proclamation by the Zone 7 Water Agency the General Manager established a system-wide conservation goal of 20% for 2014 as compared to 2013 usage, which was based on demand reductions of 5% for indoor water use and 40% for outdoor water use; and

WHEREAS, on January 31, 2014 the Department of Water Resources reduced from 5% to 0% the anticipated allocation of water to customers of the State Water Project, including the Zone 7 Water Agency; and

WHEREAS, on February 18, 2014 the District declared a State of Community Drought Emergency and established a goal of curtailing overall District water usage by twenty percent

(20%) base on five percent (5%) curtailment of inside water use and forty percent (40%) curtailment of outside water use as compared to the same period in 2013; and

WHEREAS, on February 24, 2014 the City of Livermore declared a Water Shortage Emergency; and

WHEREAS, on March 18, 2014 the City of Dublin declared a Local Drought Emergency; and

WHEREAS, on March 18, 2014 the City of Pleasanton approved an urgency ordinance amending their water conservation plan as needed to protect the immediate threat of the potentially significant drought to preserve public health and safety; and

WHEREAS, on April 9, 2014 the California Department of Water Resources announced that as of that time 2014 water allocations to the State Water Contractors (including Zone 7) will remain at or near 0%; and

WHEREAS, on April 16, 2014 the Zone 7 Water Agency directed the local water supply retailers and untreated water customers to assure a 25% total reduction for 2014 with 5% coming from indoor curtailment and 50-60% from outdoor curtailment, and adopting mandatory conservation measures to achieve these reductions; and

WHEREAS, on April 18, 2014 the California Department of Water Resources announced that anticipated 2014 water allocations to the State Water Contractors (including Zone 7) will be increased to 5% but only on condition that delivery of water occur after September 1, 2014; and

WHEREAS, on April 25, 2014 Governor Edmund G. Brown proclaimed a Continued State of Emergency in the State of California and ordered that California residents should refrain from wasting water, specifying many practices that waste water and directing urban water suppliers to implement drought response plans to limit outdoor irrigation and other wasteful water practices; and

WHEREAS, through April 30, 2014, water use curtailment in the District has been 5.7% for the calendar year as a whole and 16.7% since the February 18, 2014 declaration of a

Community Drought Emergency thus not achieved the needed level of curtailment to date as compared to the same periods in 2013; and

WHEREAS, the California Emergency Services Act and the California Water Code empowers local agencies to declare a state of emergency, which allows the agency to expend funds and promulgate orders and regulations necessary to provide for the protection of life and property, and to invoke exceptions allowed by law to normal contracting, purchasing, and California Environmental Quality Act (CEQA) requirements so that the Agency can more quickly take action and respond to rapidly changing conditions.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF DUBLIN SAN RAMON SERVICES DISTRICT, a public agency located in the Counties of Alameda and Contra Costa, California, that:

1. Resolution No. 10-14 is hereby rescinded and replaced it in its entirety with this Resolution.
2. A State of Emergency has existed since February 18, 2014 and continues to prevail in the community served by the District by reason of the fact that the ordinary demands and requirements of the water consumers in the District's service area cannot be met and satisfied by the water supplies now available to the District without depleting the water supply to the extent that there would be insufficient water for human consumption, sanitation, and/or fire protection as a result of the ongoing drought and the resulting reductions to and restrictions on the available water supply.
3. For the remainder of calendar year 2014, the General Manager is authorized and directed to take all appropriate steps and actions as may be within the General Manager's authority and/or as approved by the Board to curtail system wide water usage in the District by twenty five percent (25%) overall with five percent (5%) coming from indoor curtailment and fifty to sixty percent (50-60%) from outdoor curtailment as compared to the same period in calendar year 2013.

4. The General Manager is authorized and directed to initiate appropriate operational actions including but not limited to the temporary curtailment or cessation of service to individual customers and/or areas of the District as may be appropriate to ensure the continued integrity of the community water supply system for health and safety purposes and, in such circumstances, to timely notify the Board of such actions taken.
5. As it relates to contracting and purchasing actions associated with the District's response to the need for curtailing water usage under this Declaration of a Community Emergency, the General Manager is hereby authorized to make decisions about invoking exceptions to normal contracting and purchasing requirements as allowed by California law.
6. As it relates to California Environmental Quality Act (CEQA) actions associated with the District's response to the need for curtailing water usage under this Declaration of a Community Emergency, the General Manager is hereby authorized to make decisions regarding invoking exemptions to CEQA as allowed by California law.
7. As it relates to obtaining staffing resources to accomplish actions associated with the District's response to the need for curtailing water usage under this Declaration of a Community Emergency, the Board affirms the existing language included in Personnel Rule 2.03 that allows the General Manager in an emergency to make appointments without the requirement for first establishing an eligibility list.
8. In order to satisfy the requirements of the California Emergency Services Act which contemplates ongoing review of the need for continuing the local emergency, so that the declared emergency shall not remain in effect when conditions no longer warrant, the General Manager shall inform the Board, at its first meeting of each calendar month that this declaration remains in effect, of (a) developments regarding the water supply available to Zone 7 and the District, (b) the water demand in the District's service area and in the Tri-Valley, (c) operational issues encountered or anticipated to be encountered

related to the effect of the limited water supply on the District's water system (d) pertinent policy level decisions made at the local, regional and State level related to the drought and (e) other information relevant to the continuing need for the State of Community Drought Emergency.

9. The State of Emergency shall exist until either: (a) the Board takes action to rescind this Declaration of Continuing State of Community Drought Emergency, or (b) December 31, 2014, whichever occurs first.

10. The General Manager is authorized and directed to undertake actions related to the District's response to this drought in accordance with the authority and approval of this resolution.

ADOPTED by the Board of Directors of Dublin San Ramon Services District, a public agency in the State of California, counties of Alameda and Contra Costa, at its special meeting held on the 5th day of May 2014, and passed by the following vote:

AYES: 5 - Directors Richard M. Halket, Dawn L. Benson, D.L. (Pat) Howard, Edward R. Duarte, Georgean M. Vonheeder-Leopold

NOES: 0

ABSENT: 0

Georgean M. Vonheeder-Leopold

Georgean M. Vonheeder-Leopold, President

ATTEST: Nancy G. Hatfield

Nancy G. Hatfield, District Secretary

CERTIFIED AS A TRUE AND CORRECT COPY OF THE ORIGINAL ON FILE IN THE OFFICE OF DUBLIN SAN RAMON SERVICES DISTRICT
Secretary Nancy G. Hatfield

MAY 05 2014

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Reference 13

RESOLUTION NO. 27-14

RESOLUTION OF THE BOARD OF DIRECTORS OF DUBLIN SAN RAMON SERVICES DISTRICT DECLARING A STAGE 3 WATER SUPPLY SHORTAGE UNDER CHAPTER 4.10 OF THE DISTRICT CODE, CLARIFYING RESOLUTION NO. 11-13 AND RESCINDING RESOLUTION NO. 18-13

WHEREAS, on February 21, 2012, the District adopted Ordinance No. 329 to incorporate into the District Ordinance Code, provisions from its Water Shortage Contingency and Drought Plan, Ordinance No. 323, and Emergency Response Plan, each of which was included in the approved 2010 Urban Water Management Plan; and

WHEREAS, the State of California has and continues to experience record dry conditions, with 2013 being the driest year on record; and

WHEREAS, January 2014, normally a very wet month, was critically dry and is now the driest January on record; and

WHEREAS, meteorological and hydrological conditions improved somewhat since early February 2014 but 2014 remains a critically dry year as classified by the State of California; and

WHEREAS, on January 17, 2014 California Governor Edmund G. Brown issued a Proclamation of a State of Emergency, and encouraged all Californians to reduce their water usage by 20%; and

WHEREAS, the Zone 7 Water Agency issued a Proclamation of a Local Drought Emergency on January 29, 2014 and authorized their General Manager to "establish appropriate levels of conservation consistent with the California State of Drought Emergency and local conditions;" and

WHEREAS, in conformance with the January 29, 2014 proclamation by the Zone 7 Water Agency the General Manager established a system-wide conservation goal of 20% for

2014 as compared to 2013 usage, which was based on demand reductions of 5% for indoor water use and 40% for outdoor water use; and

WHEREAS, on January 31, 2014 the Department of Water Resources reduced from 5% to 0% the anticipated allocation of water to customers of the State Water Project, including the Zone 7 Water Agency; and

WHEREAS, on March 18, 2014 the City of Dublin declared a Local Drought Emergency; and

WHEREAS, on March 18, 2014 the City of Pleasanton approved an urgency ordinance amending their water conservation plan as needed to protect the immediate threat of the potentially significant drought to preserve public health and safety; and

WHEREAS, on February 24, 2014 the City of Livermore declared a Water Shortage Emergency; and

WHEREAS, on April 16, 2014 the Zone 7 Water Agency directed the local water supply retailers and untreated water customers to assure a 25% total reduction in overall demand for 2014 with 5% coming from indoor curtailment and 50-60% from outdoor curtailment, and adopted mandatory conservation measures to achieve these reductions; and

WHEREAS, on April 18, 2014 the California Department of Water Resources announced that anticipated 2014 water allocations to the State Water Contractors (including Zone 7) will be increased to 5% but only on condition that delivery of water occur after September 1, 2014; and

WHEREAS, On April 25, 2014 Governor Edmund G. Brown proclaimed a Continued State of Emergency in the State of California and ordered that California residents should refrain from wasting water, specifying many practices that waste water and directing urban water

suppliers to implement drought response plans to limit outdoor irrigation and other wasteful water practices; and

WHEREAS, achieving that level of water use curtailment requires a multi-faceted approach of public outreach, use restrictions and prohibitions and economic incentives to curtail water use; and

WHEREAS, the District has previously adopted Resolution No. 11-13, Establishing Water Rates Under Chapter 4.40 of the District Code and Rescinding Resolution No. 32-09, which established Water Consumption Rates During a Water Shortage (Stages 1-4) in accordance with Dublin San Ramon Services District Code Section 4.40.020; and

WHEREAS, in accordance with the January 2013 Water Rate Study for Stage 3 Water Conservation Rates, the incremental revenues generated by this action are to be used to support anticipated additional expenses necessary for public information and water conservation efforts to achieve the needed water curtailment levels.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF DUBLIN SAN RAMON SERVICES DISTRICT, a public agency located in the counties of Alameda and Contra Costa, California as follows:

1. Effective immediately upon the adoption of this Resolution and to remain in effect until terminated by Resolution of the Board of Directors, a Stage 3 - Severe Reduction Water Shortage Condition, as codified as section 4.10.030.C.1.c. of the District Code (enacted by Ordinance 329, adopted February 21, 2012), now exists in the District's water service area.
2. The references in Resolution No. 11-13 to "Ordinance No. 323" and to a "resolution declaring the existence of any stage of a water shortage condition pursuant to Resolution

No. 20-09, Approving a Water Conservation Program in Accordance with Ordinance No. 323" have at all times since the adoption of Resolution No. 11-13 been intended to refer, and have referred, and do refer, to the provisions of section 4.10.030.C.1 of the District Code.

3. Stage 3 Water Consumption Rates During a Water Shortage, as adjusted in accordance with Board Resolution No. 11-13, and as authorized by Section 4.40.020 of the District Code (Provision of Potable Water Service), are activated by the preceding actions and accordingly are in effect upon adoption, but such rates shall not be operative until June 1, 2014, and such rates shall thereafter remain in effect until terminated by Resolution of the Board of Directors. For ease of reference, the Rates operative on June 1, 2014 are attached to this Resolution as Exhibit A.

4. The specific Water Use Limitations are set forth in Ordinance No. 333, an Urgency Ordinance of Dublin San Ramon Services District Adopting Water Use Prohibitions and Restrictions for the Duration of the 2014 Community Drought Emergency, enacted contemporaneously with this Resolution, as such Ordinance may be amended, revised, or superseded from time to time.

5. The progressive schedule of penalties or fines that may be levied by District for successive violations of these water use restrictions are set forth in Ordinance No. 334, an Urgency Ordinance of Dublin San Ramon Services District Adopting Procedures and Penalties for the Enforcement of Water Use Restrictions and Prohibitions for the 2014 Community Drought Emergency, enacted contemporaneously with this Resolution, as such Ordinance may be amended, revised, or superseded from time to time.

6. Resolution No. 18-13, which rescinded Resolution 34-09, which was the District's prior declaration of a Stage I - Minimal Reduction Water Shortage Condition, is rescinded effective immediately upon the adoption of this Resolution.

ADOPTED by the Board of Directors of Dublin San Ramon Services District, a public agency in the State of California, Counties of Alameda and Contra Costa, at its special meeting held on the 5th day of May 2014, by the following vote:

AYES: 5 - Directors Richard M. Halket, D.L. (Pat) Howard, Dawn L. Benson, Edward R. Duarte, Georgean M. Vonheeder-Leopold

NOES: 0

ABSENT: 0

Georgean M. Vonheeder-Leopold

Georgean M. Vonheeder-Leopold, President

ATTEST:

Nancy G. Hatfield

Nancy G. Hatfield, District Secretary

CERTIFIED AS A TRUE AND CORRECT COPY OF THE ORIGINAL ON FILE IN THE OFFICE OF DUBLIN SAN RAMON SERVICES DISTRICT
Secretary Nancy G. Hatfield
MAY 0 5 2014

EXHIBIT A

WATER CONSUMPTION RATES AND WATER SUPPLY SHORTAGE RATES TO BE EFFECTIVE JUNE 1, 2014

	Stage 3 (per ccf)
Associated Water Use Curtailment	35%
Residential Customers	
Tier 1 (0-10 ccf)	$0.897
Tier 2 (11-34 ccf)	$2.15
Tier 3 (over 34 ccf)	$4.02
Commercial Customers	
Winter (Nov-Apr) All ccf	$1.55
Summer (May-Oct) All ccf	$2.16
Potable Irrigation Customers	
All ccf	$4.02

All other rates remain unchanged

Reference 14

ORDINANCE NO. 333

AN URGENCY ORDINANCE OF DUBLIN SAN RAMON SERVICES DISTRICT ADOPTING WATER USE LIMITATIONS DURING THE COMMUNITY DROUGHT EMERGENCY

WHEREAS, the State of California has and continues to experience record dry conditions, with 2013 being the driest year on record; and

WHEREAS, January 2014, normally a very wet month, was critically dry and is now the driest January on record; and

WHEREAS, meteorological and hydrological conditions improved somewhat since early February 2014 but 2014 remains a critically dry year as classified by the State of California; and

WHEREAS, on January 17, 2014 California Governor Edmund G. Brown issued a Proclamation of a State of Emergency, and encouraged all Californians to reduce their water usage by 20%; and

WHEREAS, the Zone 7 Water Agency issued a Proclamation of a Local Drought Emergency on January 29, 2014 and authorized their General Manager to "establish appropriate levels of conservation consistent with the California State of Drought Emergency and local conditions"; and

WHEREAS, in conformance with the January 29, 2014 proclamation by the Zone 7 Water Agency the General Manager established a system-wide conservation goal of 20% for 2014 as compared to 2013 usage, which was based on demand reductions of 5% for indoor water use and 40% for outdoor water use; and

WHEREAS, on January 31, 2014 the Department of Water Resources reduced from 5% to 0% the anticipated allocation of water to customers of the State Water Project, including the Zone 7 Water Agency; and

WHEREAS, on February 18, 2014 the District declared a State of Community Drought Emergency and established a goal of curtailing overall District water usage by twenty percent (20%) base on five percent (5%) curtailment of inside water use and forty percent (40%) curtailment of outside water use as compared to the same period in 2013; and

WHEREAS, on March 18, 2014 the City of Dublin declared a Local Drought Emergency; and

WHEREAS, on March 18, 2014 the City of Pleasanton approved an urgency ordinance amending their water conservation plan as needed to protect the immediate threat of the potentially significant drought to preserve public health and safety; and

WHEREAS, on February 24, 2014 the City of Livermore declared a Water Shortage Emergency; and

WHEREAS, on April 16, 2014 the Zone 7 Water Agency directed the local water supply retailers and untreated water customers to assure a 25% total reduction for 2014 with 5% coming from indoor curtailment and 50-60% from outdoor curtailment directed that the local water supply retailers adopt various mandatory conservation measures to achieve these reductions; and

WHEREAS, on April 18, 2014 the California Department of Water Resources announced that anticipated 2014 water allocations to the State Water Contractors (including Zone 7) will be increased to 5% but only on condition that delivery of water occur after September 1, 2014; and

WHEREAS, On April 25, 2014 Governor Edmund G. Brown proclaimed a Continued State of Emergency in the State of California and ordered that California residents should refrain from wasting water, specifying many practices that waste water and directing urban water suppliers to implement drought response plans to limit outdoor irrigation and other wasteful water practices; and

WHEREAS, the Zone 7 Water Agency supplies all of the potable water currently available to the District for distribution and use by its customers; and

WHEREAS, Zone 7's primary sources of supplies include: imported water from the State Water Project (80%); local groundwater supplies originating from rainfall, and runoff, and recharge (20%); and

WHEREAS, on May 5, 2014 the District Board of Directors declared that a State of Emergency has existed since February 18, 2014 and continues to prevail in the community served by the District by reason of the fact that the ordinary demands and requirements of the water consumers in the District's service area cannot be met and satisfied by the water supplies now available to the District without depleting the water supply to the extent that there would be insufficient water for human consumption, sanitation, and/or fire protection as a result of the ongoing drought and the resulting reductions to and restrictions on the available water supply.

NOW, THEREFORE, BE IT ORDAINED by the Board of Directors of Dublin San Ramon Services District as follows:

SECTION 1. PURPOSE AND AUTHORITY. The purpose of this Ordinance is to conserve the water supply of the District for the greatest public benefit with particular regard to public health and safety, fire protection, and domestic (indoor) use; to conserve water by enacting Water Use Limitations that are intended to preserve the District's ability to meet human health and safety needs with its limited water supply; to conserve a sufficient amount of water so that the demand for water does not exceed the supply, which otherwise would force the imposition of additional and/or stricter drought stage declarations, restrictions, or prohibitions; and to the extent necessary, reduce water use fairly and equitably. This Ordinance is adopted pursuant to

the District's authority under Sections 350 et seq. and 71640 et seq. of the California Water Code, which derive in part from Section 2 of Article X of the California Constitution.

SECTION 2. EFFECT OF ORDINANCE.

(a) This Ordinance shall take effect immediately, shall supersede and control over any other ordinance or regulation of the District in conflict herewith, and shall remain in effect until the Community Drought Emergency has ended.

(b) The Water Use Limitations specified herein shall apply throughout the District's water service area.

SECTION 3. WATER USE LIMITATIONS.

(a) Prohibitions on Water Use. During the Community Drought Emergency, and to preserve the water supply for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection, the following uses of water are prohibited except to the extent allowed under Section 3 (d) "Exemptions" of this Ordinance:

(1) Any and all waste and/or unreasonable use of potable water as determined by the District.

(2) Any and all use of potable water in violation of DSRSD District Code Section 4.10.030 (G), including but not limited to:

(i) Waste through leakage of defective or inoperable plumbing, piping or other water-use equipment;

(ii) Gutter flooding;

(iii) Single pass cooling systems in new constructions;

(iv) Non-recirculating systems in a new conveyer car wash and commercial laundry systems;

(v) Non-recycling decorative water fountains;

(vi) The use of water suitable for potable domestic use for non-potable uses, including irrigation of cemeteries, golf courses, parks, highway landscaped areas, and industrial and irrigation uses, when suitable recycled water is available to an area, for which the District has recycled water purveyorship authority.

(3) Any and all use of potable water for outdoor lawn and landscaping watering and irrigation, except to the extent allowed by exemptions described herein (nursery stock and plants available for immediate sale at commercial establishments are not considered "landscaping").

(4) Any and all use of potable water for non-potable purposes, where and when the District is ready, willing and able to furnish recycled water from its recycled water distribution system, and recycled water is permitted to be applied to that use.

(5) Any and all use of potable water for soil compaction and dust control purposes.

(6) Cleaning, Washing, Maintenance:

(i) Any and all use of potable water for street sweeping, gutter flooding, sewer or storm drain cleaning and maintenance purposes or other similar uses;

(ii) Any and all use of potable water for hosing down or pressure washing driveways, sidewalks, walkways, patios, parking lots, tennis courts, or other impervious surfaces;

(iii) Any and all vehicle washing, including autos, trucks, boats, trailers, recreational vehicles, etc., except to those allowed by exemptions described herein;

(iv) Any and all use of potable water for cleaning the exteriors of buildings or homes.

(7) Swimming Pools, Spas, and Water Themed Play Areas:

(i) Any and all use of potable water for filling of new swimming pools or spas;

(ii) Any and all use of potable water for refilling existing swimming pools or spas due to leaks, splash-out, and evaporative losses (i.e. "Topping Off");

(iii) Any and all uses of potable water as replacement water for existing water themed publicly owned "play areas" to recharge the play area with water due to leaks, splash-out, and evaporative losses (i.e. "Topping Off");

(iv) Any and all draining and subsequent refilling of existing swimming pools or spas, except where required for the protection of public health and safety, and upon the prior written approval of the District, which approval shall specify allowable refill times and rates.

(8) Any and all escape of potable water from pipe breaks or leaks after the customer has been notified of the probable existence of the break or leak by the District, or after the customer had or should have had reasonable knowledge of the pipe break or leak.

(9) Any and all use of potable water in any decorative fountain and/or other decorative water feature that is visible from areas accessible by the public.

(b) Restrictions on Water Use. During the Community Drought Emergency, and to preserve the water supply for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection the following water uses are restricted:

(1) Serving water at restaurants unless in response to an unsolicited request by the customer;

(2) The use of water in the bathrooms and/or lavatories of all non-domestic water customers of the District unless water conservation messages are posted in appropriate and effective locations in the bathrooms and/or lavatories of said customers.

(c) General Prohibition and Restriction.

(1) The use of an unreasonable and/or inappropriate amount of potable water as determined by the District considering the use to which the water is being put, even if otherwise in conformance with the prohibitions and restrictions on water use herein, is a violation of this Ordinance.

(2) Residential customers who use water at the rate of more than 640 gallons per day over the course of a week (the volume equivalent of about 50 units per bimonthly billing period, which is approximately 50% in excess of the threshold for Tier 3 consumption) are hereby found to be using an unreasonable and/or inappropriate amount of water.

(3) Indoor residential use that does not exceed health and safety needs shall generally be considered to be reasonable and appropriate. The State of California has determined (*Central Valley Project and State Water Project - Drought Operations Plan and Operational Forecast (April 1, 2014 through November 15, 2014)*) that health and

safety uses are approximately 55 gallons per person per day. This usage approximately corresponds to Tier One (10 unit) usage in the District's rate schedules assuming between two and three persons per household.

(d) Exemptions to Prohibitions and Restrictions. During the Community Drought Emergency, the following exemptions to the above listed prohibitions and restrictions are allowed:

(1) Outdoor Lawn and Landscaping Watering and Irrigation Exemptions:

(i) Drip or similarly high efficiency system watering and irrigation if no runoff, ponding, flooding or marshy conditions result;

(ii) Hand watering using a bucket, watering can or similar container without any direct connection to a potable water supply and if no runoff, ponding, flooding or marshy conditions result;

(iii) Hand watering or irrigation using a shut-off nozzle equipped hose only between the hours of 6:00 PM and 9:00 AM and on an application schedule not greater than approximately fifty (50%) of the evapotranspiration rate needed for the customer's landscaping (for lawns, approximately one half inch per week from June through September and three-eighths inch per week at other times of the year), in accordance with the weekly / monthly schedule below, if no runoff, ponding, flooding or marshy conditions result, and if it is not raining during the time of the watering or irrigation and the watering or irrigation does not take place less than three days after rain;

(iv) Semiautomatic watering and irrigation using oscillating or rotating devices connected to a hose of flexible connection that can be easily moved only while under the continual direct observation of a customer, only between the hours of

6:00 PM and 9:00 AM and on an application schedule not greater than approximately fifty (50%) of the evapotranspiration rate needed for the customer's landscaping (for lawns, approximately one half inch per week from June through September and three-eighths inch per week at other times of the year), in accordance with the weekly / monthly schedule below, if no runoff, ponding, flooding or marshy conditions result, and if it is not raining during the time of the watering or irrigation and the watering or irrigation does not take place less than three days after rain;

(v) Watering and irrigation systems using permanent irrigation piping and sprinkler heads that are not controlled by a functioning automatic timing device only between the hours of 6:00 PM and 9:00 AM and on an application schedule not greater than approximately fifty (50%) of the evapotranspiration rate needed for the customer's landscaping (for lawns, approximately one half inch per week from June through September and three-eighths inch per week at other times of the year), in accordance with the weekly / monthly schedule below, if no runoff, ponding, flooding or marshy conditions result, and if it is not raining during the time of the watering or irrigation and the watering or irrigation does not take place less than three days after rain;

(vi) Watering and irrigation systems using permanent irrigation piping and sprinkler heads that are controlled by a functioning automatic timing device only between the hours of 6:00 PM and 9:00 AM and on an application schedule not greater than approximately fifty (50%) of the evapotranspiration rate needed for the customer's landscaping (for lawns, approximately one half inch per week from

June through September and three-eighths inch per week at other times of the year), in accordance with the weekly / monthly schedule below, if no runoff, ponding, flooding or marshy conditions result, and if it is not raining during the time of the watering or irrigation and the watering or irrigation does not take place less than three days after rain;

(vii) Weekly / Monthly Irrigation schedule where applicable:

- One day per week (and not on consecutive days) during the months of April and May;
- Two days per week (and not on consecutive days) during the months of June, July, August and September;
- One day per week (and not on consecutive days) during the months of October and November; and
- At no time during the months of December, January, February and March.

(viii) Watering and irrigation of newly planted landscaping which was planted before the effective date of this Ordinance may be watered or irrigated every day for the first thirty days from the date it was planted and may only be watered or irrigated every other day for the next sixty days after the date it was planted provided that said watering or irrigation occur only between the hours of 6:00 PM and 9:00 AM and on an application schedule not greater than the evapotranspiration rate needed for the customer's landscaping (for lawns, approximately one inch per week from June through September and three-quarters inch per week at other times of the year) and if no runoff, ponding, flooding or marshy conditions result; and if it is

not raining during the time of the watering or irrigation and the watering or irrigation does not take place less than three days after rain;

(ix) Potable water may be used for watering or irrigation for very short periods of time for the express purpose of adjusting or repairing a potable irrigation system, as long as the system is continually and directly supervised by the owner or the owner's representative while the water is turned on.

(2) Cleaning, Washing, Maintenance Exemptions:

(i) Vehicle washing at commercial facilities or automobile dealerships, as long as the washing utilizes buckets or a self-contained washing system without any direct connection to a potable water supply;

(ii) Vehicle washing done at a commercial car wash facility that recirculates water;

(iii) Cleaning building or home exteriors if for the express purpose of preparing the exterior surfaces for repair and/or repainting, if done using a pressurized washing device equipped with a quick-acting positive shutoff nozzle;

(iv) Cleaning windows using potable water as long as a bucket or similar container is used, without any direct connection to a potable water supply.

(3) Swimming Pools, Spas and Water Themed Play Area Exemptions:

(i) "Topping off" of existing private swimming pools and spas (i.e. a pool or spa at a residence that is only available for use by the occupants and their guests) if the swimming pool or spa is covered to reduce evaporation when not in use, but only to the extent that the need for "Topping Off" is not due to leaks;

(ii) "Topping off" of existing semi-private swimming pools (i.e. a pool owned and professionally maintained by a home owner association, an apartment or condominium complex, or a membership club) if the pool is covered to reduce evaporation when not available for use, but only to the extent that the need for "Topping Off" is not due to leaks. If the pool is not equipped with a cover as of the effective date of this Ordinance, "Topping Off" will be allowed only until the earlier of (a) the installation of a pool cover or (b) four months from the effective date of this Ordinance;

(iii) "Topping off" of existing semi-private spa (i.e., a spa owned and professionally maintained by a home owner association, an apartment or condominium complex, or a membership club) if the spa is covered to reduce evaporation when not available for use, but only to the extent that the need for "Topping Off" is not due to leaks;

(iv) "Topping off" of existing public swimming pools (i.e., a pool that is available for use by the public at large) if the swimming pool is covered to reduce evaporation when not available for use, but only to the extent that the need for "Topping Off" is not due to leaks;

(v) "Topping off" of existing water themed publically owned "play areas" to the extent that the need for "Topping Off" is not due to leaks, and then only to the extent that the need for "Topping Off" is related to evaporative losses or to splash-out occurring when the water themed play area is used on hot days;

(vi) The draining and subsequent refilling of swimming pools and spas if needed for the protection of public health and safety, but only upon the prior written

approval of the District, which approval shall specify allowable refill times and rates.

(4) Decorative water features that, as of the effective date of this Ordinance, are in existence and which intentionally provide habitat for aquatic species.

(5) Notwithstanding anything in this Ordinance to the contrary, potable water may be used to actively irrigate or otherwise provide water to environmental mitigation projects in existence as of the effective date of this Ordinance and have been duly approved by regulatory authorities provided the project has active and valid permits.

SECTION 4. APPLICATION PROCEDURE FOR EXEMPTIONS FROM WATER USE LIMITATIONS.

The exclusive procedure for consideration of written applications from customers for exemptions from these Water Use Limitations described herein will be as follows:

(a) A customer may submit a written application for an exemption from a Water Use Limitation to the District's Drought Coordinator. The application must be on the District's form and must include the customer name, account number(s), a description of the limitation from which the customer is seeking an exemption, the reason(s) why the exemption is requested, the justification for the exemption, and the specific actions the customer proposes to take to achieve a functionally equivalent level of water curtailment. If a Notice of Violation has been issued to the customer, the customer must first resolve the violation including the payment of any and all penalties and/or costs before the Drought Coordinator will consider an application for an exemption from a Water Use Limitation;

(b) The District Drought Coordinator will consider each application for a waiver of a Water Use Limitation based on the information provided by the customer in the application. The Drought Coordinator may grant an exemption of a particular Water Use Limitation if the application is deemed reasonable. An exemption shall not be granted if, in the opinion of the Drought Coordinator, doing so would endanger the public health and safety;

(c) A customer may appeal the Drought Coordinator's denial of an application for an exemption from a Water Use Limitation within ten (10) calendar days by submitting a written appeal to the Board of Directors on the District's form and specify the reasons why the customer disagrees with the Drought Coordinator's denial;

(d) If a previous application for an exemption of a Water Use Limitation has been denied, a new application for exemption of the same Water Use Limitation is not permitted and will not be considered.

SECTION 5. ADMINISTRATIVE IMPLEMENTATION. The General Manager is authorized and directed to establish appropriate administrative procedures consistent with the provisions of this ordinance and to take reasonable and appropriate action to fully implement the provisions of this ordinance.

SECTION 6. EXEMPTION FROM CEQA. The District Board of Directors finds that the actions taken in this Ordinance are exempt from provisions of the California Environmental Quality Act of 1970 (CEQA) because they are immediate actions necessary to prevent or mitigate an emergency, as described in subdivision (b)(4) of Public Resources Code section 21080 and in section 15269(c) of the Guidelines promulgated under said Act and codified in Title 14 of the Code of California Regulations (CEQA Guidelines), and to assume the

maintenance, restoration, or enhancement of a natural resource, as described in section 15307, of the CEQA Guidelines.

SECTION 7. SEVERABILITY. If any provision of this Ordinance is held to be invalid or unenforceable, that holding will not affect the remainder of the Ordinance, which shall remain in full force and effect.

ADOPTED by the Board of Directors of Dublin San Ramon Services District, a public agency in the State of California, Counties of Alameda and Contra Costa, at its special meeting held on the 5th day of May 2014, by the following vote:

AYES: 5 - Directors Richard M. Halket, Edward R. Duarte, Dawn L. Benson, D.L. (Pat) Howard, Georgean M. Vonheeder-Leopold

NOES: 0

ABSENT: 0

Georgean M. Vonheeder-Leopold

Georgean M. Vonheeder-Leopold, President

ATTEST:

Nancy G. Hatfield

Nancy G. Hatfield, District Secretary

CERTIFIED AS A TRUE AND CORRECT COPY OF
THE ORIGINAL ON FILE IN THE OFFICE OF
DUBLIN SAN RAMON SERVICES DISTRICT
Secretary Nancy G. Hatfield
MAY 0 5 2014

Reference 15

ORDINANCE NO. 334

AN URGENCY ORDINANCE OF DUBLIN SAN RAMON SERVICES DISTRICT ADOPTING PENALTIES AND PROVISIONS FOR THE ENFORCEMENT OF WATER USE LIMITATIONS DURING THE COMMUNITY DROUGHT EMERGENCY

WHEREAS, the State of California has and continues to experience record dry conditions, with 2013 being the driest year on record; and

WHEREAS, January 2014, normally a very wet month, was critically dry and is now the driest January on record; and

WHEREAS, meteorological and hydrological conditions improved somewhat since early February 2014 but 2014 remains a critically dry year as classified by the State of California; and

WHEREAS, on January 17, 2014 California Governor Edmund G. Brown issued a Proclamation of a State of Emergency, and encouraged all Californians to reduce their water usage by 20%; and

WHEREAS, the Zone 7 Water Agency issued a Proclamation of a Local Drought Emergency on January 29, 2014 and authorized their General Manager to "establish appropriate levels of conservation consistent with the California State of Drought Emergency and local conditions"; and

WHEREAS, in conformance with the January 29, 2014 proclamation by the Zone 7 Water Agency the General Manager established a system-wide conservation goal of 20% for 2014 as compared to 2013 usage, which was based on demand reductions of 5% for indoor water use and 40% for outdoor water use; and

WHEREAS, on January 31, 2014 the Department of Water Resources reduced from 5% to 0% the anticipated allocation of water to customers of the State Water Project, including the Zone 7 Water Agency; and

WHEREAS, on February 18, 2014 the District declared a State of Community Drought Emergency and established a goal of curtailing overall District water usage by twenty percent

(20%) base on five percent (5%) curtailment of inside water use and forty percent (40%) curtailment of outside water use as compared to the same period in 2013; and

WHEREAS, on March 18, 2014 the City of Dublin declared a Local Drought Emergency; and

WHEREAS, on March 18, 2014 the City of Pleasanton approved an urgency ordinance amending their water conservation plan as needed to protect the immediate threat of the potentially significant drought to preserve public health and safety; and

WHEREAS, on February 24, 2014 the City of Livermore declared a Water Shortage Emergency; and

WHEREAS, on April 16, 2014 the Zone 7 Water Agency directed the local water supply retailers and untreated water customers to assure a 25% total reduction for 2014 with 5% coming from indoor curtailment and 50-60% from outdoor curtailment directed that the local water supply retailers adopt various mandatory conservation measures to achieve these reductions; and

WHEREAS, on April 18, 2014 the California Department of Water Resources announced that anticipated 2014 water allocations to the State Water Contractors (including Zone 7) will be increased to 5% but only on condition that delivery of water occur after September 1, 2014; and

WHEREAS, on April 25, 2014 Governor Edmund G. Brown proclaimed a Continued State of Emergency in the State of California and ordered that California residents should refrain from wasting water, specifying many practices that waste water and directing urban water suppliers to implement drought response plans to limit outdoor irrigation and other wasteful water practices; and

WHEREAS, the Zone 7 Water Agency supplies all of the potable water currently available to the District for distribution and use by its customers; and

WHEREAS, Zone 7's primary sources of supplies include: imported water from the State Water Project (80%); local groundwater supplies originating from rainfall, and runoff, and recharge (20%); and

WHEREAS, on May 5, 2014 the District Board of Directors declared that a State of Emergency has existed since February 18, 2014 and continues to prevail in the community served by the District by reason of the fact that the ordinary demands and requirements of the water consumers in the District's service area cannot be met and satisfied by the water supplies now available to the District without depleting the water supply to the extent that there would be insufficient water for human consumption, sanitation, and/or fire protection as a result of the ongoing drought and the resulting reductions to and restrictions on the available water supply.

WHEREAS, on May 5, 2014 the District Board of Directors adopted an urgency ordinance specifying Water Use Limitations that are to be effective during the Community Drought Emergency.

NOW, THEREFORE, BE IT ORDAINED by the Board of Directors of Dublin San Ramon Services District as follows:

SECTION 1. PURPOSE AND AUTHORITY. The purpose of this Ordinance is to conserve the water supply of the District for the greatest public benefit with particular regard to public health and safety, fire protection, and domestic (indoor) use; to conserve water by enforcing Water Use Limitations that if continued would endanger the District's ability to meet human health and safety needs with its limited water supply; to conserve a sufficient amount of water so that the demand for water does not exceed the supply, which otherwise would force the imposition of additional and/or stricter drought stage declarations, restrictions, or prohibitions; and to the extent necessary, authorize and direct staff to enforce said Water Use Limitations fairly and equitably. This Ordinance is adopted pursuant to the District's authority under

Sections 350 et seq. and 71640 et seq. of the California Water Code, which derive in part from Section 2 of Article X of the California Constitution.

SECTION 2. EFFECT OF ORDINANCE.

(a) This Ordinance shall take effect immediately, shall supersede and control over any other ordinance or regulation of the District in conflict herewith, and shall remain in effect until the Community Drought Emergency has ended and all Water Use Violations have been finally resolved.

(b) The provisions of this Ordinance shall apply throughout the District's water service area.

SECTION 3. ENFORCEMENT ACTIONS.

(a) Violation of Water Use Limitations.

During the Community Drought Emergency, certain Water Use Limitations have been established by a separate Ordinance of the District. A District customer who intentionally or unintentionally violates any Water Use Limitation will be subject to the following penalties and enforcement provisions:

(1) For first violations, customers will be issued either an oral or written warning, at the discretion of the District, and the warning will identify the violation and specify what the customer must do to cure the violation and a compliance schedule for curing the violation. Oral warnings will occur via telephone call or a site visit by District staff. Written warnings will be in the form of a door hanger tag, a letter sent via postal carrier, or another functionally equivalent method.

(2) For second violations, customers will be subject to a penalty of $250 in accordance with Chapter 1.3.010 (General Penalty) of the District Code. The violation and the assessment of the penalty will be communicated to the customer via a written Notice of Violation.

(3) For third violations, customers will be subject to an additional penalty of $500 in accordance with Chapter 1.3.010 (General Penalty) of the District Code. The violation and the assessment of the penalty will be communicated to the customer via a written Notice of Violation.

(4) For fourth violations, customers will be subject to an additional penalty of $1,000 in accordance with Chapter 1.3.010 (General Penalty) of the District Code. The violation and the assessment of the penalty will be communicated to the customer via a written Notice of Violation.

(5) For fifth and any subsequent violations, customers will be subject to reductions in the amount of water delivered to the customer, as determined by the District, at its sole discretion. The violation, and the amount of reduction and method by which the reduction will be achieved will be communicated to the customer via a written Notice of Violation.

A. If feasible and if sufficient to prevent a re-occurrence of the violation, as determined by the District at its sole discretion, a flow restrictor or other physical limitation will be installed on the customer's meter connection that will limit the flow of water to the home. If installed, the flow restrictor or other physical limitation will allow enough water to meet health and safety needs (i.e. most indoor water uses), but will limit the pressure and flow to a level that will not allow the Water Use Violation to continue.

B. If a flow restrictor or other physical limitation is not feasible or appropriate for any reason, as determined by the District at its sole discretion, or if a flow

restrictor would allow the Water Use Violation to continue unabated, or if a flow restrictor would allow the delivery of quantities of water equivalent to the amount consumed by the activity giving rise to the Water Use Violation, then the customer's service connection will be disconnected from the District water system (i.e., by closing and locking the service valve and/or by physically removing the water meter).

Where feasible and appropriate, a door hanger tag will be left at the service location informing the occupants of the action taken and the steps that must be taken before the District will consider removing the physical limitation. Full payment of all outstanding penalties, fees, and costs and certification by the customer that the violation has been corrected and will not reoccur will be required before the physical limitation or other physical limitation will be removed or service restored.

(b) Notice of Violation.

The Notice of Violation will identify the violation and specify what the customer needs to do to cure the violation and a compliance schedule for curing the violation. The Notice of Violation will be communicated to the customer in the form of a letter sent via postal carrier or another functionally equivalent method; as a courtesy and where feasible and appropriate, a door hanger tag may be left by the District as a preliminary notice to the occupant. The penalty amount will be added to the customer's bill on the next statement. For the second through the fourth violations, the Notice of Violation will clearly state that any further violations of a prohibited or restricted water use will be subject to greater penalties and the potential of the District installing a flow restrictor on the customer's service, or at the option of the District, disconnection (shut-off) of their service.

(c) Violation is a Misdemeanor.

Pursuant to California Water Code Section 71644, the use of water in violation of restrictions or prohibitions on water use, or the waste and unreasonable use of water in accordance with a District Ordinance is a misdemeanor.

(d) Multiple Violations.

Violations of more than one Water Use Limitation are separate violations each of which shall be subject to separate and independent enforcement in accordance with the provisions of this Ordinance.

SECTION 4. APPLICATION PROCEDURE FOR WAIVER OF VIOLATION.

The exclusive procedure for consideration of written applications for waivers of the violations of Water Use Limitations ("Waiver of Violation"), to avoid the enforcement actions described herein, will be as follows:

(a) A customer may submit a written application for a Waiver of Violation related to water use to the District's Drought Coordinator. The application must be on the District's form and must include the customer name, account number(s), a description of the water use for which the customer was cited, and a description of the reason(s) why a Waiver of Violation is requested and justification for the Waiver of Violation. If penalties and/or costs have been assessed, the application must be accompanied by a deposit in an amount specified in the enforcement action.

(b) The District Drought Coordinator will consider each application for a Waiver of Violation based on the customer's reason(s) for violating a Water Use Limitation and justification as presented. The Drought Coordinator may grant a one-time waiver of a particular violation if the customer's justification is deemed to be reasonable, and if the customer has mitigated

or agrees to immediately mitigate the cause of the violation. If a Waiver of Violation is granted the deposit furnished by the customer shall be refunded.

(c) A customer may appeal a denial of an application for a Waiver of Violation within ten (10) calendar days by submitting a written appeal to the Board of Directors on the District's form and specify the reasons why the customer disagrees with the denial.

(d) If a Waiver of Violation for a specific type of violation has been previously granted, a further waiver of that same type of violation is not permitted.

SECTION 5. ADMINISTRATIVE IMPLEMENTATION.

The General Manager is authorized and directed to establish appropriate administrative procedures, including guidelines to be used by the District's Drought Coordinator when considering applications for waivers, consistent with the provisions of this ordinance, and to take reasonable and appropriate action to fully implement the provisions of this ordinance.

SECTION 6. EXEMPTION FROM CEQA.

The District Board of Directors finds that the actions taken in this Ordinance are exempt from provisions of the California Environmental Quality Act of 1970 (CEQA) because they are immediate actions necessary to prevent or mitigate an emergency, as described in subdivision (b)(4) of Public Resources Code section 21080 and in section 15269(c) of the Guidelines promulgated under said Act and codified in Title 14 of the Code of California Regulations (CEQA Guidelines), and to assume the maintenance, restoration, or enhancement of a natural resource, as described in section 15307, of the CEQA Guidelines.

SECTION 7. SEVERABILITY.

If any provision of this Ordinance is held to be invalid or unenforceable, that holding will not affect the remainder of the Ordinance, which shall remain in full force and effect.

ADOPTED by the Board of Directors of Dublin San Ramon Services District, a public agency in the State of California, Counties of Alameda and Contra Costa, at its special meeting held on the 5th day of May 2014, by the following vote:

AYES: 5 - Directors Richard M. Halket, Dawn L. Benson, D.L. (Pat) Howard, Edward R. Duarte, Georgean M. Vonheeder-Leopold

NOES: 0

ABSENT: 0

Georgean M. Vonheeder-Leopold

Georgean M. Vonheeder-Leopold, President

ATTEST:

Nancy G. Hatfield

Nancy G. Hatfield, District Secretary

CERTIFIED AS A TRUE AND CORRECT COPY OF THE ORIGINAL ON FILE IN THE OFFICE OF DUBLIN SAN RAMON SERVICES DISTRICT
Secretary Nancy G. Hatfield

MAY 0 5 2014

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Reference 16

DUBLIN SAN RAMON SERVICES DISTRICT

2014 Report of Operations

TABLE 1

LAVWMA SYSTEM: 4th QTR FY 2013-2014 Electric Usage, Efficiency, and Costs

	PG&E Service Accounts: Rate Schedule E20S								Total					Internal Calculations		
	Acct # 8482061923-1 Service A		Acct # 8440395259-5 Service B		Billing	Total			Export	Pumping					100%	
									Flow	Energy	Cost		Efficiency	AVG	Efficient	
Month	kWh	$	kWh	$	Days	kWh	$/kWh	$	MG	kWh/MG	$/MG	$/AF	%	GPM	kWh	TDH
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Apr	62,526	$9,607	327,858	$37,437	14	390,384	$0.12	$47,044	192	2,029	$245	$80	68.5%	9,542	267,433	442.8
May	192,309	$23,095	413,163	$41,551	30	605,472	$0.11	$64,646	305	1,988	$212	$69	70.0%	7,052	423,533	442.8
Jun	219,275	$31,618	236,054	$30,985	32	455,329	$0.14	$62,603		#DIV/0!	#DIV/0!	#DIV/0!	0.0%	0	0	442.8
Average	158,037	$21,440	325,692	$36,658	25	483,728	$0.12	$58,098	249	#DIV/0!	#DIV/0!	#DIV/0!	47.6%			
Total	474,110	$64,320	977,075	$109,973	76	1,451,185		$174,293	497					Total:	690,966	
Minimum	62,526	$9,607	236,054	$30,985	14	390,384	$0.11	$47,044	192	#DIV/0!	#DIV/0!	#DIV/0!	0.0%			
Maximum	219,275	$31,618	413,163	$41,551	32	605,472	$0.14	$64,646	305	#DIV/0!	#DIV/0!	#DIV/0!	70.0%			

Notes: April read dates, electric usage, and export flow are for 4/1/14-4/14/14. May read dates, electric usage, and export flow are for 4/15/14-5/14/14. June read dates, electric usage, and export flow are for 5/15/14-6/15/14. Pumping efficiency is based on continuous average flows and a TDH of 442.8 feet, including static lift of 408.8 feet and piping losses of 34 feet (per Charlie Joyce, B&C, 2/12/07).

Reference 17

CHAPTER 2. WATER SUPPLY SYSTEM AND WATER RESOURCES PLANNING

EBMUD's water supply system extends from the Mokelumne River watershed on the western slope of the Sierra Nevada Mountains to the East Bay. The Mokelumne River water supply, in concert with aggressive conservation and recycled water programs, is sufficient during normal and wet years to meet the needs of EBMUD's customers; however, several factors affect the reliability of the water supply. EBMUD is investigating opportunities to improve the reliability of its water supply and close the gap between water supplies and water needs during multi-year drought periods.

WATER SUPPLY SYSTEM

The EBMUD water supply system collects, transmits, treats, and distributes high-quality water from its primary water source, the Mokelumne River, to its customers in the San Francisco East Bay Area (see Figure 2-1). The Mokelumne Aqueducts convey the Mokelumne River supply from Pardee Reservoir across the Sacramento-San Joaquin River Delta (Delta) to local storage and treatment facilities. After treatment, water is distributed to 20 incorporated cities and 15 unincorporated communities in Alameda and Contra Costa Counties. The cities are Alameda, Albany, Berkeley, Danville, El Cerrito, Emeryville, parts of Hayward, Hercules, Lafayette, Moraga, Oakland, Orinda, Piedmont, Pinole, parts of Pleasant Hill, Richmond, San Leandro, San Pablo, San Ramon, and parts of Walnut Creek. The unincorporated communities include Alamo, Ashland, Blackhawk, Castro Valley, Cherryland, Crockett, Diablo, El Sobrante, Fairview, Kensington, North Richmond, Oleum, Rodeo, San Lorenzo, and Selby.

EXISTING WATER SUPPLY SOURCES

Since the late 1920s, EBMUD's primary source of water has been the Mokelumne River. For details on dry-year supplemental supply sources and infrastructure refer to the "Existing Supplemental Water Supply Sources" section in this chapter.

Mokelumne River

The Mokelumne River serves a variety of uses, including agriculture, fisheries, hydropower, recreation, and municipal and industrial use. Approximately 90 percent of the water used by EBMUD comes from the Mokelumne River watershed. EBMUD has water rights that allow for delivery of up to a maximum of 325 million gallons per day (MGD) from the Mokelumne River, subject to the availability of Mokelumne River runoff and to the senior water rights of other users, downstream fishery flow requirements, and other Mokelumne River water uses.

Figure 2-2 (see page 2-5) displays EBMUD's Mokelumne River flow commitments which are determined by hydrology; a variety of agreements between EBMUD and other Mokelumne River users; water rights priorities; agreements with State and Federal regulatory agencies; State Board orders and decisions; federal directives; court decrees; and numerous agreements both upstream and downstream of EBMUD's Mokelumne River facilities.

Amongst these factors, EBMUD's Mokelumne River flow commitments are generally tied to the variability in the Mokelumne River watershed rainfall and runoff patterns which govern the release requirements for the year. Figure 2-2 provides information regarding EBMUD's flow commitments during normal and 'dry' years. For comparison, the figure also provides information on the average runoff for various periods of historical records, EBMUD's maximum water rights appropriations, and other pertinent information that illustrate the complex nature of agreements and uses on the Mokelumne River.

As depicted in Figure 2-2, EBMUD continues to meet its commitment to protect the lower Mokelumne River by providing instream flow releases from EBMUD's Camanche Dam to improve fishery conditions, per the requirements of the 1998 Joint Settlement Agreement (JSA) among EBMUD, US Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG).

In the long-term, during drought periods, the Mokelumne River cannot meet EBMUD's projected customer demands, even with an "up to 15 percent" rationing imposed under EBMUD's Board Policy 9.03 (see Appendix F) and use of existing dry-year supplemental supplies. Furthermore, EBMUD's Mokelumne River supply is expected to be reduced as demands on the Mokelumne River increase from the growing needs from users in Amador, Calaveras, and San Joaquin counties with water rights senior to those of EBMUD's.

Local Runoff

EBMUD's secondary water supply source is local runoff from the East Bay area watersheds that is stored in the terminal reservoirs located within the service area boundaries. The availability of water from local runoff is dependent on two factors: hydrologic conditions and terminal reservoir storage availability. Hydrologic conditions determine the amount of runoff in the local watershed. In dry-years, evaporation can exceed runoff, resulting in no net local supply. In addition, the amount of storage available for capturing local runoff is limited. Maintaining lower water levels in the terminal reservoirs would provide space for storing additional to supplement EBMUD's existing dry-year supplies. The collaborative effort has already resulted in a $25 million grant, and up to $12 million was allocated for the construction of the Freeport Regional Water Facility. local runoff. However, because these reservoirs also regulate EBMUD's Mokelumne River supply and provide emergency standby storage, limited space can be held for the variable local runoff. Average local supply that is used in the East Bay is 15 to 25 MGD during normal hydrologic years and is near zero during drought conditions.

EXISTING WATER SUPPLY INFRASTRUCTURE

EBMUD's water supply system consists of a network of reservoirs, aqueducts (pipelines), water treatment plants (WTP), pumping plants, and other distribution facilities that convey Mokelumne River from Pardee Reservoir to EBMUD customers.

Pardee Dam and Reservoir

Pardee Dam and Reservoir are located approximately 38 miles northeast of Stockton near the town of Valley Springs, downstream from Pacific Gas and Electric Company's Mokelumne River Hydroelectric Project. Pardee Dam, constructed in 1929, is a concrete gravity arch structure rising 345 feet above the river bed. The reservoir has 37 miles of shoreline, a surface area of 2,222 acres, and a current capacity of 197,950[1] acre-feet (AF) at spillway crest elevation. A 27.8-megawatt (MW) Pardee Powerhouse, located at the base of the dam, was placed in service in 1930. It generates 140 million kilowatt hours (kWh) during a median runoff year.

Pardee Reservoir is used principally for EBMUD's municipal water supply, power generation, and as a supply source for Jackson Valley Irrigation District. Pardee Reservoir also is operated to provide recreational facilities to the public and to protect and enhance the fishery resources and ecosystem of the lower Mokelumne River.

[1] Licensed quantity to store in Pardee Reservoir is 209,950 AFY.
[2] Camanche Reservoir was originally constructed with a capacity of 431,500 AF

Camanche Dam and Reservoir

Camanche Dam is located on the Mokelumne River approximately 10 miles downstream from Pardee Dam. Camanche Dam, constructed in 1964, is a zoned earthen structure. Camanche Reservoir has 63 miles of shoreline, a surface area of 7,470 acres, and a current capacity of 417,120AF[2] at spillway crest elevation. An 11.25-MW Camanche Powerhouse, located at the base of the dam, was placed in service in 1983. It generates 45 million kWh during a median runoff year.

Camanche Reservoir is operated jointly with Pardee Reservoir to provide water supply benefits while maintaining numerous downstream obligations, including stream-flow regulation, water for fisheries and riparian habitat, flood control, and obligations to downstream diverters. It also provides power generation and recreation opportunities.

Mokelumne Aqueduct System

Raw water from Pardee Reservoir is transported approximately 91 miles to EBMUD WTPs and terminal reservoirs through the Pardee Tunnel, the Mokelumne Aqueducts, and the Lafayette Aqueducts. Water flowing by gravity from Pardee Reservoir takes 30 to 45 hours to reach the East Bay.

The Pardee Tunnel is a 2.2 mile, 8 foot high horseshoe structure constructed in 1929. The Mokelumne Aqueducts (see Table 2-1 for pipeline characteristics) are comprised of three 82 mile long pipelines that transport water from the end of Pardee Tunnel in Campo Seco to Walnut Creek at the east end of the two Lafayette Aqueducts. The Mokelumne Aqueducts have a total capacity of 200 MGD by gravity flow and up to 325 MGD with pumping at the Walnut Creek pumping plants.

TABLE 2-1 MOKELUMNE AQUEDUCT SYSTEM CHARACTERISTICS

PIPELINE	CONSTRUCTED	DIAMETER (INCHES)	MATERIAL
MOKELUMNE AQUEDUCT NO. 1	1929	65	STEEL
MOKELUMNE AQUEDUCT NO. 2	1949	67	STEEL
MOKELUMNE AQUEDUCT NO. 3	1963	87	STEEL

EBMUD Water Treatment Infrastructure

Water from Pardee Reservoir is transported to the EBMUD service area in the Mokelumne Aqueducts, which terminate in Walnut Creek. From Walnut Creek, the water is sent directly to EBMUD's three in-line filtration WTPs or to one or more of the EBMUD terminal reservoirs (see Figure 2-1).

Figure 2-1

EBMUD Water Supply System

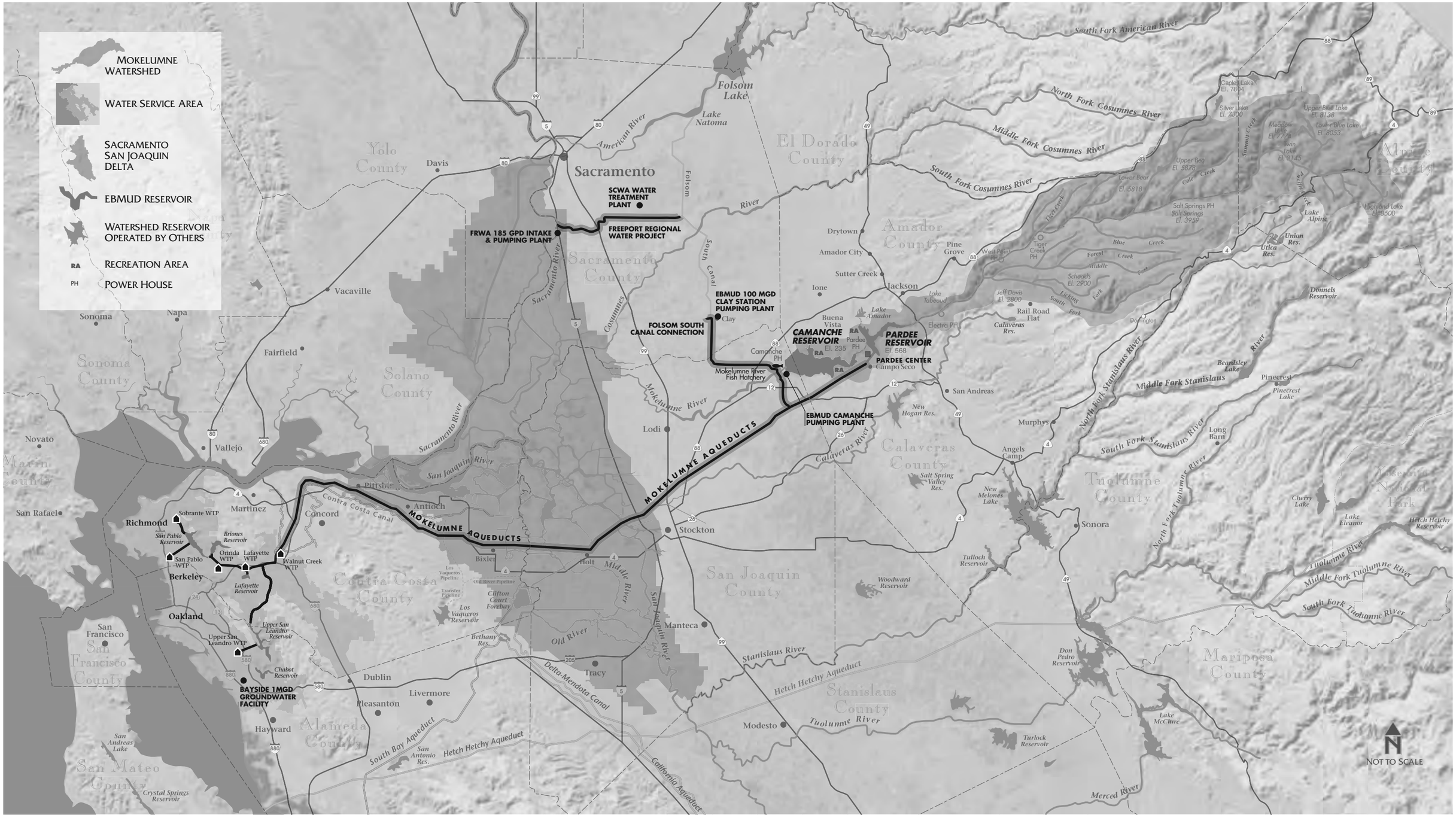

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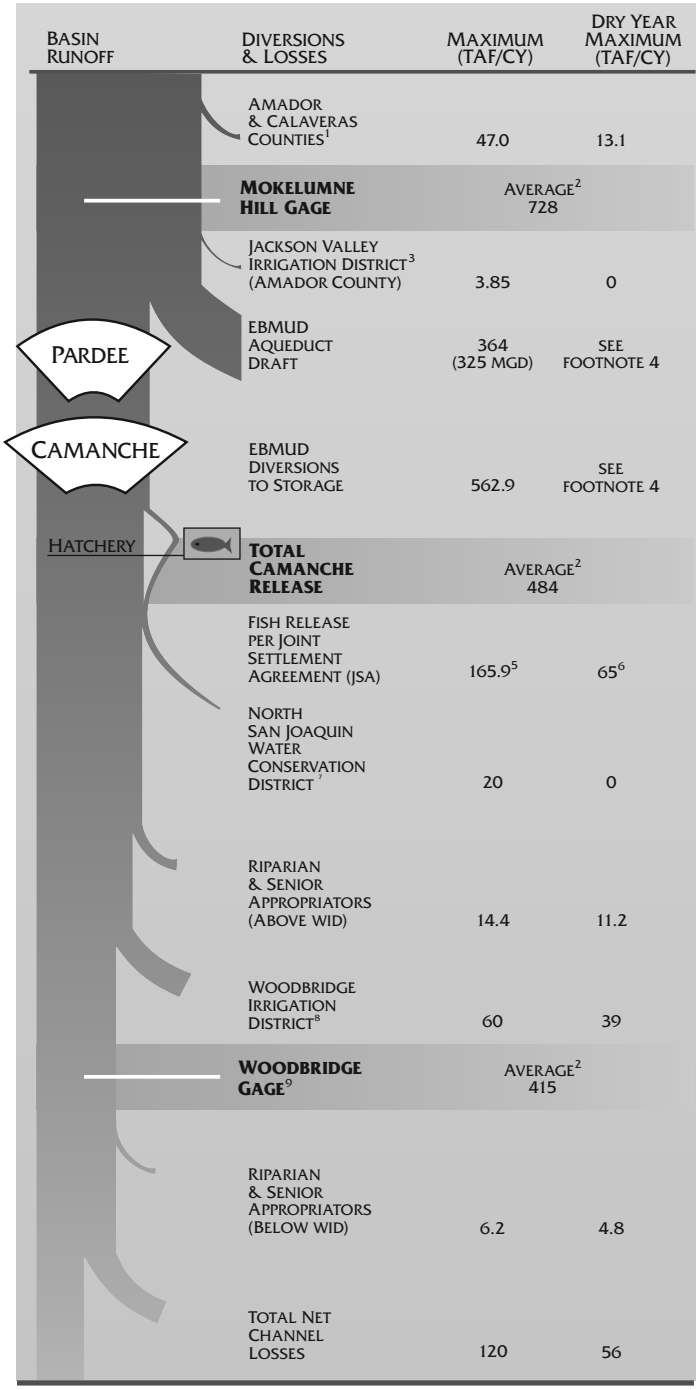
FIGURE 2-2 EBMUD FLOW COMMITMENTS



1. Amador County has 15 TAF of pre-14 rights, which could be exercised in dry years if there is sufficient runoff.
2. Average data provided for the various periods of historical record.
3. May be "0" if no water is available under JVID priority or Pardee elevation is below 550 ft.
4. Varies with runoff and storage conditions.
5. Water releases committed by EBMUD to protect fishery per "Normal and Above" water year type under JSA criteria.
6. Water releases committed by EBMUD to protect fishery per "Dry" water year type under JSA criteria. In critically dry years, the minimum releases could be as low as 22.5 TAF.
7. May be "0" if no water is available surplus to EBMUD needs.
8. EBMUD's obligation to release water to the Woodbridge Irrigation District is governed by a series of water rights settlement agreements to a maximum of 60 TAF/yr when inflow to Pardee is greater than 375 TAF.
9. Includes local runoff between Camanche and WID.

The in-line filtration plants that receive water directly from Pardee Reservoir are Walnut Creek WTP, Lafayette WTP, and Orinda WTP. Walnut Creek WTP and Lafayette WTP serve the area east of Oakland-Berkeley Hills and Orinda WTP serves primarily the central parts of the area west of the Oakland-Berkeley Hills. Three other plants, Upper San Leandro WTP, San Pablo WTP, and Sobrante WTP provide full conventional treatment and receive water from EBMUD's terminal reservoirs. These plants serve the northern and southern parts of the EBMUD distribution system west of the Oakland-Berkeley Hills.

EBMUD Terminal Reservoirs

Water that is not immediately put through the WTPs and distributed is stored in five EBMUD terminal reservoirs: Briones, Chabot, Lafayette, San Pablo, and Upper San Leandro reservoirs. The total maximum capacity of these reservoirs is 151,670 AF. The terminal reservoirs serve multiple functions that include:

- regulating EBMUD's Mokelumne River supply in winter and spring;
- augmenting EBMUD's Mokelumne water supply with local runoff;
- providing emergency sources of supply during extended drought or in the event of interrupition of delivery of the Mokelumne supply;
- providing environmental and recreational benefits to East Bay communities; and
- minimizing flooding.

Upper San Leandro, San Pablo and Briones reservoirs can supply water to EBMUD throughout the year, where as Lafayette Reservoir and Lake Chabot provide emergency standby supply. Lake Chabot also provides untreated water supply to several golf courses These two reservoirs are not used for regular domestic supplies and are used for public recreation (e.g. fishing, sailing, canoeing, hiking, jogging, bicycling, picnicking, walking, and nature observations). San Pablo Reservoir is also used for public recreation. Table 2-2 provides the capacities and water sources of the terminal reservoirs.

EBMUD Distribution Facilities

After the WTPs, water is distributed throughout EBMUD's service area, which is divided into more than 120 pressure zones ranging in elevation from sea level to 1,450 feet. Approximately 50 percent of treated water is distributed to customers by gravity. The water distribution network includes 4,100 miles of pipe, 140 pumping plants and 170

Table 2-2 Terminal Reservoir Characteristics

Reservoir	Constructed	Capacity (Acre-Feet)	Water Sources
Briones	1964	60,510	Mokelumne River, Bear Creek
Chabot	1875	10,350	Mokelumne River, San Leandro Creek, Upper San Leandro Reservoir, Miller Creek
Lafayette	1933	4,250	Lafayette Creek [1]
San Pablo	1920	38,600	Mokelumne River, San Pablo Creek, Bear Creek, Briones Reservoir
Upper San Leandro	1926	37,960	Mokelumne River, San Leandro Creek and tributaries

[1] The raw water line for the Mokelumne aqueducts was disconnected from the reservoir in 1971.

neighborhood reservoirs (tanks storing treated drinking water) having a total capacity of 830 million gallons.

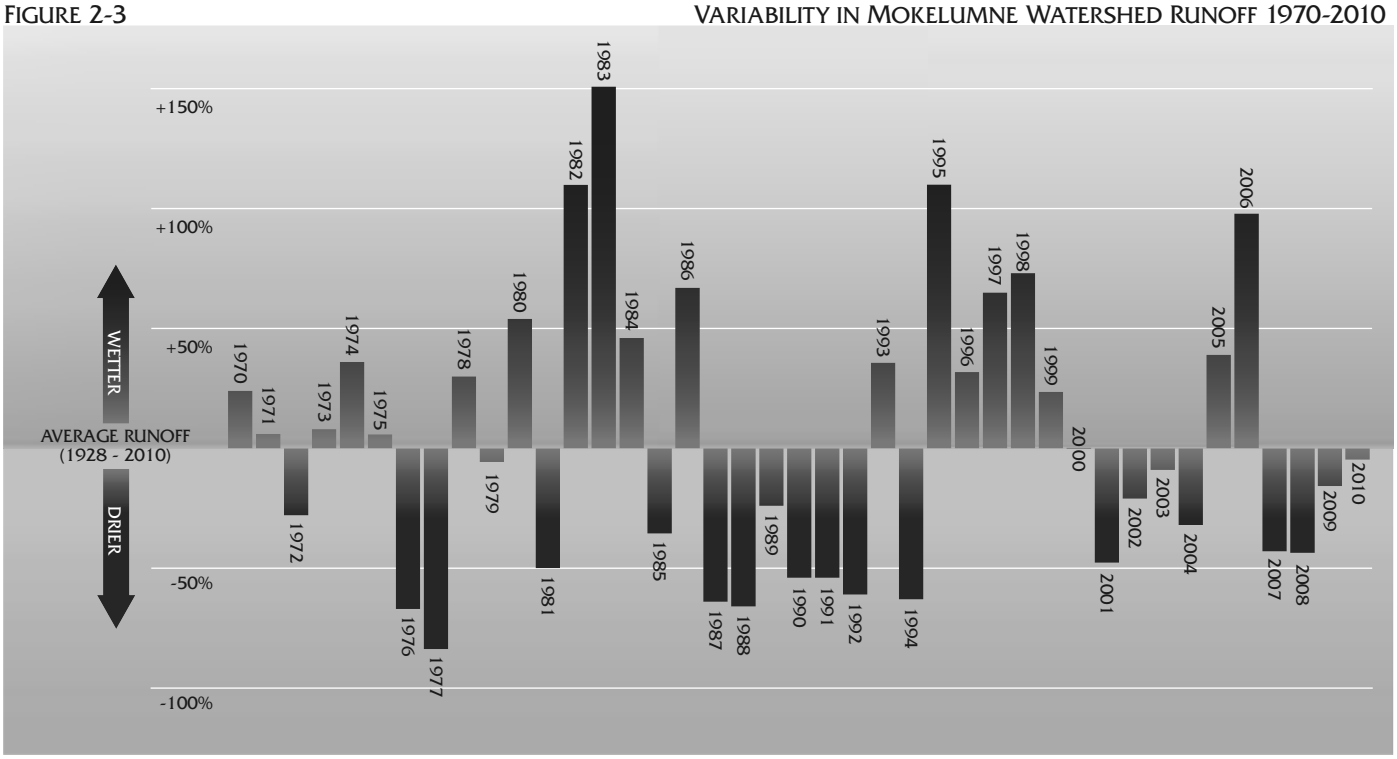
Vulnerabilities In Water Supply And System Reliability

The reliability of EBMUD's water supply sources and transmission system are affected by many factors. Droughts and climatic variations can adversely affect the availability of EBMUD's water supplies. In addition to such gradually-occurring phenomena, sudden catastrophic interruptions also can compromise the availability of water. Despite efforts to upgrade the system, the structural strength of the Mokelumne Aqueducts that cross the Delta region, could be undermined by a levee failure, especially during flooding and earthquakes. Federal authorities have warned the nation's major water suppliers that the integrity of their water supply systems could be compromised by terrorist attacks. Other factors that could affect the availability of water supply include periods of poor water quality from high turbidity, which affects the water treatment system; potential contamination of supplies; maintenance outages at terminal reservoirs; shortfalls in distribution system capacity; widespread power outage; fires; and civil disturbances.

Droughts

Northern California's water resources, including EBMUD's supplies, have been stressed by periodic drought cycles. Historical multi-year droughts have significantly diminished the supplies of water available to EBMUD's customers. The periodic drought cycles, including the most recent 2007-2009 hydrologic drought

Figure 2-3 Variability in Mokelumne Watershed Runoff 1970-2010



and high variability of runoff in the Mokelumne River watershed are illustrated in Figure 2-3.

During the early stages of a drought and throughout the drought period, EBMUD imposes drought management programs to reduce customer demands, thereby saving water for the following year in case drought conditions continue. Chapter 3 of the UWMP 2010 includes the details of EBMUD's drought management program; Chapter 4 provides an assessment of the reliability of water service for EBMUD customers during normal, single, and multiple dry-years.

Effects of Climate Change

Climate change is a growing threat to water resources. Although the full impact of climate change has not been felt, EBMUD has initiated the planning for climate change to ensure that it can continue to provide reliable, high quality water and wastewater services to its customers.

In 2008, EBMUD incorporated climate change into its Strategic Plan and issued its first Climate Change Monitoring and Response Plan. Both documents were updated in 2010. An interdisciplinary staff committee is reviewing the evolving science of climate change, assessing potential water supply impacts and vulnerabilities, and developing strategies for adaptation and mitigation.

In 2009 EBMUD evaluated the sensitivity of its current water supply system to potential climate change impacts. The results of the analysis are intended to help guide EBMUD in managing water supplies to meet demand with the maximum amount of flexibility and the ability to adapt to unknown future conditions, and show that:

- the water supply is most vulnerable to decreases in annual runoff volumes;
- an increase in air temperature may result in increases in the temperature of water flowing into Pardee Reservoir and in customer demand; and
- the frequency of rationing is sensitive to decreases in annual precipitation volume.

Although EBMUD may experience these changes in its Mokelumne River watershed supply in the future, due to the uncertainty in regional climate change projections, the severity of these impacts is unknown.

EBMUD also participates in external working groups focused on climate change, including the Climate Ready Water Utilities Working Group and the Climate Resilience Evaluation and Assessment Tool (CREAT) Working Group. These working groups are part of the Environmental Protection Agency's Climate Ready Water Utilities Program. The purpose of both groups is to increase utility awareness of climate change impacts, educate and prepare utilities for climate change, and identify and provide tools to assess and understand the impact of climate change.

The Climate Ready Water Utilities Working Group is charged with developing attributes for climate ready utilities; identifying tools, training, and products to address short and long-term needs; and facilitating the adoption of climate change adaptation and mitigation strategies. The CREAT Working Group guided the development of a computer based tool to support utilities with performing traditional risk based and scenario based assessments to evaluate the utilities resilience to climate change. Version 1 of the software was released by the EPA in 2010.

Regulatory Constraints

EBMUD's ability to use its full entitlement of Mokelumne River water is constrained by the limitations incorporated into the state issued licenses and permits that grant EBMUD the right to serve its customers 325 MGD from the Mokelumne River. Although EBMUD's water supply system was designed and constructed to deliver 325 MGD, in dry-years, the extent to which EBMUD's water rights can be exercised is further constrained by other Mokelumne River water users with water entitlements that are senior to those held by EBMUD.

In addition to the requirements set forth in the licenses and permits, EBMUD's water supply system operating goals and objectives must also conform to State Water Resources Control Board Decisions, Court Decisions, Federal Energy Regulatory Commission Orders, and water right settlement agreements. EBMUD is obligated to meet multiple operating objectives, including providing municipal water supply benefits, streamflow regulation, fishery/ public trust interests, flood control, temperature management, and obligations to downstream diverters.

In 2007, the State Water Resources Control Board (SWRCB) commenced a formal proceeding on EBMUD's petition for a time extension of its permit to put Mokelumne River water rights entitlement to full beneficial use. In accordance with the California Environmental Quality Act, EBMUD issued a Notice of Preparation of an Environmental Impact Report (EIR) for the permit extension in November 2008 with the Draft EIR expected to be released for public review at a later date.

WATER SUPPLY QUALITY

EBMUD consistently provides the highest quality water possible. EBMUD's primary water supply from the Mokelumne River requires only limited treatment to meet or surpass health standards, because it comes from a remote, mostly undeveloped watershed and is transported within two days to the EBMUD's service area in large steel pipes. EBMUD has further protected water quality at Pardee Reservoir through the purchase of conservation easements in areas with significant potential for residential development adjacent to Pardee Reservoir. As a result, the Mokelumne River supply is minimally exposed to common sources of contaminants such as pesticides, agricultural or urban runoff, municipal sewage discharges, or industrial toxics.

EBMUD and county health departments have posted health warnings to notify the public about fish consumption and elevated mercury levels. Mercury in the foothills including Pardee and Camanche Reservoirs has been associated with historical gold mining activity. However it is important to note that mercury has never been detected in EBMUD's drinking water supply from Pardee or Camanche Reservoirs at levels above the California Public Health Goal (PHG) of 1.2 ug/L.

On certain occasions, turbidity in Pardee reservoir can exceed the water quality limits that the District water treatment plants can treat adequately and reliably to meet regulatory water quality standards. The degradation in water quality has historically been attributed to extreme weather or unusual watershed emergencies such as landslides. In those situations, the Mokelumne Aqueducts must be shutdown or throttled to low flow until the water quality in Pardee Reservoir sufficiently improves. The District's local reservoir supply is the primary source of supply in these emergency situations. Since 1982 the aqueducts were taken out of service at least three times because of poor raw water quality (i.e. high turbidity) in Pardee Reservoir, caused by winter storm runoff or landslides. The longest recorded shutdown duration was for a period of 65 days in 1997 when a landslide occurred on January 7, on a slope of the Mokelumne River in the Upper Mokelumne River watershed.

As performance regulations for drinking water treatment become more stringent, recovery from poor water quality events is expected to take longer, resulting in longer aqueduct shutdowns or reduced flows.

When the aqueducts are shut down because of severe water quality events, EBMUD implements water management plans, which are already in place. Terminal reservoirs are normally operated to provide 180 days of standby storage at reduced consumption, and EBMUD meets its service area demands by relying on this supply when the Mokelumne River supply is temporarily unavailable. After water quality has returned to acceptable levels, the terminal reservoirs are refilled as soon as practical by the Mokelumne Aqueducts to meet standby storage levels.

EBMUD WTPs that process the water supplied by local terminal reservoirs are designed to handle high turbidity conditions that can be caused by severe local storms. Consequently, water quality variations do not limit the water supply available from terminal reservoirs.

EARTHQUAKES

Potential seismic events pose a significant threat to the delivery of water in the San Francisco Bay Area. Within or near EBMUD's service area, several earthquake faults, including the San Andreas, San Gregorio, Hayward, Calaveras, Concord, Antioch, Greenville, Mt. Diablo Thrust, Midland, and others, as depicted in Figure 2-4, pose varying degrees of risk to the water distribution system and to the Mokelumne Aqueducts in the Delta area. The most significant seismic threat comes from the Hayward Fault that crosses the Claremont Tunnel, which is the most critical conduit of treated water to the East Bay plain. See Table 2-3 for a list of significant earthquakes that have occured in the Bay Area since 1836.

EBMUD's Mokelumne River facilities are also located in a seismically active area. Pardee Dam is located within three miles of the Bear Mountain Fault zone (see Figure 2-5); however, according to analyses completed in 1992, it will not be adversely impacted by a seismic

TABLE 2-3 SIGNIFICANT BAY AREA EARTHQUAKES (M>6.5)

YEAR	FAULT	RICHTER MAGNITUDE
1836	HAYWARD	6.75
1838	SAN ANDREAS	7.0
1865	SAN ANDREAS	6.5
1868	HAYWARD	7.0
1892	UNDETERMINED	6.5
1898	UNDETERMINED	6.5
1906	SAN ANDREAS	8.25
1911	CALAVERAS	6.5
1989	SAN ANDREAS	7.1

Source: http://seismo.berkeley.edu/seismo.baseis.html

FIGURE 2-4 SAN FRANCISCO BAY AREA REGION FAULTS

SOURCE: URS Corporation/Jack R. Benjamin & Associates, 2007. Technical Memorandum: Delta Risk Management Strategy (DRMS) Phase 1– Topical Area: Seismology, Final. Prepared for California Department of Water Resources.

event on that fault. A seismic study of Camanche Dam completed in 2010 concluded that a major earthquake on the Bear Mountain Fault zone could cause liquefaction of the tailings materials under the Camanche Main Dam embankment. The resultant deformation would be limited to the downstream toe area and would not affect the overall dam stability nor lead to dam overtopping.

DELTA FLOODS

There is a long history of levee failures in the Delta, including the region where the Mokelumne Aqueducts cross. EBMUD experienced a near-catastrophic event in 1980 when Lower Jones Tract flooded and the railroad embankment adjacent to the aqueducts subsequently failed, allowing floodwater

FIGURE 2-5 UPCOUNTRY AREA FAULTS

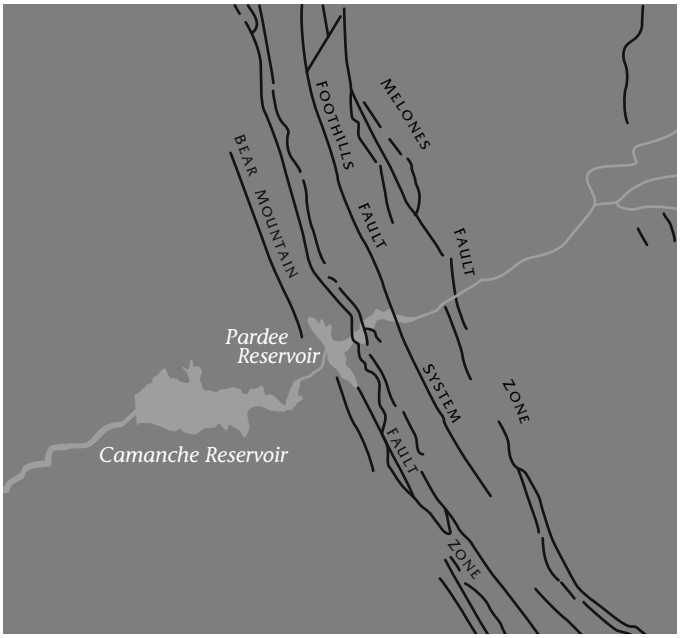


FIGURE 2-6 LEVEE FAILURE ON THE LOWER JONES TRACT IN 1980

to flow into Upper Jones Tract (see Figure 2-6). This event nearly undermined the aqueduct supports in the area. Necessary repairs were made.

In June 2004, a structural failure in the levee at the Upper Jones Tract 1.5 miles south of the Mokelumne Aqueducts caused a levee breach. The resulting flood submerged about 5.25 miles of the elevated Mokelumne Aqueducts for several months while the island was being drained. Nevertheless, the aqueducts remained in full operation during the entire time. Subsequent investigation of the damage concluded that the aqueducts and their supports were structurally sound, and the maintenance road and drainage systems for the aqueducts sustained damage to their exterior coatings.

IMPROVING WATER SUPPLY AND SYSTEM RELIABILITY

To prepare for conditions that may affect the availability of water, EBMUD implements infrastructure related programs and projects that improve the reliability of its water supply. Among these are supplemental water supply projects that not only reduce the frequency and magnitude of water rationing required of customers during droughts, but also provide EBMUD customers with greater assurance against other possible adverse situations, such as emergency water shortages. In addition to pursuing supplemental water supply sources, EBMUD also maximizes resources through continuous improvements in the delivery and transmission of available water supplies, and investments in ensuring the safety of its existing water supply facilities.

INFRASTRUCTURE IMPROVEMENT PROJECTS

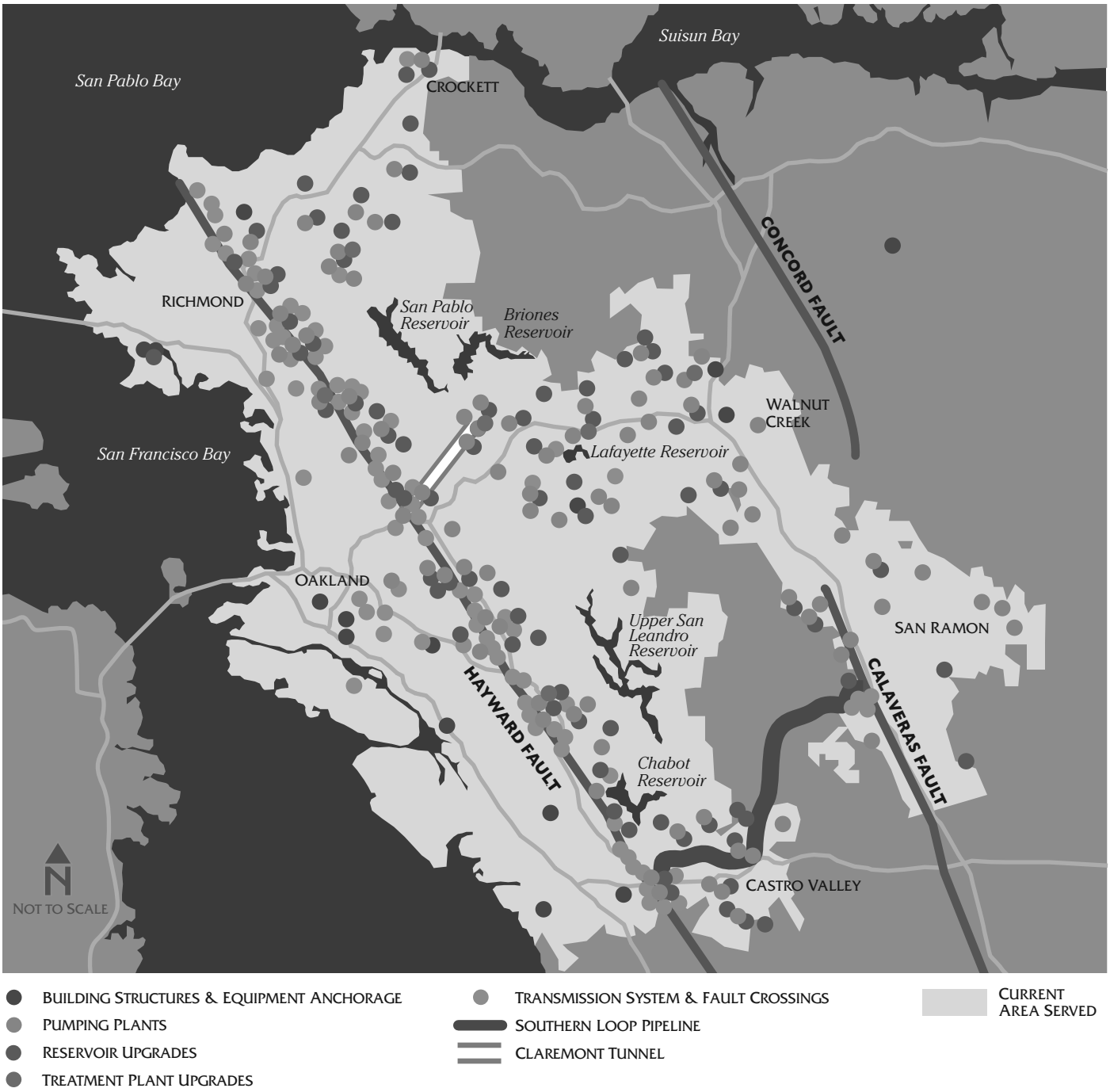
Seismic Improvement Program

EBMUD is internationally recognized for its proactive approach to minimizing seismic risk. A Seismic Improvement Program completed in 2007, made EBMUD the first water agency in the United States to retrofit its facilities on a comprehensive scale. The program was designed and implemented to protect public safety and preserve the regional economy by making improvements that would allow EBMUD to partially restore water service to its customers following a major earthquake within 30 days. The seismic improvements improved the system's operational flexibility and reliability and put in place the necessary tools for rapid response, repairs, and recovery. As illustrated in Figure 2-7, the program included installation of an 11-mile pipeline at the southern end of the service area to create an alternate transmission route, upgrades and retrofits to more than 300 critical facilities, and an innovative bypass tunnel through the Hayward Fault zone for the Claremont Tunnel, a critical facility that brings water through the Oakland-Berkeley hills to approximately 800,000 customers.

Mokelumne Aqueduct Seismic Upgrade

The Mokelumne Aqueducts convey the Mokelumne River supply from Pardee Reservoir across the Delta to EBMUD's service area. The aqueducts are buried for most of their length. At Delta river and slough crossings, they are buried from 10 to 40 feet below the channel bottoms or levee crests. The remaining above-ground sections are supported on timber, reinforced concrete or steel bents for approximately ten miles as the aqueducts cross the islands in the Delta. The

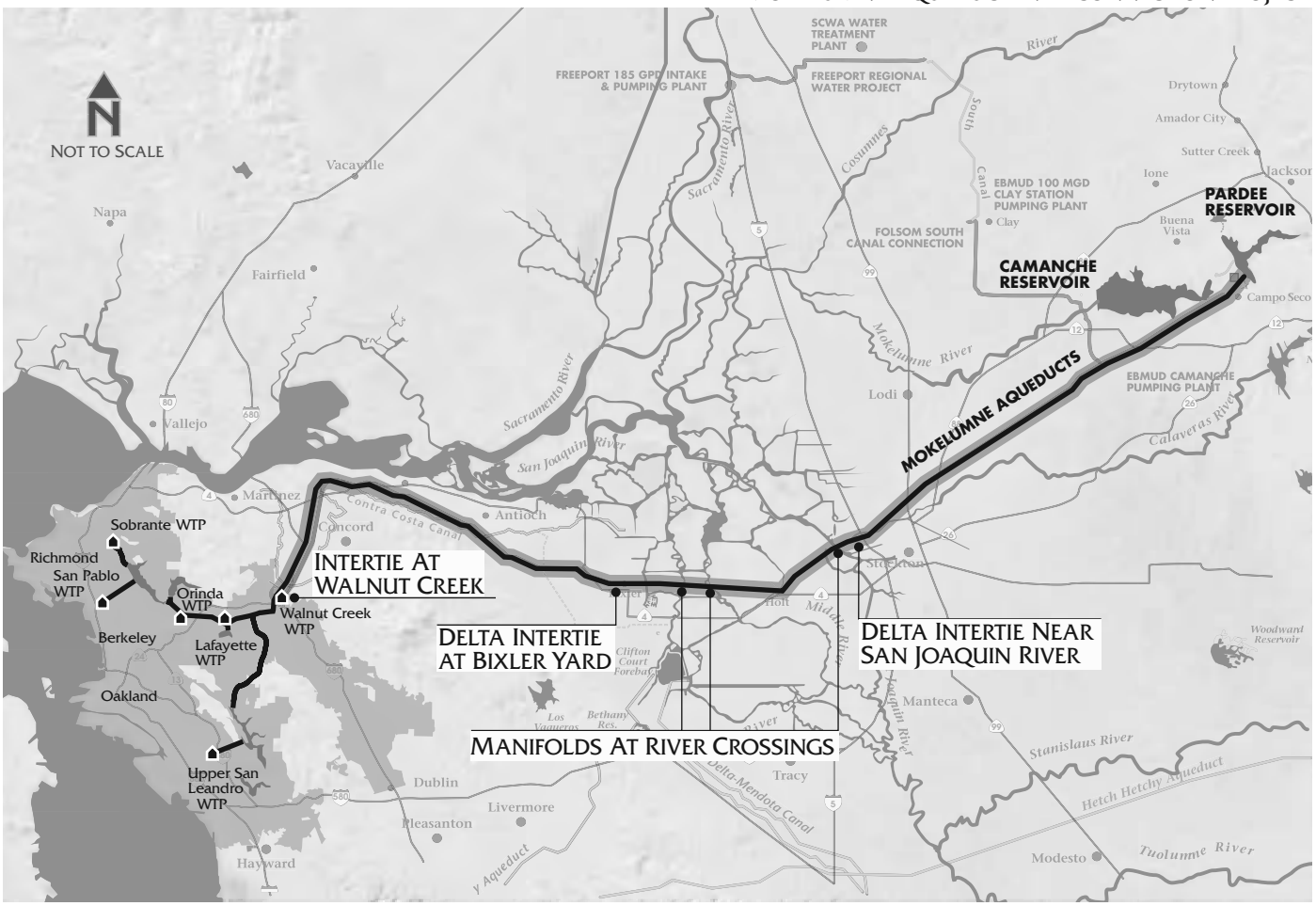
FIGURE 2-7 SEISMIC IMPROVEMENT PROGRAM



aqueducts also cross non-engineered levees constructed in the late 1800s, which provide little support.

In the 1990s, EBMUD began the Mokelumne Aqueduct Seismic Upgrade Project, as part of the comprehensive Mokelumne Aqueduct Security program, to improve the seismic performance of the aqueducts in the Delta and to ensure that raw water deliveries can be partially restored within 180 days after a major earthquake. The project improved the seismic performance of the Mokelumne Aqueduct No. 3, by strengthening of levees at aqueduct crossings and of pipe foundations at river crossings; reinforcing all pipe joints on buried portions of the pipe; and the strengthening of pipe support structures on elevated portions of the aqueduct. The project also included replacement of all low strength

FIGURE 2-8 MOKELUMNE AQUEDUCT INTERCONNECTION PROJECT



bolts with high strength bolts on elevated portions of Mokelumne Aqueduct No. 2 and No. 3. The final phase of this program was completed in 2005.

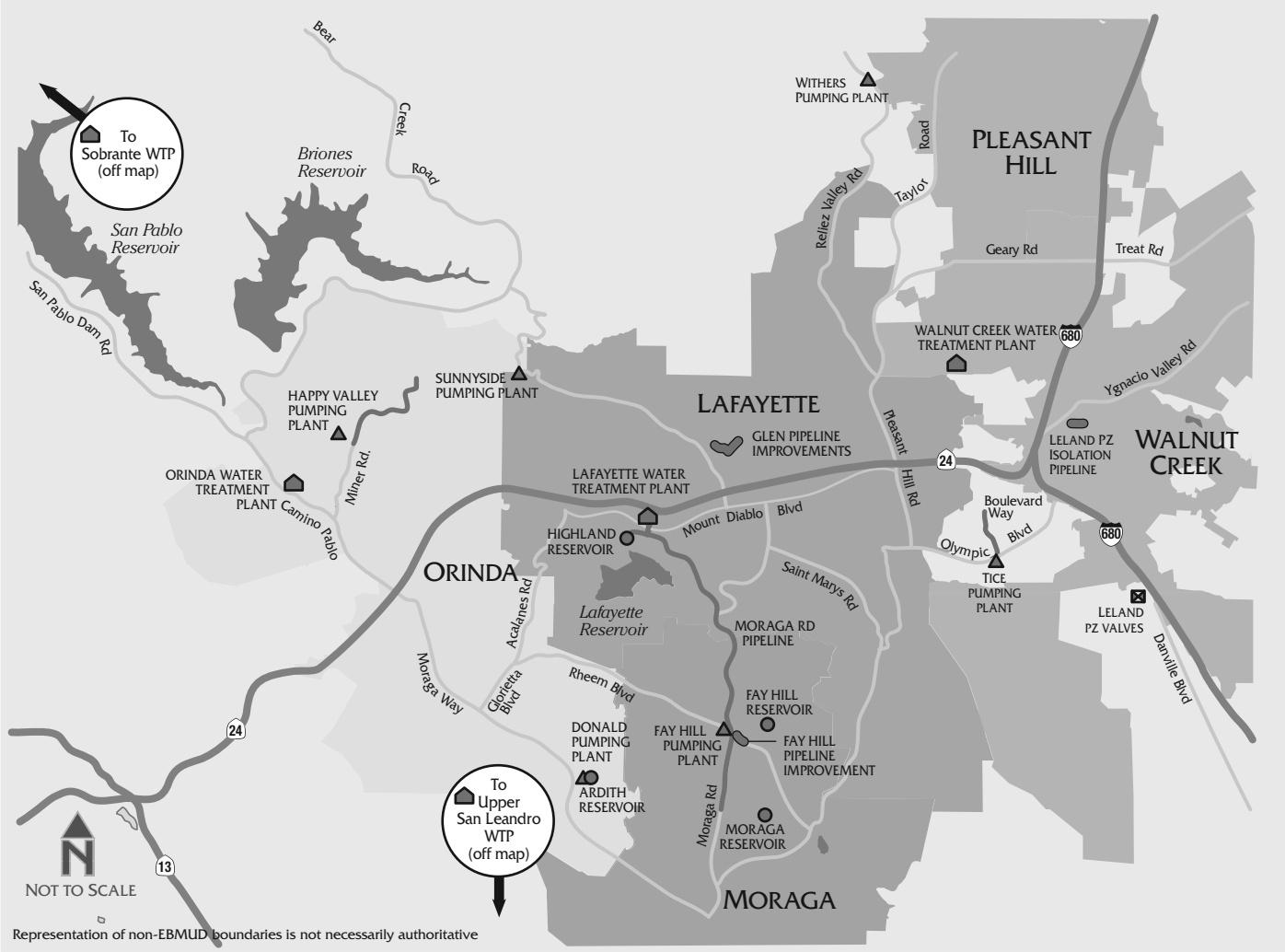
EBMUD prepared an Aqueduct Section Emergency Plan that will be activated in the event of an aqueduct or levee failure. The type and magnitude of the failure will determine whether the EBMUD Emergency Operations Plan should be activated. If the water supply to the service area is impacted, the Water Shortage Contingency Plan (see Chapter 3) will also be activated.

Mokelumne Aqueduct Interconnection Project

EBMUD is currently in the design phase of the Mokelumne Aqueduct Interconnection Project that will further improve the reliability of its water supply delivered through the Mokelumne Aqueducts. The project includes the addition of interconnections between the aqueducts in two locations in the Delta area and near Walnut Creek, and adding emergency piping manifolds to Mokelumne Aqueduct No. 3 at the Delta river crossings (see Figure 2-8). The interconnections in the Delta will allow the District to bypass segments of the Mokelumne Aqueducts that may be damaged following a levee failure or seismic event, and thus, maximize flows through surviving segments of the aqueducts. The interconnection near Walnut Creek will allow for isolation and bypassing at the two tunnels that are at the end of the Mokelumne Aqueducts to improve operational flexibility. Following an emergency event, the piping manifolds on Mokelumne Aqueduct No. 3 at the Delta river crossing will allow water to temporarily bypass these three main river crossings in the Delta, where the Mokelumne Aqueduct No. 3 is more susceptible to damage, until permanent repairs can be made.

The project is funded by a Proposition 84 grant from the California Department of Water Resources (DWR) in the amount of $10 million as part of the State's Integrated Regional Water Management Program (IRWMP).

FIGURE 2-9 WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM



Walnut Creek–San Ramon Valley Improvement Project

The Walnut Creek–San Ramon Valley Improvement Project increased system reliability in the eastern portion of the service area, improving water pressure and water availability during prolonged seasonal hot periods while maintaining adequate reserves for fire flows. This project was completed in the mid-2000s. It included capacity expansion and upgrades to the Walnut Creek WTP, construction of 4.4 miles of large diameter transmission pipeline (including a one-mile tunnel) from Walnut Creek to Alamo, and expansion of the Danville Pumping Plant in Alamo.

Water Treatment and Transmission Improvements Program

The Water Treatment and Transmission Improvements Program (WTTIP) addresses regulatory issues, maintenance needs, and water treatment and transmission capacity needs in Lafayette, Moraga, Orinda, western Walnut Creek, and parts of unincorporated Contra Costa County. The program will allow EBMUD to reliably and efficiently meet current and projected 2030 water demands of the WTTIP area. It includes improvements to the Lafayette, Orinda, Walnut Creek, Sobrante, and Upper San Leandro WTPs, four new or upgraded storage tanks, nine new or upgraded pumping plants, and approximately 5.5 miles of new pipeline, as illustrated in Figure 2-9. The WTTIP EIR and recommended projects was approved by the Board in December 2006.

One of the WTTIP components, the Moraga Road Pipeline, a new three mile 36-inch and 48-inch diameter pipeline, was placed in-service in December 2008. Highland Reservoir, a new 2.7 million gallon reservoir is scheduled to be placed in-service by the end of 2011. The Walnut Creek WTP project completion is expected in 2012, and includes construction of two new filters, a new 34 MGD distribution system pumping plant and backwash water recycling system improvements.

West-of-Hills Master Plan

The West-of-Hills Master Plan was completed in 2010 and addresses regulatory issues, existing maintenance needs, and existing and future water treatment and transmission capacity needs for the western portion of the EBMUD service area. This regional master plan was undertaken to better understand WTP and transmission capacity limitations, integrate long-range plans with the WTTIP, and develop strategies to resolve competing needs from individual pressure zones. The proposed improvements include expansion and upgrades to Orinda, Sobrante, and Upper San Leandro WTPs, five water storage reservoirs, two pumping plants, and 23 miles of new transmission pipeline projects ranging in size from 30-inches to 72-inches in diameter. Some of components of the West-of-Hills Master Plan will be completed as needed, when future development and projected water demand growth materialize.

Dam Safety Program

EBMUD maintains a comprehensive Dam Safety Program. Instrumentation monitoring, monthly visual inspections, and periodic dam safety reviews are conducted to prevent loss of life, personal injury and property damage from dam failures. EBMUD staff utilizes the latest technology in geotechnical, structural and earthquake engineering to conduct monitoring, inspection, and evaluation of the dams. While most EBMUD dams are under the jurisdiction of the California Division of Safety of Dams (DSOD), Pardee and Camanche Dams also are monitored by the Federal Energy Regulatory Commission (FERC) because they produce hydropower. DSOD and FERC conduct their annual dam inspections independently of EBMUD monitoring and inspection.

FERC uses the Potential Failure Mode Analysis (PFMA), a component of its Dam Safety Performance Monitoring Program, to identify, evaluate, and categorize potential failure modes for dams that are under FERC jurisdiction. In 2008, in compliance with FERC's regulatory requirements, an independent consultant and project team conducted the PFMA for Pardee and Camanche Dams. The results of the analysis show that Pardee and Camanche Dams were well designed, constructed, instrumented, monitored, and maintained by EBMUD. Based on results of the analyses, FERC recommended that EBMUD continues to implement its comprehensive Dam Safety Program for both dams.

In 2004 and 2005, EBMUD completed stability evaluations for San Pablo, Chabot, and Lafayette Dams. Based on the results, EBMUD completed seismic upgrades at San Pablo Dam by improving the foundation materials with cement deep soil mixing technology and a larger downstream buttress, and plans to start seismic upgrade work at Chabot Dam in the coming decade. The embankment of Lafayette Dam was found to be seismically adequate; however, its outlet tower may require seismic upgrades. EBMUD is working with DSOD to identify the appropriate measures. The seismic evaluation of Upper San Leandro Dam is currently underway and it is expected to be completed in 2011.

Security

Working with law enforcement and utility industry security experts, EBMUD has established a comprehensive security program to protect its water supply. Acting on the recommendations of the Federal Bureau of Investigation, the American Water Works Association, and the California Emergency Management Agency, EBMUD continually reviews and updates emergency response plans, and guards its water and wastewater systems.

As required by the Federal "Bioterrorism Preparedness and Response Act, Public Law 107-188," EBMUD submitted its Vulnerability Assessment to the Unite States Environmental Protection Agency (EPA) in 2003, and established a Security and Emergency Preparedness Section (SEPS) to coordinate its security efforts. Since 2003, the SEPS has continued to stay abreast of security developments and been prepared to respond to security issues that might arise. EBMUD's SEPS has trained and certified EBMUD staff in compliance with all legal requirements.

EBMUD has continually improved its ability to deter and delay criminal activity; to detect such activity when it does happen; to assess alarm and potential security breach conditions; and to dispatch responders to security incidents promptly. Physical improvements to key EBMUD facilities include, but are not limited to, re-keying locks, fencing, access control systems, lighting, alarms (interior and exterior), motion detectors, cameras, video recorders, monitors, and all related required appurtenances to complete the security systems. Operational improvements

included updating the security response section of EBMUD's Emergency Operations Plan (submitted to the EPA in 2003). In 2009, the SEPS revised the Emergency Operations Plan for full compliance with the National Incident Management System (NIMS). In addition, per EBMUD's FERC license, periodic security inspections are conducted and specific requirements have to be met to ensure the security of the FERC licensed hydropower project. EBMUD also maintains and annually updates its Emergency Action Plan for Pardee and Camanche Reservoirs to comply with current FERC requirements. EBMUD continues to adjust and improve security measures as warranted to protect against potential terrorism and other security concerns experienced by EBMUD.

Ensuring the safety of public water supplies is EBMUD's top priority. EBMUD uses an all-hazard, multi-barrier approach with physical, chemical, and operational controls to safeguard the drinking water provided to consumers. This approach is advocated by national industry and homeland security experts. In response to a threat or situation in which the quality of the water supply is potentially affected or compromised, EBMUD follows a systematic approach to assess the threat or likelihood of potential contamination, to investigate the event, and to respond appropriately to protect the public and the water system. EBMUD has plans in place and is ready to issue all required and appropriate public notices if there is a question or concern regarding the safety of its public water supplies.

EBMUD's Emergency Operations Team (EOT) is ready to respond quickly and appropriately to any emergency with other public safety and first responder agencies. The EOT manages emergency responses, meets, trains, and conducts exercises routinely. EBMUD's EOT utilizes the California Standardized Emergency Management System that incorporates all NIMS requirements, and is very well integrated with other utilities directly, by agreement, and by its active engagement with the California Utilities Emergency Association. See Chapter 3 for details on inter-agency emergency support.

EXISTING SUPPLEMENTAL WATER SUPPLY SOURCES

EBMUD's long-term water supply goals include improving water supply reliability and diversifying its water supply portfolio. Since the UWMP 2005 update, two critical steps toward realizing those goals were completed when EBMUD finished the construction of the Freeport Regional Water Facility and the Bayside Groundwater Facility. These facilities provide additional water to augment EBMUD's water supply during drought periods.

Freeport Regional Water Facility

The Freeport Regional Water Facility is a result of a regional water supply project undertaken by Freeport Regional Water Authority (FRWA), which was created by exercise of a joint powers agreement between Sacramento County Water Agency (SCWA) and EBMUD. The City of Sacramento is an associate partner. The facility, as shown in Figure 2-1, (see page 2-3) enables delivery of water diverted from the Sacramento River near the town of Freeport to EBMUD customers during dry-years and will provide water in all years for the Sacramento County. It will be used to supplement EBMUD's aggressive water conservation and recycling programs to reduce the potential for severe water rationing and associated economic losses during droughts.

Stemming from its effort to identify additional sources of supply to meet its long-term water demand since the mid-1960s, EBMUD executed a contract in 1970 with the United States Bureau of Reclamation (USBR) for delivery of Central Valley Project (CVP) water from the American River. Years of litigation followed, preventing construction of the infrastructure necessary to deliver this water supply to EBMUD. In 2000, USBR, EBMUD, and Sacramento parties reached an agreement to modify the contract and to develop a joint water supply from the Sacramento River, rather than from the American River. FRWA was created in 2002, to implement the development of the Freeport facility. The facility, as illustrated in Figure 2-1, includes:

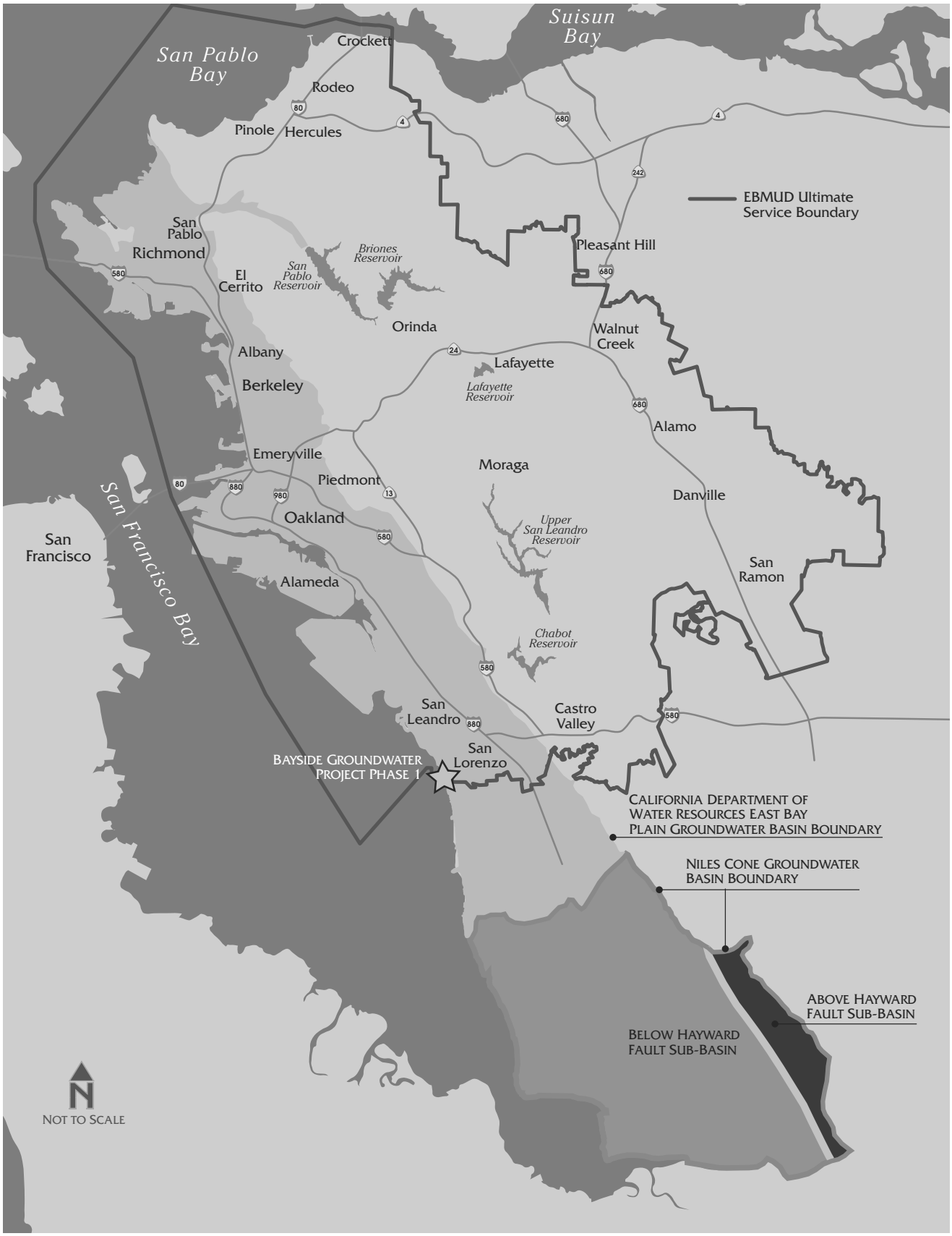
TABLE 2-4

EXISTING SUPPLEMENTAL WATER SUPPLY QUANTITIES (IN ACRE-FEET PER YEAR)

SOURCES	NORMAL YEAR	MAXIMUM SINGLE DRY YEAR	MULTIPLE DRY YEARS YEAR 1	YEAR 2	YEAR 3
FREEPORT REGIONAL WATER FACILITY	0	UP TO 112,000 [1]	165,000 OVER THREE YEARS		
BAYSIDE GROUNDWATER FACILITY	0	1,120	1,120	1,120	1,120

[1] Contractual single-year limit of supply from USBR is 133,000 AF. Continuous operation at 100 MGD, EBMUD's allocation capacity in the FRWP, yields a maximum annual delivery of 112,000 AF. Supply from the FRWP is also limited by the availability of CVP water during dry-years.

FIGURE 2-10 SOUTH EAST BAY PLAIN BASIN



- 185-MGD water intake and pumping plant (with state-of-the-art fish screens) on the Sacramento River near Freeport;
- 72- to 84-inch diameter pipeline to transport water eastward from the Sacramento River to the existing Folsom South Canal and to SCWA's treatment plant, which is presently under construction;
- the aforementioned WTP in central Sacramento County; and
- approximately 20 miles of 72-inch diameter pipeline and two 100 MGD pumping plants to transport water from the southern end of the Folsom South Canal to EBMUD's Mokelumne Aqueducts.

The project became operational in February 2011. EBMUD's ability to take delivery of water through the Freeport facility is based on its Long Term Renewal Contract (LTRC) with the USBR, which provides for up to 133,000 AF in a single dry-year, not to exceed a total of 165,000 AF in three consecutive dry-years. Under the LTRC, the CVP supply is available to EBMUD only in dry-years when EBMUD's total stored water supply is forecast to be below 500 TAF on September 30 of each year (See Chapter 3 and Appendix G for further details). Table 2-4 illustrates the supplemental supply quantities provided to EBMUD by the Freeport facility.

Bayside Groundwater Facility

The Bayside Groundwater Facility was built to enable EBMUD to inject potable drinking water into the deep aquifer of the South East Bay Plain Groundwater Basin (SEBPB) during wet years until its subsequent recovery, treatment and use during times of drought. The facility supplies supplemental water to EBMUD customers only when supplemental water is needed, and overall, the quantity of water injected into the aquifer of the SEBPB will exceed the quantity of water extracted. See Figure 2-10 for basin location.

Groundwater from the SEBPB is available only to a limited extent as part of the implementation of the injection/extraction system associated with the Bayside Groundwater Facility. Because it is possible that some extractions may include native groundwater, which will subsequently be treated, EBMUD has started the process for preparing a groundwater management plan for the SEBPB (see SEBPB Groundwater Management Plan Development section of this Chapter), but EBMUD has not yet adopted a groundwater management plan. The native groundwater of the SEBPB is not available as a significant source of water to EBMUD.

The groundwater facility became operational in 2010. The facility consists of a new water treatment facility and associated pipelines linking the treatment plant to the injection/ extraction well, subsidence monitoring system, and a network of groundwater monitoring wells. The project will supply water to EBMUD customers only when supplemental water is needed because of drought conditions.

The injection/ extraction system uses a 600-foot deep well, located on property leased from the Oro Loma Sanitary District in San Leandro. When operated in injection mode, treated water from EBMUD's distribution system is directed through the project well into the deep aquifers of the SEBPB. The injection mode operation will take place during wet years when surplus water is available for storage. During droughts water will be extracted and treated to meet all federal and state drinking water standards prior to distribution to the customers. A permit from the Department of Public Health, which is pending, is required before the groundwater can be extracted and treated for municipal use.

The project is designed to yield 2 MGD over a 6-month period, resulting in an average annual production capacity of 1 MGD or 1,120 acre-feet per year (AFY). The supplemental supply quantities available to EBMUD as a result of operation of the project are presented in Table 2-4. EBMUD's long-range plan calls for investigating potential expansion of the Bayside Groundwater Facility in the future.

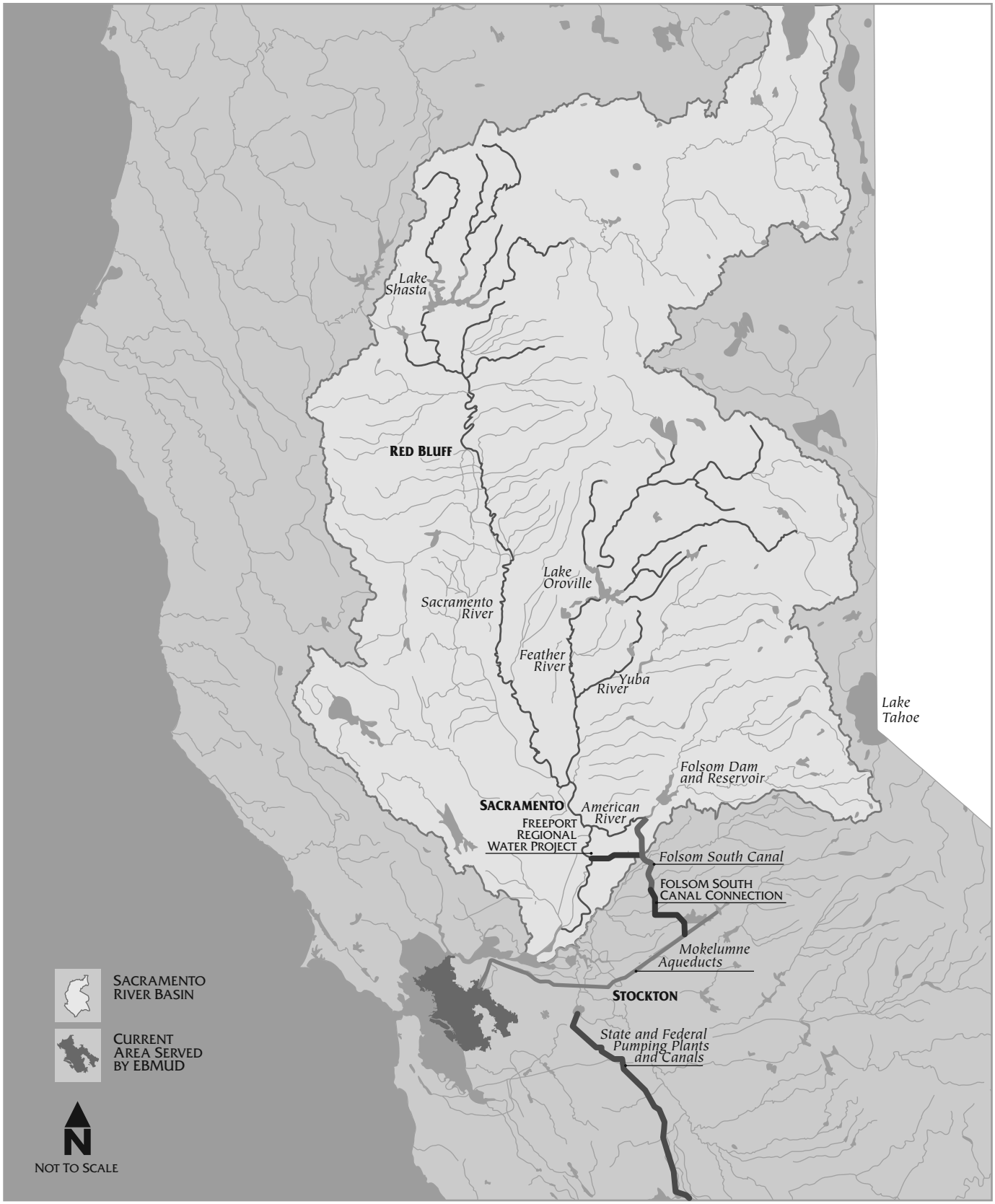
POTENTIAL SUPPLEMENTAL WATER SUPPLY SOURCES

Short-Term Potential Supplemental Water Supply Projects

EBMUD will meet future growth in projected customer demand with aggressive conservation and recycled water development, and, as necessary, by implementing additional supplemental supply components. These supply components will lower the customer rationing burden during droughts and thereby decrease direct impacts on EBMUD customers.

EBMUD has established aggressive targets for conservation and recycling, and these two actions will meet a total of 50 MGD of future demand, as described in detail in Chapter 5 and Chapter 6, respectively, of the UWMP 2010. The supplemental supply components that

FIGURE 2-11 POTENTIAL WATER TRANSFER SOURCE AREAS AND CONVEYANCE



EBMUD may pursue in order to enhance its supplies during dry-years include, but are not limited to, water transfers, and groundwater banking/ exchange efforts.

EBMUD will simultaneously pursue supplemental supply projects to meet future water needs consistent with the resources management strategies presented in DWR's 2009 California Water Plan. By considering a broad mix of projects, with inherent scalability and the ability to adjust implementation schedules for a particular component, EBMUD will be able to minimize the risks associated with future uncertainties such as project implementation challenges and global climate change. If EBMUD is able to successfully develop one component, this could result in deferral of other additional supplemental supply components over the planning period. EBMUD is interested in partnering with other agencies and other water rights owners in exploring projects to ensure the water supply for the future. Partnerships offer the best potential solutions that are environmentally sound, cost-effective, and sustainable. Separate project-level environmental documentation will be prepared, as appropriate, for specific components as they are developed in further detail and implemented in accordance with EBMUD's water supply needs.

Because EBMUD's extensive conservation savings have limited the ability to ration in dry and critical dry years without extensive cost to customers, EBMUD has set the rationing goal to up to 15 percent during multi-year droughts. As a practical matter, EBMUD may be unable to reduce rationing to 15 percent until it has developed sufficient dry-year supply to meet the demands during any particular drought. As new supplemental supplies are secured, EBMUD will be able to gradually reduce the amount of rationing it imposes upon its customers.

Northern California Water Transfers

EBMUD is interested in exploring a water transfer program to secure up to 13 MGD of dry-year water supply through voluntary water transfers. The purpose of EBMUD's Water Transfer Program is to develop and implement water transfer and exchange opportunities throughout northern California. EBMUD plans to use the Freeport facilities, illustrated in Figure 2-11, to convey the transfer water to EBMUD's service area.

Due to recent demand reductions resulting from economic downturn and drought and in combination with the District's rationing policy, EBMUD's water supplies are currently sufficient in the near-term. Therefore, EBMUD's primary interest is exploring partnership opportunities with willing parties within the Sacramento River Watershed on long-term or permanent water transfer arrangements. In the future, EBMUD's Water Transfer Program also may pursue short-term transfer arrangements, as needed, to help reliably meet EBMUD's dry-year water supply needs.

Bayside Groundwater Project Expansion

EBMUD plans to examine the potential expansion of the Bayside Groundwater Facility that was completed in 2010. EBMUD plans to utilize information gained from the operation of the facility to help determine whether and how to proceed with the expansion. EBMUD would prepare a project specific EIR for Phase 2 prior to the development of the project.

Phase 2 is envisioned to have an annual capacity ranging between 2 and 9 MGD and to use the South East Bay Plain Groundwater Basin (SEBPB), although details regarding proposed capacity, locations, and configuration of Phase 2 facilities will not be developed until Phase 1 is operated for a period of time. As planning for Phase 2 moves forward, EBMUD will work with the Bayside Community Liaison Group to address community concerns.

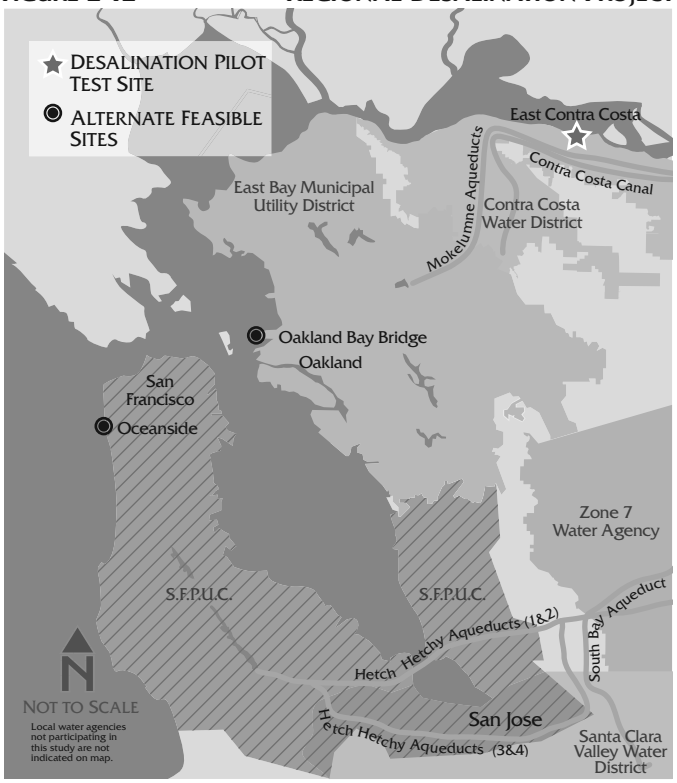
SEBPB Groundwater Management Plan Development

With the completion of the Bayside Groundwater Facility and the potential expansion of the facility, local groundwater resources have become a key component of EBMUD's future supplemental supply strategy. Because the groundwater facility relies on the SEBPB, EBMUD plans to develop a Groundwater Management Plan (GMP) in collaboration with local stakeholders as a tool to manage basin water quality and quantity. In accordance with the Urban Water Management Act, a description of the East Bay Plain Basin is provided in Appendix E of the UWMP 2010.

The SEBPB GMP development is anticipated to include a hydrogeologic review to gain a deeper understanding of basin characteristics, working with stakeholders, and setting basin management objectives. The GMP will be consistent with commitments made in the Bayside Groundwater Project EIR Mitigation Monitoring and Reporting Plan.

The first step in GMP development will be a stakeholder assessment. A collaborative workgroup will be formed and detailed objectives of the GMP will be collectively developed. As per AB 3030, the GMP development process will solicit public involvement and outreach will likely include workshops and public meetings. The GMP work effort will also include updating studies to

FIGURE 2-12 BAY AREA REGIONAL DESALINATION PROJECT



define the basin boundaries and characteristics. Some studies were conducted for the Bayside Phase 1 efforts. Additional technical studies may be used to update basin groundwater modeling, basin yield and storage estimates, and water quality characterizations. The GMP planning effort began in 2010. It is anticipated that the GMP development will take about two years to complete.

Long-Term Conceptual Supplemental Water Supply Projects

Bay Area Regional Desalination Project

The Contra Costa Water District (CCWD), EBMUD, San Francisco Public Utilities Commission (SFPUC), Santa Clara Valley Water District (SCVWD), and the Alameda County Flood Control and Water Conservation District - Zone 7 are jointly exploring the development of regional desalination facilities that would benefit over 5.6 million Bay Area residents and businesses served by these agencies. The Bay Area Regional Desalination Project (BARDP) would consist of one or more facilities, as shown in Figure 2-12, with an estimated capacity range of 10 to 50 MGD. Up to a maximum of 22,400 acre-feet per year of ocean/ bay/ brackish water would be made available to EBMUD for municipal use.

BARDP goals and benefits:

- provide a reliable water supply source that is available even during contract delivery reductions, extended droughts, and emergencies such as earthquakes or levee failures;
- allow other major facilities such as treatment plants, water pipelines, and pump stations, to be taken out of service for maintenance or repairs;
- minimize the potential for adverse environmental impacts; and
- leverage existing and contiguous infrastructure to meet needs and minimize costs.

Three potential sites have been identified where a regional desalination facility could be located: a site in the eastern part of Contra Costa County (East Contra Costa); a site in Oakland near the Bay Bridge (Oakland Bay Bridge); and a site in San Francisco near Oceanside (Oceanside). A feasibility study was completed in 2007 and a six month pilot test was completed in 2009 at the East Contra Costa site (CCWD's Mallard Slough Pump Station site). The project's pilot testing collected data on technical feasibility (pretreatment options, membrane performance, and design parameters) and the environmental impacts (brine disposal and marine life). The pilot testing confirmed:

- membrane pre-treatment and desalination can produce desired water quality;
- sensitive species, such as the Delta and Longfin smelt, may be present during certain times of the year; and
- brine, a salty by-product produced at the desalination plant, did not have a significant negative impact on local species.

Regional Desalination Project would require an assessment of potential environmental impacts and would undergo an extensive and complex regulatory review process. Implementation of the Regional Desalination Project would involve significant public outreach, hearings and negotiations to obtain a number of permits from many different agencies.

Inter-Regional Groundwater Banking/Exchange

EBMUD is investigating long-range options for combined use of groundwater and surface water sources beyond the East Bay service area. Groundwater storage is being explored in Sacramento County and San Joaquin County. Water banked underground would benefit either location, as it would help address the over-

drafted groundwater basins in both regions, while providing a potential dry-year supply for EBMUD.

A Sacramento County groundwater project option would most likely be located adjacent to a stretch of EBMUD's pipeline from the Freeport facility (a pipe which traverses the central and southern portion of Sacramento County) or the Folsom South Canal. A San Joaquin County groundwater storage project option would most likely be located in the proximity of EBMUD's Mokelumne Aqueducts (which traverse the northern portion of San Joaquin County along a west-to-east route). The proximity of the projects to existing EBMUD conveyance facilities would allow efficient transport of stored groundwater to the EBMUD service area.

Entities in both locales have discussed the potential to develop groundwater storage and banking projects in partnership with other water agencies in the IRWMP prepared for the respective regions (i.e., American River Basin IRWMP, the Mokelumne/ Amador/ Calaveras IRWMP and Northeastern San Joaquin Groundwater Banking Authority's IRWMP) .

Inter-Regional Conjunctive Use Project

The Mokelumne River Forum (Forum) is made up primarily of water agencies, local governments, and non-governmental organizations with an interest in the Mokelumne River. In April 2005, the Forum members signed a Memorandum of Understanding with the DWR and committed to seek mutually beneficial and regionally focused solutions that meet water management needs in the Sierra Foothills, San Joaquin County, and the portion of the East Bay served by EBMUD. A result of those discussions is the Mokelumne River Inter-Regional Conjunctive Use Project (IRCUP). The IRCUP envisions conjunctive use on a regional scale, with the potential to provide water supply and environmental benefits to a broad range of Mokelumne River basin stakeholders. Benefits would include:

- storage and supplies for drought protection and to meet the future water needs of the citizens of Amador and Calaveras Counties;
- long-term drought protection for areas of Alameda and Contra Costa Counties served by EBMUD;
- drought protection, replenishment of the groundwater basin, and water to create a hydraulic barrier to prevent further saline intrusion for San Joaquin County citizens; and
- enhanced cold water pool to benefit water temperatures and therefore fish in the Lower Mokelumne.

The IRCUP project elements, as currently envisioned, include the capture of excess surface water during wet years (potentially within expanded existing Mokelumne reservoirs and/ or within new off-stream reservoirs) and the diversion of water to groundwater storage/ recharge facilities that could be located in San Joaquin County and/ or western Calaveras County. During dry-years, previously stored groundwater would be extracted to supplement surface water supplies. Conveyance would be accommodated through use of existing and new systems (pipelines). EBMUD plans to continue participating with other Forum members in further refining the IRCUP concept. There are no plans to move into a project-specific stage of development until the concept is better understood and support is garnered within the region that would benefit from the IRCUP.

Expansion of Surface Water Storage

In the future, EBMUD plans to explore a wide range of options to improve reliability of its supply during droughts and to meet future needs, including examination of participation in the Los Vaqueros Expansion. If Los Vaqueros Expansion becomes feasible as a short-term potential supplemental water supply project, then the 2015 UWMP will incorporate and quantify the project. Enlargement of EBMUD's existing facilities on the Mokelumne River may be pursued in the long-term as part of an interrelated set of upcountry projects with a common set of partners. Enlargement of the Lower Bear Reservoir could also be pursued on a regional basis, and the enlargement would increase the surface water storage capacity within the upper Mokelumne watershed. If regional upcountry actions are pursued in the future, additional negotiations, as well as planning, design and environmental review, will have to be conducted.

Partnerships in Regional Management Plans

EBMUD partners with other water agencies to develop integrated water resources management strategies that would supplement existing water supplies. EBMUD participates in several consensus-based regional water management efforts with stakeholders in the San Francisco Bay Region as well as the Mokelumne and American River Basins to explore regional and statewide water resource issues.

San Francisco Bay Area Regional Partnerships

As a member of the Bay Area Water Agencies Coalition (BAWAC), EBMUD continues to work with local agencies under a Letter of Mutual Understanding to update an IRWMP that was drafted in 2007 for the nine Bay Area counties. The goal is to systematically combine water supply reliability, water quality, storm water and wastewater management, and environmental restoration planning. Integrating regional water management and planning benefit the San Francisco Bay Area Region through facilitated implementation of innovative, cost-effective and efficient multi-objectives water management solutions. Through an integrated plan, the Bay Area has been able to compete more effectively for funding from broader sources such as state bond funds and federal appropriations.

Through BAWAC, EBMUD partners with other local member agencies (Alameda County Water District, Bay Area Water Users Association, CCWD, SCVWD, and SFPUC) to formulate and support a mutually agreeable set of actions to improve water quality and supply reliability in the San Francisco Bay Area. Examples of such collaboration include: the ongoing study of a regional desalination project, in cooperation with the SFPUC, CCWD and SCVWD and (as of 2010) the Zone 7 Water Agency; completion of the SFPUC-Hayward-EBMUD Intertie Project between SFPUC, Hayward, and EBMUD; completion of the FRWP; and preparation of numerous regional grant applications submitted between 2005 through 2010 that resulted in the utilization of state funds (funds as made available through Proposition 50 and Proposition 84) to implement a broad range of supplemental supply projects, conservation programs, recycling projects, and additional regional planning work.

Mokelumne River Basin Partnerships

In collaboration with the Upper Mokelumne River Watershed Authority (UMRWA) partners from Alpine, Amador, and Calaveras counties, EBMUD received approximately $1 million in grants to complete a watershed assessment and a plan for the Upper Mokelumne (above Pardee Reservoir) watershed. That plan was completed in 2008. The project collected and assembled watershed data, conducted additional monitoring, developed a model for assessing changes in the watershed, and involved all stakeholders. Historically, watershed protection has been the most efficient and cost-effective mechanism for protecting drinking-water quality at the tap. By effectively managing its watershed lands, EBMUD can ensure that protection of the water supply is maximized, treatment costs are minimized, and natural resources are protected and sustained. Moving forward, UMRWA has taken over the development of updates to the Mokelumne/ Amador /Calaveras IRWMP, as was prepared by a range of upcountry stakeholders in 2006. UMRWA intends to apply for grant funding to support this work and work on water-saving measures such as distribution system leak detection and repairs that would benefit the entire UMRWA community.

EBMUD is also an active participant in the Mokelumne River Forum, as described in the "Inter-Regional Conjunctive Use Project" section in this Chapter.

American River Basin Partnerships

EBMUD, along with a number of water agencies and interest groups in Sacramento County, prepared the American River Basin (ARB) IRWMP in 2006/ 2007. EBMUD's participation is consistent with a 2005 agreement between SCWA and EBMUD to evaluate the potential to develop additional water supplies for both agencies through conjunctive use of surface and groundwater in the area and to transfer and deliver surface water supplies

WATER SUPPLY MANAGEMENT EFFORTS

EBMUD is in the process of developing a Water Supply Management Program that will analyze means of serving its long-term projected demands though the year 2040. EBMUD is presently supplementing the environmental analysis of the Water Supply Management Program 2040, and the District plans to adopt the Water Supply Management Program 2040 after considering the supplemental information regarding impacts and alternatives for securing supplemental supplies. This action will likely take place in 2012.

CHAPTER 4. WATER DEMAND

Currently, water consumption within the EBMUD service area has dropped as a result of an economic downturn in the Bay Area, suppressed demand in response to the drought management program, and unusually cool weather. In looking out to year 2040, EBMUD's water supply is not sufficient to meet customer demand during single- and multi-year drought periods. A supply and demand assessment was done based on a land-use based method to forecast demands.

PAST AND CURRENT DEMAND

Historical water use within the EBMUD service area is illustrated in Figure 4-1. Total demand has remained relatively constant with some variance despite the increase in the number of water service accounts (or service connections). Water use dipped significantly during periods of drought rationing in calendar years 1976-78, 1987-94, and recently in 2007-2010.

Many factors contributed to the reduced water use from the amount that would otherwise be anticipated including:

- water restrictions imposed for drought management in 1976-78, 1987-94, and recently in 2007-2010;
- EBMUD's aggressive water conservation and recycling activities;
- changed consumption demographics to a variety of land use conversions, many of which also have high efficiency water use patterns;
- legislative changes including new plumbing efficiency standards, landscape ordinances, the 1992 and 2005 Federal Energy Policy Act; and
- the economic downturn within EBMUD's service area and the region that has continued since 2007.

Figure 4-2 displays how total metered water consumption is distributed among different customer categories. The single-family residential customer category is the largest water user category followed by multi-family residential, industrial and petroleum, commercial, irrigation, and institutional users. Approximately 63 percent of the historical total water consumption was delivered to

FIGURE 4-1 EBMUD WATER ACCOUNTS AND TOTAL DEMAND

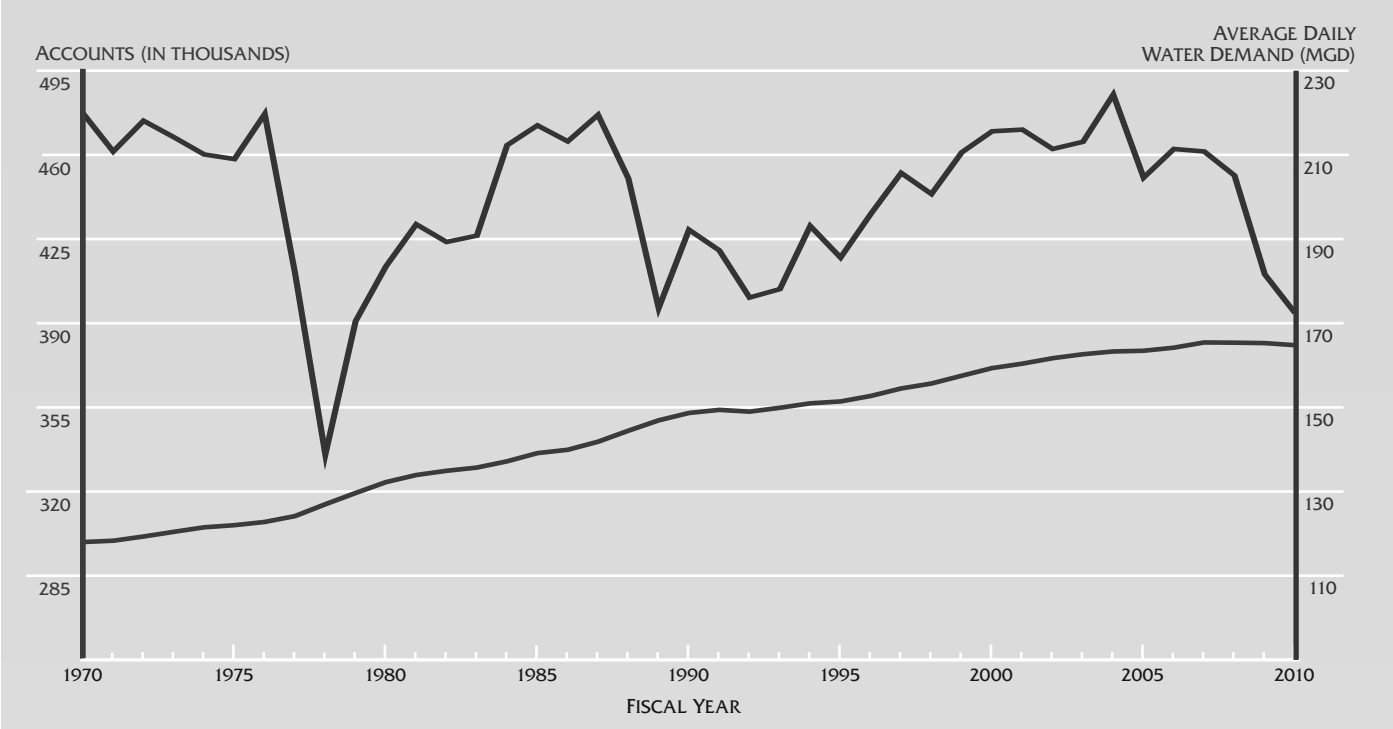
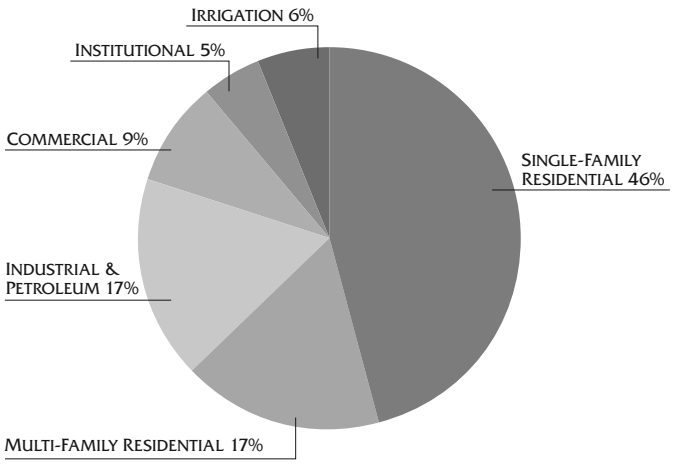


FIGURE 4-2 WATER USE BY CUSTOMER CATEGORY



NOTE:
Based on Calendar Year 1975-2010 consumption data.

EBMUD's residential customers. Historical water use for each EBMUD customer land use category is presented in Figure 4-3. It illustrates the number of accounts and metered water consumption for single-family residential, multi-family residential, industrial and petroleum, commercial, institutional, and irrigation customer categories from 1975-2010.

Other characteristics of historical water use (also from 1975-2010) are illustrated in Figures 4-4 through 4-5. In Figure 4-4, winter season water use is compared to summer season water use for each customer category. In Figure 4-5, water consumption for each customer category is differentiated between accounts situated east and west of the Oakland-Berkeley Hills. Figure 4-6 illustrates the regional variations in historical daily average water use per account for the single-family residential category within the EBMUD service area relative to the historical District-wide average.

Figures 4-7 and 4-8 illustrate residential water use characteristics. In Figure 4-7, indoor water use for an average single-family residential household is presented by specific use categories based on most recent available data from calendar year 2009 (for a drought affected year in a down economy). In Figure 4-8, indoor residential water use in calendar year 2010 averaged 68 percent of the total residential water use, and outdoor residential use averaged 32 percent.

PROJECTED WATER DEMAND

EBMUD's water demand projections are based on the *2040 Demand Study*, which was completed in 2009. The 2040 Demand Study uses a land-use based method to project average annual water demands of the distribution system out to year 2040.

The land-use based methodology relies on existing land uses and existing water consumption data for the study area. Demand projections were based on consumption data from year 2005, which provided the last complete year of conservation and water consumption data preceding development of the 2040 Demand Study and is unaffected by distribution system operation anomalies. The land use and water consumption data were used to calculate Land use Unit Demands (LUDs), a measure of water consumption per acre for each land use category. The 2005 LUDs were adjusted for historical weather effects (i.e. dry vs. wet year) and non-weather effects (e.g. economic conditions) to produce a "normalized" year. Additional adjustments to LUDs included accounting for unmetered water and future density growth. These LUDs were then applied to acreages of projected land uses that were determined by local planning agencies. The land use categories consisted of seven residential, four mixed-use (residential above commercial in the same building), and 12 non-residential. The demand projections were made for years 2010, 2015, 2020, 2025, 2030, and 2040.

The land use, consumption data, adjustment factors, and demand projections were developed in a geographic information system database, which allows for the spatial allocation of data. For example, consumption data was allocated by meter location and future growth adjustments by demand model regions (EBMUD service area is divided into 11 regions). The end result consists of demand projections that can be aggregated by land use and location.

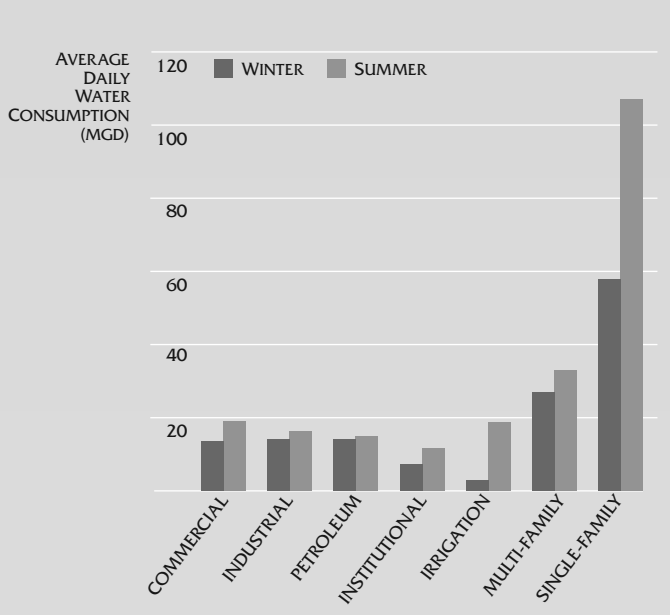
The 2040 Demand Study relied on the adopted general plans of the cities and counties in the EBMUD service area and on a series of meetings with local planning agencies regarding the timing and direction of future development in their respective communities. The district-wide land use analysis was conducted during a period reflecting an expectation of continued economic expansion. Although the economy began a period of recession in December 2007, the Demand Study projections are consistent with the anticipated level of developments in the general plans. Therefore, instead of reflecting the highest potential water demands, the demand projections in this analysis reflect

FIGURE 4-3

EBMUD WATER ACCOUNTS AND CONSUMPTION

FIGURE 4-4

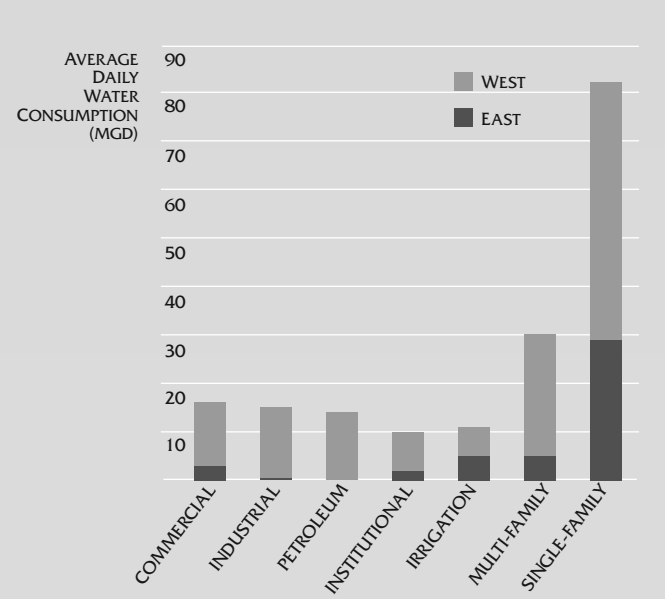
WINTER AND SUMMER WATER USE BY CUSTOMER CATEGORY



NOTES:
1. Based on Calendar Year 1975-2010 consumption data
2. Summer use based on July, August, and September consumption data
3. Winter use based on January, February, and March consumption data

FIGURE 4-5

EAST-OF-HILLS AND WEST-OF-HILLS WATER USE BY CUSTOMER CATEGORY



NOTE:
Based on Calendar Year 1975-2010 consumption data.

current planning policy by land use agencies. Higher demand projections may be associated with other forecasting techniques. These include long range population projections or demands based on assumptions that most land uses will increase in density over time, which do not specifically reflect community policy. While the actual developments and the associated increase in water demand will very likely be realized more slowly in the near term until 2020, the 2040 Demand Study still reflects a reasonable expectation for growth over the long term for demand in year 2040. Future Demand Studies will reflect updates of the general and specific plans of the cities and counties within the EBMUD service area.

The 2040 Demand Study forecasts an unadjusted customer demand of 312 million gallons per day (MGD) for the year 2040. Assuming that cumulative savings since implementation of the WCMP in 1994 of 62 MGD is achieved through existing and future conservation efforts and cumulative savings of 20 MGD is achieved through existing and future recycled water programs, the adjusted 2040 forecasted planning level of demand is 230 MGD. As a long-term planning tool, the planning level of demand remains unchanged through the current drought or other events that may temporarily impact demands. Chapters 5 and 6 of this UWMP 2010 provide further details on projected recycled water and conservation savings goals, respectively.

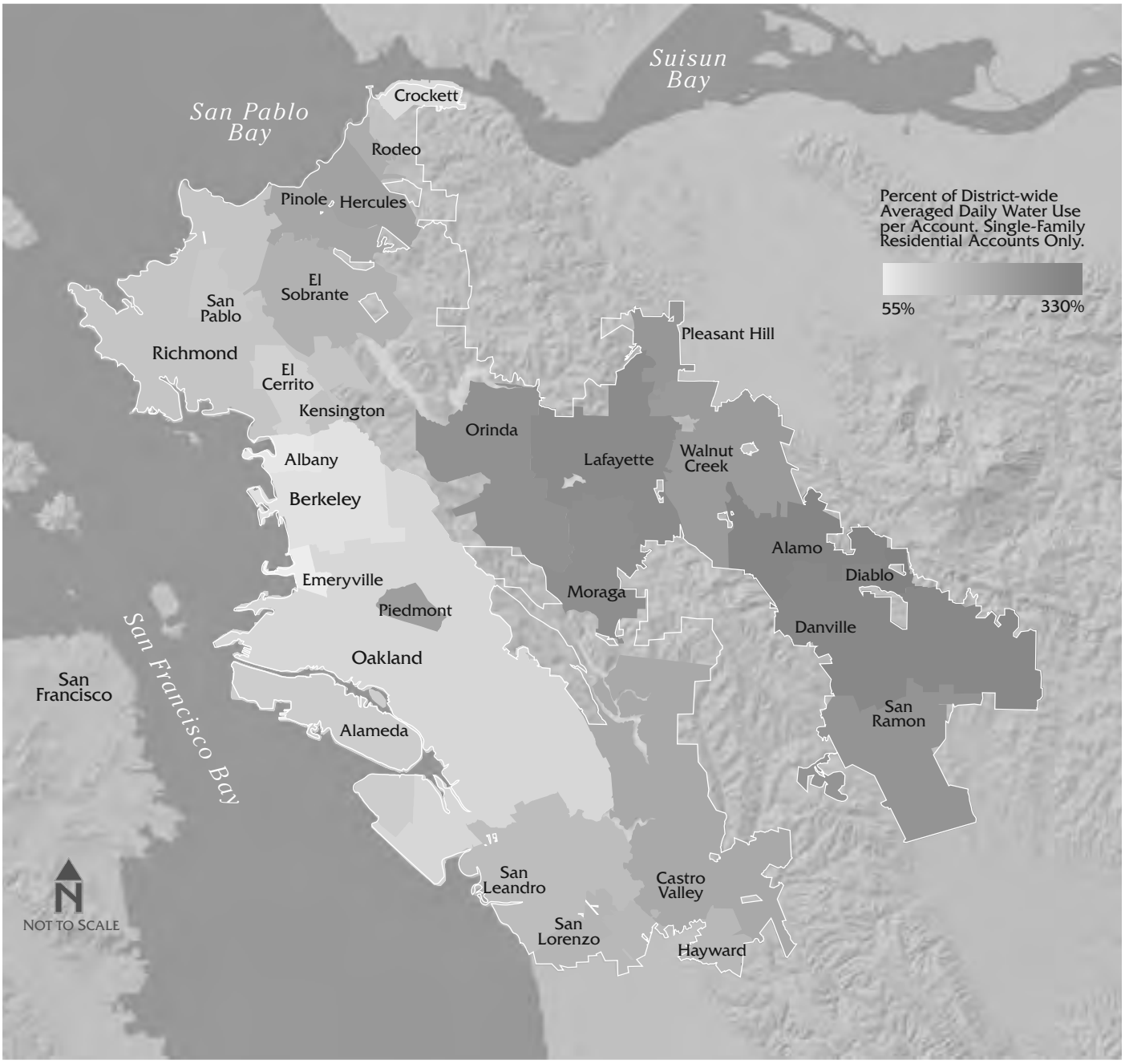
Table 4-1 illustrates water demand projections for each customer category (or water use sector): single- and multi-family, commercial, industrial, institutional, and irrigation users. The demand projections for the six customer categories are consolidated from the 23 land use categories, based on the predominant customer category found in each land use category.

WATER DEMAND PROJECTIONS FOR LOWER INCOME HOUSING

Water Code Section 10631.1 requires an estimate of projected water use needed for lower income single-family and multi-family residential housing within the EBMUD service area, which is summarized in Table 4-2. The estimated lower income water demand is based on available housing data published by the Association of Bay Area Governments (ABAG), consumption data from EBMUD water accounts, and EBMUD's water demand projections. The most recent 2008 housing data from ABAG and its projected 2007-2014 housing needs data are derived from the housing element portion of city and county general plans. The percentage of lower income housing units (4.4%) within the total housing stock in

FIGURE 4-6

HISTORICAL SINGLE-FAMILY RESIDENTIAL WATER CONSUMPTION BY REGION WITHIN THE EBMUD SERVICE AREA

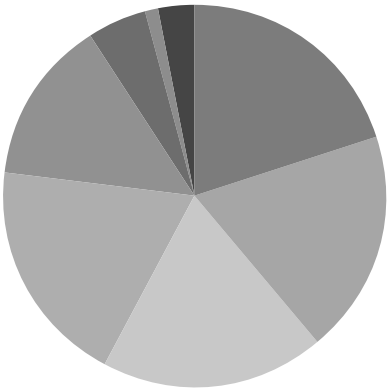


Potable water accounts only. Based on historical daily average consumption, 1975-2010
Representation of non-EBMUD boundaries is not necessarily authoritative

EBMUD's service area in year 2008 as estimated by ABAG is assumed the same as the percentage of lower income accounts that make up EBMUD's residential accounts in 2008. This estimated number of lower income accounts will be the 2008 baseline from which extrapolations will be made. Using an annualized average growth rate (5.85%) derived from ABAG's projection of lower income housing growth for years 2007-2014, EBMUD extrapolated the number of lower income EBMUD accounts for years 2015 to 2040. The total lower income water demand was estimated by assuming that water use for each account is equivalent to the average use of an EBMUD Customer Assistance Program (CAP) account in 2008. Income qualified single-family and multi-family (homeless shelter) accounts that enroll in the CAP receive discounted water rates. However, income eligibility requirements for CAP,

FIGURE 4-7

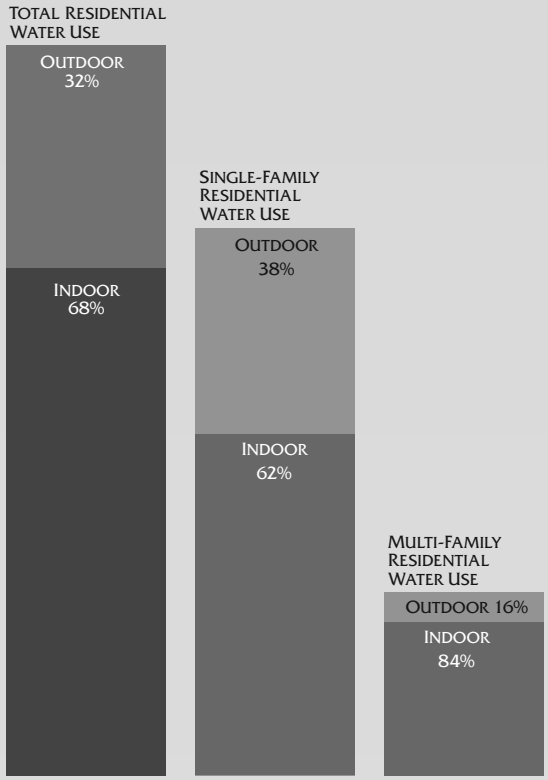
AVERAGE SINGLE-FAMILY RESIDENTIAL HOUSEHOLD INDOOR WATER USE



ELEMENT OF INDOOR USE	CALENDAR YEAR 2009 USE PER HOUSEHOLD (GAL/DAY/HH)	PERCENT OF USE
TOILET	35.3	20
CLOTHES WASHER	33.5	19
SHOWER	33.3	19
FAUCETS	33.2	19
LEAKS	25.6	14
BATH	9.7	5
DISHWASHER	2.3	1
OTHER	5.7	3
TOTAL	178.6	100

FIGURE 4-8

INDOOR AND OUTDOOR RESIDENTIAL WATER USE



NOTE:
Based on Calendar Year 2010 consumption data.

TABLE 4-1

WATER DEMAND PROJECTIONS FOR EACH WATER USE SECTOR

AVERAGE ANNUAL DEMANDS (MGD)[1]

CALENDAR YEAR	SINGLE-FAMILY	MULTI-FAMILY	COMMERCIAL	INDUSTRIAL	INSTITUTIONAL	IRRIGATION	TOTAL
2010 [2]	120	31	26	22	8	9	216
2015 [3]	121	36	26	23	8	9	223
2020	118	41	26	20	8	8	221
2025	117	47	26	19	7	8	224
2030	117	53	26	18	7	8	229
2035 [4]	117	54	26	18	7	7	229
2040	117	54	27	18	7	7	230

[1] Demand represents the Planning Level of Demand.
[2] 2010 demands are based on projections, which differ from actual water consumption.
[3] 2015 demands are based on projections and do not reflect the demand during the recovery period. The slight increase in total demand as compared to 2010 and 2020 is due to implementing conservation and recycled water projects later than anticipated as the customer demand recovers in the post-drought and from the economic downturn.
[4] 2035 values are interpolated from 2030 and 2040 demand projections.

which are based on the California Life Line Annual Income schedule, is a subset of the classification of "lower income households" as defined in Section 50079.5 of the California Health and Safety Code. Based on the ratio of projected demand between single- and multi-family categories derived from Table 4-1, EBMUD applied the same ratios to the total lower income water demand for each reporting year to estimate the appropriate allocation of the single- and multi-family categories. EBMUD's Water Service Policy 3.07 (in Appendix F) ensures that priority for new water service connections during restrictive periods is given to lower income households and that their demands are met first. This policy assures that the portion of overall water demands, as provided in Table 4-1, for lower income single-family and multi-family residential households can be met.

Effect of SBx7-7 Requirements on Projected Demand

Senate Bill No. 7 (SBx7-7) that establishes the program known as the Water Conservation Act of 2009 and often referred to as '20 by 2020,' creates a framework for future planning and actions by urban and agricultural water suppliers to reduce California's water use and requires urban water agencies to assist in reducing statewide per capita water consumption by 20 percent by the year 2020. Specifically, among other requirements, this bill establishes four methods for urban water suppliers to select from to achieve the statewide goal of a 20 percent reduction in urban water use. The act requires urban water suppliers to set an interim urban water use target for 2015 and meet the overall target by 2020.

As a water supplier, EBMUD is required to comply with the requirements of this bill to be eligible for water related state grant funding or loans. Chapter 6 and Appendix H discuss the development of the water use baseline and the targets. The projected demand of 221 MGD in year 2020 is expected to meet the requirements of SBx7-7.

Supply-Demand Assessment

In order to meet its customers' water needs now and in the future, EBMUD must balance water supply and customer demand. Both supply and demand vary seasonally and become critical during drought periods which can last several years. For planning purposes and looking to the year 2040, EBMUD's current supply is insufficient to meet customer needs during single- and multi-year droughts despite EBMUD's aggressive water conservation and recycled water programs.

Past and Current Supply-Demand

EBMUD's water demand in 1970 reached as high as 220 MGD. Subsequently, demand dropped sharply as a result of cutbacks during the three most recent drought rationing periods when drought-related programs were in effect in 1976-1978, 1987-1994, and 2007-2010. Demand was low in wetter years that immediately followed the first two droughts. This temporary event reflected changed customer water use behavior, successfully implemented conservation practices, and delayed post-drought recovery in customer consumption. As time progressed, demand recovered to pre-drought levels. Current demand levels remain lower than the planning level of demand as a result of residual effects from the 2007-2010 drought, a depressed economy, and unusually cool temperatures. In FY10, EBMUD's system demand was on average 174 MGD.

Table 4-2 — Water Demand Estimates for Lower Income Residential Accounts

	Single-Family		Multi-Family		Total Residential	
Calendar Year	Demand (MGD)	% of Sector Demand	Demand (MGD)	% of Sector Demand	Demand (MGD)	% of Total Residential Sector Demand
2015	2.4	2%	0.7	2%	3.1	2%
2020	3.1	3%	1.1	3%	4.2	3%
2025	3.9	3%	1.6	3%	5.5	3%
2030	5.1	4%	2.3	4%	7.4	4%
2035	6.7	6%	3.1	6%	9.8	6%
2040	8.9	8%	4.1	8%	13.0	8%

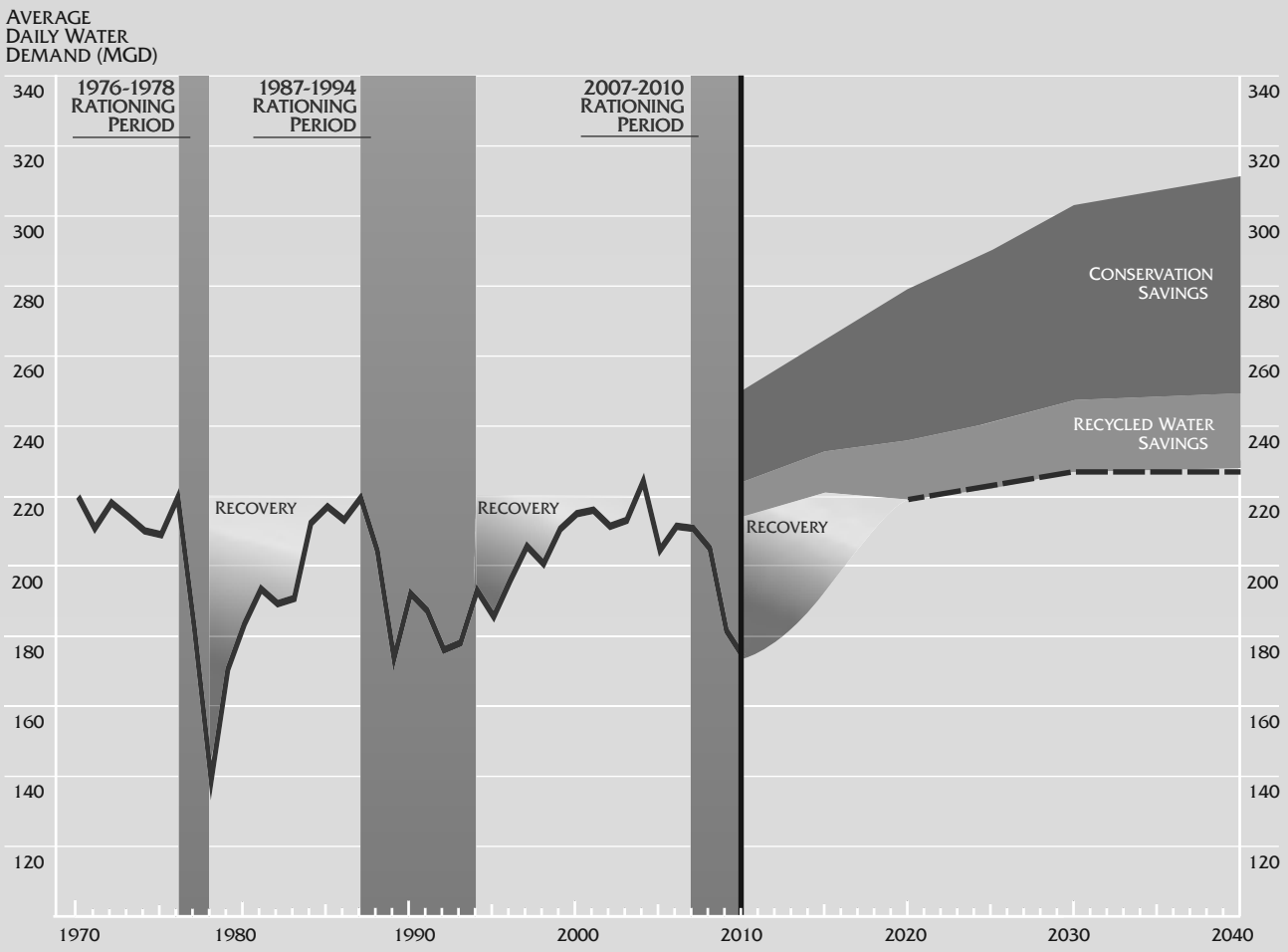
PROJECTED SUPPLY-DEMAND

Planning Level of Demand

The planning level of demand does not include the short-term reduction and rebound in demand caused by the multi-year drought and the downturn in the economy. The planning level of demand is used to assess demands as dictated by community policies. The 2040 Demand Study projected, on average, less than a one percent growth each year in customer demand through 2030 followed by a much lower increase thereafter to a 2040 planning level of demand of 230 MGD after applying reductions from conservation and recycled water savings. However, due to the current suppressed demand that is lower than estimated in the 2040 Demand Study, some planned recycled water projects and conservation programs will be deferred until the end of the anticipated recovery period. Consequently, the projected planning level of demand for 2015 has been revised to 223 MGD and is reflected in Table 4-3. Figure 4-9 shows both historical and projected demands and projected recycled water and conservation savings from 2010 to 2040.

A summary of EBMUD's demand and supply projections over the next thirty years is provided in Table 4-3. The

FIGURE 4-9 HISTORICAL AND PROJECTED DEMAND



NOTES:

1. Rationing periods include both voluntary and mandatory use restrictions imposed as part of the adopted Drought Management Program.
2. Within the projected drought recovery period following 2010, demand estimates are based on observed trends from the two past drought recovery periods and are subject to change depending on actual conditions.
3. Refer to Table 4-3 for the projected demand, projected conservation and recycled water program savings values.
4. Historical demand is plotted for fiscal years whereas projected demand is plotted for calendar years.

TABLE 4-3 EBMUD DEMAND AND SUPPLY PROJECTIONS

	2010	2015	2020	2025	2030	2035 [1]	2040
PROJECTED DEMAND (MGD)							
CUSTOMER DEMAND [2]	251	266	280	291	304	308	312
ADJUSTED FOR CUMULATIVE CONSERVATION [3]	(26)	(32)	(43)	(49)	(56)	(59)	(62)
ADJUSTED FOR RECYCLED WATER [4]	(9)	(11)	(16)	(18)	(19)	(20)	(20)
PLANNING LEVEL OF DEMAND	216	223	221	224	229	229	230
PROJECTED AVAILABLE SUPPLY AND NEED FOR SUPPLEMENTAL SUPPLY (MGD)[5]							
NORMAL YEAR	>216	>223	>221	>224	>229	>229	>230
SUPPLEMENTAL SUPPLY NEED	0	0	0	0	0	0	0
SINGLE DRY YEAR (MULTIPLE DRY YEARS – YEAR 1)							
AVAILABLE SUPPLY	211	217	215	218	223	222	222
CUSTOMER RATIONING [6]	2%	3%	3%	3%	3%	3%	4%
SUPPLEMENTAL SUPPLY NEED [7]	5	6	6	7	7	8	8
MULTIPLE DRY YEARS – YEAR 2							
AVAILABLE SUPPLY	183	189	188	190	194	194	195
CUSTOMER RATIONING [6]	15%	15%	15%	15%	15%	15%	15%
SUPPLEMENTAL SUPPLY NEED [7]	21	21	21	21	22	22	22
MULTIPLE DRY YEARS – YEAR 3							
AVAILABLE SUPPLY	183	189	188	190	183	164	144
CUSTOMER RATIONING [6]	15%	15%	15%	15%	15%	15%	15%
SUPPLEMENTAL SUPPLY NEED [7]	21	21	21	21	33	53	73
THREE-YEAR DROUGHT							
TOTAL SUPPLEMENTAL SUPPLY NEED (TAF)[7]	53	54	54	55	69	93	115

1 Projected demand for 2035 is interpolated.

2 Customer demand values are based on the demand projections from the "2040 Demand Study," Feb 2009. These projected water demands are based on land use in EBMUD's ultimate service area and is unadjusted for conservation and non-potable water. The values are also unadjusted for the current suppressed demand due to the 2007-2010 rationing period and the economic downturn.

3 Existing conservation saving from the "1994 Water Conservation Master Plan" and planned conservation program savings based on the "2011 Water Conservation Master Plan".

4 Existing recycled water achieved per the "1993 Water Supply Management Program" and planned recycled water program savings as outlined in Chapter 5 of the UWMP 2010.

5 Projected available supply data includes dry year supply deliveries from the Freeport Regional Water Project (FRWP) and Bayside Groundwater Project, Phase 1. Delivery rules for the FRWP follow the rules as developed in the Freeport EIR, 2003.

6 Rationing reduction goals are determined according to projected system storage levels in the Long-Term Drought Management Program guidelines per Table 3-2 in Chapter 3 of the UWMP 2010.

7 The supplemental supply need is based on EBMUDSIM modeling studies. It is the amount of water needed based on EBMUD's updated demand projections, the provisions of the 1998 Joint Settlement Agreement and the rationing policy stated in Table 3-2, Chapter 3 of the UWMP 2010. The actual need will be dependent on antecedent conditions and the severity of actual drought conditions. Supplemental supply stored during the initial year of the drought could be later released, diminishing supplemental supply needs. During the drought that continued into 2010, the combined effects of water rationing and an economic downturn suppressed demand below the planning level of demand to maintain a sufficient water supply and deferred the need for supplemental water. However, if the drought had continued into its second year, most likely supplemental supplies would have been obtained from the Freeport Regional Water Facility as anticipated in the Interim Drought Management Program Guidelines discussed in Appendix G-2.

demand data is based on EBMUD's 2040 Demand Study (as discussed in the Projected Water Demand section of this chapter) and revised projections. The supply data is derived from EBMUD's water supply system Simulation Model (EBMUDSIM).

EBMUD evaluates and forecasts water supply availability for any calendar year based on forecasted runoff and existing storage levels in the reservoirs. A "normal year" is a year in which EBMUD does not need to implement a Drought Management Program. For a normal year, the April projection of the total system storage at the end of September would be 500 thousand acre-feet (TAF) or greater (as shown in Table 3-2). EBMUD can meet customer demands through the year 2040 during normal year conditions; therefore, the available supply is considered equal to or greater than demand. However, as discussed in Chapter 2, unless supplemental water supplies are developed and while EBMUD's Mokelumne River supply continues to decrease, the frequency of normal year-types will decrease in the future. The frequency of dry years that require customer rationing is expected to increase.

In evaluating its water supply availability, EBMUD takes into account diversions of both upstream and downstream water right holders and fishery releases. The available water supply shown in Table 4-3 in years one, two, and three of a multiple-year drought is derived from EBMUDSIM analyses with the following assumptions:

- EBMUD's drought planning sequence is used for 1976, 1977, and 1978 (as discussed in Chapter 3);
- total system storage is depleted to minimum operating levels by the end of the third year of the drought planning sequence;
- EBMUD will implement its Drought Management Program when necessary (as described in Chapter 3);
- the diversions by Amador and Calaveras counties upstream of Pardee Reservoir continues to increase up to 47 TAF in 2040;
- releases from Camanche are sufficient to meet the requirements of downstream senior water right holders;
- minimum instream flow requirements for the Lower Mokelumne River are in accordance with the 1998 Joint Settlement Agreement;
- dry-year supply of CVP water, through the Freeport Regional Water Facility, is available beginning in 2010; and
- Bayside Groundwater Project, Phase 1, is available beginning in 2010.

In Table 4-3, "Single Dry Year" (or Multiple Dry Years - Year 1) is a year in which EBMUD would implement Drought Management Program elements at the "moderate" stage with the goal to achieve a reduction between zero to ten percent in customer demand (as shown in Table 3-2). Based on this EBMUD rationing policy, rationing in the first year of a drought is estimated at two percent of the planning level of demand in 2010 and four percent in 2040 only if additional supplemental supplies beyond the dry-year supply available through the Freeport Regional Water Facility and through the Bayside Groundwater Facility are obtained. Therefore, deficiencies continue to exist unless additional supplemental supplies are obtained.

Year 2 of "Multiple Dry Years" is a year in which EBMUD would implement Drought Management Program elements at the "severe" stage with the goal to achieve between 10 to 15 percent reduction in customer demand (as shown in Table 3-2). Year 3 of "Multiple Dry Years" is a year in which EBMUD would implement Drought Management Program elements at the "critical" stage. Despite water savings from EBMUD's aggressive conservation and recycling programs and rationing of up to 15 percent, additional supplemental supplies beyond those provided through the Freeport Regional Water Facility and the Bayside Groundwater Facility will be needed during Years 2 and 3 of a three year drought. In Table 4-3, the term "Supplemental Supply Need" is the additional amount of water necessary to limit customer rationing to 15 percent during droughts while meeting the requirements of senior downstream water right holders and the provisions of the 1998 Joint Settlement Agreement. The forecasted need for supplemental supply ranges from 21 MGD in 2010 to 73 MGD by 2040 during Year 3 of a three year drought.

As indicated in Table 4-3, EBMUD has a total supplemental supply need of 69 TAF over multiple dry years for 2030 level demands, beyond the current supplemental supplies provided through the Freeport Regional Water Facility and the Bayside Groundwater Facility. EBMUD plans to meet this need by relying on short-term supplemental supply sources that include the Northern California Water Transfers (expected to provide up to 13 MGD (15 TAF/yr) of dry-year water) and the Bayside Groundwater Project Expansion (expected to provide up to 9 MGD (10 TAF/yr) of dry-year water) as described in Chapter 2. Beyond 2030 and outside the current required 20-year planning horizon of the UWMP, EBMUD's supplemental supply needs will be met by implementing long-term conceptual supplemental supply sources, whose project capacities can only be quantified in subsequent UWMPs through refined project developments. Chapter 3 discusses how EBMUD would plan for and manage a water supply shortage.

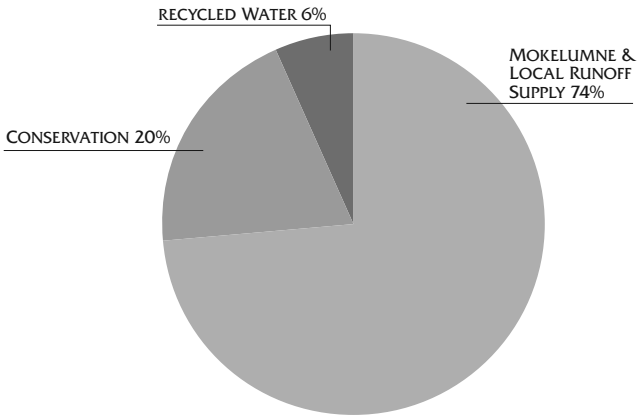
Figure 4-10 illustrates the projected water supply available to EBMUD by 2040. In a normal year, conservation and recycled water programs will play a very important role in future reliability of EBMUD's supply. In a normal year for a 312 MGD demand, conservation is expected to offset about 20 percent of the needed supply, and recycled water programs will offset about 6 percent. For a 312 MGD demand in an average drought year of a three year drought sequence projected for year 2040, rationing and supplemental supply will account for 25% and the projected shortfall to be met by developing supplemental water supply sources will be about 11%.

Interim Level of Demand

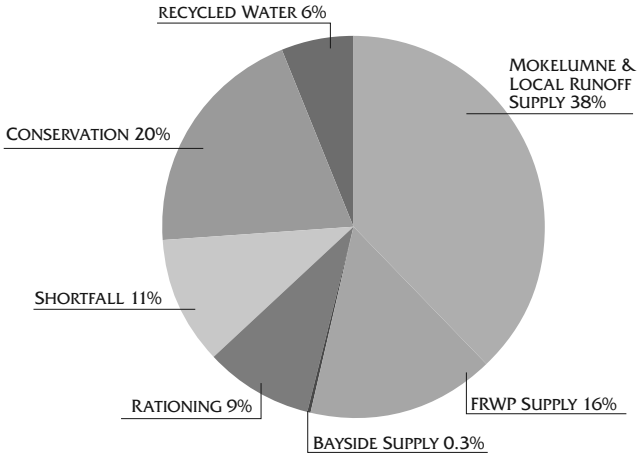
During the recent 2007-2010 rationing period, EBMUD customers were subjected to mandatory and voluntary water use restrictions. The residual rationing effect of the recently ended drought management program and the suppressed demand from the downturn in the economy has led EBMUD to adopt interim drought management program guidelines. These interim guidelines recognize that demand is below the planning level during the recovery period as depicted in Figure 4-9. During this time, when demand remains significantly suppressed, below the planning level of demand, the existing water supply is sufficient, which defers the need for any supplemental drought year water supply. Appendix G-2 provides further discussion on the interim drought management program guidelines.

FIGURE 4-10 PROJECTED (2040) WATER SUPPLY — 312 MGD

NORMAL YEAR



THREE YEAR DROUGHT AVERAGE YEAR



NOTE:
Numbers may not add to 100% due to rounding.

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Reference 18

Policy 9.05

EFFECTIVE 26 MAR 13

SUPERSEDES 14 NOV 06

NON-POTABLE WATER

IT IS THE POLICY OF EAST BAY MUNICIPAL UTILITY DISTRICT TO:

Require that customers of the East Bay Municipal Utility District ("EBMUD") use non-potable water, including recycled water, for non-domestic purposes when it is of adequate quality and quantity, available at reasonable cost, not detrimental to public health and not injurious to plant life, fish and wildlife. When nonpotable water satisfying these conditions is made available to the customer, the use of potable water for nondomestic purposes may constitute a waste and unreasonable use of water within the meaning of Section 2 of Article X of the California Constitution and is prohibited.

Findings Related To Use Of Non-potable Water

The Board of Directors of EBMUD has determined that existing water supplies will not adequately accommodate existing and future demand within the EBMUD's Ultimate Service Boundary. Non-potable water resources, including treated wastewater discharged to the San Francisco Bay from EBMUD and other Bay Area treatment plants, and other alternative water sources that could provide a safe and effective alternative water supply for certain non-potable purposes, increase the availability of the limited water supplies of EBMUD, assure non-potable water customers of a more reliable water supply during periods of drought, reduce wastewater discharges to the Bay, and provide EBMUD with greater flexibility to meet instream needs in the Mokelumne River. The State Legislature has determined that the use of potable domestic water for certain non-potable uses may constitute a waste or unreasonable use of water if recycled water is available which meets specified conditions. (Water Code Section 13550 et seq.)

Definitions

Non-potable Water - All reclaimed, recycled, reused, untreated, or alternative water supplies that meet the conditions set forth in the California Water Code, Section 13550, and are determined by EBMUD to be suitable for non-domestic purposes and feasible for the particular intended use.

Non-domestic Uses - For purposes of this policy, "non-domestic uses" shall mean all applications except drinking, culinary purposes and the processing of products intended for direct human consumption.

Mandated Uses Of Non-potable Water

Customers may be required to use non-potable water for their non-domestic uses which may include, but are not limited to, the following:

- irrigation of cemeteries, golf courses, playing fields, parks, and residential and nonresidential landscaped areas;
- commercial and industrial process uses; and
- toilet and urinal flushing in nonresidential buildings.

Determination Of Feasibility Of Non-potable Water

In determining whether non-potable water is feasible for a particular non-domestic use, EBMUD shall consider the following factors:

- Whether the non-potable water may be furnished for the intended use at a reasonable cost to the customer and EBMUD.
- Whether the non-potable water is of adequate quality for the intended use and does not require significant additional on-site treatment by the customer beyond that required for potable water.
- Whether the use of non-potable water is consistent with all applicable federal, state, and local laws and regulations.
- Whether the use of non-potable water will not be detrimental to the public health and will not adversely affect plant life, fish and wildlife.

Regulations Governing Non-potable Service

The regulations governing non-potable water service and the rates therefore shall be determined by the Board of Directors and published in the Regulations Governing Water Service and Schedule of Rates and Charges for Customers of East Bay Municipal Utility District.

Water Reuse Zones

EBMUD designates Water Reuse Zones within EBMUD's service area where non-potable water service has been determined to be reasonably available.

Non-potable Water Service Agreements

Where implementation of this Policy requires agreements, such agreements shall, wherever possible, have a term of 20 or more years and shall include provisions governing facilities operation and maintenance responsibilities. Upon termination or expiration of an agreement, customers receiving non-potable water service pursuant to that agreement shall be governed by the non-potable water service regulations and rate schedule, unless a new agreement is entered into.

Authority

Resolution No. 32981-96, April 9, 1996
As amended by Resolution No. 33443-04, September 28, 2004
As amended by Resolution No. 33564-06, November 14, 2006
As amended by Resolution No. 33919-13, March 26, 2013

References

Regulations Governing Water Service and Schedule of Rates and Charges for Customers of East Bay Municipal Utility District

Reference 19

RESOLUTION NO. 33978-14

DECLARE A NEED TO USE THE FREEPORT PROJECT TO DELIVER SUPPLEMENTAL SUPPLIES, SUSPEND IMPLEMENTATION OF THE SUPPLEMENTAL SUPPLY SURCHARGE FOR FISCAL YEAR 2014, AND REAFFIRM THE 2014 PRELIMINARY DRY YEAR RESPONSE PLAN

Introduced by Director Coleman ; Seconded by Director Patterson

WHEREAS, California is experiencing one of the most severe droughts on record; and

WHEREAS, the 2014 water year has been one of the driest in decades and follows two consecutive dry years throughout the state; and

WHEREAS, even after the recent rain and snowfall, the state's major reservoirs remain well below average levels for the date and the statewide snowpack is less than a third of normal, with little time remaining to recover in 2014; and

WHEREAS, many areas of the state will face water shortages this year; and

WHEREAS, the East Bay Municipal Utility District (the "District") has undertaken substantial investments in aggressive water conservation programs, water recycling projects and dry year supplemental water supply projects to help reduce the severity of water rationing that may be required in droughts, and will continue doing so; and

WHEREAS, Governor Brown declared a drought state of emergency on January 17, 2014, and called on all Californians to do their part to reduce their water use; and

WHEREAS, on February 11, 2014, the District Board of Directors (the "Board") responded to the Governor's call by implementing a 2014 Preliminary Dry Year Response Plan which asked customers to voluntarily reduce water use by ten percent starting on February 11, 2014 and continuing until further notice along with a comprehensive water conservation and customer outreach program; and

WHEREAS, the 2014 Preliminary Dry Year Response Plan also prepared for the use of supplemental water supplies and provided ongoing monitoring of water supply and demand consistent with the District's Urban Water Management Plan 2010; and

WHEREAS, the Board approved a one-year water transfer agreement with Placer County Water Agency (PCWA) for additional supplemental water supplies; and

WHEREAS, the District has a long-term renewal contract with the United States Bureau of Reclamation (the "Bureau") for the Central Valley Project (the "CVP") supplemental water supply and during specified dry year conditions, may request delivery of the CVP water and convey it by using the Freeport Regional Water Facility (the 'Freeport Project'); and

WHEREAS, the District can take supplemental water supply from its CVP contract with the Bureau in Fiscal Year 2014 because the projected end of September total system storage is less than 450 thousand acre-feet and the District is entitled to take up to 66,500 acre-feet of CVP water during this federal water year which ends on February 28, 2015; and

WHEREAS, the District has scheduled to receive 6,900 acre-feet of water from its CVP contract to conduct a series of tests in April that are necessary to meet regulatory requirements and to confirm the system is prepared to deliver additional supplemental supply; and

WHEREAS, the District has reserved 16,000 acre-feet of supplemental supply water from its CVP contract for delivery to the District's service area in May and June 2014 for potable water service if the Board declares the need to use the Freeport Project to deliver these supplemental supplies to the District; and

WHEREAS, the Board accepted a Water Supply Availability and Deficiency Report from District staff at its April 22, 2014 meeting, advising the Board that the District's projected September 30 total system storage will fall below 450,000 acre-feet and declaring that the District's water supply is deficient for meeting normal customer demands in 2014; and

WHEREAS, the Water Supply Availability and Deficiency Report also advises the Board to continue the customer water use reduction program begun in February as part of the 2014 Preliminary Dry Year Response Plan and coupled with supplemental supplies from the Freeport Project in order to preserve supplies in case the dry conditions persist into the next water year; and

WHEREAS, the cost to purchase and deliver 16,000 acre-feet of CVP water to the District's service area is estimated to be eight million dollars; and

WHEREAS, Schedule A of the District's Schedule of Rates and Charges states that a Supplemental Supply Surcharge is effective after the Board declares a need to use the Freeport Project to deliver supplemental supplies from outside of the District's normal watershed, and the surcharge amount is 14% of the total charge for water delivered per billing period for all potable water customer accounts, continuing until the additional costs are recovered; and

WHEREAS, the revenue from the Supplemental Supply Surcharge covers the additional costs that are incurred when the Freeport Project facilities are operated, including purchases of water from the Bureau and other water agencies, and the costs for delivery and treatment, and the surcharge remains in effect until these additional costs are recovered; and

WHEREAS, customer communications about the water supply shortage, the need for voluntary conservation and the costs and benefits of using supplemental supplies began just two months ago and require additional time to adequately educate ratepayers; and

WHEREAS, due to the short time frame when the Freeport Project will be operated to deliver supplemental supplies to the District for potable water service in Fiscal Year 2014 and the availability of unbudgeted one-time revenue from the sale of the Redwood Filter Plant property, these costs can be funded in Fiscal Year 2014 without adversely affecting the District's finances and the Board has the legislative authority to suspend the implementation of the Supplemental Supply Surcharge for the delivery of the 16,000 acre-feet of CVP supplemental water supply for potable water service in May and June 2014; and

WHEREAS, suspending the implementation of the Supplemental Supply Surcharge in Fiscal Year 2014 does not prevent the Board from implementing the Supplemental Supply Surcharge in the future whenever it declares a need to operate the Freeport Project to deliver supplemental water supplies;

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of East Bay Municipal Utility District finds and determines and hereby declares the following:

Section 1. The Board hereby declares a need to use the Freeport Project to deliver 16,000 acre-feet of supplemental supply water from the District's CVP contract with the Bureau which is from outside of the District's normal watershed for delivery to the District's service area for potable water service in May and June 2014.

Section 2. The Board hereby suspends implementation of the Supplemental Supply Surcharge for the delivery of the 16,000 acre-feet of supplemental supply water to the District's service area in May and June 2014 for potable water service based on the Board's findings that due to the short time frame when the Freeport Project will be operated and the availability of unbudgeted one-time revenue from the sale of the Redwood Filter Plant property, the expenditures intended to be covered by the revenue from the Supplemental Supply Surcharge can be funded in Fiscal Year 2014 without adversely affecting the District's finances.

Section 3. The Board reserves the right to implement the Supplemental Supply Surcharge at any future subsequent date whenever it declares a need to operate the Freeport Project to deliver supplemental supplies from outside of the District's normal watershed.

Section 4. The Board hereby declares a need to continue requesting ten percent voluntary conservation by all customers to preserve up to 10,000 acre-feet of water supplies by reaffirming the 2014 Preliminary Dry Year Response Plan.

ADOPTED this 22nd day of April, 2014 by the following vote:

AYES: Directors Coleman, Foulkes, Linney, McIntosh, Mellon, Patterson, and President Katz.

NOES: None.

ABSENT: None.

ABSTAIN: None.

Andy Katz

President

ATTEST:

Rischa Cole for

Secretary

APPROVED AS TO FORM AND PROCEDURE:

Laura Collins

General Counsel

Reference 20

East Bay Municipal Utility District
DERWA Phase 3 Recycled Water Project
EBMUD San Ramon Valley Phase 2 Pipeline
Anticipated Recycled Water Customer Demand

Customer Name	Phase	Address	AFY
City of San Ramon (greenbelt)	2A	13990 Alcosta Blvd.	5.20
Granada Sales Inc.	2A	4000 Executive Pky	10.48
Granada Sales Inc.	2A	2503 Bishop Drive	8.11
Granada Sales Inc.	2A	3080 Executive Parkway	7.83
Granada Sales Inc.	2A	3000 Executive Pky	7.07
Granada Sales Inc.	2A	2 Annabel Lane	5.38
Granada Sales Inc.	2A	5000 Executive Pky	2.77
Sunset Development Co.	2A	2682 Bishop Drive	5.60
Sunset Development Co.	2A	2680 Bishop Drive	6.70
Sunset Development Co.	2A	2694 Bishop Drive	1.17
Toyota Motor Dist Inc.	2A	2451 Bishop Drive	42.49
Valacal Company (UPS)	2A	4500 Norris Canyon Road	28.50
Crow Canyon Country Club	2A	881 Silver Lake Dr.	70.20
PG&E	2A	3301 Crow Canyon Road	47.22
SBC	2A	2600 Camino Ramon	29.09
Sunset Development Co.	2A	2603 Camino Ramon	13.30
Calfront Associates	2A	2350 Camino Ramon	16.99
Granada Sales Inc.	2A	2301 Camino Ramon	16.27
Commons Office Park Assn	2A	2228 Camino Ramon	12.30
Sunset Development Co.	2A	2420 Camino Ramon	7.10
Granada Sales Inc.	2A	2410 Camino Ramon	10.29
Sunset Development Co.	2A	2527A Camino Ramon	6.30
2300CR Associates LLC	2A	2300 Camino Ramon	9.20
Granada Sales Inc.	2A	2665 Camino Ramon	8.90
Commons Office Park Assn	2A	2256 Camino Ramon	5.80
Annabel Investment Co.	2A	2409 Camino Ramon	5.07
Sunset Development Co.	2A	2623 Camino Ramon	0.20
Sunset Development Co.	2A	2633 Camino Ramon	4.25
Sunset Development Co.	2A	2527 Camino Ramon	2.00
Town of Danville	2A	2101 El Capitan Dr.	3.30
Crow Canyon CC Estates	2A	901 Silver Lake Dr.	3.20
Sunset Development Co.	2A	2453 Camino Ramon	3.20
Town of Danville	2A	2151 El Capitan Dr.	2.80
City of San Ramon	2A	3585 Crow Canyon Rd.	2.40
Annabel Investment Co.	2A	2440 Camino Ramon	2.39
Sunset Development Co.	2A	2613 Camino Ramon	2.35
Annabel Investment Co.	2A	2430 Camino Ramon	1.76
Sunset Development Co.	2B	12677 Alcosta Blvd. (BR15)	20.30
Sunset Development Co.	2A	2600 Camino Ramon (AT&T)	30.00
Sunset Development Co.	2A	2600 Camino Ramon (AT&T#2)	4.80
Sunset Development Co.	2A	2600 Camino Ramon (AT&T#3)	4.30
PHASE 2A TOTAL			**476.59**

Reference 21

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

San Francisco Bay Regional Water Quality Control Board

ORDER No. R2-2014-0014
NPDES No. CA0038873

WASTE DISCHARGE REQUIREMENTS FOR NUTRIENTS FROM MUNICIPAL WASTEWATER DISCHARGES TO SAN FRANCISCO BAY

The following dischargers are subject to waste discharge requirements (WDRs) set forth in this Order, for the purpose of regulating nutrient discharges to San Francisco Bay and its contiguous bay segments:

Table 1. Discharger Information

Discharger	Facility Name	Facility Address	Minor/ Major
American Canyon, City of	Wastewater Treatment and Reclamation Facility	151 Mezzetta Court American Canyon, CA 94503 Napa County	Major
Benicia, City of	Benicia Wastewater Treatment Plant	614 East Fifth Street Benicia, CA 94510 Solano County	Major
Burlingame, City of	Burlingame Wastewater Treatment Plant	1103 Airport Boulevard Burlingame, CA 94010 San Mateo County	Major
Central Contra Costa Sanitary District	Central Contra Costa Sanitary District Wastewater Treatment Plant	5019 Imhoff Place Martinez, CA 94553 Contra Costa County	Major
Central Marin Sanitation Agency	Central Marin Sanitation Agency Wastewater Treatment Plant	1301 Andersen Drive San Rafael, CA 94901 Marin County	Major
Crockett Community Services District	Port Costa Wastewater Treatment Plant	End of Canyon Lake Drive Port Costa, CA 94569 Contra Costa County	Minor
Delta Diablo	Wastewater Treatment Plant	2500 Pittsburg-Antioch Highway Antioch, CA 94509 Contra Costa County	Major
East Bay Dischargers Authority (EBDA), City of Hayward, City of San Leandro, Oro Loma Sanitary District, Castro Valley Sanitary District, Union Sanitary District, Livermore-Amador Valley Water Management Agency, Dublin San Ramon Services District, and City of Livermore	EBDA Common Outfall	EBDA Common Outfall 14150 Monarch Bay Drive San Leandro, CA 94577 Alameda County	Major
	Hayward Water Pollution Control Facility		
	San Leandro Water Pollution Control Plant		
	Oro Loma/Castro Valley Sanitary Districts Water Pollution Control Plant		
	Raymond A. Boege Alvarado Wastewater Treatment Plant		
	Livermore-Amador Valley Water Management Agency Export and Storage Facilities		

Discharger	Facility Name	Facility Address	Minor/ Major
	Dublin San Ramon Services District Wastewater Treatment Plant		
	City of Livermore Water Reclamation Plant		
East Bay Municipal Utility District	East Bay Municipal Utility District, Special District No. 1 Wastewater Treatment Plant	2020 Wake Avenue Oakland, CA 94607 Alameda County	Major
Fairfield-Suisun Sewer District	Fairfield-Suisun Wastewater Treatment Plant	1010 Chadbourne Road Fairfield, CA 94534 Solano County	Major
Las Gallinas Valley Sanitary District	Las Gallinas Valley Sanitary District Sewage Treatment Plant	300 Smith Ranch Road San Rafael, CA 94903 Marin County	Major
Marin County (Paradise Cove), Sanitary District No. 5 of	Paradise Cove Treatment Plant	3700 Paradise Drive Tiburon, CA 94920 Marin County	Minor
Marin County (Tiburon), Sanitary District No. 5 of	Wastewater Treatment Plant	2001 Paradise Drive Tiburon, CA 94920 Marin County	Minor
Millbrae, City of	Water Pollution Control Plant	400 East Millbrae Avenue Millbrae, CA 94030 San Mateo County	Major
Mt. View Sanitary District	Mt. View Sanitary District Wastewater Treatment Plant	3800 Arthur Road Martinez, CA 94553 Contra Costa County	Major
Napa Sanitation District	Soscol Water Recycling Facility	1515 Soscol Ferry Road Napa, CA 94558 Napa County	Major
Novato Sanitary District	Novato Sanitary District Wastewater Treatment Plant	500 Davidson Street Novato, CA 94945 Marin County	Major
Palo Alto, City of	Palo Alto Regional Water Quality Control Plant	2501 Embarcadero Way Palo Alto, CA 94303 Santa Clara County	Major
Petaluma, City of	Ellis Creek Water Recycling Facility	3890 Cypress Drive Petaluma, CA 94954 Sonoma County	Major
Pinole, City of	Pinole-Hercules Water Pollution Control Plant	11 Tennent Avenue Pinole, CA, 94564 Contra Costa County	Major
Rodeo Sanitary District	Rodeo Sanitary District Water Pollution Control Facility	800 San Pablo Avenue Rodeo, CA 94572 Contra Costa County	Major
San Francisco (San Francisco International Airport), City and County of	Mel Leong Treatment Plant, Sanitary Plant	918 Clearwater Drive San Francisco International Airport San Francisco, CA 94128 San Mateo County	Major
San Francisco (Southeast Plant), City and County of	Southeast Water Pollution Control Plant	750 Phelps Street San Francisco, CA 94124 San Francisco County	Major

Discharger	Facility Name	Facility Address	Minor/ Major
San Jose/Santa Clara Water Pollution Control Plant and Cities of San Jose and Santa Clara	San Jose/Santa Clara Water Pollution Control Plant	4245 Zanker Road San Jose, CA 95134 Santa Clara County	Major
San Mateo, City of	City of San Mateo Wastewater Treatment Plant	2050 Detroit Drive San Mateo, CA 94404 San Mateo County	Major
Sausalito-Marin City Sanitary District	Sausalito-Marin City Sanitary District Wastewater Treatment Plant	#1 Fort Baker Road Sausalito, CA 94965 Marin County	Major
Sewerage Agency of Southern Marin	Wastewater Treatment Plant	450 Sycamore Avenue Mill Valley, CA 94941 Marin County	Major
Sonoma Valley County Sanitary District	Municipal Wastewater Treatment Plant	22675 8th Street East Sonoma, CA 95476 Sonoma County	Major
South Bayside System Authority	South Bayside System Authority Wastewater Treatment Plant	1400 Radio Road Redwood City, CA 94065 San Mateo County	Major
South San Francisco and San Bruno, Cities of	South San Francisco and San Bruno Water Quality Control Plant	195 Belle Air Road South San Francisco, CA 94080 San Mateo County	Major
Sunnyvale, City of	Sunnyvale Water Pollution Control Plant	1444 Borregas Avenue, Sunnyvale, CA 94089 Santa Clara County	Major
U.S. Department of Navy (Treasure Island)	Wastewater Treatment Plant	681 Avenue M, Treasure island San Francisco, CA 94130-1807 San Francisco County	Major
Vallejo Sanitation and Flood Control District	Vallejo Sanitation and Flood Control District Wastewater Treatment Plant	450 Ryder Street Vallejo, CA 94590 Solano County	Major
West County Agency (West County Wastewater District and City of Richmond Municipal Sewer District)	West County Agency Combined Outfall	601 Canal Blvd. Richmond, CA 94804 Contra Costa County	Major

Table 2. Discharge Locations

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
Discharge locations are specified in individual NPDES permits listed in Attachment B.				

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	**April 9, 2014**
This Order shall become effective on:	**July 1, 2014**
This Order shall expire on:	**June 30, 2019**

I, Bruce H. Wolfe, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of the Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on the date indicated above.

Digitally signed by Bruce H. Wolfe
DN: cn=Bruce H. Wolfe, o=SWRCB, ou=Region 2, email=bwolfe@waterboards.ca.gov, c=US
Date: 2014.04.14 11:08:33 -07'00'

Bruce H. Wolfe, Executive Officer

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Attachment B – Individual Order and NPDES Permit Numbers B-1
Attachment C – Discharger Location Map C-1
Attachment D – Federal Standard Provisions (not included, see individual permits)
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Attachment G – Regional Standard Provisions (not included, see individual permits)

I. FACILITY INFORMATION

Information describing the facilities subject to this Order is summarized in Table 1 and in Fact Sheet (Attachment F) sections I and II.

II. FINDINGS

The California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board), finds:

A. Legal Authorities. This Order serves as WDRs pursuant to California Water Code article 4, chapter 4, division 7 (commencing with § 13260). This Order is also issued pursuant to federal Clean Water Act (CWA) section 402 and implementing regulations adopted by U.S. EPA, and Water Code chapter 5.5, division 7 (commencing with § 13370). It shall serve as an NPDES permit for point source discharges from the Dischargers' facilities to surface waters.

B. Background and Rationale for Requirements. The Regional Water Board developed the requirements in this Order based on information the Dischargers submitted, information obtained through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F) contains background information and rationale for the requirements in this Order and is hereby incorporated into and constitutes findings for this Order. Attachments B, C, and E are also incorporated into this Order.

C. Provisions and Requirements Implementing State Law. No provisions or requirements in this Order are included to implement State law only.

D. Notification of Interested Parties. The Regional Water Board notified the Dischargers and interested agencies and persons of its intent to prescribe these WDRs and provided an opportunity to submit written comments and recommendations. The Fact Sheet provides details regarding the notification.

E. Consideration of Public Comment. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharges. The Fact Sheet provides details regarding the public hearing.

THREFORE, IT IS HEREBY ORDERED that, in order to meet the provisions of Water Code division 7 (commencing with § 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations and guidelines adopted thereunder, the Dischargers shall comply with the requirements in this Order. This Order supersedes nutrient-related requirements in the individual NPDES permits listed in Attachment B, with the exception of effluent limitations for ammonia as well as special studies the Central Contra Costa Sanitary District is to conduct pursuant to Order No. R2-2012-0016 (Provision C.5c).

III. DISCHARGE PROHIBITIONS

This Order does not establish additional discharge prohibitions.

IV. DISCHARGE SPECIFICATIONS

This Order does not establish additional discharge specifications.

V. RECEIVING WATER LIMITATIONS

This Order continues receiving water limitations that are applicable to nutrients that are specified in the individual NPDES permits listed in Attachment B.

VI. PROVISIONS

A. Federal and Regional Standard Provisions

Federal and Regional Standard Provisions are specified in Attachments D and G in, and as modified by, each Discharger's individual NPDES Permits (see Attachment B).

B. Monitoring and Reporting Program Requirements

Dischargers shall comply with the Monitoring and Reporting Program (MRP), and future revisions thereto, in Attachment E of this Order.

C. Special Provisions

1. Evaluation of Potential Nutrient Discharge Reduction by Treatment Optimization and Side-stream Treatment

The major Dischargers listed in Table 1 shall, individually or in collaboration with other Dischargers, evaluate options and costs for nutrient discharge reduction by optimization of current treatment works. The evaluation shall include the following:

- Describe the treatment plant, treatment plant process, and service area;
- Evaluate site-specific alternatives, along with associated nitrogen and phosphorus removal levels, to reduce nutrient discharges through methods such as operational adjustments to existing treatment systems, process changes, or minor upgrades;
- Evaluate side-stream treatment opportunities along with associated nitrogen and phosphorus removal levels;
- Describe where optimization, minor upgrades, and sidestream treatment have already been implemented;
- Evaluate beneficial and adverse ancillary impacts associated with each optimization proposal, such as changes in the treatment plant's energy usage, greenhouse gas emissions, or sludge and biosolids treatment or disposal;
- Identify planning level costs of each option evaluated; and

- Evaluate the impact on nutrient loads due to treatment plant optimization implemented in response to other regulations or requirements.

Dischargers that have recently completed optimization evaluations may use previously completed reports.

a. Submit and Implement Scoping and Evaluation Plans

By December 1, 2014, the major Dischargers listed in Table 1 shall, individually or in collaboration with other Dischargers, submit a Scoping Plan that defines the level of work for the proposed optimization evaluation. The Scoping Plan shall be acceptable to the Executive Officer.

By July 1, 2015, the major Dischargers listed in Table 1 shall, individually or in collaboration with other Dischargers, submit an Evaluation Plan that includes a schedule describing how they will conduct the evaluation of potential nutrient discharge reduction by treatment optimization. The Evaluation Plan shall include sampling, as necessary, to support proposed optimization studies. The Evaluation Plan shall be acceptable to the Executive Officer.

The Dischargers shall proceed with implementation of the Evaluation Plan within 45 days of submittal.

b. Submit Status Report

By July 1, 2016, and subsequently by July 1, 2017, major Dischargers listed in Table 1 shall submit, or cause to be submitted, a report describing the tasks completed, preliminary findings, and tasks to be completed, highlighting any adaptive changes to be made to the Evaluation Plan submitted in accordance with task a, above.

c. Submit Final Report

By July 1, 2018, the major Dischargers listed in Table 1 shall submit, or cause to be submitted, the results of their evaluations with planning level cost estimates for each optimization option studied.

2. Evaluation of Potential Nutrient Discharge Reduction by Treatment Upgrades or Other Means

The major Dischargers listed in Table 1 shall, individually or in collaboration with other Dischargers, conduct an evaluation to identify options and costs for potential treatment upgrades for nutrient removal.

The evaluation shall be conducted for each Discharger's treatment works or categories of like treatment works (e.g., high purity oxygen plants, conventional activated sludge plants, plants without anaerobic digestion). The evaluation must estimate nutrient reductions from treatment upgrades and, at a minimum, shall entail the following:

- Describe the treatment plant, treatment plant process, and service area;

- Identify potential upgrade technologies for each treatment plant category along with associated nitrogen and phosphorous removal levels;
- Identify site-specific constraints or circumstances that may cause implementation challenges or eliminate any specific technologies from consideration;
- Include planning level capital and operating cost estimates associated with the upgrades and for different levels of nutrient reduction, applying correction factors associated with site-specific challenges and constraints;
- Describe where Dischargers have already upgraded existing treatment systems or implemented pilot studies for nutrient removal. As part of this description, document the level of nutrient removal the upgrade or pilot study is achieving for total nitrogen and phosphorus;
- Evaluate the impact on nutrient loads due to treatment plant upgrades implemented in response to other regulations and requirements; and
- Evaluate beneficial and adverse ancillary impacts associated with each upgrade, such as changes in the treatment plant's energy use, changes in greenhouse gas emissions, changes in sludge and biosolids treatment or disposal, and reduction of other pollutants (e.g., pharmaceuticals) through advanced treatment.

Dischargers that have recently completed upgrade evaluations may use previously completed reports.

Dischargers who have planned or are implementing facility upgrades or modifications to address the impacts of sea level rise and climate change alone, or as part of infrastructure renewal, shall also include in its nutrient removal evaluation consideration of the impacts of sea level rise and climate change on identified nutrient upgrade options.

In addition to the above upgrade evaluation, Dischargers may evaluate ways to reduce nutrient loading through alternative discharge scenarios, such as water recycling or use of wetlands, in combination with, or in-lieu of, the upgrades to achieve similar levels of nutrient load reductions. This evaluation shall identify any institutional barriers to water recycling along with proposals for overcoming such barriers and include ancillary benefits and adverse impacts associated with such alternative discharge scenarios such as the following:

- Reduction in potable water use through enhanced reclamation;
- Creation of additional wetland or upland habitat;
- Changes in energy use, greenhouse gas emissions, sludge and biosolids quality and quantities;
- Reduction of other pollutant discharges;
- Impacts to existing permit requirements related to alternative discharge scenarios; and
- Implications related to discharge of brine or other side-streams associated with advanced recycling technologies.

a. Submit and Implement Scoping and Evaluation Plans

By December 1, 2014, the major Dischargers listed in Table 1 shall, individually or in collaboration with other Dischargers, submit a Scoping Plan that defines the

level of work for the proposed upgrade evaluation. The Scoping Plan shall be acceptable to the Executive Officer.

By July 1, 2015, the major Dischargers listed in Table 1 shall, individually or in collaboration with other Dischargers, submit an Evaluation Plan and schedule describing how they will conduct the evaluation of potential nutrient discharge reduction by treatment upgrades or other means. The Evaluation Plan shall define the categories of treatment works that will be evaluated to support potential upgrades and alternative discharge scenarios. The Evaluation Plan shall be acceptable to the Executive Officer.

The Dischargers shall proceed with implementation of the Evaluation Plan within 45 days of submittal.

b. Submit Status Report
By July 1, 2016, and subsequently by July 1, 2017, major Dischargers listed in Table 1 shall submit, or cause to be submitted, a report describing the tasks completed, preliminary findings, and tasks to be completed, highlighting any adaptive changes to be made to the Evaluation Plan submitted in accordance with task a, above.

c. Submit Final Report
By July 1, 2018, major Dischargers listed in Table 1 shall submit, or cause to be submitted, the results of their evaluations with planning level cost estimates for each upgrade option studied.

3. Monitoring, Modeling, and Embayment Studies

Each Discharger shall conduct, or cause to be conducted, studies to address the potential adverse impacts of nutrients on San Francisco Bay beneficial uses. The studies shall include efforts described below:

a. Support Science Plan Development and Implementation
The Dischargers shall collaborate with other regional stakeholders to support development and implementation of a science plan of necessary studies to implement the San Francisco Bay Nutrient Management Strategy and support consideration of future management actions, including the development of nutrient water quality objectives, both informed through modeling. The science plan shall include studies necessary for San Francisco Bay as a whole and also on issues identified for specific subembayments.

By February 1, 2015, the Dischargers shall cause to be submitted an implementation plan and schedule for proposed studies acceptable to the Executive Officer and update and revise it as necessary annually by February 1 of each subsequent year.

b. Support Receiving Water Monitoring for Nutrients

The Dischargers shall collaborate with other regional stakeholders to support receiving water monitoring for nutrients, as necessary, that go beyond the monitoring already provided by the Regional Monitoring Program and others, by providing the following:

i. A network of nutrient monitoring locations to track nutrient concentrations, dissolved oxygen, and phytoplankton biomass in San Francisco Bay;
ii. Adequate data to support modeling of nutrient fate and transport in San Francisco Bay; and
iii. Studies furthering the understanding of harmful algae bloom development, including, at a minimum, monitoring for algae species and toxins.

4. Reopener Provisions

The Regional Water Board may modify or reopen this Order prior to its expiration date in any of the following circumstances as allowed by law:

a. If the discharges governed by this Order have or will have a reasonable potential to cause or contribute to, or will cease to have, adverse impacts on water quality or beneficial uses of the receiving waters;

b. If new or revised water quality objectives or total maximum daily loads (TMDLs) come into effect for San Francisco Bay and contiguous water bodies (whether statewide, regional, or site-specific);

c. If State Water Board precedential decisions, new policies, new laws, or new regulations are adopted;

d. If an administrative or judicial decision on a separate NPDES permit or WDRs addresses requirements similar to those in this Order; or

f. As otherwise authorized by law.

Any Discharger may request a permit modification based on any of the circumstances above. With any such request, the Discharger shall include antidegradation and anti-backsliding analyses.

ATTACHMENT B – INDIVIDUAL ORDER AND NPDES PERMIT NUMBERS

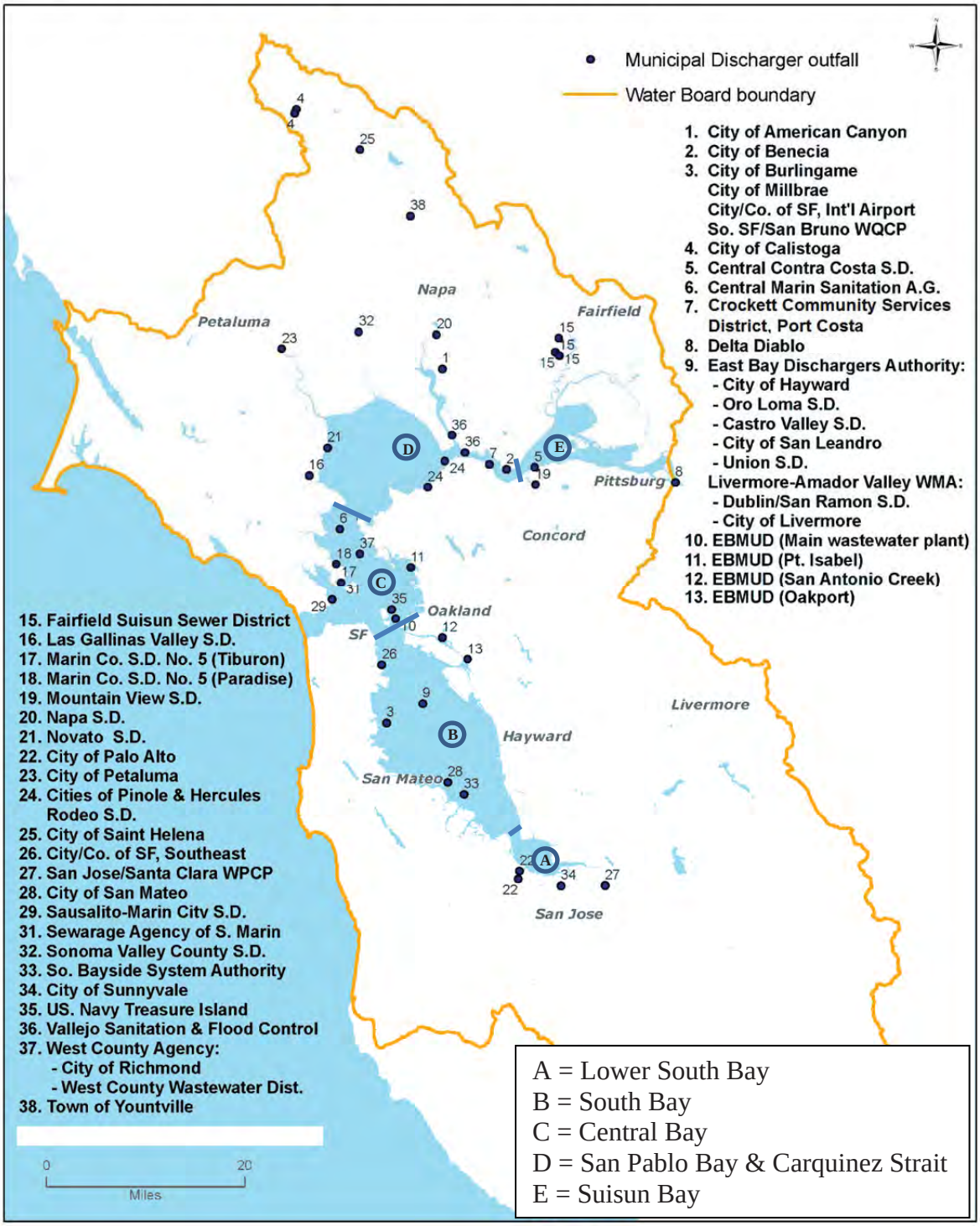
Municipal Dischargers:

Discharger	NPDES Permit No.	Existing Order No.[1]	Existing Order Adoption Date	Existing Order Expiration Date
American Canyon, City of	CA0038768	R2-2011-0046	7/13/11	8/31/16
Benicia, City of	CA0038091	R2-2008-0014	3/12/08	5/30/13
Burlingame, City of	CA0037788	R2-2013-0015	5/08/13	6/30/18
Central Contra Costa Sanitary District	CA0037648	R2-2012-0016	2/08/12	3/31/17
Central Marin Sanitation Agency	CA0038628	R2-2012-0051	6/13/12	7/31/17
Crockett Community Services District, Port Costa Sanitary Dept.	CA0037885	R2-2013-0035	10/09/13	11/30/18
Delta Diablo	CA0038547	R2-2009-0018	3/11/09	4/30/14
East Bay Dischargers Authority	CA0037869	R2-2012-0004	1/18/12	2/28/17
Union S.D. Wet Weather Outfall	CA0038733	R2-2010-0097	7/14/10	8/31/15
Dublin San Ramon Services District	CA0037613	R2-2012-0005	1/18/12	2/28/17
City of Livermore	CA0038008	R2-2012-0006	1/18/12	2/28/17
LAVWMA Wet Weather Outfall	CA0038679	R2-2011-0028	5/11/11	6/30/16
East Bay Municipal Utility Dist. WWTP	CA0037702	R2-2010-0060	3/10/10	4/30/15
Fairfield-Suisun Sewer District	CA0038024	R2-2009-0039	4/08/09	5/31/14
Las Gallinas Valley Sanitary District	CA0037851	R2-2009-0070	10/14/09	11/30/14
Marin County (Paradise Cove), Sanitary District No. 5 of	CA0037427	R2-2011-0016	4/13/11	5/31/16
Marin County (Tiburon), Sanitary District No. 5 of	CA0037753	R2-2013-0027	8/14/13	9/30/18
Millbrae, City of	CA0037532	R2-2013-0037	12/11/13	1/31/19
Mt. View Sanitary District	CA0037770	R2-2010-0114	11/10/10	12/31/15
Napa Sanitation District	CA0037575	R2-2011-0007	2/09/11	3/31/16
Novato Sanitary District	CA0037958	R2-2010-0074	5/12/10	6/30/15
Palo Alto, City of	CA0037834	R2-2009-0032	4/08/09	5/31/14
Petaluma, City of	CA0037810	R2-2011-0003	1/12/11	2/28/16
Pinole, City of	CA0037796	R2-2012-0059	8/08/12	9/30/17
Rodeo Sanitary District	CA0037826	R2-2012-0027	4/11/12	5/31/17
San Francisco, City and County of, San Francisco International Airport	CA0038318	R2-2013-0011	5/08/13	6/30/18
San Francisco (Southeast Plant), City and County of	CA0037664	R2-2013-0029	8/14/13	9/30/18
San Jose/Santa Clara Water Pollution Control Plant and Cities of San Jose and Santa Clara	CA0037842	R2-2009-0038	4/08/09	5/31/14
San Mateo, City of	CA0037541	R2-2013-0006	3/13/13	4/30/18
Sausalito-Marin City Sanitary District	CA0038067	R2-2012-0083	11/14/12	12/31/17
Sewerage Agency of Southern Marin	CA0037711	R2-2012-0094	12/12/12	1/31/18
Sonoma Valley County Sanitary District	CA0037800	R2-2008-0090	10/08/08	11/30/13
South Bayside System Authority	CA0038369	R2-2012-0062	8/08/12	9/30/17
South San Francisco and San Bruno, Cities of	CA0038130	R2-2008-0094	11/12/08	12/31/13
Sunnyvale, City of	CA0037621	R2-2009-0061	8/12/09	9/30/14
US Department of Navy, Treasure Island	CA0110116	R2-2010-0001	1/13/10	2/28/15
Vallejo Sanitation and Flood Control District	CA0037699	R2-2012-0017	2/08/12	3/31/17
West County Agency (West County Wastewater District and City of Richmond Municipal Sewer District)	CA0038539	R2-2013-0016	5/08/13	6/30/18

[1] The orders shown are for the primary permit reissuance and do not include permit amendments.

ATTACHMENT C – DISCHARGER LOCATION MAP

Municipal Discharger outfall locations



ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations (40 C.F.R. § 122.48) requires that all NPDES permits specify monitoring and reporting requirements. Water Code section 13383 also authorizes the Regional Water Board to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements that implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. Dischargers shall comply with this MRP and all requirements contained in the Regional Standard Provisions (Attachment G of individual permits). The Executive Officer may amend this MRP pursuant to 40 C.F.R. sections 122.62, 122.63, and 124.5. If any discrepancies exist between this MRP and the Regional Standard Provisions, this MRP shall prevail.

B. Sampling is required during the entire year when discharging. The Discharger shall conduct all monitoring in accordance with the Federal Standard Provisions (Attachment D of individual permits), as supplemented by Attachment G. Equivalent test methods must be more sensitive than those specified in 40 C.F.R. section 136 and must be specified in this permit.

II. MONITORING LOCATIONS

Dischargers shall establish the following monitoring locations to characterize loads and comply with other requirements in this Order:

Table E-1. Monitoring Station Locations

Discharge Point Name	Monitoring Location Description
Effluent sampling shall be at the compliance monitoring location for ammonia specified in the Discharger's NPDES permit. For San Francisco (Southeast Plant) this shall be E-001.	Monitoring locations are described in individual NPDES permits.

III. EFFLUENT MONITORING REQUIREMENTS

Dischargers shall monitor effluent for nutrients as shown in Tables E-2 and E-3 below and report as described in the next section:

Table E-2. Effluent Monitoring Requirements

Parameter	Units	Sample Type[1]
Ammonia	mg/L and kg/day as N	C-24
Total Kjeldahl Nitrogen	mg/L and kg/day as N	C-24
Nitrate-Nitrite	mg/L and kg/day as N	C-24
Total Phosphorus	mg/L and kg/day as P	C-24
Soluble Reactive Phosphorus	mg/L and kg/day as P	C-24
Total Nitrogen	mg/L and kg/day as N	Calculated

Unit Abbreviations:

mg/L = milligrams per liter
kg/day as N = kilograms per day as nitrogen
kg/day as P = kilograms per day as phosphorus

Sample Type:

C-24 = 24-hour composite sample

Footnote:

(1) 24-hour composite samples (C-24) may be made up of a minimum of four discrete grab samples, collected over the course of 24 hours, and volumetrically or mathematically flow-weighted. During a 24-hour period, the samples may be collected only when the plant is staffed, if necessary.

Table E-3. Minimum Sampling Frequency

Discharger Type	Minimum Sampling Frequency[1,2,3]
Major municipal discharger (Flow ≥ 10 mgd)	Twice per month
Major municipal discharger (Flow < 10 mgd)	Once per month
Minor municipal discharger (Flow < 1 mgd)	Twice per year

Footnotes:

[1] Samples need only be collected when discharging (i.e., seasonal dischargers shall collect samples only during the discharge season).

[2] After two years of data collection, the Discharger may reduce or eliminate the frequency for parameters specified in Table E.2 if it has collected adequate data for modeling and load characterization. The Discharger must request and then obtain written approval from the Executive Officer prior to monitoring reduction.

[3] For municipal wastewater treatment plants that discharge via the EBDA outfall, individual treatment plant monitoring shall occur twice per year.

IV. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

Dischargers shall comply with all Federal Standard Provisions (Attachment D) and Regional Standard Provisions (Attachment G) related to monitoring, reporting, and recordkeeping, as modified in individual permits.

B. Individual Reporting in Self-Monitoring Reports (SMRs)

1. Reporting of Nutrients Data

a. Routine SMRs

Dischargers shall submit nutrients data collected as part of this Order in the regular monthly or quarterly SMRs required in each Discharger's individual permit. If a Discharger monitors nutrients more frequently than required by this Order at the monitoring location described in Table E-1, the Discharger shall include the results of this monitoring in the calculations and reporting for the SMR.

b. Annual Nutrients Report

Starting in 2015, by September 1 of each year, each Discharger shall provide its nutrient information in a separate annual report or state that it is participating in a group report that will be submitted by the Bay Area Clean Water Agencies (BACWA) under section B.1.c below. Each Discharger shall submit the following:

i. Documentation that it is complying with Provision C.3. Or if group annual reporting pursuant to B.1.c, below, then certification that each Discharger

has provided adequate support or contributed its portion of the required contribution under Provision C.3.

ii. Summary tables depicting the Discharger's annual and monthly flows, nutrient concentrations, and nutrient mass loads, calculated as described in Section VIII.1 Arithmetic Calculations of Standard Provisions (Attachment G of individual permits) covering July 1 through June 30 of the preceding year. Each individual Discharger shall document its nutrient loads relative to other facilities covered by this Order that discharge to the same subembayment, i.e., Suisun Bay, San Pablo Bay, Central Bay, South Bay, and Lower South Bay. Nutrient information from other Dischargers may be obtained from the State Water Board's California Integrated Water Quality System (CIWQS) Program website (http://www.waterboards.ca.gov/ciwqs/index.html).

iii. An analysis of nutrient trends, load variability, and an assessment as to whether or not nutrient mass discharges are increasing or decreasing.

iv. If trend analysis shows a significant change in load, the Discharger shall investigate the cause and shall report its results, or status, or plans for investigation, in the annual report or in subsequent annual reports. This investigation shall include, at a minimum, whether treatment process changes have reduced or increased nutrient discharges, changes in nutrient loads related to water reclamation (increasing or decreasing), and changes in total influent flow related to water conservation, population growth, transient work community, new industry, and/or changes in wet weather flows.

c. Optional Group Report for Annual Nutrients Report

As an alternative to submitting an individual Annual Nutrients Report, each Discharger may instead be part of a group report provided by BACWA. Starting 2015, by October 1 of each year, the Annual Group Nutrients Report shall include the information detailed in B.1.b above.

2. **Monitoring Periods**

Monitoring periods for all required monitoring shall be completed according to the following schedule:

Table E-4. Monitoring Periods

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period
Monthly	First day of calendar month following permit effective date or on permit effective date if on first day of month	First day of calendar month through last day of calendar month
Quarterly	Closest January 1, April 1, July 1, or October 1 following (or on) permit effective date	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31

Twice per year	Closest May 1 or November 1 following (or on) permit effective date	November 1 through April 30 May 1 through October 31
Annually	As specified in EO concurrence describe in section III.	January 1 through December 31

C. Discharge Monitoring Reports (DMRs)

1. At any time during the term of this Order, the State Water Board or Regional Water Board may notify the Discharger to electronically submit DMRs. Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.
2. Once notified by the State Water Board or Regional Water Board, the Discharger shall submit hard copy DMRs. The Discharger shall sign and certify DMRs as Attachment D requires. The Discharger shall submit original DMRs to one of the addresses listed below:

Standard Mail	**FedEx/UPS/ Other Private Carriers**
State Water Resources Control Board Division of Water Quality c/o DMR Processing Center PO Box 100 Sacramento, CA 95812-1000	State Water Resources Control Board Division of Water Quality c/o DMR Processing Center 1001 I Street, 15th Floor Sacramento, CA 95814

3. All discharge monitoring results must be reported on the official U.S. EPA pre-printed DMR forms (EPA Form 3320-1) or self-generated forms that follow the exact same format of EPA Form 3320-1.

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

This Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order. As described in section II.B of the Order, the Regional Water Board incorporates this Fact Sheet as its findings supporting the issuance of the Order.

I. PERMIT INFORMATION

The following tables summarize administrative information related to the facility:

Table F-1. Facility Information

Discharger	Facility Contact, Title, and Phone Number	Mailing Address	Effluent Description	Facility Design Flow (mgd)
American Canyon, City of	Peter Lee Wastewater Systems Manager (707) 647-4525	Same as Facility Address	Advanced Secondary	2.5
Benicia, City of	Jeff Gregory Wastewater Treatment Plant Superintendent (707) 746- 4790	Same as Facility Address	Secondary	4.5
Burlingame, City of	William Toci Plant Manager (650) 342-3727	501 Primrose Burlingame, CA 94010	Secondary	5.5
Central Contra Costa Sanitary District	Curt Swanson Director of Operations (925) 229-7336	Same as Facility Address	Secondary	53.8
Central Marin Sanitation Agency	Robert Cole Environmental Services Manager (415) 459-1455	Same as Facility Address	Secondary	10
Crockett Community Services District	Michael Kirker Port Costa Dept. Manager (510) 787-2992	Crockett Community Services District, Port Costa Sanitary Department P.O. Box 578 Crockett, CA 94525	Secondary	0.033
Delta Diablo	Gary W. Darling General Manager (925) 756-1920	Same as Facility Address	Secondary	16.5
East Bay Dischargers Authority: EBDA Common Outfall	Michael S. Connor General Manager (510) 278-5910	2651 Grant Avenue San Lorenzo, CA 94580	Secondary	107.8
Hayward Water Pollution Control Facility				
San Leandro Water Pollution Control Plant				
Oro Loma/Castro Valley Sanitary Districts Water Pollution Control Plant				
Raymond A. Boege Alvarado Wastewater Treatment Plant				

Discharger	Facility Contact, Title, and Phone Number	Mailing Address	Effluent Description	Facility Design Flow (mgd)
Livermore-Amador Valley Water Management Agency (LAVWMA) Export and Storage Facilities				
Dublin San Ramon Services District Wastewater Treatment Plant				
City of Livermore Water Reclamation Plant				
East Bay Municipal Utility District Main Wastewater Treatment Plant	Kurt H. Haunschild Manager of Wastewater Treatment (510) 287-1407	EBMUD WW Treatment P.O. Box 24055, MS 59 Oakland, CA 94623	Secondary	120
Fairfield-Suisun Sewer District	Greg Baatrup General Manager (707) 429-8930	Same as Facility Address	Advanced Secondary	23.7
Las Gallinas Valley Sanitary District	Mark Williams District Manager (415) 472-1734	300 Smith Ranch Rd San Rafael, CA 94903-1929	Secondary	2.92
Marin County (Paradise Cove), Sanitary District No. 5 of	Tony Rubio Chief Plant Operator (415) 435-1501	P.O. Box 227 Tiburon, CA 94920	Secondary	0.04
Marin County (Tiburon), Sanitary District No. 5 of	Tony Rubio Chief Plant Operator (415) 435-1501	2001 Paradise Drive Tiburon, CA 94920	Secondary	0.98
Millbrae, City of	Joseph Magner Superintendent (650) 259-2388	621 Magnolia Avenue Millbrae, CA 94030	Secondary	3
Mt. View Sanitary District	Michael D. Roe District Manager (925) 228-5635 ext. 32	P. O. Box 2757 Martinez, CA 94553	Advanced Secondary	3.2
Napa Sanitation District	Tim Healy General Manager (707) 258-6000	P.O. Box 2480 Napa, CA 94558	Secondary	15.4
Novato Sanitary District	Beverly James Manager-Engineer (415) 892-1694 x111	500 Davidson Street Novato, CA 94945	Secondary	7.05
Palo Alto, City of	Ken Torke Environmental Compliance Manager (650) 329-2243	2501 Embarcadero Way, Palo Alto, CA 94303	Advanced Secondary	39
Petaluma, City of	Leah Walker Environmental Services Manager (707) 776-3777	3890 Cypress Drive Petaluma, CA 94954	Secondary	6.7
Pinole, City of	Ron Tobey Plant Manager (510) 724-8963	2131 Pear Street, Pinole, CA 94564	Secondary	4.06
Rodeo Sanitary District	Steven S. Beall Engineer-Manager (510) 799-2970	Same as Facility Address	Secondary	1.14

Discharger	Facility Contact, Title, and Phone Number	Mailing Address	Effluent Description	Facility Design Flow (mgd)
San Francisco (San Francisco International Airport), City and County of	Mark Costanzo Utilities Manager (650) 821-7809	P.O. Box 8097 San Francisco, CA 94128	Secondary	2.2
San Francisco (Southeast Plant), City and County of	Tommy Moala Assistant General Manager of Wastewater (415) 554-2465	1155 Market St., 11th Floor San Francisco, CA 94103	Secondary	150
San Jose/Santa Clara, Cities of	James Ervin Acting Environmental Compliance Officer (408) 945-5124	700 Los Esteros Road San Jose, CA 95134	Advanced Secondary	167
San Mateo, City of	Ramon Towne Interim Director of Public Works (650) 522-7300	330 West 20th Avenue San Mateo, CA 94403	Secondary	15.7
Sausalito-Marin City Sanitary District	Craig Justice General Manager (415) 332-0244	P.O. Box 39 Sausalito, CA 94966-0039	Secondary	1.8
Sewerage Agency of Southern Marin	Mark Grushayev General Manager (415) 388-2402	26 Corte Madera Ave. Mill Valley, CA 94941	Secondary	3.6
Sonoma Valley County Sanitary District	Pam Jeane Deputy Chief Engineer (707) 521-1864	Sonoma County Water Agency 404 Aviation Blvd. Santa Rosa, CA 95403	Secondary	3
South Bayside System Authority	Daniel Child Manager (650) 591-7121	Same as Facility Address	Secondary	29
South San Francisco and San Bruno, Cities of	Brian Schumacker Plant Superintendent (650) 877-8555	South San Francisco-San Bruno Water Pollution Control Plant 195 Belle Air Road South San Francisco, CA 94080	Secondary	13
Sunnyvale, City of	Melody Tovar Division Manager (408) 730-7808	Sunnyvale Water Pollution Control Plant P.O. Box 3707 Sunnyvale, CA 94088-3707	Advanced Secondary	29.5
U.S. Department of Navy (Treasure Island)	Patricia A. McFadden BRAC Field Team Leader San Francisco Bay Area (415) 743-4720	Navy BRAC PMOW 410 Palm Avenue, Bldg 1, Suite 161 Treasure Island, San Francisco, CA 94130-1807	Secondary	2
Vallejo Sanitation and Flood Control District	Melissa Morton District Manager (707) 644-8949 X211	Same as Facility Address	Secondary	15.5
West County Agency (West County Wastewater District and City of Richmond Municipal Sewer District)	E.J. Shalaby District Manager (510) 222-6700	2910 Hilltop Drive Richmond, CA 94806	Secondary	28.5

Table F-2. Additional Facility Information

Discharger	Authorized Person to Sign and Submit Reports	Billing Address (if different from mailing address)	Pretreatment Program	Receiving Water Type
American Canyon, City of	Same as Contact	Same as mailing address	Y	Estuarine
Benicia, City of	Same as Contact	Same as mailing address	Y	Estuarine
Burlingame, City of	Same as contact	Same as mailing address	Y	Marine
Central Contra Costa Sanitary District	Same as contact	Same as mailing address	Y	Estuarine
Central Marin Sanitation Agency	Same as contact	Same as mailing address	Y	Estuarine
Crockett Community Services District	Same as contact	Same as mailing address	N	Estuarine
Delta Diablo	Steve Dominguez Plant Manager (925) 756-1967	Same as mailing address	Y	Estuarine
East Bay Dischargers Authority	Same as contact	Same as mailing address	Y	Estuarine
Hayward Water Pollution Control Facility				
San Leandro Water Pollution Control Plant				
Oro Loma/Castro Valley Sanitary Districts Water Pollution Control Plant				
Raymond A. Boege Alvarado Wastewater Treatment Plant				
LAVWMA Export and Storage Facilities				
Dublin San Ramon Services District Wastewater Treatment Plant				
City of Livermore Water Reclamation Plant				
East Bay Municipal Utility District	Ben Horenstein Director of Wastewater (510) 287-1846	EBMUD Accounts Payable P.O. Box 24055, MS #5 Oakland, CA 94623-2306	Y	Marine
Fairfield-Suisun Sewer District	Same as contact	Same as mailing address	Y	Estuarine
Las Gallinas Valley Sanitary District	Same as contact	Same as mailing address	N	Estuarine
Marin County (Paradise Cove), Sanitary District No. 5 of	Same as contact	Same as mailing address	N	Marine
Marin County (Tiburon), Sanitary District No. 5 of	Same as contact	Same as mailing address	N	Marine
Millbrae, City of	Same as contact	Same as mailing address	N	Marine
Mt. View Sanitary District	Same as contact	Same as mailing address	N	Estuarine
Napa Sanitation District	James Keller Plant Manager (707) 258-6020	Same as mailing address	Y	Estuarine
Novato Sanitary District	Same as contact	Same as mailing address	Y	Estuarine
Palo Alto, City of	Same as contact	Same as mailing address	Y	Estuarine

Discharger	Authorized Person to Sign and Submit Reports	Billing Address (if different from mailing address)	Pretreatment Program	Receiving Water Type
Petaluma, City of	Matthew Pierce Operations Supervisor (707) 776-3777	Same as mailing address	Y	Estuarine
Pinole, City of	Same as contact	Same as mailing address	N	Marine
Rodeo Sanitary District	Same as contact	Same as mailing address	N	Estuarine
San Francisco (San Francisco International Airport), City and County of	Peter Acton Deputy Airport Director (650) 821-5000	Same as mailing address	Y	Marine
San Francisco (Southeast Plant), City and County of	George Engel Superintendent (415) 920-4944	Same as mailing address	Y	Marine
San Jose/Santa Clara Water Pollution Control Plant and Cities of San Jose and Santa Clara	Joanna De Sa Acting Deputy Director (408) 535-8560	Same as mailing address	Y	Estuarine
San Mateo, City of	Same as contact	Same as mailing address	Y	Marine
Sausalito-Marin City Sanitary District	Same as contact	Same as mailing address	N	Marine
Sewerage Agency of Southern Marin	Same as contact	Same as mailing address	N	Marine
Sonoma Valley County Sanitary District	Brian Anderson Operations Coordinator (707) 526-5370	Same as mailing address	N	Estuarine
South Bayside System Authority	Same as contact	Same as mailing address	Y	Marine
South San Francisco and San Bruno, Cities of	Same as contact	Same as mailing address	Y	Marine
Sunnyvale, City of	Same as contact	Same as mailing address	Y	Estuarine
U.S. Department of Navy (Treasure Island)	Same as contact	Same as mailing address	N	Marine
Vallejo Sanitation and Flood Control District	Same as contact	Same as mailing address	Y	Estuarine
West County Agency (West County Wastewater District and City of Richmond Municipal Sewer District)	E.J. Shalaby District Manager (510) 222-6700	Same as mailing address	Y	Estuarine

A. The Dischargers listed in Table 1 of the Order own and operate secondary and advanced secondary wastewater treatment facilities as described in their individual permits. Wastewater is discharged to San Francisco Bay and its tributaries, which are waters of the United States within the San Francisco Bay watershed. Attachment C shows a map of the Dischargers subject to this Order.

This Order supersedes nutrient-related requirements in the individual NPDES permits listed in Attachment B, with the exception of effluent limitations for ammonia as well as special studies the Central Contra Costa Sanitary District is to conduct pursuant to Order No. R2-2012-0016 (Provision C.5c). For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and State laws, regulations, plans, or policy are held to be equivalent to references to the Dischargers herein.

B. The San Francisco Bay estuary has long been recognized as nutrient-enriched. Despite this, the abundance of phytoplankton in the estuary is lower than would be expected due to a number of factors, including strong tidal mixing; high turbidity, which limits light penetration; and high filtration by clams. However, recent data indicate an increase in phytoplankton biomass and a small decline in dissolved oxygen concentrations in many areas of the estuary, suggesting that its historic resilience to the effects of nutrient enrichment may be weakening. The contributing factors for this include (1) natural oceanic oscillations that have increased benthic predators, thus reducing South San Francisco Bay's clam population and clam grazing; and (2) decreases in suspended sediment that have resulted in a less turbid environment and increased light penetration.

South San Francisco Bay's clam population filters phytoplankton biomass. However, beginning in the late 1990s, gross primary production in the South San Francisco Bay has increased sharply.[1] This increase appears to be due to a decrease in bivalve grazing because predators (fish, shrimp, and crabs) of benthic feeders have increased significantly. The increase in predator abundance has been attributed to a change in natural oceanic oscillations that is bringing colder waters to San Francisco Bay and has allowed these predators to feed on bivalves.

San Francisco Bay is turbid due to high suspended sediment concentrations. However, recent studies show that the Bay may be clearing, with Bay-wide decreases in turbidity. In certain areas (e.g., Suisun Bay) decreases in turbidity of up to 50% have occurred since 1975.[2] The reasons appear to be related to decreases in (1) sediment loads from the Sierra Nevada Mountains and Central Valley, and (2) the amount of erodible material within San Francisco Bay. Even with a significant decrease in turbidity, phytoplankton biomass production continues to be suppressed in Suisun Bay. This needs to be further studied as described on page F-16.

[1] Cloern, J. E., and A. D. Jassby (2012), "Drivers of change in estuarine-coastal ecosystems: Discoveries from four decades of study in San Francisco Bay," *Reviews of Geophysics,* 50, RG4001, page 21.
[2] San Francisco Estuary Institute (SFEI), Nutrient Conceptual Model Draft, May 1, 2013, page 14.

Spring phytoplankton blooms are relatively frequent in San Francisco Bay, and fall blooms have been occurring with increased frequency. The reasons are unknown, but the increase could be the result of a less turbid environment and lower grazing pressure from clams. San Francisco Bay experiences strong tidal mixing, which breaks down stratification in the water column.[3] However, there are two periods each year (March/April and September/October) that are low points for tidal energy. During these low-energy periods, stratification develops if there are sufficient freshwater inputs (salinity stratification is more typical in the spring) or calm clear days (temperature stratification is more typical in the fall). Under these conditions, phytoplankton can remain in the light-rich zone and grow rapidly. Typically, these blooms are short-lived, lasting 10 to 14 days, with blooms ending when increased tidal energy re-mixes the water column.

Under current conditions, phytoplankton growth and biomass accumulation are limited much of the time by lack of light, and biomass accumulation is further controlled by clam grazing. If these constraints continue to shift, increases in phytoplankton biomass could follow. Under this scenario, it may be necessary to limit the availability of essential nutrients. This Order establishes new information collection requirements because municipal wastewater treatment plants are a significant source of nutrients to San Francisco Bay. Municipal wastewater treatment plants account for about 63 percent of the annual average total nitrogen load to San Francisco Bay. Their contribution varies, depending on embayment, as shown in the table below:

Table F-3. Annual Average Loads for Dissolved Inorganic Nitrogen, kg/day

Embayment	Municipal	Refinery	Stormwater	Delta	Total	POTW %
Lower South Bay	6,805	n/a	539	n/a	7,344	93
South Bay	19,401	n/a	670	n/a	20,071	97
Central Bay	11,667	n/a	159	n/a	11,826	99
San Pablo Bay & Carquinez Strait	2,721	842	7,484	n/a	11,047	25
Suisun Bay	5,618	130	1,968	15,930	23,646	24
Baywide	46,212	972	10,820	15,930	73,934	63

SFEI, External Nutrient Loads to San Francisco Bay, Table 6, Draft, April 9, 2013.

C. Several years may be needed to determine an appropriate level of nutrient control and to identify management actions necessary to protect San Francisco Bay beneficial uses. This Order is the first phase of what the Regional Water Board expects to be a multi-permit effort. It sets forth a regional framework to facilitate collaboration on studies that will inform future management decisions and regulatory strategies. The overall purpose of this phase is to track and evaluate treatment plant performance, fund nutrient monitoring programs, support load response modeling, and conduct treatment plant optimization and upgrade studies for nutrient removal. These studies will increase the understanding of external nutrient loads, improve load response models, support development of nutrient objectives, and increase the certainty that any required nutrient removal at treatment plants will produce the desired outcome. In the 2019 permit

[3] SFEI, Nutrient Conceptual Model Draft, May 1, 2013, page 14.

reissuance, the Regional Water Board anticipates considering establishment of performance-based effluent limits for nutrients and may require implementation of treatment optimization or other means to reduce loads or increase assimilative capacity if scientific studies show results that warrant such activities. The Regional Water Board will also consider load offsets between Dischargers within and between subembayments if permissible. The 2019 permit reissuance will also continue efforts to evaluate control measure scenarios as informed by load response modeling. In the 2024 and 2029 permit reissuances, the Regional Water Board anticipates using the information from studies conducted under earlier orders and the Nutrient Management Strategy to require implementation of additional management actions, as needed, and may allow load offsets as appropriate.

II. FACILITIES DESCRIPTION

A. Description of Wastewater Treatment

Municipal wastewater treatment plants provide secondary treatment, which includes screening, skimming, settling, and biological treatment. Some plants also provide advanced treatment that “nitrifies” ammonia to make nitrate-nitrogen. Municipal wastewater treatment plants generally remove around 20 to 30 percent of the total nitrogen load in their influent. The primary source of nutrients in municipal wastewater is human waste; therefore, most dischargers have no practical way of controlling influent nutrient levels.

B. Discharge Points and Receiving Waters

Discharge points and receiving waters are identified in the individual permits listed in Attachment B.

C. Existing Nutrient Discharge Data

Dischargers have been collecting nutrient data since the Executive Officer of the Regional Water Board issued a Water Code section 13267 order on March 2, 2012. These data show that about 90 percent of municipal wastewater treatment plant nutrient discharges are from facilities that have a permitted design flow of 10 mgd or greater. These data are summarized below:

Table F-4. Nutrient Loads (July 2012 to June 2013)

Discharger	Average Annual Total Nitrogen Load (kg/day)	Average Annual Total Phosphorus Load (kg/day)	Design Flow (mgd)
American Canyon, City of	66	26	2.5
Benicia, City of	223	27	4.5
Burlingame, City of	459	95	5.5
Calistoga, City of	58	6.6	0.84
Central Contra Costa Sanitary District	4187	138	53.8
Central Marin Sanitation Agency	903	89	10
Crockett Community Services District			0.033
Delta Diablo	1725	33	16.5

Discharger	Average Annual Total Nitrogen Load (kg/day)	Average Annual Total Phosphorus Load (kg/day)	Design Flow (mgd)
East Bay Dischargers Authority, including City of Hayward, City of San Leandro, Oro Loma Sanitary District, Castro Valley Sanitary District, Union Sanitary District, Livermore-Amador Valley Water Management Agency, Dublin San Ramon Services District, and City of Livermore	8641	555	107.8
East Bay Municipal Utility District	10583	973	120
Fairfield-Suisun Sewer District	1327	196	23.7
Las Gallinas Valley Sanitary District	261	40	2.92
Marin County (Paradise Cove), Sanitary District No. 5 of	2.1	0.27	0.04
Marin County (Tiburon), Sanitary District No. 5 of	61	8.2	0.98
Millbrae, City of	251	16	3
Mt. View Sanitary District	134	18	3.2
Napa Sanitation District	509	48	15.4
Novato Sanitary District	253	23	7.05
Palo Alto, City of	2341	336	39
Petaluma, City of	71	50	5.2
Pinole, City of	347	34	4.06
Rodeo Sanitary District	41	9.3	1.14
Saint Helena, City of	114	36	0.5
San Francisco (San Francisco International Airport), City and County of	236	15	2.2
San Francisco (Southeast Plant), City and County of	8307	101	150
San Jose/Santa Clara WPCP	5233	332	167
San Mateo, City of	1501	124	15.7
Sausalito-Marin City Sanitary District	158	25	1.8
Sewerage Agency of Southern Marin	241	42	3.6
Sonoma Valley County Sanitary District	119	40	3.0
South Bayside System Authority	2118	171	29
South San Francisco and San Bruno, Cities of	1165	153	13
Sunnyvale, City of	1086	213	29.5
U.S. Department of Navy (Treasure Island)	13	1.8	2.0
Vallejo Sanitation and Flood Control District	845	128	15.5
West County Agency (West County Wastewater District and City of Richmond Municipal Sewer District)	850	57	28.5
Yountville, Town of	23	3.8	0.55
Aggregate Mass Load (kg/day)	**54,500**[4]	**4,160**	
Load from design flow ≥ 10 mgd	**51,300 (94%)**	**3,650 (88%)**	

[4] The aggregate nitrogen loads in Table F-4 are about 20% higher than those noted in Table F-3. This is because Table F-4 represents total nitrogen whereas Table F-3 only represents the dissolved inorganic form.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements in the Order are based on the requirements and authorities described below:

A. Legal Authorities

This Order serves as WDRs pursuant to California Water Code article 4, chapter 4, division 7 (commencing with § 13260). This Order is also issued pursuant to federal Clean Water Act (CWA) section 402 and its implementing regulations adopted by U.S. EPA and Water Code chapter 5.5, division 7 (commencing with § 13370). It shall serve as an NPDES permit for point source discharges from the named facilities to surface waters.

B. California Environmental Quality Act (CEQA)

Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act, Public Resources Code division 13, chapter 3 (commencing with § 21100).

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plan.** The Regional Water Board adopted the *Water Quality Control Plan for the San Francisco Bay Basin* (Basin Plan), which designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. The Basin Plan specifies numeric and narrative water quality objectives. The narrative biostimulatory substances objective states, “Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.” Requirements in this Order implement the Basin Plan.

   This Order is consistent with State Water Board Resolution No. 88-63, which established State policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses for the discharges’ receiving waters are listed below:

Table F-5. Basin Plan Beneficial Uses

Receiving Water	Beneficial Uses
San Francisco Bay and its Tidally-Influenced Tributaries	Ocean, Commercial, and Sport Fishing (COMM) Estuarine habitat (EST) Industrial Service Supply (IND) Marine Habitat (MAR), Fish Migration (MIGR) Navigation (NAV) Preservation of Rare and Endangered Species (RARE) Water Contact Recreation (REC1) Noncontact Water Recreation (REC2) Shellfish Harvesting (SHELL) Fish Spawning (SPWN) Wildlife Habitat (WILD)

2. **Anti-Backsliding Requirements.** CWA sections 402(o) and 303(d)(4) and 40 C.F.R. section 122.44(l) restrict backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed.

3. **Antidegradation Policy.** Federal regulations at 40 C.F.R. section 131.12 requires that state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy through State Water Board Resolution 68-16, which is deemed to incorporate the federal antidegradation policy where the federal policy applies under federal law. Resolution 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. Permitted discharges must be consistent with the antidegradation provisions of 40 C.F.R. section 131.12 and State Water Board Resolution 68-16.

4. **Endangered Species Act Requirements.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code §§ 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. §§ 1531 to 1544). This Order contains requirements to protect the beneficial uses of waters of the State, including protecting rare, threatened, or endangered species. Each Discharger is responsible for meeting all applicable endangered species act requirements.

D. Impaired Waters on CWA 303(d) List

In October 2011, U.S. EPA approved a revised list of impaired waters prepared pursuant to CWA section 303(d), which requires identification of specific water bodies where it is expected that water quality standards will not be met after implementation of technology-based effluent limitations on point sources. Where it has not done so already, the Regional Water Board plans to adopt Total Maximum Daily Loads (TMDLs) for pollutants on the 303(d) list. TMDLs establish wasteload allocations for point sources

and load allocations for non-point sources, and are established to achieve the water quality standards for the impaired waters. San Francisco Bay is not listed as impaired by nutrients.

IV. RATIONALE FOR DISCHARGE PROHIBITIONS AND SPECIFICATIONS

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants discharged into waters of the United States. The control of pollutants discharged is established through NPDES permit requirements. There are two principal bases for effluent limitations: 40 C.F.R. section 122.44(a) requires that permits include applicable technology-based limitations and standards; and 40 C.F.R. section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of receiving waters.

This Order continues the receiving water limits that apply to biostimulatory substances from the individual NPDES permits listed in Attachment B. At this time, the Regional Water Board has determined that there is insufficient evidence to conclude that nutrients cause or contribute to excursions of the narrative water quality objective for biostimulatory substances. Therefore, this Order does not include water quality-based effluent limits for nutrients. The individual NPDES permits listed in Attachment B contain other discharge prohibitions, technology-based limitations, and water quality-based specifications, including ammonia effluent limitations.

A. Anti-backsliding

This Order does not backslide because existing permits do not include effluent limitations for nutrients based on the narrative biostimulatory substances water quality objective.

B. Antidegradation

Federal regulations at 40 C.F.R. section 131.12 require that state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy through State Water Board Resolution No. 68-16. This Order covers existing discharges, all of which have been covered by individual NPDES permits adopted in accordance with antidegradation policies. According to a State Water Board guidance memorandum (William Attwater, Chief Counsel, October 7, 1987), "…the federal antidegradation policy ordinarily does not apply to consideration of existing discharges, even if exceptions or variances from other applicable water quality objectives or effluent guidelines are required to permit the discharge to continue." According to the memorandum, considerations in determining whether to perform an antidegradation analysis include the following:

1. whether there are new discharges or an expansion of existing facilities,
2. whether there would be a reduction in the level of treatment of an existing discharge,
3. whether an existing outfall has been relocated,

4. whether there has been a substantial increase in mass emissions, and
5. whether there has been a change in water quality from a point source or non-point source discharge or water diversion.

None of these conditions apply to this Order.

Moreover, no antidegradation analysis is required when the Regional Water Board has no reason to believe that baseline water quality will be reduced. Baseline quality is the best quality of the receiving water that has existed since 1968 when considering Resolution 68-16, or since 1975 under the federal policy, unless subsequent lowering was due to regulatory action consistent with State and federal antidegradation policies. If poorer water quality was permitted, the most recent water quality resulting from permitted action is the baseline water quality to be considered in any antidegradation analysis.

Because all the individual NPDES permits were adopted in accordance with the antidegradation policies, the baseline for evaluating antidegradation is the existing water quality resulting from the individual permits. This Order does not allow for any increase in permitted design flow or allow for any reduction in treatment; therefore, no increase in nutrient discharge beyond the discharges already taking place are foreseeable, and no findings justifying degradation are necessary.

C. Stringency of Requirements for Individual Pollutants

This Order's discharge specifications are no more stringent than required to implement CWA requirements.

V. RATIONALE FOR RECEIVING WATER LIMITS

This Order continues receiving water limits that apply to biostimulatory substances from the individual NPDES permits listed in Attachment B. These limits are based on the Basin Plan water quality objectives. This continuance is necessary, because this Order supercedes nutrient-related requirements in the individual NPDES permits. No other additional limitations are necessary.

VI. RATIONALE FOR PROVISIONS

A. Standard Provisions

The individual NPDES permits listed in Attachment B contain all standard provisions.

B. Monitoring and Reporting Program

Pursuant to 40 C.F.R. section 122.48, NPDES permits must specify requirements for recording and reporting monitoring results. Water Code section 13383, and 40 C.F.R. sections 122.41(h) and (j), authorize the Regional Water Board to require technical and monitoring reports. This Order establishes monitoring and reporting requirements, contained in the Monitoring and Reporting Program (Attachment E), that implement

federal and State requirements. For more background regarding these requirements, see section VII of this Fact Sheet.

C. Special Provisions

1. Evaluation of Potential Nutrient Discharge Reduction by Treatment Optimization and Side-Stream Treatment

This Order requires major Dischargers to study how existing treatment can be optimized and how much it would cost to optimize and implement minor upgrades to their existing treatment systems to reduce nutrient loads to San Francisco Bay. This information is necessary to understand the extent that Dischargers can maximize existing treatment systems for nutrient removal to reduce the risk of impairment of San Francisco Bay. This Order also requires evaluation for side-stream treatment opportunities. Implementing side-stream treatment can be a capital intensive upgrade, but it is included in the optimization evaluation since opportunities for side-stream treatment are site-specific.

Major facilities are those with a design flow greater than or equal to 1 million gallons per day (mgd). While most of the nutrient loads to San Francisco Bay are from municipal wastewater treatment facilities with design flows greater than 10 mgd, this Order requires other major facilities to evaluate the potential to optimize their treatment and to evaluate the costs of upgrades because there is uncertainty concerning nutrient cycling within in San Francisco Bay. It is possible that all nutrient sources may contribute significantly to nutrient impacts and that many Dischargers will need to optimize treatment.

For Dischargers that implement minor upgrades or treatment plant optimization, the Regional Water Board intends to recognize early actions and encourage early nutrient removal where opportunities exist. As part of Dischargers' actions to implement minor upgrades or treatment plant optimization, Dischargers should also consider how such actions may be consistent with or contrary to actions Dischargers plan to address the impacts of sea level rise and climate change.

This provision is authorized by Clean Water Act section 1318(a) and Water Code section 13383. Section 1318(a) authorizes the collection of information necessary to carry out the objectives of the Clean Water Act, including but not limited to developing or assisting in the development of any effluent limitation, other limitation, prohibition, effluent standard, pretreatment standard or standard of performance. The Regional Water Board implements this requirement through Water Code section 13383.

2. Evaluation of Potential Nutrient Discharge Reduction by Treatment Plant Upgrades or Other Means

This Order requires major Dischargers to study how existing treatment plants can be upgraded and how much it could cost to upgrade their existing treatment systems to reduce nutrient loads to San Francisco Bay and its tributaries. This information is

necessary to understand measures the Dischargers could need to implement to significantly reduce nutrient discharges should the need arise to reduce the risk of impairment of San Francisco Bay.

This requirement is consistent with U.S. EPA's NPDES Permit Writers' Manual, which states:

> Treatability studies are applicable when treatability information is lacking for a pollutant or pollutants that would prohibit a permit writer from developing defensible technology-based effluent limits. Treatability studies can also be required if the permit writer suspects that a facility may not be able to comply with an effluent limit.[5]

This Order requires major Dischargers to evaluate options for upgrading their treatment plants because nutrient load reductions from their facilities could be important in reducing potential nutrient-related impacts in San Francisco Bay.

The intent of the requirement to address sea level rise and climate change as part of the nutrient upgrade evaluation is to avoid identifying nutrient removal options that turn out to be infeasible because of actions implemented or planned to address sea level rise or climate change.

Additionally, this provision highlights that major Dischargers can evaluate other means for reducing nutrient loads that may have positive ancillary benefits. For example, Dischargers could consider increasing water recycling to reduce nutrient loads and potable water use. It may also be possible to use wetlands or other treatment upgrades to remove nutrients while also providing habitat, including habitat for endangered species; protecting against sea level rise; and removing constituents of emerging concern, such as pharmaceuticals. This evaluation should also consider how upgrades that reduce nutrient loads may be consistent with or contrary to upgrades Dischargers plan to address the impacts of sea level rise and climate change.

This provision is authorized by Clean Water Act section 1318(a) and Water Code section 13383. Section 1318(a) authorizes the collection of information necessary to carry out the objectives of the Clean Water Act, including but not limited to developing or assisting in the development of any effluent limitation, other limitation, prohibition, effluent standard, pretreatment standard or standard of performance. The Regional Water Board implements this requirement through Water Code section 13383.

Also, this Order requires Dischargers to evaluate the impact on nutrient loads due to treatment plant optimization and upgrades implemented in response to other regulations or requirements. The Regional Water Board understands reductions in nutrient loads may impact the loads of other pollutants in the effluent as well as biosolids quality, and vice versa. For example, an upgrade from biosolids

[5] *U.S. EPA NPDES Permit Writers' Manual*, Publication Number EPA-833-B-96-003, December 1996, page 139.

incineration to anaerobic digestion will result in an increase in nutrient loading to the POTW effluent. This requirement will allow Dischargers to show how nutrient loads will increase or decrease after process changes are made in response to other regulations and requirements and will help elucidate the balance of competing environmental benefits.

3. Monitoring, Modeling, and Embayment Studies

This Order requires the Dischargers to conduct, or to collaborate on, studies to address the potential impacts of nutrients on San Francisco Bay beneficial uses. The Regional Water Board recognizes there are great efficiencies from collaborating on large scale study efforts. The Bay Area Clean Water Agencies (BACWA) has identified $880,000[6] each permit year as a collective level of effort from the Dischargers. The Regional Water Board finds this amount to be an appropriate level of effort initially to support science plan development and implementation and receiving water monitoring for nutrients identified in this provision. If the Dischargers and BACWA are successful in securing additional outside resources, such as from grants or other agencies for nutrient monitoring or studies identified in the science plan, the outside funding and work would not be requirements under this Order, nor would the outside funding count towards the Dischargers' level of effort under this provision.

The Regional Water Board notes that Dischargers have contributed over a million dollars directly and through the RMP to fund scientific studies examining the impact of nutrients on San Francisco Bay and have conducted facility nutrient monitoring since July 2012. Dischargers are also collaborating with other regional stakeholders on the development of a science plan and governance structure to guide scientific research on nutrient impacts.

Support for modeling will inform the development of Nutrient Numeric Endpoints (NNEs) that the Regional and State Water Boards are developing. The NNE framework aims to establish a suite of numeric endpoints based on the ecological response of a waterbody to nutrient over-enrichment and eutrophication (e.g., excessive algal blooms leading to decreased dissolved oxygen). In addition to numeric endpoints for response indicators, the NNE framework will include models that link the response indicators to nutrient loads and other management control**s** for a range of potential future conditions in the Bay. The NNE framework is intended to serve as numeric guidance to translate the Basin Plan's narrative objective for biostimulatory substances. The modeling efforts will enable a mechanistic (cause and effect) approach that bases management endpoints on ecological response. In this way, the model may be used to link nutrient loads with co-factors (e.g., strength of tides, residence time, clam grazing, increase/decreases in turbidity) and, therefore, provide more accurate information on the relative importance of reducing nutrient loads from certain Dischargers.

[6] The $880,000 identified by BACWA does not include costs to comply with other provisions of this Order or funds Dischargers contribute to the Regional Monitoring Program.

On the subembayment level, there is a need to coordinate studies, such as those in Suisun Bay, to better understand why phytoplankton biomass is suppressed in this bay segment. In Suisun Bay, extremely low phytoplankton biomass and a highly-altered phytoplankton community composition have characterized the system since 1987, when the invasive clam *Corubula amurensis* became widely established. Studies suggest that elevated levels of ammonium or an altered ratio in nitrogen to phosphorus may be contributing to low phytoplankton biomass and changes in phytoplankton species composition.[7] Additionally, there is also a need to coordinate studies for the Lower South Bay because it is enriched with nitrogen and phosphorus. The median dissolved inorganic nitrogen concentrations in South San Francisco Bay are almost ten times higher than those in estuaries that do not have direct municipal wastewater treatment plant discharges.[8] Trends in chlorophyll (a) suggest that this portion of the estuary may be starting to lose some of its historic resilience to high nutrient loads.

This provision is authorized by Clean Water Act section 1318(a) and Water Code section 13383. Section 1318(a) authorizes the collection of information necessary to carry out the objectives of the Clean Water Act, including but not limited to developing or assisting in the development of any effluent limitation, other limitation, prohibition, effluent standard, pretreatment standard or standard of performance. The Regional Water Board implements this requirement through Water Code section 13383.

4. Reopener Provisions

These provisions are based on 40 C.F.R. sections 122.62 and 122.63 and allow modification of this Order as necessary in response to updated water quality standards, regulations, or other new and relevant information that may become available in the future, and other circumstances as allowed by law.

VII. RATIONALE FOR MONITORING AND REPORTING PROGRAM (MRP)

Attachment E contains the MRP for this Order. It specifies pollutants to be monitored, monitoring frequencies, and reporting requirements. The following provides the rationale for the MRP requirements.

Consistent with the Regional Water Board's March 2, 2012, Water Code section 13267 order to collect nutrient data, this Order requires Dischargers to report nitrogen and phosphorus discharge levels and trends. The monitoring frequencies specified depend on each Discharger's nutrient loads and its resources to conduct the monitoring. For example, those with larger flows are required to monitor more frequently.

This Order requires the Dischargers to support receiving water monitoring to enable load/response modeling, track nutrient trends over time, and identify harmful algae blooms

[7] SFEI, Nutrient Conceptual Model Draft, May 1, 2013, page 6.
[8] Cloern, J. E., and A. D. Jassby (2012), "Drivers of change in estuarine-coastal ecosystems: Discoveries from four decades of study in San Francisco Bay," *Reviews of Geophysics,* 50, RG4001, page 14.

and associated toxins. These requirements are necessary because San Francisco Bay may be becoming less resistant to nutrient discharges, municipal wastewater treatment facilities are the primary source of nutrient loadings to San Francisco Bay, and the need for future controls can be informed by an improved understanding of the fate and transport of nutrients in San Francisco Bay.

Finally, this Order requires Dischargers to submit an annual report, either individually or as a group. The annual report is to include a summary of monitoring data and an evaluation of nutrient load and concentration trends. This information is necessary to establish baseline loads. The requirement for a trend analysis is to ensure that Dischargers investigate the causes of any changes in nutrient discharges from their treatment plants. This will allow for a better understanding of why nutrient loads may change and help identify controllable measures for maintaining levels of treatment. Additionally, this Order requires that Dischargers report nutrient loads from all municipal treatment plants in their respective subembayments. This is to establish baseline loads by subembayment and the potential for nutrient load trading.

VIII. PUBLIC PARTICIPATION

The Regional Water Board considered the issuance of WDRs that will serve as an NPDES permit for the Dischargers' facilities. As a step in the WDR adoption process, Regional Water Board staff developed tentative WDRs and encouraged public participation in the WDR adoption process.

A. Notification of Interested Parties. The Regional Water Board notified the Dischargers and interested agencies and persons of its intent to prescribe WDRs for the discharge and provided an opportunity to submit written comments and recommendations. Notification was provided by transmitting electronic copies of tentative WDRs to the Dischargers and other interested parties and by publishing a notice in the Oakland Tribune. The public had access to the agenda and any changes in dates and locations through the Regional Water Board's website at www.waterboards.ca.gov/sanfranciscobay.

B. Written Comments. Interested persons were invited to submit written comments concerning the tentative WDRs as explained through the notification process. Comments were due either in person or by mail at the Regional Water Board office at 1515 Clay Street, Suite 1400, Oakland, California 94612, to the attention of **Robert Schlipf**. For full staff response and Regional Water Board consideration, the written comments were due at the Regional Water Board office by **5:00 p.m.** on Monday, **March 10, 2014**.

C. Public Hearing. The Regional Water Board held a public hearing on the tentative WDRs during its regular meeting at the following date and time, and at the following location:

Date: **April 9, 2014**
Time: 9:00 a.m.
Location: Elihu Harris State Office Building

1515 Clay Street, 1st Floor Auditorium
Oakland, CA 94612

Contact: Robert Schlipf, (510) 622-2478, robert.schlipf@waterboards.ca.gov

Interested persons were invited to attend. At the public hearing, the Regional Water Board heard testimony pertinent to the discharge, WDRs, and permit. For accuracy of the record, important testimony was requested to be in writing.

Dates and venues change. The Regional Water Board web address is http://www.waterboards.ca.gov/sanfranciscobay, where one could access the current agenda for changes in dates and locations.

D. **Reconsideration of Waste Discharge Requirements.** Any aggrieved person may petition the State Water Board to review the Regional Water Board decision regarding the final WDRs. The State Water Board must receive the petition at the following address within 30 calendar days of the Regional Water Board action:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

For instructions on how to file a petition for review, see http://www.waterboards.ca.gov/public_notices/petitions/water_quality/wqpetition_instr.shtml.

E. **Information and Copying.** Supporting documents, and comments received are on file and may be inspected at the address above at any time between 9:00 a.m. and 5:00 p.m., Monday through Friday. Copying of documents may be arranged by calling (510) 622-2300.

F. **Register of Interested Persons.** Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Regional Water Board, reference the Facility, and provide a name, address, and phone number.

G. **Additional Information.** Requests for additional information or questions regarding this Order should be directed to Robert Schlipf at (510) 622-2478 or RSchlipf@waterboards.ca.gov.

Reference 22

CALIFORNIA
Water Boards

RECEIVED
JUN 02 2014
WATER RESOURCES PLANNING DIV.

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

May 27, 2014

EAST BAY MUNICIPAL UTILITY DISTRICT
PO BOX 24055 MS 901
OAKLAND, CA 94623

In Regards to Water Right(s): S020476, S020477

NOTICE OF UNAVAILABILITY OF WATER AND IMMEDIATE CURTAILMENT FOR THOSE DIVERTING WATER IN THE SACRAMENTO AND SAN JOAQUIN RIVER WATERSHEDS WITH A POST-1914 APPROPRIATIVE RIGHT

On January 17, 2014, Governor Edmund G. Brown, Jr. proclaimed a State of Emergency (Proclamation) to address the record dry conditions around the State. On the same day, as directed by the Proclamation, the State Water Resources Control Board (State Water Board) issued a statewide notice of water shortages and potential for future curtailment of water right diversions.

Curtailment of Post-1914 Water Rights:
Based upon the most recent reservoir storage and inflow projections, along with forecasts for future precipitation events, the State Water Board has determined that the existing water supply in the Sacramento and San Joaquin River watersheds is insufficient to meet the needs of all water rights holders. With this notice, the State Water Board is notifying all holders of post-1914 appropriative water rights within the Sacramento and San Joaquin River watersheds of the need to immediately stop diverting under their post-1914 water rights, with the exceptions discussed below. This condition of curtailment will continue until water conditions improve. Even if there is water physically available at your point of diversion, that water is necessary to meet senior water right holders' needs or is water released from storage that you are not entitled to divert. If precipitation occurs in the following weeks or months, you should not commence diversion before being notified by the State Water Board that water is legally available for diversion under your priority of right.

Permission to initiate diversions during or following significant rainfall events may be posted at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/index.shtml#notices. You can get immediate email updates from the State Water Board about these notices by subscribing to "Drought Updates" at: http://www.waterboards.ca.gov/resources/email_subscriptions/

Compliance Certification Required:
Curtailed post-1914 diverters are required to document receipt of this notice by completing an online Curtailment Certification Form (Form) within seven days. The Form confirms cessation of diversion under the specific post-1914 water right, and, if applicable, identifies the alternate water supply to be used in lieu of the curtailed water right. Completion of the Form and identification of alternate rights can avoid unnecessary enforcement proceedings.

Please complete the Form for each post-1914 water right identified through this curtailment at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/ewrims/curtailment/

If you are unable to complete the form online, you should download the Form at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/ewrims/curtailment/curtailment_certification_form.pdf and email your response to: SWRCB-Curtailment-Certification@waterboards.ca.gov.

Warning of Potential Future Curtailment of Senior Rights:
You may have received this notice because the State Water Board's records show you divert water under a riparian or pre-1914 water right. As such, it is important that you conserve water due to declining supplies. If current conditions persist, the State Water Board may curtail some pre-1914 and riparian water rights in the near future. If you are a riparian or pre-1914 water right holder located downstream of major reservoir operations (such as the Central Valley Project or State Water Project) which are releasing water from storage and you do not have a contract or transfer order authorizing diversion of the released water, you are not permitted to divert the released water quantity.

Exceptions to Curtailment:
If your post-1914 diversion is your only source for human health and safety purposes, you may contact the State Water Board with information supporting that there is no other available supply and maximum conservation has been implemented. The State Water Board may be able to assist with identifying alternatives on a case-by-case basis. Additionally, if your diversion is for hydroelectric generation and all water diverted is returned to the stream, you may continue to divert under your post-1914 permit or license. If you continue to divert under either of the above circumstances, you must identify that on the Form and provide the information requested.

Potential Enforcement:
Those who are found to be diverting water beyond what is legally available to them may be subject to administrative fines, cease and desist orders, or prosecution in court. The State Water Board may levy fines of $1,000 per day of violation and $2,500 for each acre-foot diverted or used in excess of a valid water right. (See Water Code, §§ 1052,1055.) Additionally, if the State Water Board issues a Cease and Desist Order against an unauthorized diversion, violation of any such order can result in a fine of $10,000 per day. (See Water Code, §§ 1831, 1845.)

The State Water Board is encouraging diverters to work together to reach local voluntary agreements that not only provide solutions that help local communities with water shortages, but also prevent impacts to other legal users of water and do not cause unreasonable effects on fish and wildlife. If you have any questions, please call our Curtailment Hotline at (916) 341-5342, contact us by email at: SWRCB-Curtailment-Certification@waterboards.ca.gov, or review our drought year webpage at:
http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/index.shtml

Sincerely,

Thomas Howard

Thomas Howard
Executive Director

Reference 23

WHITLEY BURCHETT & Associates

Memo

To: Rhodora Biagtan, Dublin San Ramon Services District
Stan Kolodzie, Dublin San Ramon Services District

From: Kevin O'Toole, WBA (CA C58594)

Reviewed by: Roanne Ross, WBA

Date: September 11, 2013

Subject: Title XVI Feasibility Study for Dublin Recycled Water Expansion Project Market Survey - *Admin Draft (Final)*

The purpose of this memo is to document the market survey and determination of the potential recycled water demand for the Title XVI Feasibility Study for Dublin Recycled Water Expansion Project.

Executive Summary

As part of the Dublin Recycled Water Expansion Project, the Dublin San Ramon Services District (DSRSD) is investigating an expanded recycled water project to serve parts of the City of Dublin and a number of federal and county entities and institutions that are not provided with recycled water. DSRSD is pursuing Federal funding for the project through the Title XVI program which is administered through the Bureau of Reclamation (Reclamation). Title XVI funding requires the project sponsor submit to Reclamation a Feasibility Study and supporting documentation for the project and request Reclamation make a determination of feasibility. A requirement for the Feasibility Study is a description of the current recycled water system and the potential recycled water market. This memo documents the analysis of the potential recycled water market.

DSRSD identified potential recycled water customers in the Western Dublin and Central Dublin areas and provided the "Utility Inventory and Routes" and "Consumption" information from the electronic accounting system for each account. Whitley Burchett & Associates (WBA) analyzed the provided account data to determine the irrigation component for each account and the annual irrigation demand for calendar years 2007 through 2011. Certain accounts were excluded from the analysis, including accounts that were not designated as irrigation meters or did not exhibit a seasonal demand pattern (assumed to be an indicator of irrigation use), closed accounts, or accounts that were identified by DSRSD for exclusion based on their experience and knowledge of the account.

For all the accounts remaining in the analysis, the average annual irrigation demand for the years 2007 through 2011 was calculated. In addition, WBA estimated the irrigation demand for the planned Camp Parks Cantonment Area developments in Central Dublin and included the estimated demand in the total potential recycled water demand.

The estimated recycled water demand for the Dublin Recycled Water Expansion Project is 456 acre-feet per year (AF/yr). Approximately 60% of the total estimated demand is from three customers: the planned Camp Parks Cantonment Area improvements (33%), Federal Correctional Institution (14%), and Santa Rita Jail (13%).

Background

As part of the Dublin Recycled Water Expansion Project, DSRSD is investigating an expanded recycled water project to serve parts of the City of Dublin and a number of federal and county entities and institutions that are not provided with recycled water. Potential recycled water customers include city parks, street medians, schools, churches, and several retail establishments in Western Dublin and two Federal facilities (Camp Parks and the Federal Correctional Institute) and Alameda County facilities (including Santa Rita Jail) in Central Dublin.

Preliminary recycled water market studies have been conducted in the proposed Project area. These studies indicate a high degree of acceptance and desire for using the recycled water to replace potable water supplies where drinking water quality is not a requirement.

DSRSD is pursuing Federal funding for the project through the Title XVI program which is administered through Reclamation. Title XVI funding requires the project sponsor to conduct a Feasibility Study and submit to Reclamation a Feasibility Report. Reclamation will review the Report - and any supporting documentation - to determine whether the Report meets the requirements of a Title XVI Feasibility Report. This is unofficially referred to as a “feasibility determination.” Such a determination is one of the three major requirements for a project to be eligible to receive Federal funds for construction: feasibility determination, NEPA/NHPA compliance determination, and Congressional construction authorization. A requirement for the Feasibility Report is a description of the current recycled water system and the potential recycled water market. This memo documents the analysis of the potential recycled water market.

Methodology

The methodology for estimating the recycled water demand for the Dublin Recycled Water Expansion project included the following general steps:

- Identify potential recycled water customers based on water meter accounts in the areas of interest. Single-family units were excluded.
- Analyze historical water meter readings for each account.
- Separate each account into one of three categories:

A. Accounts that are closed or are identified for exclusion by DSRSD.

B. Accounts with irrigation meters.

C. Accounts without irrigation meters.

- Exclude accounts in Category A from further analysis.
- Calculate the average annual irrigation demand for accounts in Category B.
- Analyze data for accounts in Category C to determine if there was an irrigation component. If there was, categorize the account as "mixed use," estimate the irrigation component of each meter reading, and calculate the average annual irrigation demand. Exclude accounts without an irrigation component from further analysis.
- Identify significant new potential customers - Category D - and estimate the average annual irrigation demand.
- Sum the average annual irrigation demands for the Category B accounts, the mixed use accounts from Category C, and the Category D new accounts for the total estimated recycled water demand.

Analysis

DSRSD had previously identified potential recycled water customers in the Western Dublin area. DSRSD supplemented these customers with additional water meter accounts in Western Dublin and identified potential customers in Central Dublin. DSRSD and WBA used an iterative process to confirm the inclusion of the previously identified potential customers. Consideration was given to customer proximity to the planned distribution pipeline, existing landscaping and compatibility with recycled water, and estimated recycled water demand.

DSRSD provided the "Utility Inventory and Routes" and "Consumption" information from the electronic accounting system (Eden accounting software). An example of the provided account information is included in Attachment A for the City of Dublin Senior Center (Customer ID 28). These accounts were reviewed and separated into categories A, B, or C listed in the methodology above. A summary of the accounts, including the categorization of each account, are shown in Attachment B.

Category A

Accounts that were closed or that were identified by DSRSD for exclusion based on their experience and knowledge of the account were designated as Category A. A total of 15 accounts were designated as Category A: 11 closed accounts, one minimal irrigation or non-irrigation account (Alameda County Sewer Screw Site, Customer ID 6), one account for a "deduct meter" where the measured flow was captured by an upstream meter (Nielsen Elementary School, Customer ID 37), and two accounts identified for exclusion by DSRSD (Amador Apartments, Customer ID 10, Meter ID 112, and Armstrong Garden Center, Customer ID 11). In addition, the

new potential account for the planned Dublin Crossing development is considered an "ultimate demand" and designated as a Category A account for this study (the demand development methodology is included in Attachment C for reference). These accounts were excluded from analysis and not included in the potential recycled water demand.

Category B

Thirty-three accounts were identified as irrigation meters and designated as Category B accounts (those with irrigation meters). For these accounts, it was assumed that 100% of the metered volume was used for irrigation. For each account, the annual irrigation demand for the years 2007 through 2011 and the average annual irrigation demand for this period were calculated. A five year period was selected to provide a sufficient number of years in the calculation to dampen out the affects of any abnormal years (e.g., high irrigation flows in drought years).

The results are shown in Attachment B.

Category C

The remaining 42 accounts were designated as Category C accounts (not identified as irrigation meters). For these accounts, WBA analyzed the account data provided to identify the accounts that exhibited a seasonal demand pattern, assumed to be an indicator of irrigation use. A total of 13 of the Category C accounts exhibited a seasonal demand pattern and were labeled as "mixed" water use. The 29 Category C accounts that did not exhibit a seasonal demand pattern were excluded from the analysis.

Next, WBA estimated the irrigation component for the "mixed" water use Category C accounts. The process included the following steps:

- Account for any missed monthly or bi-monthly readings. Because the meter readings are based on the difference of the cumulative volume taken from the meter for the current reading and the cumulative total from the prior reading, the volumes from any missed readings are captured in the succeeding reading. The values from any "catch-up" readings were distributed across missed readings with a weighting based on the pattern of succeeding readings (first choice), the pattern of prior readings (second choice), or as the mean (third choice).

- For each calendar year, identify the minimum monthly or bi-monthly reading. Assume this value is the non-irrigation component for the calendar year.

- For each calendar year, deduct the non-irrigation component from each monthly or bi-monthly value to estimate the irrigation component. By using the minimum value for the non-irrigation component, none of the irrigation estimates were negative.

- For each calendar year, total the monthly or bi-monthly irrigation estimates to estimate the annual irrigation value.

- Estimate the average irrigation rate, based on the estimated irrigation demand and a rough estimate of the irrigation area, to check if the estimated irrigation demand is reasonable.

Three customers, Alameda County Santa Rita Jail (Customer ID 5, Meter ID 107), Alameda County Sheriff's Office (Customer ID 7, Meter ID 109), and Nielsen Elementary School (Customer ID 37, Meter IDs 145 and 146), required additional analysis.

Alameda County operates a potable water reservoir that serves the Alameda County Santa Rita Jail and Alameda County Sheriff's Office. The water meter account attached to each customer is for a common meter on the reservoir influent line. For this common account, the standard Category C estimating procedure described above resulted in an average annual irrigation demand of 291 AF/yr, equal to 63% of the total average annual water use of 459 AF/yr. Because the potable water usage for this common account is relatively large, an alternate irrigation estimating procedure was developed for these customers to serve as a check on the standard estimating procedure.

Using aerial images taken from Google Earth, the landscape areas were estimated to be approximately 12 acres for the Santa Rita Jail property and approximately 3.4 acres for the Alameda County Sheriff's Office property. An annual average irrigation demand of 48 in/yr was assumed (DSRSD's nominal irrigation demand for turf, per Stan Kolodzie, DSRSD, January 12, 12 email correspondence). The resulting estimated irrigation demands are 48 AF/yr for the Santa Rita Jail and 14 AF/yr for the Alameda County Sheriff's Office. An adjustment factor of 1.25 was applied to allow for estimating errors in the irrigation area and irrigation rate, resulting in estimated irrigation demands of 60 AF/yr (rounded) for the Santa Rita Jail and 17 AF/yr (rounded) for the Alameda County Sheriff's Office. Together, the estimated irrigation demand for these customers is 77 AF/yr, which is approximately 17% of the total average water use of 459 AF/yr. Because these customers may have other seasonal factors besides irrigation that may result in a seasonal demand pattern, the area method is assumed to provide more accurate estimates of the irrigation demands. Therefore, the estimated irrigation demands used in this study are 60 AF/yr for the Santa Rita Jail and 17 AF/yr for the Alameda County Sheriff's Office.

The Nielsen Elementary accounts consist of two meters: a mixed-use meter that measures all water used and a "deduct meter" located on a water line downstream of the mixed-use meter for estimating a portion of the irrigation usage. All of the demand measured by the deduct meter was assumed to be for irrigation use. The deduct meter readings were subtracted from the corresponding mixed-use meter readings to determine the "non-deduct" component of the mixed-use meter readings. The irrigation component of the "non-deduct" component of the mixed-use meter was estimated using the process described above and added to the corresponding deduct meter values to estimate the total irrigation component of the mixed-use meter. The annual irrigation value for each calendar year was calculated as described above. For a total estimated average irrigation demand of 13.8 AF/yr and a rough estimate of 3.5 acres of irrigation area, the estimated average irrigation rate is 47 in/yr, which is nearly equal to the nominal irrigation rate for turf of 48 in/yr used by DSRSD.

Category D

In addition to the existing water meter accounts, the Camp Parks Cantonment Area in Central Dublin was identified as a new potential customer. A breakdown of the various land uses was not available for the planned Camp Parks Cantonment Area development. Therefore, a simplified approach was used to estimate the potential irrigation demand. Based on historic landscaping at Camp Parks and the planning drawing included in Attachment D, it was assumed that the new development landscaping will be significantly less than traditional planned developments. It was assumed that 15% of the total area of the new development would be irrigated as turf. Using the planning drawing shown in Attachment D, the total area for the new development was estimated to be 547 acres. The estimated irrigation area is approximately 37 acres, resulting in an average annual irrigation demand of 150 AF/yr assuming an annual average irrigation rate of 48 in/yr as described above. The 547 acres excludes the approximate 30 acres for the existing RCI Housing located in the southwest corner of the Cantonment Area. The RCI Housing consists of single family homes that are not assumed to be potential recycled water demand customers.

Summary

The total potential recycled water demand was then calculated by adding the estimates of the average annual irrigation demands for the Category B, Category C, and Category D accounts.

Results

The total estimated recycled water demand for the Dublin Recycled Water Expansion Project is 456 AF/yr. The potential recycled water customers and the associated recycled water demands are summarized in Table 1. The locations of the potential customers are shown in Figure 1.

Table 1: Potential Recycled Water Customers and Demands

Potential Recycled Water Customer	Customer ID	Potential RW Demand (AF/yr)
Alameda County - Animal Shelter	1	4.4
Alameda County - Santa Rita Jail	5	60
Alameda County - Sheriff's Office	7	17.0
Amador Apartments	10	6.0
California Highway Patrol	12	0.9
Camp Parks - Cantonment Area (Planned Development)	13	150
Church of Christ	14	1.0
City of Dublin - Dolan Park	26	12.0
City of Dublin - Firehouse 16	16	0.7

Table 1: Potential Recycled Water Customers and Demands (*Continued*)		
Potential Recycled Water Customer	Customer ID	Potential RW Demand (AF/yr)
City of Dublin - Firehouse 17	17	2.6
City of Dublin - Medians	19-24	16.1
City of Dublin - Mape Park	27	4.7
City of Dublin - Senior Center	28	2.0
City of Dublin - Shannon Community Center	15	1.5
City of Dublin - Shannon Park	25	13.5
Dublin Boulevard Associates	29	6.6
Dublin Chevron	30	0.7
Dublin Executive Center	32	1.4
Dublin Historic Park	33	0.8
Dublin Iceland	34	2.2
Dublin Pioneer Cemetery	35	9.7
Dublin Unified School District - Dublin Elementary	36	19.9
Dublin Unified School District - Nielsen Elementary	37	13.8
Federal Correctional Institution (FCI Dublin)	38	66.1
Frankie Johnnie & Luigi Too	39	1.0
Heritage Park Office Center	40	6.3
Hexcel Corporation	41	6.0
John Knox Church	42	1.7
McNamaras Steak Chop House	43	1.2
Michael Perkins	44	0.6
Public Storage	45	1.8
Shell Station	46	1.1
St. Raymond's Church	47	8.0
The Springs	48	8.2
Town & Country	49	4.9
Whitney Investments (7601 Amador Valley Blvd.)	52	1.1
Total (Rounded)		**456**

Additional details for the potential customers and demand calculations are included in Attachment B, including:

- Unique customer and meter ID numbers used in the study.
- The customer name, address, meter serial number, meter account number, meter size, and account status for each account, based on information from the electronic accounting system.
- A general description of the account and the type of water use for the meter (domestic, irrigation, or mixed).
- The designated Category (A, B, C, or D) for each account. For the Category A accounts, a description of the reason for excluding the account is indicated. For the Category C accounts, an indication of whether the account exhibits a seasonal demand pattern is included.
- An indication of whether each account is included as a potential recycled water demand.
- The annual total of the meter readings for years 2007 through 2011, based on information from the electronic accounting system (for Category C accounts, the annual totals are calculated after any distribution of missed meter readings as described above), and the annual average metered amount for years 2007 through 2011.
- The annual irrigation component for years 2007 through 2011, calculated as described above, and the annual average irrigation component for years 2007 through 2011.
- The irrigation component for each account equal to the Irrigation Component Annual Average (2007-2011) divided by the Metered Annual Average (2007-2011) and expressed as a percentage of the total water used for each account. For the Category B accounts, this value is 100% because it is assumed that all of the metered volume is used for irrigation. For the Category C and D accounts, the value ranges from 22% to 97%. Such a wide range is acceptable because each customer account is not expected to have the same ratio of irrigation to total water use.
- The potential average recycled water demand for each account and the total potential average recycled water demand for this study.

Approximately 60% of the total estimated demand is from three customers: the planned Camp Parks Cantonment Area improvements (33%), Federal Correctional Institution (14%), and Santa Rita Jail (13%).

While the Camp Parks Cantonment Area is in the planning phase, the approach used to estimate the irrigation demand is not sensitive to the final facilities layout. The estimated irrigation

demand is based on the total development area which is not anticipated to change significantly from the planning estimate. The assumed irrigation rate used to estimate the irrigation demand is based on 100% turf, and the final landscaping mix will certainly include a variety of plants that require less water. Therefore, the estimated irrigation demand of 150 AF/yr is considered conservative (i.e., high) for facility sizing.

The estimated irrigation demand for the Federal Correctional Institution is based on five accounts, two irrigation meter accounts (Category B) and three mixed-use accounts (Category C). One of the Category C accounts is responsible for approximately 88% of the total irrigation estimate, and the three Category C accounts together are responsible for approximately 97% of the total irrigation estimate.

Per the Category C estimating procedure, for each Category C account, the annual minimum meter reading value is assumed to be the average non-irrigation component for the year. If the annual minimum meter reading is an anomalously low and not indicative of the average annual non-irrigation component, then the resulting estimated irrigation component will be high. Therefore, given the large dependence on the Category C procedure to estimate the irrigation demand for this customer, the estimated irrigation demand of 66.1 AF/yr may be high and is therefore considered conservative for facility sizing. Per the Category C estimating procedure, for each Category C account, the annual minimum meter reading value is assumed to be the average non-irrigation component for the year. If the annual minimum meter reading is an anomalously low and not indicative of the average annual non-irrigation component, then the resulting estimated irrigation component will be high. Therefore, given the large dependence on the Category C procedure to estimate the irrigation demand for this customer, the estimated irrigation demand of 66.1 AF/yr may be high and is therefore considered conservative for recycled water facility sizing.

As described above, the irrigation demand values used for the Santa Rita Jail and Alameda County Sheriff's Office customers are based on estimates of the landscaping areas and an assumed irrigation rate (with an adjustment factor of 1.25 applied to allow for estimating errors in the irrigation area and irrigation rate). These estimates may be low if the customers irrigate additional areas that are not included in the estimates or use greater irrigation rates.

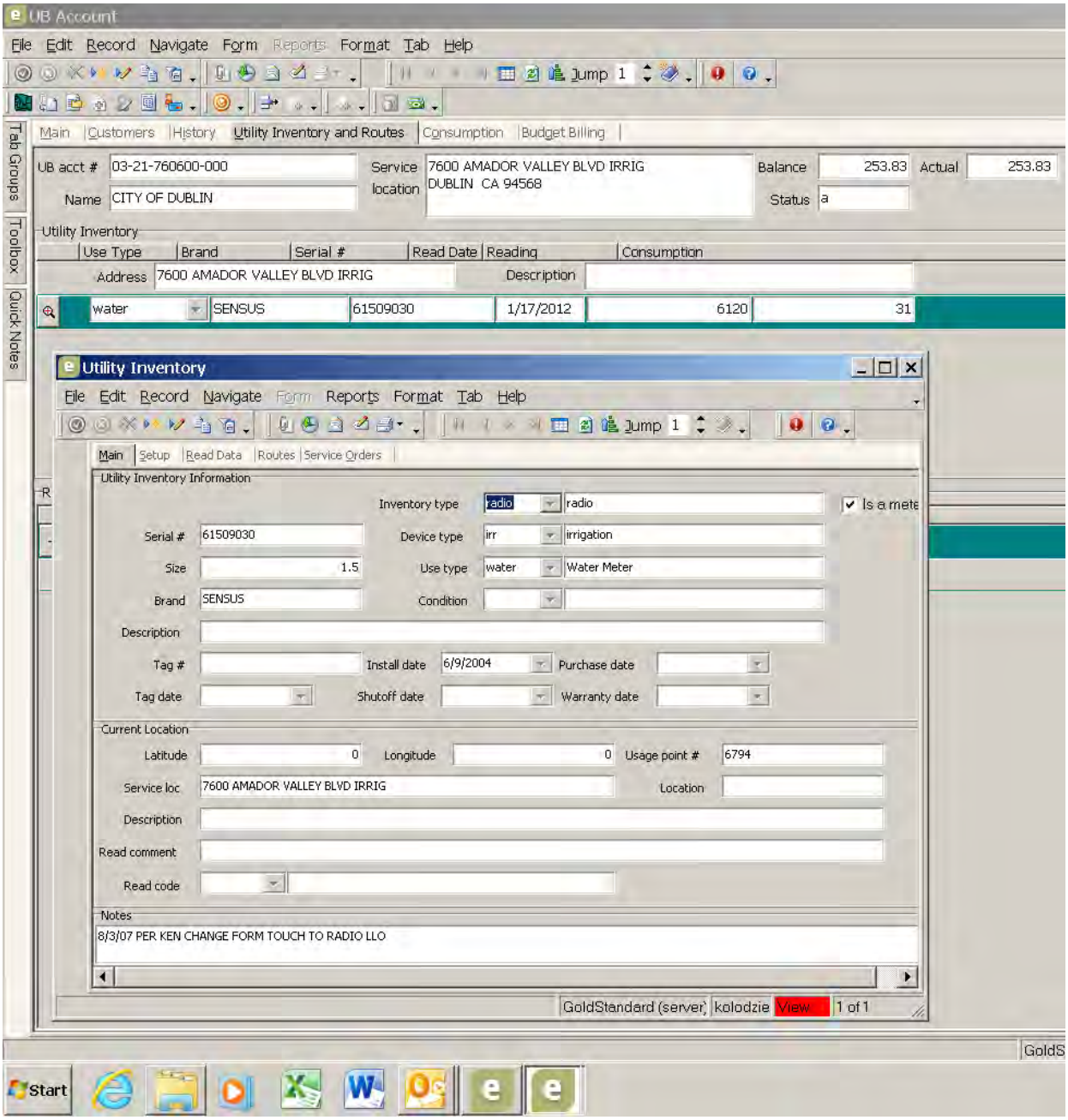
In general, the procedure for estimating the irrigation demands for the "mixed-use" Category C accounts yielded reasonable results. Three of the accounts are within 5% of the nominal irrigation rate of 48 in/yr (Church of Christ at 48 in/yr, Nielsen Elementary at 47 in/yr, and John Knox Church at 50 in/yr), four accounts are within 15% of the nominal irrigation rate (Federal Correctional Institute, which includes three Category C accounts, at 53 in/yr and Hexcel Corporation at 43 in/yr), and one account is within 35% of the nominal irrigation rate (Dublin Chevron at 32 in/yr). Two accounts were set to be equal to the nominal irrigation rate plus 25% (Santa Rita Jail and Alameda County Sheriff's Office). The estimated irrigation demands for the remaining three accounts are over twice the nominal irrigation rate (Michael Perkins at 98 in/yr, Shell Station at 102 in/yr, and Alameda County Animal Shelter at 114 in/yr). Possible explanations for the Michael Perkins and Shell Station results include overwatering, additional irrigation area not included in the estimates (which would result in lower calculated irrigation rates), or relatively high amounts of overspray to non-irrigable areas due to the relatively small

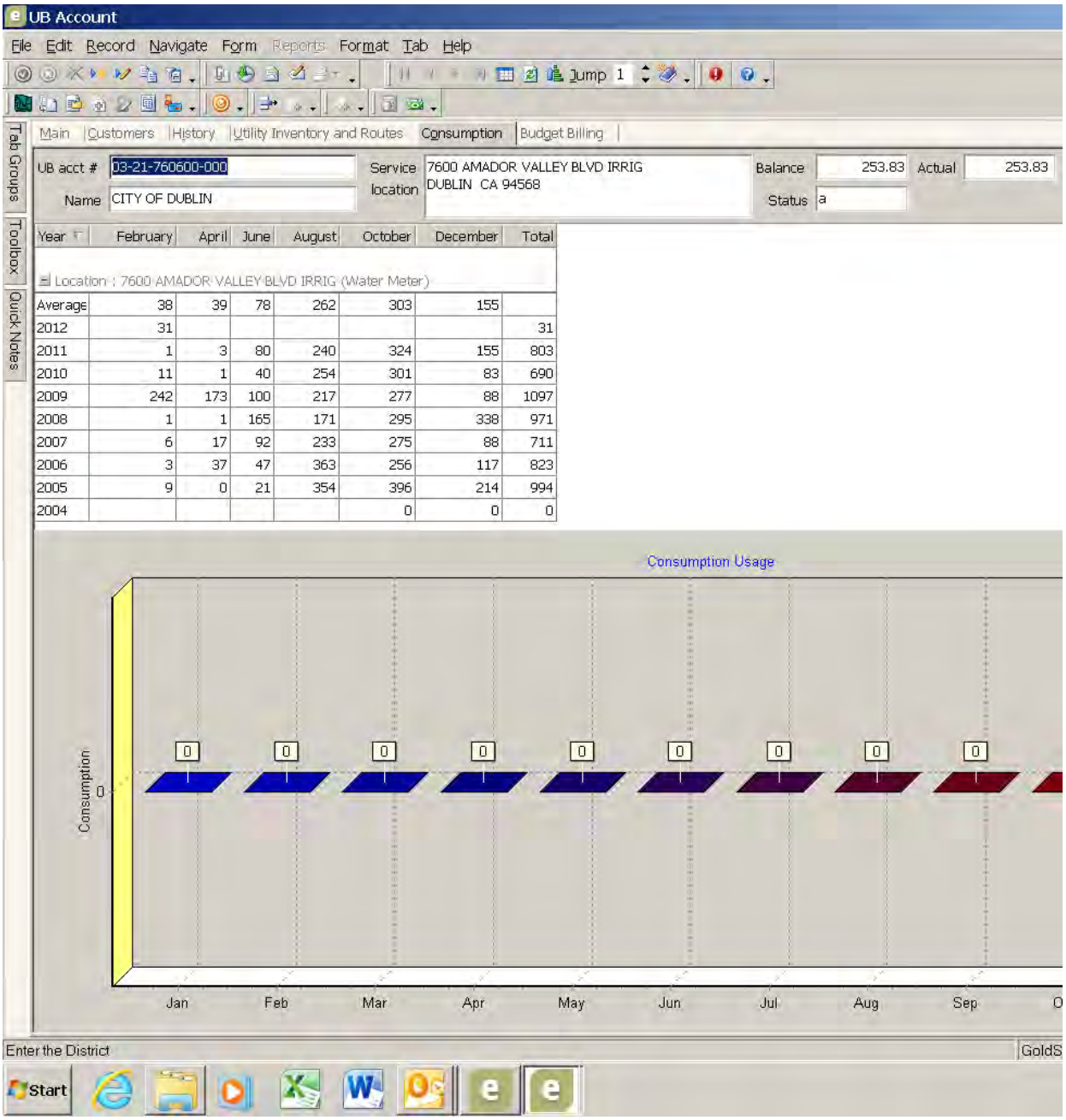
irrigation areas (approximately 0.1 acres each). Possible explanations for the Alameda County Animal Shelter result include a variable wash down water demand, additional irrigation area not included in the estimate (which would result in a lower calculated irrigation rate), or a need to irrigate at a higher rate due to extensive use by the animals. Given the uncertainties of the irrigation rate estimate, the estimated irrigation demand for the Alameda County Animal Shelter was not adjusted for this study.

ATTACHMENT A

ACCOUNT INFORMATION EXAMPLE

Account Information for the City of Dublin Senior Center (Customer ID 28)





Year	February	April	June	August	October	December	Total
Location : 7600 AMADOR VALLEY BLVD IRRIG (Water Meter)							
Average	38	39	78	262	303	155	
2012	31						31
2011	1	3	80	240	324	155	803
2010	11	1	40	254	301	83	690
2009	242	173	100	217	277	88	1097
2008	1	1	165	171	295	338	971
2007	6	17	92	233	275	88	711
2006	3	37	47	363	256	117	823
2005	9	0	21	354	396	214	994
2004					0	0	0

ATTACHMENT B
Potential Recycled Water Customer Demands

Attachment B
Dublin Recycled Water Expansion Project
Potential Recycled Water Customers Demands

Customer ID	Meter ID	Customer	Description	Address	Water Use	Serial #	Eden Account Number	Meter Size Inches	Account Status	Category A: Excluded B: Irrig. Meter C: Mixed Use D: New	Reason Excluded [Category A]	Seasonal Demand Pattern? [Category C]	Include as Potential RW Demand?
1	101	Alameda County G.S.A.	Animal Shelter	4595 Gleason Dr	Irrigation	65849996	06-21-459520-000	1.5	Active	B	-	-	**Y**
1	102	Alameda County G.S.A.	Animal Shelter	4595 Gleason Dr	Mixed	65854203	06-21-459500-000	3	Active	C	-	Y	**Y**
2	103	Alameda County G.S.A.	Gas Station	6175 Madigan Ave	Domestic	34366663	06-21-617500-000	1	Active	C	-	N	N
3	104	Alameda County G.S.A.	Heavy Equipment Repair	6089 Madigan Ave	Domestic	09057622	06-21-608910-000	2	Active	C	-	N	N
4	105	Alameda County G.S.A.	Public Works	4825 Gleason Dr	Domestic	45468512	06-21-482500-000	2	Active	C	-	N	N
5	106	Alameda County G.S.A.	Santa Rita Jail	4985 Broder Blvd	Domestic	69115444	05-41-115444-000	2	Closed	A	Closed	-	N
5	107	Alameda County G.S.A.	Santa Rita Jail	5325 Broder Blvd	Mixed	64097147	05-38-640900-000	6	Active	C	-	Y	**Y**
6	108	Alameda County G.S.A.	Sewer Screw Site	5325 Broder Blvd	Industrial	67801573	05-38-678000-000	2	Active	A	Non-irrigation	Y	N
7	109	Alameda County G.S.A.	Sheriff's Office	6289 Madigan Drive	Mixed	64097147	05-38-640900-000	6	Active	C	-	Y	**Y**
8	110	Alameda County G.S.A.	Small Vehicle Repair	6175 Madigan Ave	Domestic	34366661	06-21-617510-000	1	Active	C	-	N	N
9	111	Alameda County G.S.A.	Truck Wash	6089 Madigan Ave	Domestic	54467596	06-21-608900-000	1	Active	C	-	N	N
10	112	Amador Apartments	Residential	7571 Amador Valley Blvd	Irrigation	67202404	03-21-384030-000	1.5	Active	A	Directed	-	N
10	113	Amador Apartments	Residential	7571 Amador Valley Blvd	Irrigation	69808088	03-21-386080-000	1.5	Active	B	-	-	**Y**
11	114	Armstrong Garden Center	Commercial	7360 San Ramon Rd	Irrigation	R56763180	03-21-600000-001	0.625	Active	A	Directed	-	N
12	115	California Highway Patrol	CHP	4999 Gleason Dr	Domestic	65400920	06-21-499920-000	2	Active	C	-	N	N
12	116	California Highway Patrol	CHP	4999 Gleason Dr	Irrigation	01415744	06-21-499900-000	2	Active	B	-	-	**Y**
13	N/A	Camp Parks	Cantonment Area	N/A (Eastern Dublin)	Irrigation	N/A	N/A	N/A	N/A	D	-	-	**Y**
14	117	Church of Christ	Church	11873 Dublin Blvd	Mixed	69683839	03-21-299030-000	0.625	Active	C	-	Y	**Y**
15	118	City of Dublin	Community Center	11600 Shannon Ave	Irrigation	70287733	03-51-287733-000	1	Active	B	-	-	**Y**
16	119	City of Dublin	Firehouse 16	7494 Donohue Dr Firehouse	Irrigation	69808045	03-21-389040-001	1.5	Active	B	-	-	**Y**
17	120	City of Dublin	Firehouse 17	6200 Madigan St	Domestic	61509157	06-21-620000-000	2	Active	C	-	N	N
17	121	City of Dublin	Firehouse 17	6200 Madigan St	Irrigation	R59708550	06-21-620010-000	1	Active	B	-	-	**Y**
18	122	City of Dublin	Firehouse 18	4800 Fallon Rd	Domestic	61509160	06-21-480000-000	2	Active	C	-	N	N
19	123	City of Dublin	Median	0 W Vomac and San Ramon Rd	Irrigation	69808017	03-21-431570-000	1.5	Active	B	-	-	**Y**
20	124	City of Dublin	Median	Across from 7745 Amador Valley Blvd	Irrigation	64180944	03-21-448790-000	1	Active	B	-	-	**Y**
21	125	City of Dublin	Median	Amador Valley Blvd at Amador Plaza Rd	Irrigation	64381190	03-21-448880-000	1	Active	B	-	-	**Y**
22	126	City of Dublin	Median	In Front of 7100 San Ramon Rd	Irrigation	69127097	03-21-253550-000	1	Active	B	-	-	**Y**
23	127	City of Dublin	Median	San Ramon Rd S/W Corner Dublin Blvd	Irrigation	61509033	03-21-509033-000	1.5	Active	B	-	-	**Y**
24	128	City of Dublin	Median	West Vomac and San Ramon Rd	Irrigation	65400906	03-21-432000-000	1.5	Active	B	-	-	**Y**
25	129	City of Dublin	Park	11600 Shannon Ave	Irrigation	67202672	03-21-438070-000	3	Active	B	-	-	**Y**
26	130	City of Dublin	Park	Dolon Park	Irrigation	69808047	03-21-438520-000	1.5	Active	B	-	-	**Y**
26	131	City of Dublin	Park	Dolon Park on Iglesia	Irrigation	69808051	03-21-441290-000	2	Active	B	-	-	**Y**
27	132	City of Dublin	Park	Mape Park	Irrigation	69808043	03-21-443070-000	2	Active	B	-	-	**Y**
28	133	City of Dublin	Senior Center	7600 Amador Valley Blvd	Irrigation	61509030	03-21-760600-000	1.5	Active	B	-	-	**Y**
29	134	Dublin Blvd Associates	Commercial	11555 Dublin Blvd	Domestic	65850025	03-21-283520-000	2	Active	C	-	N	N
29	135	Dublin Blvd Associates	Commercial	11555 Dublin Blvd	Irrigation	69127093	03-21-283430-000	1	Active	B	-	-	**Y**
30	136	Dublin Chevron	Commercial	7007 San Ramon Rd	Mixed	64180952	03-21-256030-000	1	Active	C	-	Y	**Y**
31	N/A	Dublin Crossing	Mixed Use Development	N/A (Eastern Dublin)	Irrigation	N/A	N/A	N/A	N/A	A	Ultimate Demand	-	N
32	137	Dublin Exec Center	Commercial	11501 Dublin Blvd	Domestic	64284914	03-21-283340-000	1.5	Active	C	-	N	N
32	138	Dublin Exec Center	Commercial	11501 Dublin Blvd	Irrigation	69127094	03-21-283520-000	1	Active	B	-	-	**Y**
33	139	Dublin Historic Park	Park	11825 Dublin Blvd	Irrigation	71293290	03-21-293290-000	0.75	Active	B	-	-	**Y**
34	140	Dublin Iceland	Commercial	7212 San Ramon Rd	Mixed	65850033	03-21-253000-000	2	Active	C	-	N	N
34	141	Dublin Iceland	Commercial	7212 San Ramon Rd	Irrigation	55833380-Deduct	03-21-284050-000	0.625	Active	B	-	-	**Y**
35	142	Dublin Pioneer Cemetery	Cemetery	11825 Dublin Blvd	Irrigation	65400850	03-50-118250-000	1.5	Active	B	-	-	**Y**
35	143	Dublin Pioneer Cemetery	Cemetery	11825 Dublin Blvd	Irrigation	49288774	03-21-294040-001	0.625	Closed	A	Closed	-	N
35	143	Dublin Pioneer Cemetery	Cemetery	11825 Dublin Blvd	Irrigation	49288774	03-21-294040-000	0.625	Closed	A	Closed	-	N
36	144	Dublin Unified School District	Dublin Elementary	7997 Vomac Rd	Irrigation	67202671	03-21-420050-000	3	Active	B	-	-	**Y**

Attachment B
Dublin Recycled Water Expansion Project
Potential Recycled Water Customers Demands

Customer ID	Meter ID	Customer	Description	Metered 2007 CCF/yr	Metered 2008 CCF/yr	Metered 2009 CCF/yr	Metered 2010 CCF/yr	Metered 2011 CCF/yr	Metered Average 2007-2011 CCF/yr	Irrigation Comp. 2007 CCF/yr	Irrigation Comp. 2008 CCF/yr	Irrigation Comp. 2009 CCF/yr	Irrigation Comp. 2010 CCF/yr	Irrigation Comp. 2011 CCF/yr	Irrigation Comp. Average 2007-2011 CCF/yr	Irrigation Component %	Potential Average RW Demand CCF/yr	Potential Average RW Demand AF/yr
1	101	Alameda County G.S.A.	Animal Shelter	1,036	800	855	411	614	743	1,036	800	855	411	614	743	100%	743	**1.7**
1	102	Alameda County G.S.A.	Animal Shelter	1,483	1,454	1,946	1,563	1,082	1,506	1,159	1,004	1,724	1,341	746	1,195	79%	1,195	**2.7**
2	103	Alameda County G.S.A.	Gas Station	0	115	1	0	0	23	-	-	-	-	-	-	-	-	**-**
3	104	Alameda County G.S.A.	Heavy Equipment Repair	388	448	366	330	368	380	-	-	-	-	-	-	-	-	**-**
4	105	Alameda County G.S.A.	Public Works	64	108	67	58	66	73	-	-	-	-	-	-	-	-	**-**
5	106	Alameda County G.S.A.	Santa Rita Jail	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
5	107	Alameda County G.S.A.	Santa Rita Jail	275,229	278,178	164,692	144,395	138,091	200,117	-	-	-	-	-	26,136	13%	26,136	**60**
6	108	Alameda County G.S.A.	Sewer Screw Site	-	444	118	327	502	348	-	-	-	-	-	-	-	-	**-**
7	109	Alameda County G.S.A.	Sheriff's Office	275229	278178	164692	144395	138091	200,117	-	-	-	-	-	7,416	4%	7,416	**17.0**
8	110	Alameda County G.S.A.	Small Vehicle Repair	0	121	47	25	27	44	-	-	-	-	-	-	-	-	**-**
9	111	Alameda County G.S.A.	Truck Wash	148	84	49	42	30	71	-	-	-	-	-	-	-	-	**-**
10	112	Amador Apartments	Residential	598	1,560	2,374	2,101	2,038	1,734	-	-	-	-	-	-	-	-	**-**
10	113	Amador Apartments	Residential	1,686	2,104	3,885	2,978	2,509	2,632	1,686	2,104	3,885	2,978	2,509	2,632	100%	2,632	**6.0**
11	114	Armstrong Garden Center	Commercial	2,603	2,383	16	1,132	1,782	1,583	-	-	-	-	-	-	-	-	**-**
12	115	California Highway Patrol	CHP	183	221	302	236	270	242	-	-	-	-	-	-	-	-	**-**
12	116	California Highway Patrol	CHP	465	443	478	286	325	399	465	443	478	286	325	399	100%	399	**0.9**
13	N/A	Camp Parks	Cantonment Area	-	-	-	-	-	-	-	-	-	-	-	65,340	100%	65,340	**150**
14	117	Church of Christ	Church	487	762	600	518	415	556	445	732	456	272	337	448	81%	448	**1.0**
15	118	City of Dublin	Community Center	-	-	-	657	612	635	-	-	-	657	612	635	100%	635	**1.5**
16	119	City of Dublin	Firehouse 16	259	160	294	392	399	301	259	160	294	392	399	301	100%	301	**0.7**
17	120	City of Dublin	Firehouse 17	317	342	367	319	299	329	-	-	-	-	-	-	-	-	**-**
17	121	City of Dublin	Firehouse 17	1,036	1,119	1,179	987	1,267	1,118	1,036	1,119	1,179	987	1,267	1,118	100%	1,118	**2.6**
18	122	City of Dublin	Firehouse 18	109	127	135	111	132	123	-	-	-	-	-	-	-	-	**-**
19	123	City of Dublin	Median	1277	2814	1869	2013	2403	2,075	1,277	2,814	1,869	2,013	2,403	2,075	100%	2,075	**5.0**
20	124	City of Dublin	Median	99	194	134	166	157	150	99	194	134	166	157	150	100%	150	**0.3**
21	125	City of Dublin	Median	60	155	147	95	120	115	60	155	147	95	120	115	100%	115	**0.3**
22	126	City of Dublin	Median	1,118	1,014	1,276	1,304	1,117	1,166	1,118	1,014	1,276	1,304	1,117	1,166	100%	1,166	**2.7**
23	127	City of Dublin	Median	651	953	802	681	857	789	651	953	802	681	857	789	100%	789	**1.8**
24	128	City of Dublin	Median	2184	3753	1826	2678	3355	2,759	2,184	3,753	1,826	2,678	3,355	2,759	100%	2,759	**6.0**
25	129	City of Dublin	Park	6,557	5,680	6,498	5,661	4,947	5,869	6,557	5,680	6,498	5,661	4,947	5,869	100%	5,869	**13.5**
26	130	City of Dublin	Park	0	0	999	0	0	200	0	0	999	0	0	200	100%	200	**0.5**
26	131	City of Dublin	Park	4,368	8,346	3,787	4,292	4,313	5,021	4,368	8,346	3,787	4,292	4,313	5,021	100%	5,021	**11.5**
27	132	City of Dublin	Park	2,311	2,573	2,132	1,592	1,731	2,068	2,311	2,573	2,132	1,592	1,731	2,068	100%	2,068	**4.7**
28	133	City of Dublin	Senior Center	711	971	1,097	690	803	854	711	971	1,097	690	803	854	100%	854	**2.0**
29	134	Dublin Blvd Associates	Commercial	327	333	260	217	215	270	-	-	-	-	-	-	-	-	**-**
29	135	Dublin Blvd Associates	Commercial	3236	3107	3243	2278	2604	2,894	3,236	3,107	3,243	2,278	2,604	2,894	100%	2,894	**6.6**
30	136	Dublin Chevron	Commercial	740	754	348	434	365	528	416	364	198	278	203	292	55%	292	**0.7**
31	N/A	Dublin Crossing	Mixed Use Development	-	-	-	-	-	-	-	-	-	-	-	82,800	100%	-	**-**
32	137	Dublin Exec Center	Commercial	307	249	172	187	150	213	-	-	-	-	-	-	-	-	**-**
32	138	Dublin Exec Center	Commercial	-	-	-	-	621	621	-	-	-	-	621	621	100%	621	**1.4**
33	139	Dublin Historic Park	Park	-	-	-	-	360	360	-	-	-	-	360	360	100%	360	**0.8**
34	140	Dublin Iceland	Commercial	2130	2419	2678	2791	2579	2,519	2,130	2,419	2,678	2,791	2,579	2,519	100%	-	**-**
34	141	Dublin Iceland	Commercial	942	845	987	1032	1068	975	942	845	987	1,032	1,068	975	100%	975	**2.2**
35	142	Dublin Pioneer Cemetery	Cemetery	-	-	-	-	4244	4,244	-	-	-	-	4,244	4,244	100%	4,244	**9.7**
35	143	Dublin Pioneer Cemetery	Cemetery	130	0	0	-	-	43	-	-	-	-	-	-	-	-	**-**
35	143	Dublin Pioneer Cemetery	Cemetery	117	-	-	-	-	117	-	-	-	-	-	-	-	-	**-**
36	144	Dublin Unified School District	Dublin Elementary	10,177	10,796	7,286	6,885	8,119	8,653	10,177	10,796	7,286	6,885	8,119	8,653	100%	8,653	**19.9**

Attachment B
Dublin Recycled Water Expansion Project
Potential Recycled Water Customers Demands

Customer ID	Meter ID	Customer	Description	Address	Water Use	Serial #	Eden Account Number	Meter Size Inches	Account Status	Category A: Excluded B: Irrig. Meter C: Mixed Use D: New	Reason Excluded [Category A]	Seasonal Demand Pattern? [Category C]	Include as Potential RW Demand?
37	145	Dublin Unified School District	Nielsen Elementary	7500 Amarillo Rd	Mixed	68472721	03-21-440030-000	4	Active	C	-	Y	**Y**
37	146	Dublin Unified School District	Nielsen Elementary	7500 Amarillo Rd	Irrigation	67202718-Deduct	03-21-440030-000	3	Active	A	Incl. in Meter 145	-	N
38	147	FCI Dublin	Prison	6th St Bldg 920 (CA National Guard)	Mixed	65400905	05-38-400705-001	2	Active	C	-	Y	**Y**
38	148	FCI Dublin	Prison	6th St Bldg 960 (CA National Guard)	Domestic	71374160	05-38-737416-000	3	Active	C	-	N	N
38	149	FCI Dublin	Prison	8th Monroe Camp Parks Barracks C1	Domestic	64140309	06-99-000008-000	2	Active	C	-	N	N
38	150	FCI Dublin	Prison	8th St - In Front Of Unicor	Domestic	67250643	05-38-250643-000	6	Active	C	-	N	N
38	151	FCI Dublin	Prison	989 8th St	Irrigation	58634715	05-38-634715-001	1.5	Active	B	-	-	**Y**
38	152	FCI Dublin	Prison	Barracks in Front of C4	Domestic	67523559	05-38-523559-001	2	Active	C	-	N	N
38	153	FCI Dublin	Prison	Bldg 973, 8th St & Keppler	Irrigation	64140332	05-38-140332-000	2	Closed	A	Closed	-	N
38	154	FCI Dublin	Prison	Camp Parks Womens Barracks C2	Domestic	67523562	06-99-000080-001	2	Active	C	-	N	N
38	155	FCI Dublin	Prison	FCI Admin Bldg, Goodfellow St	Domestic	57654316	06-99-654316-000	1	Active	C	-	N	N
38	156	FCI Dublin	Prison	FCI Behind Trailer Park	Mixed	67250626	06-99-035055-000	3	Active	C	-	Y	**Y**
38	157	FCI Dublin	Prison	FCI Garage	Domestic	31923899	06-99-654321-000	2	Closed	A	Closed	-	N
38	158	FCI Dublin	Prison	FCI Rear Gate	Domestic	67823958	06-99-654318-000	8	Active	C	-	N	N
38	159	FCI Dublin	Prison	FCI Sort Goodfellow Ave	Domestic	57654317	06-99-654317-000	1	Active	C	-	N	N
38	160	FCI Dublin	Prison	FCI Tool Yard	Domestic	58678837	05-38-678837-001	0.75	Closed	A	Closed	-	N
38	161	FCI Dublin	Prison	FCI Training Ctr Irrig	Irrigation	01415241	06-99-415241-000	1.5	Active	B	-	-	**Y**
38	162	FCI Dublin	Prison	FCI Training Ctr, Goodfellow & 8th	Domestic	57939471	06-99-939477-000	1	Active	C	-	N	N
38	163	FCI Dublin	Prison	FCI Visitor Center	Domestic	58678340	05-38-678840-001	0.75	Closed	A	Closed	-	N
38	164	FCI Dublin	Prison	FCI Warehouse	Domestic	98485988	06-99-654320-000	2	Closed	A	Closed	-	N
38	165	FCI Dublin	Prison	FDC Loop at 8th Street	Mixed	67202844	06-99-654319-000	8	Active	C	-	Y	**Y**
38	166	FCI Dublin	Prison	Park @ FCI 8th St	Irrigation	59210326	05-38-210326-000	1.5	Closed	A	Closed	-	N
38	167	FCI Dublin	Prison	Unicore	Domestic	009752	06-99-654322-000	2	Closed	A	Closed	-	N
39	168	Frankie Johnnie & Luigi Too	Restaurant	11891 Dublin Blvd	Domestic	69127114	03-21-300090-000	1	Active	C	-	N	N
39	169	Frankie Johnnie & Luigi Too	Restaurant	11891 Dublin Blvd	Irrigation	65313123	03-21-301070-000	0.75	Active	B	-	-	**Y**
40	170	Heritage Park Office Center	Commercial	11875 Dublin Blvd	Domestic	65849961	03-21-297070-000	1.5	Active	C	-	N	N
40	171	Heritage Park Office Center	Commercial	11875 Dublin Blvd	Irrigation	67202575	03-21-298050-000	2	Active	B	-	-	**Y**
41	172	Hexcel Corp	Commercial	11711 Dublin Blvd	Mixed	68472484	03-21-283070-000	2	Active	C	-	Y	**Y**
42	173	John Knox Church	Church	7421 Amarillo Rd	Mixed	60919099	03-21-439050-000	1.5	Active	C	-	Y	**Y**
43	174	McNamaras Steak Chop House	Restaurant	7400 San Ramon Rd	Domestic	61954174	03-21-250150-002	2	Active	C	-	N	N
43	175	McNamaras Steak Chop House	Restaurant	7400 San Ramon Rd	Irrigation	64180940	03-21-250060-002	1	Active	B	-	-	**Y**
44	176	Michael Perkins (Commercial)	Commercial	7370 San Ramon Rd	Mixed	69683848	03-21-251040-001	0.625	Active	C	-	Y	**Y**
45	177	Public Storage	Commercial	7420 San Ramon Rd	Domestic	64180953	03-21-249200-000	1	Active	C	-	N	N
45	178	Public Storage	Commercial	7420 San Ramon Rd	Irrigation	69683847	03-21-249100-000	0.625	Active	B	-	-	**Y**
45	179	Public Storage	Commercial	7440-7460 San Ramon Rd	Domestic	64180969	03-21-249300-000	1	Active	C	-	N	N
46	180	Shell Station	Commercial	11989 Dublin Blvd	Mixed	69127105	03-21-302050-001	1	Active	C	-	Y	**Y**
46	180	Shell Station	Commercial	11989 Dublin Blvd	Mixed	69127105	03-21-302050-000	1	Closed	A	Closed	-	N
47	181	St. Raymonds Church	School/Church	11555 Shannon Ave	Irrigation	67202469	03-21-437090-000	2	Active	B	-	-	**Y**
48	182	The Springs	Residential	7100 San Ramon Rd	Domestic	63016544	03-21-272000-001	3	Active	C	-	N	N
48	183	The Springs	Residential	7100 San Ramon Rd	Irrigation	R1604559	03-21-273080-001	1.5	Active	B	-	-	**Y**
49	184	Town & Country (Chiu Family Trust)	Commercial	7214 San Ramon Rd	Domestic	64284869	03-21-255140-001	2	Active	C	-	N	N
49	185	Town & Country (Chiu Family Trust)	Commercial	7214 San Ramon Rd	Irrigation	69808079	03-21-255230-001	1.5	Active	B	-	-	**Y**
50	186	Tri-Valley SPCA	SPCA	4651 Gleason Dr	Domestic	01604533	06-21-459600-000	1.5	Active	C	-	N	N
51	187	US Bank	Commercial	11805 Dublin Blvd	Domestic	47395867	03-21-284050-000	0.625	Active	C	-	N	N
52	188	Whitney Investments	Commercial	7601 Amador Valley Blvd	Irrigation	69683745	03-21-390010-000	0.625	Active	B	-	-	**Y**

Attachment B
Dublin Recycled Water Expansion Project
Potential Recycled Water Customers Demands

Customer ID	Meter ID	Customer	Description	Metered 2007 CCF/yr	Metered 2008 CCF/yr	Metered 2009 CCF/yr	Metered 2010 CCF/yr	Metered 2011 CCF/yr	Metered Average 2007-2011 CCF/yr	Irrigation Comp. 2007 CCF/yr	Irrigation Comp. 2008 CCF/yr	Irrigation Comp. 2009 CCF/yr	Irrigation Comp. 2010 CCF/yr	Irrigation Comp. 2011 CCF/yr	Irrigation Comp. Average 2007-2011 CCF/yr	Irrigation Component %	Potential Average RW Demand CCF/yr	Potential Average RW Demand AF/yr
37	145	Dublin Unified School District	Nielsen Elementary	6,400	8,185	5,758	4,818	5,683	6,169	6,184	7,897	5,644	4,728	5,599	6,010	97%	6,010	**13.8**
37	146	Dublin Unified School District	Nielsen Elementary	5,817	5,350	3,940	3,089	3,867	4,413	-	-	-	-	-	-	-	-	**-**
38	147	FCI Dublin	Prison	-	-	-	-	421	421	-	-	-	-	373	373	89%	373	**1.0**
38	148	FCI Dublin	Prison	-	-	-	-	409	409	-	-	-	-	-	-	-	-	**-**
38	149	FCI Dublin	Prison	4780	6749	7252	5903	6492	6,235	-	-	-	-	-	-	-	-	**-**
38	150	FCI Dublin	Prison	-	1,719	528	496	466	802	-	-	-	-	-	-	-	-	**-**
38	151	FCI Dublin	Prison	1,045	1,014	218	17	23	463	1,045	1,014	218	17	23	463	100%	463	**1.1**
38	152	FCI Dublin	Prison	2,190	6,637	6,244	5,907	6,316	5,459	-	-	-	-	-	-	-	-	**-**
38	153	FCI Dublin	Prison	182	381	36	2	0	120	-	-	-	-	-	-	-	-	**-**
38	154	FCI Dublin	Prison	5452	5821	4912	4405	4763	5,071	-	-	-	-	-	-	-	-	**-**
38	155	FCI Dublin	Prison	78	33	9	19	31	34	-	-	-	-	-	-	-	-	**-**
38	156	FCI Dublin	Prison	6,635	6,254	4,435	3,608	3,184	4,823	2,879	1,856	1,915	1,160	2,218	2,006	42%	2,006	**4.6**
38	157	FCI Dublin	Prison	157	222	38	-	-	139	-	-	-	-	-	-	-	-	**-**
38	158	FCI Dublin	Prison	94,622	68,039	57,555	47,321	33,062	60,120	-	-	-	-	-	-	-	-	**-**
38	159	FCI Dublin	Prison	177	56	17	3	4	51	-	-	-	-	-	-	-	-	**-**
38	160	FCI Dublin	Prison	368	1,371	2,083	21	0	769	-	-	-	-	-	-	-	-	**-**
38	161	FCI Dublin	Prison	1,659	738	98	45	35	515	1,659	738	98	45	35	515	100%	515	**1.2**
38	162	FCI Dublin	Prison	935	222	52	28	22	252	-	-	-	-	-	-	-	-	**-**
38	163	FCI Dublin	Prison	223	277	115	100	101	163	-	-	-	-	-	-	-	-	**-**
38	164	FCI Dublin	Prison	223	304	66	-	-	198	-	-	-	-	-	-	-	-	**-**
38	165	FCI Dublin	Prison	24,789	49,089	46,783	57,373	65,207	48,648	15,411	16,389	7,723	39,949	47,297	25,354	52%	25,354	**58.2**
38	166	FCI Dublin	Prison	-	-	30	5	37	24	-	-	-	-	-	-	-	-	**-**
38	167	FCI Dublin	Prison	230	154	10	-	-	131	-	-	-	-	-	-	-	-	**-**
39	168	Frankie Johnnie & Luigi Too	Restaurant	941	815	829	859	971	883	-	-	-	-	-	-	-	-	**-**
39	169	Frankie Johnnie & Luigi Too	Restaurant	591	225	568	377	502	453	591	225	568	377	502	453	100%	453	**1.0**
40	170	Heritage Park Office Center	Commercial	664	575	535	574	586	587	-	-	-	-	-	-	-	-	**-**
40	171	Heritage Park Office Center	Commercial	3732	3339	2271	2070	2207	2,724	3,732	3,339	2,271	2,070	2,207	2,724	100%	2,724	**6.3**
41	172	Hexcel Corp	Commercial	3854	3950	2730	3342	2960	3,367	2,714	3,206	2,094	2,694	2,414	2,624	78%	2,624	**6.0**
42	173	John Knox Church	Church	1,188	1,096	1,264	798	608	991	870	880	934	522	506	742	75%	742	**1.7**
43	174	McNamaras Steak Chop House	Restaurant	818	622	556	732	628	671	-	-	-	-	-	-	-	-	**-**
43	175	McNamaras Steak Chop House	Restaurant	852	603	431	375	400	532	852	603	431	375	400	532	100%	532	**1.2**
44	176	Michael Perkins (Commercial)	Commercial	627	256	353	652	194	416	417	178	275	334	110	263	63%	263	**0.6**
45	177	Public Storage	Commercial	55	45	63	95	98	71	-	-	-	-	-	-	-	-	**-**
45	178	Public Storage	Commercial	-	-	815	700	797	771	-	-	815	700	797	771	100%	771	**1.8**
45	179	Public Storage	Commercial	315	266	263	266	247	271	-	-	-	-	-	-	-	-	**-**
46	180	Shell Station	Commercial	830	1502	963	389	224	782	662	422	819	281	116	460	59%	460	**1.1**
46	180	Shell Station	Commercial	830	1502	963	389	224	782	-	-	-	-	-	-	-	-	**-**
47	181	St. Raymonds Church	School/Church	3,935	3,381	3,220	3,366	3,421	3,465	3,935	3,381	3,220	3,366	3,421	3,465	100%	3,465	**8.0**
48	182	The Springs	Residential	6424	7403	5973	7179	6394	6,675	-	-	-	-	-	-	-	-	**-**
48	183	The Springs	Residential	3009	5003	3842	3341	2730	3,585	3,009	5,003	3,842	3,341	2,730	3,585	100%	3,585	**8.2**
49	184	Town & Country (Chiu Family Trust)	Commercial	2003	2832	3234	5790	5064	3,785	-	-	-	-	-	-	-	-	**-**
49	185	Town & Country (Chiu Family Trust)	Commercial	2872	2217	2047	1829	1632	2,119	2,872	2,217	2,047	1,829	1,632	2,119	100%	2,119	**4.9**
50	186	Tri-Valley SPCA	SPCA	390	341	422	527	641	464	-	-	-	-	-	-	-	-	**-**
51	187	US Bank	Commercial	23	23	19	16	29	22	-	-	-	-	-	-	-	-	**-**
52	188	Whitney Investments	Commercial	654	620	432	433	356	499	654	620	432	433	356	499	100%	499	**1.1**
																Total:	**198,426**	**455.5**
																Say:		**456**

ATTACHMENT C
Dublin Crossing Development Demand

Dublin Crossing Development Demand

Background

The Dublin Crossing is a planned mixed-use development in eastern Dublin. Although considered an ultimate demand and therefore not included in the demand estimate presented above, the estimated demand for the Dublin Crossing development has been identified as a large demand and is presented here for production and distribution facility sizing considerations

The planned Dublin Crossing development is summarized in the following description from the City of Dublin website (http://dublinca.gov/index.aspx?NID=202, accessed March 2012):

> "In April of 2003 the Department of the Army, Army Reserve Division requested an amendment to the City of Dublin General Plan for approximately 180 acres of land located on Camp Parks (formerly known as the Parks Reserve Forces Training Area). The property is currently designated Public Lands and the Army proposes a combination of commercial retail, office and residential uses…The Camp Parks Real Property Exchange/Dublin Crossing project provides the Army with an opportunity to obtain much needed facilities through the exchange of 180 acres of land from Federal ownership to private ownership for development of commercial retail, office and residential uses. In return, Camp Parks would receive new facilities at a value commensurate with the value of the exchanged land."

The City of Dublin is preparing the *Dublin Crossing Specific Plan* for the development. The Specific Plan and updates on the planned development are summarized in the following description from the City of Dublin website (http://dublinca.gov/index.aspx?NID=202, accessed September 2013):

> "The Dublin Crossing Specific Plan is a plan for the orderly development of approximately 189 acres in the City of Dublin. The project area includes 8.7 acres owned by Alameda County Surplus Property Authority, an 8.9 acre parcel owned by NASA, and a portion of the 2,485-acre Camp Parks Reserve Forces Training Area (Camp Parks) in the center of Dublin, north of Interstate 580 and Dublin Boulevard. The Specific Plan addresses the future development of the project area, which includes demolition of the existing buildings and other improvements on the site and construction of a residential mixed-use project with up to 1,995 single- and multi-family residential units; up to 200,000 square feet of retail, office and/or commercial uses; a 30 acre Community Park; a 5 acre Neighborhood Park, and a 12 acre elementary school site to serve up to 900 students."

At the time of this Market Survey, the City has not finalized the *Dublin Crossing Specific Plan*. The estimated irrigation demand is based on information from the *Draft Dublin Crossing Specific Plan* (Draft Specific Plan), dated June 2013.

Recycled Water Demand Estimate

The Draft Specific Plan describes the various land use districts that are being planned for the development. The following excerpt from the Draft Specific Plan, Section 2.5.4 - Recycled Water, describes the planned use of recycled water for the development:

> "Per DSRSD Ordinance 301, the Specific Plan area is required to connect to recycled water for landscaping, except for single family residential uses that do not have landscaping maintained in common. The Specific Plan area will be served by recycled water facilities for public roadways, schools, parks, commercial, and multi-family residential landscape irrigation."

The various land use districts and acreages are summarized in the Draft Specific Plan, Table 2-1: Land Uses. The Draft Specific Plan does not specify the split between private landscaping and common landscaping for the residential units. To develop the recycled water demand estimate, it is assumed that 50% of the Lower Density Residential land use, 80% of the Medium Density Residential land use, and 100% of the Mixed Use and Commercial/Residential land uses will consist of common landscaping that will be served by recycled water.

To estimate the potential recycled water demand for the Dublin Crossing development, the irrigation demand for the common area landscaping was estimated for each land use. The Common Landscape Area for each land use area was estimated by multiplying the land use area by the percent common landscaping for the land use area. The Common Area Irrigation Demand for each land use area was estimated by multiplying the Common Landscape Area by the assumed annual average irrigation rate. The total Common Area Irrigation Demand for the development was calculated by totaling the individual Common Area Irrigation Demands for each land use. The estimated Common Area Irrigation Demand for the proposed Dublin Crossing development is shown in Table C-1.

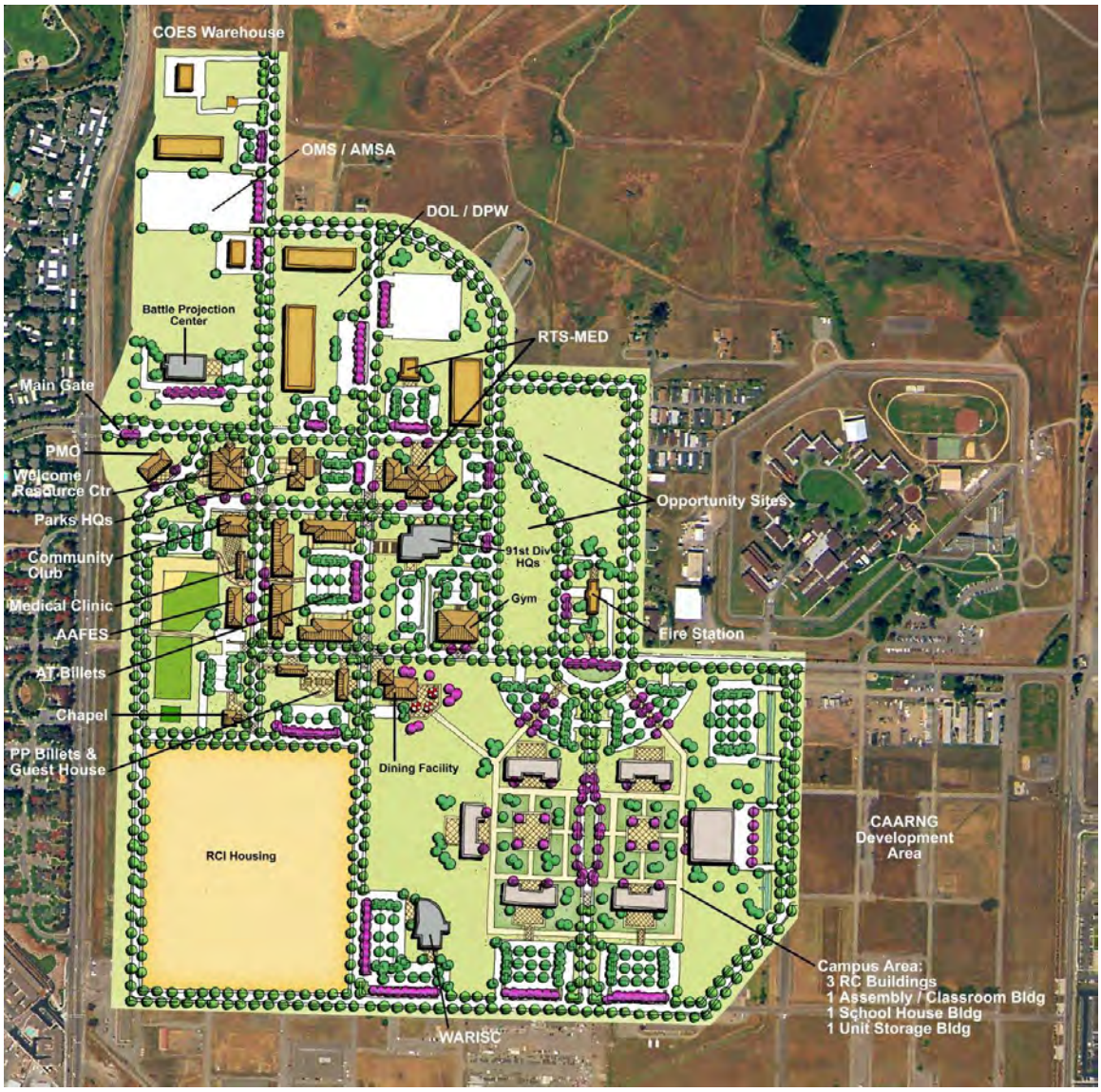
The Dublin Crossing development is in the late stages of the planning phase but there remains the potential for changes in the land use mix by time the development is completed. Possible changes include reducing the amount of park space, especially the Parks (Useable), Parkland, and School spaces which together account for approximately 70% of the current common area irrigation demand estimate. In addition, the assumed irrigation rate used is based on 100% turf, and the final landscaping mix will certainly include a variety of plants that require less water. Therefore, the estimated common area irrigation demand of 190 AF/yr is considered conservative (i.e., high) for facility sizing.

Table C-1: Dublin Crossing Common Area Irrigation Demand Estimate				
Land Use[1]	Total Area (ac)[1]	Percent Common Landscaping[2]	Common Landscape Area (ac)	Irrigation Demand (AF/yr)[3]
Residential				
Lower Density	41.9	10%[4]	4.2	16.8
Medium Density	46.5	8%[5]	3.7	14.8
Mixed Use				
Commercial/Residential	8.5	5%	0.4	1.6
Parkland	5.0	80%	4.0	16.0
Commercial/Residential				
Medium Density Residential	9.1	10%	0.9	3.6
High Density Residential	9.9	5%	0.5	2.0
Parks (Useable)	30.0	80%	24.0	96.0
Open Space	2.6	0%	0.0	0.0
School	12.0	50%	6.0	24.0
Roadways, Utilities, Infrastructure	23.8	15%	3.6	14.4
Totals	**189.0**		**47.3**	**190 (Rounded)**

1. From the *Draft Dublin Crossing Specific Plan*, Table 2-1: Land Use Summary.
2. Assumed values based on estimates for similar local land use types. Unless otherwise noted, assume 100% of the area uses common landscaping.
3. Assume Annual Average Irrigation Rate of 48 in/yr (DSRSD's nominal irrigation demand for turf, per Stan Kolodzie, DSRSD, 1/12/12 email correspondence).
4. Assume 20% of the land use district consists of landscaping and 50% of the area uses common landscaping, for a net percent landscaping value of 10%.
5. Assume 10% of the land use district consists of landscaping and 80% of the area uses common landscaping, for a net percent landscaping value of 8%.

ATTACHMENT D
Camp Parks Cantonment Area

The following image was taken from the cover page of "Execution Plan: Parks RFTA Proposed Future Development Plan, May 2004."



Project 7: Calistoga Recycled Water Storage Facility

1. City of Calistoga, 2014a. Calculations and Estimates of Primary and Secondary Benefits completed by Senior Civil Engineer.
2. City of Calistoga, 2014b. Stage II Water Emergency declaration – Resolution 2014-052.
3. City of Calistoga, 2014c. Notice of Exemption for Calistoga Recycled Water Storage Pond Expansion Project. June 14.
4. City of Calistoga, Municipal Code Section 3.32.
5. Kirn, M., 2013. Letter from City of Calistoga to San Francisco Bay Regional Water Quality Control Board, dated December 10, 2013.
6. Larry Walker Associates, 2008. Recycled Water Strategic Plan Technical Memorandum No. 3: Recycled Water Disposal/Storage Scenarios to Meet Buildout Conditions, pp. 8-12. May 2008.
7. Larry Walker Associates, 2013. Bypass Alternatives Investigation Report. Prepared for City of Calistoga.
8. Rayner, Derek, 2014. E-mail communication.

STAEDTLER® No. 937 811E Engineer's Computation Pad

I. Purpose: To determine approximate annual increase in recycled water use.

II. Assumptions:

A. See 6/5/14 table of historic recycled use

III. Calcs:

A. 2005 123 AF
2014 209 AF
Given & $y = 3.9179x - 7695.3$

2005 → $y = 3.9179(2005) - 7695 = 160$ AF

2014 → $y = 3.9179(2014) - 7695 = 196$ AF

$\left(\frac{196-160}{160}\right) * 100 = 22\%$ over 9 yrs

$22/9 = \underline{2.5\%}$ increase

STAEDTLER® No. 937 811E Engineer's Computation Pad

I. Purpose: To determine increase in recycled water use w/ addition of New 20MG pond.

II. Assumptions:

A. Annual Recycle water reports (see Attached)

B. Discussion's w/ Warren Schanstrum Operations Superintendant for WWTP & recycled water System (see attached)

III. Calc's:

A. Average recycle use from 2005 to 2014 (without spray field or bypass qty's)

Avg = 57 MG/yr OR 176 AF/yr.

B. Increase in Use last year due to drought

$$\left(\frac{209 - 168}{168}\right) 100 = 24\% \text{ increase}$$

C. 2013 recycled water use was 209 AF

D. Assume 5% increase from this w/ new customers
209 * 0.05 = 10.5 AFY

E. Assume 5% increase of increased use since going from 8 months average on to 12 months always on, so 4 more months of use, granted during winter very small infrequent use...

$$\frac{176}{12} = 14.7 \text{ Af/month} * 0.25 = 3.5 * 4 = 14 \text{ AFY}$$

OR

209 * 5% = 10.5 AFY

IV. Conclusion?

New recycle water use = New customers + Increase fro continuous operation

→ 21AFY = 10.5 + 10.5

*Should confirm new customers # w/ Indian springs Dog Park & New residential parcel coming online...

STAEDTLER® No. 937 811E Engineer's Computation Pad

I. Purpose: Projected NEW recycled water users

II. Assumptions:

A. Warren email dated 6-4-14 (Residential connection)

B. North Bay Irrigation Calc 6-5-14

C. Dog Park Irrigation Calcs

III. Calcs:

A. New Residential (domestic water offset):

2,500 sf of lawn irrigation

4 gal/sf/yr * 2,500 sf = 102,500 gal/yr.
OR
0.3 AFY

B. North Bay Irrig. (Indian Springs) Groundwater offset:

⊕ 1st - 2 years full water cycle
after this lawn irrigation only

1. Summer Demand:

Lawn 3x per week @ 36,000 gpd = 108,000 gpw
OR
0.47 MG/month

Drip 2x per week @ 9,000 gpd = 18,000 gpw
OR
0.08 MG/month

Σ = 0.55 MG/month

Summer total 3 months = 1.7 MG

2. Spring/Fall = 50% of Summer Demands for 6 months

6 months x (0.55 MG/month) 0.5 = 1.7 MG

3. Winter = 25% of Summer

STAEDTLER® Engineer's Computation Pad No. 937 914E

III. Calcs (cont...)

3. (cont...) winter 3 months @ 25% summer demand

$3 * 0.25 (0.55) = 0.41 MG$

4. Total Annual = winter 0.41 MG + spring/fall 1.7 + summer 1.7 = 3.8 MG

OR

11.7 AFY

C. Dog Park

10,675 sf lawn * 41 gal/sf/yr = 0.44 MG

OR

1.4 AF

D. Total New users:

1.4 + 11.7 + 0.3 = 13.4 AFY ← Total New use

STAEDTLER® No. 977 914E Engineer's Computation Pad

per tdcon w/ Warren on June 5, 2014 reasonable to assume w/ new pond we can run recycled water 365 days per year for at least 5% increase in use + new customer of another 5%

only 7 to 8 months of recycled water on time now

Derek Rayner

From: Warren Schenstrom
Sent: Wednesday, June 04, 2014 3:15 PM
To: Derek Rayner
Cc: Michael Kirn
Subject: RE: Prop 84, Round 3 - Grant Application

Good Afternoon Derek,

I know that you are on a tight schedule. Here is the information you requested – with the opportunity for a follow up.....

1) There is a new reclaimed water application by Robert MacDuff. His volume request is not reasonable (ie 370,000 gallons annually for 2500 sq ft of lawn). A more realistic volume would be at least an order of magnitude less or 37,000 gallons.

2) Standard observations will be conducted on a daily basis. These will mostly consist of a berm inspection and a water level recording. There will be annual spraying of the banks to keep them clear of weeds. If a leak is observed, the first response will be to contain the water, isolate the pond, lower the level in the pond to a safe elevation, determine cause of leak and then conduct repairs. A report to the RWQCB is only necessary if there is a spill.

3) The volume of 20 MG is fine - conservative. This is approximately the volume disposed on fields 2,3 over the course of a year (see item 4).

4) The reclaimed volume of 131 MG for 2013 is correct. Of that volume 20 MG was applied to irrigation fields 2,3. Another 42 MG was applied to the Fox fields (of that total, 27 MG as an approved bypass.....). The remainder or 69 MG was pumped to the reclaimed water users in town. The estimate of increased recycled water use is fine – conservative.

5) Reducing river discharge by 20 MG annually would reduce loading to the Napa River by the following; BOD 379 kg/yr, TSS 341 kg/yr, Total N 1514 kg/yr.

6) There is no additional monitoring or reporting required (other than previously described in item 2) by the Regional Board for new the pond – other than maintaining a minimum of a 2 foot freeboard. All effluent monitoring is completed at the WWTP.

Let me know if you need additional information.

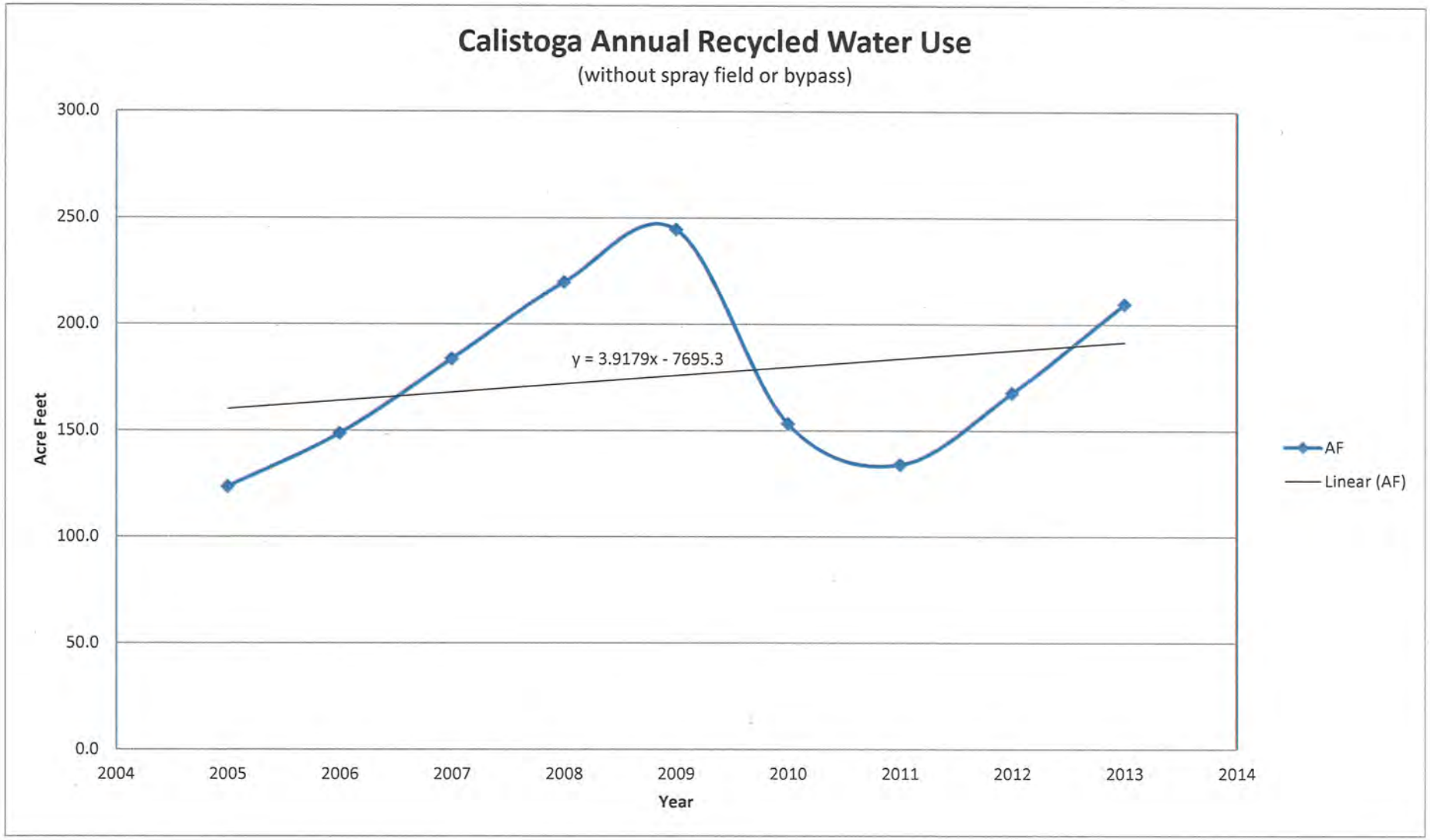
Warren Schenstrom
Water Systems Superintendent
City of Calistoga

From: Derek Rayner
Sent: Wednesday, June 04, 2014 12:04 PM
To: Warren Schenstrom
Cc: Michael Kirn
Subject: Prop 84, Round 3 - Grant Application

City of Calistoga Historic Recycled Water Use

By: djr
Date: 6/5/2014

	Recycled Water Use in MG (without Spray Field or Bypass Amounts)							Total	
Year	Park	Golf Courses	Green Belts	Schools	Truck Pick ups	Commercial	Residential	MG	AF
2005	4.2	22.2	3.7	8.6	1.5	0	0	40.2	123.4
2006	4.4	28.2	4.7	8.9	2.2	0	0	48.4	148.5
2007	4.8	34.9	5.7	9.9	4.5	0	0	59.8	183.5
2008	6.5	40.4	0	11.4	2.2	9.7	1.3	71.5	219.4
2009	7.8	46.4	0	10.2	1.1	11.9	2.2	79.6	244.3
2010	5.4	25.9	0	7.9	0.9	8.2	1.6	49.9	153.1
2011	5.2	19.5	0	8.9	0.2	8.4	1.4	43.6	133.8
2012	6.6	27	0	7.6	0.7	11.2	1.5	54.6	167.6
2013	7.1	34.2	0	9.9	2.4	11.0	3.6	68.2	209.3
Max=	7.8	46.4	5.7	11.4	4.5	11.9	3.6	79.6	244.3
Min=	4.2	19.5	0	7.6	0.2	0	0	40.2	123.4
Avg=	5.8	31.0	1.6	9.3	1.7	6.7	1.3	57.3	175.9

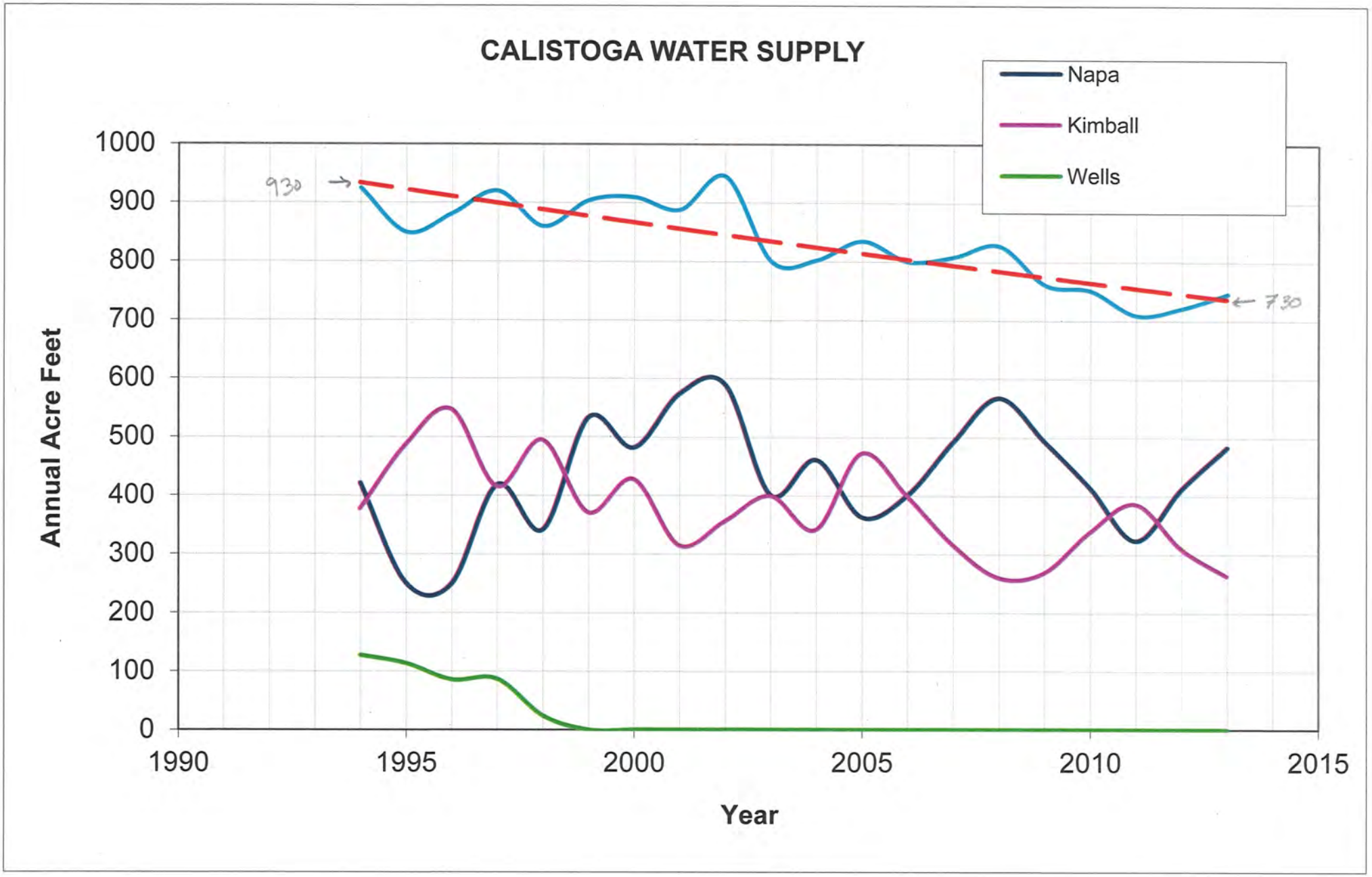

Calistoga Annual Recycled Water Use
(without spray field or bypass)
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Acre Feet
y = 3.9179x - 7695.3
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Year
AF
Linear (AF)

Water Useage

Date: 2/3/2014
by: djr

		Source (AF)				
Item	Year	Napa	Kimball	Wells	Total Supply (AF)	Annual (HCF)
1	1994	420.7	376.4	127.1	924.2	402,556
2	1995	250.1	485.7	113.2	849.0	369,801
3	1996	248.8	546.7	85.5	881.0	383,739
4	1997	418.3	414.9	86.57	919.8	400,626
5	1998	341.3	494.3	23.9	859.5	374,374
6	1999	533.05	370.72	0	903.8	393,657
7	2000	481.8	427.46	0	909.3	396,048
8	2001	573.64	314.29	0	887.9	386,757
9	2002	589.42	355.27	0	944.7	411,481
10	2003	400.95	399.16	0	800.1	348,506
11	2004	461.22	341.04	0	802.3	349,442
12	2005	363	471.62	0	834.6	363,537
13	2006	400.95	399.16	0	800.1	348,506
14	2007	491.9	315.7	0	807.6	351,768
15	2008	567.13	259.63	0	826.8	360,114
16	2009	493.2	267.74	0	760.9	331,444
17	2010	413.7	337.3	0	751.0	327,115
18	2011	323.29	385.7	0	709.0	308,816
19	2012	412.0	309.4	0	721.4	314,222
20	2013	483.5	262.63	0	746.1	324,976
	Max =	589.4	546.7	127.1	944.7	411480.5
	Min =	248.8	259.6	0.0	709.0	308816.2
	Avg =	430.8	382.7	21.8	841.7	367127.0

Percent Redution over 20 years	19.3%
Percent Reduction per year	0.97%


CALISTOGA WATER SUPPLY
Napa
Kimball
Wells
930
730
Annual Acre Feet
1000
900
800
700
600
500
400
300
200
100
0
1990
1995
2000
2005
2010
2015
Year

Groundwater offset

NORTH BAY
LANDSCAPE MANAGEMENT, INC.

444 Payran St. Petaluma, CA 94953

June 5, 2014

Attn: Daniel Merchant

Re: Indian Springs Resort & Spa: Irrigation Water Calculations

Danny,

Please find our estimate water usage breakdown below.

Estimated Water Usage

1" Valves – Dripline and Emitters:

- 30 Valves x 10 GPM = 300 GPM x 30 Minute Run Times = 9,000 Gallons/Cycle

1" Valves- Lawn or Meadow Mix

- 12 Valves x 10 GPM = 120 GPM x 20 Minute Run Times = 2,400 Gallons/Cycle

1 ½" Valves- Lawn or Meadow Mix

- 32 Valves x 35 GPM = 1,120 GPM x 30 Minute Run Times = 33,600 Gallons/Cycle

1- Watering Cycle Total = 45,000/ Gallons

Note

**These calculations are based on optimum run times. The Valve counts and sizes may vary during construction. These are only estimates based on current scope/extend of work 6-2-14. **

**One watering cycle is each valve watering for its allotted run time within a 24 hr. period of time. **

STAEDTLER® No. 937 811E Engineer's Computation Pad

I. Purpose:

To determine annual irrigation for Loguy Park (turf irrigation demand)

II. References / Assumptions:

A. Annual Reclaimed Demand 2013 = 5,974,000 gal/yr for Loguy irrigation

B. Area of Loguy Turf = 126,910 sf (see Attached) + Pool 17,160 = 144,070

C. Monthly reclaimed water meter Reads for Loguy

III. Calc's:

A. Annual Turf Demand = 5,974,000 gal/yr / ~~126,910~~ 144,070 sf = ~~47~~ 41 gal/sf/yr.

B. By month Demands (See attached spreadsheet) → over

Month	Gallons	Days in Month	Daily Demand
Jan	0		
Feb	0		
March	57,000		
April	241,000		
May	691,000		
June	734,000		
July	1,202,000		
August	1,140,000		
Sept	727,000		
Oct	651,000		
Nov	285,000		
Dec	246,000		

IV. Conclusions:

See spreadsheet

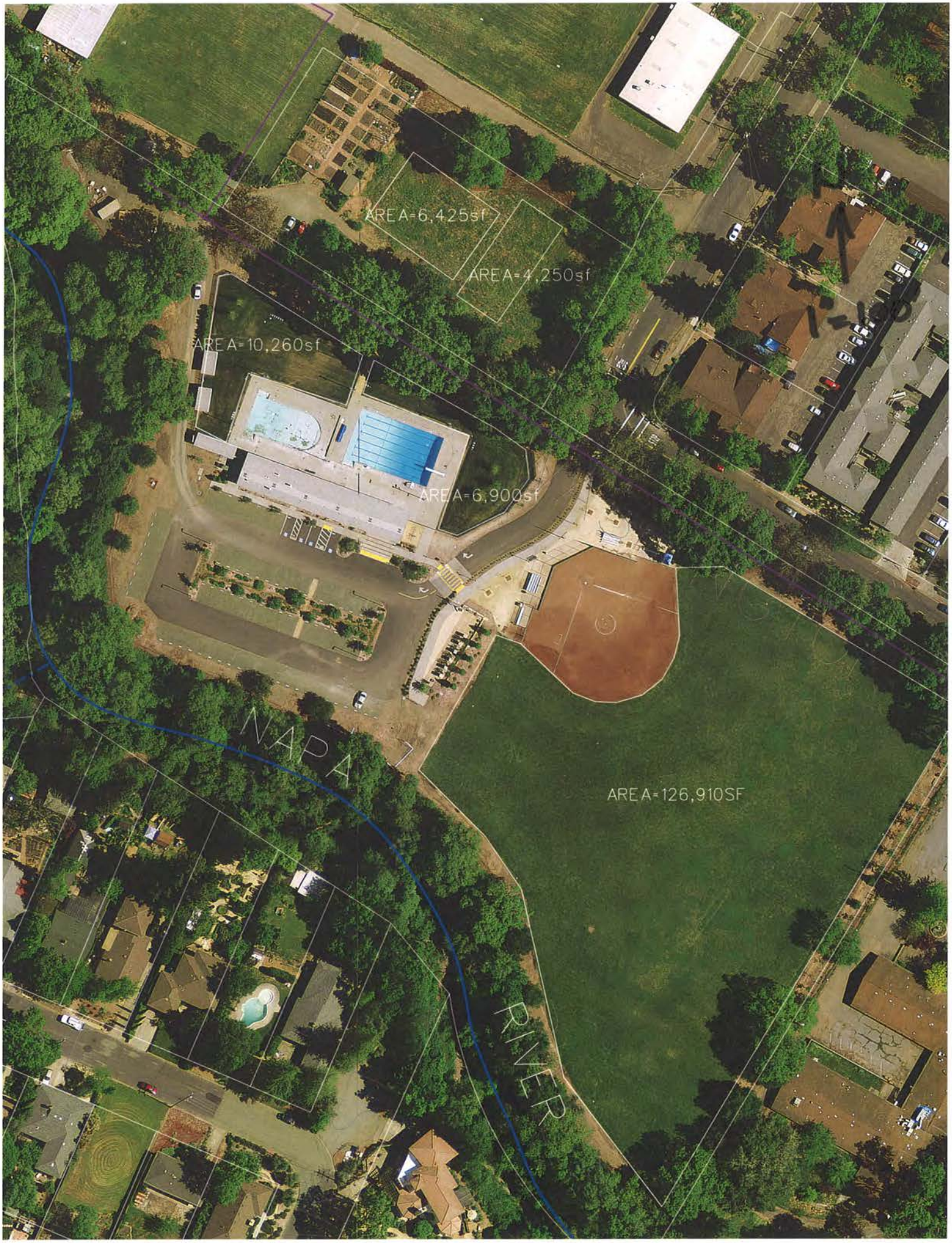
Annual Use = ~~47~~ 41 gal/sf/yr.

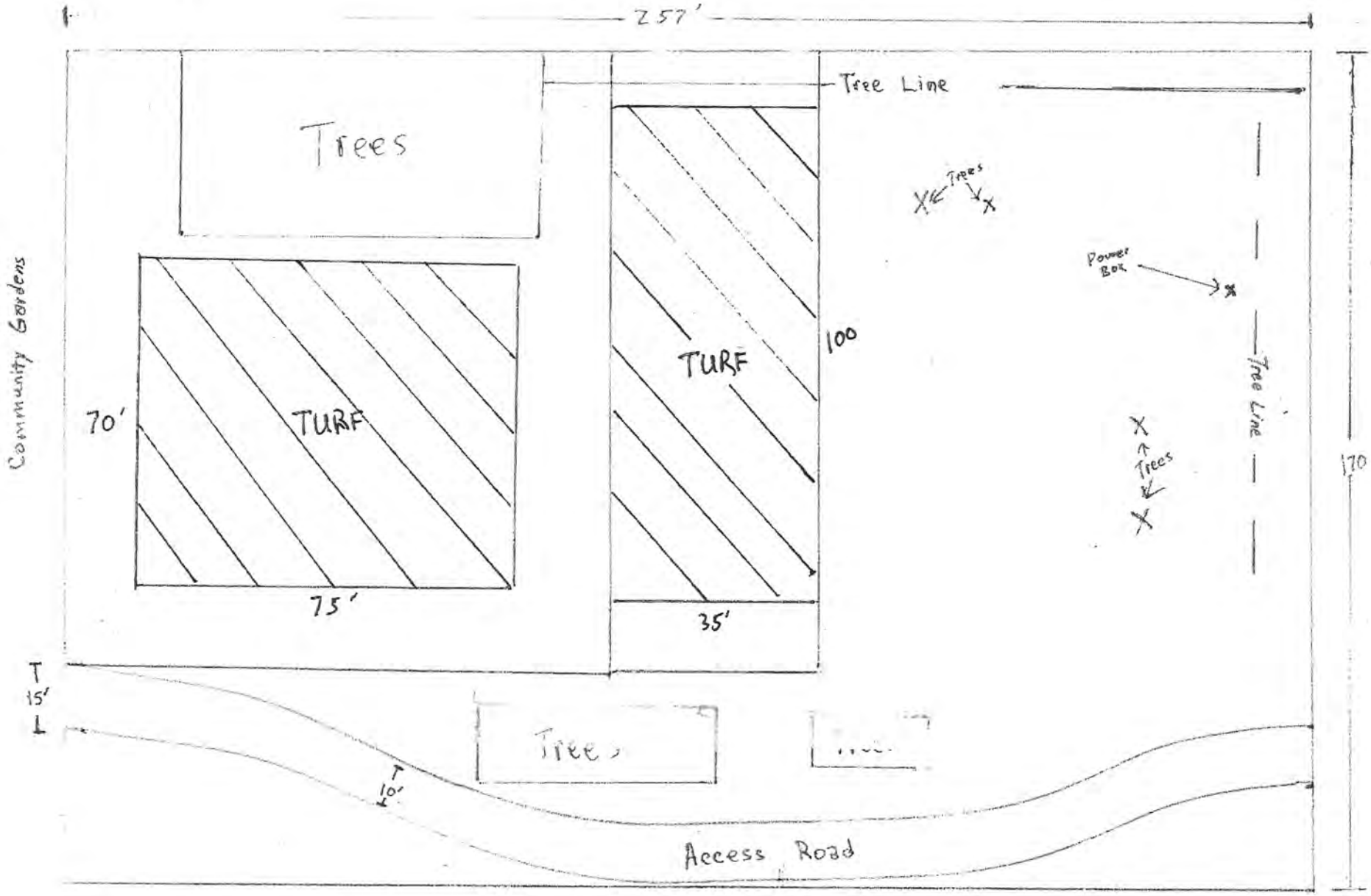
Max Day Use = ~~0.31~~ 0.27 gal/sf/day

Reclaimed Water Use For Logvy Park
1745 Washington St.
Area of Turf = 144,070 sf

2013 Recorded Reclaimed Water Use

Month	*Use MG*	*Use (Gal/Month)*	*Days/Month*	*Daily Demand (gal/day)*	**Irrigation Demand (gal/day/sf)**
Jan	0.000	-	31	-	-
Feb	0.000	-	28	-	-
March	0.057	57,000	31	1,839	0.0128
April	0.241	241,000	30	8,033	0.0558
May	0.691	691,000	31	22,290	0.1547
June	0.734	734,000	30	24,467	0.1698
July	1.202	1,202,000	31	***38,774***	***0.2691***
August	1.140	1,140,000	31	36,774	0.2553
September	0.727	727,000	30	24,233	0.1682
October	0.651	651,000	31	21,000	0.1458
November	0.285	285,000	30	9,500	0.0659
December	0.246	246,000	31	7,935	0.0551
Total=	5.974	5,974,000	365		


AREA=6,425sf
AREA=4,250sf
AREA=10,260sf
AREA=6,900sf
AREA=126,910SF
NAPA
RIVER


257'
Tree Line
Trees
Trees
Power Box
TURF
100
TURF
70'
75'
35'
Tree Line
Trees
170
Community Gardens
15'
Trees
10'
Access Road

City of Calistoga
Recycled Water Program
Monthly Summary of Recycled Water Usage
Calender Year 2013
Table 1

MG units

	APPLICANT	USE SITE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Site Total	% of Reuse
1	CJUSD - High School	1608 Lake St.	0.000	0.000	0.155	0.283	1.007	0.983	1.312	1.041	0.669	0.582	0.270	0.167	6.469	4.9
2	CJUSD - Elementary School	1327 Berry St.	0.000	0.008	0.218	0.303	0.442	0.515	0.727	0.545	0.266	0.299	0.119	0.024	3.466	2.6
3	La Pradera Apartments	38 Brannan St.	0.000	0.002	0.004	0.160	0.223	0.219	0.510	0.515	0.503	0.190	0.309	0.004	2.639	2.0
4	Palisades Apartments	40 Brannon St.	0.000	0.000	0.067	0.043	0.051	0.066	0.041	0.140	0.100	0.147	0.070	0.025	0.750	0.6
5	Presbyterian Church	1407 Third St.	0.000	0.000	0.000	0.003	0.015	0.012	0.044	0.027	0.016	0.023	0.003	0.000	0.143	0.1
6	Cottage Grove Inn	1711 Lincoln Ave.	0.000	0.003	0.015	0.017	0.056	0.062	0.083	0.057	0.036	0.075	0.045	0.039	0.488	0.4
7	Stevenson Manor Inn	1830 Lincoln Ave.	0.000	0.002	0.000	0.010	0.034	0.065	0.044	0.018	0.015	0.018	0.007	0.009	0.222	0.2
8	Napa County Fairgrounds	1435 N. Oak St.	0.000	0.211	0.440	1.991	4.046	5.557	5.339	6.629	3.052	4.473	2.280	0.197	34.215	26.1
9	Solage Resort & Spa	755 Silverado Trail	0.000	0.016	0.351	0.072	0.034	0.580	0.929	0.916	0.582	0.824	0.452	0.170	4.926	3.8
10	Helmer Residence	345 Silverado Trail	0.000	0.015	0.260	0.134	0.318	0.473	0.717	0.516	0.221	0.579	0.230	0.153	3.616	2.8
11	Calistoga Mineral Water	865 Silverado Trail	0.000	0.000	0.000	0.000	0.315	0.314	0.289	0.309	0.225	0.241	0.068	0.018	1.779	1.4
12	COC- Logvy Comm. Park	1745 Washington St.	0.000	0.000	0.057	0.241	0.691	0.734	1.202	1.140	0.727	0.651	0.285	0.246	5.974	4.6
13	COC- Little League Field	Washington St.	0.000	0.000	0.000	0.000	0.061	0.255	0.199	0.204	0.169	0.141	0.087	0.016	1.132	0.9
14	COC- Fox Property Irrg	Washington St.	0.000	0.035	2.343	13.817	11.702	1.812	3.996	2.906	0.937	2.344	1.197	1.416	42.505	32.4
15	COC- Irrigation Fields 2,3	WWTP	0.000	0.264	2.343	0.934	2.018	3.448	3.444	2.284	1.694	2.246	0.938	0.714	20.327	15.5
16	Treatment Plant Truck-Out	WWTP	0.000	0.001	0.000	0.006	0.124	0.582	0.335	0.387	0.427	0.406	0.127	0.028	2.423	1.8
	Monthly Total		0.000	0.557	6.253	18.014	21.137	15.677	19.211	17.634	9.639	13.239	6.487	3.226	131.074	100.0

COC - City of Calistoga

I. Purpose: To Project Dog Park water use.

II. References:

A. See Logry Calc's (done on 2/20/14)

B. Proposed New lawn is = 10,675 sf

III. Calc's / Conclusions:

A. Projection (see spreadsheet attached)

Annual use = 10,675 sf * ~~47~~ 41 gal/sf/yr = ~~0.502 MG~~ 0.44

Max Daily use = 10,675 sf * ~~0.31~~ 0.27 gal/sf/day = ~~3,310~~ 2,882 gpd

STAEDTLER® No. 937 811E Engineer's Computation Pad

Projected Water Use By Month
Area of Turf= 10,675 sf

Month	Daily Demand (gal/day)	Use (Gal/Month)
Jan	-	-
Feb	-	-
March	136	4,223
April	595	17,857
May	1,652	51,200
June	1,813	54,386
July	2,873	89,063
August	2,725	84,469
September	1,796	53,868
October	1,556	48,236
November	704	21,117
December	588	18,228
	Total =	***442,649*** gallons/year

Derek Rayner

From: Kevin Pottorff <kevin@northbaylandscape.com>
Sent: Friday, June 06, 2014 10:53 AM
To: Derek Rayner
Cc: Willie Black; Daniel Merchant (dannysmp@gmail.com)
Subject: RE: Reclaimed Water Use
Attachments: Indian Springs Resort & Spa- Water Calculations 6-5-14.pdf

Hi Derek,

Please see our optimum water calcs. for Indian Springs Resort & Spa attached.

Spring/Fall: 1- Water Cycle Total Gallons Used= 27,000
Winter: 1- Water Cycle Total Gallons Used= 12,000

These are rough estimates based on our initial valve counts. Please keep in mind that our valve counts may change during the course of construction, but this should be close.

Let me know if you have any questions,
Thanks,

NORTH BAY
LANDSCAPE MANAGEMENT, INC.
Kevin Pottorff T. 707.762.3850
Project Manager F. 707.762.6118

From: Derek Rayner [mailto:DRayner@ci.calistoga.ca.us]
Sent: Friday, June 06, 2014 10:41 AM
To: Kevin Pottorff
Subject: RE: Reclaimed Water Use

Thanks Kevin. This should be good.

Derek Rayner, PE, QSD/P, LEED Green Associate
City of Calistoga | Public Works Department
Senior Civil Engineer| Phone: 707.942.2828
www.ci.calistoga.ca.us

From: Kevin Pottorff [mailto:kevin@northbaylandscape.com]
Sent: Friday, June 06, 2014 9:35 AM
To: Derek Rayner; Willie Black
Cc: Daniel Merchant; paulcoates@PAULCOATESCONSTRUCTION.COM
Subject: RE: Reclaimed Water Use

Hi Derek,

I have water calcs. done that show the water usage at optimum rates that I can send you now. Or you need this broken down per season or will this meet your requirements?

If you need the breakdown I should be able to get it to you by the end of the day.

Please let me know,
Thanks,

NORTH BAY
LANDSCAPE MANAGEMENT, INC.
Kevin Pottorff T. 707.762.3850
Project Manager F. 707.762.6118

From: Derek Rayner [mailto:DRayner@ci.calistoga.ca.us]
Sent: Friday, June 06, 2014 9:26 AM
To: Willie Black; Kevin Pottorff
Cc: Daniel Merchant; paulcoates@PAULCOATESCONSTRUCTION.COM
Subject: RE: Reclaimed Water Use

Willie/Kevin,

If you could let me know some rough numbers for summer, spring/fall, winter recycled water use I would appreciate it. They don't have to be exact, approximations are fine. I would really like to have your numbers by Monday, June 9th. We are utilizing these numbers for a grant application we are putting together. Appreciate anything you can provide me.

Thanks,

Derek Rayner, PE, QSD/P, LEED Green Associate
City of Calistoga | Public Works Department
Senior Civil Engineer| Phone: 707.942.2828
www.ci.calistoga.ca.us

From: Daniel Merchant [mailto:dannysmp@gmail.com]
Sent: Wednesday, June 04, 2014 11:04 AM
To: Derek Rayner; Willie Black; Kevin Pottorff
Cc: paulcoates@PAULCOATESCONSTRUCTION.COM
Subject: Re: Reclaimed Water Use

Derek,

I would be more than happy to help. As you know, we are planting drought tolerant plants so our water use after year two will begin to scale back. I have cc'd our landscapers to see if they can send an estimated weekly dry season usage.

Kevin / Willie, would you guys mind sending us what you anticipate weekly summer usage to be? From there we will be able to run the annual numbers.

Thanks,
Danny

On Wed, Jun 4, 2014 at 10:51 AM, Derek Rayner <DRayner@ci.calistoga.ca.us> wrote:

Hello Danny,

I wanted to ask you for some information regarding Indian Springs projected, reclaimed/recycled water use. The City is going after some Prop 84 Round 3, grant monies for the new 20MG reclaimed pond we are going to build. As part of the grant application we need to justify additional recycle water users demands. As your project is going to be utilizing recycled water from the City in the near future, I would like to know what your latest projections are, for annual recycled water use (volume/year)? If you could let me know I would appreciate your help. I have to submit my information next Wed, June 11th so any volumes you can provide me before than would be much appreciated.

Thank you,

Derek Rayner, PE, QSD/P, LEED Green Associate

City of Calistoga | Public Works Department

Senior Civil Engineer| Phone: 707.942.2828

www.ci.calistoga.ca.us

Louise Harrison

From: Derek Rayner
Sent: Friday, June 06, 2014 12:06 PM
To: Louise Harrison
Subject: FW: Prop 84, Round 3 - Grant Application

Louise,
Here's another attachment for Secondary Benefit/Claimed section

Thanks,

Derek Rayner, PE, QSD/P, LEED Green Associate
City of Calistoga | Public Works Department
Senior Civil Engineer| Phone: 707.942.2828
www.ci.calistoga.ca.us

From: Warren Schenstrom
Sent: Friday, June 06, 2014 11:57 AM
To: Derek Rayner
Subject: RE: Prop 84, Round 3 - Grant Application

Good Morning Derek,

For 2014 (still an opportunity for discharge this fall...)	E1	41.151 MG – below average
	E2	11.362 MG – below average
	Total	52.513 MG
For 2013	E1	15.682 MG !
	E2	0 MG !!
	Total	15.682 MG
For 2012	E1	111.335 MG – a little low, but typical
	E2	41.591 MG – a little low, but typical
	Total	152.926 MG – this is why we favor discharge.....

Warren Schenstrom
Water Systems Superintendent
City of Calistoga

From: Derek Rayner
Sent: Friday, June 06, 2014 11:28 AM
To: Warren Schenstrom
Cc: Michael Kirn; Louise Harrison
Subject: RE: Prop 84, Round 3 - Grant Application

Good Morning Warren,
Can you let me know how much wastewater was annually discharged to the Napa River the last 3-years?

Thanks,

Derek Rayner, PE, QSD/P, LEED Green Associate
City of Calistoga | Public Works Department
Senior Civil Engineer| Phone: 707.942.2828
www.ci.calistoga.ca.us

From: Derek Rayner
Sent: Thursday, June 05, 2014 12:33 PM
To: Warren Schenstrom
Cc: Michael Kirn; Louise Harrison
Subject: RE: Prop 84, Round 3 - Grant Application

Good Afternoon Warren,

Wondering if we can state that with the new 20MG pond we'll be able to serve more recycled water because now with two ponds we can operate two systems at the same time (e.g. treat for river discharge and store in 10MG knowing rains are coming but still supplying recycled from 20MG pond)? I guess what I'm trying to say is, is it going to help operations side of things, so now we can supply recycled water earlier or later into the year because we can operate off the larger recycle pond longer than before since we have a separate 20MG pond? If we could say something like this and possibly quantify more recycled water use because of this it would be very helpful...let me know your thoughts when you have a moment. Maybe easier to discuss this one over a phone call.

Thanks,
Derek

From: Warren Schenstrom
Sent: Wednesday, June 04, 2014 3:15 PM
To: Derek Rayner
Cc: Michael Kirn
Subject: RE: Prop 84, Round 3 - Grant Application

Good Afternoon Derek,

I know that you are on a tight schedule. Here is the information you requested – with the opportunity for a follow up.....

1) There is a new reclaimed water application by Robert MacDuff. His volume request is not reasonable (ie 370,000 gallons annually for 2500 sq ft of lawn). A more realistic volume would be at least an order of magnitude less or 37,000 gallons.

2) Standard observations will be conducted on a daily basis. These will mostly consist of a berm inspection and a water level recording. There will be annual spraying of the banks to keep them clear of weeds. If a leak is observed, the first response will be to contain the water, isolate the pond, lower the level in the pond to a safe elevation, determine cause of leak and then conduct repairs. A report to the RWQCB is only necessary if there is a spill.

3) The volume of 20 MG is fine - conservative. This is approximately the volume disposed on fields 2,3 over the course of a year (see item 4).

4) The reclaimed volume of 131 MG for 2013 is correct. Of that volume 20 MG was applied to irrigation fields 2,3. Another 42 MG was applied to the Fox fields (of that total, 27 MG as an approved bypass.....). The remainder or 69 MG was pumped to the reclaimed water users in town. The estimate of increased recycled water use is fine – conservative.

5) Reducing river discharge by 20 MG annually would reduce loading to the Napa River by the following; BOD 379 kg/yr, TSS 341 kg/yr, Total N 1514 kg/yr.

6) There is no additional monitoring or reporting required (other than previously described in item 2) by the Regional Board for new the pond – other than maintaining a minimum of a 2 foot freeboard. All effluent monitoring is completed at the WWTP.

Let me know if you need additional information.

Warren Schenstrom
Water Systems Superintendent
City of Calistoga

From: Derek Rayner
Sent: Wednesday, June 04, 2014 12:04 PM
To: Warren Schenstrom
Cc: Michael Kirn
Subject: Prop 84, Round 3 - Grant Application

Good Morning Warren,

As discussed, below are items I need your help responding too regarding grant funding for our new 20MG recycled water pond:

1. Any new recycled water user customers applications that you have received in 2014 – I need to know the amounts of projected recycled water use, and would like the page of their application that states this volume scanned in a pdf.
2. Project Operation and Maintenance – a brief description of the O&M planned for the new pond (e.g. how often is it inspected by operations staff, daily weekly, etc...), if leaks are found describe what protocol operations staff follows to fix (something generic is fine like: "leaky pipe is fixed by operations staff with new pipe and backhoe...and then reported to RWQCB through blank....)
3. Reduced discharge to Napa River/Bay in MG/yr – We have assumed 20MG storage, so 20MG/yr – is this too conservative, or should this amount be a higher? Don't want to over shoot but want to be close...
4. Total 2013 Recycled water use – I'm seeing 131MG (or 402AF/yr) in your annual report, is that correct? We are estimating with the new pond we be able to produce another 4% more recycled water use (about 5MG or 15AF annually). We have Indian Springs coming online as well as another residential customer and potentially the dog park. If you think we will increase more than this if the drought continues, please let me know your ballpark (that's realistic).
5. Determine Nutrient Reduction to River/Bay – Estimated Pollution load reduction for BOD, TSS, and Nitrogen in kg/yr
6. Project Monitoring and Reporting – a brief description of the monitoring & reporting that is required by the Regional Water Quality Control Board for the new pond (e.g. how often water quality reporting is done, annual reporting, etc..)

Our deadline to submit is Wed, June 11th , and I will need some time before that to incorporate into their format, so if you could have your responses to me by Tuesday next week, that would be much appreciated. Please let me know if you have any questions or want to discuss anything. Thanks in advance for your help with this...

Thank you,

Derek Rayner, PE, QSD/P, LEED Green Associate

City of Calistoga | Public Works Department
Senior Civil Engineer| Phone: 707.942.2828
www.ci.calistoga.ca.us

Reference 2

RESOLUTION 2014 - 013

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CALISTOGA, COUNTY OF NAPA, STATE OF CALIFORNIA, DECLARING A STAGE II WATER EMERGENCY

WHEREAS, the City of Calistoga obtains its drinking water from the State Water Project (SWP) and its Kimball Reservoir Water Treatment Facility; and

WHEREAS, for the current rain season, the City of Calistoga and most regions of California have experienced unusually low precipitation levels in December 2013 and January 2014; and

WHEREAS, Since October, 2013 the Kimball Reservoir Water Treatment Plant has been off-line and producing no potable water for the City of Calistoga; and

WHEREAS, for the current year, the State Department of Water Resources has projected an initial SWP allocation of five percent; and

WHEREAS, as of January 31, 2014 the City of Calistoga's Kimball Reservoir held 5 acre feet of water, well below typical levels for January; and

WHEREAS, the North Bay Aqueduct is currently the City's only potable water supply; and

WHEREAS, on September 3, 2013, the City adopted Resolution No. 2013-082 declaring a Stage I Water Emergency and implementing voluntary restrictions on water use with a conservation goal of ten percent; and

WHEREAS, On January 17, 2014 the Governor declared a State of Emergency in California due to the current drought conditions and called for statewide voluntary twenty percent conservation of water and requested that local agencies implement water shortage contingency plans; and

WHEREAS, on February 4, 2014 the City Council received the report from the Public Works Director that the Stage I voluntary conservation measures have failed to achieve the desired water conservation goal of ten percent reduction in water use.

NOW, THEREFORE BE IT RESOLVED that the City Council of the City of Calistoga finds that the Stage I program did not achieve the desired water use reduction.

BE IT FURTHER RESOLVED that the City Council of the City of Calistoga finds that a Stage II Water Emergency for the City of Calistoga exists and mandatory water conservation measures are needed to achieve a desired water conservation goal of twenty percent under last year's water usage.

BE IT FURTHER RESOLVED, that the City Council of the City of Calistoga approves the Best Management Practices (BMPs) for water conservation as shown on Exhibit A attached hereto, and declares that any violation of the BMPs is subject to a notice of violation or other form of citation, and economic penalties as authorized by Section 13.04.350 of the Calistoga Municipal Code.

BE IT FURTHER RESOLVED, that the City Manager is authorized and directed to take the necessary action to implement and beginning March 1, 2014 enforce the Stage II mandatory water conservation efforts to achieve the desired goal of a twenty percent reduction in water use as compared to the previous year's water use, and beginning March 1, 2014 impose economic penalties as specified in Exhibit B attached hereto.

PASSED, APPROVED, AND ADOPTED by the City Council of the City of Calistoga at a regular meeting held this **4th day of February, 2014**, by the following vote:

AYES:	**Vice Mayor Dunsford, Councilmembers Barnes, Lopez-Ortega and Kraus and Mayor Canning**
NOES:	**None**
ABSTAIN:	**None**
ABSENT:	**None**

CHRIS CANNING, Mayor

ATTEST:

Kathy Flamson

KATHY FLAMSON, Deputy City Clerk

Exhibit A

City of Calistoga, 2014 Best Management Practices ("BMP") for Water Conservation

All Water Customers:

1. Outdoor irrigation with potable water only during the early morning hours to reduce evaporation loss with an odd/even address watering schedule (odd addresses water Tuesday and Thursday and even water Monday and Wednesday). No outdoor irrigation on Friday, Saturday or Sunday with potable water.
2. No initial filling or draining of swimming pools with potable water. Pools can be topped off to prevent damage to pumps and equipment.
3. No washing sidewalks, buildings, driveways, patios, or other paved areas with potable water
4. No noncommercial washing of privately owned motor vehicles, trailers and boats except from a bucket and hose equipped with an automatic shut-off nozzle
5. Prohibiting any use of water from a fire hydrant, except for fighting fires and line flushing required by regulatory agencies.
6. No use of potable water for dust control or compaction at construction sites
7. Inspect all irrigation systems, repair leaks, and adjust spray heads to provide optimum coverage and eliminate avoidable over-spray.
8. Run full loads through dishwasher
9. Wash full loads of laundry

Restaurants

1. Tap water provided to customers only upon request
2. Scrape all dishes prior to rinsing
3. Run full loads through dishwasher
4. Wash full loads of linens

Hotels and Spas

1. Bed linens and towels changed only upon guest request
2. Wash full loads of linens/laundry
3. Inspect all irrigation systems, repair leaks, and adjust spray heads to provide optimum coverage and eliminate avoidable over-spray
4. No washing sidewalks, driveways, patios, or other paved areas with potable water
5. Prohibit any use of water from a fire hydrant, except for fighting fires and line flushing required by regulatory agencies
6. No initial filling or draining of swimming pools using potable water. Pools can be topped off to prevent damage to pumps and equipment.
7. No noncommercial washing of privately owned motor vehicles, trailers and boats except from a bucket and hose equipped with an automatic shut-off nozzle
8. Outdoor irrigation with potable water only during the early morning hours to reduce evaporation loss with an odd/even address watering schedule (odd addresses water Tuesday and Thursday and even water Monday and

Exhibit A (continued)

Wednesday). No outdoor irrigation on Friday, Saturday or Sunday with potable water.

Violation of a BMP is subject to issuance of a notice of violation or other citation and subject to monetary penalties. Violations are cumulative unless there are no violations during the subsequent billing cycle.

Exhibit B

City of Calistoga, Monetary Penalties for Violation of Water Conservation Best Management Practices ("BMP")

A violation occurs if a BMP is observed to be violated and documented by City staff. The first violation would result in a written warning being issued to the person in responsible care of the water account. Subsequent BMP violations would result in the issuance of a notice of violation or citation and result in a "Tiered Surcharge multiplier" being accessed to any water use above Tier 1 usage on the subsequent water bill for multiple tiered water users, or the Tier 1 water use for single tiered water users. Violations are cumulative unless there are no violations during the subsequent billing cycle.

Violation	Surcharge Multiplier
First	0 – written warning issued
Second	1.20
Third	1.35
Fourth	1.50
Fifth	Suspension of water service for seven days, surcharge multiplier of 2.0, payment of all delinquent charges, and a restart charge of $150

Reference 3

Notice of Exemption

Appendix E

To: Office of Planning and Research
P.O. Box 3044, Room 113
Sacramento, CA 95812-3044

County Clerk
County of: Napa

From: (Public Agency): City of Calistoga
414 Washington Street
Calistoga, CA 94515
(Address)

Project Title: Calistoga Recycled Water Storage Pond Expansion Project

Project Applicant: City of Calistoga

Project Location - Specific:
The project is located on approximately 10 acres City-owned land adjacent to the existing 10 million gallon effluent storage pond. Address for Dunaweal WWTP is 1100 Dunaweal Lane, Calistoga CAQ 94515

Project Location - City: Calistoga Project Location - County: Napa

Description of Nature, Purpose and Beneficiaries of Project:
The proposed Calistoga Recycled Water Storage Pond Expansion Project in the City of Calistoga, Napa County involves expansion of an existing effluent storage pond.

Name of Public Agency Approving Project: City of Calistoga

Name of Person or Agency Carrying Out Project: Derek Rayner

Exempt Status: **(check one):**

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- ☒ Categorical Exemption. State type and section number: Section 15301(b), Class 1 – Existing Facili
- ☐ Statutory Exemptions. State code number:

Reasons why project is exempt:
The proposed project is categorically exempt from environmental review under CEQA because the project involves negligible expansion of use beyond the existing one.

Lead Agency Contact Person: Derek Rayner Area Code/Telephone/Extension: 707.942.2828

If filed by applicant:

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? ☒ Yes ☐ No

Signature: Date: 6/11/2014 Title: Senior Civil Engineer

☐ Signed by Lead Agency ☐ Signed by Applicant

Authority cited: Sections 21083 and 21110, Public Resources Code.
Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR:

Reference 4

Chapter 3.32
PUBLIC WORKS BID REQUIREMENTS

Sections:

3.32.010 Purpose.
3.32.020 Bid limitations.
3.32.030 Maintenance of contractor's lists.
3.32.040 Eligible construction contracts.
3.32.050 Informal bidding.
3.32.060 Adoption of plans, specifications and working details for certain public projects.
3.32.070 Formal bidding.
3.32.080 Tie bids.
3.32.090 Rejection of bids.
3.32.100 Performance bonds.
3.32.110 Procedure for emergencies.

3.32.010 Purpose.

This chapter is enacted for the purpose of implementing the Uniform Public Construction Cost Accounting Act (Public Contract Code Sections 22000 et seq.) (hereafter "CUCCAC") and to provide bidding procedures in undertaking public works projects. (Ord. 678 § 2, 2012; Ord. 459, 1991).

3.32.020 Bid limitations.

The following bid limitations shall be in effect:

A. Public projects of $30,000 or less may be performed by City employees by force account, by negotiated contract, or by purchase order;

B. Public projects of $175,000 or less may be let to contract by informal procedures as set forth in this chapter and promulgated by the State Controller; and

C. Public projects over $175,000 shall, except as otherwise provided by State law, be let to contract by formal bidding procedures.

D. The above limits shall be adjusted from time to time as provided by State law. When in conflict, the latest CUCCAC bid limitations shall govern. (Ord. 678 § 2, 2012; Ord. 459, 1991).

3.32.030 Maintenance of contractor's lists.

Each year, the City Manager shall mail a written notice to all construction trade journals designated by the CUCCAC, inviting all licensed contractors to submit the names of their firms to the City Manager for inclusion on the list of qualified bidders for the following calendar year according to category. The notice shall require that the contractor provide the name and address to which a notice to contractors or proposal should be mailed, a telephone number at which the contractor may be reached, the type or category of work in which the contractor is interested and currently licensed, together with the class of the contractor's license or licenses held and the contractor's license number or numbers. The City Manager shall create a new contractor's list on January 1st of each year which shall include at a minimum all contractors who submitted one or more valid bids to the City during the preceding calendar

year and all contractors who have properly provided the City Manager with the information required to be added to the list. A contractor may be added to the list at any time by providing the required information. (Ord. 678 § 2, 2012; Ord. 459, 1991).

3.32.040 Eligible construction contracts.

A. The following “public projects” shall be contracted for pursuant to the CUCCAC:

1. Construction, reconstruction, erection, alteration, and renovation, improvement, demolition, and repair work involving any publicly owned, leased or operated facility;

2. Painting or repainting any publicly owned, leased, or operated facility; and

3. In the case of a publicly owned utility system, the construction, erection, improvement, or repair of dams, reservoirs, power plants, and electrical transmission lines of 230,000 volts and higher.

B. The following “maintenance projects” may be contracted for under the CUCCAC:

1. Routine, recurring, and usual work for the preservation or protection of any publicly owned or publicly operated facility for its intended purpose;

2. Minor repainting;

3. Resurfacing of streets and highways at less than one inch;

4. Landscape maintenance, including mowing, watering, trimming, pruning, planting, replacement of plants, and serving or irrigation and sprinkler systems;

5. Work to be performed to keep, operate, and maintain publicly owned water, power, or waste disposal systems, including, but not limited to, dams, reservoirs, power plants, and electrical transmission lines of 230,000 volts or higher; and

6. Any other work which does not fall within the definition of a “public project” as defined in subsection (A) of this section. (Ord. 678 § 2, 2012).

3.32.050 Informal bidding.

Public projects of an estimated value between $30,000 and $175,000 may be made by informal bidding procedures. The Council delegates to the City Manager the authority to award informal contracts as follows:

A. Minimum Number of Bids. The award of bids, whenever possible, shall be based on at least three bids and shall be awarded to the lowest responsible bidder.

B. Notices Inviting Bids – Contractors. The City Manager shall solicit bids by written requests to contractors licensed and experienced for the type of public work to be performed. The City Manager shall maintain a list of qualified contractors, identified according to categories of work. The minimum criteria for the development and maintenance of the contractor’s list shall be determined by the (CUCCAC). All qualified contractors on the list for the category of the work to be performed and/or all construction trade journals specified by the CUCCAC shall be mailed a notice inviting informal bids, unless the product or service is proprietary. All mailing of notices to such qualified contractors and

construction trade journals shall be completed not less than 10 calendar days before the bids are due to be opened and awarded.

C. Notices Inviting Bids – Form. The notice inviting informal bids shall be uniform and shall describe the project in general terms, describe how to obtain more detailed information concerning the project, and state the time and place for the submission of bids. The notice shall also specify the classification of the contractor's license which a contractor shall possess at the time a contract is awarded.

D. Written Bids. Sealed written bids to be opened at the time specified shall be submitted to the City Manager who shall keep a record of all informal bids for a period of one year after the submission of the bids or the awarding of the contract. Such record, while so kept, shall be open to public inspection.

E. Award of Contract. If a contract is awarded, it shall be awarded to the lowest responsible bidder. The City Manager is authorized to execute the construction contract provided the bid does not exceed the budgeted amount for the project and the contractor has posted the required bonds and insurance as established by resolution of the Council for all informal bids. In the event the lowest responsible bid exceeds the budgeted amount for the project, the City Manager shall obtain authority by resolution of the Council to award the bid, together with the additional budget allocation. The City Manager shall report to the Council the results of the bidding procedure.

F. Excess Bids. If all bids received are in excess of $175,000, the Council may by passage of a resolution by a four-fifths vote, award the contract, at $192,500 or less, to the lowest responsible bidder, if the Council determines the City's original cost estimate was reasonable. (Ord. 678 § 2, 2012; Ord. 459, 1991).

3.32.060 Adoption of plans, specifications and working details for certain public projects.

The Council shall adopt plans, specifications, and working details for all public projects of more than $175,000. Any plans prepared for a public project shall specify the classification of the contractor's license which a contractor shall possess at the time a contract is awarded. (Ord. 678 § 2, 2012; Ord. 459, 1991).

3.32.070 Formal bidding.

Formal bidding for public projects of an estimated value over $175,000 shall be made as follows:

A. Authorization to Call for Bids. The Council shall authorize the call for bids by adopting a resolution in accordance with CMC 3.32.060.

B. Notices Inviting Bids. The City Manager shall solicit bids by written requests to prospective contractors. The notice inviting formal bids shall state the time and place for receiving and opening sealed bids and distinctly describe the project. The notice shall be published in a newspaper of general circulation printed and published in the City at least 14 days before the date of opening the bids. The notice inviting bids shall also be mailed to all construction trade journals specified by the CUCCAC. The notice shall also be sent electronically, by either facsimile or electronic mail and mailed at least 15 calendar days before the date of opening bids. The notice shall also specify the classification of the contractor's license which a contractor shall possess at the time a contract is awarded.

C. Written Bids. All bids shall be accompanied by either a certified or cashier's check or a bidder's bond, executed by a corporate surety authorized to engage in such business in the State, made payable to the City. Such security shall be in an amount not less than specified in the notice inviting bids or in the specifications referred to therein, or if no amount is so specified, then in an amount not less than 10 percent of the aggregate amount of the bid. If the successful bidder neglects or refuses to enter into the contract within the time specified in the notice inviting bids or specifications referred to therein, the amount of the bidder's security may be declared to be forfeited to the City and may be collected and paid into its general fund, and all bonds so forfeited shall be prosecuted in the amount thereof collected and paid into such fund. The bid shall also be accompanied by a certificate of insurance, together with any and all bonds required by resolution of the Council.

D. Award of Contract. All bids shall be sealed and be filed with the City Manager no later than the opening time specified in the notice inviting bids. The City Manager shall receive and be the custodian of such bids and keep the bids confidential until they are opened and declared. All bids shall be publicly opened and declared at the time and at the place fixed in the notice inviting bids. The bids shall be tabulated and analyzed by the City Manager. The City Manager shall review the bids and submit them to the Council with appropriate recommendations at the next regular Council meeting. The Council shall have the right to waive any informality or minor irregularity in a bid. If a contract is awarded, the Council shall award to the lowest responsible bidder by the adoption of a resolution. (Ord. 678 § 2, 2012; Ord. 459, 1991).

3.32.080 Tie bids.

If two or more bids received are the same and the lowest, the Council may accept the bid it chooses. (Ord. 678 § 2, 2012; Ord. 459, 1991).

3.32.090 Rejection of bids.

A. In its discretion the Council may reject any and all (informal and formal) bids presented. If all bids are rejected, then after the first invitation of bids, after reevaluating its cost estimates of the project, the Council shall have the option of either of the following:

1. Abandoning the project or readvertising for bids in the manner described by this chapter; or

2. By passage of a resolution by a four-fifths vote of the Council declaring that the project can be performed more economically by the employees of the City, having the project done by force account without further complying with this chapter.

B. If no bids are received, the project may be performed by the employees of the City by force account, or by negotiated contract. (Ord. 678 § 2, 2012; Ord. 459, 1991).

3.32.100 Performance bonds.

The Council shall have the authority to require a performance bond or labor and material bond in such amount as the Council shall establish to protect the best interest of the City before entering into a contract. If the Council requires a performance bond, the form and amount of the bond shall be described in the notice inviting bids or in the specifications referred to therein. (Ord. 678 § 2, 2012; Ord. 459, 1991).

3.32.110 Procedure for emergencies.

Pursuant to Public Contract Code Section 22035, the Council hereby delegates to the City Manager the power to declare a public emergency, subject to confirmation by the Council, by a four-fifths vote, at its next meeting. In cases of such great emergency, when repair or replacements are necessary to permit the continued conduct of City operations or services, or to avoid danger to life or property, any public facility may be replaced or repaired without giving notice for bids to let contracts. At the next Council meeting, the City Manager shall provide a full report on the declared emergency and necessary work performed. (Ord. 678 § 2, 2012).

The Calistoga Municipal Code is current through Ordinance 702, passed June 3, 2014.
Disclaimer: The City Clerk's Office has the official version of the Calistoga Municipal Code. Users should contact the City Clerk's Office for ordinances passed subsequent to the ordinance cited above.

Reference 5

CITY OF CALISTOGA

1232 Washington Street • Calistoga, CA 94515
Telephone 707-942-2828 – Public Works Dept.
Fax 707-942-9472
www.ci.calistoga.ca.us

December 10, 2013

Mr. John Madigan, P.E.
Water Resources Control Engineer
NPDES Division
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

RE: **Riverside Ponds Water Balance Report**

Mr. Madigan,

In accordance with our September 27, 2013 proposal to you (copy attached) to conduct a water balance investigation and evaluation of the Calistoga Riverside Ponds we are transmitting our findings as contained in the December 9, 2013 Technical Memorandum from Denise Conners of Larry Walker Associates.

We would also like to take this opportunity to update you on a couple of the action items contained in our June 24, 2013 Bypass Alternative Investigation Report (Report). Two items identified in the Report were to investigate additional temporary storage and additional irrigation areas.

With regard to additional temporary storage, the City contacted the owners of the agricultural storage ponds immediately adjacent to the wastewater treatment facilities. As part our discussions we offered to pay for the seasonal use of their ponds to store recycled water until such time as irrigation demand increased, or river flows were such that we could discharge to the Napa River. Both property owners declined our offer.

We plan on taking an action item to our Council on January 7, 2014 approving a contract amendment with one of our consultants to provide consulting engineering services to design a new permanent storage pond on one of our existing irrigation fields. Our intent is to construct this storage pond soon as possible.

We also approached the property owner of the gliderport (located immediately to the west of the City's irrigation field) about using his 20 acre parcel for irrigation disposal. The property owner was receptive to our request but indicated that due to threatened species we would need to obtain approval from the California Department of Fish and Wildlife. On December 4, 2013 City staff met with Suzanne Gilmore, Environmental Scientist and her supervisor Karen Weiss, Senior Environmental Scientist at the Department of Fish and Wildlife Yountville Office.

They indicated that due to some very rare and endangered plants (Calistoga Popcorn Flower-P. strictus and Napa Blue Grass) growing on the gliderport it would require extensive and exhaustive special studies to confirm if irrigation of recycled water would even be allowed, and if so, under what special conditions. Although they didn't say exactly what would be required I was left with the impression that it would take several years of studies before they would be able to even consider allowing irrigation on the gliderport property.

If you have any questions regarding the Water Balance Technical Memorandum or if you would like to discuss in greater detail our efforts to increase storage and irrigation opportunities please feel free to contact me at 707-942-2782. In closing we appreciate the good working relationship we have with your office in resolving these important issues.

Sincerely,

Michael Kirn

Michael Kirn
Public Works Director
City of Calistoga

cc:

Mayor Chris Canning and City Council
City of Calistoga

Richard Spitler,
City Manager, City of Calistoga

Denise H. Conners
Larry Walker Associates

Dave Tompkins

Reference 6

City of Calistoga
Recycled Water Strategic Plan

Technical Memorandum No. 3
Recycled Water Disposal/Storage Scenarios to Meet Buildout Conditions

Preliminary Draft

The City of Calistoga has contracted with Larry Walker Associates to prepare a Recycled Water Strategic Plan to ensure that sufficient disposal and storage facilities are available to match projected growth in the Calistoga area. Target date and growth conditions were selected by the City to correspond with "buildout" conditions specified in the *City of Calistoga General Plan* (City of Calistoga, 2003). In the General Plan, buildout is estimated to occur in 2038. Three technical memoranda have been prepared to address the project tasks:

> Technical Memorandum No. 1 (Draft #1 Submitted 2/20/06; Draft #2 Submitted 12/28/07, Draft #3 Submitted 3/10/08) *"Projection of Influent Flowrates at the Dunaweal Wastewater Treatment Plant"*
>
> Technical Memorandum No. 2 (Draft #1 Submitted 3/1/06; Draft #2 Submitted 3/10/08) *"Recycled Water Production and Required Disposal/Storage Capacity"*
>
> **Technical Memorandum No. 3 (Draft #1 Submitted XX/XX/08) *"Recycled Water Disposal/Storage Scenarios to Meet Buildout Conditions"***

The purpose of T.M. No. 3 is to outline potential ideas and costs for disposal or storage of the volume of recycled water produced at the Calistoga Wastewater Treatment Plant (WWTP) through buildout. Additional disposal and/or storage will be needed to ensure continued compliance with the City of Calistoga's National Pollutant Discharge Elimination System (NPDES) Permit. The Calistoga WWTP operates under a NPDES Permit that allows seasonal discharged of treated effluent to the Napa River. Discharge is permitted during the wet season (November 1st to June 15th) provided that specific dilution conditions are met in the river. During the remainder of the year, treated effluent is stored and used for irrigation by contracted recycled water users and land application on City disposal sites.

Based on current recycled water users and future scenarios, there will not be enough disposal and/or storage facilities at City Buildout conditions (estimated to occur in 2038). Existing users of recycled water are provided in Table 1, totaling 108 acres and using approximately 70 million gallons for irrigation. The City has approximately 43 million gallons of storage available for recycled water. At Buildout (depending on permitted river discharge and pump capacity), additional disposal of 217 mgal (representing 238 acres of grassland) and additional storage of 75 million gallons may be required to handle all wastewater delivered to the City sanitary sewer system.

Table 6. Other Potential Uses for Calistoga Recycled Water

Use	Location
Firefighting Supply	Tanks and/or ponds placed in strategic locations. May need provisions for draining and refilling each year.
Irrigation of Nursery Plants	Possible locations: Terra Trees Olive Tree Farm Lake County Grapevine Nursery
Landscape Impoundments	Possible location: Fairgrounds/Golf Course
Irrigation of Highway Landscape	Along Highway 29

POSSIBLE TREATMENT PLANT UPGRADES

To provide sufficient treatment, storage, and disposal capacity in 2038, the Calistoga WWTP will require significant upgrades. However, the specific types of upgrades will be based on the City's preferred option for wastewater handling. Possible facility changes are outlined in the following sections.

Boron Removal

Boron removal from the Calistoga effluent will be necessary before vineyard users will accept recycled water for irrigation. Boron can have a toxic effect on grape vines if applied at concentrations of 1.0 mg/L or greater. The boron concentration in Calistoga recycled water has ranged from 2 to 3 mg/L.

Several treatment processes are available for boron removal as presented in Table 7. A reduction in boron from 3 mg/L to .5 mg/L (projected for Calistoga effluent) requires removal of 83.33% of the constituent. Ion exchange appears to be the most reliable method to accomplish this level of reduction. Ion exchange is the **reversible** interchange of ions between an ion exchange resin and a liquid. The resin is usually a three dimensional porous support matrix made up of hydrocarbon chains with ionic functional groups as the exchange sites.

Table 7. Literature Review of Boron Removal Technologies[1]

Technology	Water Tested	%Removal	Comments	Reference
Softening	Seawater	Insignificant	Batch tests of calcite precipitation	Kitano et al., 1978
Coagulation	Drinking Water	<28%	Typical removal < 10%	Borax (1996)
Activated Carbon	Synthetic Water	Up to 90%	High carbon doses needed	Choi et al, (1979)
Reverse Osmosis	Seawater	43 -78%	Survey of 8 operating RO Plants	Magara (1996)
Ion Specific Resin	RO Permeate	>99%	pH of produced waters <4.5 for 600 bed volumes	Nadav(1999)
2-pass RO with pH adjustment	RO Permeate	40 -100%	Best removal at pH 10.5	Pratset al (2000)
	Synthetic Water	>80	%N-methyl-D-glucamine	Smith et al, (1995)
Boron Chelation	RO Permeate	>98%	Fluoride	Derwent(1997-1999)

Ionic exchange occurs when an ion in solution replaces another ionic species attached to the resin. This happens in a stoichiometric manner as water contaminated with an anion, for example, is pumped into the resin:

Anion exchange: $R - OH^- + X^- \rightarrow R - X^- + OH^-$

R = resin

OH^- = hydroxide

X^- = anion impurity

As the exchange proceeds, the resin will eventually approach its exhaustive capacity. At this time, $R\text{-}X^-$ complexes are pervasive in the resin and few $R - OH^-$ sites remain for exchange. To regenerate the resin, a strong base is typically used to de-complex the anion and replace it:

$$R - X^- + OH^- \rightarrow R - OH^- + X^-$$

The two common types of anion exchange resins are weak base anion resins and strong base anion resins. Weak base anion resins are sensitive to pH, and do not effectively split salts above a pH of 7. Above this pH, the resin works primarily as an acid sorbent. Strong base anion resins are not influenced by pH, but require heavier doses of chemicals for regeneration. [2]

[1] Tai J. Tseng, Robert C. Cheng, et al. *Bench and Pilot-Scale Investigation of Boron Removal for Seawater Membrane Desalination*. American Water Works Association 2004 Annual Conference. June 15, 2004.

[2] Remco Engineering Water Systems and Controls. *Ion Exchange Basic Concepts*. http://www.remco.com/ix.htm. Accessed August 1, 2007.

The selectivity of a particular resin for an ion determines the exchange efficiency and therefore the ability of the system to remove a pollutant. However, more chemicals are consumed during the regeneration stage for resins with high selectivity for a particular ion. The type of base used as well as how often and to what degree the resin is regenerated will determine the cost associated with this step. The desired water quality will play a role in the decision to fully or partially regenerate the resin.[2]

Boron is commonly found bonded to three oxygen atoms and is referred to as Borate in this form. Borates exists in a number of different varieties, including Boric acid ($B(OH)_3$), and Borate Salts (sodium metaborate - $NaBO_2$, sodium tetraborate-$Na_2B_4O_7$, and others) .[3]

When present as an acid, DOW chemical company recommends DOWEX M-43, an anion exchange resin. For Borate salts, they recommend DOWEX 21K XLT, a strong base resin, which will remove all of the anions as well as common anions like chloride and sulfate. Resins for high organic content flows are also available.[4]

Two ion exchange equipment manufacturers were contacted for information on possible systems for Calistoga. The following criteria were supplied to the manufacturers:

Initial Boron Concentration = 3 mg/L

Final Boron Concentration = 0.5 mg/L

Effluent Flowrate = 0.3 mgd
(Process operated for 5 months/yr will supply irrigation water for 550 acres of vineyards)

Bob Mesick of Remco Engineering (RemcoBob@Remco.com, (805) 658-0600), did some rough calculations on the costs of installing a system. He estimated around $600,000-700,000 for a three column system. A more detailed design and estimate from Remco could be obtained for a negotiated fee. Frank Grindey of ProSep, Ltd. (frankgrindey@prosep-ltd.com, 815-623-7630), provided a $250,000 estimate for a one column system (including equipment and resin). Frank indicated that test work at Panoche Water District in 2004 yielded less than 0.5 mg/L boron concentration in the effluent when starting with a 11 mg/L feed.

The ion exchange resin must be regenerated every 3 to 4 days using HCl, H_2SO_4, or NaOH. Approximately 5% of the resin must be replaced annually. The ProSep resin costs about $775 per cubic foot, resulting in an initial investment of $110,000 with replacement costs of $5,500 per year. Rohm and Hass supplies Amberlite™ PWA10 resin, which forms a stable complex with boric acid. Initial cost of the resin was estimated at $65,000 with annual replacement costs of $3,250. Regeneration costs were estimated to be about $25,000 per year for chemicals.

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[3] Wikipedia. *Borate*. http://en.wikipedia.org/wiki/Borate. Accessed July 31, 2007

[4] DOW. *DOW Water Solutions*. http://www.dow.com/liquidseps/prod/pt_b.htm. Accessed August 1, 2007.

The advantages of ion exchange include: proven technology, high removal rates, and low energy requirements. The main disadvantage is the initial cost of the system. Depending on the type of ion exchange system used, the disadvantages may also include calcium sulfate fouling for demineralisers using sulfuric acid when high calcium levels are present; iron fouling when anaerobic water from bores is used; adsorption of organic matter; organic contamination from the resins themselves; bacterial contamination from the resins; and chlorine contamination of the resin from source water.

Supplemental Filter Capacity

Under the growth scenario outlined in T.M. No. 1 and T.M. No. 2, the current filter capacity of 1.0 mgd would be exceeded sometime around 2025. By 2038, a total filter capacity of 2.2 mgd would be required to meet the maximum irrigation demand during the month of July, 2038. This capacity would also be sufficient to treat average monthly flows during the maximum wet weather flow month of January, 2038.

Increased Pump Capacity

Currently a maximum of 2 mgd can be discharged to the Napa River when effluent is pulled from the Effluent Storage Pond. When that pond is empty, effluent is pulled from the filters at a maximum rate of 1 mgd. Based on a minimum river to effluent flow ratio of 10:1, there are many days during the discharge season when the Napa River flowrates are sufficient to allow effluent disposal at greater than 2 mgd. Maximizing effluent discharge to the river will result in minimizing additional storage ponds and reducing the need for additional recycled water users. However, the allowable discharge rate will be based on the dilution credit and river to effluent flow ratio approved the Water Board during the next NPDES Permit cycle. Based on a preliminary review of Napa River flowrates and effluent discharges under a 10:1 and 70:1 river to effluent flow ratio, 5 mgd to 15 mgd of total effluent pump capacity may be required.

Additional Storage Ponds

Additional storage will be required to handle the expected flows through 2038. The amount of additional storage needed will be based on the dilution credit and river to effluent flow ratio approved by the Water Board during the next NPDES Permit cycle. The critical time for storage is at the end of the dry season when irrigation is no longer needed by the recycled water users, but the permitted date for river discharge has not been reached. All effluent during these days is sent to storage. Often times, even after the permitted date for river discharge has been reached, there is insufficient flow in the Napa River to allow significant discharge. During these days a small portion of the treated effluent is sent to the river (based on allowable discharge rates) and the rest is sent to storage. Insufficient flowrates in the Napa River can actually occur throughout the discharge season, forcing storage of treated effluent until flowrates rise again. The number of days waiting for proper discharge conditions will vary depending on rainfall, soil infiltration rates, and the permitted river to effluent flow ratio.

Depending on length of new pipe and head differential to supply new recycled water users, additional recycled water pumps may be needed…

PLANNING LEVEL INFRASTRUCTURE COSTS

Capital costs are provided in Table 8 for a planning level comparison of alternatives. These costs include installation, materials, earthwork, required monitors, and electrical supplies. The costs were based on recent pipeline installations in Napa, previous filter/pond construction in Calistoga, and phone calls with manufacturers. All costs were escalated to July 2008 dollars using the California Construction Cost Index (CCCI) provided by the State of California Department of General Services (http://www.resd.dgs.ca.gov/CaliforniaContructionCostIndexPage.htm).

Table 8. Capital Costs for a Planning Level Evaluation of Recycled Water Alternatives for the City of Calistoga

Item	Units	Cost
4-inch PVC Pipe	Per linear foot	$17.23
12-inch PVC Pipe	Per linear foot	$128.52
18-inch PVC Pipe	Per linear foot	$192.78
Ion Exchange System for Boron Removal	For 0.3 mgd system	$250,000 to $700,000
Recycled Water Pumps		
River Discharge Pumps		
Water Meter/Gate Valve	Per unit installation	$8,730
Dynasand Filters	Per mgd	$650,750
Storage Pond	Per acre-ft	$11,875

ALTERNATIVES ANALYSIS

[To be written based on direction from the City of Calistoga.]

PREFERRED ALTERNATIVE

[To be written based on direction from the City of Calistoga.]

Reference 7

CITY OF CALISTOGA

1232 Washington Street • Calistoga, CA 94515
Telephone 707-942-2828 – Public Works Dept.
Fax 707-942-9472
www.ci.calistoga.ca.us

June 24, 2013

Mr. John Madigan, P.E.
Water Resources Control Engineer
NPDES Division
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

RE: **Bypass Alternative Investigation Report**

Mr. Madigan,

Pursuant to our meeting on May 14, 2013 wherein the City committed to submitting a report on or before July 1, 2013, we are transmitting the attached Bypass Alternative Investigation Report (Report) for your review. Contained in the Report are eight alternatives the City has investigated to reduce the amount of tertiary treated effluent that bypasses the permitted discharge outfall.

As discussed in the Report, the City has investigated eight alternatives for mitigating future irrigation bypass events. Although the City will proceed with additional and more in-depth investigation and analysis of all of the alternatives, some alternatives appear to be more viable and cost effective than others. In addition, some alternatives are acknowledged as being temporary approaches that will be undertaken while we identify and secure funding, and construct long-term permanent solutions.

As we previously discussed, we anticipate scheduling a meeting with your office in mid-July to discuss the Report and begin the detailed engineering and analysis of the alternatives once we have reached agreement on moving the work plan forward.

Due to staffing schedules and consultant availably the earliest we are able to meet with you is the week of July 15th, with the exception of the afternoon of July 17th, to discuss the Report. The City of Calistoga greatly appreciates your willingness to continue to work with us in resolving this important issue. If you have any questions, please contact our Public Works Director, Michael Kirn, at 707-942-2782.

Sincerely,

Richard D. Spitler
City Manager
City of Calistoga

cc:

Mayor Chris Canning and City Council
City of Calistoga
Denise H. Conners
Larry Walker Associates
Dave Tompkins

City of Calistoga
Dunaweal Wastewater Treatment Plant

BYPASS ALTERNATIVES INVESTIGATION REPORT

Background

The City of Calistoga's Dunaweal Wastewater Treatment Plant (WWTP) is regulated by NPDES Permit No. CA0037966 currently implemented as Order No. R2-2010-0104. The WWTP may discharge fully treated effluent to the Napa River from November 1 to June 15 as long as a minimum river to effluent flow ratio is maintained (i.e., 10:1 for tertiary effluent, 50:1 for secondary effluent). A dry fall occurred at the beginning of the 2011 river discharge season. Demand from recycled water users declined, but river flowrates did not rise to the level required to conduct a significant river discharge event. As a result, effluent storage capacity was fully utilized by mid-November 2011. To protect the integrity of the storage pond levees and prevent an uncontrolled discharge to the Napa River, the City requested approval from the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) on November 14, 2011 to bypass the permitted discharge outfall. The City proposed to spray effluent at the City-owned irrigation fields at a rate equal to WWTP influent flows. The Regional Water Board issued approval for the alternate disposal operation on November 22, 2011 based on the "anticipated bypass" provisions of the Clean Water Act (40 CFR, Section 122.41(m)(4)(ii)). The City applied tertiary treated effluent to the irrigation fields until January 20, 2012 when flowrates in the Napa River had increased and discharges could be effectively undertaken.

An unusually dry winter of 2013 also resulted in lower than normal Napa River flowrates and effluent storage capacity concerns. The City suspended river discharge operations on February 7, 2013 and requested approval from the Regional Water Board for irrigation bypass operation on March 28, 2013. Approval was granted on April 2, 2013 and the City irrigated at a rate equal to WWTP inflows until recycled water demand increased in May 2013. In its April 2, 2013 correspondence to the City, the Regional Water Board noted this was the City`s second bypass request in 16 months and required the City to investigate all feasible bypass alternatives, including increased storage capacity, and submit a report to the Regional Water Board by July 1, 2013. This "Bypass Alternatives Investigation Report" is submitted to comply with that requirement.

City staff met with Regional Water Board staff on May 14, 2013 to discuss NPDES permit compliance issues and potential bypass alternatives. Based on those discussions, the following projects are being considered by the City to increase storage capacity, increase river discharge, increase recycled water application, and reduce the amount of effluent requiring disposal.

Alternative #1 - Modify River Discharge Provisions of the NPDES Permit

The NPDES permit includes seasonal discharge start and stop dates, in addition to the minimum 10:1 and 50:1 river to effluent dilution ratios. The City will determine the impact to storage/disposal operations by initiating discharge earlier in the season and/or continuing discharge later in the season while continuing to meet the minimum river to effluent flow ratios. At the beginning of the rainfall season, Napa River flowrates are typically slow to rise because local soils must be saturated before runoff and substantially higher river flowrates can occur. However, if the City was allowed to discharge effluent prior to the current November 1st start date, some storage/disposal pressure may be alleviated during the middle of the rainfall season. Napa River flowrates typically drop quickly at the end of the rainfall season, and are rarely high past the current June 15th stop date. However, it may be possible for the City to continue discharging at low levels through the end of June and lessen disposal pressure during the dry season. The increased amount of effluent that may be disposed of under this scenario is not expected to be significant but it could prove some relief. During very dry years, the scenario will not be a viable approach to solving the City's current storage/disposal limitations.

Alternative #2 - Add Temporary Storage Capacity

As an "interim" measure, the City will determine the feasibility of acquiring temporary effluent storage capacity in existing privately owned irrigation ponds. The goal will be to develop 1 to 5 year agreements between the City and private property owners for temporary use of their ponds when City-owned storage ponds are at capacity, Napa River discharge is not possible, and irrigation options are fully utilized.

The City has utilized temporary storage agreements with private property owners in the past, but operations ceased in 2009 and the agreements were not renewed. The City will initiate new discussions with neighboring property owners and determine the possibility of developing lease options to store treated effluent during times of reduced Napa River flow conditions. Such agreements will provide temporary storage capacity while permanent solutions are being developed.

Alternative #3 - Increase Landscape Irrigation

The City provides disinfected tertiary recycled water to irrigate landscape at contracted recycled water use sites and City-owned properties (approximately 76 acres of golf course, schools, hotels, apartment buildings, sports fields, and a church). The City also applies recycled water to three City-owned spray fields (approximately 24 acres total - Fox Field, Spray Field 2, Spray Field 3) for grasslands irrigation. The City is always investigating new opportunities for additional landscape irrigation. A new recycled water customer will be added to the recycled water program in the next few months that will use approximately 100,000 gallons per month.

The City will investigate the costs/benefits of extending recycled water lines to reach additional landscape areas and purchasing new land for disposal irrigation. A water balance, developed and calibrated using the 2004/5 water year for baseline conditions, predicted that 190 mgal/year of river discharge is needed to offset the City's existing irrigation sites and storage pond capacity. During the last 10 years, the total volume of river discharge has ranged from 100 to 190 mgal/yr. The river discharge deficit and constant irrigation acreage has resulted in storage ponds at capacity and requests for

irrigation bypass approval. The evapotranspiration requirement of grass in the Calistoga area is 2.8 ft/yr. Based on this agronomic rate, a 90 mgal reduction in river discharge volume will necessitate an additional 100 acres of grasslands irrigation.

Alternative #4 - Reduce Geothermal Inflows

Geothermal inflows and spa wastewater discharges to the City's collection system contain high concentrations of boron and other nuisance constituents. As a result, the City's recycled water quality is not suitable for sensitive vegetation and effluent quality has periodically exceeded receiving water objectives. The City will investigate the costs/benefits of reducing geothermal inflows to the collection system, requiring source control actions by the spas, and mandating separate plumbing systems for geothermal wastewater. A plan is underway to meter wastewater discharges from the spas and apply surcharges as an incentive to reduce flows. Additional actions will be evaluated, as appropriate.

Alternative #5 - Evaluate Impediments for Agricultural Irrigation Program

Currently the City provides recycled water for landscape irrigation only. Geothermal discharges to the collection system contain high concentrations of boron (greater than 0.5 mg/L) which makes the City's recycled water quality unsuitable for irrigation of wine grapes, the dominant agricultural crop in the area. Reducing boron concentrations in the City's recycled water could increase the demand and use of recycled water, since large agricultural acreages exist near the WWTP and existing irrigation supplies are limited. Creating good quality recycled water for agricultural irrigation would help reduce the volume of effluent stored at the WWTP and make recycled water storage in privately owned ponds more attractive. However, the costs to install boron removal processes as well as the annual operating costs to maintain the treatment system, are projected to be exorbitant. The City will investigate the costs/benefits of reducing boron reductions by source control and treating a portion of the wastewater flow by advanced treatment (i.e., ion exchange) either at the WWTP or within the collection system. Source control and advanced treatment may also reduce the concentrations of other constituents of concern, such as antimony, copper, and cyanide.

Alternative #6 - Conduct Focused Inflow and Infiltration Study

In the winter, inflow and infiltration (I/I) into the City`s sewer collection system increases flows to the WWTP and therefore, requires utilization of more treatment and storage capacity. There are many potential sources of I/I, including leaking sewer laterals, manholes and pipes; manholes in flooded streets; and direct connections from roofs, parking lots and storm drains. A multi-year plan for conducting a Focused I/I Study will assist the City in performing field studies to determine if I/I can be identified and reduced.

The City will determine the best method for implementing the Focused I/I Study. At this time, the City is considering a Preliminary I/I Field Study that includes:

- Review of City`s Sewer System Management Plan;
- Interviews with City maintenance staff to ascertain their collection system field experiences;
- Review of trial smoke testing conducted in 2009;
- Prioritize investigations and focus field work on areas of historical concern;

- Smoke test geographically targeted areas of the collection system to identify direct connections;
- Visual inspection of manholes not in streets for stormwater flow diversions; and
- For suspected high I/I areas of collection system:
    - Conduct CCTV video inspection of pipes and record findings.
    - Install flow meters during wet weather events.

Depending on results from the Preliminary I/I Field Study, the City will consider planning and remediation activities, such as:

- Building a collection system computer model to identify wet weather peaking factors by trunk line and calibrating with WWTP inflows and some temporary collection system flow metering.
- Isolating and removing roof drains, parking lots, and storm drains from the collection system.
- Repairing or replacing failed collection system piping.
- Sealing leaking manholes.

The Focused I/I Study and associated follow up activities will be ongoing events that are scheduled over several years. As the City`s I/I project progresses, new areas worthy of further investigations may be discovered. The intent of the Focused I/I Study will be the identification of cost effective measures to reduce the historical peaking factors of wet weather events and reduce WWTP storage and disposal requirements.

Alternative #7 - Increase WWTP Effluent Pumping Capacity

After significant storm events, Napa River flowrates can increase from 10 mgd to 2,000 mgd. The high river flow provides substantial capacity for increased effluent discharges while still meeting the minimum 10:1 river to effluent flow ratio. The City has two effluent storage ponds (10 million and 20 million gallon capacity) that are used to store treated effluent when river flows are functionally less than the permitted dilution ratio. These two ponds have disposal pumping capacities of approximately 1.75 mgd and 1.25 mgd, respectively. Therefore, even when river flowrates are greater than 30 mgd, discharges from the storage ponds are limited to approximately 3 mgd based on the maximum combined effluent pumping capacity.

During wet weather conditions, river flowrates are typically high and WWTP inflows can approach 4 mgd due to geothermal discharges and I/I impacts on the collection system. However, given the physical constraints of the pumping capacities, during these high flow periods the City can only discharge a maximum of 3 mgd which may address WWTP inflows but does not facilitate drawdown of stored effluent. The following discussion is provided to illustrate the potential impacts of increasing effluent pumping capacity.

Assuming WWTP inflows are close to 3 mgd and it takes 10 days to empty 30 million gallons of storage ponds (30 million gallons/3 mgd = 10 days), the City would need an additional effluent pumping capacity of 3 mgd to dispose of all effluent produced/stored during this theoretical time period. The increase in pump capacity would allow the City to dispose of 6 mgd of effluent, 3 mgd of effluent produced during the storm event and 3 mgd of stored effluent. The 20 million gallon storage pond currently has 1.25 mgd effluent pumping capacity. The pond disposal pipe is 10" in diameter, which allows 2.5

mgd (maximum) when the pumps are operated at 7 feet per second. Under this scenario, an additional 1.25 mgd pump capacity would be needed (from 3 mgd to 4.25 mgd), as well as larger disposal piping.

The City will investigate the feasibility of increasing effluent pumping capacity, considering the hydraulic, electrical and mechanical impacts on existing WWTP infrastructure and outfalls. The conceptual approach would be to add effluent pump capacity at the 20 million gallon storage pond and discharge effluent into a new pipe with connection to Riverside Pond 1. The hydraulic capacity of the existing inlet and outfall pipe will be reviewed and analyzed.

Alternative #8 - Increase Permanent Storage

The City owns land near the WWTP that may be suitable for construction of additional permanent storage ponds. Constructing additional effluent storage will reduce the need to conduct bypass operations. This alternative will also consider future uses of the Riverside Ponds (which are in need of rehabilitation) and compliance with effluent limitations within the storage ponds. The current approach for compliance with some effluent limitations is to monitor effluent quality in the final Riverside Pond (Riverside Pond 1) prior to river discharge.

As shown in the attached figure, the City`s existing spray fields are suitably located for construction of permanent storage ponds. Spray Fields 2 and 3 may be able to accommodate construction of a 16 million gallon storage pond. Low river flows are seasonal, but dry weather conditions early in the spring or late in the fall (i.e., shoulder months) can necessitate unusual effluent storage demands due to inadequate river dilution ratios. However, because these same dry conditions also cause low influent flows into the WWTP, less effluent needs to be stored. During the dry weather shoulder months, plant influent flows average 0.5 mgd. Therefore, 16 million gallons of storage could provide approximately 32 days of additional storage during these critical time periods.

The Fox Field will also be investigated for storage pond placement. However, because of the close proximity to the Napa River and influence that some of this field is in the 100yr floodway, the useable footprint for building a pond is reduced. This pond size is estimated to provide less than 10 million gallons of storage. As the City's irrigation fields are converted to storage ponds, the irrigation disposal capacity will be reduced. As noted in Alternative #3, the City is investigating acquisition of additional land for irrigation disposal purposes.

The design capacity of the four Riverside Ponds is about 2.5 million gallons. The Riverside Ponds are not utilized as functional storage ponds, but they are kept full year-round. The ponds are in need of rehabilitation and the City is assessing options for either their rehabilitation or removal. The City's effluent storage capacity will be impacted under either one of these scenarios and will be investigated as part of this alternative. The City will consider different options for future use of the Riverside Ponds, including:

- Rehabilitation with setbacks from the Napa River and 2 feet of freeboard;
- Conversion to spray fields; or
- Demolition.

Summary and Recommendations

As discussed above, the City is considering several alternatives for mitigating future irrigation bypass events. Although the City will proceed with additional investigation of all of these alternatives, some alternatives appear to be more viable and cost effective than others. In addition, some alternatives are considered just temporary approaches that will be undertaken while funding and construction of permanent approaches are underway. The City will under take the Alternatives Investigation as follows:

Initial Evaluation

- Alternative No. 1 - Modify River Discharge Provisions of the NPDES Permit
- Alternative No. 5 - Evaluate Impediments for Agricultural Irrigation Program

In Depth Evaluation

- Alternative No. 2 - Add Temporary Storage Capacity
- Alternative No. 3 - Increase Landscape Irrigation
- Alternative No. 4 – Reduce Geothermal Inflows
- Alternative No. 6 - Conduct Focused I/I Study
- Alternative No. 7 - Increase WWTP Effluent Pumping Capacity
- Alternative No. 8 - Increase Permanent Storage

The City proposes the following work plan tasks and schedule for Regional Water Board approval:

Task	Duration	Deadline
Meet with Regional Water Board staff to discuss "Bypass Alternatives Investigation Report" and next steps.	---	July 2013
Evaluate alternatives, select approach, submit findings and implementation schedule to Regional Water Board.	One year	August 1, 2014
Implement selected approach(es).	Three to five years	According to agreed-upon schedule
Submit progress reports to Regional Water Board.	Quarterly	End of each calendar quarter, with applicable Monthly Self-Monitoring Report
Evaluate implementation success to-date, consider additional measures if needed, submit report to Regional Water Board.	Two years	May 1, 2015, with Report of Waste Discharge

legend

- CALISTOGA CITY LIMITS
- CREEK
- DITCH/CHANNEL
- NAPA RIVER
- RECLAIMED WATER PIPE
- SANITARY SEWER PIPE
- SPRAY FIELD

CALISTOGA WWTP FIGURE

0' 200' 400'
SCALE 1"=400' ON 11"x17"

NORTH

Reference 8

Louise Harrison

From: Derek Rayner
Sent: Friday, June 06, 2014 12:06 PM
To: Louise Harrison
Subject: FW: Prop 84, Round 3 - Grant Application

Louise,
Here's another attachment for Secondary Benefit/Claimed section

Thanks,

Derek Rayner, PE, QSD/P, LEED Green Associate
City of Calistoga | Public Works Department
Senior Civil Engineer| Phone: 707.942.2828
www.ci.calistoga.ca.us

From: Warren Schenstrom
Sent: Friday, June 06, 2014 11:57 AM
To: Derek Rayner
Subject: RE: Prop 84, Round 3 - Grant Application

Good Morning Derek,

For 2014 (still an opportunity for discharge this fall...)	E1	41.151 MG – below average
	E2	11.362 MG – below average
	Total	52.513 MG
For 2013	E1	15.682 MG !
	E2	0 MG !!
	Total	15.682 MG
For 2012	E1	111.335 MG – a little low, but typical
	E2	41.591 MG – a little low, but typical
	Total	152.926 MG – this is why we favor discharge.....

Warren Schenstrom
Water Systems Superintendent
City of Calistoga

From: Derek Rayner
Sent: Friday, June 06, 2014 11:28 AM
To: Warren Schenstrom
Cc: Michael Kirn; Louise Harrison
Subject: RE: Prop 84, Round 3 - Grant Application

Good Morning Warren,
Can you let me know how much wastewater was annually discharged to the Napa River the last 3-years?

Thanks,

Derek Rayner, PE, QSD/P, LEED Green Associate
City of Calistoga | Public Works Department
Senior Civil Engineer| Phone: 707.942.2828
www.ci.calistoga.ca.us

From: Derek Rayner
Sent: Thursday, June 05, 2014 12:33 PM
To: Warren Schenstrom
Cc: Michael Kirn; Louise Harrison
Subject: RE: Prop 84, Round 3 - Grant Application

Good Afternoon Warren,

Wondering if we can state that with the new 20MG pond we'll be able to serve more recycled water because now with two ponds we can operate two systems at the same time (e.g. treat for river discharge and store in 10MG knowing rains are coming but still supplying recycled from 20MG pond)? I guess what I'm trying to say is, is it going to help operations side of things, so now we can supply recycled water earlier or later into the year because we can operate off the larger recycle pond longer than before since we have a separate 20MG pond? If we could say something like this and possibly quantify more recycled water use because of this it would be very helpful...let me know your thoughts when you have a moment. Maybe easier to discuss this one over a phone call.

Thanks,
Derek

From: Warren Schenstrom
Sent: Wednesday, June 04, 2014 3:15 PM
To: Derek Rayner
Cc: Michael Kirn
Subject: RE: Prop 84, Round 3 - Grant Application

Good Afternoon Derek,

I know that you are on a tight schedule. Here is the information you requested – with the opportunity for a follow up.....

1) There is a new reclaimed water application by Robert MacDuff. His volume request is not reasonable (ie 370,000 gallons annually for 2500 sq ft of lawn). A more realistic volume would be at least an order of magnitude less or 37,000 gallons.

2) Standard observations will be conducted on a daily basis. These will mostly consist of a berm inspection and a water level recording. There will be annual spraying of the banks to keep them clear of weeds. If a leak is observed, the first response will be to contain the water, isolate the pond, lower the level in the pond to a safe elevation, determine cause of leak and then conduct repairs. A report to the RWQCB is only necessary if there is a spill.

3) The volume of 20 MG is fine - conservative. This is approximately the volume disposed on fields 2,3 over the course of a year (see item 4).

4) The reclaimed volume of 131 MG for 2013 is correct. Of that volume 20 MG was applied to irrigation fields 2,3. Another 42 MG was applied to the Fox fields (of that total, 27 MG as an approved bypass.....). The remainder or 69 MG was pumped to the reclaimed water users in town. The estimate of increased recycled water use is fine – conservative.

5) Reducing river discharge by 20 MG annually would reduce loading to the Napa River by the following; BOD 379 kg/yr, TSS 341 kg/yr, Total N 1514 kg/yr.

6) There is no additional monitoring or reporting required (other than previously described in item 2) by the Regional Board for new the pond – other than maintaining a minimum of a 2 foot freeboard. All effluent monitoring is completed at the WWTP.

Let me know if you need additional information.

Warren Schenstrom
Water Systems Superintendent
City of Calistoga

From: Derek Rayner
Sent: Wednesday, June 04, 2014 12:04 PM
To: Warren Schenstrom
Cc: Michael Kirn
Subject: Prop 84, Round 3 - Grant Application

Good Morning Warren,

As discussed, below are items I need your help responding too regarding grant funding for our new 20MG recycled water pond:

1. Any new recycled water user customers applications that you have received in 2014 – I need to know the amounts of projected recycled water use, and would like the page of their application that states this volume scanned in a pdf.
2. Project Operation and Maintenance – a brief description of the O&M planned for the new pond (e.g. how often is it inspected by operations staff, daily weekly, etc...), if leaks are found describe what protocol operations staff follows to fix (something generic is fine like: "leaky pipe is fixed by operations staff with new pipe and backhoe...and then reported to RWQCB through blank....)
3. Reduced discharge to Napa River/Bay in MG/yr – We have assumed 20MG storage, so 20MG/yr – is this too conservative, or should this amount be a higher? Don't want to over shoot but want to be close...
4. Total 2013 Recycled water use – I'm seeing 131MG (or 402AF/yr) in your annual report, is that correct? We are estimating with the new pond we be able to produce another 4% more recycled water use (about 5MG or 15AF annually). We have Indian Springs coming online as well as another residential customer and potentially the dog park. If you think we will increase more than this if the drought continues, please let me know your ballpark (that's realistic).
5. Determine Nutrient Reduction to River/Bay – Estimated Pollution load reduction for BOD, TSS, and Nitrogen in kg/yr
6. Project Monitoring and Reporting – a brief description of the monitoring & reporting that is required by the Regional Water Quality Control Board for the new pond (e.g. how often water quality reporting is done, annual reporting, etc..)

Our deadline to submit is Wed, June 11th , and I will need some time before that to incorporate into their format, so if you could have your responses to me by Tuesday next week, that would be much appreciated. Please let me know if you have any questions or want to discuss anything. Thanks in advance for your help with this...

Thank you,

Derek Rayner, PE, QSD/P, LEED Green Associate

City of Calistoga | Public Works Department
Senior Civil Engineer| Phone: 707.942.2828
www.ci.calistoga.ca.us

Project 8: Drought Relief for South Coast San Mateo County

1. Alford, 2010. Dynamic Water Resources Needs in California's Central Coast Watersheds.
2. American Rivers, 2013. San Gregorio Creek Stream Impact Evaluation for a Diversion Pumping Rate of 90gpm. Technical analysis submitted to the California Department of Fish and Wildlife, August 8, 2013.
3. Becker, G.S., K.M. Smetak, and D.A. Asbury. 2010. Southern Steelhead Resources Evaluation: Identifying Promising Locations for Steelhead Restoration in Watersheds South of the Golden Gate. Cartography by D.A. Asbury. Center for Ecosystem Management and Restoration. Oakland, CA.
4. ESA, 2004. Pescadero-Butano Watershed Assessment: pp. 2-2 and 8-2.
5. National Oceanic Atmospheric (NOAA), 2012. Central Coast Coho Recovery Plan.
6. NHI, 2010. San Gregorio Creek Watershed Management Plan.
7. U.S. Geological Survey (USGS), 2014a. USGS San Gregorio Gage data.
8. USGS, 2014b. USGS Pescadero Creek Gage.

Reference 1

Dynamic Water Resources Needs in California's Central Coast Watersheds: An Assessment of the Physical and Institutional Challenges of Managing Surface Water Flows While Balancing Human and Environmental Uses

By

Christine Amanda Alford

A thesis submitted in partial satisfaction of the requirements for the degree of

Master of Landscape Architecture

In

Environmental Planning

In the

Graduate Division

Of the

University of California, Berkeley

Committee in charge:

Professor G. Mathias Kondolf

Professor Adina M. Merenlender

Professor Emeritus Robert H. Twiss

Spring 2010

Table 5-1: Ratio of water rights allocations to instream flows under various climate conditions

Seasonal Condition	Sample Time Period	Avg. Daily Water Rights Allocation (cfs)	Entire Record		3 wettest water years (1983,1982,1973)		3 driest water years (1977,1976,1990)	
			Avg. Daily Discharge (cfs)	Ratio of Water Rights to Instream Flow	Avg. Daily Discharge (cfs)	Ratio of Water Rights to Instream Flow	Avg. Daily Discharge (cfs)	Ratio of Water Rights to Instream Flow
Peak Winter	Dec - Feb	1.31	81.35	0.02	331.37	0.002	6.85	0.19
Draw-Down	Apr - Jun	4.3	18.80	0.23	62.30	0.07	3.08	1.40
Summer Base Flow	Jul - Oct	3.75	1.87	2.01	5.52	0.68	0.29	12.93

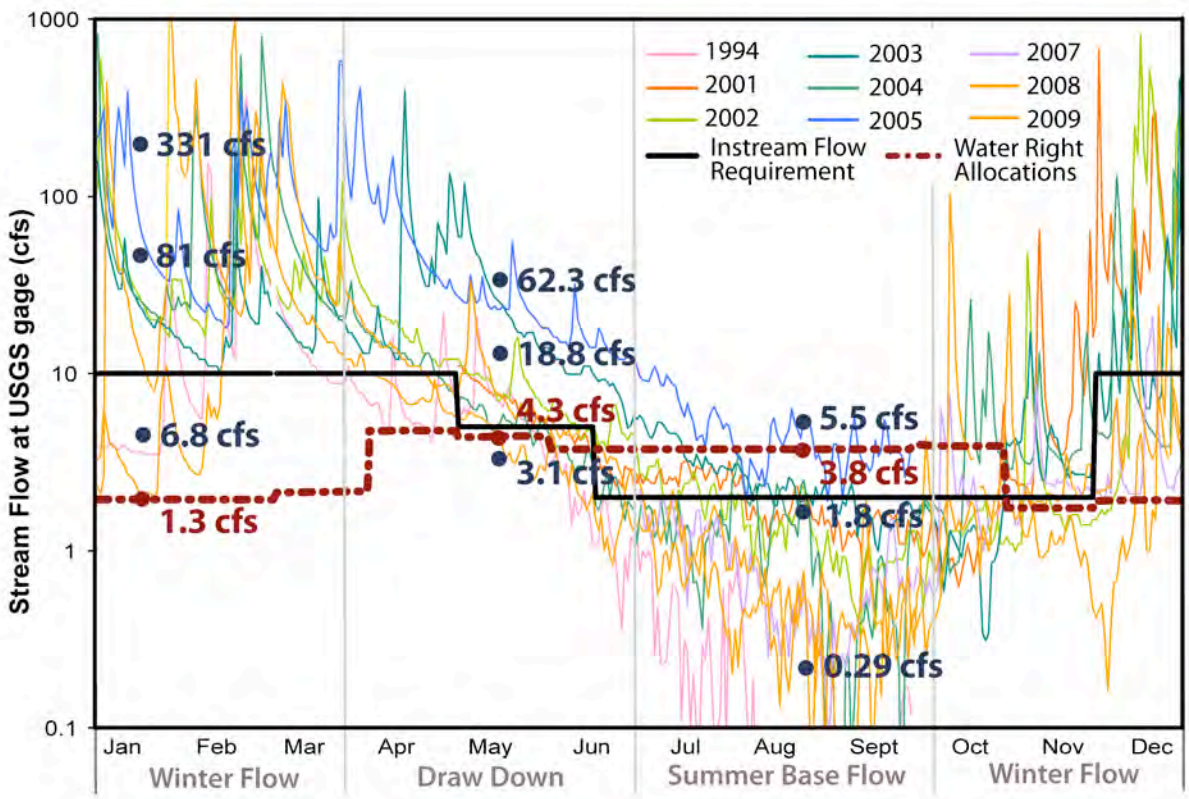


Figure 5-4: Daily mean flow at the USGS gauge for available records after the 1993 adjudication with the sum of all water rights allocations upstream of the USGS gauge shown as a dashed line and recommended minimum instream flow values listed in the 1993 adjudication document shown as a solid black line (*Source: USGS gauge, SWRCB 1993*)

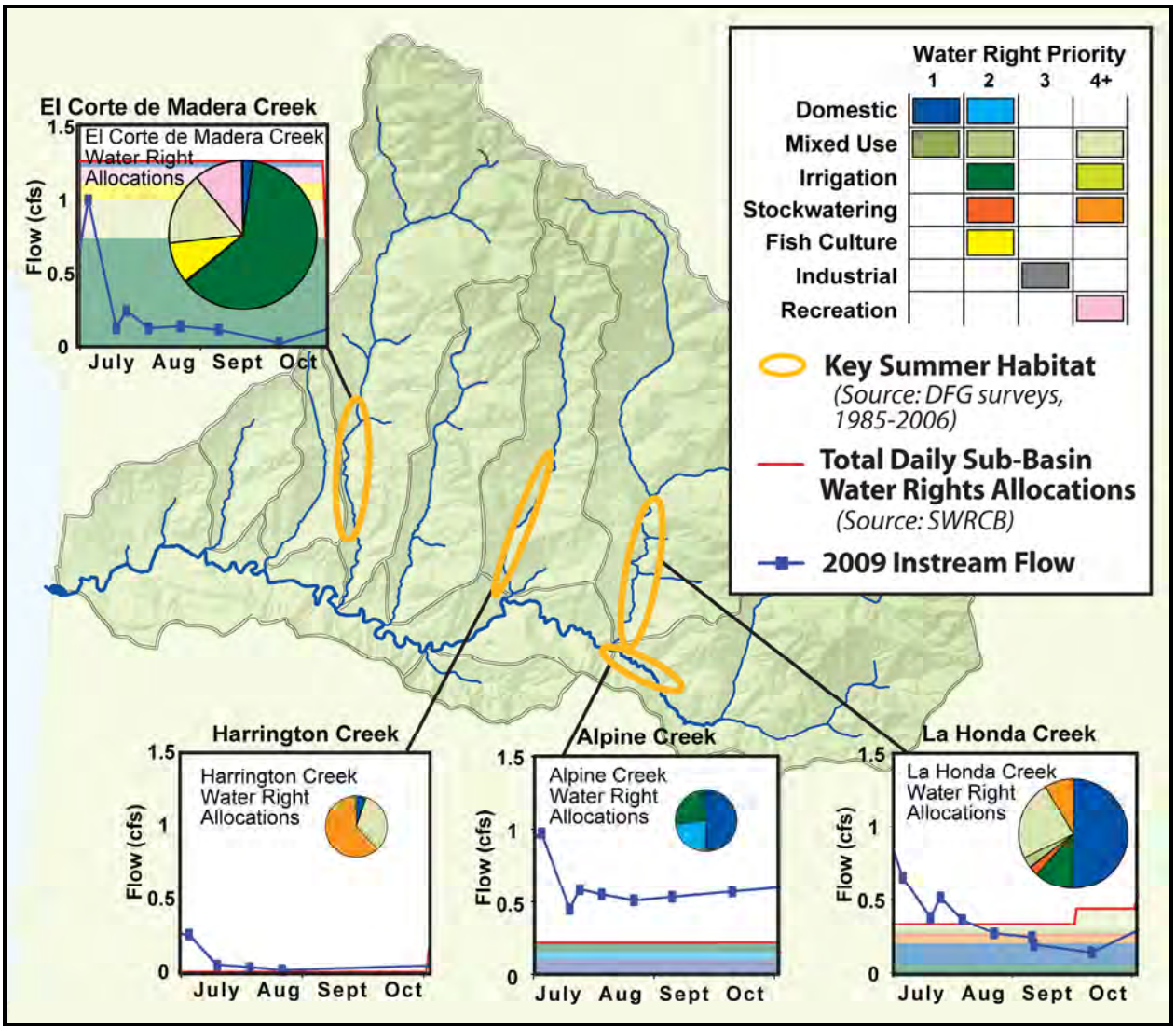


Figure 5-11: Comparison of water right allocations for sub-basins with key summer salmon rearing habitat

5.6 Summer Instream Flow Protection Example

As discussed in Section 5.5, many of the sub-basins in the San Gregorio watershed face significant instream flow impacts if existing water rights allocations are fully utilized. Alpine Creek, La Honda Creek, and el Corte de Madera Creek (all sub-basins that contain summer salmon rearing habitat) have existing water rights allocations that amount to 37%- 493% of their 2009 average summer base flows. Considering that the La Honda sub-basin contains documented salmon summer rearing habitat, contributed the second highest volume of late

summer instream flows in 2009, and has existing summer water rights allocations that are greater than the volume of 2009 late summer base flows (See Figure 5-10) this site provides a good opportunity for potential improvements in instream flow management.

Since water rights are typically managed on an individual basis, I conducted a simple analysis for a single agricultural water right, 'Farm A', located in La Honda Creek to see what the potential impact to instream flows would be if the surface water diversion period for the entire water right was transferred from summer to winter. Farm A is located upstream of summer rearing habitat locations in La Honda Creek and is in a location where construction of a pond to store water diverted in winter and spring for use in the summer low flow period is feasible. By maintaining the volume of water currently allocated to Farm A's summer water right (Farm A's water right is approximately 5% of the total volume of summer water right allocations in the sub-basin) and transferring it to months outside of the summer base flow period (including an additional 10% to account for evaporative and seepage losses), there is a potential instream flow increase of up to 10% during the summer base flow period at the summer rearing location near the base of the sub-basin and a much higher percent increase (up to 30-40%) in stream flow at the diversion site. At the same time this transfer in timing of surface water diversion only increases the impairment to average winter flows by 0.4% the base of the sub-basin and less than 5% at the site of the diversion. Further investigation is necessary to determine other impacts associated with developing a pond on this site (i.e. impacts to terrestrial species of concern and economic impacts to the landowner). While this is just a single case, it shows that the change in timing of even a small percentage of the overall summer surface water diversion within a basin can provide a significant increase in instream flows at critical habitat locations during low flow

periods while minimally impacting winter flow conditions. These benefits can be greatly enhanced if water rights are coordinated at and upstream of critical habitat areas.

Table 5-3: Example of potential transfer of timing of water right use impacts for Farm A

	Estimated Instream Flow	Total Daily Water Rights (gpd)	Farm A withdrawal (gpd)	Ratio Water Rights to Instream Flow (%)	Ratio Farm A Water Right to Instream Flow (%)
Exiting condition					
Jul-Sept:	0.36	438,542	22,300	188%	10%
Jan-Mar:	8.74	216,945	0	3.8%	0%
Switch Farm A to winter withdrawal					
Jul-Sept:	0.40	416,242	0	161%	0%
Jan-Mar:	8.70	241,475	24,530	4.3%	0.4%

*All estimated flows are based on 2009 flow values

Figure 5-12: Level of potential instream flow impairment under existing (summer diversion) and proposed (winter diversion) water rights conditions for Farm A

Reference 2

San Gregorio Creek Stream Impact Evaluation for a Diversion Pumping Rate of 90gpm

Justification that use of a 90gpm water diversion pump, which diverts no more than 10% of stream flow when discharge at the San Gregorio Creek USGS gage is at or above 2cfs, is protective of stream resources for flows above 2cfs

August 8, 2013

The San Gregorio Streamflow Enhancement Project is intended to improve late summer instream flow conditions and reduce overall impacts of water diversions on steelhead and Coho salmon in San Gregorio Creek while maintaining viable agriculture through the modification of irrigation infrastructure and water diversion timing. Phase 1 of this project involves making several changes to irrigation infrastructure on a single Project Site. The primary changes include upgrades to the site's irrigation system to maximize water use efficiency and a reduction of the rate in which water is pumped from San Gregorio Creek during summer months from an existing pumping rate of ~250 gpm (0.56cfs) down to ~70-90gpm (0.16-0.20cfs).

While the proposed reduction in summer pumping rate is obviously a substantial improvement over existing conditions, the following evaluations additionally show that a pump diverting at a rate of 90gpm or less within the lower half of the San Gregorio Creek stream channel does not significantly impact stream resources when stream discharge is between 2-10cfs *(Note: when stream discharge is less than 2cfs diversion of water may only occur with the authorization of the San Gregorio Watermaster, therefore impacts to flows below 2cfs were not included in the following evaluations).*

San Gregorio Creek Stage/Discharge Evaluation

Data collected in the mainstem of San Gregorio Creek both upstream (Reach 2) and downstream (USGS gage) of the Project Site were evaluated to provide a relative comparison of the relationship between water depth and discharge for stream flows between 2-10cfs.

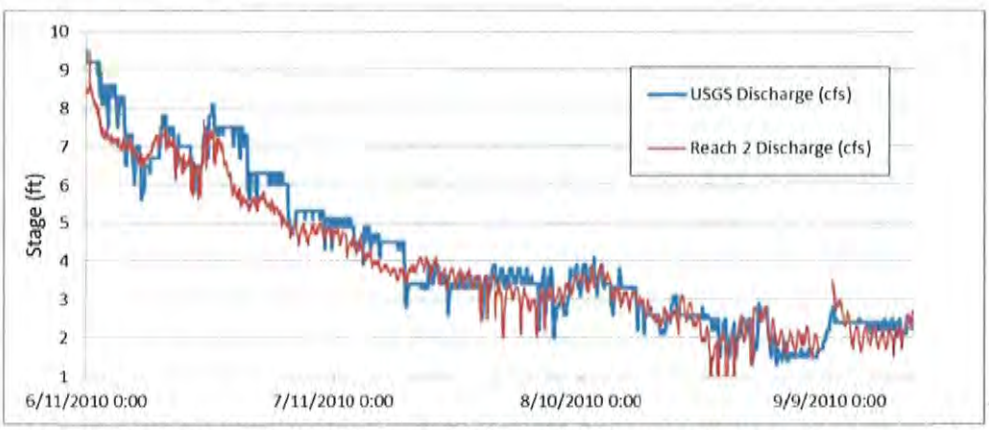
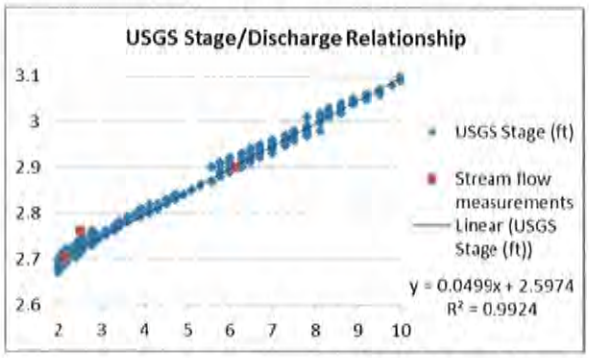
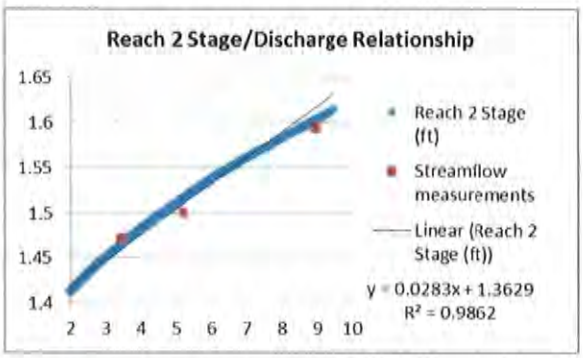


Figure 2: San Gregorio USGS Gage and Reach 2 Stream Flows – Summer 2010

For both the USGS gage site and Reach 2, the stage/discharge relationship is closely correlated when flows are between 2-10cfs (See Figures 3 and 4). When stream discharge is between 2-4cfs, the change in stage due to a 10% reduction in discharge is between 0.01-0.02ft at both sites and there is a maximum drop in stream depth of 0.01ft at both sites when discharge is reduced by 0.2cfs (equivalent to the maximum diversion rate of the proposed pump). Stream flow would have to drop by more than 1cfs when flows range between 2-10cfs in order to show more than a 0.1ft drop in surface water elevation at either of these locations.





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Discharge (cfs)	Stage (ft)	Discharge Reduced 10%	10% of Discharge (cfs)	Reduced Stage	Change in Stage (ft)
4	2.81	3.60	0.40	2.78	0.02
3.8	2.79	3.42	0.38	2.77	0.02
3.6	2.78	3.24	0.36	2.76	0.02
3.4	2.77	3.06	0.34	2.75	0.02
3.2	2.76	2.88	0.32	2.74	0.02
3	2.75	2.70	0.30	2.73	0.01
2.8	2.74	2.52	0.28	2.72	0.01
2.6	2.73	2.34	0.26	2.71	0.01
2.4	2.72	2.16	0.24	2.70	0.01
2.2	2.71	1.98	0.22	2.69	0.01
2	2.70	1.80	0.20	2.68	0.01

Table 2: Change in stage at Reach 2 with a 10% reduction in discharge

Discharge (cfs)	Stage (ft)	Discharge Reduced 10%	10% of Discharge (cfs)	Reduced Stage	Change in Stage (ft)
4	1.48	3.60	0.40	1.46	0.01
3.8	1.47	3.42	0.38	1.46	0.01
3.6	1.46	3.24	0.36	1.45	0.01
3.4	1.46	3.06	0.34	1.45	0.01
3.2	1.45	2.88	0.32	1.44	0.01
3	1.45	2.70	0.30	1.44	0.01
2.8	1.44	2.52	0.28	1.43	0.01
2.6	1.44	2.34	0.26	1.43	0.01
2.4	1.43	2.16	0.24	1.42	0.01
2.2	1.43	1.98	0.22	1.42	0.01
2	1.42	1.80	0.20	1.41	0.01

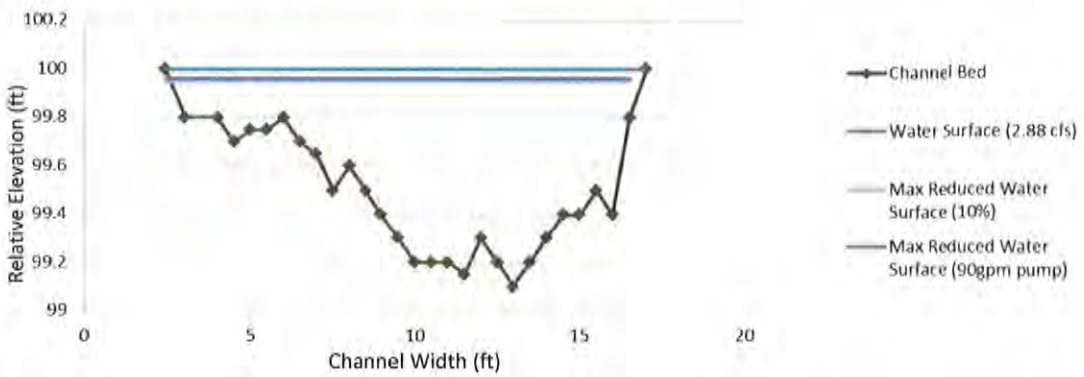
USGS gage Change in Discharge (cfs)	Change in Stage (ft)
0.2	0.01
0.56	0.03
1	0.05

Reach 2 Change in Discharge (cfs)	Change in Stage (ft)
0.2	0.01
0.56	0.02
1	0.03

Site Specific Cursory Evaluation

In order to obtain a very conservative estimate of the impact that a reduction in stream flow would have on water depth and associated habitat availability in the immediate vicinity of the project site when flows were within the range of 2-4cfs, we calculated the maximum change in water depth due to a reduction in discharge by applying a proportional relationship between discharge and wetted area to a surveyed channel cross section located downstream of the project site.

Channel cross section and stream flow data used for this cursory analysis were taken approximately 350 feet downstream of the proposed pump location site at approximately 2:30pm on June 27, 2013. Stream discharge measured at the channel cross section site using a Marsh-McBirney flow meter (Model 2000) was 2.88cfs at the time of the survey. No pumps were operating within 1,000ft upstream of the surveyed site during the time of the measurements. The USGS gage discharge reading at that time was 2.9cfs and the discharge at Reach 2 was measured at 3.05cfs three hours earlier in the day.



We assumed a proportional relationship between discharge and wetted area and applied the reduced wetted area to the channel profile in order to determine the relative change in water depth. Under this scenario the change in water depth when discharge drops 10% from 2.88cfs to 2.59cfs is 0.051ft. Using the same methodology but with a 0.2cfs drop in discharge (the maximum rate of the proposed pump) from 2.88cfs to 2.68, the maximum change in water depth at the project site would be 0.037ft. Considering that the site is located in an alluvial reach, the section of stream channel near the project location is likely influenced by subsurface flow and inputs from the groundwater table that would mute the effects of a diversion, further reducing the change in water depth. The results of the stage/discharge relationship evaluation for the San Gregorio USGS gage and Reach 2 (see Tables 1-4), sites that are also located in alluvial reaches of the stream channel, seem to confirm this assumption.

Tables 5: Estimated maximum change in depth relative to change in wetted area

discharge (cfs):	2.88	2.59	discharge (cfs):	2.88	2.60
wetted area (ft^2):	7.31	6.58	wetted area (ft^2):	7.31	6.60
change in depth (ft)*:		0.051	change in depth (ft)*:		0.037

**Calculation assumes uniform velocity and no buffering or interaction with subsurface flow. As such, the resulting change in depth values are likely greater than what would be observed in the field.*

Reference 3

Southern Steelhead Resources Evaluation

Identifying Promising Locations for Steelhead Restoration in Watersheds South of the Golden Gate

Gordon S. Becker
Katherine M. Smetak
David A. Asbury

This report should be cited as:
Becker, G.S., K.M. Smetak, and D.A. Asbury. 2010. Southern Steelhead Resources Evaluation: Identifying Promising Locations for Steelhead Restoration in Watersheds South of the Golden Gate. Cartography by D.A. Asbury. Center for Ecosystem Management and Restoration. Oakland, CA.

Center for Ecosystem Management and Restoration

Chapter 1. San Mateo County

According to our review, 22 coastal San Mateo County watersheds were associated with some fisheries related information, of which 18 provided habitat for steelhead historically (Table 1). Of these, 14 are believed to continue to provide spawning and rearing opportunities for *O. mykiss*. However, Purisima Creek does not support anadromy, and was not advanced to a comparison of habitat resources.

Table 1. San Mateo County Watersheds Screening by *O. mykiss* population

Watershed	*O. mykiss* population?
San Pedro	Y
Martini	Y*
San Vicente	N
Denniston	Y
Deer	N
Frenchmans	Y
Pilarcitos	Y
Cañada Verde	N
Purisima	Y'
Lobitos	Y
Tunitas	Y
San Gregorio	Y
Pomponio	Y
Pescadero	Y
Arroyo de los Frijoles	N
Gazos	Y
Whitehouse	Y
Cascade	N
Green Oaks	N
Año Nuevo	Y
Finney	N
Elliot	N

Notes:
*Insufficient information to determine habitat.
'A waterfall near the mouth of the creek precludes anadromy.

Available data and supplemental information were used to estimate rearing habitat in watersheds hosting *O. mykiss* populations, as shown in Table 2. The results indicate that the San Gregorio and Pescadero creeks systems (Figure 3) contain the vast majority of the county's steelhead resources.

Table 2. San Mateo County Watersheds Screening by Habitat

Watershed	Area (sq.mi.)	Habitat (stream miles) Total[1]	Available[2]
San Pedro	7.4	3.9	3.9
Denniston	3.8	2.8	0.8
Frenchmans	4.2	2.3	2.3
Pilarcitos	28.7	11.8	7.7
Lobitos	4.0	2.5	0.6
Tunitas	11.6	4.0	4.0
San Gregorio	52.2	32.8	32.8
Pomponio	7.1	1.7	1.7
Pescadero	81.0	50.7	49.3
Gazos	11.6	6.4	6.4
Whitehouse	4.3	2.9	2.9
Año Nuevo	2.4	0.8	0.8

Notes
[1]Includes all habitat located downstream from natural limits of anadromy
[2]Excludes habitat located upstream from impassible anthropogenic barriers

To further refine the areas containing suitable and available rearing habitat, mainstems and tributaries in the San Gregorio and Pescadero creeks watersheds were examined, as shown in Table 3. In the two San Mateo County anchor watersheds, we identified eight streams (of 35 candidates) that appear to account for the majority of the high value rearing habitat. Various aspects of steelhead habitat within the anchor watersheds are described below.

Table 3. San Mateo County Anchor Watershed Habitat by Stream

Watershed	Mainstem/Tributary	Habitat (stream miles) Total[1]	Available[2]
San Gregorio		**32.8**	**32.8**
	San Gregorio	8.6	8.6
	Coyote	0	0
	Clear	0	0
	El Corte de Madera	4.5	4.5
	Bogess	4.9	4.9
	Kingston	*	*
	Harrington	1.7	1.7
	La Honda	4.9	4.9
	Woodhams	0	0
	Langley	1.5	1.5
	Woodruff	1.5	1.5
	Alpine	5.3	5.3
	Mindego	2.7	2.7
	Rodgers Gulch	--	--

Table 3, continued

Watershed	Mainstem/Tributary	Habitat (stream miles) Total[1]	Available[2]
Pescadero		**50.7**	**49.3**
	Pescadero	25.6	25.6
	Butano	3.0	3.0
	Little Butano	*	*
	South Fork Butano	*	*
	Bradley	1.9	1.9
	Shaw Gulch	1.0	0
	Tahana Gulch	--	--
	Honsinger	0.9	0.9
	Weeks	0.1	0.1
	McCormick	0.2	0.2
	Hoffman	0	0
	Tarwater	2.2	2.2
	Peters	4.9	4.9
	Evans	0	0.4
	Bear	0	0
	Lambert	1.0	1.0
	Fall	0	0
	Slate	1.3	1.3
	Oil	5.2	5.2
	Little Boulder	0.8	0.8
	Waterman	2.0	2.0

Notes
[1]Includes all habitat located downstream from natural limits of anadromy
[2]Excludes habitat located upstream from impassible anthropogenic barriers
*Supports a reproducing *O. mykiss* population above natural limit of anadromy
--Insufficient information to determine habitat

Anchor Watersheds

San Gregorio Creek
Steelhead Resources
San Gregorio Creek was one of four "A-1" streams noted in San Mateo County in a 1912 DFG letter. Steelhead run size estimates from the 1960s vary between 300 and 1,000 individuals (DFG 1962a). In 1975, the system was deemed "one of the more important salmonid spawning and nursery resources along the coast of central California" (DFG 1975).

The majority of the watershed's rearing habitat has been documented in mainstem San Gregorio Creek, and in Bogess, La Honda and Alpine creeks (Table 3). El Corte de Madera Creek also offers extensive habitat resources, as well as substantially shorter migration distance to available spawning habitat than upstream tributaries. Additionally, researchers note, "…a substantial portion of potential smolt production is in the relatively large lagoon…" (Smith 1994). A recent watershed management plan for San Gregorio notes, "Based on CDFG sampling in 2005 and 2006, steelhead rearing in the lagoon consisted

primarily both age 0+ and age 1+ (>90%) and occurred for up to approximately eight months…. A variety of freshwater life histories were identified (Stillwater Sciences *et al.* 2010, p. 105). The plan goes on to state, "Amount and quality of lagoon habitat alleviates the effects of habitat restrictions in the upper watershed during years when the lagoon can form, and limit steelhead production when the lagoon can not [sic] form due to breaching or lack of freshwater" (p. 114). Accordingly, "actions affecting lagoon quality probably have the biggest effect on steelhead production" (Smith 1994).

Causes of Decline

Critical summer flows are likely to be an important factor that limits steelhead production in the creek (DFG 1971). A 2001 letter staff from the Division of Water Rights (DWR) stated, "…our preliminary analysis of water availability in the San Gregorio Creek watershed indicates that collectively, existing approved water demands exceed 50 percent of the estimated average unimpaired flow from October 1 to March 31 at the San Gregorio gage. According to guidelines… diversion of over 10 percent of the average unimpaired flow is likely to cause adverse effects on coho salmon and steelhead trout habitat in San Gregorio Creek" (SWRCB 2001). The watershed is fully adjudicated and there are numerous individuals seeking to obtain water rights.

Lack of summer and winter rearing habitat have been cited as limiting factors in recent reports (DFG 1996a; Stillwater Sciences *et al.* 2010). According to the 2010 watershed management plan, "A natural lack of boulders in some reaches, a lack of [large woody debris], and embeddedness of cobble/boulder substrates by fine sediment are the main causes of limited winter habitat" (Stillwater Sciences *et al.* 2010, p.114). Lack of summer rearing habitat has been attributed to low instream flows, filling in of pools with fine sediment, and lack of cover to control water temperature in rearing pools (DFG 1996a; Stillwater Sciences *et al.* 2010). As noted above, mechanical breaching of the lagoon or lack of freshwater inputs to the closed lagoon can significantly impact the steelhead population.

The San Gregorio watershed is listed as impaired by sediment pursuant to §303(d) of the Clean Water Act. The 2010 watershed management plan notes, "Due to its geology, steep gradients, and tectonic activity, the San Gregorio Creek watershed has the potential for a relatively high fine sediment yield" (Stillwater Sciences *et al.* 2010, p. 57). Anthropogenic sources of sediment have been observed to exert additional pressure on the system. According to the management plan, "Pool filling appears to be occurring from sediment transport from upslope sources and has been noted to reduce available habitat throughout the San Gregorio Creek watershed since the 1970s from logging, agriculture, and urbanization" (Stillwater Sciences *et al.* 2010, p. 110).

A 1985 stream survey of El Corte de Madera Creek noted, "Cattle grazing and logging have been the two major problems which have greatly reduced the amount of salmonid spawning [and rearing] habitat" (DFG 1985a). Cattle impacts were reiterated in a 1996 DFG survey (Hickethier and Miles 1996). Also, erosion of roads and trails in the upper portion of the basin appear to be contributing to high sedimentation rates (NMFS 2001).

La Honda Creek has suffered from historical logging practices, over-appropriation of flows, high sedimentation due to encroachment and poor road maintenance, and water quality

impacts from dumping and discharge to the creek (DFG 1962b; DFG 1973; DFG 1985b; DFG 1996a).

Alpine Creek similarly has been impacted by sedimentation and excessive diversion (DFG 1996a; DFG 1997a). The 2010 management plan notes, "Alpine Creek Road parallels much of the creek, and it is likely that landslides and road-maintenance activities contribute fine sediment to the channel" (Stillwater Sciences *et al.* 2010, p.11).

Conservation Activities

The San Gregorio Environmental Research Center (SGERC) and multiple partners are participating in ongoing collaborative restoration planning to develop the San Gregorio Watershed Assessment and Plan, a comprehensive program that includes the scientific assessment of watershed conditions, continuous water quality and stream flow monitoring, and preparation of a watershed management plan. The plan, published in June, 2010, provides an overview of the current state of the watershed's steelhead resources and includes management objectives and restoration recommendations. In addition, the San Gregorio Watershed Information System, an online database that contains a compilation of studies and reports about the watershed, was recently developed.

The San Gregorio Environmental Resource Center and other partners receiving funding from the State Water Resources Control Board succeeded in re-activating the USGS gauging station at Stage Road and purchased equipment to implement continuous monitoring of instream flows and water quality. Funding was obtained to modify a passage barrier at the Alpine Creek fish ladder identified by Ross Taylor & Associates in 2004. Though the project was not implemented due to conflict with the property owner, the funding may be used for restoration in other parts of the watershed.

American Rivers obtained an EPA grant for a project entitled "San Gregorio Creek Watershed - Filling Critical Flow Needs." The goal of this project is to increase water quality and habitat through a non-regulatory approach to healthy river flow while maintaining agricultural productivity.

A joint project by Trout Unlimited and CEMAR began in winter 2009 to install gages in two mainstem locations as well as in tributaries including Alpine and El Corte de Madera creeks. The project also incorporates data from the SGERC-maintained gage in La Honda Creek and the USGS gage in San Gregorio Creek. When sufficient data are collected and analyzed, a stream management plan will be developed that identifies opportunities--such as providing increased storage and altering location and timing of diversion--for purposes of reducing the impact of diversion on dry season habitat quality. The project is being supported the California State Coastal Conservancy with support from American Rivers.

Open space preserves in the San Gregorio watershed provide additional opportunities for steelhead habitat enhancement. The Midpeninsula Regional Open Space District (MROSD) manages preserves within the El Corte de Madera and La Honda Creek sub-basins. The El Corte de Madera Creek Open Space Preserve consists of 2,817 acres in the San Gregorio Creek watershed headwaters and the La Honda Creek Open Space Preserve consists of 5,759 acres within the La Honda Creek, Harrington Creek, and Bogess Creek sub-basins.

The MROSD worked with other agencies to develop a watershed protection program for the Preserve directed toward improving overall watershed condition and functioning and protecting salmonid habitat in the lower San Gregorio watershed by identifying problematic upland sources of erosion and reducing sediment input to the system. Road and trail erosion inventory reports were commissioned by the MROSD for the El Corte de Madera Creek Preserve (Best 2002) and the La Honda Creek Preserve (Best 2007). The reports identify sediment sources, assign priority rankings for treatment, and outline treatment prescriptions. Of the 200 sites inventoried in the El Corte de Madera Creek Preserve, 73 received "moderate" to "high" treatment priority. Of the 157 sites inventoried in the La Honda Creek preserve (including the Driscoll Ranch property), 85 received moderate to high treatment priority, 40 of which were located within the Driscoll Ranch parcel.

Restoration Opportunities

A review of passage barriers in the San Gregorio watershed was conducted using the PAD, supplemented by various references. Key barriers are listed in Table 4 and labeled in Figure 3. Passage barrier modification and other restoration opportunities for essential streams within the San Gregorio watershed are discussed below.

Table 4. San Gregorio Creek Watershed Key Passage Barriers

Barrier ID	Watershed	Stream	Description	Type	Source
82-02	San Gregorio	El Corte de Madera	Bear Gulch Road crossing	Partial	PAD
82-03	San Gregorio	El Corte de Madera	Dam with 2' step	Partial	PAD
84-01	San Gregorio	Bogess	San Gregorio Creek Rd. crossing	Partial	DFG 1996
84-02	San Gregorio	Bogess	Private road crossing	Partial	DFG 1996
94-01	San Gregorio	Alpine	Concrete apron d/s of fishway	Partial	Taylor 2004

No anthropogenic passage barriers were noted on mainstem San Gregorio Creek. The most important restoration actions for mainstem San Gregorio include curtailing diversions during the dry season to maintain rearing habitat and provide freshwater input to the lagoon. The use of off-stream water tanks to store water during winter high flows as an alternative to pumping water from the streams during the dry season is recommended here and in the 2010 watershed management plan. Other recommendations in the 2010 watershed management plan and supported here include avoiding human-caused summer sandbar breaching, conducting stream flow monitoring to identify critical instream flow needs for over-summering steelhead and coho salmon, and monitoring steelhead and coho populations.

In El Corte de Madera Creek, the Bear Gulch Road crossing (Barrier 82-02) is located at approximately stream mile 2.8. Staff from the San Mateo Resource Conservation District (RCD) visited this crossing in February 2010 and noted that it "appeared very clearly to be a partial barrier" (K. Nelson pers. comm.). As substantial habitat exists upstream of this barrier, we recommend assessing its potential to limit steelhead migration and modifying it for passage in accordance with other passage barrier modification priorities. Another barrier on El Corte de Madera Creek, described in the PAD as a dam with a two-foot step (Barrier 82-03), is located on private property approximately 0.7 miles downstream from the upper limit of anadromy. We recommend obtaining permission from the landowner to assess the severity of this barrier.

In Bogess Creek, the San Gregorio Road crossing and a private road crossing (Barriers 84-01 and 84-02) create potential passage constraints in the most downstream half mile. As substantial habitat exists upstream of these crossings, we recommend assessing their severity and modifying them if they prove to be problematic for migrating steelhead in accordance with other passage barrier modification priorities.

No anthropogenic barriers were noted on La Honda Creek. A 2006 report recommends implementing treatments for road-related sedimentation for sources identified in previously prepared sediment assessments (Baglivio and Kahles 2006).

On Alpine Creek, a concrete apron downstream of a fishway was identified as a partial barrier (Barrier 94-01). As noted above, funding was obtained to modify this passage barrier, but the project was not implemented due to conflict with the owner. According to staff from the San Mateo RCD, the concrete apron does not likely create significant passage problems and should not be considered a priority project, as NOAA staff and Department of Public Works roads crews recently observed adult steelhead and coho salmon spawning upstream of this site (K. Nelson pers. comm.).

Pescadero Creek

Steelhead Resources

Pescadero Creek also was one of four "A-1" streams noted in San Mateo County in a 1912 DFG letter and it appears to have supported the largest steelhead run in San Mateo County historically. In a 1967 report, the annual steelhead run of Pescadero Creek was estimated to consist of 1,500 individuals (DFG 1967).

Extensive habitat areas occur on mainstem Pescadero Creek in Pescadero Creek County Park and in Portola State Park. A watershed assessment noted high quality habitat in the mid and upper Pescadero Creek watershed and lower in the Butano Creek watershed (ESA 2004). Watershed assessment work indicates that several headwaters tributaries including Peters and Oil creeks should receive "special attention in regards to conservation and restoration" (ESA 2004). Additionally, the system offers estuarine habitat that, if managed properly, can provide important rearing habitat. According to a principal researcher, up to 80 percent of the steelhead population of the watershed may rear in the lagoon (SWRCB 1996).

Causes of Decline

A 1946 DFG report states, "Undoubtedly, the condition of Pescadero Lagoon and the lower part of Pescadero Creek has deteriorated over the years, the lagoon becoming shallower and the summer flows in the stream smaller. The principal causes have been the increasing use of water for irrigation and domestic use, deforestation of the drainage basin, and silting created by highway construction and erosion of cultivated fields" (DFG 1946).

A 1962 DFG survey report noted that Pescadero Creek was "under-utilized" due to passage barriers and sedimentation (DFG 1962c). High sedimentation rates have been observed in Oil Creek due to past logging practices and to poor road maintenance (DFG 1962d; DFG 1997b). Pescadero Creek is listed as impaired by sediment pursuant to §303(d) of the Clean Water Act, and Total Maximum Daily Load (TMDL) requirements are being developed by the San Francisco Regional Water Quality Control Board.

A 2004 recent watershed assessment identified several primary limiting factors for the Pescadero Creek system including lack of pool habitat (due in part to logging effects) and sedimentation (ESA 2004). The existence of extensive protected land uses in the upper watershed suggests that upland rearing habitat may remain in relatively good condition into the future.

Lagoon conditions continue to limit steelhead restoration in the Pescadero Creek system. The lagoon and marsh are expected to transition seasonally from an open estuarine system to a closed lagoon system when a sandbar forms across the mouth of Pescadero Creek. In years when the closed lagoon converts to freshwater conditions, it provides important summer and fall rearing habitat for juvenile steelhead and can account for the majority of smolt production in the watershed. Sufficient freshwater inflows at the time of closure allow the lagoon to rapidly convert from saltwater to freshwater.

Restoration work in the Pescadero Marsh was implemented by State Parks between 1993 and 1997 as part of the Pescadero Marsh Natural Preserve Hydrological Enhancement Project to address habitat issues in lower Pescadero Creek. Observations made by Dr. Jerry Smith and others indicate that although sandbar formation in the 1980s typically occurred between the months of May and July, bar formation since completion of the enhancement project may be delayed until September or October. Late sandbar formation has been linked to a strongly salinity-stratified lagoon in fall with severe hypoxia and anoxia. Hypoxic/anoxic bottom water conditions observed while the sandbar is in place have been observed to persist until several days after the breaching of the sandbar. Fish kills (including steelhead) coinciding with the breach of the sandbar have been observed in multiple years since completion of the enhancement project. The first large fish kill was documented in 1995, and is believed to be a result of rapid mixing of anoxic bottom water into the main area of the lagoon at the time of the sandbar breach.

Conservation Activities

A 2003 sediment assessment report for the Pescadero Park complex, consisting of Memorial, Pescadero and Sam MacDonald parks, identified projects to reduce sediment input to Pescadero Creek (PWA 2003). Sediment reduction projects were implemented along Old Haul, Tarwater, and Camp Pomponio roads between 2003 and 2006 based on recommendations in the report.

The San Mateo County Farm Bureau, Red Tree Properties, and multiple resource agencies coordinated the removal of a 12 foot high legacy log dam barrier in Waterman Creek, a tributary to Pescadero Creek, with funding from American Rivers and the local Native Sons of the Golden West. The project was implemented between 2008 and 2010 and provided steelhead access to approximately 1.5 miles of previously unavailable habitat.

Public agencies and other stakeholders formed the Pescadero Marsh Working Group (PMWG) with the mission to protect and enhance the ecological health of the Pescadero Marsh ecosystem through collaborative, science-based planning and action. In December 2008 PMWG held a restoration forum in the Town of Pescadero at which stakeholders discussed problems facing the marsh and generated a list of potential restoration goals and actions. The working group is preparing a set of recommended goals and hypotheses to assess to improve the conceptual model of the Pescadero Marsh.

Environmental Science and Associates (ESA) has conducted extensive studies for State Parks to assess current conditions in the marsh, impacts of human activities, and potential restoration options. To address fish kills in the short term, bladder dams may be placed at locations in the marsh to isolate anoxic water away from the main lagoon at the time of the sandbar breach. The PMWG has decided that further study of the marsh system is required before long-term solutions can be developed. Such investigations will help determine appropriate restoration actions necessary to increase the quality of the lagoon steelhead habitat.

Restoration Opportunities

A review of passage barriers listed in the PAD and other sources indicates a number of potential restoration projects for the Pescadero watershed. Key barriers are listed in Table 5 and labeled in Figure 3.

Table 5. Pescadero Creek Watershed Key Passage Barriers

Barrier ID	Watershed	Stream	Description	Type	Source
100-01	Pescadero	Pescadero	hay bale and plank dam	Partial	PAD
100-02	Pescadero	Pescadero	Constructed branch dam	Partial	PAD
100-03	Pescadero	Pescadero	sand bag dam	Partial	PAD
100-04	Pescadero	Pescadero	Constructed log dam	Partial	PAD
100-05	Pescadero	Pescadero	summer flashboard dam	Partial	PAD

A 2004 ESA report notes, "Few barriers to fish migration, other than natural falls, were seen by our field crews or noted in previous surveys, except in small tributaries and high in some larger tributaries. We did not find that artificial barriers are a major impediment to the fishery in this watershed" (p. 2-18). However, as the above listed potential barriers are located downstream from a substantial portion of mainstem and tributary habitat, they warrant assessment. Staff from the San Mateo RCD are developing plans to visit the barriers listed in Table 5 to confirm their presence and assess their severity (K. Nelson pers. comm.).

A 1996 DFG survey report recommended restoration actions including assuring adequate stream flows for over-summering, reducing nutrient loading, and decreasing sedimentation through land use improvements and revegetation (DFG 1996b). Staff from DFG also has recommended pursuing only off-stream reservoirs in the watershed and establishing minimum flows to be measured in the area near the mouth of the creek (SWRCB 1996). Revegetation of denuded areas along essential stream corridors would help address sedimentation and water quality issues. Other important physical improvements in the watershed likely will include alteration of the lagoon and marsh configuration coupled with provision of adequate streamflow into the marsh following sandbar closure, and erosion and runoff control in the Butano Creek basin.

Reference 4

PESCADERO-BUTANO WATERSHED ASSESSMENT

Final Report

March 5, 2004

PESCADERO-BUTANO WATERSHED ASSESSMENT

Final Report

March 5, 2004

Prepared for

Monterey Bay
National Marine Sanctuary Foundation
299 Foam Street
Monterey, CA 93940

Prepared by

Environmental Science Associates
Pacific Watershed Associates
O'Connor Environmental, Inc.
Albion Environmental, Inc.
Dennis Jackson, Hydrologist

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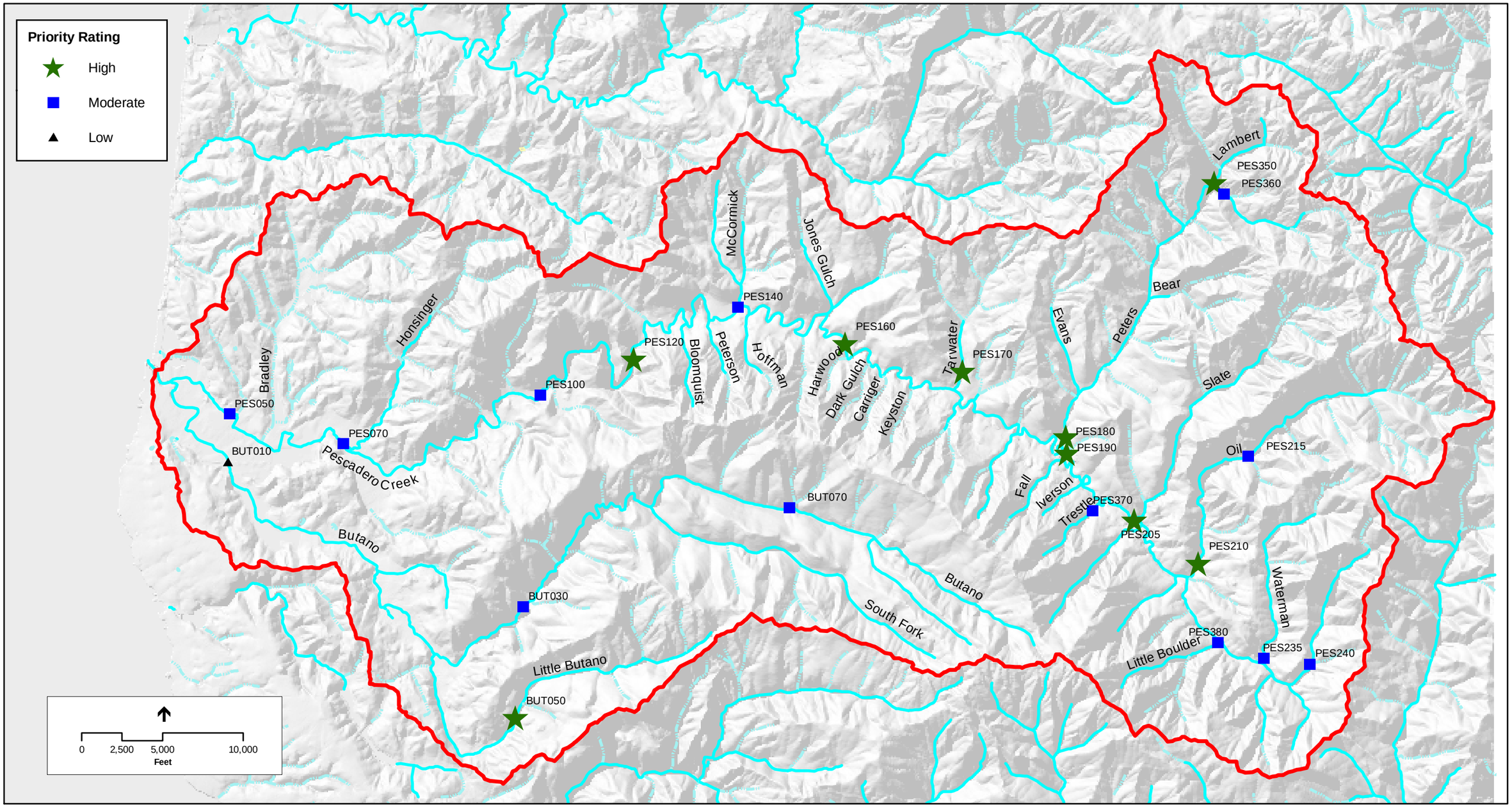
ESA Environmental Science Associates

202395



SOURCE: USGS data sets from Bay Area Regional Database; Sampling points from San Francisco Bay Regional Water Quality Control Board and Environmental Science Associates

Map 2-3

Fisheries Habitat Ratings

during the summer 2003 survey period and was therefore only assessed qualitatively. Furthermore, two sites were established in the vicinity of previous SWAMP sampling locations. At these sites, we collected site-specific CSBP habitat data, as well as pool and water quality data, but used the existing biotic condition data generated during the 2002 SWAMP effort. Table 8-1 summarizes by sampling site the various existing and new data sources used in this assessment. Sampling site locations are shown in Map 2-3 in Chapter 2.

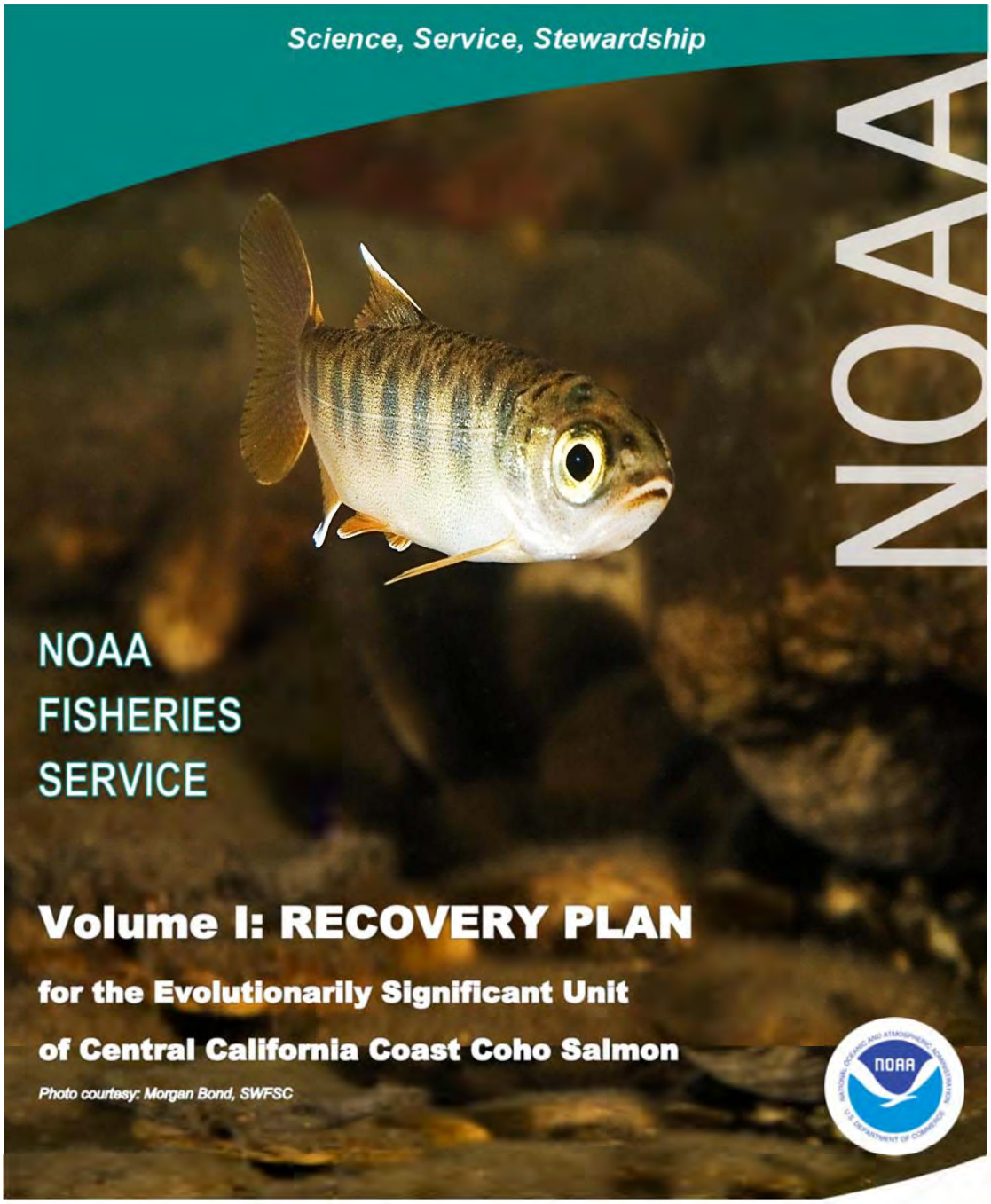
TABLE 8-1
FISHERIES HABITAT DATA SOURCES BY SAMPLING SITE

	Existing Data (SWAMP, Spring 2002)		New Data (ESA, Summer, 2003)				
Site ID	**CSBP Habitat**	**CSBP Biotic**	**CSBP Habitat**	**CSBP Biotic**	**Pool Habitat**	**Water Quality**	**Water Temp.**
PES050	√	√			√	√	
PES070	√	√			√	√	√
PES100	√	√			√	√	√
PES120	√	√			√	√	
PES140	√	√			√	√	
PES160	√	√			√	√	√
PES170	√	√			√	√	√
PES180	√	√			√	√	√
PES190	√	√			√	√	√
PES205		√*	√		√	√	√
PES210	√	√			√	√	
PES215			√	√	√	√	√
PES235		√**	√		√	√	√
PES240	√	√			√	√	
PES320			DRY	DRY	DRY	DRY	DRY
PES350			√	√	√	√	
PES360			√	√	√	√	
PES370			√	√	√	√	
PES380			√	√	√	√	
BUT010	√	√			√	√	
BUT030	√	√			√	√	
BUT050	√	√			√	√	√
BUT070			√	√	√	√	

Notes: * CSBP biotic condition data derived from SWAMP site PES200
** CSBP biotic condition data derived from SWAMP site PES230

Reference 5

Science, Service, Stewardship



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Volume I: RECOVERY PLAN

for the Evolutionarily Significant Unit of Central California Coast Coho Salmon

Photo courtesy: Morgan Bond, SWFSC

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Figure 37: Coho Focus and Supplemental Populations for Recovery

Reference 6

Photo credit: N.Panton

San Gregorio Creek Watershed Management Plan

San Gregorio Creek Watershed Management Plan

JUNE 2010

Prepared for the Natural Heritage Institute

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With an appendix on Groundwater Influences Affecting Aquatic Habitat Potential, San Gregorio Creek Watershed by Robert Zatkin and Barry Hecht

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Funding provided by:

State Water Resources Control Board, under Proposition 40, the California Clean Water, Clean Air, Safe Neighborhood Parks, and Coastal Protection Act of 2002

and rearing habitat, which could reduce production in the basin. Coho salmon upstream migration and spawning typically occurs after the onset of winter rains, but may have been impacted in San Gregorio by impediments during dry years which are often associated with delayed lagoon breaching, or during years when the onset of rains occurs after the peak of migration.

In depressed populations, such as in San Gregorio Creek, production from limited spawning may not be adequate to seed summer rearing habitat. When this occurs, every constructed redd is critical to produce enough progeny to seed available habitat, and the recovery of the population is effectively reduced by density-independent sources of mortality, such as flow migration barriers for adults and egg mortality from redd scour. In this instance egg-to-fry survival will prevent full seeding of available habitat, but is otherwise not the factor that likely drove the population to a depressed condition. Smith (2008) noted significant mortality due to redd scour in Gazos, Waddell, and Scott creeks in 1992, 1995, 1998, and 1999.

The mouth of the San Gregorio Creek watershed is protected by a seasonal lagoon, which forms naturally in response to tidal and rainfall cycles. This lagoon is used by age 1+ coho salmon during the spring while migrating to the ocean (Smith 1990; K. Atkinson, pers. comm., 2009), and the presence of the sandbar and the timing of breaching and closure affects coho salmon migration timing. Anthropogenic alteration of the lagoon, from increased sediment loads or lower stream flows, may influence sandbar formation through delayed bar opening in the winter or accelerated bar closure in the spring and affect fish migration (CDFG 2004). During wet years migration appears unimpeded for both smolts and adults, especially when breaching is exacerbated by the public. However, during dry years the formation of the berm appears to block the potential migration for both adults and smolts (K. Atkinson, pers. comm., 2009).

4.3.2.5 Limiting factors hypotheses

Based on our conceptual model, San Gregorio Creek historically likely had all of the habitat elements to support a viable coho salmon population. However, currently, the San Gregorio Creek watershed does not support viable numbers of coho salmon for any brood year class (CDFG 2002). As discussed above, many factors have the potential to affect all life stages of coho salmon in San Gregorio Creek. Rather than listing all elements that potentially influence the population, we have used our conceptual model of coho salmon to generate the following hypotheses, which isolate the highest priority and most likely causes of the dramatic declines in abundance of coho salmon in the watershed[24]:

1. Lack of LWD and off-channel habitat limit the area and quality of winter rearing habitat, reducing winter survival enough to have caused drastic declines of coho salmon prior to the 1970s, limit current production, and unless addressed will continue to delay potential recovery of the population in the watershed.
2. Low instream flows during fall resulting in delayed lagoon bar breaching prevent migration to spawning habitat in some years, limit current production, and unless addressed will continue to delay potential recovery of the population in the watershed.
3. Poor marine conditions reduce coho salmon ocean survival and thus exacerbate freshwater habitat limitations in San Gregorio Creek, reducing abundance but not ultimately limiting production or recovery.

[24] Although developed prior to the release of the NMFS draft coho salmon recovery plan, the limiting factor hypotheses correspond with NMFS draft restoration priorities for San Gregorio Creek to improve baseflow, increase and improve the number of off channel habitats, increase the amount of large wood in streams, decrease the number of roads near the stream and reduce impacts from remaining roads, and improve pool habitat (NMFS 2010).

availability likely contribute to the productivity of the lagoon and its value as salmonid rearing habitat (K. Atkinson, pers. comm., 2009). Overall, the lagoon habitat is crucial to the life history of steelhead in this watershed, and is likely increasing the carrying capacity of the watershed, alleviating some of the limitations from poor habitat conditions in the upper watershed.

4.3.3.5 Limiting factors hypotheses

Our conceptual model of steelhead in San Gregorio Creek results in the following hypotheses, and the general understanding that primarily density-dependant factors likely limit production in the upper watershed (e.g., availability of winter rearing habitat), while primarily density-independent factors affect production in the lagoon (e.g., water quality):

1. A lack of winter habitat for age 0+ steelhead limits the abundance of the age 1+ population, resulting in under-seeding of available summer rearing habitat.
2. A lack of winter habitat for age 1+ steelhead limits the production of the population.
3. A natural lack of boulders in some reaches, a lack of LWD, and embeddedness of cobble/boulder substrates by fine sediment are the main causes of limited winter habitat.
4. Low summer instream flows limit potential rearing habitat for age 0+ steelhead and invertebrate production from riffles.
5. Reduced LWD, fine sediment filling of pools, and low instream flows limit formation and maintenance of complex pool habitat for age 1+ steelhead.
6. Amount and quality of lagoon habitat alleviates the effects of habitat restrictions in the upper watershed during years when the lagoon can form, and limit steelhead production when the lagoon can not form due to breaching or lack of freshwater.

4.3.4 Tidewater goby limiting factors analyses

4.3.4.1 Distribution and status

Tidewater goby historically occurred in at least 134 localities along the California Coast, in coastal lagoons, marshes, and estuaries from Tillas Slough in the Smith River of Del Norte County to Agua Hedionda Lagoon in San Diego County (Moyle 2002, USFWS 2005). The fish still occur within this range, but over half of the populations at these localities are extirpated or extremely small with uncertain long-term persistence (USFWS 2005). The dramatic decline in these species resulted in USFWS listing tidewater goby as a federally endangered species in 1994 (USFWS 1994).

The San Gregorio Creek lagoon was proposed as critical habitat for the tidewater goby in 2006 and again in 2008 (USFWS 2006, 2008). Critical habitat contains features that are essential for the conservation of a threatened or endangered species and may require special management consideration or protection (USFWS 2005). The lagoon is also part of the Greater Bay (GB) recovery unit, which extends from Salmon Creek in Sonoma County to the Salinas River in Monterey County, and is within the GB-5 sub-unit that includes San Gregorio, Pescadero, and Bean Hollow creeks. All three watersheds in sub-unit GB-5 support populations of tidewater goby. Recovery units are based upon morphological characteristics supported by genetic testing (Ahneldt et al. 2004, Dawson et al. 2001, both as cited in USFWS 2005), and sub-units are considered to be genetically different from one another (USFWS 2005). The population in San Gregorio is genetically distinct from the population in Pescadero Creek based upon microsatellite analysis (Mendonca et al. 2001). San Gregorio also has very low microsatellite genetic diversity, indicating that it has gone through a major population bottleneck.

Reference 7

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Hydrologic Unit Code 18050006
Latitude 37°19'33", Longitude 122°23'08" NAD27
Drainage area 50.9 square miles
Gage datum 11.40 feet above NGVD29

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00060, Discharge, cubic feet per second,												
YEAR	Monthly mean in ft3/s (Calculation Period: 1969-10-01 -> 2013-09-30) Calculation period restricted by USGS staff due to special conditions at/near site											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1969										4.15	4.61	38.7
1970	258.6	65.1	70.0	14.7	9.27	4.83	2.81	1.54	0.895	1.30	28.8	187.6
1971	49.4	16.8	45.9	23.5	10.7	6.09	2.97	1.39	0.695	0.762	2.92	29.1
1972	14.8	28.8	7.91	5.61	2.58	0.880	0.119	0.015	0.280	9.79	161.7	47.0
1973	270.1	327.0	151.9	36.4	14.3	7.28	3.49	2.33	2.77	3.54	127.9	212.7
1974	163.8	42.6	162.5	184.5	24.7	12.7	11.7	4.98	3.51	3.73	5.28	11.3
1975	21.4	82.1	116.0	45.4	15.5	7.67	5.17	3.25	2.48	4.44	4.39	3.84
1976	3.51	4.54	6.99	5.41	1.91	0.814	0.058	0.786	0.065	0.463	0.707	1.70
1977	2.99	2.21	2.98	1.05	1.42	0.391	0.035	0.000	0.000	0.000	1.23	19.2
1978	206.8	146.8	80.0	80.9	19.7	12.0	4.61	0.383	0.460	0.771	3.71	3.49
1979	39.1	116.4	98.6	28.0	11.1	3.63	2.16	1.01	0.658	4.11	7.94	58.3
1980	170.4	223.3	60.5	24.5	12.7	8.29	4.36	3.05	1.52	1.52	1.33	2.88
1981	27.2	17.1	82.5	17.0	2.06	0.350	0.116	0.570	0.046	1.30	25.8	137.8
1982	345.1	203.3	127.5	258.6	37.5	20.5	10.8	6.68	3.92	6.13	41.9	98.5
1983	248.5	311.4	432.3	97.8	68.5	20.4	10.2	5.15	4.46	11.6	120.2	296.8

1984	62.0	39.8	30.2	18.7	11.0	7.76	3.16	2.16	1.70	6.88	61.2	51.5
1985	13.6	75.7	56.6	20.6	7.06	3.69	1.14	0.353	0.752	1.70	5.89	11.8
1986	35.8	379.4	280.2	34.5	13.7	7.73	3.61	1.58	3.75	2.78	3.04	4.85
1987	8.70	69.4	30.4	7.29	2.65	0.822	0.275	0.014	0.014	1.06	5.61	23.0
1988	50.5	8.36	3.60	3.80	1.82	0.358	0.019	0.000	0.000	0.011	3.63	9.70
1989	16.7	8.91	82.2	14.6	5.89	1.74	0.330	0.181	0.659	5.97	11.9	7.48
1990	11.1	24.5	8.56	6.44	6.29	4.01	1.00	0.424	0.276	0.394	0.920	2.60
1991	1.17	4.44	144.3	12.9	3.57	1.84	0.699	0.234	0.091	2.28	1.11	5.98
1992	10.8	218.6	69.5	15.5	4.49	2.31	0.881	0.119	0.124	1.04	1.40	20.5
1993	309.5	160.2	71.8	34.9	14.8	9.11	3.49	1.93	1.31	1.92	2.93	8.71
1994	7.72	69.0	12.5	7.44	7.13	1.72	0.388	0.109	0.023			
2001					7.49	3.61	2.68	1.78	1.32	1.29	10.8	101.4
2002	69.4	54.2	37.0	16.5	9.20	5.08	2.25	1.44	0.843	1.20	4.13	137.5
2003	34.4	24.9	21.6	59.3	32.8	9.19	3.93	2.27	1.68	1.18	4.32	43.8
2004	65.8	154.5	39.6	12.1	5.66	2.72	1.32	1.75	0.405	4.52	4.88	53.1
2005	113.4	99.4	163.5	65.8	25.9	15.2	7.09	3.95	3.52			
2007							1.39	0.521	0.565	2.01	2.58	4.35
2008	139.9	96.7	19.6	7.69	4.26	2.01	0.853	0.373	0.251	1.60	2.61	4.00
2009	4.05	122.5	83.0	11.6	9.69	3.93	1.40	0.632	0.499	7.06	2.24	5.43
2010	104.8	65.7	70.5	75.2	16.7	8.11	4.48	2.90	2.12	2.56	6.01	92.4
2011	29.4	80.2	245.4	43.0	17.6	14.7	8.67	5.26	3.29	4.98	4.60	3.78
2012	9.39	7.18	114.6	89.1	12.1	5.47	3.01	1.33	0.826	1.26	13.3	209.5
2013	30.7	13.3	10.2	8.38	3.74	2.45	1.18	0.628	0.387			
Mean of monthly Discharge	84	96	87	40	13	6.1	3.0	1.7	1.2	3.0	20	56

** No Incomplete data have been used for statistical calculation

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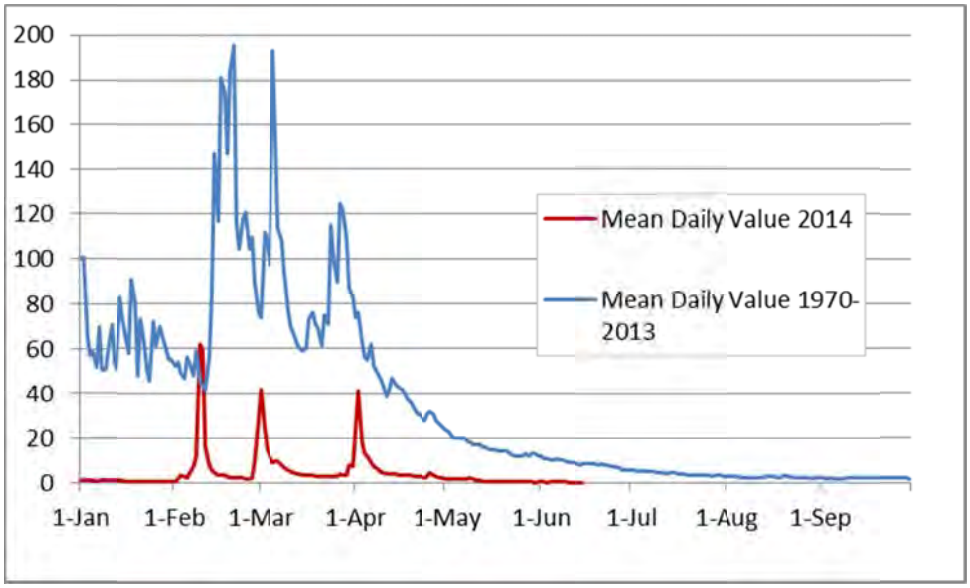

Figure 1: Mean daily average stream flow recorded at the USGS San Gregorio Creek Stream Gage (11162570) for all available records between 1969-2013 compared to mean daily average recorded so far in the year 2014.

Mean Daily Discharge at USGS gages

	San Gregorio					
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**
mean monthly discharge (1970-2013):	84	96	87	40	13	6.1
2014:	0.68	10.89	7.2	6.65	1.04	0.25
% of Average:	**0.8%**	**11.3%**	**8.3%**	**16.6%**	**8.0%**	**4.1%**

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San Mateo County, California Hydrologic Unit Code 18050006 Latitude 37°15'39", Longitude 122°19'40" NAD27 Drainage area 45.9 square miles Gage datum 62.30 feet above NGVD29	**Output formats** HTML table of all data Tab-separated data Reselect output format

00060, Discharge, cubic feet per second,												
YEAR	Monthly mean in ft3/s (Calculation Period: 1951-05-01 -> 2013-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1951					18.0	9.84	6.67	5.11	3.15	3.84	7.80	158.0
1952	418.3	134.2	268.3	54.5	23.8	13.8	8.82	5.32	3.14	2.55	7.01	158.6
1953	184.2	34.7	53.0	34.0	23.6	10.7	6.58	5.53	3.20	4.08	9.25	5.31
1954	35.7	58.9	82.6	46.9	14.9	8.35	3.63	3.56	3.24	3.99	11.6	64.3
1955	72.5	34.9	23.9	19.3	14.8	6.15	3.56	2.91	1.46	1.97	3.70	469.4
1956	338.0	134.9	72.0	32.2	19.6	11.3	7.33	5.17	4.04	5.28	4.59	5.86
1957	13.6	45.2	54.6	18.6	47.8	12.2	4.73	3.71	2.23	8.37	7.26	27.0
1958	75.3	429.2	255.8	398.4	33.4	16.1	10.0	6.64	3.97	2.80	3.89	6.83
1959	48.6	98.3	19.5	7.96	5.46	3.30	1.65	1.16	5.53	2.38	2.95	3.67
1960	19.6	67.2	11.1	8.86	4.30	2.33	1.29	0.710	0.807	0.971	5.60	8.30
1961	5.44	12.2	17.3	7.99	5.03	2.25	0.494	0.219	0.223	0.377	2.62	8.60

1962	8.13	153.3	82.9	14.5	7.54	3.74	1.75	1.63	0.330	92.8	9.98	19.8
1963	127.1	259.3	68.7	151.5	41.6	17.8	9.80	5.56	3.99	5.47	21.8	7.64
1964	45.6	13.0	10.7	6.68	5.09	3.66	2.00	1.14	0.983	1.34	11.1	158.5
1965	229.5	39.2	21.1	109.1	24.7	13.1	6.90	3.79	2.95	2.55	18.6	35.4
1966	57.6	60.1	20.5	9.69	5.76	3.69	2.37	1.12	1.06	1.12	10.4	54.6
1967	253.7	80.5	147.3	199.2	47.5	21.0	10.1	5.86	3.34	3.95	4.69	11.5
1968	71.6	60.8	67.5	21.3	8.91	5.09	2.85	3.06	1.70	1.89	4.21	24.4
1969	372.0	389.9	145.4	55.8	20.5	9.59	9.80	10.5	5.16	5.19	4.80	33.7
1970	256.0	77.5	80.6	20.9	10.3	6.30	4.03	2.18	1.68	1.76	28.1	124.8
1971	52.8	17.8	36.7	19.9	9.76	5.63	3.55	2.29	1.90	1.76	3.34	23.1
1972	10.8	18.0	6.52	6.69	3.01	1.79	1.03	0.649	0.799	9.32	71.4	23.2
1973	244.8	301.7	148.2	40.9	16.3	8.53	5.44	3.48	2.79	4.73	49.4	137.0
1974	130.7	37.4	179.5	172.1	32.9	19.0	8.58	5.11	4.24	4.65	8.34	28.3
1975	41.3	117.6	138.7	50.3	18.1	10.1	7.13	4.93	3.53	5.64	4.75	4.38
1976	4.29	4.73	9.71	8.48	2.76	1.91	0.921	1.12	0.674	0.921	1.78	2.30
1977	3.22	2.92	4.58	1.93	2.00	0.780	0.205	0.012	0.083	0.488	3.90	25.8
1978	299.2	166.8	124.0	86.1	30.4	12.3	6.40	3.25	2.80	2.25	3.43	3.75
1979	34.2	104.9	68.9	36.4	13.8	5.47	3.85	2.75	2.08	4.62	6.14	34.6
1980	150.4	281.9	115.9	51.1	24.9	12.1	6.14	4.17	4.03	2.13	2.40	5.20
1981	31.9	18.9	65.3	19.6	6.49	3.46	1.75	1.78	0.640	3.01	27.6	56.5
1982	292.6	178.6	205.6	351.9	43.5	16.3	9.34	6.95	5.74	7.39	51.2	317.6
1983	311.5	475.7	540.1	129.9	93.8	28.1	14.8	8.71	7.79	10.4	85.9	308.9
1984	72.0	38.0	28.2	17.6	12.3	10.7	4.09	3.20	2.34	5.83	35.1	30.5
1985	11.1	55.7	56.5	21.3	9.38	5.20	2.55	2.24	3.32	3.16	8.05	15.1
1986	28.0	434.3	231.6	35.9	15.5	8.00	5.00	3.67	4.57	3.27	3.48	5.41
1987	8.24	27.5	27.6	7.45	3.76	2.14	1.29	0.786	0.787	1.16	2.49	18.0
1988	27.5	6.93	4.25	5.98	3.61	2.23	0.949	0.391	0.229	0.514	6.21	12.3
1989	13.2	6.87	57.4	11.3	3.47	1.87	1.10	1.27	1.42	11.7	21.2	12.7
1990	17.3	23.4	10.4	7.03	8.72	5.47	3.17	2.48	2.04	1.73	2.12	3.61
1991	2.75	3.64	121.5	13.1	4.56	2.61	1.76	1.35	0.753	1.93	1.61	7.57
1992	10.8	212.9	63.8	14.8	6.46	3.39	2.26	1.09	0.829	1.45	1.90	24.6
1993	288.9	168.8	78.5	36.9	13.0	9.08	5.02	3.11	2.84	2.93	4.79	16.1
1994	12.1	85.0	14.1	8.45	7.63	3.02	1.29	0.952	0.645	0.831	8.72	9.62
1995	362.7	54.5	367.5	66.4	62.2	21.9	13.4	7.90	5.28	4.21	4.14	31.9
1996	87.9	310.7	120.7	41.5	25.4	13.8	8.05	5.25	4.08	4.12	14.0	133.1
1997	435.3	77.9	28.5	16.0	10.1	6.28	4.27	3.31	2.88	2.91	16.2	28.5
1998	233.5	865.3	132.0	98.2	51.4	32.5	17.5	11.6	8.64	8.26	9.58	16.0
1999	79.5	247.1	92.4	81.7	24.5	14.1	9.00	6.01	5.88	4.98	6.62	5.95
2000	96.7	361.5	133.1	38.3	20.2	11.5	7.91	4.80	4.64	8.19	5.90	6.85

2001	26.5	94.8	66.2	18.3	8.45	4.88	3.56	2.47	1.88	1.69	11.4	118.7
2002	67.1	35.6	39.8	19.0	10.2	6.57	3.83	2.22	1.77	1.81	5.25	175.1
2003	46.0	22.6	20.9	72.6	39.7	12.0	6.89	3.98	2.69	2.33	4.39	66.1
2004	84.3	159.2	49.2	14.9	7.93	4.84	2.86	2.08	1.55	4.74	4.75	69.5
2005	144.0	96.6	153.2	76.1	32.5	16.8	9.35	5.19	3.88	3.57	5.00	133.7
2006	154.8	62.0	329.0	333.7	43.8	18.4	10.5	7.04	5.09	5.13	7.41	13.8
2007	8.69	64.4	24.1	8.35	5.42	3.66	2.34	1.87	1.48	2.71	2.29	4.27
2008	149.0	87.0	22.5	9.59	6.23	3.41	1.98	1.42	0.954	1.30	3.76	6.66
2009	4.55	172.4	100.5	11.5	7.13	4.35	2.47	1.45	1.26	10.9	2.71	6.83
2010	101.2	91.0	90.4	95.0	22.0	9.66	5.26	3.94	2.69	2.97	5.69	62.7
2011	28.7	92.4	255.9	54.4	17.9	15.4	8.38	5.71	3.65	5.54	6.02	4.73
2012	11.3	6.25	105.1	61.3	12.2	6.18	3.65	2.16	1.75	2.21	15.2	186.2
2013	32.8	12.1	9.89	8.15	4.00	2.72	1.56	0.984	0.935			
Mean of monthly Discharge	111	127	96	56	19	9.0	5.2	3.5	2.7	5.2	12	58

** No Incomplete data have been used for statistical calculation

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U.S. Department of the Interior | U.S. Geological Survey
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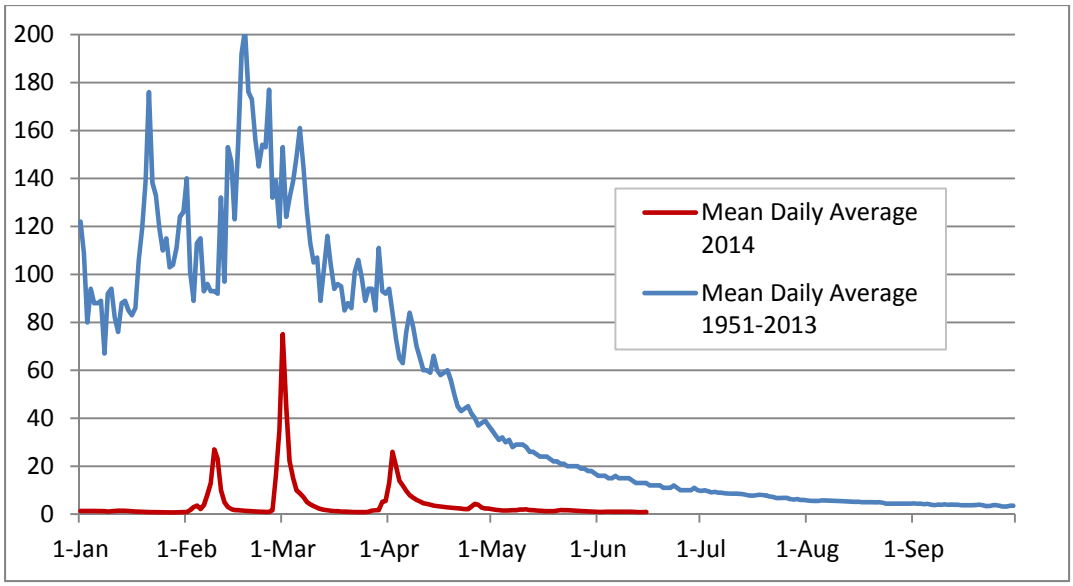

Figure 2: Mean daily average stream flow recorded at the USGS Pescadero Creek Stream Gage (11162500) for all available records between 1951-2013 compared to mean daily average recorded so far in the year 2014.

Mean Daily Discharge at USGS gages

	Pescadero					
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**
mean monthly discharge (1951-2013):	111	127	96	56	19	9
2014:	1.06	10.15	7.47	5.55	1.51	0.98
% of Average:	**1.0%**	**8.0%**	**7.8%**	**9.9%**	**7.9%**	**10.9%**

Project 9: Stinson Beach Water Supply & Drought Preparedness Plan

1. California Department of Water Resources (DWR), 2012a. Public Water System Statistics Report for Stinson Beach CWD, Calendar Year 2012.
2. California Department of Water Resources (DWR), 2012b. Leak Detection website.
3. Stinson Beach County Water District (SBCWD), 2006. 2005 Urban Water Management Plan Stinson County Water District, p. 59. Prepared by Stetson Engineers, September.
4. SBCWD, 2010. Stinson Beach County Water District, Water Supply Accomplishments and Challenges.
5. Stetson Engineers, Inc., 2006. Draft Water Supply and Demand Management Options Stinson Beach County Water District. Reconnaissance Report. July.

Reference 1

State of California | DEPARTMENT OF WATER RESOURCES | California Natural Resources Agency

PUBLIC WATER SYSTEM STATISTICS

Calendar Year **2012**

Stinson Beach CWD
Ed Schmidt, General Manager
PO Box 245
Stinson Beach, CA 94970
PWS# 2110004 NCRO

1. General Information

Please follow the provided instructions.

Contact : Ed Schmidt
Title: General Manager
Phone: (415) 868-1333
Fax: (415) 868-9417
E-mail: ed@stinson-beach-cwd.dst.ca.us
Website: http://stinson-beach-cwd.dst.ca.us
County: **Marin**
Population served: **750+**
Names of communities served: Stinson Beach

2. Active Service Connections

Customer Class	Potable Water		Recycled Water	
	Metered	Unmetered	Metered	Unmetered
Single Family Residential	692			
Multi-family Residential	7			
Commercial/Institutional	25			
Industrial				
Landscape Irrigation	3			
Other				
Agricultural Irrigation				
TOTAL	727			

3. Total Water Into the System - Units of production: **MG** (Select: **AF**=acre-feet; **MG**=million gallons; **CCF**=hundred cubic feet)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Potable	*Wells*	2.477	1.209	1.378	1.392	2.059	2.784	3.584	3.331	3.089	2.281	0.886	1.014	25.484
	Surface	1.243	2.087	2.516	2.372	2.944	3.34	2.685	3.23	2.351	2.553	3.014	2.044	30.379
	Purchased 1/													
	Total Potable	3.72	3.296	3.894	3.764	5.003	6.124	6.269	6.561	5.44	4.834	3.9	3.058	55.863
Untreated Water														
Recycled 2/														

1/ Potable wholesale supplier(s): _____

2/ Recycled wholesale supplier(s): _____
Level of treatment: _____

4. Metered Water Deliveries - Units of delivery: **MG** (Select: **AF**=acre-feet; **MG**=million gallons; **CCF**=hundred cubic feet)

If recycled is included, X box ↓		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A.SingleFamilyResidential		2.927	2.177	2.817	2.528	3.421	4.505	4.81	4.893	4.573	3.261	2.492	2.257	40.661
B.Multi-family Residential		0.056	0.047	0.052	0.052	0.059	0.064	0.072	0.067	0.07	0.053	0.043	0.043	0.678
C.Commercial/Institutional		0.256	0.214	0.232	0.213	0.263	0.284	0.348	0.34	0.288	0.227	0.196	0.203	3.064
D.Industrial		0	0	0	0	0	0	0	0	0	0	0	0	0
E.Landscape Irrigation		0.053	0.049	0.041	0.087	0.118	0.178	0.189	0.171	0.153	0.082	0.05	0.027	1.198
F.Other		0	0	0.01	0	0.022	0.027	0.035	0.035	0.016	0.023	0.023	0.012	0.203
Total Urban Retail (A thru F)		3.292	2.487	3.152	2.88	3.883	5.058	5.454	5.506	5.1	3.646	2.804	2.542	45.804
Agricultural Irrigation														
Wholesale*(to other agencies)*														

#VALUE!

Reference 2

Leak Detection

Leak detection is a necessary component to the management of water distribution systems worldwide. Accurate determination of the position of leaking water pipes within a supply system and subsequent repair serves to conserve water as well as energy. Water that is lost after treatment and pressurization, but before delivery to customers, is money and energy wasted.

LEAK DETECTION FREQUENTLY ASKED QUESTIONS

How much water is lost to leaks?

Answer: A detailed water audit and leak detection program of 47 California water utilities found an average loss of 10 percent and a range of 30 percent to less than 5 percent of the total water supplied by the utilities. The July 1997 Journal American Water Works Association cites examples of more than 45 percent leakage.

Do leaks get bigger with age?

Answer: Yes. Leaks invariably get larger with time. A small leak this year will grow to become a large leak next year, all the while losing water and causing greater damage to infrastructure and property.

Does water from leaks always rise to the surface?

Answer: No, leaks are often unseen at the surface. Nonvisible leaks include leaks that percolate into the surrounding ground, leaks that enter other conveyance facilities, such as storm drains, sewers, stream channels, or old abandoned pipes. DWR estimates that up to 700,000 acre-feet of leakage occurs in California each year from nonvisible leaks.

What are the reasons to find and repair leaks?

Answer:

- Leaks get bigger with age.
- Repairing leaks reduces growing water losses.
- Repairing leaks with regularly scheduled maintenance reduces overtime costs of unscheduled repairs.
- Leak repairs provide more treated, pressurized water to sell to customers.
- Leak detection and repair can reduce power costs to deliver water and reduce chemical costs to treat water.
- Leaks have been known to cause damage to nearby roads, other infrastructure, and sometimes buildings. Some water utilities conduct frequent leak detection and repair programs near unstable geologic areas to reduce their legal liability against expensive lawsuits.
- Leak detection and repair improves public relations. The public appreciates seeing that its water systems are being maintained.
- The utility gains credibility by putting its own house in order before asking the customers to conserve water.

How can I determine if there are leaks at my home or business?

Answer: Leaks from the pipes going to the building or inside the building lose water delivered through the utility meter and service.

There is one way to test if leaks exist inside the building:

- Repair leaky faucets, showers, toilets, etc.
- Turn off all the water using appliances (including the swimming pool, ice cube maker, water softener, etc.),
- Look at the meter. On the dial of many meters is a small triangle which rotates if any water passes through the meter. If this device is turning, then water is flowing to an appliance or a leak.
- You can also listen for the sound of leaks at the meter or at a hose bib.

What is Unaccounted-for-Water?

Answer: Unaccounted-for-water is a misleading term long used by the water industry. Unaccounted-for-water includes unmeasured water put to beneficial use as well as water losses from the system. Better terms distinguish between authorized unmetered uses and water losses. Authorized unmetered uses include firefighting, main flushing, process water for water treatment plants, landscaping of public areas, etc. Water losses include all water that is not identified as authorized metered water use or authorized unmetered use. Water losses are lost from the distribution system, do not produce revenue, and are unavailable for other beneficial uses. Examples of water losses are: illegal connections, accounting procedure errors, reservoir seepage and leakage, reservoir overflow, leaks, theft, evaporation, and malfunctioning distribution system controls.

Where does the water from leaks go?

Answer: Leaks often stay underground. The water may enter other underground facilities such as storm drains, sewers, electrical conduits, basements of buildings, or old abandoned pipes. Some water percolates into the surrounding ground, flows over the surface to stream channels, or evaporates.

What does leak detection cost?

Answer: Acoustic leak detection surveys can be conducted at the rate of about 2 miles of pipe main per day. The dollar cost will vary with local labor or consultant charges. For a California leak detection program, half the savings were achieved with survey cost of less than $100 per acre-foot and 80 percent of the water savings were achieved with survey cost of less than $200 per acre-foot.

What do leak repairs cost?

Answer: The cost of leak repair varies widely, from a few minutes by one person to tighten a nut on a leaky meter, to two days by a crew with heavy equipment to repair a deeply buried main. Scheduled maintenance for leak repairs is far cheaper than unscheduled overtime.

Why do leaks produce noise?

Answer: Leaks make noise because the pressurized water forced out through a leak loses energy to the pipe wall and to the surrounding soil area. This energy creates sound waves in the audible range, which can be sensed and amplified by electronic transducers, or in some cases, by simple mechanical means. Some additional noise created by the impact of water upon soil in the area of the leak. Agitated sand and gravel can sometimes be heard striking the pipe.

Reference 3

2005 Urban Water Management Plan
Stinson Beach County Water District

September 2006

prepared by

Stetson Engineers

STETSON ENGINEERS INC.

San Rafael and Covina, California Mesa, Arizona

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7.3 SUMMARY OF WATER SERVICE RELIABILITY

The District's available source water capacity from existing surface and groundwater resources is deficient to meet maximum daily water demand estimates according to the methodologies prescribed in both the existing and proposed DHS waterworks standards. The ability of the District's source water capacity to meet maximum day demand conditions according to the proposed DHS waterworks standards is better than its ability to meet maximum day demand under the existing DHS standards. According to both existing and proposed DHS standards, the District's existing storage capacity is more than sufficient to meet peak hourly demands during the maximum day.

Planned upgrades to the Laurel WTP should help the District better meet system demands during maximum day conditions because the District currently has 570,000 gallons of raw water storage, equating to nearly 400 gpm (for one day only), of auxiliary source capacity that could be used to meet peak hour demands if the treatment capacity existed.

The recommended minimum target objective for the identified source water capacity deficiency (115 gpm) may be met by developing additional water from groundwater sources and surface water resources, combined with implementation of additional demand management measures that would act to reduce demand during peak water use periods. A groundwater investigation to determine the extent of the District's available underground resources is recommended.

The importance of evaluating additional water supply options and continuing to promote water conservation efforts is very apparent. Obtaining an additional source water supply of 115 gpm to satisfy maximum day demand will be difficult. In the event of multiple consecutive dry years, the District could experience a substantial reduction in its already limited surface water capacity (estimated at 108 gpm during a dry year), requiring the District implement the advanced stage of alert under its Staged Response Plan for Water Supply Shortages, and requiring mandatory water rationing. To prepare for the multiple consecutive dry year scenario, more secure sources of supply (groundwater) and storage options need to be considered.

Reference 4

STINSON BEACH COUNTY WATER DISTRICT

WATER SUPPLY ACCOMPLISHMENTS AND CHALLENGES

A REPORT TO OUR CUSTOMERS

AUGUST 2010

The State of California has gotten serious about water conservation. In March 2008, Governor Schwarzenegger announced a statewide target of a 20 percent reduction in urban water use by 2020. The Legislature enacted this ambitious goal into law in October of last year. In February 2010, the State Department of Water Resources released a water conservation plan by which the 20 percent target reduction can be achieved by 2020. And in May of this year, the State Water Resources Control Board, responding to an earlier law, adopted a "Policy for Maintaining Flows in Northcoast Streams." This Policy applies to coastal streams from Humboldt to Marin County, including those in Stinson Beach.

These laws and policies highlight the importance for the Stinson Beach Water District, and our customers, to be mindful of how we use water and alert for ways to use it more efficiently.

The statewide goals have particular significance for Stinson Beach: the creeks we rely on for a portion of our supply are also the habitat of steelhead trout, a protected species under the federal and State Endangered Species Act. And they pose particular challenges because our community is so small that costs cannot be spread across a large customer base and because an unusually large percentage of overall water consumption is due to use by tourists, seasonal renters and other short-term visitors.

The purpose of this brief report is to provide accurate information about our water sources, water use trends and steps your Water District is taking to ensure a reliable supply and minimize environmental impact. Additional information, including water conservation tips, can be found on the District's website at http://stinson-beach-cwd.dst.ca.us or by calling our office at 415-868-1333.

1. No Increase in Total Water Use Since 1995

There has been a modest increase in the number of customers in each category between 1995 and 2009.

	1995	2009
Single Family Residential	672	687
Multi-Family Residential	6	7
Commercial	20	25
Landscape Irrigation	1	3

Despite this growth in our customer base, water demand on an annual basis is unchanged from the early 1990s. The average annual production over the last five years (56 million gallons) is the same as that during the five years between 1995 and 1999 (56 million gallons).

This has been accomplished through efforts by the Water District and by its customers:

- All water service connections are metered.
- The District recently converted to a monthly billing cycle (rather than bi-monthly) in order to be able to identify leaks in customers' water lines/fixtures more quickly.
- The District has adopted both tiered water rates and a drought water rate structure.
- The District engaged a specialist to survey its water distribution system for leaks and then purchased water detection equipment so that District employees can conduct surveys themselves.
- The District's capital improvement program includes systematic replacement of aging pipelines and water tanks, to minimize in-system water losses.
- District staff is available 24 hours a day, seven days a week, to isolate and repair water leaks promptly.
- Many District customers have implemented the water efficiency recommendations contained in the materials regularly distributed by the District as part of its water conservation education program.

Single-family residential use in Stinson Beach is significantly lower than State-wide residential water use estimates, and single-family residential usage reported by the Marin Municipal Water District (MMWD). For 2009, single-family residential use in Stinson Beach averaged about 45 gallons per capita per day (gpcd), based on meter records for the areas in Stinson Beach primarily occupied by year-round residents (i.e., not occupied by the transient population of non-residents and vacationers). Comparatively, single-family residential consumption reported by MMWD (2005 Urban Water Management Plan) calculates to approximately 287 gallons per connection per day, or 96 gpcd, assuming 3 persons per connection. Single-family residential consumption data reported by the California Department of Water Resources for the San Francisco Region is approximately 115 gpcd (2005 baseline data as reported in the 20x2020 Water Conservation Plan, February, 2010).

2. <u>Seasonal Peak Use has been Reduced Since 2001</u>

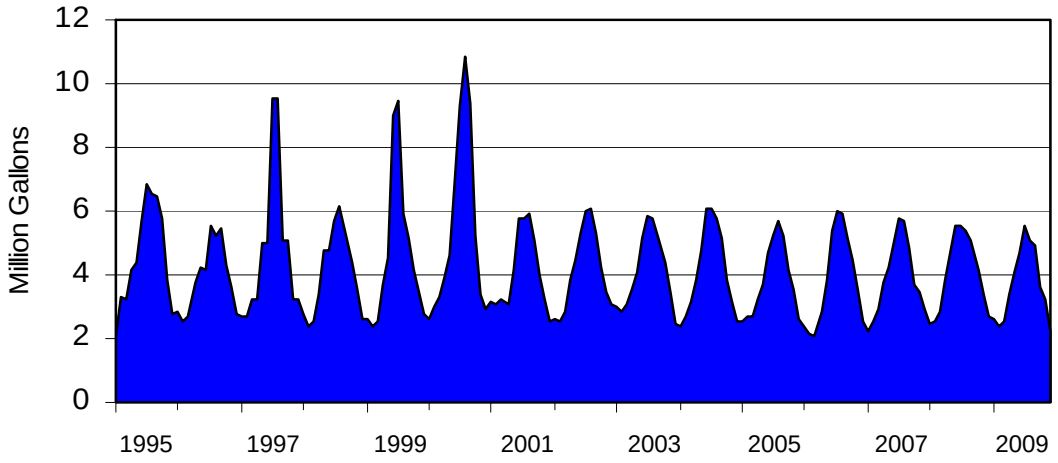
There are fewer than 1,000 year-round residents in Stinson Beach. However, during summer weekends, there can be tens of thousands of people enjoying our popular beach town.

Over 40 percent of the residences in Stinson Beach are second homes, or vacation rentals, which are not used on a full-time basis. During the summer months, occupancy rates increase dramatically. It is common for multiple families, or other large groups, to occupy single-family

vacation rentals during the peak summer/fall season. In addition, large numbers of residents of other Bay Area communities, as well as tourists, visit the Golden Gate National Recreation Area and State Park lands. The seasonal demand fluctuation created by so many visitors presents a challenge to the District's ability to meet peak demands and still maintain adequate storage, including an emergency reserve for firefighting.

Prior to 2001, summertime monthly peaks were extreme. In 2001, the District began an active campaign to increase public awareness of the need to conserve water, with a particular focus on vacation rental properties. It also initiated a tiered rate structure, with differentials reflecting the higher costs imposed by peak demands. The results of these efforts can be seen in the following chart which illustrates lower peak monthly water use during the summer seasons beginning in 2001 and a general decline in peak monthly use over the most recent years.

Monthly Metered Water Deliveries
1995 - 2009

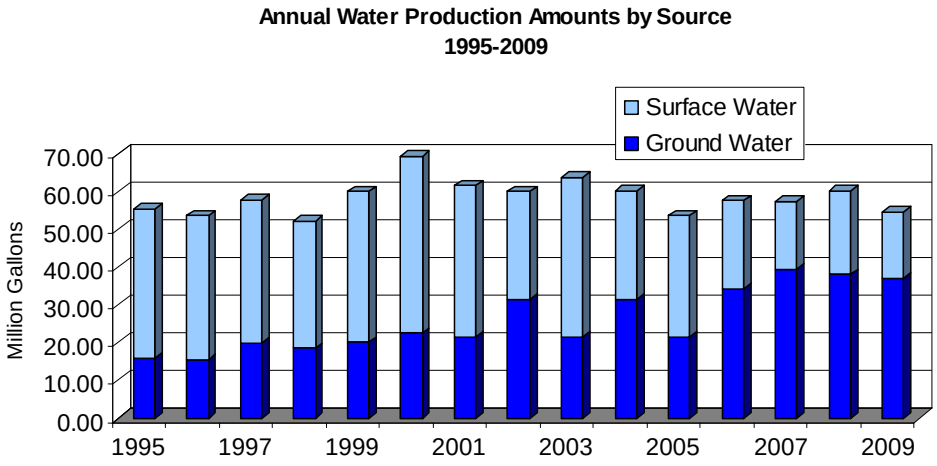


Summer/fall peak demands coincide with the time of year during which local creeks, relied on by the District for a significant portion of its supply, run low. Reductions in peak demand during this season help take pressure off the creeks. Coupled with the District's efforts to increase use of groundwater (discussed below) conservation efforts by our customers directly benefit the fish and other wildlife resources that depend on local streams.

3. <u>Increased Use of Groundwater Since 2006 Helps Local Creeks</u>

The water the District delivers to its customers comes entirely from local sources. Historically, about 70 percent was drawn from local creeks, while 30 percent was pumped from groundwater.

As noted above, flows in surface streams naturally decline in summer and fall, just when demands for water are highest. In order to reduce its reliance on diminished surface flows, the District has in recent years begun relying more on groundwater and has diverted less from local creeks. As of 2009, groundwater accounted for nearly 70 percent of the District's total water production. The chart below shows water production by source from 1995 through 2009; it illustrates the recent trend towards the greater use of groundwater.



This ability to use groundwater and surface water resources conjunctively allows the District to draw on groundwater when demand is high and flows in the creeks are low. The District plans to drill a new groundwater well later this year. If it proves successful, it will provide additional operational flexibility, and supply reliability.

LOOKING AHEAD

Stinson Beach has made a good start toward achieving efficiencies in our use of local water resources. But there is more we can do; water conservation is an on-going effort. District staff monitors water use characteristics by customer category, by geographic location, and by season (as well as in-system losses) and will continue to identify cost-effective conservation and water efficiency measures. Promising water conservation and efficiency measures not yet in place are presented for consideration by the District's Board of Directors and the community.

Reference 5

DRAFT

Water Supply and Demand Management Options
Stinson Beach County Water District

Reconnaissance
Report
July 2006

prepared by

Stetson Engineers

STETSON ENGINEERS INC.

San Rafael and Covina, California Mesa, Arizona

WATER SUPPLY & DEMAND MANAGEMENT OPTIONS REPORT

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APPENDICES

APPENDIX A: SUMMARY TABLES FOR RANKING OF WATER SUPPLY OPTIONS

July 2006 DRAFT

Reconnaissance-Level Ranking of Water Supply Options

	Surface Water Options					Groundwater Options										Storage Options				Desal	Import		Other	
	WSO No. 1 - New Diversion on McKinnan Gulch	WSO No. 2 - New Diversion on Fitzhenry Creek II	WSO No. 3 - New Diversion on Cataract Creek	WSO No. 4 - New Diversion from Springs near Highway 1	WSO No. 5 - New Diversion on Lower Fitzhenry Creek I	WSO No. 6 - Rehabilitate Ranch Tank Well No. 1	WSO No. 7 - Rehabilitate Highlands Well	WSO No. 8 - New Well at Laurel WTP	WSO No. 9 - New Well at Steep Ravine Tank Site	WSO No. 10 - New Well at Black Rock Tank Site	WSO No. 11 - New Well in McKinnan Gulch	WSO No. 12 - New Well at Stinson Beach School	WSO No. 13 - Rehabilitate Existing Well at State Park	WSO No. 14 - Rehabilitate Existing Well at Barn (Ranch Well)	WSO No. 15 - New Well in Cataract Creek Basin	WSO No. 16 - Construct Off-Steam Reservoir near Webb Creek	WSO No. 17 - Raise Existing Dam on Webb Creek	WSO No. 18 - Construct Reservoir on Cataract Creek	WSO No. 19 - Construct New 15 MG Closed Reservoir	WSO No. 20 - Construct New Desalination Plant at Beach	WSO No. 21 - Construct Intertie with Bolinas PUD	WSO No. 22 - Construct Intertie with Marin MWD	WSO No. 23 - Water Reuse	WSO No. 24 - Intercept Fog
Evaluation Criteria																								
Cost	◑	●	◕	◕	◕	●	●	◕	◕	◕	◑	◕	◕	◕	◕	○	◑	○	○	○	◔	◔	○	◕
Yield	○	◔	◔	◑	◔	◑	◑	◑	◔	◔	◕	◑	◔	◑	◕	●	○	●	◑	◕	◔	●	○	○
Cost-effectiveness	◔	◕	◑	◕	◑	●	●	●	◕	◕	◕	●	◕	◕	◑	◔	○	◔	◔	◔	◔	◑	○	○
Ease of implementation	◕	●	◑	◕	◕	◕	◕	◑	◑	◑	◑	◑	◕	◕	◑	◔	◔	○	◑	○	○	◔	◑	●
Cost-sharing potential	○	○	◑	◔	○	◔	◔	◔	◔	◔	○	◕	◕	◔	◑	◕	◔	◕	◑	◕	●	◕	◔	◑
Staff resources and capability	●	●	◔	◑	◑	○	○	○	○	○	◔	◔	◔	◔	◔	○	◔	○	◔	○	○	◔	◔	●
Environmental/Regulatory issues	○	◔	◔	◕	◔	●	●	●	●	●	◑	◑	◔	◔	◑	◑	◔	◔	◕	○	○	◑	◑	◕
Public acceptance	◔	◔	○	◑	◔	●	●	●	●	◑	◕	◕	◑	◕	○	◔	◔	○	◑	◑	◔	◔	◕	◑
Overall Rating	◔	◑	◑	◑	◑	◕	◕	◕	◑	◑	◑	◕	◑	◑	◑	◑	◔	◔	◑	◔	◔	◑	◔	◑

	Better				Worse
Rating Scale	●	◕	◑	◔	○

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Reconnaissance-Level
Ranking of Water Supply Options for Cost

Water Supply Option	Estimated Cost ($)
WSO No. 7 - Rehabilitate Highlands Well	160,000
WSO No. 6 - Rehabilitate Ranch Tank Well No. 1	168,000
WSO No. 2 - New Diversion on Fitzhenry Creek II	171,000
WSO No. 24 - Intercept Fog	229,000
WSO No. 12 - New Well at Stinson Beach School	232,000
WSO No. 8 - New Well at Laurel WTP	233,000
WSO No. 9 - New Well at Steep Ravine Tank Site	233,000
WSO No. 15 - New Well in Cataract Creek Basin	235,000
WSO No. 10 - New Well at Black Rock Tank Site	238,000
WSO No. 5 - New Diversion on Lower Fitzhenry Creek I	250,000
WSO No. 13 - Rehabilitate Existing Well at State Park	280,000
WSO No. 4 - New Diversion from Springs near Highway 1	287,000
WSO No. 3 - New Diversion on Cataract Creek	289,000
WSO No. 14 - Rehabilitate Existing Well at Barn (Ranch Well)	292,000
WSO No. 1 - New Diversion on McKinnan Gulch	314,000
WSO No. 11 - New Well in McKinnan Gulch	344,000
WSO No. 17 - Raise Existing Dam on Webb Creek	550,000
WSO No. 22 - Construct Intertie with Marin MWD	1,100,000
WSO No. 21 - Construct Intertie with Bolinas PUD	1,700,000
WSO No. 20 - Construct New Desalination Plant at Beach	2,000,000
WSO No. 19 - Construct New 15 MG Closed Reservoir	3,000,000
WSO No. 23 - Water Reuse	3,700,000
WSO No. 16 - Construct Off-Steam Reservoir near Webb Creek	5,000,000
WSO No. 18 - Construct Reservoir on Cataract Creek	11,000,000

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Reconnaissance-Level
Ranking of Water Supply Options for Yield

Water Supply Option	Total Estimated Annual Yield (mg)
WSO No. 18 - Construct Reservoir on Cataract Creek	50
WSO No. 22 - Construct Intertie with Marin MWD	26
WSO No. 16 - Construct Off-Steam Reservoir near Webb Creek	23
WSO No. 11 - New Well in McKinnan Gulch	20
WSO No. 15 - New Well in Cataract Creek Basin	20
WSO No. 20 - Construct New Desalination Plant at Beach	20
WSO No. 7 - Rehabilitate Highlands Well	16
WSO No. 8 - New Well at Laurel WTP	16
WSO No. 12 - New Well at Stinson Beach School	16
WSO No. 14 - Rehabilitate Existing Well at Barn (Ranch Well)	16
WSO No. 19 - Construct New 15 MG Closed Reservoir	15
WSO No. 4 - New Diversion from Springs near Highway 1	13
WSO No. 6 - Rehabilitate Ranch Tank Well No. 1	13
WSO No. 21 - Construct Intertie with Bolinas PUD	10
WSO No. 3 - New Diversion on Cataract Creek	10
WSO No. 9 - New Well at Steep Ravine Tank Site	10
WSO No. 10 - New Well at Black Rock Tank Site	10
WSO No. 13 - Rehabilitate Existing Well at State Park	10
WSO No. 2 - New Diversion on Fitzhenry Creek II	8
WSO No. 5 - New Diversion on Lower Fitzhenry Creek I	8
WSO No. 23 - Water Reuse	5.3
WSO No. 1 - New Diversion on McKinnan Gulch	5
WSO No. 17 - Raise Existing Dam on Webb Creek	2
WSO No. 24 - Intercept Fog	0.66

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Reconnaissance-Level
Ranking of Water Supply Options for Cost-Effectiveness

Water Supply Option	Cost-Effectiveness ($/mg/year)
WSO No. 7 - Rehabilitate Highlands Well	2,250
WSO No. 6 - Rehabilitate Ranch Tank Well No. 1	2,500
WSO No. 12 - New Well at Stinson Beach School	2,700
WSO No. 8 - New Well at Laurel WTP	2,700
WSO No. 11 - New Well in McKinnan Gulch	3,000
WSO No. 14 - Rehabilitate Existing Well at Barn (Ranch Well)	3,000
WSO No. 2 - New Diversion on Fitzhenry Creek II	3,400
WSO No. 4 - New Diversion from Springs near Highway 1	3,400
WSO No. 9 - New Well at Steep Ravine Tank Site	4,300
WSO No. 10 - New Well at Black Rock Tank Site	4,400
WSO No. 13 - Rehabilitate Existing Well at State Park	4,800
WSO No. 3 - New Diversion on Cataract Creek	5,900
WSO No. 5 - New Diversion on Lower Fitzhenry Creek I	6,250
WSO No. 22 - Construct Intertie with Marin MWD	6,500
WSO No. 15 - New Well in Cataract Creek Basin	6,700
WSO No. 18 - Construct Reservoir on Cataract Creek	8,900
WSO No. 1 - New Diversion on McKinnan Gulch	9,200
WSO No. 20 - Construct New Desalination Plant at Beach	9,800
WSO No. 16 - Construct Off-Steam Reservoir near Webb Creek	9,900
WSO No. 21 - Construct Intertie with Bolinas PUD	11,500
WSO No. 19 - Construct New 15 MG Closed Reservoir	12,000
WSO No. 17 - Raise Existing Dam on Webb Creek	29,200
WSO No. 24 - Intercept Fog	49,000
WSO No. 23 - Water Reuse	59,700

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2. California Department of Water Resources (DWR), 2008. Economic Analysis Guidebook, page 34.
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17. Water Research Foundation, 2005. Energy and Water Quality Management System (EWQMS) Saves Electricity Dollars, 2005.

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Website page – Also see other AWE Active Resources for Clothes washers and Landscape on this same webpage

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Promoting the Efficient and Sustainable Use of Water

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Toilet Fixtures Introduction

Background

Toilet fixture replacement has been a staple of the water industry's initiatives to reduce potable water consumption since the late 1980s. It still represents one of today's most popular water efficiency initiatives, as the first "program of choice" by water providers embarking on their initial foray into hardware-related conservation. In these programs, older 3.5- and 5.0-gallons per flush (gpf) [13 litres per flush (Lpf) and 19 Lpf] toilet fixtures in residences are replaced with 1.6-gpf (6 Lpf) or 1.28-gpf (4.8 Lpf) fixtures. Today, some water providers with aggressive replacement programs are already approaching a level of "saturation" in their residential sector wherein the majority of toilet fixtures are the efficient models. Therefore, a number of water providers have moved on to other more efficient products and higher priorities in their conservation programs.

Density of Use - Residential

As the number of bathrooms in housing steadily increases, and, in some cases, the number of occupants decreases, development of cost effectiveness information related to toilet replacement programs must address just which toilets within a residence should be replaced, e.g., all of them, the most-used toilet, the oldest toilet, the toilet with the highest flush volume, or some other replacement criteria. To aid in this analysis, we have compiled some national numbers on toilet "density" in residential housing. Download the table that shows the increase in density during the period from 1970 to 2003.

Types, Technologies, and Definitions

Two distinct types of toilet fixtures dominate the marketplace today: ULFTs (Ultra-Low Flush Toilets – aka "low flow" or "ultra-low-flow") and HETs (High-Efficiency Toilets). ULFTs are defined by an effective flush volume in the range between 1.28-gpf and 1.6-gpf (4.8 Lpf and 6.0 Lpf), while HETs are defined as 1.28-gpf (4.8 Lpf) or less. View the prevalence of HETs in the North American marketplace here.

Several different technologies are used by the manufacturers to achieve these efficient flush volumes. Those technologies are **NOT** all equal in flush performance nor cost. The following sections provide information on both technologies.

Ultra-Low-Flush Toilets (ULFTs)

ULFTs are defined as fixtures that have a maximum average flush volume not exceeding 1.6-gallons-per-flush (6 Lpf). Such fixtures have existed elsewhere in the world for more than two decades. ULFTs began making their way into U.S. homes in the 1980s. Beginning with Massachusetts in 1989, ULFTs began to be mandated by various local and state jurisdictions. Subsequent to Massachusetts, 15 other states and 6 local jurisdictions mandated that all toilets sold and installed be ULFTs. This prompted the U.S. Congress (with the support of the plumbing industry and water purveyors) to take the requirement national, and the Environmental Policy Act of 1992 (EPAct 92) mandated that all toilets sold in the U.S. (with a few minor exceptions) be ULFTs.

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63 page PDF – pg. 34

State of California
The Resources Agency

Department of Water Resources

Economic Analysis Guidebook

January 2008

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Department of Water Resources

Chapter 5
Economic Analysis Models

Numerous economic analysis computer software packages and other analytical tools can be used to assist in water resource economic justification and socioeconomic impact analyses

Economic Justification

For economic analyses, models have been developed by different organizations for specific project purposes (water supply reliability, ecosystem restoration, flood damage reduction, and water quality improvement). These models are used to determine the economic justification of a proposed project through benefit-cost or cost-effectiveness analyses. Some of these models are also used to provide critical information for statewide planning purposes, such as, forecasting urban and agricultural water demands for the California Water Plan Update (Bulletin 160 series).

Water Supply Reliability

DWR and the US Army Corps of Engineers (Corps) have developed several models for assessing water supply reliability. These include the following:

- DWR Least Cost Planning Simulation Model. The Least-Cost Planning Simulation Model is a PC-based simulation/optimization model that assesses the economic benefits and costs of increasing urban water service reliability at the regional level. The primary objective of LCPSIM is to develop a regional water management plan based on the principle of least-cost planning. Under this principle, the cost to be minimized is the sum of two costs: (1) the cost of the water supply reliability enhancement via a response package and (2) the cost of unreliability, recognizing that the latter is inversely related to the former. Because this principle incorporates economic benefits (that is, reducing the cost of unreliability), it is fundamentally different than cost effectiveness, which is based on minimizing the cost of meeting a physical objective (for example, a quantity of water delivered over a specified drought period.) Any incremental change from managing at the least-cost point will, by definition, result in greater economic costs than gains (that is, a loss of economic efficiency). LCPSIM can be used in the California Water Plan Update process to help determine an economically efficient regional urban water management strategy. It can also be used to specify demand reduction response options and optimize supply augmentation response options (or vice versa) as well as estimate the cost in lost economic efficiency of study plans. Key modeling inputs into LCPSIM include Central Valley Project and State Water Project (SWP) water deliveries estimated by CALSIM (a project operations model) and average water use coefficients from the Corps' Institute for Water Resources (IWR-MAIN, described below). LCPSIM is described in more detail under *Models* at the Web site www.economics.water.ca.gov/.
- DWR California Agriculture. CALAG is a regional, PC-based model of irrigated agricultural production and economics that simulates the decisions of agricultural producers (farmers) in California. The model, which is still being developed in 2006, assumes that farmers maximize profit subject to resource, technical, and market constraints. Farmers sell and buy in competitive markets, and no single farmer can affect or control the price of any commodity. To obtain a market solution, the model's objective function maximizes the sum of producers' surplus (net

Reference 3

DWR, 2012, Phase 1 Greenhouse Gas Emissions Reduction Plan.
(http://www.water.ca.gov/climatechange/docs/Final-DWR-ClimateActionPlan.pdf

103 page PDF - pgs. 9-11

California Department of Water Resources

Climate Action Plan

Phase 1: Greenhouse Gas Emissions Reduction Plan

GREENHOUSE GAS EMISSIONS REDUCTION PLAN

Summary

The California Department of Water Resources (DWR) in an effort to reduce its impact on the environment and lead by example, has developed this Greenhouse Gas (GHG) Emissions Reduction Plan to guide its project development and decision making with respect to energy use and GHG emissions.

It is now clearly understood that these gases enhance the Earth's ability to absorb and retain the heat radiated from the sun. Increased concentrations of GHGs in the atmosphere are the principal cause of anthropogenic climate change. As the connection between GHG emissions and climate change has strengthened and California has established GHG policies and reduction goals, DWR has focused on its own GHG emissions and developed strategies to reduce its contribution to the global problem of climate change consistent with those policies and goals.

This GHG Emissions Reduction Plan (Plan) is the first Phase in DWR's Climate Action Plan and considers GHG emissions from all DWR activities. In this Plan, DWR details

- its progress and future plans for reducing GHG emissions consistent with the GHG emissions reduction targets established in Assembly Bill (AB) 32, Executive Order S-3-05, and DWR's own policies,
- the aggressive steps it will take to reduce its emissions by over 80% below 1990 levels, and
- the steps that it will take to monitor its progress toward achieving these reductions.

DWR estimates that its total GHG emissions in 1990 were nearly 3.5 million metric tons, roughly the equivalent of a coal fired power plant or 680,000 passenger cars. Most of these emissions were released as a result of generation of electricity used to move water through the State Water Project (SWP), which DWR owns and operates. Since 1990, DWR's GHG emissions have fluctuated due to hydrologic conditions, water demands, and energy resources. DWR GHG emissions peaked in 2003 at over 4.1 million metric tons per year.

This Plan shows how DWR will make substantial reductions in its GHG emissions in the near-term (present to 2020) and how it will continue to reduce emissions beyond 2020 to achieve its long-term (2050) GHG emissions reduction goals. To this end, this Plan lays out both near-term and long-term GHG emissions reduction goals to guide decision making though 2050:

- Near-term goal—reduce emissions by 50% below 1990 levels by 2020
- Long-term goal—reduce emissions by 80% below 1990 levels by 2050.

In order to meet these GHG emissions reduction goals, DWR has identified 11 GHG emissions reduction measures that it will implement (Table S-1). These 11 GHG emissions reduction measures

include DWR's termination of its interest and associated delivery of electricity from a coal-fired power plant, efficiency improvements to DWR's existing facilities, purchase and development of renewable and high efficiency electricity supplies, comprehensive improvements to DWR's construction practices, and improvements to DWR's business activities that will reduce GHG emissions. In total, these measures will reduce annual GHG emissions in 2020 by more than 1.1 million metric tons and by more than 2.5 million metric tons in 2050.

Table S-1. DWR GHG Reduction Measures

Measure	2020 Annual Emissions Reduction ($mtCO_2e$)	2050 Annual Emissions Reduction ($mtCO_2e$)
OP-1 Reid Gardner Power Termination	882,700	882,700
OP-2 Energy Efficiency Improvements	48,500	48,500+
OP-3 Renewable Energy Procurement Plan	157,320	1,573,200
OP-4 On-Site Renewable Generation	10	Unknown
OP-5 Lower Emissions Energy Resources	23,180	23,180+
OP-6 Carbon Sequestration Actions	Unknown	Unknown
CO-1 Construction Best Management Practices	580	Not quantified
CO-2 Statewide Equipment and Fuel Regulations	900	Not quantified
BP-1 SMUD Commercial Greenergy Program	960	960
BP-2 SMUD Carbon Offset Program	2,580	2,580
BP-3 Implement DWR Sustainability Initiatives	Not quantified	Not quantified
Total Annual Reductions	**1,116,730**	**2,531,120**

DWR has developed projections of future GHG emissions using these GHG emissions reduction measures and other important factors that affect DWR emissions such as assumptions about regulatory constraints and hydrologic conditions, water demands, and electricity market characteristics. These GHG emissions projections indicate that DWR will exceed both its long and short-term GHG

emissions reduction goals, reducing emissions in 2020 to just over 1 million metric tons (62% below 1990[1] levels) and in 2050 to just over 190,000 metric tons (93% below 1990 levels).

Based on the analysis provided in this Plan, DWR will

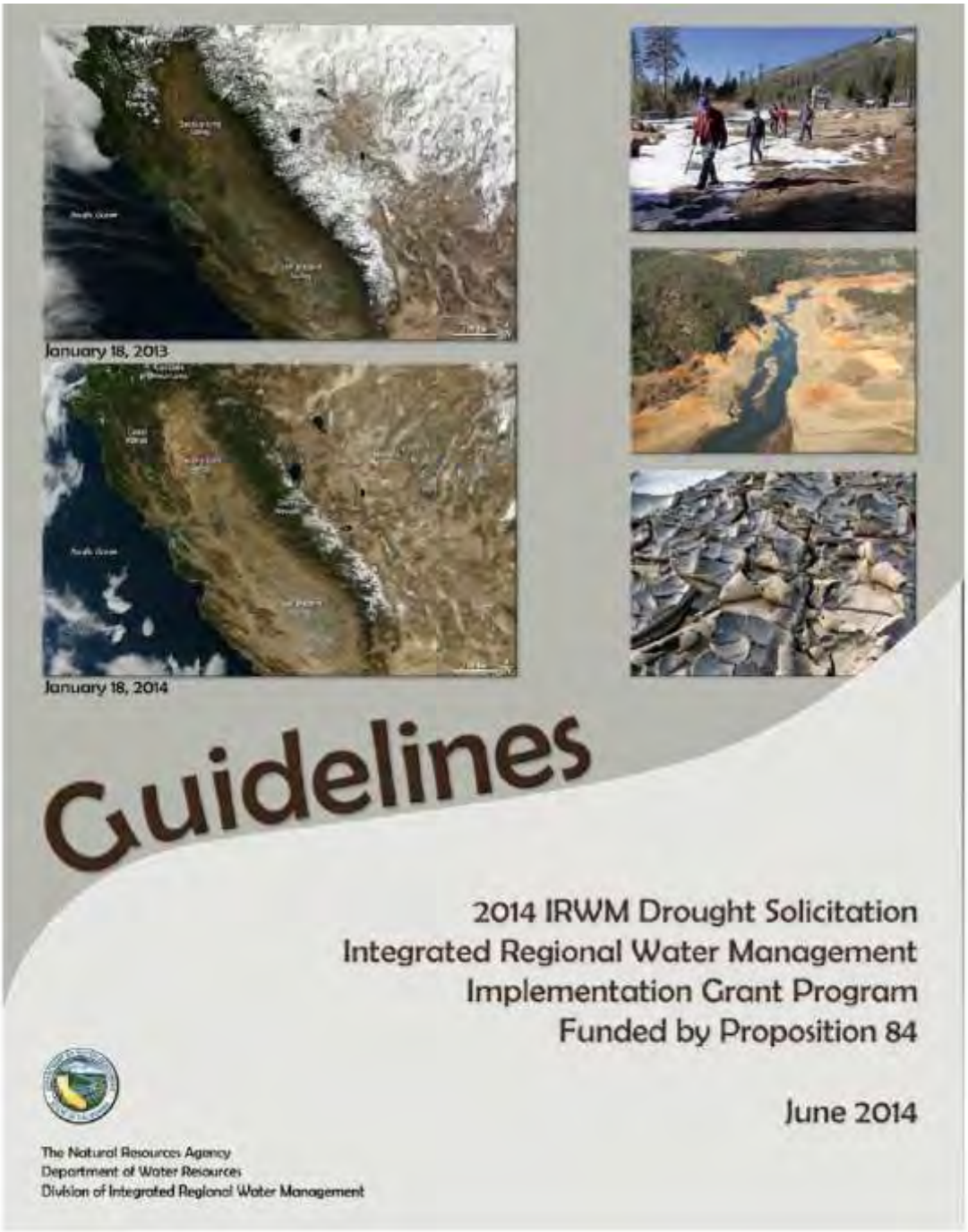
- realize substantially greater emissions reductions than the 2020 legislative and administrative targets for GHG emissions reductions established under AB 32 and Executive Order S-3-05 (reduce GHG emissions to 1990 levels),
- be able to achieve its own more aggressive goal of reducing GHG emissions from its own activities to 50% below 1990 levels by 2020, and
- be on track to meet or exceed the 2050 target for GHG emissions reductions established under Executive Order S-3-05 and DWR's own long-term goal (reduce GHG emissions to 80% below 1990 levels).

In addition to demonstrating DWR's progress toward and future plans for meeting California's GHG emissions reduction targets (articulated in AB 32 and Executive Order S-3-05), this Plan will also be used to streamline DWR's analysis for California Environmental Quality Act (CEQA) purposes of most future DWR projects' potential to contribute to the cumulative impact of increased GHG concentrations in the atmosphere. A CEQA Initial Study and Draft Negative Declaration analyzing the environmental effects of the Plan have been prepared and will be available for public review prior to adoption of the Plan and Negative Declaration.

[1] Because of variability in annual emissions, which is described in detail in section V of the Plan, DWR uses a 5-year average (1988-1992) as the benchmark emissions for 1990. This 5-year average is 2,746,000 metric tons.

Reference 4

DWR, 2014, Guidelines, 2014 IRWM Drought Solicitation, Integrated Regional Water Management Implementation Grant Program, Funded by Proposition 84, June 2014, pages 35,54,55,67



those groups may require different intensities or types of communication. What mechanisms are available to accommodate adequate two-way communication?

- Long-term implementation of IRWM Plan: IRWM Plans are long-term planning documents. The description of region standard refers to a 20-year planning horizon. How does the governance structure help ensure implementation of the plan in the long-term?
- Coordination with neighboring IRWM efforts, State agencies, and federal agencies: How does the governance structure ensure coordination with neighboring RWMGs, State agencies, and federal agencies? Does the governance structure contain appropriate region-wide roles for such entities? Do the appropriate regulatory and resource agencies have advisory roles?
- The collaborative process used to establish Plan objectives: Does the governance structure show that a collaborative process was used for the development of IRWM Plan objectives? The groups that were involved in the process? And how the final decision was made and accepted by the RWMG?
- Interim changes and formal changes to the Plan: IRWM Plans need to include adaptive management processes for updating the Plan in response to changing conditions. This may include informal changes that reflect minor process, organizational, or water management changes that occur relatively frequently and do not necessitate a decision by the governing bodies of the RWMG. Formal changes may include those which reflect significant changes to processes, organizational structure, water management conditions, or routine periodic programmatic updates of the IRWM Plan. How does the governance structure ensure the Plan is formally updated periodically and how are changes to the Plan identified and made interim to the formal update period?
- Updating or amending the IRWM Plan: Does the IRWM Plan indicate the process used to informally and formally update or amend the Plan? What changes to the Plan would require it to be readopted? What is the frequency to formally amend and readopt the Plan? DWR encourages use of adaptive management processes to ensure that the IRWM Plan and associated objectives are current. Formal updates to the Plan may be resource and time intensive processes, but are necessary to ensure that the IRWM Plan is not a static document and that the Plan continues to be accepted by the RWMG and those entities necessary to implement the Plan. Therefore, DWR encourages IRWM planning efforts to formally review, revise, and adopt the IRWM Plan, at a frequency of no less than every five years. In the Governance section, indicate if this information is contained in another part of the Plan, such as in the Project Performance section.

Region Description

The intent of the Region Description Standard is to document that the IRWM planning region is defined by the combination of the water systems being managed; common water issues; and that there is sufficient variety of interested parties included in the planning region. The region description contained in the IRWM Plan should closely follow the information required in the RAP whereby DWR accepts IRWM regions into the grant program.

IRWM regions vary widely in physical size for a variety of reasons. As a result, there is no single physical size definition that can be imposed on an IRWM region. However, CWC §10541(f) and PRC §75026.(b)(1)define a region as follows:

> "At a minimum, a region shall be a contiguous geographic area encompassing the service areas of multiple local agencies, and shall be defined to maximize opportunities for integration of water management activities: and effectively integrates water management programs and projects within a hydrologic region defined in the California Water Plan, the Regional Water Quality Control Board region, or subdivision or other region specifically identified by DWR."

Each RWMG has the responsibility of defining its own IRWM region. IRWM Plans are a form of resource planning so describing the region focuses on the resource being managed. DWR has released CWP Update 2009 (http://www.waterplan.water.ca.gov/cwpu2009/index.cfm), which emphasizes the importance of describing the major water-related objectives and conflicts within an IRWM planning region. DWR is in the process of developing

Table 5 – IRWM Plan Financing Example					
Activity Description	Approx Total Cost	Funding Source & % of Total Cost	Funding: Certainty/Longevity	O&M Finance Source	O&M Finance Certainty
IRWM planning efforts	$850,000	Local Partners – MOU, 100%	Contingent on continued success in grant programs. Secure through fall, 2011.	NA	NA
Implementation Project #1	$10M	XY water agency, 50%	Secure, part of XY agency current capital improvement budget.	XY water agency budget	Secure- 2011 O&M budget.
		Grant-Prop 84, 30%	Application will be submitted FY 11/12	NA	NA
		Federal Grant, 20%	Tentative award, contingent on State funding.	NA	NA
Implementation Project #2	$250,000	State Grant, DAC assistance, DWR, 100%	Application submitted, in review.	Agency YY, operational budget	Secure, rate increase covers O&M costs

The RWMGs may condense or expand activity descriptions as they see fit. As an example, it may be helpful for an RWMG to break the costs of the functional effort into categories if those categories have separate funding sources, or present only the priority projects that are well defined.

Although a table listing the information described may satisfy the standard, the RWMGs should include any additional explanatory text that would help a stakeholder understand how the IRWM Plan would be financed.

The list described in the table above should also contain information on how project O&M costs will be paid and the certainty of O&M funding. O&M costs are not eligible costs for grant reimbursement by the IRWM grant programs and most other State financial assistance programs.

The purpose of this standard is not to document that all funding has been fully secured. DWR wants to see that the RWMG has thought through financing of the Plan and implementation projects and programs even though substantial uncertainty regarding funding may exist. It is recommended that RWMGs do not overly rely on grant awards, but look at other forms of consistent, secure, long-term sources of funding, such as general funds or rate-based funds.

Technical Analysis

The intent of this standard is to document that the IRWM Plan is based on sound technical information, analyses, and methods. The IRWM planning horizon is for a minimum of 20 years. The objectives, RMS, and implementation projects contained in the IRWM Plan are based on the water management needs forecasted within that planning horizon. The Technical Analysis Standard requires a discussion in the IRWM Plan that explains the technical information, methods, and analyses used by the RWMG to understand the water management needs over the planning horizon.

Technical Information

Provide a brief description of the technical information sources and/or data sets used to develop the water management needs in the IRWM Plan. Explain why this technical information is representative or adequate for

developing the IRWM Plan. For example, how the technical information represents the current conditions, the scope of historic highs and lows, or the best forecast for future years, etc.

Data sets may be from studies, historical records, monitoring activities, or investigations. It is not necessary to include the technical information and literature reviewed in the IRWM Plan development, but the Plan should provide references and brief descriptions.

The IRWM Plan should identify data gaps where additional monitoring or studies are needed, and should also describe how the Plan will help bridge these data gaps.

TECHNICAL ANALYSES AND METHODS

Provide a description of studies, models, or other technical methodologies used to analyze the technical information and data sets. Explain how such studies, models, or technical methodologies aid the RWMG's and stakeholders' understanding of the water management picture for the period of the planning horizon.

In describing technical analyses and studies, it is not necessary to have an exhaustive discussion of each type of analysis and study performed, nor all copies of raw input and output files, nor inclusion of every study used. Provide summary information, such as what the particular technical analysis does; what are the outcomes; what is the certainty or uncertainty involved in the analysis; or how the outcomes are applied to the planning horizon.

Examples of possible studies/data sets are shown in Table 6. The listed items in the table are examples only. For a specific IRWM Plan, there are likely to be more items to document. Any referenced data should be made available to the public upon request.

Table 6 – Possible Studies/Data Sets

Data or Study	Analysis Method	Results/Derived Information	Use in IRWM Plan	Reference or Source
Population Growth Study	Statistical Analysis	Future Population	Used to calculate future water demand.	Census Bureau
Surface Storage Capacity Study	HEC-ResSim	Current Reservoir Capacity	Used to calculate current surface capacity.	Army Corps of Engineers
Floodplain Analysis	HEC-RAS, HEC-FDA	Identify flood areas and potential damage	Used to prioritize levee repairs.	Army Corps of Engineers
Water Use Study	Review of existing records	Current water use	Used to evaluate current water supply system and as basis for future water supply needs.	Local Water Purveyor
Additional studies to be added as necessary:				

Relation to Local Water Planning

The intent of the Relation to Local Water Planning Standard is to ensure the IRWM Plan is congruent with local plans, and that the Plan includes current, relevant elements of local water planning and water management issues common to multiple local entities in the Region. Regional planning does not replace or supersede local planning, rather regional planning should appropriately incorporate local planning elements. Per CWC §10540(b), the IRWM Plan must describe how the RWMG has or will coordinate its water management planning activities to address or incorporate all or part of the following actions of its members:

- Groundwater Management
- Urban Water Management
- Water Supply Assessments
- Agricultural Water Management

Table 7 – Addressing Climate Change Within Existing IRWM Plan Standards	
Region Description	IRWM plans must contain language in their Region Description Section that describes likely Climate Change impacts on their region as determined from the vulnerability assessment.
Plan Objectives	*Adapting to Climate Change:* In developing plan objectives, IRWM regions must consider the following: • IRWM Plans should address adapting to changes in the amount, intensity, timing, quality and variability of runoff and recharge. • IRWM Plans need to consider the effects of SLR on water supply conditions and identify suitable adaptation measures. RWMGs should consider the guidance provided in the OPC's SLR Policy. *Reducing Emissions* • IRWM plans can also help mitigate Climate Change by reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions. • In evaluating different ways to meet IRWM plan objectives, where practical, RWMGs should consider the strategies adopted by CARB in its AB 32 Scoping Plan. • In addition to offsetting emissions, RWMGs also may consider options for carbon sequestration and using renewable energy where such options are integrally tied to supporting IRWM Plan objectives.
Resource Management Strategies	Identify and implement, using vulnerability assessments and tools such as those provided in the Climate Change Handbook, Adaptation Strategies that address region-specific climate change impacts. • An IRWM region must demonstrate how the effects of Climate Change on its region are factored into its resource management strategies. • IRWM Plans should address adapting to changes in the amount, intensity, timing, quality and variability of runoff and recharge. • IRWM Plans need to consider the effects of SLR on water supply conditions and identify suitable adaptation measures. • IRWM Plans also can help mitigate Climate Change by reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions. • IRWM regions should pursue increasing water use efficiency, practice integrated flood management, and seek to enhance and sustain ecosystems.
Project Review Process	The Project Review Process must include the following factors: • *Contribution of the project to adapting to Climate Change*: RWMGs must include potential effects of Climate Change on their region and consider if adaptations to the water management system are necessary. • *Contribution of the project in reducing GHG emissions as compared to project alternatives*: The RWMG needs to consider a project's ability to help the IRWM region reduce GHG emissions as new projects are implemented over the 20-year planning horizon. Considerations include energy efficiency and reduction of GHG emissions when choosing between project alternatives. *CEQA project-level analyses:* In preparing a project-level GHG emissions analysis, RWMGs and the project proponents should estimate GHG emissions from the project; establish significance criteria; identify those project components that may support carbon sequestration; and, if applicable, explain how the project may help in adapting to effects of Climate Change.
Relation to Local Water Planning	IRWM Plans must consider and incorporate water management issues and Climate Change adaptation and mitigation strategies from local plans into the IRWM Plan.
Relation to Local Land Use Planning	IRWM regions must demonstrate information sharing and collaboration with regional land use planning in order to manage multiple water demands throughout the state, as described in CWP Update 2009, adapt water management systems to Climate Change, and potentially offset Climate Change impacts to water supply in California.
Plan Performance and Monitoring	IRWM Plans should contain policies and procedures that promote adaptive management. As more effects of Climate Change manifest, new tools are developed, and new information becomes available, RWMGs must adjust their IRWM plans accordingly.
Coordination	• RWMGs should stay involved in CNRA's California Adaptation Strategy process to help shape the document through their participation. • Agencies that are part of an IRWM effort should consider joining The Climate Registry, http://www.theclimateregistry.org/.

Reference 5

DWR, 2014, Climate Change (www.water.ca.gov/climatechange/)

Website – pg. Breaking Drought News

CA.gov | Help | Accessibility

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WATER RESOURCES

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Breaking Drought News

One of California's Driest Years Ever

Calendar year 2013 closed as the driest year in recorded history for many areas of California, and the severe drought is continuing this year.

On January 17, Gov. Edmund G. Brown Jr. declared a drought state of emergency and directed state officials to take all necessary actions in response and on April 25, Governor Brown asked all Californians to redouble their efforts to conserve water, instructed agencies to cut red tape to get water to farmers more quickly, ensure that people have safe drinking water, protect vulnerable wildlife species and prepare for an extreme fire season. Read the executive order at http://gov.ca.gov/news.php?id=18496.

The proclamation is available here: http://www.gov.ca.gov/news.php?id=18368.

Water Deliveries Slightly Boosted

There was a bit of good news on April 18 as the Department of Water Resources (DWR) announced an increase from 0 to 5 percent in the State Water Project allocation (water delivery estimate) for the remainder of the year. If it stands, this will be the lowest SWP (SWP) allocation since deliveries began in the 1960s. The allocation – changed or unchanged – will be finalized later this spring. Also on April 18, the federal Bureau of Reclamation announced that senior water rights holders in the Sacramento Valley would receive 75 percent rather than 40 percent of contracted water supplies this year.

Drought Barriers Cancelled for 2014

February and March storms that slightly boosted water deliveries also eliminated the immediate need for salinity barriers in the Sacramento-San Joaquin Delta to control saltwater intrusion from San Francisco Bay, as described in this April 18 news release. The rock barriers would have been installed at Sutter and Steamboat sloughs near Courtland and False River near Oakley. DWR continued to assess water supply and demand in the weeks following the April 18 announcement and concluded in late May that the barriers will not be needed in 2014. Planning and permitting will continue for the barriers' possible installation in 2015 if drought conditions persist into a fourth consecutive dry year.

The fifth and final snow survey of the season on May 1 recorded manual and electronic readings of the statewide snowpack's water content – which normally provides about a third of the water for California's farms and cities – at a mere 18 percent of average for the date. By late May, the Sierra snowpack's water equivalent statewide had decreased to almost zero.

When Governor Brown declared a drought State of Emergency in January, he directed state officials to take all necessary actions to prepare for water shortages. CAL FIRE recently announced it hired 125 additional firefighters to help address the increased fire threat due to drought conditions, the California Department of Public Health identified and offered assistance to communities at risk of severe drinking water shortages and the California

Resources

- Drought Home
- Governor's Drought Declaration
- Water Conditions
- Drought Background
- Emergency Drought Barriers
- Publications
- Groundwater Info Center

Featured Information

- California Drought – U.S. Geological Survey - New
- Drought Response – Groundwater, April 2014
- 2014 Drought Operations Plan
- Daily Hydrologic Overview *interactive*
- Klamath/San Joaquin/Sacramento Hydroclimatic Reconstructions from Tree Rings
- Treering Report Appendix.zip (data files)
- ACWA Launches Interactive Map Showing Local Response Actions
- Cal OES Drought Page
- Governor's letter, Interagency Drought Task Force
- DWR-CSUF Agricultural Drought Preparedness Workshop

Reference 6

California Natural Resources Agency, 2009 Climate Adaptation Strategy, page 79.
(http://www.tribesandclimatechange.org/docs/tribes_263.pdf)

VII. WATER MANAGEMENT

Introduction

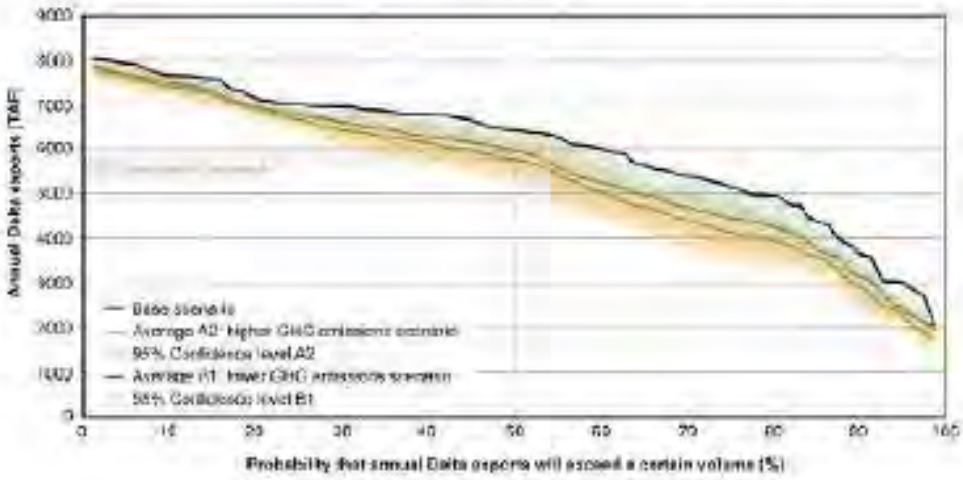
Water is the lifeblood of California's natural and human systems. For more than 200 years, California water and flood management systems have provided the foundation for the state's economic vitality, providing water supply, sanitation, electricity, recreation, and flood protection. However, the climate patterns that these systems were based upon are different now and may continue to change at an accelerated pace. These changes collectively result in significant uncertainty and peril to water supplies and quality, ecosystems, and flood protection.

Nearly 75 percent of California's available water supply originates in the northern third of the state (north of Sacramento), mainly from water stored in the Sierra Nevada snowpack. At the same time, 80 percent of the demand occurs in the southern two-thirds of the state.[1] California has been able to bridge the geographic distance between water supply and demand by building one of the most complex water storage and transport systems in the world to convey large quantities of water throughout the state.

However, drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. Today, the effects of hydrologic droughts are increasingly being exacerbated by additional regulatory requirements to protect listed fish species, especially regarding water diversion from the Bay-Delta. For example, the hydrologic severity of California's present three-year drought is not remarkable in comparison to past three-year droughts, but drought impacts in the Delta export area are such that a statewide drought emergency has been proclaimed for the first time in California.

Population growth expected over the next few decades will lead to additional demand. Even without higher air temperatures and changing precipitation patterns over the next few decades, California's water supply problems would already be challenging. A portfolio of measures implemented at the local and regional level will be needed to meet these growing challenges.

Figure 13: Using mid-century climate projections to support water resources decision making in California (Source: Chung, et al 2009)



Reference 7

CUWCC, 2000. Seattle home water conservation study the impacts of high efficiency Plumbing Fixture Retrofits In Single-Family Homes (www.cuwcc.org/Portals/0/Seattle%20Final%20Report%20Dec%202000.pdf)

170 page PDF - pgs. xiii-xv

SEATTLE HOME WATER CONSERVATION STUDY

THE IMPACTS OF HIGH EFFICIENCY PLUMBING FIXTURE RETROFITS IN SINGLE-FAMILY HOMES

December 2000

Submitted to:

Seattle Public Utilities
and
The United States Environmental Protection Agency

Prepared by:

Peter W. Mayer, William B. DeOreo, and David M. Lewis
Aquacraft, Inc. Water Engineering and Management
2709 Pine St.
Boulder, Colorado 80302
www.aquacraft.com

retrofits in reducing daily demand can be seen from the fact that while during the baseline period indoor use fell below 175 gallons 66 percent of the time, in the post-retrofit period it fell below this level 90 percent of the time.

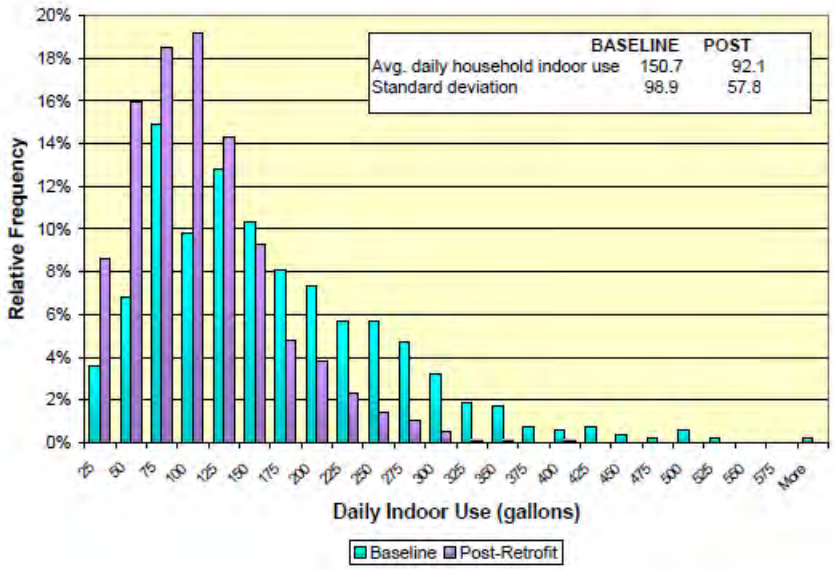


Figure ES.1 Daily per household indoor water use distributions, pre and post-retrofit

Per Capita Demand

Indoor water use patterns changed dramatically after the conservation retrofit. Average daily per capita use decreased in 35 on the 37 study homes. After the retrofit, toilet usage, which had previously been the largest component of indoor use dropped below faucets into fourth place. Clothes washers became the largest indoor water use followed by showers, and faucets. The combination of showers and baths actually form the largest block of indoor use in the post-

[2] Similar studies are planned for Oakland, California and Tampa, Florida.

retrofit era at 28.4 percent. A pie chart showing the relative importance of each per capita end use is shown in Figure ES.2.

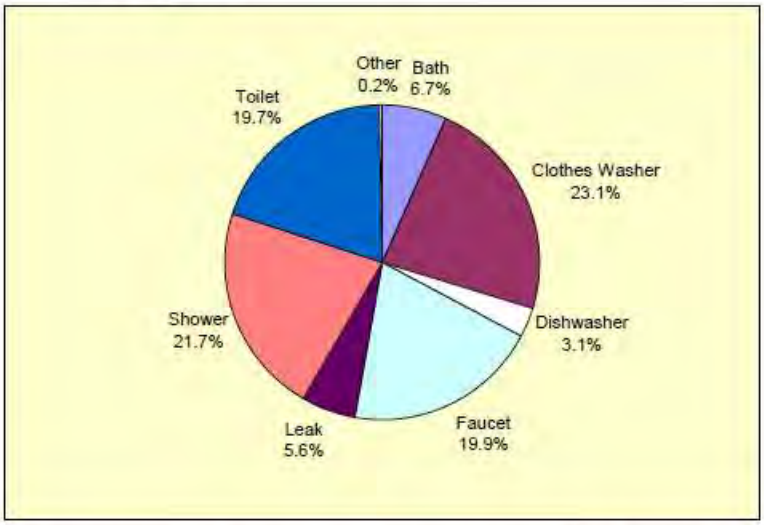


Figure ES.2 Post-retrofit indoor per capita water use percentage including leakage

Table ES.1 presents a comparison of the mean indoor per capita water use from the baseline and post-retrofit data collection periods. Overall, indoor water use decreased by 23.6 gpcd – a 37.2 percent drop. A series of unpaired *t-tests* were performed on each end use in these two data sets to determine which changes in water use are statistically significant at the 99 percent confidence level. The results of this analysis are also presented in Table ES.1 as the t-Value and P-Value from the t-test. In order for a difference in means to qualify as statistically significant, the P-Value must be less than the alpha level of 0.01, the 99 percent confidence level. Statistically significant changes in water use were detected for clothes washers, faucets, leaks, toilets, and total indoor use.

More than 20 gallons of the 23.6 gpcd average saved through the retrofit was the result of three end uses: toilets, clothes washers, and leaks. Installation of ULF toilets, including some dual flush models saved an average of 10.9 gpcd. The new conserving clothes washers saved an average of 5.6 gpcd. A reduction in leakage resulted in savings of 4.3 gpcd. The leakage

savings were almost certainly the result of the toilet retrofit. Toilet leaks, primarily flapper leaks, are the single largest contributor to household leakage. In this study, replacing old toilets through the retrofit eliminated almost all of these toilet leaks and resulted in substantial savings. None of the other measures implemented through this study (clothes washers, showerheads, or faucet aerators) should have had any impact on the leakage rate, although it is known that at least one study participant repaired a substantial faucet leak (44 gpcd) about the time of the retrofit.

Statistically significant reductions in water use occurred in most of the end use categories impacted by the retrofits: toilets, faucets, leaks and clothes washers. Showers did not show any significant water use reduction, even though new showerheads were installed. The remaining categories not targeted by the retrofit (baths and dishwashers) also showed no change. Mean per capita faucet use was reduced by 1.2 gpcd (13.1 percent) after the installation of faucet aerators. But mean per capita shower usage only decreased by 0.3 gpcd (3.8 percent) in spite of the installation of LF showerheads in many of the study homes.

Table ES.1 Mean indoor per capita water use, baseline and post-retrofit

Category	Baseline (gpcd)	Post-Retrofit (gpcd)	Difference in Means (gpcd)	% Change	t-Value	P-Value	Statistically significant difference? *
Bath	3.7	2.7	-1.0	-27.9%	2.443	0.0147	No
Clothes Washer	14.8	9.2	-5.6	-37.7%	5.157	<0.0001	Yes
Dishwasher	1.4	1.2	-0.2	-13.6%	1.460	0.1446	No
Faucet	9.2	8.0	-1.2	-13.1%	3.310	0.0010	Yes
Leak	6.5	2.2	-4.3	-66.0%	9.891	<0.0001	Yes
Shower	9.0	8.7	-0.3	-3.8%	0.740	0.4596	No
Toilet	18.8	7.9	-10.9	-58.1%	25.29	<0.0001	Yes
Indoor	63.4	39.8	-23.6	-37.2%	13.935	<0.0001	Yes
Other/Unknown	0.2	0.1	-0.1	-46.9%	1.570	0.1166	No
Total	63.6	39.9	-23.7	-37.2%	13.927	<0.0001	Yes
Avg. # of Residents per household	2.54	2.51					

*99 percent confidence level

Customer Satisfaction Ratings

About seven months after installation of the new fixtures and appliances the study participants were asked to rate their performance. Each participating household was asked to

Reference 8

CUWCC, 2002. Veritec/Canadian Mortgage and Housing Corporation (2002)
www.cuwcc.org/Portals/0/CMHC%20Dual%20Flush%20Report.pdf

27 page PDF pgs. 5-7

Canada Mortgage and Housing Corporation

Dual-flush Toilet Project

Evaluating –

- *Public perception, acceptance, and satisfaction,*
- *Water Savings, and*
- *Cost-Effectiveness*

Completed by

Veritec Consulting Inc.

April 2002

suite per day (approximately 35% of the total savings). Savings related to reduced toilet leakage equate to 176 litres per suite per day[5]. (See Appendix 3 for complete details of savings achieved at this site.)

- Bowl streaking was the largest single complaint (one site stated that although they supported the dual-flush option they felt that they had to remove the toilet after the project due to severe streaking problems).

Acceptance: Participants overwhelmingly accept and support the dual-flush technology.

Satisfaction: Program participants expressed a range of satisfaction with the Caroma dual-flush toilets. While most comments were very positive, others expressed a strong dislike of the toilet. Significant bowl 'streaking' was the most common complaint, even among participants that expressed support for the toilet.

5.2 Water Savings Compared to 13-Litre and Conventional 6-Litre Toilets

Table #3 – Average Flush Volumes

Toilet	Flush Volume, L
Existing Toilets	14.1
Caroma	3.4 'short', 6.0 'long'
TOTO	6.1
Niagara	6.2
Western Potteries	7.5

Table #4 – Changes in Average Flushes per Day

Site	Flushes/Day Pre	Flushes/Day Post	Changes in Flushes/Day[6]
Caroma	16.6	10.6 'short', 6.8 'long'	5% increase
TOTO	14.0	12.0	14% decrease
Niagara	13.0	7.9	39% decrease
Western Potteries	10.9	15.0	37% increase

Table #5 – Comparison of Caroma Savings in Different Sectors[7]

Sector	'Short' Flushes per Day	'Long' Flushes per Day	Ratio 'Short' to 'Long'	Increase in Flushes per day	Savings, %
Single-Family	9.0	4.1	1.6 to 1	5%	68%
Office (overall)	7.9	4.6	1.7 to 1	6%	56%
Office (female)	12.8	4.8	2.7 to 1	-1%	64%
Office (male)	4.5	4.2	1.1 to 1	12%	50%
Coffee Shop	82	61	1.3 to 1	12%	52%

While data from the *Office* (female) sector shows that there are approximately 2.7 'short' flushes

[5] Note that it is likely that this reduction in leakage would have been achieved by installing any non-leaking toilet, or perhaps even by replacing the existing toilet flappers (flush valves).

[6] Outliers and erroneous data have been removed. Analysis includes 30 Caroma, 7 TOTO, 3 Flapperless, and 1 Aris; Caroma value is expected to be accurate to ±18% at 95% confidence, other values are significantly less accurate and are presented for illustration purposes only.

[7] Similar analysis for schools, golf courses, etc., was not included because of insufficient data.

to every one 'long' flush, data from the *Office* (male) sector indicates that the number of 'short' and 'long' flushes are similar. This result suggests that less water savings should be expected if dual-flush toilets are installed in washrooms where urinals are available.

It also appears that in applications where a low ratio of 'short' to 'long' flushes would be expected (e.g., in a mens restroom where urinals are available) there may be a corresponding increase in the number of flushes per day (*possibly* indicating an increased frequency of double-flushing). Although this result is not conclusive, it is not unexpected as clearing solids is a more difficult task for a toilet than clearing liquids. Again, dual-flush toilets seem better suited to environments where urinals are not available.

The ratio of 'short' to 'long' flushes was also relatively low at the Coffee Shop, however, this may be more related to customer curiosity about the toilet than to flush performance (i.e., a changing customer base may continue to be curious about the novelty of a dual-flush toilet and experiment with the different flushes).

The *effective* flush volume of a dual-flush toilet (i.e., the *total* volume of water used divided by the *total* number of flushes, both 'long' and 'short') depends upon the location where it is installed, i.e., the effective flush volume decreases as the ratio of 'short' flushes to 'long' flushes increases and vice versa. The *overall* effective flush volume identified in this project was 4.4 litres per flush[8]. It should be reiterated, however, that the effective flush volume is dependent on the installation location, i.e., the effective flush volume appears to be lower in ladies restrooms than in mens restrooms equipped with urinals. This said, the effective flush volume of dual-flush toilets appears to be about 32% less than that of conventional ULF toilets in ladies restrooms, 27% less in single-family applications, and 23% less in mens restrooms where urinals are installed.

The data also showed a small increase in the average number of flushes per day at sites where dual-flush toilets were installed (5% more flushes), and a decrease at sites where TOTO Drakes and Niagara Flapperless toilets were installed (14% and 39% fewer flushes respectively[9]). There is insufficient data, however, to ascertain whether the increase in flush rates at dual-flush sites is related to flush performance or simply to participant curiosity about the toilet.

Table #4 – Avg. Savings per Flush *(based on replacing existing toilet flushing with 14.1 litres)*

Toilet	Savings per Flush	Savings per Flush
Caroma (based on 'effective flush volume')	9.7 L	69%
TOTO	8.1 L	57%
Niagara	7.9 L	56%
Western Potteries	6.6 L	47%

5.3 Cost-Effectiveness of Dual-Flush Toilets

[8] (3.4 L/flush * 10.6 flushes/day + 6.0 L/flush * 6.8 flushes/day) ÷ (10.6 flushes/day + 6.8 flushes/day) = 4.4 L/flush.
[9] Outliers and erroneous data have been removed from calculation.

The cost-effectiveness of a toilet reflects the relationship between the cost and the water savings associated with the toilet. To avoid misinterpretation it should be pointed out that:

- toilets are often selected for a variety of reasons – design, water savings, flush performance, cost, colour, etc.,
- cost-effectiveness calculations consider only the cost and flush volume,
- the cost of a toilet is not related to the flush volume.

The following tables identify approximate costs of toilets included in this study as well as other makes and models. The tables also includes the payback period for each toilet assuming the following conditions:

- an existing toilet flushing at 14.1 litres is replaced,
- a non-dual-flush toilet will save 8.0 litres/flush,
- a dual-flush toilet wills save 9.7 litres/flush,
- each toilet is flushed 10 times per day,
- the combined water/sewer cost is \$1.00 per m^3.

Table #5 – Approximate Retail Cost of Toilets in Program

6-Litre Toilet Make/Model	Cost	Payback Period in Years
Caroma Tasman	\$300	8.5
Caroma Caravelle	\$400	11.3
TOTO Drake	\$300	10.3
Niagara Flapperless	\$169	5.8

Table #6 – Sample Retail Costs of 13-Litre Toilets*

13-Litre Toilet Make/Model	Cost	Payback Period in Years
Briggs Altima	\$97	3.3
Briggs Abingdon Elongated	\$119	4.1
American Standard Plebe	\$175	6.0
American Standard Cadet III	\$189	6.5

Table #7 – Sample Retail Costs of 6-Litre Toilets*

6-Litre Toilet Make/Model	Cost	Payback Period in Years
Komet International Deco 611	\$78	2.7
American Standard Marina	\$116	4.0
Komet Deco 614	\$118	4.0
Komet Albany	\$198	6.8
Briggs Millennium one piece	\$248	8.5
Komet International Bohemian	\$290	9.9
Briggs Kingsley one piece	\$298	10.2

**prices from 'The Building Box' flier, Book 3/02, 03/16/02, pages 28 & 29*

As can be seen in Tables 5, 6, and 7, there is a range of toilet costs and, therefore, there is also a range in respective payback periods. Based on the criteria outlined above, however, it appears that the additional savings achieved in this program by employing dual-flush technology were not significant enough to completely offset the additional costs of the Tasman or Caravelle toilets. Again, it is important to note that maximizing water savings is often not the primary consideration for persons purchasing new toilets.

6.0 CONCLUSIONS

Reference 9

CUWCC, 2014 CUWCC MOU Exhibit 1, BMP 3, Residential BMP Coverage Requirements (www.cuwcc.org/Resources/MemorandumofUnderstanding/Exhibit1BMPDefinitions,Schedules,andRequirements/BMP3Residential.aspx)

Website page – pgs. Section 3. Residential, Part A Implementation requirements

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3. RESIDENTIAL

Residential water users throughout California depend on a reliable and safe supply of water for their homes. This BMP will define the best and most proven water conservation methods and measures those residents, working in conjunction with water agencies, can implement. By implementing these methods and measures homeowners, multi-family property owners, and tenants will increase water use efficiency and reliability. Credit for prior activities, as reported through the BMP database, will be given for documented water savings achieved though 2008.

A. Implementation

Retail water agencies shall implement a water use efficiency program that consists of either the coverage goals listed below or achieving the water savings goals by implementing measures on the Flex Track Menu in Section F below.

1) Residential assistance program (formerly BMPs 1 & 2)

Provide site-specific leak detection assistance that may include, but is not limited to, the following: a water conservation survey, water efficiency suggestions, and/or inspection. Provide showerheads and faucet-aerators that meet the current water efficiency standard as stipulated in the WaterSense Specifications (WSS) as needed.

2) Landscape water survey (formerly BMP 1)

Perform site-specific landscape water surveys that shall include, but are not limited to, the following: check irrigation system and timers for maintenance and repairs needed; estimate or measure landscaped area; develop customer irrigation schedule based on precipitation rate, local climate, irrigation system performance, and landscape conditions; review the scheduling with customer; provide information packet to customer; and provide customer with evaluation results and water savings recommendations.

3) High-efficiency clothes washers (HECWs) (formerly BMP 6)

Provide incentives or institute ordinances requiring the purchase of high-efficiency clothes washing machines (HECWs) that meet an average water factor value of 5.0. If the WaterSense specification is less than 5.0, then the average water factor value will decrease to that amount.

4) WaterSense Specification (WSS) toilets (formerly BMP 14)

Provide incentives or ordinances requiring the replacement of existing toilets using 3.5 or more gpf (gallons per flush) with a toilet meeting WSS.

5) WaterSense Specifications for residential development

Provide incentives such as, but not limited to, rebates, recognition programs, or reduced connection fees, or ordinances requiring residential construction meeting WSS for single-family and multi-family housing until a local, state or federal regulation is passed requiring water efficient fixtures.

B. Implementation Schedule

Implementation shall commence no later than July 1 of the first year following the latter of either:

1) the year the agency signed or became subject to the MOU, or
2) the year this exhibit is amended.

C. Coverage Requirements

Coverage shall consist of:

1) Residential Assistance

Provide leak detection assistance to an average of 1.5 percent per year of current single-family accounts and 1.5 percent per year of current multi-family units during the first ten years after signing the MOU. After completing the ten-year 15 percent target, agencies will maintain a program at the level of high-bill complaints or not less than 0.75 percent per year of current single-family accounts and 0.75 percent per year of current multi-family units. Showerhead distribution will be considered complete when 75 percent market saturation is achieved.

Reference 10

EBMUD, 2011. California Single-Family Water Use Efficiency Study, Aquacraft Consulting (www.ebmud.com/sites/default/files/pdfs/CaSingleFamilyWaterUseEfficiencyStudyJune2011_0.PDF) Outdoor Model, page 220)

Therefore, more xeric landscapes will have lower landscape coefficients. Although the exponent of this variable is not as high as the irrigated area it is much higher than the household income variable. Consequently, its impact on outdoor use is intermediate of the two.

Table 85 shows the workings of the outdoor model in more detail. There is a row for each of the model parameters. The second column shows the value of the coefficients for the three linear parameters and for the exponents for the four power parameters. The third column shows the value of the parameter in the study group data, and the fourth column is for the user to insert an assumed value for sensitivity analyses. In this table they are the same as the study mean values. The fifth column shows the value for each factors based on the model coefficients and the assumed values in column four. The overall outdoor use value, predicted by the observed data is 91.3 kgal per household per year. In this table the assumed values have been set to the study means, so the model is predicting the same outdoor use as was observed from the data.

Table 85: Outdoor use model details

Parameter	Coefficient or Exponent	Study Mean	Assumed Value	Predicted Outdoor Use
Factor	1.6207E-04	--		1.6207E-04
Irrigated Area (sf)	0.682	3802.615	3802.000	275.318
Net ETo (in)	1.659	42.193	42.193	496.064
Landscape Ratio	0.506	0.960	0.960	0.980
Excess Irrigators (%)	3.130	0.505	0.505	2.076
In ground sprinklers (%)	1.212	0.739	0.739	1.157
Swimming pool (%)	1.385	0.158	0.158	1.061
Household income ($1000)	0.125	$118.12	$118.12	1.82
Correction	-9.200			-9.200
Observed Mean Use (kgal)				91.3
Predicted Value (kgal)				91.3

If the values for the parameters are modified without going too far from their original values the model will show the predicted change in outdoor water use assuming no other changes occur. This allows us to see how sensitive the predictions are to changes in each parameter. Table 86 shows how the predicted mean outdoor use for the population is expected to vary if the value for each parameter is either increased or decreased by 10%.

If the irrigated areas of the homes were reduced by 10% the model predicts an 8% reduction in water use or 6.9 kgal per home. If Net ETo on the other hand, increases by 10% the unconstrained water demand would increase by 20% or 17.2 kgal per household. If less turf intensive landscape were installed, such that the overall landscape ratio dropped by 10%, from 0.96 to 0.86, the water demand would drop by 6% or 5.2 kgal. If the percentage of households that are over irrigating were dropped by 10%, from 50% to 40%, there would be a 12% reduction in average outdoor use, or 10.8 kgal per year. Dropping the percentage of homes with in-ground sprinkler systems would have an effect on water use, but a 10% reduction would only result in a 2% reduction in average water use. Reduction in the percent of homes with swimming pools, from 15% to 5% would result in a 4% reduction in average outdoor use, or 3.5 kgal per year. A

Reference 11

EBMUD, 2011, California Single-Family Water Use Efficiency Study, Conclusions pg. 272-282. (www.ebmud.com/sites/default/files/pdfs/CaSingleFamilyWaterUseEfficiencyStudyJune2011_0.PDF)

Sponsored by:
The California Department of Water Resources

Managed by:
The Irvine Ranch Water District

FINAL REPORT

Prepared by:

Aquacraft
WATER ENGINEERING & MANAGEMENT

with Stratus Consulting & the Pacific Institute

CHAPTER 11 – CONCLUSIONS AND RECOMMENDATIONS

The research team offers the following conclusions and recommendations.

Conclusions

Since the signing of the original Memorandum of Understanding, the water agencies in the State of California have made a concerted effort to implement water conservation programs. These efforts have clearly paid off in the form of reduced water use. The data collected for this study has shown that indoor water uses have been reduced by 13% compared to the 1997 demand patterns. The penetration rates of toilets has increased to the point that 60% or more individual units are ULF or better models, and 30% of all homes appear to be fully equipped with toilets that are flushing at two gallons per flush or less. Similarly, 30% of homes now have clothes washers that use 30 gallons per load or less, and these volumes are falling continuously as newer, more efficient models come on the market. Showers appear to be fully saturated with 2.5 gpm devices. The areas where the most interesting challenges persist are in managing leaks (and continuous uses that appear to be leaks) and eliminating excess irrigation applications.

The fundamental conclusion of this report is that there has been significant progress made in single-family water conservation. Indoor use, normalized for a family of three has declined by 13% since the REUWS study was completed. The data show, however, that there is still a significant amount of remaining potential available. This is true for both indoor and outdoor uses. Tapping these potential savings could represent a major portion of the conservation savings goals for the state.

In the most conservative case, indoor savings are estimated at approximately 20 kgal per year per household and outdoor savings at 25 kgal per household per year. This equates to 45 kgal per household per year, or 1.2 MAF for the households in the state. These savings represent 27% of the baseline single-family demand. In the most aggressive conservation program investigated, the total household savings are 40 kgal per household indoors and 40 kgal per household outdoor. In this case the total savings from the single-family category would amount to 2.18 MAF per year, which equates to 50% of the baseline demand.

Savings associated with the conservative estimates could probably be achieved without making any major adjustments to lifestyles, but they would require some technological and programmatic advances. The primary indoor challenge is to develop ways to eliminate the long term "leakage" patterns seen in some homes. Our assumption is that most of these are true leaks or malfunctions of some sort. Some additional work needs to be done to determine if there are legitimate uses (such as water treatment, medical or other uses) that require a constant flow of water. If these uses are avoidable they would reduce overall indoor water use significantly. There are devices on the market for detecting and interrupting these types of flows that should be investigated. For outdoor uses the challenge is to find ways of eliminating over-irrigation for

customers where it is occurring, without simultaneously causing irrigation use to rise for customers who are under-irrigating.

The more aggressive conservation scenarios would require increasingly lifestyle changes. Additional work needs to be done to determine how these scenarios might be accomplished technically, economically and from the perspective of customer acceptance. This report did not deal with cost-effectiveness analyses.

The savings projections made in this study are based on clearly defined assumptions and parameters. They are theoretically possible to achieve, and have been demonstrated to be achievable in pilot studies. Only future studies and efforts by agencies working with their customers in practical situations will demonstrate how achievable they may be and what techniques are most promising. It is clear, however, that the more valuable water becomes the more cost-effective the conservation efforts will prove.

These average savings estimates are not evenly distributed over the population. In most homes the savings potential is smaller than the average, but in a few homes it is far larger than the average. The skewed nature of both water use and potential savings is another key finding of this report, and has important implications on how to best achieve water savings in the most practical manner and in program design.

The water use in the study homes matched the water use of the populations from which they were drawn in both average and median annual water use. While geography was not one of the selection criteria, in cases where it was checked, as, for example in San Francisco and Los Angeles, the proportion of study homes in zip codes was found to match the percentage of single-family customers therein.

The research team believes that in general the study homes in this sample were fairly typical of single-family homes in the state. Exceptions to this were found in that the average occupancy of the study homes was slightly larger than the statewide population and the income of the study homes was higher than for the state as a whole. The savings estimates in the study have been corrected to account for these differences.

The basic sample of 60 homes per study site uniformly provided sufficient accuracy in results such that the 95% confidence intervals around the mean values of end uses was less than 10% of the mean, and provided sufficient accuracy to detect whether changes in the mean use were statistically significant and whether the percentage of homes complying with efficiency criteria were significant. The pooled sample group provided a more than adequate data set for performing the indoor and outdoor modeling on a range of explanatory variables.

The errors and inaccuracies in the data and analysis were unavoidable given the available data and the fact that water use was being disaggregated by examination of a flow trace from a single water meter. The errors in the data, however, were mainly random in nature, creating plusses and minuses in the results, and we do not believe significant systematic errors occurred.

The data collected for this study reveal a wide array of details about single-family household use in the study homes and by extension for California, and how these uses have changed over time. Some of the key findings are:

- The annual water use in the 1.3 million single-family customers from which the study sample was selected was 132 kgal (176 CCF) per year. This is equivalent to 361 gphd. Based on the average occupancy of 2.94 persons per home, this equates to an average per capita use of 123 gpcd for annual single-family use.
- Analysis of the data on an annual and seasonal basis indicates that that 47% of the single-family household use was for indoor uses and 53% was for outdoor uses. This equates to 62 kgal per year for indoor uses and 70 kgal per year for outdoor uses, averaged over all single-family households in the study.
- Based on data logged consumption, the total indoor water use for the study homes was 175 gphd, which was statistically similar to both the indoor use for the entire REUWS group, which was 177 gphd, and just the California homes from the REUWS, which was 186 gphd.
- The only continuous variable found to be significant with respect to predicting indoor water use was the number of residents living in the home. The age of the home, household income, number of bedrooms or bathrooms, and the size of the home were not significant predictors.
- Indoor water use is not linear with respect to the number of residents, but follows a power curve relationship, with the exponent of the equation less than 1.0.
- When corrected for the number of occupants by normalizing household demands for a family of three, the indoor water use from the current study group was 13% lower than for the REUWS group.
- As an efficiency benchmark, this study used the data from the EPA Retrofit Study, which showed the water use in homes that had been retrofit with high-efficiency fixtures and appliances. The average indoor use for the Retrofit group was 107 gphd, although for projections of savings, we only sought to obtain savings down to the level of 120 gphd in order to be conservative.
- There were eight indoor end uses identified, five of which are major end uses:
    - toilets (20%)
    - clothes washers (18%)
    - showers (19%)
    - faucets (18%)
    - leakage (16%)

  These account for 91% of indoor uses by volume. Baths, dishwashers and other uses make up the remaining 9%.
- Of the eight indoor end uses analyzed in this study:
    - Two categories, toilets and clothes washers, showed unambiguous reductions in use compared to the REUWS sample.
    - Four categories, showers, faucets, leaks and baths showed increased usage.
    - Two categories: other (miscellaneous) uses and dishwasher uses remained unchanged.

There were 122,869 toilet flushes recorded in the flow trace database.

- According the survey data 67% of all of the toilets in the study group are ULF or better devices. The data show that this rate of penetration still leaves the majority of homes flushing above the 2.0 gpf threshold, which is due to a combination of the mixtures of high volume and ULF toilets in the homes, and the fact that many ULF design toilets clearly flush at more than 1.6 gpf.
- In 1999, when the REUWS was published, only 22% of all toilet flushes were at 2.5 gpf or less. In this study 59% of all flushes are at 2.5 or less. That represents a major improvement and demonstrates the benefits of the conservation efforts that have been made.
- The household use for toilet flushing decreased from 45.2 gphd in the REUWS to 37.7 gphd in this study.
- The average toilet flush was 2.76 gallons per flush, which compares to an average flush volume of 3.48 gpf in the REUWS data. The median flush volume was 2.45 gal.
- It appears that 75% of all homes have at least one ULF or better toilet and 25% do not.
- Overall, 30% of the houses had average toilet flush volumes at 2.0 gpf or less. The remaining 70% of homes have a mixture of toilets and would benefit from additional toilets upgrades or repairs.
- The data show a clear improvement in the water use efficiency for toilet flushing, but they also show that there is still a considerable amount of remaining potential available.
- The toilet flush data in this study suggest that around 30% of the homes use ULF or better toilets exclusively, 25% of the houses do not use ULF or better toilets to a significant extent, and 60% of the toilets in the population are ULF or better devices.

There were 7,935 loads of clothes identified from the flow trace data during the logging study.

- The data show clear improvements in clothes washer efficiencies.
- In the REUWS group only 1% of the loads were washed at 30 gallons or less. The current data show that 29% of all homes use 30 gpl or less.
- The household water use for clothes washing dropped from 39.3 gphd in the REUWS to 33.2 gphd in this study.
- The average gallons per load was 36 gpl, which compared to 40.9 gpl in the REUWS study.
- If all clothes washers were high-efficiency devices, which in this study was set at only 30 gpl, the household use could be reduced to less than 20 gpd for clothes washing. Obviously, if lower wash volumes provided by the more recently produced machines with lower water factors this would drop further.

There were 17,334 showers recorded during the logging study

- The household use for showering increased from 31.9 to 35.3 gphd from the REUWS group to this.
- The average flow rate for the showers was 2.14 gpm, which is less than the 2.5 gpm standard.

- The average minutes per day for showers in the homes was 17.1 minutes. At 1.7 gpm this would require 29 gphd for showering, which gives an indication of the potential for conservation from shower heads when compared to the 35 gphd recorded use.
- The average volume of water used for showers in the homes was 18 gallons per shower. This is approximately the volume required to fill up a standard bath tub with someone sitting in the tub.

During the 9,021 days logged in the study period the average volume of events classified as leaks or leak-like events was 30.8 gphd.

- Only 7% of the homes showed volumes for leaks and leak-like events at 100 gpd or more, but these homes were responsible for 44% of the total volume assigned to leakage. A few of these homes may have devices such as reverse osmosis systems that are being run continuously, and this needs further study.
- The leaks in homes with 100 gpd or more of leakage tend to be of long duration, which would lend themselves to interruption by various devices currently on the market.
- The regression model of leakage showed a 12.8 gphd difference in leakage between manual and sprinkler irrigators. This implies that a significant percentage of the observed leakage was due to leaky irrigation systems.
- Elimination of these long and large volume "leak" events should be a high priority for making residential water use more efficient.
- If there are devices, such as whole house reverse osmosis systems, that create a continuous demand these should be documented, and criteria established for categorizing their use.

In terms of the number of events per day, faucets rank number one.

- There was an average of 57 faucet events per day in the homes, which lasted an average of 37 seconds at a flow rate of 1.1 gpm.
- Faucet use appears to be reduced by having a dishwasher.
- The presence of a disposal also was associated with *decreased* faucet use, which was not anticipated.
- Faucet use accounts for 33 gphd, up slightly from the REUWS sample of 26.8 gphd.
- A combination of reduced flow rates and devices to reduce flow durations are probably the best approach to reducing faucet use.

The data show an increase in the penetration rates of water efficient devices in the homes.

- In the REUWS group, only 1% of homes met high-efficiency clothes washer criteria and 10% met efficient toilet criteria.
- The current data show that 29% of the California homes meet clothes washer criteria and 30% meet toilet criteria. Nearly 80% of all homes meet shower criteria.
- It is safe to conclude that approximately 30% of all clothes washers in the single-family group are high-efficiency, since there is normally only one washer per home.
- Since there are multiple toilets per home the percentage of these devices that are efficient would be substantially greater than the 30% percent of homes meeting the efficiency criteria. The data suggest that a 30% household efficiency rate is equivalent to at least a 60% toilet fixture rate.

- The quantification of the precise percentage of ULF or better toilets in the study group is complicated by the fact that ULF toilets often flush at more than 1.6 gpf.

The average outdoor use for the group as a whole was 80.6 kgal (108 CCF) per year.

- Approximately 87% of the homes in the sample appeared to be irrigating, or using significant amounts of water for outdoor purposes.
- The split between indoor and outdoor use, while variable from site to site averaged approximately 40% indoor to 60% outdoor for the houses that were irrigating.
- Irrigation use is more heavily skewed by large users than is indoor use. The top half of the irrigators (those using more than the median use of 67 kgal per year) account for approximately 75% of the total outdoor use.
- The average irrigated area on these lots was 3,631 sf while the median area was 2,634 sf.
- There was a fairly good relationship between lot size and irrigated area for these homes which were included in the outdoor analysis.
- The actual application rate for the sites equaled 58.3 inches, compared to the average ET requirement of 42.1 inches, implying that the overall application ratio was 138% of the required irrigation amount, but this was not evenly distributed. Most homes are not over-irrigating.
- Roughly 50% of the irrigators, 42% of all homes are over-irrigating.
- The average volume of over-irrigation was 27.9 kgal per year for all irrigators.
- The average excess irrigation on just the lots that were over irrigating was 60 kgal.

Since most of the water agencies were following similar practices in their water conservation programs it was difficult to identify differences in water use patterns that could be attributed to individual conservation programs.

Most of the survey respondents had little knowledge about how much water they use or how much money they spend on water. Most respondents also did not consider price when deciding how much water to use either indoors or outdoors. Only 16% of respondents agreed with the statement "I conserve water mainly for environmental reasons," while 80% of respondents disagreed with this statement. This may simply point out that there are more reasons for conserving water than just the environmental benefits.

The factors that were found to be significant in modeling indoor water use were:

- the number of residents in the home,
- whether there was a significant leak,
- whether youth were present, and
- the presence of high-efficiency fixtures and appliances.

The factors that affected outdoor use included:

- ET,
- irrigated area,
- household income,
- landscape coefficient,
- pool,

- sprinkler system.
- Whether the home is over-irrigating.

The water use models derived from the study data were used to project water use and water savings for the general population of single-family homes across the state. As shown in Table 104, these resulted in projected water savings ranging from a low of 1.21 MAF per year to a high of 2.18 MAF per year of water from the single-family customers. This equates to 27% to 50% of the baseline single-family demands.

The data lead to the conclusion that in order to achieve maximum savings the following things would need to be done:

- Reduce average indoor water use from 175 gphd to somewhere between 105 and 120 gphd.
    - Reduce average leakage to less than 10 gphd.
    - Install HET toilets over time.
    - Use high-efficiency clothes washers in all homes.
    - Use water-smart shower-heads at 1.7 gpm, where compatible with existing plumbing so as to avoid scalding hazards due to incompatible flow rates.
    - Reduce faucet run times by >10%.
- Reduce outdoor use to an average of 46.7 kgal per year from current average of 86.1.
    - Reduce rate of over-irrigation from 50% to 25% of irrigators.
    - Reduce landscape ratio from 0.96 to 0.80.
    - Reduce average irrigated area by 20%, from 3802 sf to 3042 sf.

This study did not deal with the costs to achieve each of these savings or other issues surrounding economics or customer acceptance. The main goal of this study was to quantify the potential savings based on an analysis of the water use patterns circa 2007.

The conclusions on water savings included in this study are based on what has been shown to be technically feasible with respect to reducing both indoor and outdoor single-family residential water use. The study, however, did not deal with the cost-effectiveness of any individual conservation program aimed at making these reductions. The entire issue of cost-effectiveness and the economics of water conservation are topics for future studies.

Recommendations

One of the key recommendations from this study is that more attention needs to be given to the performance of customers measured by their water use, rather than the counting of activities such as rebates, audits and other conservation practices. Accounting for activities is a necessary part of evaluating a conservation program, but it is not sufficient technique on its own. The approach of tracking changes in measured water use is also reflected in the recent revisions to the BMP programs, which focus on reductions of water use by the customers. Such performance-tracking could be accomplished by the creation of annual reports that are based on normalized parameters (e.g. gphd annual and winter use, gallons per sf of irrigated area) which can be compared and tracked over time. The use of total gallons of water deliveries divided by estimated population is too imprecise a measure for good analysis.

The State of California has specified that per capita water use is to be used as the primary measure of water use efficiency. The 20% reduction in water use called for by the legislature means that the per capita water use is to decline by 20%. Barring a massive increase in the number of residents per household, a 20% reduction in single-family per capita water use is equivalent to a 20% reduction in household water use.

Since it is difficult to accurately determine the population served, and small errors in these estimates can change per capita use estimates significantly we recommend that the procedure used in this study be followed, where household use is first analyzed for scientifically selected samples of customers, and then normalized on the basis of population. This technique made it possible to identify a 13% reduction in indoor water use shown in Table 73, which was not evident in just the raw household use data.

The number or residents per household is a highly significant factor in predicting indoor water use. The fact that this relationship is non-linear has implications for the establishment of water budgets. Since the water use does not rise proportionally with the number of persons in the home then establishing water budgets in a linear manner will results in artificially large budgets for larger households and inadequate budgets for small households. Some agencies, such as IRWD, deal with this by providing a minimum budget based on a default value for their residences.

Use of household consumption as a primary performance indicator implies that when evaluating the effectiveness of a water conservation program, actual levels of household use by residential customers must be determined, and that a *reduction* of these numbers should be demonstrated based on a standard number of residents. This reduction in household (and per capita) use should be given more weight than the numerical BMP implementation numbers as is required by the revised MOU.

The notion that water savings due to specific BMPs such as toilet and clothes washer retrofits will automatically carry through as household water use savings is supported by this study. The study showed that there was a total reduction in toilet and clothes washer use of nearly 17 gphd, but that indoor water use did not decline by this amount. These data show that water savings from installation of higher efficiency devices tended to get obscured by increased water use elsewhere. This may be an example of the rebound effect (also known as the Jeavons paradox). This is an area that needs additional work, and should be pursued.

Water agencies should keep track of and report the number of single-family accounts, their average and median annual use, seasonal use and non-seasonal use. This will allow household water use to be continuously compared against known efficiency benchmarks to see how well the conservation targets are being met.

It would also be very useful if water agencies could expand their customer information systems to include the number of residents per home, irrigated areas, and other key parameters shown to be important for predicting water use in CHAPTER 9. This would make it possible to make adjustments to billing data information as needed to account for changes in these key parameters

so that changes, say in the number of persons per house, do not mask or masquerade as changes in efficiency.

The data in this study indicate that logical goals for indoor water conservation should be to achieve consumption levels of 120 gallons or less per household per day for an average home. Outdoor goals should be based on halving the occurrence of excess irrigation, design of landscapes that have landscape factors no greater than 0.8, and where more aggressive measures are needed, a reduction in irrigated area. Each community will need to decide which of these it wishes to emphasize based on local policies.

This study did not deal with the costs of achieving specific efficiency levels, only the technical feasibility of doing so. Additional studies need to be done to quantify the types of measures that could lead to the target efficiency levels and the costs of their implementation. It is possible that many of these can be developed that involve little or no cost to the customer or agency. As the marginal cost of water increases, so will the value of conserved water and the cost-effectiveness of water conservation efforts.

The fact that, according to the survey, few customers are even aware of the cost of water or how much water they are using suggests that there may be benefits from using rate structures that send strong price signals for customers that fall into the excess use category. Communication of this over-use (and hopefully avoiding it) could be improved by implementing improved methods of providing real-time information to the customers on their water use.

Even though there are problems in doing so, it would make sense to express water bills in terms of gallons instead of billing units (hundreds of cubic feet). Customers find billing units or CCF to be highly confusing and do not know how to interpret the information. Given that water-using devices in the home are measured in gallons, the basic unit of measurement in the United States, is seems reasonable to bill in units of gallons where practical to do so.

We know of no better way of sending price signals than by developing water budgets linked to indoor and outdoor use. The results of this study show clearly that the water savings available in the population derives from a relatively small number of users. This is especially true for highly skewed categories such as leakage and excess irrigation use. It is very inefficient and difficult to devise programs to be applied to the general population in order to reach a small number of customers. Water budgets automatically identify the customers in need of attention, and provide incentives to the customers to address their water use problems in the form of price signals.

To the extent that water budgets or highly tiered water rates are used, it becomes more important to provide the customers with real-time information on their water use. Fortunately, there are an increasing number of ways to do this as more systems install AMR/AMI metering systems. Providing customers with targets from their water budget and feedback on their real-time consumption should be considered as two sides of the same coin.

Even though significant progress has been made in the areas of clothes washers and toilets, just less than one third of the potential has been achieved for these devices. So, continued efforts need to be made in upgrades to HET devices and repairs of malfunctioning units. That does not

mean, however, that this necessarily involves rebates. Building codes, water budgets, retrofit on sale ordinances and other incentives may be a more cost-effective method of accomplishing upgrades and replacements of obsolete devices.

Additional research should be done on the degree to which toilets that are rated as ULF models are actually flushing at their design levels, and on ways to correct the problem of over-flushing through repairs and design changes. A significant number of toilets in this study that were flushing between 1.6 and 3.5 gpf may be malfunctioning ULF devices.

Leakage is a category that has increased as a dilemma. Leaking water does nothing useful, and should be eliminated to the degree practical. There are increasingly effective technical devices such as smart meters, and sensor linked valves that are capable of recognizing and interrupting leaks. The issue of what types of "uses" of water may be creating continuous demands that mimic leaks also needs further investigation. A water budget rate structure is effective at leak reduction by making the customer aware of their excess consumption through their bills.

Faucet use has also been shown to decrease with the presence of dishwashers and disposals, and with increased knowledge about water use and costs. One-touch faucets and hands-free faucet controllers could help shorten the duration of faucet events. Clearly these are expensive devices which would have to be introduced on a voluntary basis, subject to customer acceptance and after additional investigation.

The data showed a strong correlation between automatic sprinkler systems and leakage. One excellent way to reduce leakage in sprinkler systems is to equip these systems with master valves which de-pressurize the system when active irrigation is not taking place. When a zone valve is open this acts to reduce pressure in the system so most of the water goes to the actively irrigating zone. When all zone valves are closed, the pressure in the system rises, and any leaks are exposed to the full static pressure of the system. These leaks will continue indefinitely. A master valve, however, shuts off the water at the top end of the system, and will eliminate leakage. Master valves should be required on all automatic sprinkler system to the extent it is practical to do so.

Adopting more aggressive building codes provides an opportunity to ensure that new homes constructed in the state use the best available technologies described above. The most practical time to install water conserving devices is when the home is built. The CalGreen building codes were adopted in California in 2010.

The results of this study suggest some items that should be considered for new homes and retrofits of existing homes:

- WaterSense fixtures and appliances.
- High-efficiency clothes washers meeting WaterSense criteria.
- Hands free faucet controllers, or other devices for limiting run times, for kitchen and bathrooms should be investigated to determine their effectiveness in reducing faucet use and the acceptability to customers.
- Real time feedback on water use for the customer.
- Devices that sense and interrupt continuous uses of water due to leakage.

- Master valves on irrigation systems.
- Landscapes that have landscape factors or 0.8 or less.
- Appropriate limits on irrigated areas.
- Systems that discourage over-irrigation while allowing deficit irrigation to continue.
- Water budgets for all single-family residential customers based on WaterSense criteria for indoor uses and locally appropriate water conserving landscapes outdoors.

The State of California has adopted a goal of reducing per capita water use by 20% by the year 2020. Single-family residential water use can meet or beat this goal by reducing waste and leakage, use of high-efficiency fixtures and appliances, reducing the number of customers who are over-irrigating and by making modest modifications to landscape plant material and irrigated area.

Efforts at improving single-family residential water use efficiency should not be discontinued, but should be refocused on achieving measurable reductions in household water use towards the efficiency benchmarks described in this report. By doing so in an aggressive manner, savings from 1.2 to 2.2 million acre feet per year are achievable from existing single-family households.

The approach of sampling scientifically selected groups of customer and collecting highly detailed information on their water use and other characteristics could provide a way of understanding baseline use and changes in water use patterns in the state's single-family customers on a much timelier basis than reliance on reports prepared from billing data. Small changes in water use can be identified using the data logging technique, which are not apparent from billing data analysis. Just as the comparison between this study and the 1997 REUWS results provided information on changes in residential water use, future studies using similar techniques can provide additional information on how water demands in the single-family sector are changing during coming years.

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Hydrol. Earth Syst. Sci., 17, 3957–3967, 2013
www.hydrol-earth-syst-sci.net/17/3957/2013/
doi:10.5194/hess-17-3957-2013
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Hydrology and Earth System Sciences

Household water use and conservation models using Monte Carlo techniques

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Received: 17 March 2013 – Published in Hydrol. Earth Syst. Sci. Discuss.: 17 April 2013
Revised: 19 August 2013 – Accepted: 4 September 2013 – Published: 15 October 2013

Abstract. The increased availability of end use measurement studies allows for mechanistic and detailed approaches to estimating household water demand and conservation potential. This study simulates water use in a single-family residential neighborhood using end-water-use parameter probability distributions generated from Monte Carlo sampling. This model represents existing water use conditions in 2010 and is calibrated to 2006–2011 metered data. A two-stage mixed integer optimization model is then developed to estimate the least-cost combination of long- and short-term conservation actions for each household. This least-cost conservation model provides an estimate of the upper bound of reasonable conservation potential for varying pricing and rebate conditions. The models were adapted from previous work in Jordan and are applied to a neighborhood in San Ramon, California in the eastern San Francisco Bay Area. The existing conditions model produces seasonal use results very close to the metered data. The least-cost conservation model suggests clothes washer rebates are among most cost-effective rebate programs for indoor uses. Retrofit of faucets and toilets is also cost-effective and holds the highest potential for water savings from indoor uses. This mechanistic modeling approach can improve understanding of water demand and estimate cost-effectiveness of water conservation programs.

1 Introduction

Models predicting residential water use and conservation potential based on empirically estimated parameters, water-consuming device turnover rates, and regression analysis are fairly common. The uses and drawbacks of various types of these models are detailed and then contrasted with the model developed here.

Some water utilities develop regression relations for total single-family residential water use based on historical trends for planning purposes (Sacramento Department of Utilities, 2011; San Jose Environmental Services Department, 2011). Such models assume increasing levels of conservation in the future, but often give little indication of where this conservation will come from. Estimating realistic conservation potential for each end use under various drought, pricing, and demographic conditions requires an understanding of where water is currently being used in homes. Measurement-based studies now provide reliable data on water consumption for each end use (e.g. toilets, showers, irrigation) (Mayer and DeOreo, 1999), yet these studies can be costly.

Using end use data, some models estimate conservation potential by assuming natural replacement rates of appliances with more efficient appliances and calculating the expected amount of water saved (CALFED Bay Delta Program, 2006; Blokker et al., 2010; Gleick et al., 2003). These models often assume average savings values for retrofitting devices and apply them uniformly to the proportion of the population expected to adopt the devices. Such a modeling approach is useful for long-term, large-scale predictions of conservation potential, but does not allow for much heterogeneity of behavior or population characteristics.

Case studies for Europe, Africa, America and Australia (Blokker et al., 2010; Gumbo et al., 2003; Kampragou et al., 2011; Sauri, 2003), highlight the use of modeling to assess the effectiveness of water conservation programs.

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28 page PDF – pgs. 18-25

Evaluation of Potential Best Management Practices

High-Efficiency Plumbing Fixtures – Toilets & Urinals

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DISCLAIMER

This report is based on readily available information and cursory analysis of potential water savings within the State of California that might result from a specific action. It does NOT constitute acceptance nor endorsement of a product, program, or other action by a water utility, municipality, or the California Urban Water Conservation Council (CUWCC). It does NOT create nor endorse a specific Best Management Practice and should not be construed as such. The name or logo of the CUWCC shall not be used by anyone in making any product claims or representing any findings within this report without the written authorization of the CUWCC. Please contact the CUWCC if you have any questions regarding this report or any of the CUWCC's Potential Best Management Practice reports.

4. Cost-Benefit Analyses

More experience probably exists within the water conservation community in the implementation of residential toilet replacement programs than any other water-efficiency initiative. Costs have been well-defined for a number of outreach and implementation approaches, most of which have been tried, fine-tuned, and very successful in California. These include:

- Rebate programs
- Voucher programs
- Full-service direct-installation programs
- Giveaway free-distribution programs
- Combinations of the above

Water agencies and municipalities have chosen their particular approach based upon a variety of factors: economics and budget, the demographics of their constituency, age of housing, urgency of water use reductions, involvement of the constituent business community (retailers, distributors, etc.), customer relations policies and impacts, and, of course, politics, to name a few. Over the years, many water agencies and municipalities have refined their programs to a point where they became very unique to their situation, but extremely effective in reaching their community and accomplishing their water use efficiency goals.

On the other hand, broad experience with large CII toilet replacement programs does not exist, other than dealing with the lodging industry, where the replacement of all toilets within a particular establishment is attractive to the toilet manufacturer and to the water agency or municipality.[31] In this case, most agencies and municipalities offer rebates to the owners, rather than become involved directly in the purchase and/or installation process.

It is not the purpose of this paper to detail all of the nuances and costs of toilet replacement programs. Rather, the analysis of economics was focused on general costs of implementation at a planning level. Recent experience was used to apply cost factors to the various alternatives discussed earlier.

With regard to urinals, however, there has been little experience (and limited success) within the water conservation community with massive urinal replacement or retrofit programs[32]. Therefore, much of the economic analyses here is based upon general assumptions as to costs.

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[31] This occurs even though the data gathered through a study sponsored by the Council showed that the replacement of toilets within hotel-motel sector yielded some of the lowest water savings per installed ULF toilet:
California Urban Water Conservation Council, 1997. *The CII ULFT Savings Study, Final Report*, Table S-1, by Hagler Bailly Services, Inc., August 5.

[32] When the term "replacement" is used, it is in the context of complete replacement of a urinal fixture and of the diaphragm within the flush valve serving it; when the term "retrofit" is used, it is in the context of replacing parts within a urinal flush valve (the diaphragm, for example) to reduce the flush volume of the fixture without replacing the vitreous china. It is rare that merely throttling down a urinal flush valve from 1.0-gpf (or greater) to 0.5-gpf will result in a urinal that actually performs satisfactorily. In fact, some urinal manufacturers agree that their 1.0-gpf products can be flushed at as low as 0.7-gpf and still meet the minimum performance standards referenced in the plumbing codes. However, they do not

Residential Applications – Toilet Fixtures

Whereas the existing BMP14 is targeted at the replacement of residential toilet fixtures, this analysis is essentially directed at evaluating a more aggressive stance, that is, replacing residential toilet fixtures with HETs, rather than with conventional 1.6-gallon toilet fixtures.

Costs for HETs are declining steadily as more product enters the marketplace. As noted in Section 1 of this paper, 13 manufacturers are currently competing at the HET level. This is very significant, given that only one manufacturer addressed this market sector just seven years ago. Consequently, competition is very intense, both on product performance and on cost, thereby benefiting the consumer, as well as the water agencies and municipalities and the programs they sponsor.

Table 15a summarizes cost and savings information for the three alternatives[33] under the residential category. Because the method of implementation of any alternative is undetermined at this time, an average cost of $200 per toilet replacement was assumed[34]. In addition, it was assumed that the water provider implementing a program would include the entire cost of the toilet fixture within the rebate (or other subsidy) amount.

Table 15a. Summary of Expected Water Savings and Costs - Residential Toilets

Alternative	No. of residential fixtures in category (millions)	With 1.0-gpf Toilet Fixtures			With 1.25-gpf Toilet Fixtures		
		AF Savings (millions) (a)	Implementation Cost to Water Authorities ($ millions)	$ per AF (c)	AF Savings (millions) (b)	Implementation Cost to Water Authorities ($ millions)	$ per AF (c)
a – Replace all existing toilets with HETs	21.2	9.18	$4,240	$462	6.28	$4,240	$675
b- Replace existing non-efficient toilets with HETs	8.7	7.28	$1,740	$239	5.38	$1,740	$323
c – Mandate HETs in new construction	8.6	1.30	$43	$33	0.62	$43	$69

(a) Savings accumulated over 25-year life of pressure-assist toilet fixture
(b) Savings accumulated over 20-life of gravity-fed toilet fixture
(c) Assumes that rebate (or other subsidy) covers **ENTIRE** cost of the fixture

recommend installing a 0.5-gpf kit into a flushometer valve (a retrofit) and expecting fully satisfactory performance. As such, the analyses in this paper assume that all urinal initiatives will be replacements, rather than retrofits.

[33] The effect of combining either alternative (a) or alternative (b) with the mandate of alternative (c) may derived by adding the cost and savings data and computing the overall cost per acre-foot.

[34] Assumes a rebate program with an implementation and administrative cost of $50 per replaced fixture; full purchase cost of the fixture estimated at $150, for a total cost of $200. Installation cost is not included. The rebate amount may, however, be less than the purchase cost of the fixture and, as such, the overall cost of the program would then be less than $200.

The cost per acre-foot (to the program implementer) of water saved would be reduced significantly if the subsidy was limited, for example, to one-half the cost of the fixture plus program administrative costs. With that revised assumption, costs and benefits would be as shown in Table 15b.

Table 15b. Summary of Expected Water Savings and Costs - Residential Toilets

Alternative	No. of residential fixtures in category (millions)	With 1.0-gpf Toilet Fixtures			With 1.25-gpf Toilet Fixtures		
		AF Savings (millions) (a)	Implementation Cost to Water Authorities ($ millions)	$ per AF (c)	AF Savings (millions) (b)	Implementation Cost to Water Authorities ($ millions)	$ per AF (c)
a – Replace all existing toilets with HETs	21.2	9.18	$2,650	$289	6.28	$2,650	$422
b- Replace existing non-efficient toilets with HETs	8.7	7.28	$1,088	$149	5.38	$1,088	$202
c – Mandate HETs in new construction	8.6	1.30	$43	$33	0.62	$43	$69

(a) Savings accumulated over 25-year life of pressure-assist toilet fixture

(b) Savings accumulated over 20-life of gravity-fed toilet fixture

(c) Assumes that rebate (or other subsidy) covers **ONE-HALF** the cost of the fixture

As stated in the Council's draft Cost and Savings Study[35] (p. 54-64), program costs range from $155 to $230 per toilet replacement. That study is designed to evaluate factors related to BMP 14. As such, it does not incorporate the higher cost of HET fixtures and instead cites historical information (some of which is very dated) for conventional 1.6-gpf toilet replacement programs as anticipated in BMP 14. Whereas conventional fixtures are shown in the study to cost between $60 and $120, HETs are currently priced in the range from $150 to $300, depending upon the type of fixture and current conditions in the marketplace (i.e., pricing "what the market will bear"). As noted earlier, prices are dropping significantly and water agencies and municipalities willing and able to negotiate quantity purchases of HETs have been able to purchase quality HET products at $150 for their free distribution and direct installation programs. On the other hand, the retail customer (who is the candidate for a rebate program) visiting their local retail supplier today should expect to pay near $200 for the same fixture. Because of these vast cost differences (to both the water provider and to the end use customer), it was necessary to use an overall average for Tables 15a and 15b.

[35] California Urban Water Conservation Council, 2005. *Draft Revision, BMP Cost & Savings Study*, by A&N Technical Services, March.

CII Applications – Toilet Fixtures

Opportunities for the replacement of conventional toilet fixtures in the CII sector are much more limited than in residential applications. Several factors contribute to this:

- A smaller installed base of existing fixtures, i.e., 4.9 million as compared to 21.2 million residential fixtures today.
- Higher costs of fixtures, due to more stringent code, permitting, and installation requirements, as well as a large number of flushometer valve and bowl fixtures, which require more installation effort and higher resulting costs.
- The lack of HETs in the flushometer valve and bowl category.
- The reluctance of many end-users to permit replacement of existing, well-functioning fixtures, particularly when doing so may interrupt business operations or cause other restroom modifications to be required.
- The need for significant capital to replace large numbers of fixtures; rebates by themselves are usually insufficient to cover a significant portion of the replacement cost.
- The reputation of "low-flow" toilet fixtures that follows from the bad experiences of the early to mid-1990s; frequently, that reputation overshadows any willingness that a business owner might have to take a "risk" and replace toilet fixtures UNLESS the existing fixtures are causing problems.
- The difficulty that water agencies and municipalities have in reaching out to business owners and managers, whose attention is more focused on day-to-day business operations than the efficiencies that might be gained in the area of water.

Because of these factors (and others), the success of CII toilet replacement programs in achieving meaningful water use reductions has been marginal. Costs to develop and execute effective programs, whether of the rebate, voucher, or direct-installation type, are higher than for residential programs. Based again upon experience with past and existing programs, and considering the higher prices of HETs today, we have assumed a cost of $250 per rebated HET for the purpose of this analysis.[36]

Table 16a summarizes cost and savings information for the same three alternatives under the commercial category. For this analysis, it was assumed that the water provider implementing a program would include the entire cost of the toilet fixture within the rebate (or other subsidy) amount.

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[36] The BMP Cost and Savings Study (CUWCC, 2005) cites the Santa Clara Valley Water District CII program as costing $270 per HET installation on a direct-install basis. However, this program is directed only at tank-type installations and is using a pressure-assist 1.0-gpf HET as a replacement toilet. While this is definitely representative of the cost for both pressure-assist 1.0-gpf and gravity-fed dual-flush HETs, it is not necessarily going to be representative of the cost for flushometer valve and bowl installations, for which replacement HET product is yet to be introduced to the marketplace.

The $250 cost is assumed for a typical rebate program. In this analysis, the cost is based upon a $75 per unit program implementation cost and an average purchase cost of the fixture at $175. The rebate amount may, however, be less than the purchase cost of the fixture and, as such, the overall cost of the program would then be less than $250.

Table 16a. Summary of Expected Water Savings and Costs - CII Toilets

Alternative	No. of CII fixtures in category (millions)	With 1.0-gpf Toilet Fixtures			With 1.25-gpf Toilet Fixtures		
		AF Savings (millions) (a)	Implementation Cost to Water Authorities ($ millions)	$ per AF (c)	AF Savings (millions) (b)	Implementation Cost to Water Authorities ($ millions)	$ per AF (c)
a – Replace all existing toilets with HETs	4.9	0.95	$1,225	$1,289	0.64	$1,225	$1,914
b- Replace existing non-efficient toilets with HETs	2.1	0.73	$525	$724	0.52	$525	$1,010
c – Mandate HETs in new construction	1.5	0.13	$8	$60	0.06	$8	$125

(a) Savings accumulated over 25-year life of pressure-assist toilet fixture
(b) Savings accumulated over 20-life of gravity-fed toilet fixture
(c) Assumes that rebate (or other subsidy) covers **ENTIRE** cost of the fixture

As would be the case with a residential program, the cost per acre-foot (to the program implementer) of water saved would be reduced significantly if the subsidy was limited to one-half the cost of the fixture plus program administrative costs[37]. With that revised assumption, costs and benefits would be as shown in Table 16b.

Table 16b. Summary of Expected Water Savings and Costs - CII Toilets

Alternative	No. of CII fixtures in category (millions)	With 1.0-gpf Toilet Fixtures			With 1.25-gpf Toilet Fixtures		
		AF Savings (millions) (a)	Implementation Cost to Water Authorities ($ millions)	$ per AF (c)	AF Savings (millions) (b)	Implementation Cost to Water Authorities ($ millions)	$ per AF (c)
a – Replace all existing toilets with HETs	4.9	0.95	$796	$838	0.64	$796	$1,244
b- Replace existing non-efficient toilets with HETs	2.1	0.73	$341	$471	0.52	$341	$656
c – Mandate HETs in new construction	1.5	0.13	$8	$60	0.06	$8	$125

(a) Savings accumulated over 25-year life of pressure-assist toilet fixture
(b) Savings accumulated over 20-life of gravity-fed toilet fixture
(c) Assumes that rebate (or other subsidy) covers **ONE-HALF** the cost of the fixture

[37] Amounting to an average cost of $87.50 attributable to the fixture (at one-half) plus $75 for administrative and implementation costs, for a total cost of $162.50 per toilet fixture.

CII Applications – Urinal Fixtures

The replacement within water conservation programs of existing urinals with HEUs is a rarity, with the exception of replacement with non-water urinals. The cost of replacement of the full fixture with a non-water urinal was documented by Orrett[38] as costing between $333 and $590 (including tax and installation), depending upon which model of urinal was chosen. Prices have declined since that study, however, and the average cost for a non-water urinal is approximately $275. Adding a $75 per unit cost for program administration and implementation brings the average total cost to $350 for this analysis.

The only urinals certified at 0.5-gpf are those manufactured by American Standard, Kohler, and Mansfield (refer to Table 5), two of which house an integrated sensor-operated flush valve. The list price of the fixtures and the integrated valve is as follows[39]:

American Standard Innsbook - $901 to $1,195
Kohler Bardon™ Touchless™ - $1,241

While the list prices today would not necessarily be the quantity purchase costs for an aggressive or massive urinal replacement program, the do provide an upper boundary for these types of fixtures. Assuming that, at some future date, water agencies and municipalities were to undertake HEU programs as a part of BMP compliance, it is extremely likely that competition would drive more manufacturers into this sector and prices would drop. For the purpose of this analysis, we have therefore assumed that 0.5-gpf and 0.26-gpf urinals (including the requisite flush valves) would ultimately cost approximately $375 each. A $75 program implementation cost would bring the total cost to $450 per urinal for this analysis.

Fixture life for all categories of urinals was assumed at 30 years, based upon analyses by a team of water conservation professionals on behalf of the Metropolitan Water District.[40]

Table 17a summarizes cost and savings information for the same three alternatives as evaluated for toilet fixtures. Within this table, it was assumed that the water provider implementing a program would include the entire cost of the urinal fixture within the rebate (or other subsidy) amount.

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[38] Orrett, Edwin B., 2001. City of Petaluma, Financial Analysis (of waterless urinals), spreadsheet document. January 27.
[39] List prices for the urinal fixtures taken from the websites of the respective firms on July 23, 2005.
[40] April 2005 spreadsheet documents prepared by a Project Advisory Committee of member water agencies analyzing the potential savings from 0.5-gpf and non-water urinals for the derivation of recommended subsidy levels for these types of fixtures.

Table 17a. Summary of Expected Water Savings and Costs - CII Urinals

Alternative	No. of CII urinal fixtures in category (millions)	With 0.5-gpf Urinals			With 0.26-gpf Urinals		
		AF Savings (millions) (a)	Implementation Cost to Water Authorities ($ millions)	$ per AF (b)	AF Savings (millions) (b)	Implementation Cost to Water Authorities ($ millions)	$ per AF (b)
a – Replace all existing urinals with HEUs	1.40	0.63	$630	$1,000	0.72	$630	$875
b- Replace existing non-efficient urinals with HEUs	1.05	0.60	$473	$788	0.66	$473	$716
c – Mandate HEUs in new construction	0.43	0.06	$0.10	$2	0.09	$0.10	$1

Alternative	No. of CII urinal fixtures in category (millions)	With Non-Water Urinals		
		AF Savings (millions) (a)	Implementation Cost to Water Authorities ($ millions)	$ per AF (b)
a – Replace all existing urinals with HEUs	1.40	0.84	$490	$583
b- Replace existing non-efficient urinals with HEUs	1.05	0.75	$368	$490
c – Mandate HEUs in new construction	0.43	0.12	$0.20	$2

(a) Savings accumulated over 30-year life of urinal

(b) Assumes that rebate (or other subsidy) covers ENTIRE cost of fixture

As would be the case with a toilet replacement program, the cost per acre-foot (to the program implementer) of water saved would be reduced significantly if the subsidy was limited to one-half the cost of the fixture plus program administrative costs[41]. With that revised assumption, costs and benefits would be as shown in Table 17b.

[41] Amounting to an average cost of $87.50 attributable to the fixture (at one-half) plus $75 for administrative and implementation costs, for a total cost of $162.50 per toilet fixture.

Table 17b. Summary of Expected Water Savings and Costs - CII Urinals

Alternative	No. of CII urinal fixtures in category (millions)	With 0.5-gpf Urinals			With 0.26-gpf Urinals		
		AF Savings (millions) (a)	Implementation Cost to Water Authorities ($ millions)	$ per AF (b)	AF Savings (millions) (b)	Implementation Cost to Water Authorities ($ millions)	$ per AF (b)
a – Replace all existing urinals with HEUs	1.40	0.63	$354	$561	0.72	$354	$491
b- Replace existing non-efficient urinals with HEUs	1.05	0.60	$265	$442	0.66	$265	$402
c – Mandate HEUs in new construction	0.43	0.06	$0.10	$2	0.09	$0.10	$1

Alternative	No. of CII urinal fixtures in category (millions)	With Non-Water Urinals		
		AF Savings (millions) (a)	Implementation Cost to Water Authorities ($ millions)	$ per AF (b)
a – Replace all existing urinals with HEUs	1.40	0.84	$298	$354
b- Replace existing non-efficient urinals with HEUs	1.05	0.75	$223	$298
c – Mandate HEUs in new construction	0.43	0.12	$0.20	$2

(a) Savings accumulated over 30-year life of urinal

(b) Assumes that rebate (or other subsidy) covers ONE-HALF the cost of the fixture

Reference 14

The Climate Registry, PG&E system wide average, 2012
(www.theclimateregistry.org/resources/protocols/general-reporting-protocol/#jump3)

Website – Protocol home page

2012 Emission Rates		
Utility	Factor Type	Emission Factor (lbs CO_2/MWh)
City of Vernon, Light and Power	System Average	765.97
Pacific Gas & Electric	System Average	444.62
Sacramento Municipal Utility District	Retail Power	521.73
	Special Power	0.0
	Wholesale Power	799.77
Seattle City Light	Retail Power	25.62
	Special Power	0.0
	Wholesale Power	362.85
Metropolitan Water District of Southern California	Wholesale Power	658.73
	Self-consumed Power	157.87
NOTE: Utility-specific emission factors have been converted from tonnes/MWh to lbs/MWh in order to streamline reporting in CRIS.		

Reference 15

California Water Plan, 2009
(www.waterplan.water.ca.gov/docs/cwpu2009/0310final/v4c08a03_cwp2009.pdf)

80 page PDF – pgs. 25

ENERGY DEMANDS ON WATER RESOURCES

REPORT TO CONGRESS ON THE INTERDEPENDENCY OF ENERGY AND WATER

U.S. DEPARTMENT OF ENERGY

DECEMBER 2006

Chapter III. Supplying Water Requires Energy

Satisfying the Nation's water needs requires energy for supply, purification, distribution, and treatment of water and wastewater. Nationwide, about 4 percent of U.S. power generation is used for water supply and treatment, which, as shown in Figure III-1, is comparable to several other industrial sectors (EPRI, 2002b). Electricity represents approximately 75 percent of the cost of municipal water processing and distribution (Powicki, 2002).

A recent study funded by the Electric Power Research Institute (EPRI) looked at energy requirements for water supply and treatment across the country. The results are examined in terms of per capita use of energy for water supply and treatment in Figure III-2.

The biggest difference among regions is the amount of energy used to supply water for agriculture. In general, per capita non-agricultural use of energy for water is similar region to region.

However, within regions, there can be substantial variation in energy requirements for water supply and treatment, depending upon the source, the distance water is conveyed, and the local topography. California is an interesting case study in electrical consumption and illustrates the cost of long-distance water conveyance. California uses about 5 percent of its electricity consumption for water supply and treatment (CEC, 2005). This is substantially above the national average. As shown in Table III-1, a study by the California Energy Commission (CEC) illustrates how energy use can vary among water systems.

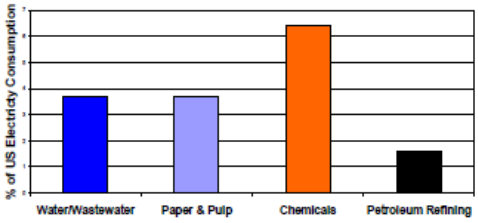

Figure III-1. Percent of U.S. Electricity Consumption by Sector (EPRI, 2002b; EIA, 1998)

SUPPLY AND CONVEYANCE

Supply and conveyance can be the most energy-intensive portion of the water delivery chain. If the water source is groundwater, pumping requirements for supply of freshwater from aquifers vary with depth: 540 kWh per million gallons from a depth of 120 feet, 2000 kWh per million gallons from 400 feet (Cohen et al., 2004). These energy needs will increase in areas where groundwater levels are declining.

Table III-1. Energy Requirements for Water Supply and Treatment in California (CEC, 2005)

	kWh/Million gallons	
Water Cycle Segments	**Low**	**High**
Supply and Conveyance	0	16,000
Treatment	100	1,500
Distribution	700	1,200
Wastewater Collection and Treatment	1,100	4,600
Wastewater Discharge	0	400
TOTAL	**1,900**	**23,700**
Recycled Water Treatment and Distribution for Non-potable Uses	400	1,200

Reference 16

EPA, 2009 Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act, pg. 8-9 (www.wbdg.org/ccb/EPA/epa_841b09001.pdf)

United States Environmental Protection Agency
Office of Water (4503T) Washington, DC 20460
EPA 841-B-09-001 December 2009 www.epa.gov/owow/nps/lid/section438

Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act

Using pre-development hydrology as the guiding control principal also allows the designer to consider climatic and geologic variability and tailor the solutions to the project location. Thus the need for a one size fits all approach is rendered unnecessary since the design objective is dictated by the pre-development site conditions and other technicalities of the project site and facility. Instead of prescribed approaches dictating discharge volumes or flow rates, site assessments of historical infiltration and runoff rates will inform the designer and provide the basis for a suitable design. The use of this approach will minimize compliance complications that may arise from prescriptive design approaches which do not account for the variability of precipitation frequencies, rainfall intensities and pre-development land cover and soil conditions that influence infiltration and runoff.

B. Benefits and Outcomes of the New Stormwater Performance Requirements

Implementation of these new stormwater performance requirements in EISA Section 438 provides numerous environmental and economic benefits in addition to reducing the volume of stormwater runoff.

Benefits to Water Resources:

- *Cleaner Water.* The use of plants, soils and water harvesting and use practices can reduce stormwater runoff volumes and pollutant loadings and the frequency and magnitude of combined sewer overflows (volume and pollutant loading reductions). These practices are part of a larger set of practices called green infrastructure/low impact development.
- *Clean and Adequate Water Supplies.* GI/LID approaches using soil based vegetated infiltration systems can be used to recharge ground water and maintain stream base flow. By recharging ground water aquifers, aquatic ecosystem health is maintained and base flows are increased which helps ensure more constant flows for drinking water withdrawals. Harvesting and reusing rainwater also reduces the need to use potable water for all uses and can reduce both the infrastructure and energy needed to treat and transport both drinking water and stormwater.
- *Source Water Protection.* GI/LID practices provide pollutant removal benefits, thereby providing some protection for both ground water and surface water sources of drinking water. In addition, GI/LID provides ground water recharge benefits.

GI/LID approaches are a set of management approaches and technologies that utilize and/or mimic the natural hydrologic cycle processes of infiltration, evapotranspiration and use. GI/LID practices include green roofs, trees and tree boxes, rain gardens, vegetated swales, pocket wetlands, infiltration planters, porous and permeable pavements, vegetated median strips, reforestation and revegetation and protection of riparian buffers and floodplains. These practices can be used almost anywhere soil and vegetation can be worked into the urban or suburban landscape. They include decentralized harvesting approaches such as rain barrels and cisterns that can be used to capture and re-use rainfall for watering plants or flushing toilets.

Other Social and Environmental Benefits:

- *Cleaner Air.* Trees and vegetation improve air quality by filtering many airborne pollutants and can help reduce the amount of respiratory illness (Vingarzan and Taylor, 2003).
- *Reduced Urban Temperatures.* Summer city temperatures can average 10°F higher than nearby suburban temperatures (Casey Trees, 2007). High temperatures are also linked to higher ground level ozone concentrations. Vegetation creates shade, reduces the amount of heat absorbing materials and emits water vapor – all of which cool hot air (Grant, et al., 2003). Reductions in impervious surface and the use of light colored pervious surfaces (e.g., permeable concrete) also can mitigate urban temperatures.
- *Moderate the Impacts of Climate Change.* Climate change impacts and effects vary regionally, but GI/LID techniques can provide adaptation benefits for a wide array of circumstances. They can be used to conserve, harvest and use water, to recharge ground waters and to reduce surface water discharges that could contribute to flooding. In addition, there are mitigation benefits such as reduced energy demand and carbon sequestration by vegetation.
- *Increased Energy Efficiency.* Green space helps lower ambient temperatures and, when incorporated on and around buildings, helps shade and insulate buildings from wide temperature swings, decreasing the energy needed for heating and cooling. Diverting stormwater from wastewater collection, conveyance and treatment systems can reduce the amount of energy needed to pump and treat the water. Energy efficiency not only reduces costs, but also reduces generation of greenhouse gases.
- *Community Benefits.* Trees and plants improve urban aesthetics and community livability by providing recreational and wildlife areas. Studies show that property values are higher when trees and other vegetation are present. Increased green space also has public health benefits and has been shown to reduce crime and the associated stresses of urban living.

Figure 5. Rain water cistern.

C. APPLICABILITY AND DEFINITIONS

Applicability

1. Who is a "Sponsor" of a project?

Section 438 applies to the "sponsor of any development or redevelopment project involving a Federal facility . . ." Section 438 requires that the "sponsor . . . shall use . . . strategies for the property to maintain or restore . . . the predevelopment hydrology. . ." The "sponsor" should

Reference 17

Water Research Foundation, Energy and Water Quality Management System (EWQMS) Saves Electricity Dollars, 2005 (http://www.waterrf.org/resources/Lists/PublicCaseStudiesList/Attachments/16/caseStudyEWQMS.pdf)

3 page PDF – pgs. 1-3

WATER RESEARCH FOUNDATION

ADVANCING THE SCIENCE OF WATER

Case Study: Energy and Water Quality Management System (EWQMS) Saves Electricity Dollars – 10/18/2005

The Issue

The publicly owned East Bay Municipal Utility District (EBMUD) delivers drinking water to more than 1.3 million people in 20 cities and 16 unincorporated communities in parts of Alameda and Contra Costa counties in the eastern part of the San Francisco Bay Area. The average water consumption in this service area is 220 million gallons per day (mgd) and consumption peaks at 341 mgd. EBMUD operates six water treatment plants, nearly 4,000 miles of water mains, and 135 pumping stations. Two EBMUD hydroelectric plants generate 185 gigawatt hours (GWh) of electricity in a median year. The electricity generated is sold into the wholesale market.

Delivering water on this scale requires enormous amounts of energy, mostly in the form of electricity. In 2004 EBMUD spent about $12 million purchasing electricity; approximately two-thirds, or $8 million, of that amount was required for pumping water through the distribution system. The consumption of electricity represents the single largest, non-labor expense in EBMUD's operations and maintenance department. Thus, this expense has been targeted for cost-reduction efforts.

In the early 1990s, the Total Coliform Rule (TCR) drove efforts to monitor and improve water quality within the distribution system. Energy costs were increasing. The deregulation of the California electric utility industry in the mid-1990s created the potential for energy-cost volatility . The introduction of time of use (TOU) electricity rates added to EBMUD's incentives to manage the factors it could control.

EBMUD's ongoing efforts to manage water quality in the distribution system included a 1993 internal study that led to development of new operating techniques to maintain water quality in the distribution system. EBMUD incorporated these water quality operations into its energy optimization procedures – essentially, manual pump scheduling based on the local electric utility's three different energy-cost periods. Initially, distribution system pumping was virtually eliminated during the peak energy-cost period. At first, annual cost savings were estimated at $500,000 to $700,000, but these savings dwindled as water demand increased and EBMUD maintained practices that met its standards for water quality.

In 1995 and 1997, respectively, EBMUD joined two research projects that sought to integrate the goals of maintaining water quality and managing energy use. The first project, co-sponsored by Water Research Foundation and the Electric Power Research Institute/Community Environmental Center (EPRI/CEC), developed the concept of an energy and water quality management system (EWQMS) and resulted in a report, *Energy and Water Quality Management System* (order # C0002). The second project, also in tandem with the Foundation and EPRI/CEC, achieved functional specifications for EWQMS software that could serve a variety of drinking water utilities. That project resulted in the report, *A Total Energy and Water Quality Management System* (order # TR-113528). The "universal" EWQMS conceived by this process, however, was complex and prohibitively expensive to develop. Subsequently, a Foundation Tailored Collaboration project with Colorado Springs Utilities (CSU) developed a

prototype for a portion of the EWQMS, resulting in the Foundation report, *Implementing a Prototype Energy and Water Quality Management System* (order # 90948F).

The Solution

Using knowledge gained from the development of functional specifications, EBMUD pursued a modified, operational EWQMS. EBMUD focused its software development efforts on optimizing distribution system operations to manage energy costs, while applying its own operational rules for water quality in the distribution system. The utility issued a request for proposals (RFP) in April 1999. To limit the potential financial risks inherent in developing state-of-the-art software, EBMUD imposed a compensation formula for its vendor partly based on documented savings. The first vendor was unsuccessful. The second vendor, Dercoto Inc., started in 2003 and completed development and installation of an EWQMS-type system in September 2004.

The Dercoto EWQMS generates an optimized pump schedule for the ensuing 24 to 48 hours. It is based on water-demand forecasting, pump scheduling, a water quality component, an energy-cost calculator, a data "scrubber," and an interface with the utility's Supervisory Control and Data Acquisition (SCADA) system. The EWQMS takes into account daily zone demands, available supply, system constraints, and energy costs. For more detail, refer to a paper on EBMUD's EWQMS delivered at ACE in June 2005.

EBMUD has implemented its EWQMS in a pilot program in its San Ramon Valley service area, which represents about one-third of the utility's cost for distribution system pumping, though that service area represents only one-fifth of its water demands.

To ensure that EBMUD personnel could present their concerns and the vendor would gain understanding of the utility's distribution system, relevant operational and engineering groups from EBMUD joined the vendor's design team in a Hazards and Operability study – a technique borrowed from the oil and gas industry.

In order to accommodate a planned upgrade of EBMUD's SCADA system, the vendor created two distinct EWQMS/SCADA interfaces allowing EBMUD to swap back and forth between each during the SCADA upgrade project.

To measure savings and therefore implement a payment schedule to the vendor based on shared savings, the vendor as part of its contract provided a baseline energy-cost measuring tool.

The EWQMS went online in late July 2004 and was fully operational by mid-August, a few weeks later. During the first 11 months of operation the savings have been estimated at approximately $300,000, or 11 percent of the energy bills. Winter savings are estimated at about 9 percent.

EBMUD is investigating the economics of expanding the EWQMS to other portions of its distribution system.

Lessons Learned

- Benchmarking proved to be a difficult and labor-intensive task.
- Shared savings/performance base contracts provide customer protection from first-time software installations.

- Training emphasizes that EWQMS is a tool for optimizing distribution operations, not a replacement to the SCADA system.
- The utility needs to address distribution operators' concerns over potential loss of jobs due to the perceived threat of total automation of the distribution system.
- It is difficult to operate a software system designed for full automation in semi-automatic mode.

- It is important to immediately initiate a productive dialogue with operations personnel and include them in all stages of system design, development, and implementation to assure their "buy-in."

Utility Profile:

- East Bay Municipal Utility District
- EBMUD serves 1.3 million people in parts of Alameda and Contra Costa counties in the eastern part of the San Francisco Bay Area
- The average water consumption in this service area is 220 million gallons per day (mgd) and consumption peaks at 341 mgd
- EBMUD's source is surface water derived from a network of reservoirs, aqueducts, treatment plants, and distribution facilities extending from the Mokelumne River basin in California 's Sierra Nevada range.
- Basic treatment approach: EBMUD has both inline filtration plants with sodium hypochlorite disinfection and conventional filtration plants with ozonation and sodium hypochlorite disinfection.
- Utility contact: Dave Beyer, 510-287-1144, dbeyer@ebmud.com

Project 11: WaterSMART Irrigation with AMI/AMR

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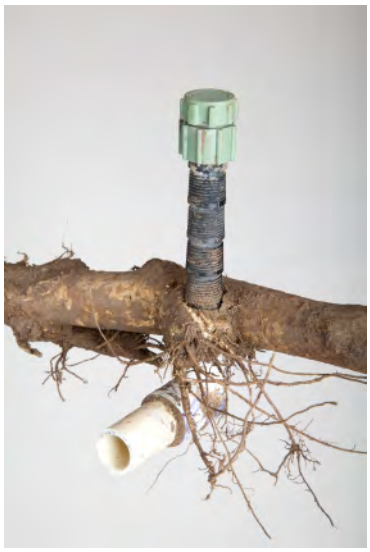
Reference 1

Irrigation System Design and Installation Introduction

Many people desire the convenience and flexibility of an automatic, in-ground irrigation system and many large properties simply cannot be effectively irrigated manually without a substantial amount of labor. A properly designed, installed, and maintained automatic irrigation system can provide appropriate applications of water across a landscape as well as convenience to the residents.

Best Practices

The Irrigation Association, which is the trade association of the irrigation industry, has identified five best management practices (BMPs) related to irrigation systems. The IA's five Turf and Landscape Irrigation Best Management Practices include:



Assure the overall quality of the irrigation system. This best practice requires that the irrigation system is designed to be efficient and uniformly distribute water. The system must be installed according to design specifications. The system must also be well maintained. The irrigation schedule must be managed to maximize water efficiency.

Design the irrigation system for the efficient and uniform distribution of water. The designer must consider site-specific criteria such as soil type, slope, root depth, plant materials, microclimates, weather conditions and water source. The designer must select equipment that meets state and local codes.

Install the irrigation system to meet the design criteria. The system should be installed according to the designed specifications, manufacturers' specifications and local and state regulations. The system should have good distribution uniformity. The irrigation contractor and / or installer should be licensed and insured.

Maintain the irrigation system for optimum performance. The irrigation system should be well maintained. The goal of the maintenance is to sustain the system's efficiency and distribution uniformity. The irrigation contractor and /or installer should be licensed and insured.

Manage the irrigation system to respond to the changing requirement for water in the landscape. The irrigation schedule should be changed to provide an efficient amount of supplemental water to maintain a healthy landscape.

Regulations for New Construction

Water utilities and building departments can promote "water smart from the start' landscaping by encouraging certification of landscape professionals. Properly designed and installed irrigations systems should be more water efficient than under-designed and poorly installed systems. Building departments can also support certification for landscape irrigation professionals. These requirements can function in concert since trained and certified professionals are in

Evapotranspiration and Net Irrigation Needs Introduction

Evapotranspiration

Evapotranspiration or ET is a measurement (usually in inches) of the amount of water required for plant growth. ET measures the quantity of water transpired from plant tissues and evaporated from the surface of surrounding soil, expressed as a depth (usually in inches). ET is based on a number of factors that can include: local temperature, precipitation, cloud cover, solar radiation, and the type of plants you are growing. Most of the ET calculations done in urban settings are for turf grass.

The American Society of Civil Engineers (ASCE) has attempted to standardize the calculation of ET by establishing the modified Penman-Monteith equation as the preferred method for determining ET. A detailed explanation of the ASCE-Penman-Monteith formula and methodology is available here.

The general form of the ASCE-standardized equation is :

$$ET_{sz} = \frac{0.408\,\Delta\,(R_n - G) + \gamma \frac{C_n}{T + 273}\,u_2(e_s - e_a)}{\Delta + \gamma(1 + C_d U_2)}$$

The publication from ASCE explains each factor in the equation.

Other ET calculation methods, such as Blaney-Criddle, are available and may be perfectly appropriate.

Know Your ET

ETo is the reference ET for a standard crop of grass 4 inches to 7 inches tall (10.2 cm to 17.8 cm).

ET Factor is used to set a landscape water efficiency goal. Also known as an "adjustment factor".

Net ET is ETo with the effective rainfall depth deducted.

NIR is the net irrigation requirement – which is often less than ETo or Net ET.

How to calculate the water requirements for a landscape

Intrepid irrigators and internet users find it fairly easy to calculate the theoretical irrigation requirement for a landscape. There are two key pieces of information you need to obtain:

1) The area (in square feet) of your lawn; and

2) the evapotranspiration (ET) rate for the irrigation season in your area. Don't worry, both of these items should be fairly easy to obtain.

Lawn Area

If your lawn isn't too big you could simply go outside with a tape measure and physically measure the area. Divide the yard into a series of rectangles and triangles and sum up the areas. Recall that the area of a rectangle is the base length ´ height length. The area of a triangle is ½´ the base length ´ height length.

If you're not in the mood to measure your yard you can calculate the lawn area in another way. Start with the total lot size. If you only know the lot size in acres you can convert to square feet by knowing that 1 acre = 43,560 square feet (4,047 square meters). From the total lot size subtract the footprint of your house and the area of your driveway and sidewalks. If you don't know these exact areas make an educated guess. Finally, subtract any other areas on your lot that are not irrigated (swimming pools, patios, bare patches, ponds, etc.). The result will be an estimate of the lawn area at your house. This calculation is summarized below.

Total lot area (sf)
- building footprint (sf)
- driveway area (sf)
- sidewalk area (sf)
- all other non-irrigated areas (sf)

= Total irrigated area (sf)

Evapotranspiration (ET) Rate

To find the ET rate for your area you will need to do a little searching on the world wide web. Using google or your favorite search engine simply search for "evapotranspiration" followed by your city and state. You should turn up a number of possibilities. Usually ET is calculated by a local university or weather service. It is also used frequently in agriculture.

Once you have a measurement of the annual ET rate in inches you are ready to go!

Calculate the Water Requirement for Your Lawn

Use the following equation to calculate the water requirement for your lawn:

Irrigated area (sf) x ET rate (inches) x 0.6233 = Water requirement in gallons

This calculation will give you a rough estimate of the amount of water your landscape needs over the course of the entire irrigation season.

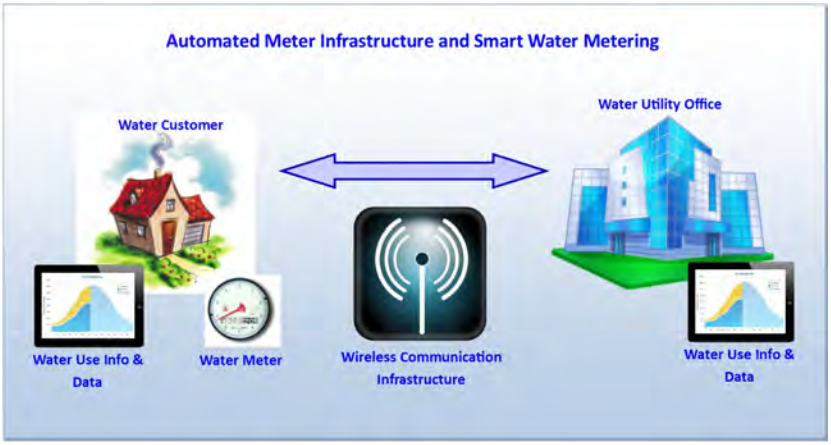
Copyright © 2010 Alliance for Water Efficiency. All Rights Reserved. Optimized for Viewing with Microsoft Internet Explorer.

Reference 2

Smart Metering Introduction

A water meter is a device used to measure the amount of water consumed in a building. A "smart" water meter is a measuring device that has the ability to store and transmit consumption data frequently. Sometimes "smart" meters are referred to as "time-of-use" meters because in addition to measuring the volume consumed, they also record the date and time the consumption occurs.

Traditional water meters are read monthly or bi-monthly by a person and a water bill is generated from this manual reading of the meter. "Smart" meters can be read remotely and more frequently, providing instant access to water consumption information for both customers and water utilities. "Smart" water meters are one component of an automated meter infrastructure (AMI) system that water utilities may choose to deploy. The simple graphic below shows how an AMI system transmits information and data in two directions - both to and from the customer and the water utility.



AMI systems using "smart" water meters are capable of measuring, collecting, and analyzing water use information and then communicating this information back to the customer via the internet either on request or on a fixed schedule. AMI systems include hardware, software, communications, consumer water use portals and controllers, customer associated systems, Meter Data Management (MDM) software, and supplier business systems.

Water utilities are implementing advanced metering infrastructure (AMI) systems as part of larger "Smart Grid" initiatives that may also including electricity and natural gas services. AMI extends current advanced meter reading (AMR) technology by providing two-way meter communications, allowing information and commands to be sent toward end users for multiple purposes including: Real-time usage and pricing information, leak and abnormal usage detection, targeted water efficiency messaging, measuring changes in water use, and even remote service disconnects.

The network between "smart" meters, utility business systems, and information portals allows both customers and utilities to take advantage of the usage data and information created through the AMI system. AMI differs from automatic meter reading (AMR) in that it enables two-way communications with the meter and the customer. Systems only capable of remote meter readings without two-way communication do not qualify as AMI systems.

Reference 3

City of Dallas *study of water savings from leak detection and repair:*
www.awwa.org/publications/journal-awwa/abstract/articleid/26828.aspx

CAROLE DAVIS

Davis

Making WaterSense Work for You: How Dallas and USEPA Teamed Up for Fix-a-Leak Week 2010

Saving water, forging new partnerships, serving the disadvantaged, heightening public awareness about the need to conserve water—all are worthy pursuits, especially if they can be accomplished in one fell swoop. What utility wouldn't want to save more than 2 million gallons of water each year?

In March 2010 the US Environmental Protection Agency's (USEPA's) WaterSense program selected the city of Dallas, Texas, Water Utilities (DWU) to spotlight its national Fix-a-Leak Week event. To identify the 2010 Fix-a-Leak Week spotlight community, WaterSense asked its utility partners to submit their best ideas. The prize was USEPA co-sponsorship of the winning utility's Fix-a-Leak Week media event. The program is intended to remind consumers to check household plumbing fixtures and irrigation systems for leaks. According to the USEPA, leaks account for the loss of more than 1 trillion gallons of water each year—enough to serve the combined annual water needs of Miami, Fla.; Chicago, Ill.; and Los Angeles, Calif.

As part of the city's overall commitment to water conservation, Dallas has assisted low-income residents with plumbing repairs for decades through its Minor Plumbing Repair Program (MPRP), which is designed to fix leaking faucets, hose bibs, easily accessible pipe joints, and water heaters. Those who qualify receive assistance with repair of minor plumbing problems and fixtures that may cause water waste and result in higher bills. In addition to covering repairs, the program also provides faucet aerators and high-efficiency toilets and showerheads. Approximately 400 families receive assistance

Concept Facility Services, a minority-owned firm, was hired as the official plumber to oversee completion of the repairs during the Fix-a-Leak Roundup in Dallas, Texas.

2011 © American Water Works Association

Reference 4

http://dx.doi.org/10.5991/OPF.2012.38.0024

Bridget Berardinelli is a product manager at Sensus (www.sensus.com), Raleigh, N.C.

Recent advancements in water meter technology are providing solutions that will help utilities capture more revenue, provide unprecedented business intelligence, reduce meter maintenance costs, and protect natural water resources. **BY BRIDGET BERARDINELLI**

TAKING MEASURE OF ADVANCED WATER METER TECHNOLOGIES

RISING LABOR AND ENERGY COSTS are forcing water utilities to do more with less. Focused on improving operational efficiencies, many utilities are exploring and using advanced metering infrastructure (AMI) to manage those costs.

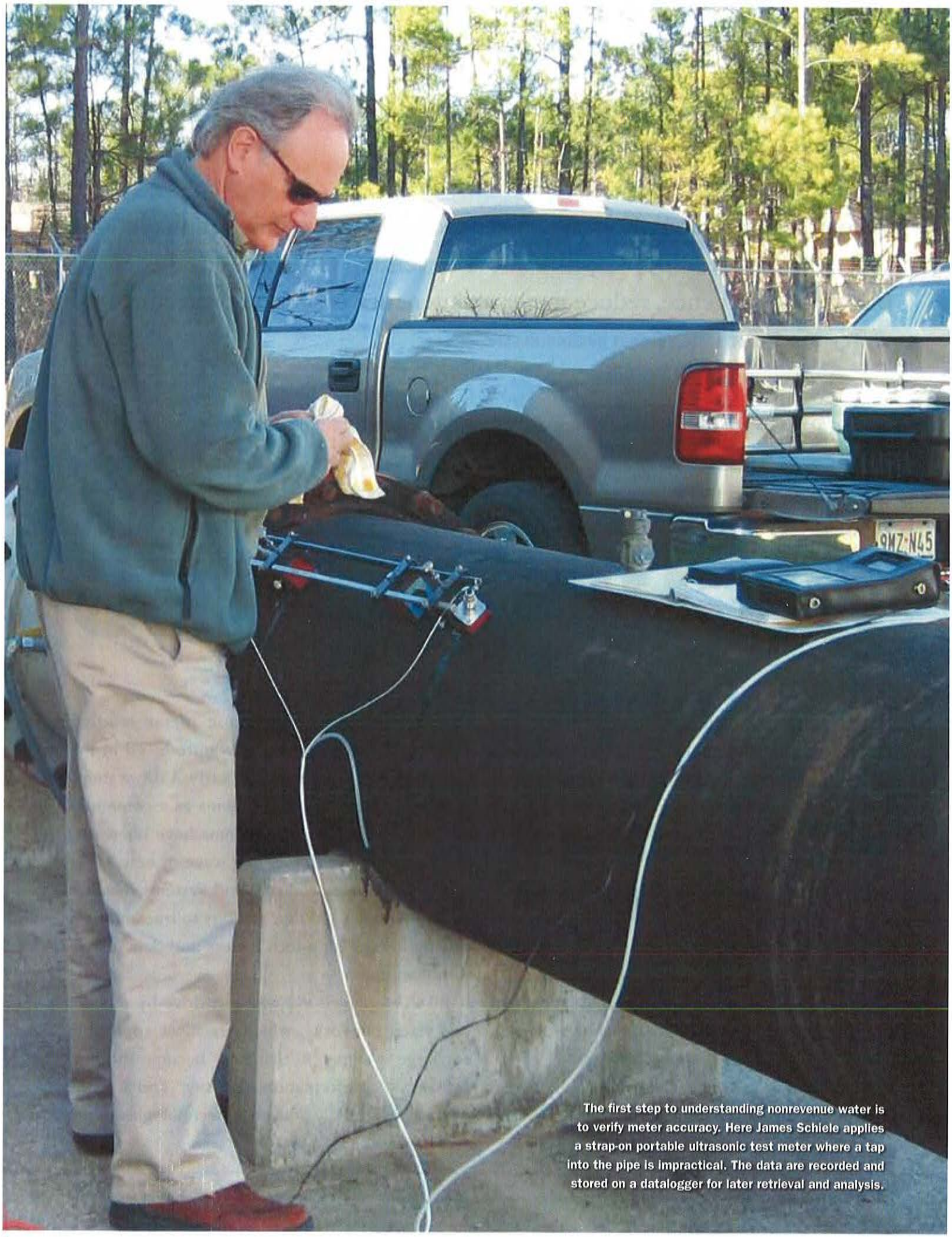
With new choices in flow measurement technologies, utilities can

- capture more revenue by accurately measuring a wider range of high and low flows.
- reduce the cost of owning and operating meters.
- decrease energy consumption over the life cycle of a meter.
- reduce water loss, energy use, and repair costs through superior leak detection and proactive notification of trouble conditions.

AMI stems from automatic meter reading (AMR) technology, which was introduced in the United States in the 1960s. Early AMR systems used network telephone systems as a communication link. Today such systems have been surpassed by an ever-increasing wave of new AMR/AMI technology, products, and systems that use radio frequency (RF) technology to transmit data among today's high-tech meters and data collection computers.

RF is employed via walk-by, drive-by mobile, and fixed networks, which are most applicable for large systems. RF has now become the preferred AMR "information highway," and it's one of the most rapidly advancing technologies in the water industry.

PHOTOGRAPH: JBS ASSOCIATES



The first step to understanding nonrevenue water is to verify meter accuracy. Here James Schiele applies a strap-on portable ultrasonic test meter where a tap into the pipe is impractical. The data are recorded and stored on a datalogger for later retrieval and analysis.

COMMON METERING TECHNOLOGIES

The water industry is undergoing significant regulatory and technological changes, with solid-state meters providing an alternative to mechanical meters. It's important to understand the pros and cons of common metering technologies found in ultrasonic meters, fluidic oscillator meters, and magnetic flowmeters.

Ultrasonic Meters. In these meters, an ultrasonic transducer sends sound waves upstream and downstream through the water. The difference in the sound waves determines water velocity, which is translated into water volume. Ultrasonic meters don't have a measuring element impeding water flow, so there's no reduction of accuracy over time.

However, ultrasonic meters require sound, and sound requires power. The high sampling rate required for high accuracy (nearly continuous sampling) results in a heavy power drain. To conserve power and battery life, the sampling rate can be reduced and periodic measurements averaged, but doing so diminishes accuracy, especially at low-flow rates.

Fluidic Oscillator Meters. These meters measure the frequency with which a fluid entering the meter attaches to one of two opposite diverging sidewalls and then to the other. The tendency of a fluid jet to attach itself to a nearby surface is known as the Coandă effect.

A fluidic oscillator meter measures only the flow of water, so the meter isn't affected by the presence of air in the water system. And, because it has no moving parts, the meter can be used when sand and grit are present in the water. However, the meter struggles at low-flow measurements, because it requires a minimum flow rate (given specific vessel size) for the Coandă effect to start.

Magnetic Flowmeters. These meters are based on Faraday's law of induction. When ionized water flows through a magnetic field, an electrical signal is measured. The faster the water flows, the more voltage is created and measured. Because voltage is linearly proportional to speed, voltage and volume increase as water speed increases.

Water meters equipped with remanent field technology require less energy and can help increase revenue by accurately capturing low-flow water usage.

A magnetic flowmeter contains no mechanical measuring element inside the flow chamber, so there's no wearing of mechanical parts that would reduce accuracy over time. Measuring performance is linear across the flow range, and the meter maintains accuracy at forward- and reverse-flow directions.

However, in traditional magnetic meters, creating a magnetic field and sustaining the right electrical environment for accurate readings requires a controlled magnetic field and a considerable amount of energy.

RECENT INNOVATIONS

Significant technological advancements in AMI systems have overshadowed recent breakthroughs for smart water meters, but new metering technologies are critical nonetheless. Many technological advances in water meters are enabling even more precise leak detection and intelligent water management.

Floating Ball Technology. Floating ball technology (FBT), a variant of turbine water metering, significantly reduces pressure loss and eliminates component wear while improving accuracy across an extended flow range. The technology offers water utilities many benefits, from improved billing accuracy to decreased maintenance costs. However, most important for water conservation and leak detection, FBT is characterized by a thermoplastic ball that's weightless in water and rises and falls according to small changes in flow. Therefore, FBT easily detects low-flow leaks that once would have continued to flow and go on wasting water at a silent cost to the utility.

Remanent Field Technology. Remanent field technology, in conjunction with magnetic metering technology, requires far less energy than traditional magnetic meters and provides greater accuracy, even at intermittent or low flows. Remanent field

PHOTOGRAPH: SENSUS

New solid-state flow measurement technologies are enabling meters to deliver real business benefits—cost savings, new revenues, and a competitive edge.

technology also uses a pulse of current in a drive coil to magnetize a small piece of magnetic material. The remanent material holds its magnetic field strength without consuming battery current and keeps electrical noise low, allowing accurate measurement of lower flows of water.

Each time a pulse of energy is emitted to the material, the magnetic field is reversed, thereby inducing voltages of opposite polarity on each magnetic field reversal. Traditional magnetic meters have difficulty with low flow because, as water flow slows, the voltage signal is reduced and can be lost in the electronic noise.

Remanent field technology is particularly well suited when sediment and sand are present in the water, where customers have fire sprinklers or other mission-critical water services, or when well water is being metered. By reducing pressure loss 40–50 percent relative to traditional meters, utilities spend less to achieve acceptable water pressure at customer premises.

For systems with elevated water storage tanks and towers, reducing pressure loss at the meter allows customers to sustain water pressure with far less stored water. For pumped systems, less resistance at the meter level means less energy required to push water through the system.

Putting "Smart" in the Grid. According to AWWA's Manual of Water Supply Practices M6: *Water Meters—Selection, Installation, Testing, and Maintenance*, more than half of all the water meters sold in the United States are equipped for some form of AMR/AMI functionality. Whereas early systems used cable or telephone networks, these have been surpassed by the ever-increasing use of RF technology. Fixed wireless communications—the hallmark of AMI—allow meters to be read, monitored, and managed from a remote, central location. This capability eliminates the need to send a fleet of vehicles to a service area, which also reduces fuel consumption and greenhouse gas emissions.

Water is a precious commodity to be used and conserved wisely. Leaks in a water distribution system or at customer sites cost a utility money in terms of nonrevenue water and the cost of energy to treat, pump, and distribute water that isn't used. Remote system intelligence enables utility personnel to be proactive regarding notification of leaks, tampering, out-of-threshold operating conditions, low battery power, and more. In addition, utilities can alert customers before the customers become aware of problems and damage occurs, and then quickly identify, troubleshoot, and resolve the problems.

AMI connectivity allows utilities to be informed of these events in real time for faster resolution and improved customer service. Peak-flow and consumption data, measured at utility-defined intervals ranging from 15 minutes to 24 hours, are stored in the system datalog to provide the utility with additional information on consumer usage patterns.

Radio-based endpoints can be attached to new or existing water meters, allowing utilities the flexibility of adopting AMR/AMI benefits without having to replace existing assets.

PHOTOGRAPH: ITRON

BUSINESS BENEFITS

Water meters, largely unchanged for decades, have historically been viewed as a utilitarian component of a water delivery system. Now, new solid-state flow measurement technologies are enabling meters to deliver real business benefits—cost savings, new revenues, and a competitive edge.

These technologies can help utilities reduce annual energy and maintenance costs, remotely manage meter reads, proactively identify potential problems, and capture nonrevenue water by accurately measuring a full range of low-to-high flow water use over a system's lifetime.

RESOURCES

- AWWA Manual of Water Supply Practices M36: *Water Audits and Loss Control Programs*, 2009 (catalog No. 30036), and M22: *Sizing Water Service Lines and Meters*, 2004 (catalog No. 30022).
- Thornton, J.; Sturm, R.; and Kunkel, G., 2008. *Water Loss Control*, McGraw-Hill (catalog No. 20511).

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conservation

PETER W. MAYER AND WILLIAM B. DEOREO

Improving urban irrigation efficiency by using weather-based "smart" controllers

A MULTIYEAR STUDY OF A CALIFORNIA SMART-IRRIGATION-CONTROLLER PROGRAM FOUND THAT TARGETING HOUSEHOLDS THAT OVERIRRIGATE COULD DOUBLE POTENTIAL SAVINGS AND REDUCE IMPLEMENTATION COSTS.

Throughout many parts of North America, irrigation demand is the single largest end use of water in the urban sector. Irrigation demands in California typically account for 50% or more of the total water used in many homes and businesses (DeOreo et al, 2008; Mayer et al, 1999). Improving irrigation efficiency may be the single most important goal for water conservation professionals in the coming years. In support of this objective, the California Department of Water Resources (CDWR) funded two large-scale regional efforts to effect urban irrigation efficiency and reduce runoff through the installation of smart controllers.

Smart controllers—also referred to as evapotranspiration (ET) controllers, weather-based irrigation controllers, smart sprinkler controllers, and water-smart irrigation controllers—are part of a new generation of irrigation controller products that use prevailing weather conditions, current and historic ET, solar radiation, soil moisture levels, and other relevant factors to adapt water applications to meet the actual needs of plants. Because smart controllers represent a relatively new technology, water utilities have had only limited experience with them. New technology must be proven effective at reducing water demands in laboratory and field settings before it can be responsibly adopted by local, regional, statewide, and national water conservation programs. Research studies over the past eight years have measured statistically significant water savings and runoff reduction achieved through the implementation of smart-irrigation-control technology (IA, 2008a, 2008b;

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PHOTOS: ALICE WARBECKE OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Water utility customers participate in training as part of a smart-controller exchange program in Southern California.

counted for, a typical value of 0.8 is used to adjust from the reference ET to the landscape ET, and the irrigation efficiency is assumed to be 100%. The effect of these assumptions was that the TIRs calculated were designed to estimate the depth of irrigation water required for landscape health and growth at each site without including an extra allowance for irrigation system efficiency at each site (which was a completely unknown quantity). The consequences of these assumptions become significant when considering the number of study sites found to be underirrigating before installation of the smart controller.

Determination of the landscape coefficient (k_c or k_l) is essential to calculating an accurate TIR and assessing whether a site is over- or underirrigating. In this study, a landscape coefficient value of 0.8 was used for all sites, which is considered sufficient for a primarily turf landscape with a mixture of some trees, shrubs, and other plants. Although a reasonable general estimate, this value was almost certainly a source of error at individual sites. The true landscape coefficient for a given site is the product of three factors:

- the crop or species coefficient (k_s), which relates to the amount of water a particular plant material requires as a fraction of the reference crop,
- the density coefficient (k_d), and
- the microclimate coefficient (k_{mc}), which relates to the amount of shade for a given landscape zone.

In determining the TIR, the current study assumed an irrigation efficiency of 100%, an assumption that likely resulted in an underestimate of irrigation requirements. The application ratio (AR) is a measure of how closely irrigation applications at a site matched the TIR determined from proximal ET weather stations. If the research team had used an efficiency of 80% (which in practice would represent an excellent level of efficiency for an automatic irrigation system), the effect would be to increase the calculated TIRs by 25%, which in turn would have reduced all of the ARs and the amount of excess irrigation in the group. This study was designed as an intervention-style, pre- and postintervention analysis in which the actual irrigation application rates during the pre- and post-installation periods were compared against the TIR in each period. Because the TIR was calculated for both the pre- and post-installation periods, key assumptions regarding crop coefficients and irrigation efficiencies were not harmful to the overall analysis of changes in water use. Future studies must decide how best to include irrigation system efficiencies in the evaluation of landscape programs.

> Improving irrigation efficiency may be the single most important goal for water conservation professionals in the coming years.

RESEARCH FINDINGS SHOWED MIXED RESULTS

Weather-normalized outdoor water use volumes were reduced. The average weather-normalized change in water use per smart-controller site is shown in Table 2. Across the 2,294 sites examined in this study, outdoor water use was reduced by an average of 47,300 gal per site (–6.1% of average outdoor use). This reduction was found to be statistically significant at the 95% confidence level. At smart-controller sites in Northern California, the average change in outdoor use was a reduction of 122,200 gal per site (–6.8% of average outdoor use). This change was not statistically significant at the 95% confidence level but was significant at the 90% confidence level. At smart-controller sites in Southern California, the average change in outdoor use was a reduction of 30,900 gal per site (–5.6% of average outdoor use), a change that was

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statistically significant at the 95% confidence level.

The outcome of smart-controller installation in this study was an overall reduction in irrigation demands, but results suggested that those customers who historically applied less than the TIR for their landscapes were most likely to increase their water use after installing a smart controller. In fact, the preinstallation AR (pre-AR), i.e., the level of over- or underirrigation before the installation of the smart controller, proved to be the most important factor in determining whether a site increased or reduced water use with the smart controller. In this study, 1,300 (56.7%) of the 2,294 study sites showed a statistically significant reduction in the weather-normalized irrigation AR, whereas 959 (41.8%) sites had a statistically significant increase in AR. For 35 (1.5%) sites, no statistically significant change in application was seen. These results are shown in Table 3.

Although the overall findings showed reductions in outdoor water use following the installation of smart controllers, nevertheless 41.8% of study sites experienced an increase in their weather-normalized irrigation AR after the installation of a smart controller. Table 4 shows the differences between sites that increased and those that decreased their weather-normalized irrigation AR.

Sites that increased application after installation of a smart controller had a mean pre-AR of 131% and a median of 95% (Table 4). The median indicates that more than half of these customers were applying less than the TIR before the installation of the smart controller. Because smart controllers are designed to adapt irrigation to match the theoretical requirement, it would be expected that installing a smart controller at a site with a history of applying less than the TIR would result in increased demand.

Sites that decreased their AR after installation of a smart controller had a mean pre-AR of 182% and a median of 137% (Table 4). The median here indicates that more than 50% of these sites were irrigating in excess of the theoretical requirement before the installation of the smart controller. The water savings achieved through installation of smart controllers can be maximized by targeting the technology to irrigators with historically high irrigation application rates. Irrigation application rates can be calculated using two pieces of data: the landscape area at the site and annual outdoor water use at the site.

In reviewing and comparing the performance of controllers in this study, it is important to bear in mind that water savings are only one evaluation measure. An essential evaluation parameter to consider is the postirrigation AR (post-AR). A primary goal of smart-irrigation technology is to reliably match the actual irrigation application to the TIR to achieve a post-AR of 1.0. Controllers that match actual applications to the TIR can be considered a technical success because they are performing as designed even if they do not reduce (or if they increase) water use.

Study identified specific factors that affected water savings. Multiple regression analysis was used to determine those factors that did or did not influence changes in AR. This analysis methodology allowed the researchers to examine the relationship between key site characteristics (such as controller technology) and AR after adjusting for factors known to influence savings (such as the AR before installation of the smart controller).

The following factors were examined and determined to have a statistically significant effect on the change in AR:

TABLE 2 Weather-normalized change in outdoor water use

Site Characteristic	Number of Sites	Mean Reduction/ Increase × 1,000 gal	Standard Deviation × 1,000 gal	95% Confidence Boundary × 1,000 gal	Statistically Significant Reduction?	Change %
Northern sites	411	–122.2	1,305.2	126.2	No	–6.8
Southern sites	1,883	–30.9	416.5	18.8	Yes	–5.0
Coastal ET zone	155	–42.5	399.3	30.6	Yes	–7.0
Intermediate ET zone	1,444	–52.2	756.7	39.0	Yes	–5.8
Inland ET zone	195	–26.2	707.4	99.3	No	–4.5
Professional installation	920	–38.3	599.0	38.7	No	–3.0
Self-installation	1,374	–53.2	712.4	32.7	Yes	0.0
Commercial	206	–228.9	1,783.8	203.2	Yes	–5.5
Irrigation	11	108.3	231.1	136.6	No	10.9
Residential	1,987	–21.1	197.0	8.7	Yes	–7.3
All sites	2,294	–47.3	669.5	27.4	Yes	–6.1

ET = evapotranspiration

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TABLE 3 Number of smart-controller sites and change in AR

Statistically Significant Change in Water Use	Number of Sites	Percentage
Increase	959	41.8
No change (± 0.6%)	35	1.5
Decrease	1,300	56.7

AR—application rate

TABLE 4 Comparison of sites that increased or decreased irrigation AR with statistical significance after installation of a smart controller

Category	Sites Increasing AR After Controller Installation	Sites Decreasing AR After Controller Installation
Customer category		
Nonresidential sites—%	32.9	67.1
Residential sites—%	43.0	57.0
Landscape area		
Mean—sq ft	22,084	28,505
Median—sq ft	6,286	5,098
Pre-AR		
Mean—%	131	182
Median—%	95	137

AR—application rate; pre-AR—preinstallation application rate

• the preinstallation AR (the application rate relative to the calculated TIR),

• the installation method (self versus professional), and

• the participating agency (sometimes a significant factor, likely because of the distinct differences in participant selection methods and program design).

The following factors were examined and determined not to have a statistically significant effect on the change in AR:

• the site classification (residential versus nonresidential),

• the region (Northern versus Southern California),

• the climate zone (coastal, intermediate, or inland),

• the smart-irrigation-control methodology (historical ET, onsite readings, remote readings, soil moisture sensor), and

• the landscape area (not a factor in AR change but would be in changes in the volume of water use).

Preinstallation outdoor water use was the most influential factor. The single most significant factor influencing outdoor water savings at a site was the amount of excess irrigation before the smart controller was installed. A site that historically applied twice the TIR had more opportunity to reduce water use through installation of a smart controller than a site that historically applied half the TIR.

Table 5 compares average water savings results for sites that applied less than 100% of the TIR to sites that applied more than 100% of the TIR before installation of a smart controller. The average preinstallation application rate for the 47% of sites that were underirrigating was only 19.9 in. (55.2% of the TIR). The overall effect of smart controllers on the underirrigators resulted in an average per site water use increase of 1.49 kgal.

The average preinstallation application rate among the 53% of sites that were overirrigating was 85 in. (236.6% of the TIR). Once the weighting of the differing irrigated areas was brought back into the analysis, the overall effect of smart controllers on sites that were overirrigating preinstallation was an average per site water savings of 90.6 kgal. This is nearly twice the water savings for the study group as a whole (shown in Table 2). This finding is important because the program cost is proportional to the number of sites, and benefits are proportional to the water savings. Therefore, if twice the savings can be obtained with only half of the sites, the benefit-cost ratio is improved by a factor of 4.0.

Table 5 shows the effect of excess water use during the preinstallation period on water savings achieved through installation of a smart controller. The smart controllers installed in this study by and large performed as intended. Sites that historically irrigated less than the TIR increased their application to come closer to an application rate of 100%. Sites that historically irrigated more than the TIR decreased their application. The data indicated that even after installation of a smart controller, these historic overirrigators were still applying more water as a group than was probably necessary in the postinstallation period (1,108,300 gal versus 361,400 gal for historic underirrigators). Although installation of the smart controller did not decrease water use as much as was expected, savings rates may improve over time as the controllers are fine-tuned to better meet irrigation requirements.

Figure 1 shows the relationship between pre-AR and post-AR. In Figure 1, data for all of the study sites were sorted according to the pre-AR. This formed a smooth line extending

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from nearly zero to nearly 10 on the graph. The corresponding post-AR was plotted for each site as a blue dot. A polynomial line was then fit to the post-AR so that trends could be observed and compared. Figure 1 shows that despite a tremendous amount of scatter in the post-AR data, there is a definite trend for the sites at either end of the line to be closer to 1.0 than during the preinstallation period. This indicates that the smart controllers achieved some improvement in the AR and for the most part performed as designed. What is perplexing about the results shown in Figure 1 is the amount of scatter in the postinstallation data. Ideally, all of the postinstallation points would lie on a horizontal line where AR = 1.0. Future research should more closely examine the ability of smart controllers to hit target irrigation application rates in field installations over time.

Smart-irrigation control provides multiple benefits. Water utilities and customers may wish to promote and install smart-irrigation-control technology for reasons other than potential water and cost savings. For water utilities, smart irrigation control offers potential additional benefits such as reduced runoff from urban landscape, adaptation of customer demands to calculated water budget allotments, potential for peak demand reduction (through coordinated irrigation "brownouts" similar to energy utility peak-shaving), and improved health and condition of urban landscapes through more proper irrigation applications.

For customers and end users, smart controllers offer some of the same potential benefits plus a few others. Many participants in this study reported appreciating the convenience associated with smart-control technology. Applying the proper amount of water usually improved the appearance of the landscape and health of plantings. In addition, many smart controllers feature diagnostic tools not available on traditional controllers and can provide better feedback about potential problems with the irrigation system. Furthermore, applying the proper amount of water to a zone often reveals distribution uniformity problems or other system deficiencies that may have been masked by excess application in the past.

RECOMMENDATIONS AND CONCLUSION

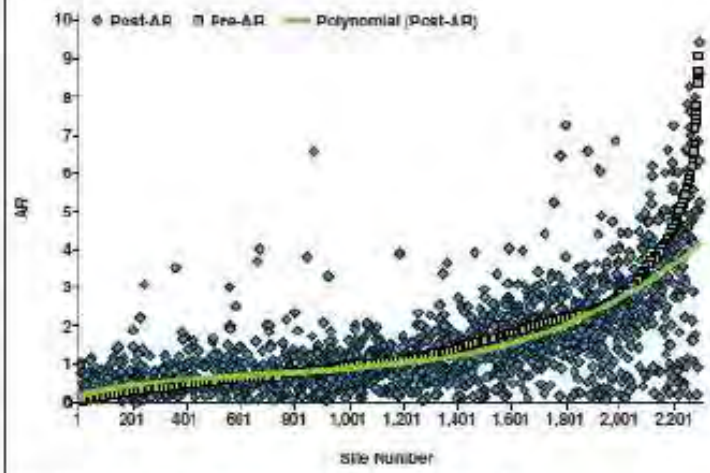
Capitalize on specific factors that influence water savings. The current study identified only a few factors that have a statistically significant influence on water savings—specifically, the pre-AR at the site, the

TABLE 5 Comparison of water-savings results by pre-AR and excess-use analysis

Statistic	Sites With Pre-AR ≤ 100%	Sites With Pre-AR > 100%
Number of sites	1,070	1,215
Percentage of sites	47.0	53.0
Irrigated area—sq ft	30,819	26,125
Average pre-installation application rate—in.	19.9	85
Average postinstallation application rate—in.	24.1	77.6
Average pre-AR—%	55.2	236.6
Average post-AR—%	64.1	201.4
Average change in AR	0.089	-0.153
Average weather-normalized change in outdoor use—× 1,000 gal	1.49	-50.6
Change in weather normalized outdoor use—%	0.43	-7.8
Average postinstallation outdoor use—× 1,000 gal	361.8	1,348.0
Average postinstallation excess use—× 1,000 gal	−129.8	487.3
Postinstallation use in excess—%	NA	44.0

AR—application ratio. NA—not applicable. post-AR—postinstallation application ratio. pre-AR—pre-installation application ratio

FIGURE 1 Comparison of pre- and post-ARs for all sites



AR—application ratio, post-AR—postinstallation application ratio, pre-AR—pre-installation application ratio

Site numbers are sorted from lowest to highest by pre-AR.

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installation method (self versus professional), and the participating agency (sometimes a significant factor). The study's most emphatic finding was the significance of preinstallation overirrigation as a factor influencing water savings.

Water savings can be maximized by targeting overirrigators. Smart controllers can save water, but only if they are installed properly at sites that already have some savings potential. Smart controllers are far more likely to achieve savings when they are installed at sites with a history of applying excess irrigation water. Water providers seeking significant volumetric savings must target these customers in particular for smart controller installation. To identify this group, the utility needs three essential pieces of data: the estimated outdoor water use at the site, a reliable measurement of the irrigated landscape area and coefficient at the site, and the specific (or average) ET rate for the locale.

In the current study, 41.8% of study sites increased their irrigation water use after installation of the smart controller. Irrigators who historically apply less than the TIR for their landscapes are poor candidates for smart controllers and should be prescreened from utility distribution programs. The water savings measured at sites that were overirrigating were twice the savings for the study group as a whole.

Proper installation and programming of the smart controller are key to maximizing savings. Every landscape is unique. Experience has shown that the initial or default settings used to program a smart controller likely will need to be fine-tuned over the first few weeks or even months of operation to ensure optimal performance. The smart controller is not a technology that can simply be installed and forgotten; adjustments are often required during the initial setup to calibrate the controller default settings to the specific conditions of the site. Once the controller is properly adjusted for the site, few (if any) adjustments should be needed. However, manufacturers, irrigation contractors, water agencies, and consumers must be made aware of the need for fine-tuning. Training and tools should be developed to improve the installation and adjustment process to help ensure that the smart controller performs optimally and does not ultimately increase water use unnecessarily.

Even the most water-efficient controller cannot make up for poor irrigation system design, installation, and maintenance.

Surprisingly, self-installed smart controllers performed better than professionally installed controllers in this study. It is unclear exactly why this was the case, but a reasonable hypothesis is that customers who installed their own controller were more familiar and comfortable with the technology and therefore better able to fine-tune the programming to maximize efficiency at their site. Irrigation experts, landscape professionals, and knowledgeable water conservation staff agree that proper installation, programming, and fine-tuning are critical to successful installation of a smart controller.

In Northern California, utility personnel conducted inspections of nearly all smart-controller sites, during which programming adjustments were made. This approach appears to have improved savings for some Northern California agencies, but it is unclear if the benefits of these efforts outweigh the additional program costs associated with conducting site inspections. Postinstallation inspections are a good idea, but results from the current study indicate that smart-controller programs can achieve significant water savings without site inspections.

Customer training programs at distribution and exchange events in Southern California proved that a little training goes a long way. Participants were required to bring their old controller to the exchange event or class and were walked through exercises with the new controller to help familiarize them with the technology and demonstrate the differences from the old controller. Research pointing to higher water savings from self-installed controllers bears out the efficacy of this training concept. The verbatim customer survey responses indicated that not all self-installations were successful, and in some cases professional assistance was sought.

Because of the relatively low cost of implementing an exchange program, other agencies may opt for this distribution method as a reasonable way to promote smart-irrigation-control technology. An approach that first targets customers with a history of applying water in excess of the ET and then distributes the smart controllers through a low-cost and easy-to-implement exchange method could be an excellent hybrid program solution.

Cost-effectiveness of smart controllers depends on water savings, avoided costs, and water rates. Installing smart controllers may or may not be cost-effective for a utility or their customers. The extent of cost-effectiveness is determined by the water savings, the avoided cost for water, local retail water rates, the discount rate factor used, and the expected useful life of the product. Programs that target customers who historically irrigate in excess of the theoretical requirement are far more likely to be cost-effective under any avoided cost and pricing scenario. Utilities seeking cost-effective demand reduc-

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tions should focus their efforts on identifying sites that stand the best chance of reducing demands through installation of a smart controller. The data from this study suggest that such an effort could result in fourfold improvement in the benefit–cost ratio.

Smart controllers will be cost-effective for many end users, but not all. Utilities could easily provide simple cost-effectiveness calculations for customers to assist them in determining if a smart controller makes sense for them, based on their historical outdoor water demands. However, some customers may be convinced to install a smart controller by factors other than water use reduction and cost savings such as convenience and a desire to enhance landscape health and appearance.

More data on the long-term performance of smart controllers are required. The limited multiyear analysis presented here—which showed increasing savings over time—indicates the potential for long-term water savings from smart controllers is promising, but these findings are certainly not the final word on this subject. The CDWR contract with the participating water agencies in Northern and Southern California specifies that postinstallation water use must be tracked over a five-year period. The participating water agencies should take full advantage of this opportunity to continue to monitor the effects of smart controllers over the coming years and track the persistence and/or decay of water savings over that time.

Long-term landscape health and appearance should also be considered. Water use data included in the current study were taken from monthly or bimonthly billing records. Consequently, this study was not able to examine how the controllers distribute irrigation through time (i.e., frequency and duration or irrigation run times over a given period of time). With such coarse data, it is possible that a controller might apply an amount of water close to the TIR over the course of a month or two, but within a given week, the irrigation run times might not be distributed properly. Although the distribution of irrigation events through time could not be examined in this study, it is potentially significant in the way smart controllers can affect overall plant health and thus warrants further investigation. Some smart-controller technologies adjust only run times and not water days, which could result in frequent shallow waterings. Data on the long-term appearance and health of landscapes irrigated with smart controllers should be collected.

A new ET should be formulated for acceptable landscape appearance and health using the least amount of water. There is a bright future for the use of ET data to help manage urban irrigation. The essential goal of this effort is to maximize water efficiency. Currently, CIMIS ET data must be modified with various crop and landscape coefficients to adapt to urban water requirements. Although there is general agreement on how this is done, in the long run something different is needed.

The authors recommend the development of a new urban ET factor designed to maximize water efficiency while maintaining landscape health and appearance. Several recent landscape studies, including the one detailed here, have found that the current ET formulation with a landscape coefficient k_l value of 0.8 or even 0.7 is simply too high for many urban landscapes that contain a mixture of turf, trees, and plants in which shading plays a large role (White et al, 2007; Sovocool et al, 2006). The revised urban landscape coefficient should be developed by agronomists, horticulturists, and landscape experts from around the country with the goal of developing an ET value designed for the efficient irrigation of urban landscapes. An ET factor oriented toward water conservation should not be based on maximizing plant growth (as many current ET formulations are) but instead should be developed with the goal of acceptable landscape appearance and health using the least amount of water. The new factor must be formulated for different parts of the United States, different soils, different plant materials appropriate to the setting, and different climates, but with the same objective of acceptable landscape appearance using as little water as possible. Ideally the new water conservation ET factor could be developed in the university environment at different locations across the country. Many universities already have facilities and programs that could be enlisted in this effort, which would probably require federal funding to move forward. If urban landscape water conservation is expected to help stretch and support water supplies, this fundamental tool to help manage water use should be developed. Once developed, the water conservation ET factor could be incorporated into smart-controller algorithms and scheduling engines (the internal software programs that develop and adjust irrigation run times) to improve water savings.

Irrigation experts, landscape professionals, and knowledgeable water conservation staff agree that proper installation, programming, and fine-tuning are critical to successful installation of a smart controller.

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Reference 6

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Climate change is having a profound impact on California water resources, as evidenced by changes in snowpack, sea level, and river flows . These changes are expected to continue in the future and more of our precipitation will likely fall as rain instead of snow. This potential change in weather patterns will exacerbate flood risks and add additional challenges for water supply reliability.

The mountain snowpack provides as much as a third of California's water supply by accumulating snow during our wet winters and releasing it slowly when we need it during our dry springs and summers. Warmer temperatures will cause what snow we do get to melt faster and earlier, making it more difficult to store and use. By 2050, scientists project a loss of at least 25 percent of the Sierra snowpack. This loss of snowpack means less water will be available for Californians to use.

Climate change is also expected to result in more variable weather patterns throughout California. More variability can lead to longer and more severe droughts. In addition, the sea level will continue to rise threatening the sustainability of the Sacramento-San Joaquin Delta, the heart of the California water supply system and the source of water for 25 million Californians and millions of acres of prime farmland.

The Department of Water Resources (DWR) is addressing these impacts through mitigation and adaptation measures to ensure that Californians have an adequate water supply, reliable flood control, and healthy ecosystems now and in the future. Below are some of DWR's climate change activities.

- In 2013, DWR completed its ownership divestment of a coal-fired power plant in Nevada and ceased taking electricity from it. By replacing this electricity with electricity generated by high-efficiency gas-fired power plants and renewables, DWR reduced its GHG emmissions by over 800,000 metric tons per year (equivalent to removing 170,000 cars from the road).
- In 2012, DWR adopted phase 1 of its Climate Action Plan, a Department-wide Greenhouse Gas Emissions Reduction Plan
- In 2011, DWR in cooperation with the U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, and Resources Legacy Fund completed the Climate Change Handbook for Regional Water Planning
- In 2010, DWR adopted an Environmental Stewardship Policy which supports a Department-wide "Total Resource Management" approach to planning activities and projects. Clear and measurable Goals for sustainability implementation were also adopted in 2010 following the 2009 adoption of DWR's Sustainability Policy to promote a departmental change in the way DWR does business. (Visit DWR's Sustainability Portal and Watch DWR's Sustainability Videos)
- Between 2007 and 2009, DWR was a member of the California Climate Action Registry and made the list as a Climate Action Leader by reporting its GHG emissions and having the data verified through a third party audit. In 2010, DWR transitioned to The Climate Registry, a North America-wide climate registry, and continued to provide third party verified GHG emissions inventory data.
- DWR adopted a Climate Change Adaptation Strategy (2008)

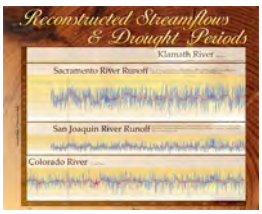
Other Climate Change Activities

Adapting to the current and future effects of climate change is essential for DWR and California's water managers. DWR addresses climate change in its California Water Plan, which is updated every five years. The California Water Plan provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. DWR continues to improve and expand the analysis of climate change in the California Water Plan. The 2013 California Water Plan Update includes multiple scenarios of future climate conditions and stresses the inclusion of uncertainty, risk, and sustainability.

Climate Change Technical Advisory Group

Featured Link

Paleoclimate (Tree-Ring) Study Released



New Hydroclimate Reconstructions have been released, using updated tree-ring chronologies for these California river basins; Klamath, San Joaquin and Sacramento. The report, prepared by the University of Arizona, allows assessment of hydrologic variability over centuries to millennia, gives historic context for assessing recent droughts, and can be used in climate change research.

Report
Poster
Data files

Department of Water Resources

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Reference 7

Automated Meter Reading Helps Utilities Meet Future Challenges, AWWA Journal, Jan. 2008
www.awwa.org/publications/opflow/abstract/articleid/18304/issueid/33550455.aspx?getfile=/documents/dcdfiles/18304/waternet.0065631.pdf

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OPERATING TODAY'S WIRED UTILITY

Christina Kelly is a marketing and communications specialist for Itron (www.itron.com), Liberty Lake, Wash., and has 25 years' experience as a daily newspaper reporter.

Automatic Meter Reading Helps Utilities Face Future Challenges

BY CHRISTINA KELLY

Water infrastructure is buried out of sight—you turn on the tap and water comes out. Most of us pay our monthly bill and don't give it a second thought. But many cities throughout North America are now forced to think about aging infrastructure.

Older water systems commonly have cast-iron pipes, which were laid in the 19th century with an average life expectancy of 100 years. As water infrastructure outlives its useful life, it can deteriorate and corrode, resulting in widespread water leakage, burst water mains, unreliable pumps, and aging treatment plants. The American Society of Civil Engineers recently gave the nation's drinking water infrastructure a near-failing grade of D–. The US Environmental Protection Agency estimates that about $534 billion to $1 trillion may be required to meet infrastructure needs by 2025.

FUNDING CHALLENGES

Besides dealing with aging infrastructures, water utilities are challenged, now more than ever, with security issues and sabotage possibilities. Securing water systems is a costly burden that will ultimately be passed along to consumers.

Further, the United States uses more than 408 bgd, and USEPA estimates water shortages could be critical by 2025. Financial obligations, such as federal assistance, haven't kept pace. Funding for drinking water in 2005 was less than 10 percent of the total national requirement. Because most water utilities are small—there are more than 54,000 community water systems in the US—and have limited access to bond and equity markets, funding is a challenge.

WATER WASTE

An average US city loses 20–30 percent of its water production in transit from treatment plants to consumers. If the system is old, it can lose as much as half of its drinking water through tiny and often undetected leaks and breaks each day. This not only wastes money, it drains a precious finite resource.

In addition, there's much waste in our homes. AWWA estimates that 22 gal of water per person are lost to leakage each day. A single running toilet can account for as much as 300 gal of lost water per day, or more than 100,000 gal of water per year, for one house. Saving even small amounts of water helps, whether it's in the piping infrastructure or plugging water leaks in homes. Technology is available to water utilities to work more efficiently, bill more accurately, and provide more real-time usage data—all in an effort to conserve water.

AUTOMATIC METER READING

One of the best ways to save is through the water meter—the "cash register" for utilities. Actual consumption is measured, and the metering system helps account for almost every drop delivered. In the United States, only about 22 percent of water utilities use automatic meter reading (AMR) systems, according to the National City Water Survey of 2005, which was sponsored by the US Conference of Mayors Urban Water Council. Of the utilities surveyed, 68 percent said they would upgrade to AMR if they could save money and water.

Advanced AMR systems permit frequent collection of usage-profiling data, which helps to manage conservation programs and leak detection behind the meter to reduce waste and increase supplies. Some systems also work with distribution system leak-detection technologies to reduce nonrevenue water, improve supply management, and plug revenue leaks. In an era in which it's essential to measure water use more accurately, every drop saved builds up the resource, saves the utility time and money, and ultimately benefits consumers.

Automatic Meter Reading Offers Operational Efficiencies

As water utilities face the challenges of aging infrastructures, elusive funding, and finite natural resources, automatic meter reading (AMR) could provide relief. To help utilities enhance operations and pinpoint nonrevenue water, AMR can

- Increase operational efficiencies by allowing utilities to read more meters in less time.
- Reduce operational costs by eliminating time spent on hard-to-access meters.
- Improve customer satisfaction by eliminating intrusive meter readings and maintaining more accurate information for billing and dispute resolution.
- Increase employee and customer safety.
- Improve billing-data quality by eliminating manual data-entry errors, performing off-cycle reads, and eliminating estimated readings.
- Reduce theft and revenue loss due to meter tampering.
- Identify revenue loss and distribution system problems.
- Manage water conservation programs.

2008 © American Water Works Association

Reference 8

MADDAUS WATER MANAGEMENT

CONSERVATION TECHNICAL ANALYSIS

Date: May 29, 2009

To: Daniel Carney, Marin Municipal Water District

From: William Maddaus and Michelle Maddaus, Maddaus Water Management

Subject: ***FINAL Additional Conservation Program Evaluation - Summary of Data Inputs, Assumptions and Results. Addendum to May 8, 2007 Conservation Technical Analysis***

EXECUTIVE SUMMARY

Introduction

A conservation technical analysis was conducted by Maddaus Water Management (MWM) for Marin Municipal Water District (MMWD). The purpose of the analysis was to:

1. Research and investigate, with the help of MMWD staff, 4 specific items that could be implemented by MMWD to reduce future water demand. The new measures requested by MMWD for analysis were the following:
    1. Influence of new future plumbing requirements, taking effect in 2014
    2. Leak detection and repair with Automated Metering System (AMS)
    3. AMS Meter installations
    4. Drought Ordinance review

2. Review MMWD Conservation Savings Goals, revise the parameters used with the existing 30 measures in the 2007 MMWD Conservation Master Plan based on staff input. MMWD was responsible for providing a list of revisions to MWM through a list of changes on Attachment 1 in the May 8, 2007 Conservation Technical Analysis Memorandum.

3. Estimate the costs, water savings and cost-effectiveness of the four new measures and revised Master Plan measures.

4. Combine the measures listed above into a more aggressive program (called herein Program E) and evaluate the costs, water savings and cost-effectiveness of the program. Program E also includes the measures in Program D, as described in the May 8, 2007 Technical memorandum.

In addition the prior drought conservation technical analysis was extended, the purpose of which was to:

1. Evaluate the effectiveness of the existing MMWD drought ordinance on a possible future drought, if Program E was in effect.
2. Quantify the combined water savings from the long-term conservation program working together with the drought ordinance to help meet supply shortages.
3. Determine how much demand hardening would occur in the future due to long-term conservation generated demand reductions (that may reduce the effectiveness of the drought ordinance).

This report was intended to be an Addendum to our May 8, 2007 Conservation Technical Analysis. The original 2007 study can be found in the Marin Municipal Water Conservation Master Plan Appendix A, currently available on the MMWD website. At the request of MMWD, items that remained unchanged in the 2007 Memorandum were not included in this 2009 Addendum. Additional background on the methodologies and assumptions for the DSS Model used in both projects can be found in the 2007 MWM report.

Key Findings

Based on the Conservation Technical analysis completed in 2009, Maddaus Water Management can offer the following 9 key findings.

1. As requested by MMWD, Maddaus Water Management researched adding an additional crew for Leak Repair and separately the installation and implementation of an Automated Metering System (AMS). One of the goals of the AMS system would be to find leaks and assist with residential and commercial water audits. Both of these items appear to be good ideas that MMWD can consider in the future to create additional water savings. According to this study results, adding an additional crew dedicated to Leak Repair can save an additional 200 AF/yr (when compared to Program D that has two leak detection crews). After the installation of an AMS system the Leak detection notification (Tier 2 – 10) will save an additional 100 AF/yr.

2. The change in California plumbing code requiring 1.28 gallon per flush High Efficiency Toilets (HETs) and 0.5 gallon per flush urinals by the year 2014 increases savings 306 AF/yr in 2025 (367 AF in 2030). The new legislation was signed by the Governor in October 2007 and therefore was not included in the May 8, 2007 Conservation Technical Analysis.

3. Program E saves 1,057 AF/Yr more water than Program D in the year 2025 (1,168 AF/Yr more in the year 2030). Water savings estimates assume the installation of the AMS system is complete by the end of the year 2014.

4. The cost of Program E has a cost of water saved of $437 / AF (without the cost of the installation of the AMS). The present value utility cost of the entire program is $44 Million. This total cost does include some historical costs back to the year 2006 and concludes at the end of the study period in the year 2030. These costs do not include the installation of the AMS system as the cost, timing, and other parameters have not been decided by MMWD at this time. Additionally, the AMS is not planned to be entirely funded out of the MMWD conservation budget.

5. MMWD has not yet made a decision on the AMS system, specifically the exact installation date and cost of the system that would be assigned to the conservation department. Therefore, the exact cost was excluded from this conservation technical analysis except to run a few hypothetical scenarios to determine approximate cost / benefit ratio and cost of water saved. At the request of MMWD, two scenarios were considered, a 20% and a 40% cost sharing for the conservation department (For example, the conservation department would fund 20% of the entire cost of the AMS system). For these two scenarios it was assumed there would be a 3 year installation in the years 2012, 2013 and 2014. The total cost of the AMS system provided by MMWD was approximately $19.6 Million. Using these parameters, Program E with a 20% cost share of AMS would have a utility cost of water saved of $467 / AF. The present value utility cost of the entire program would be $47 Million. Similarly using these assumed parameters, Program E with a 40% cost of AMS would have a utility cost of water saved of $498 / AF. The present value utility cost of the entire program would be $50 Million.

6. Program D measure assumptions (program length and market penetration rates) were reviewed with the MMWD Staff. Adjustments were made to each measure such that MMWD staff is comfortable with the targeted number of activities at this time. Rain water catchments and gray water systems were added as eligible items under existing Tier 2 – 6 Financial Incentives for Irrigation Upgrades program. Apart from the measure savings listed in Key Finding No. 1, the revisions to the other existing measures and use of the AMS system saves a total of approximately 750 AF/yr in 2025 and 850 AF/yr in 2030.

7. MMWD has made great progress in building a strong foundation for a large conservation program (hiring staff, creating new programs, etc.) in a relatively short amount of time. However, Program D is not yet fully operational at this time. Not all of the projected budget and staff has been committed as of April 2009. Based on this fact, it is too soon to tell whether water savings goals for Program D will be reached. Several years of monitoring Program D including the number of actual program participants and their actual water savings would increase confidence in the ability to forecast higher savings from increased efforts.

8. An update on the assessment of the drought ordinance effectiveness if Program E is implemented was made. The combined savings (average year) from Program D and E from a simulated drought in 2025 are 36 and 39 percent reduction respectively.

9. If a simulated drought occurs in 2025 the drought ordinance will save not 25% but rather 4 to 4.3 percent less. Said in other terms, the ordinance would only save from 21 to 20.7 percent if the drought ordinance works in conjunction with Program D or E instead of on its own with no conservation program. This occurs because some of the end uses have been reduced by the conservation program and there is less water available for a temporary demand reduction during a drought. In our opinion this estimated demand hardening should not be a key factor in deciding whether to pursue Program D or E. It is cost-effective to save this water over time, rather than leave the "waste" in the system so it can be saved during a future drought. The District should consider revising its expectations of the effectiveness or the drought ordinance. If it wants to save say 25 percent on top Program D or E savings then it should ask customers for about 30% reductions so it will net about 25 percent on top of savings from Program D or E.

Long-Term Program E Conservation Program Analysis Overview

Thirty one conservation measures were analyzed and combined into two alternative programs of increasingly higher water savings and costs. Figure ES-1 shows the projected savings from these programs, labeled Program D (the current approved Master Plan), and E (more aggressive). The programs are defined and water savings tabulated for 2025 and 2030 in Table ES-1. Water savings in 2025 and 2030 for Program E, including the future effects of the plumbing codes, is approximately 6,047 acre-feet/year in 2025 and 6,553 acre-feet/year (AF/Yr) in 2030. The incremental savings of Program E over D, as shown in Table ES-1 are 1,057 AF/Yr and 1,168 AF/Yr in 2025 and 2030 respectively.

Figure ES-1
Long Term Conservation Program Savings

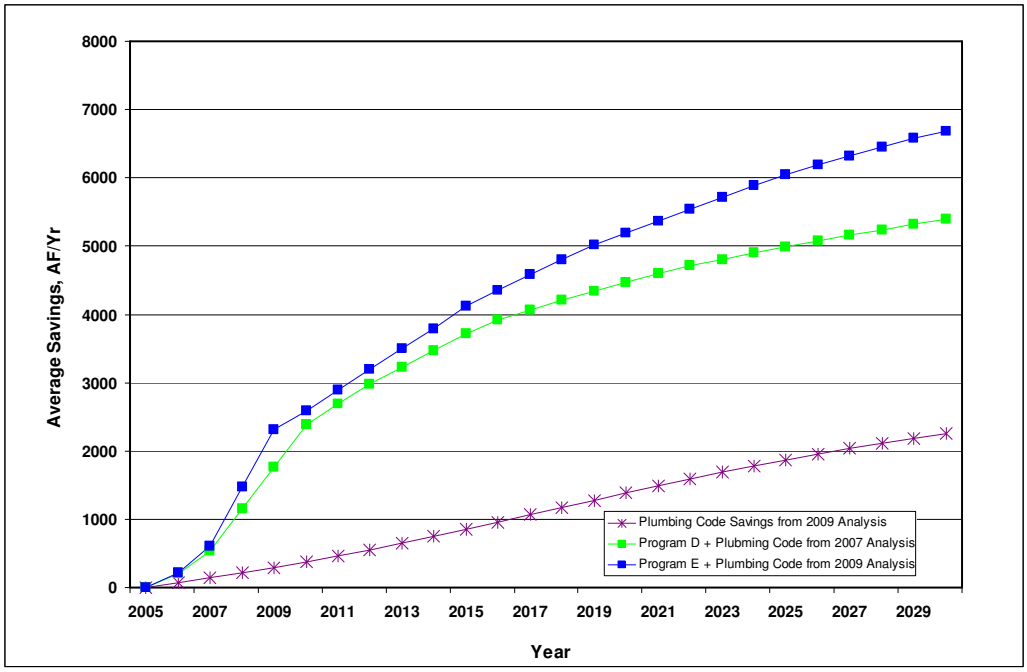


Table ES-1
Conservation Program Description and Future Water Savings

Program	Description	2025 Water Savings with Plumbing Code, AF/Yr	2030 Water Savings with Plumbing Code, AF/Yr
Plumbing Code Only	No Conservation beyond Plumbing Code (Revised to include new California Legislation requiring High Efficiency Toilets and Urinals in the year 2014. Plumbing code water savings increased when compared to the May 8, 2007 Technical Analysis)	1,871	2,251
D	Program D is the same as described in May 8, 2007 Conservation Technical Analysis. The water savings for Program D + Plumbing Code remained unchanged from the May 8, 2007 Technical Analysis.	4,990	5,385
E	New Program E includes a total of 31 measures (includes AMS, Leak Repair, and revisions to 30 measures in Program D) + Plumbing Code	6,047	6,553
Difference Between Program D and E	Comparison between Program D and Program E	1,057	1,168

Table ES-2 shows the relative cost-effectiveness of Program E. Additional resources are required to reach the higher level of water savings. The plumbing code is included for reference and represents the amount MMWD would save if there were no long-term conservation program. Note that all Program E programs are cost-effective (benefit-cost ratio greater than 1.0) from the utility perspective and also from the community perspective (which includes both the utility and the customer costs and benefits). The cost of water saved for MMWD is $437 per acre-foot excluding the cost of installation of AMS to $498 per acre-foot with a 40% AMS installation cost allocation to the conservation department. Programs E would save enough water to more than meet the needs of projected future customers in the District through 2030 during normal water years.

Table ES-2
Cost Effectiveness of Alternative Programs

Conservation Program	Water Utility Benefit-Cost Ratio	Community Benefit-Cost Ratio	Total Water Savings as a % of Total Production in 2030**	Present Value of Water Utility Costs ($1,000s)	Present Value of Customer Costs ($1,000s)	Present Value of Community Costs ($1,000s)*	Five Year Utility Cost 2009-2013 ($1,000s)	Utility Cost of Water Saved ($/AF)	% of Water Needed for New Development (2005 to 2030)
Plumbing Code	NA	NA	7.04%	NA	NA	NA	NA	NA	68.7%
Program E	2.22	1.10	13.45%	$ 43,655	$ 72,463	$ 116,117	$ 15,526	$ 437	131.4%
Plumbing Code + Program E, No Cost of AMS	2.22	1.10	20.49%	$ 43,655	$ 72,463	$ 116,117	$ 15,526	$ 437	200.1%
Plumbing Code + Program E, 20% Cost of AMS	2.09	1.08	20.49%	$ 46,871	$ 72,463	$ 119,334	$ 18,277	$ 467	200.1%
Plumbing Code + Program E, 40% Cost of AMS	1.96	1.05	20.49%	$ 49,972	$ 72,463	$ 122,435	$ 20,898	$ 498	200.1%

*Includes customer energy savings at 2009 PG&E retail gas and electric rates, *plus customer costs as well as utility costs and benefits*
**Percent of water saved for programs refer to demand with plumbing code

Drought Measure Water Savings

The analysis of the drought ordinance effectiveness and demand hardening made in the 2007 Conservation Technical Analysis was extended to include the Revised Plumbing Code and Program E. Key results from evaluating a simulated drought in 2025 are the following:

- Plumbing Code (no additional conservation program) + 25% Drought Ordinance can reduce total demand 30.5 percent
- Program D + 25% Drought Ordinance can reduce demand 36 percent
- Program E + 25% Drought Ordinance can reduce demand 39 percent
- Savings are diminished a small amount from the sum of Program Savings and the Drought Ordinance Savings if acting alone. In other words program savings from Table ES-1 above cannot be added to the drought ordinance (25%) directly. Combined savings are less.
- The drought ordinance acting with Program D or E will result in an additional drought reduction of about 21 percent, rather than the planned 25 percent due to demand hardening. If MMWD desires to achieve a 25 percent reduction during a future drought and Program D or E is in place, then it should revise its ordinance and ask for about a 30 percent reduction so it will net about 25 percent (or be satisfied with 21 percent net savings).

These demand reductions should not be confused with reductions assumed in the MMWD Supply model, computed as necessary to balance supply and demand. No inferences should be drawn about whether these simulated droughts would ever occur or whether the temporary demand reductions used in the MWM analysis would be adequate to balance supply and demand in such a future shortage.

In summary long-term conservation from Program E can save significant amounts of water and is cost-effective for MMWD. However, this program is very aggressive and since Program D has not yet been fully implemented, expansion of additional conservation should be considered carefully and done over a reasonable time period.

INTRODUCTION AND PURPOSE

The purpose of this report is to present an overview of the conservation evaluation process which has been completed for Marin Municipal Water District (MMWD). The evaluation was performed on a total of 31 individual measures and an updated plumbing code. The 2009 Conservation Technical Analysis includes new technology and methods (such as Automatic Meter System/Infrastructure (AMS), Leak Detection) plus a review and revision of the 30 measures evaluated for the 2007 MMWD Master Plan (10 Tier One measures, 9 Tier Two measures and 11 New Development measures). Specifically the report includes an analysis of the following as requested by MMWD:

1. Influence of new future plumbing requirements, taking effect in 2014
2. AMS Meter and infrastructure installations
3. System and customer leak detection (notification) and repair with Automated Metering System (AMS)
4. Use AMS to enhance planned residential and commercial water surveys and tracking landscape water budgets
5. Drought Ordinance review
6. Review of 30 measures analyzed in the 2007 MMWD Conservation Master Plan

The Tier One measures correspond to the 2006 California Urban Water Conservation Best Management Practices (CUWCC BMPs). The conservation measures, where quantification is possible (BMP 1, 2, 3, 5, 6, 7, 9, and 14), were analyzed using the Least Cost Planning Decision Support System (DSS) Model. The remaining BMPs (4, 8, 10, 11, 12, and 13) are of a qualitative nature or not applicable to MMWD and were not included in this analysis. The evaluation was also performed using the Least Cost Planning Decision Support System (DSS) Model on the Tier Two measures and potential New Development measures to make new single family homes, apartments, and businesses more water efficient. These conservation measures were then organized into programs showing benefits, costs, and water savings. The conservation savings are based on a 10% to 50% market penetration for existing accounts and 100% for new development ordinances (account participation). Only the new Program E will be discussed in detail in this report. Programs B, C, and D were described in the 2007 report.

It is possible to achieve lower or higher conservation savings than those stated in this report. For example, the savings could be increased if (a) program length and/or resources are increased or decreased, or (b) different programs, other than those analyzed in the report(s), with higher savings are implemented (if new technology becomes available), or (c) if programs are redesigned to offer higher or reduced incentives (direct installation or higher rebate amounts can often increase participation, and lower incentive amounts often leads to a lower participation rate).

CONTENTS

This technical report provides a general overview for the methodology, assumptions, and results for the conservation analysis. The following ten pieces of information are included in this report:

1. Overview of Evaluation Process
2. Revised Baseline Water Demands with and without the new plumbing fixture requirements (2014)
3. Leak Detection and Repair with Automated Metering System (AMS)
4. AMS Meter installations
5. Comparison of Individual Conservation Measures
6. Results of Conservation Program Evaluation
7. Update on Drought Analysis and Demand Hardening
8. Conclusions
9. Attachment 1: Assumptions for the Conservation Measures Evaluated
10. Attachment 2: Program E Annual Costs 2009 - 2030

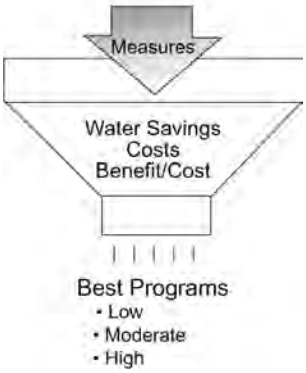
Each of these will be discussed in individual sections below.

1. OVERVIEW OF EVALUATION PROCESS

Long Term Conservation Evaluation Process

Using the same evaluation process in 2009 as in 2007 water savings were estimated and costs for the measures were developed. To review, benefits and costs were compared in a formal present value analysis and conclusions were drawn about which measures produce cost-effective water savings. This process can be thought of as an economic screening process, shown in Figure 1. Packaging the best measures into alternative programs allows MMWD to consider what level of conservation is appropriate.

Figure 1
Evaluation Process



Benefit-cost analysis has been used by many water agencies to evaluate and help select a water conservation measure best suited to local conditions. This analysis requires a locale-specific set of data, such as historical water consumption patterns by customer class, population projections, age of housing stock, and prior conservation efforts.

The following nine steps were used to implement the methodology by expanding upon the same DSS model used to prepare the demand projections.

1. Develop baseline water use projections without the national plumbing code. Projections cover each key customer category and are broken down into indoor end uses and outdoor end uses. Note, the plumbing code refers to savings from the 1992 Energy Act; it is not the same as savings from BMP conservation. The baseline water use projections (demand projections) for this project were matched to the 2005 Urban Water Management Plan (UWMP) forecasts created by MMWD, found in the Water Use Provisions section of the UWMP on Page 32. The projections used in the DSS Model are shown in Table 2.
2. Identify possible water conservation measures and screen the measures qualitatively to identify those that are applicable to the service area. Develop appropriate unit water savings and cost factors for each measure.
3. Estimate the affected customers (or number of accounts) for each conservation measure by dividing the measure's projected customers (or accounts) that implements the measure by the total service area customers (accounts). This factor is called the market penetration or installation rate. For this analysis 10% to 100% is assumed as shown in Attachment 1. These individual penetration rates could be higher if more time and/or resources were dedicated to the program.
4. Estimate total annual average and peak day water savings. The water savings are computed by multiplying unit water savings, per measure, by the market penetration or installation rate (10% to 100% of accounts), and then multiplying by the number of units in a particular service area (such as dwelling units) targeted by a particular measure.
5. Identify benefits to Marin Municipal Water District including potential reduction in imported water
6. Quantify total benefits for each year in the planning period by multiplying average water savings for each measure by the computed value of the benefits.
7. Determine initial and annual costs to implement the measures based upon pilot projects, local experience, and the costs of goods, services, and labor in the community. This is multiplied by the number of units participating each year and then added to overall administration and promotion costs to arrive at a total measure cost, which may be spread over a number of years.
8. Compare benefits and costs of measures by computing the present value of costs and benefits over the planning period.
9. Compile and compare packages containing various new measures (for example, benefit-cost ratios greater than 1.0 and significant water savings).

2. BASELINE WATER DEMANDS WITH AND WITHOUT PLUMBING CODE

Water demand projections were developed out to the year 2030 using the Least Cost Planning Water Demand Management Decision Support System (DSS) model. This model incorporates information from the:

- 2005 MMWD Urban Water Management Plan.
- 2006 Water Management Report.

- 2000 and 2005-7 Census data and estimates.
- 2007 MMWD Conservation Master Plan
- 2007 Maddaus Water Management Conservation Technical Analysis
- Data provided by MMWD staff including estimates for value of water saved, historical water use, past conservation efforts, and water system facilities.

National Plumbing Code

National law requires that for new construction after January 1, 1992 only fixtures meeting the following standards can be installed in *new buildings*:

- Toilet – 1.6 gal/flush maximum
- Urinals – 1.0 gal/flush maximum
- Showerhead - 2.5 gal/min at 80 psi
- Residential Faucets – 2.2 gal/min at 60 psi
- Public Restroom Faucets - 0.5 gal/min at 60 psi

Replacement of fixtures in *existing buildings* is also governed by the Federal Energy Policy Act that requires only devices with the specified level of efficiency (shown above) can be sold after January 1, 1994 for residential use and January 1, 1997 for commercial toilets. Only efficient models can be legally sold by manufacturers to be placed in new structures or used as replacement parts for existing fixtures. Natural replacement rates for toilets, urinals and showerheads used in this analysis were 3 to 4 percent per year (varying by fixture type). The net result of the plumbing code is that new buildings will be more efficient and old inefficient fixtures will slowly be replaced with new more efficient models. The national plumbing code is an important piece of legislation and carefully taken into consideration when analyzing the overall water efficiency of a service area.

In addition to the plumbing code the US Department of Energy regulates appliances such as residential clothes washers. Regulations to make these appliances more energy efficient has driven manufactures to dramatically reduce the amount of water these efficient machines use. Generally horizontal axis washing machines use 30-50 percent less water than conventional models (which are still sold). We forecast a gradual transition to efficient clothes washers so that by 2020 this will be the only type of machines sold. Given that machines last about 15 years eventually all machines in the MMWD area will be of this type.

In October 2007, the California legislature passed a new requirement AB715, which mandates that by 2014 all toilets sold by manufacturers be High Efficiency Toilets (flushing at 1.28 gallons per flush or less) and all urinals be High Efficiency Urinals (flushing at 0.5 gallons per flush or less). This new regulation was included in the plumbing code analysis for MMWD. Shown below in Table 1 are the current requirements and possible future fixture requirements that may apply to MMWD.

Table 1 - Plumbing Fixture Legislation and Regulations

.

Plumbing Fixture	Required by Plumbing Legislation and Regulations	Possible Future Fixture Requirements
Urinals	0.5 gpf by 2014 in California	1 pint per flush
Residential Lavatory Faucets	2.5 gpm	0.5 gpm
High Efficiency Toilets	1.28 gpf by 2014 in California	1.28 gpf

gpf = gallons per flush; gpm = gallons per minute

Demand Forecasts without the Plumbing Code

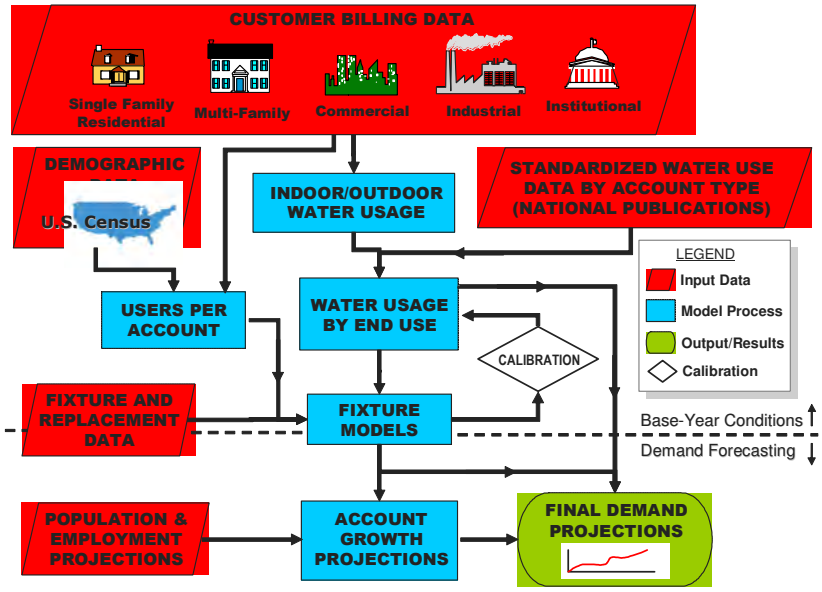
As mentioned previously, we matched the demand projections generated by MMWD in their Urban Water Management Plan for the years 2010 through 2025. The projection in the UWMP was equated to our "without the plumbing/appliance code" projection.

Demand Forecasts with the Plumbing Code

We then used the DSS model as outlined by the Figure 2 to generate an additional projection "with the plumbing code" to take into account the plumbing fixture changes and appliance changes that are taking place since the enactment of the 1992 Energy Act and subsequent plumbing fixture legislation and regulations. It is important to generate a demand projection "with the plumbing code" to currently determine the level of efficient fixtures in the service area. For example, the "with the plumbing code" demand takes into account all of the toilets that have been changed from high flush volumes to the more efficient 1.28 gallons per flush model. In addition new homes built since 1992 have these low flow fixtures in them and are added into the housing mix in the model. This is a very important step that is taken to make sure that any water conservation measures undertaken by MMWD that overlap with the effects of the plumbing code are properly accounted for.

Figure 2 below describes how the above listed items are incorporated into the flow of information in the DSS Model.

Figure 2
DSS Model Overview



Graph of Revised Projected Baseline Demands

Figure 3 shows the projection at five-year increments. The graph shows projections for demand with and without the plumbing code through 2030. The upper demand curve closely match those in the Urban Water Management Plan "Past, Current and Projected Water Use" shown in the Water Use Provisions section on page 32. The lower curve reflects the 2014 plumbing code changes described above and is lower than the baseline curve presented in the 2007 report.

Table of Water Demand Projections

Table 2 presents the water demands projection which includes the following:

1. The water demand projections are based on the future population projections.
2. The water demands in 2030 without plumbing code are the same as in the 2005 Urban Water Management Plan.
3. Projections were made *with and without* the plumbing codes.
4. Projections shown in the below table are for potable water only.

The plumbing codes and appliance standards will reduce 2030 demands 2,251 AF/Yr or approximately 6.5 percent (this is an increase of one percent from the 2007 analysis). We include these savings in the overall savings projected for MMWD. Further reductions in demand due to conservation measures are calculated from an end use version of the demands "with plumbing code".

Figure 3
Revised Baseline Average Day Water Use Projections for MMWD Potable System

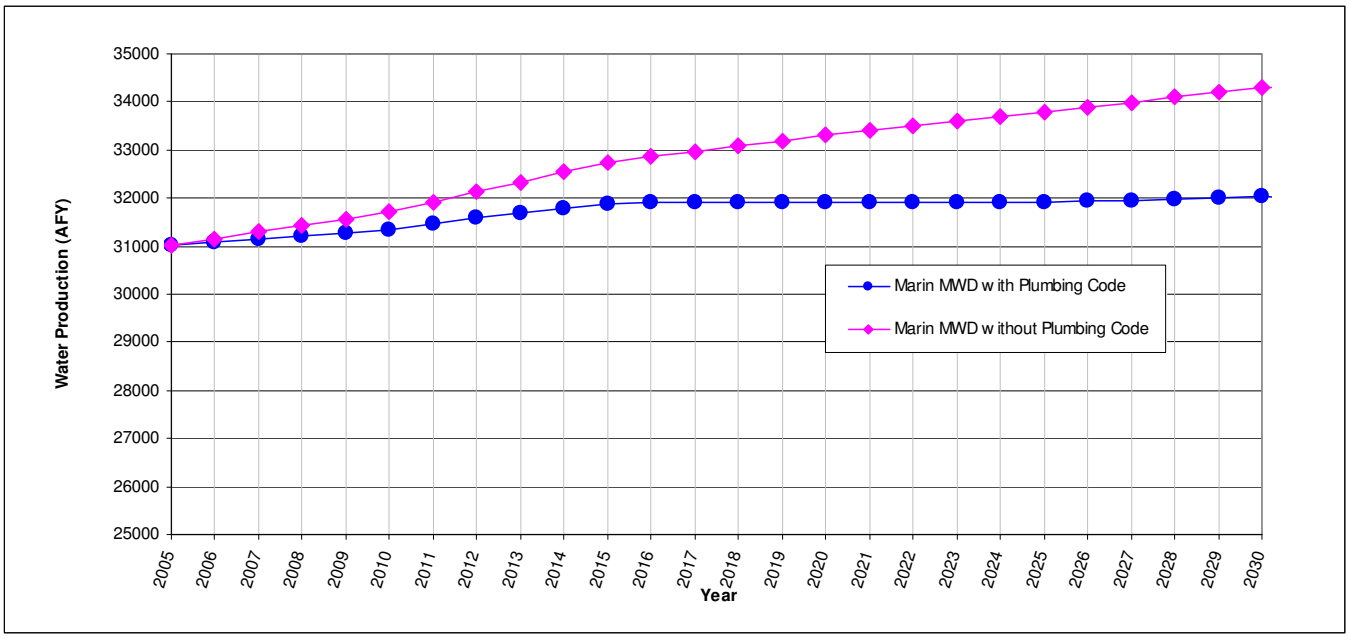


Table 2
Baseline Water Use Projections for MMWD Potable System

Data Source for Projection		Plumbing Code	Water Production, (AF/Yr)*					
Residential	Non-Residential		2005	2010	2015	2020	2025	2030
2005 Urban Water Management Plan	2005 Urban Water Management Plan	Not Included	31,018	31,715	32,752	33,302	33,792	34,293
2005 Urban Water Management Plan	2005 Urban Water Management Plan	Included	31,018	31,341	31,894	31,917	31,920	32,042

*Total Water Production is potable only. Demand without plumbing code; closely match demands in Urban Water Management Plan. Plumbing code included values revised from 2007 report.

3. LEAK DETECTION AND REPAIR WITH AUTOMATED METERING SYSTEM

Maddaus Water Management interviewed MMWD Operations department staff to understand the current leak detection program and learn of any remaining conservation savings potential. MMWD staff provided data and an explanation of the current positions and responsibility of each leak detection crew. During the summer of 2008, there were up to 20 identified leaks that were unable to be repaired due to the lack of staff availability. The service crews are responsible for not only leak repairs but also installation of new services, service up sizing, hydrant installation and repairs.

Figure 5 and Table 4 quantify the past ten year history of unaccounted for water (UFW) at MMWD. UFW is the difference between water produced and water sold, expressed as a percentage of water produced. The low points on the graph of 7.2% and 8.9% were during the

two years MMWD had a proactive leak detection program (meaning that MMWD looked for leaks rather than just repair leaks that were reported). The leak detection program was recently reinstated in the year 2008 following the adoption of the 2007 Marin Municipal Water Conservation Master Plan. In 2008, the two crews have been very successful at identifying and repairing over 700 leaks on the MMWD system saving an estimated 375,000 gallons per day (0.375 mgd). The typical stated industry goal is to have a UFW under 10%. The goal of the MMWD aggressive program will be to reduce UFW below this 10% industry recommended goal.

Figure 5
MMWD 10 year History of Unnaccounted for Water (UFW)

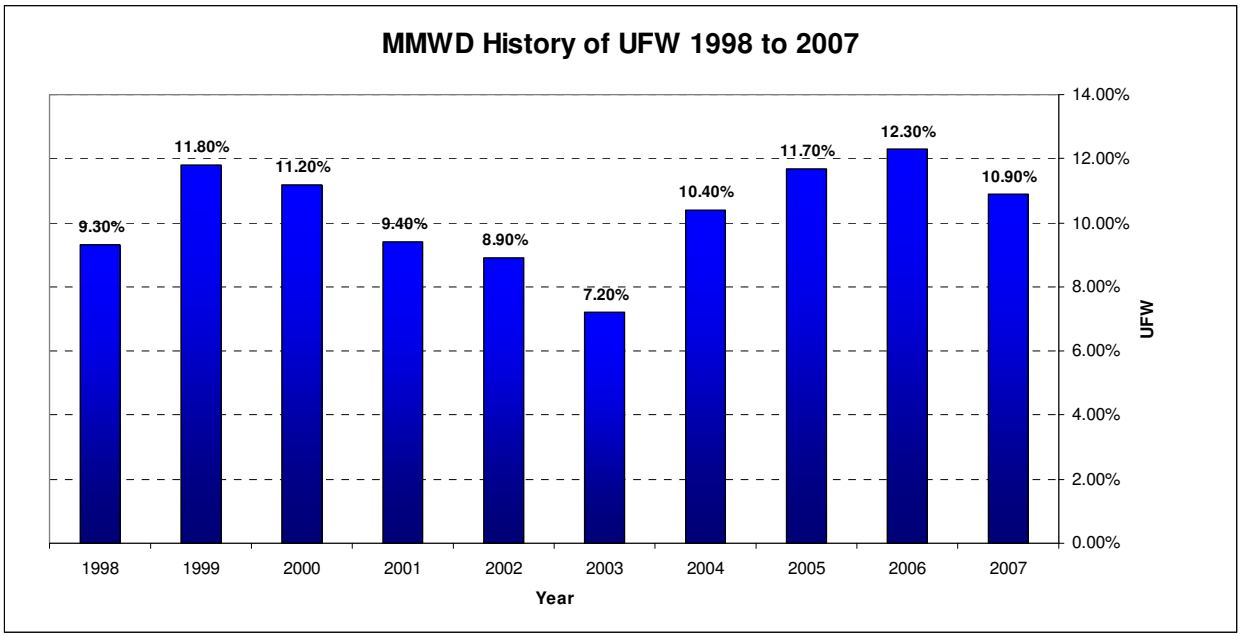


Table 4
MMWD 10 year History of Unnaccounted for Water (UFW)

Year	MMWD UFW
1998	9.30%
1999	11.80%
2000	11.20%
2001	9.40%
2002	8.90%
2003	7.20%
2004	10.40%
2005	11.70%
2006	12.30%
2007	10.90%
Average	**10.3%**

Following multiple discussions and data analysis on UFW as shown above, MMWD staff agreed there is remaining potential water savings if a third crew was hired. This third crew would be dedicated to repair only (rather than sharing their time amongst other activities other than leak repair). The additional staff would allow the repair of leaks in a timely fashion. Currently, with existing crews, leaks are scheduled for repair by severity of the leak and additional work load. At times there can be 5 to 10 leaks waiting for repair, occasionally that number can rise to as high as 15 to 20. With the assistance of the MMWD staff, the following assumptions were created for Program E:

- The savings goal from Program E would be to reduce unaccounted for water from 10.7% as reported in the 2005 MMWD Urban Water Management Plan down to 7.0%. The 7.0% value was just under the actual UFW of 7.2% shown in Table 4 during the year 2003 when MMWD last had a leak detection program.
- Cost of a "dedicated leak repair crew" was provided to MWM and incorporated into the DSS model as Tier 1 - 3 (BMP 3 UFW Reduction). The cost for the additional crew was added to the existing program budget to arrive at a total cost to run the leak detection program with a total of 3 crews. The incremental cost for a leak detection crew was provided by MMWD staff at approximately $145,000 per year. The annual cost includes a crew leader, heavy equipment operator, utility worker, labor worker, small service truck, small dump truck, and small excavator.
- The Leak Detection program would be greatly assisted using the Automated Metering Systems (AMS) described in the next section. The AMS system would enable the detection of more leaks and make it possible to efficiently maintain the 7.0% UFW goal.

4. AUTOMATED METERING SYSTEM (AMS)

Maddaus Water Management interviewed MMWD Operations department staff to understand the feasibility of installing an automated metering system (AMS) for the MMWD service area. An AMS system includes both the meters and the communication hardware and data management software that creates a 2-way "fixed" network between advanced water meter and utility business system. AMS allows the automated collection and distribution of information to both customers and the utility.

A previous study on automatic metering systems was completed on September 5, 2007. The study reviewed the 57,300 meters in service (report quoted number of meters in 2007, current meter total in 2009 is closer to 62,000 to 65,000) and concluded the meter accuracy of the system was between 93.88% and 96.66%. This meter inaccuracy may cost MMWD between $1.2 million and $2.2 million per year in lost revenue. However, the AMS system is very expensive and according to the 2007 estimate will cost MMWD approximately $19.6[1] million dollars.

MMWD has not yet made a decision on the AMS system, specifically the exact installation date and cost of the system that would be assigned to the conservation department. Therefore, the exact direct cost was excluded from this conservation technical analysis except to run a few hypothetical

[1] $19.6 Million cost for the AMS system was provide by MMWD and generated in 2007 by Mountain States Pipe and Supply, representing U.S. Metering and Technology. Cost elements include MMWD staff time, overhead and indirect costs, CEQA, reporting, etc.

scenarios to determine approximate cost / benefit ratios and cost of water saved. At the request of MMWD, two scenarios were considered, a 20% and a 40% cost sharing for the conservation department (For example, the conservation department would fund 20% of the entire cost of the AMS system). These scenarios are examples only, and not the actual costs of AMS assigned to conservation department.

For these two scenarios it was assumed there would be a 3 year installation period starting in the year 2012 and concluding at the end of the year 2014. The total cost of the AMS system provided by MMWD was approximately $19.6 Million as discussed earlier in this section. As shown in Table 10, using the assumed parameters, the cost of Program E with a 20% cost share of AMS would have a cost of water saved of $467 / AF. The present value cost of the entire program would be $47 Million. Similarly using these assumed parameters, the cost of Program E with a 40% cost of AMS would have a cost of water saved of $498 / AF. The present value cost of the entire program would be $50 Million.

A few of the key benefits of the AMS system (that pertain to water conservation) listed in the MMWD study are the following:

1. Real-time usage and monthly billing: Current billing on 30-60 day cycles do not allow for customers to judge their individual water conservation efforts until after the billing cycle (60 days later). In-home remote meter readouts would allow consumers to see their actual usage. By providing multiple reads per day and posting the reads to the web on a daily basis, both the consumer and MMWD would be able to track conservation efforts such as a repair of a customer leak, or a change out to efficient equipment in real-time.
2. Customer Large Water Leaks Written Off / Forgiven: With an AMS system, thresholds for unusual usage can be individually set, and will alert MMWD immediately. MMWD can be proactive in notifying the customers or dispatching a crew to avoid having to write off revenue as a result of the water leak. The faster response at catching leaks early will help to reduce the UFW as discussed above in Section 3.
3. Enhanced residential, commercial and landscape surveys and water budgets: The AMS system will enable staff to target customers for surveys that appear to have leaks on their property and/or use excessive amounts of water for irrigation or other purposes that could be reduced by better water management. The surveys will show customers how they can save money on their water bill, enhancing their participation over conventional surveys without AMS.

The 2007 AMS Study authors and MMWD Operations department staff recommended a pilot project to determine if the system is feasible for the service area. It was recommended to do a residential area distant from MMWD headquarters (possibly Fairfax or Woodacre) that could be monitored closely. This small system could be tested to ensure customer satisfaction, accuracy in data collection, and integrity with hilly terrain (MMWD service area has approximately 40% of its service area in hilly areas). If it is concluded the pilot test is successful, then MMWD staff would recommend a three year meter and infrastructure installation program.

MWM was directed by MMWD staff to incorporate this system into Program E measures starting in the year 2015, to allow system tests and ensure the system is fully functional. Thus implementation of Program E requires an AMS system to be fully functional by 2015. The

individual conservation measures in Program E that benefit from the AMS system are BMP 1a and BMP 1b, Residential surveys (allows the conservation staff to target homes with existing leaks for surveys, BMP 3 Leak Detection as described above, BMP 5a water budgets can help with the aid of increased meter accuracy, BMP 9 commercial surveys (again allows conservation to target businesses that already appear to have a leak for a water survey), and Tier 2-10 AMS installation and customer leak notification.

5. COMPARISON OF INDIVIDUAL CONSERVATION MEASURES

Perspectives on Benefits and Costs

The determination of the economic feasibility of water conservation programs depends on comparing the costs of the programs to the benefits provided. The analysis was performed using the DSS model. The DSS model calculates savings at the end-use level; for example, the model determines the amount of water a toilet rebate program saves in daily toilet use for each single family account. For this evaluation, benefits are based the avoided costs of developing new sources of imported water for Marin Municipal Water District estimated to cost about $1,631 per acre-foot[2]. At the request of MMWD, this cost of water was not changed for the 2009 Conservation Technical Analysis. The following text is included from the 2007 report to help the reader recall the methods used in the previous study. Similar methods were used for in 2009 analysis.

Present value analysis is used to discount costs and benefits to the base year. From this analysis benefit-cost ratios of each measure are computed. When measures are put together in programs the interactions are accounted for by multiplying water use reduction factors together at the end use level. A water use reduction factor is 1.0 minus the water savings, expressed as a decimal. This avoids double counting when more than one measure acts to reduce the same end use of water.

Benefit-cost analysis can be performed from several different perspectives, based on who is affected. For planning water conservation programs for utilities, the perspectives most commonly used for benefit-cost analyses include the utility and the community. The "utility" benefit-cost analysis is based on the benefits and costs to the water provider. The "community" benefit-cost analysis includes the utility benefit and costs together with account owner/customer benefits and costs. These include customer energy benefits and costs of implementing the measure, beyond what the utility pays.

The utility perspective offers two advantages for this analysis. First, it considers only the program costs that will be directly borne by the utility. This enables the utility to fairly compare potential investments for saving and supplying water. Second, because revenue shifts are treated as transfer payments, the analysis is not complicated with uncertainties associated with long-term rate projections and retail rate design assumptions. Revenue reductions, as a result of reduced water sales due conservation will be predictable and can be accommodated by adjusting utility water rates over time, as is current MMWD practice. Because it is the water provider's role in developing a conservation plan that is paramount in this study, the utility perspective was primarily used to evaluate elements of the plan.

[2] Daniel Carney, Marin Municipal Water District, December 2006

No evaluation perspectives are without shortcomings. The principal weakness of the utility perspective is that it does not count the benefits accrued or costs incurred outside of the utility. Therefore another perspective is also used – the community perspective. The community perspective is defined to include the utility costs and benefits and the customer costs and benefits. Costs incurred by customers striving to save water while participating in conservation programs are considered, as well as the benefits received in terms of reduced energy bills (from water heating costs). Other factors external to the utility, such as environmental effects, are not included in the benefit-cost analysis. Because these external factors are often difficult to quantify, they are frequently excluded from economic analyses, including this one.

Present Value Parameters

The time value of money is explicitly considered. The value of all future costs and benefits is discounted to 2005 (the base year) at the real interest rate of 3.0%. The DSS model calculates this real interest rate, adjusting the current nominal interest rate (assumed to be approximately 6.1%) by the assumed rate of inflation (3.0%). Cash flows discounted at 3 percent are herein referred to as "Present Value" sums.

Assumptions about Costs

Costs were determined for each of the measures based on industry knowledge, past experience and data provided by MMWD. Costs may include incentive costs, usually determined on a per-participant basis; fixed costs, such as marketing; variable costs, such as the costs to staff the measures and to obtain and maintain equipment; and a one-time set-up cost. The set-up cost is for measure design by staff or consultants, any required pilot testing, and preparation of materials that will be used in marketing the measure. Measure costs were estimated for each year between 2005 and 2030. Costs were spread over the time period depending on the length of the implementation period for the measure.

Lost revenue due to reduced water sales is not included as a cost because the conservation measures evaluated herein generally take effect over a span of time that is sufficient to enable timely rate adjustments, if necessary, to meet fixed cost obligations.

Water Savings

Data necessary to forecast water savings of measures include specific data on water use, demographics, market penetration, and unit water savings. Savings normally develop at a measured and predetermined pace, reaching full maturity after the target market penetration is achieved. This may occur three to ten years after the start of implementation, depending upon the implementation schedule.

Conservation Measures Evaluated with the DSS Model

Upon inspection of the overall list of new measures it became apparent that some measures could be combined and others could be separated into two categories as follows:

- Measures that were voluntary and incentive based
- Measures that were regulatory and applied to new development only

This division was used to create two lists of measures that could be evaluated separately. Tier Two targets various types of customers and offers a range of incentives to enhance participation. New Development measures were targeted at single family homes (including town homes and

condos), apartments and non-residential accounts as this category represents the largest category of new development with the most water savings potential.

Table 5 summarizes the 10 Tier One measures, 10 Tier Two measures, and 11 New Development measures evaluated in the DSS Model for Program E. The measure package was specifically designed to illustrate an increasing level of water savings for MMWD.

The program is not intended to be rigid programs but rather to demonstrate the range in saving that could be generated if selected measures were run together. In this step we account for the overlap in water savings (and benefits) and estimate combined savings and benefits from programs or packages of measures.

Program E

Program E builds on Program D and contains all Program D measures plus a revised unaccounted for water program and enhanced measures using AMS. Program E includes all 31 analyzed conservation measures at high market penetrations of 30 to 50 percent range except for the New Development measures which are at 100% market penetration as they are ordinances for all new development. Note that some measures are listed in two parts due the addition of AMS; the market penetration range of 30 to 50 percent is obtained by adding the two measures together (for example Tier 1a with and without AMS). Measures without AMS would be implemented until about 2015 when the AMS system is planned to be available and then these measures would be replaced by measures using AMS. Also note that measures that either saved a small amount of water or were not cost-effective (Benefit-Cost ratio less than 1.0 and a high cost of water saved) were included here so as to represent the highest water savings based on the all measures analyzed. Some of the Tier Two measures are small programs in that the target number of accounts is very small. Even though they appear to be relatively expensive from a measure point of view, their impact on the overall program costs and savings is relatively minor.

Table 5
Conservation Measures Included in Program E, Descriptions and Changes Made to Measures for Program E Only

Description of Conservation Activity	Measure Number	Target Customer Category	Measure Description
BMP 1a - Residential Water Surveys-Indoor	Tier 1 - 1	SF, CONDO, MF	This is the indoor component of indoor and outdoor water surveys for existing single-family and multifamily residential customers. Normally those with high water use are targeted and a customized report is provided to homeowner. Assumes program will switch to using the AMS system in the year 2015.
BMP 1b - Residential Water Surveys-Outdoor	Tier 1 - 2	SF, CONDO, MF	This is the outdoor component of indoor and outdoor water surveys for existing single-family and multifamily residential customers. Normally those with high water use are targeted and a customized report is provided to homeowner. Assumes program will switch to using the AMS system in the year 2015.

Description of Conservation Activity	Measure Number	Target Customer Category	Measure Description
BMP 3 - UFW Reduction 3.7%	Tier 1 - 3	SYSTEM	MMWD will hire a 3rd Leak detection and repair crew to increase efforts to find and repair leaks in the distribution system and take other actions (such as meter replacement) to reduce water losses. A ten year program to reduce unaccounted for water from 10.7 to as low as 7.0 percent (variable) is proposed for this measure. (This effort is greater than Program D which had a 3.0% UFW reduction down to 7.7 percent)
BMP 5a - Landscape Water Budgets	Tier 1 - 4	IRR	90% - 100% of all irrigators of landscapes with separate irrigation accounts would receive a monthly or bi-monthly irrigation water use budget. Assumes program will switch to using the AMS system in the year 2015.
BMP 5b – Large Landscape Conservation Audits	Tier 1 - 5	COM, INS	All public and private irrigators of landscapes larger than one acre would be eligible for free landscape water audits upon request.
BMP 6 - Washing Machine Rebate	Tier 1 - 6	SF, CONDO	Homeowners would be eligible to receive a rebate on a new water efficient clothes washer. Water savings have been increased to account for more efficient machines available on the market. Assume MMWD will rebate highest efficiency machines. Program E extends washer rebates to the year 2015 with a goal of 1,400 washers per year. (Program D concludes the washer rebate program in the year 2010).
BMP 7 – Public Information	Tier 1 - 7	SF, CONDO	Public education would be used to raise awareness of conservation measures available to customers. Programs could include poster contests, speakers to community groups, radio and television time, and printed educational material such as bill inserts, etc.
BMP 9 - Commercial Water Audits	Tier 1- 8	COM, INS	High water use accounts would be offered a free water audit that would evaluate ways for the business to save water and money. Assumes program will switch to using the AMS system in the year 2015.
BMP 14 – ULF Toilet Ordinance- Single Family	Tier 1- 9	SF	Homeowners would be required to replace an existing high volume toilet with a 1.6 gallon per flush efficient toilet when the name on the water account changes. Program concluded in the year 2007 and was replaced with a HET rebate program (See measure Tier 2-3), but savings continue from toilets replaced due to the ordinance for the life of the toilet. DSS Model only has program active for the years 2006 and 2007.
BMP 14 – ULF Toilet Ordinance- Multifamily	Tier 1- 10	MF	Homeowners would be required to replace an existing high volume toilet with a 1.6 gallon per flush efficient toilet the when name on water account changes. Program concluded in the year 2007 and was replaced with an HET direct install program for RMF customers (See measure Tier 2-3), but savings continue from toilets replaced due to the ordinance for the life of the toilet.

Description of Conservation Activity	Measure Number	Target Customer Category	Measure Description
			DSS Model only has program active for the years 2006 and 2007.
Rain Sensor Retrofit	Tier 2 - 1	SF, Condo	Agency pays for the $40 rain sensor; homeowner has the option to pay for installation ($35). Program start date changed to 2009 (was originally 2008) and extended 3 years to the year 2015 (Program D concluded in the year 2012).
San Quentin Toilets	Tier 2 - 2	Existing Customers CII	Toilet replacement at San Quentin. Replace a total of 1,000 toilets over 5 years. Entire program cost and administration was provided by the prison. Current completion date is sooner than planned and will finish in the year 2009 (Program D concluded in the year 2017).
Residential High Efficiency Toilet Rebates	Tier 2 - 3a	SF, CONDO	Provide an average of a $200 rebate or voucher for the installation of a high efficiency toilet (HET). Program will start with a rebate of $250, and then decrease to $150 per toilet by the end of the program. HETs are defined as any toilet to flush 20% less than ULFTs and include dual flush technology. Rebate amounts would reflect the incremental purchase cost. Program was extended three years to conclude in the year 2019.
CII High Efficiency Toilets Rebates and Direct Install	Tier 2 - 3b	Existing Customers: MF & COM, INS	Provide a $200 rebate or $300 direct installation of a high efficiency toilet (HET). Costs assume MMWD will use a contractor for this particular program. HETs are defined as any toilet to flush 20% less than ULFTs and include dual flush technology. Rebate amounts would reflect the incremental purchase cost. Program began in the year 2008 and planned to continue until the year 2018.
Homeowner Landscape Classes Intensive	Tier 2 - 4	Existing Customers: SF & CONDO	Sponsor classes at stores where irrigation equipment is sold or other suitable venues on selection and installation of efficient plant material and irrigation equipment (drip irrigation, smart controllers, low volume sprinklers, etc.). This program began in 2008 and is currently known as the Bay Friendly Landscape Program.
Coin-Op Washer Rebate	Tier 2 - 5	Existing Customers: MF	Provide a $400 rebate for efficient coin-op washing machines to existing apartment complexes over a certain size with a common laundry room.
Financial Incentives/ Rebates for Irrigation Upgrades	Tier 2 - 6	Existing Customers SF, CONDO, MF, CII, IRR	For SF, CONDO, MF, CII, and IRR customers with landscape, provide for rebates towards the purchase and installation of selected types of irrigation equipment upgrade including low volume sprinkler heads, check valves, smart irrigation controllers, low water use plants, food producing plants, gray water and rain catchment systems. Rebate is up to $350 for residential accounts and up to $650 for mixed use accounts and up to $3,500 for dedicated irrigation accounts. Assume average rebate claimed equates to $1,500 for non-Residential accounts.

Description of Conservation Activity	Measure Number	Target Customer Category	Measure Description
Hotel Retrofit 60% Market Penetration	Tier 2 - 7	Existing Customers: COM	Following a free water audit, offer the hotel a rebate for equipment identified that would save water. Provide a rebate schedule for certain efficient equipment such as air-cooled ice machines, steamers, washers, cooling towers, and spray rinse valves.
CII Rebates to Replace Inefficient Equipment	Tier 2 - 8	Existing Customers: CII	Provide a rebate for a standard list of water efficient equipment. Included would be x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, and add conductivity meters on cooling.
Existing Commercial Urinals Intensive	Tier 2 - 9	Existing Customers: COM	Rebate increased to $400 for existing buildings to encourage installation of 0.5 gal/flush urinals rather than the current standard of 1.0 gal/flush models. The $400 cost assumes some drain line height changes are required.
Customer notification through AMS System	Tier 2 - 10	ALL	Install AMS system throughout the entire service area by 2015. Use the system to automatically and electronically notify customers of the presence of a leak on their property. Assign one MMWD full-time staff person equivalent to perform email and telephone follow-up until leaks are repaired.
Require Rain Sensors	ND-1	New Customers: SF, CONDO, MF, COM, INS	Require-sensor or rain shut off devices with all new automatic irrigation system installations on new homes and buildings. Ordinance start year changed from 2008 to 2009. Ordinance assumed to be initiated on July 1, 2009.
Smart Irrigation Controller	ND-2	New Customers: SF, CONDO, MF, COM, INS	Require developers to provide the latest state of the art SMART irrigation controllers. These SMART controllers have on-site temperature sensors or rely on a signal from a central weather station that modifies irrigation times at least weekly. Ordinance start year changed from 2008 to 2009. Ordinance assumed to be initiated on July 1, 2009.
High Efficiency Toilets	ND-3	New Customers: SF, CONDO, MF, COM, INS	Require developers to install a high efficiency toilet (HET). HET are defined as any toilet to flush 20% less than an ULFT and include dual flush technology. Ordinance start year changed from 2008 to 2009. Ordinance assumed to be initiated on July 1, 2009.
Dishwasher New Efficient	ND-4	New Customers: SF, CONDO, MF, COM, INS	Require developers to install an efficient dishwasher (meeting certain water efficiency standards, such as gallons/load). Ordinance start year changed from 2008 to 2009. Ordinance assumed to be initiated on July 1, 2009.
Clothes Washing Machine Requirement	ND-5	New Customers: SF, CONDO, MF, COM, INS	Building departments would be responsible to ensure that an efficient washer was installed before new home or building occupancy. Ordinance start year changed from 2008 to 2009. Ordinance assumed to be initiated on July 1, 2009.

Description of Conservation Activity	Measure Number	Target Customer Category	Measure Description
Hot Water on Demand	ND-6	New Customers: SF, CONDO, MF, COM, INS	Require developers to equip new homes or buildings with a hot water on demand system such as those made by Metland Systems and others. These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to the water heater. Ordinance start year changed from 2008 to 2009. Ordinance assumed to be initiated on July 1, 2009.
High Efficiency Faucets and Showerheads	ND-7	New Customers: SF, CONDO, RMF, COM, INS	Require developers to install lavatory faucets that flow at no more than 1.5 gpm, kitchen faucets at 2.2 gpm, showerheads at 2.0 gpm Ordinance start year changed from 2008 to 2009. Ordinance assumed to be initiated on July 1, 2009.
Landscape and Irrigation Requirements	ND-8	New Customers: SF, CONDO, MF, COM, INS	Enforce a regulation that specifies that new homes or buildings be landscaped according to Bay Friendly Landscape principals, with appropriate irrigation systems. (Combines with Smart Controller listed above). Goal is overall 25% in irrigation water use (measure ND-2 and ND-9 combined). Ordinance start year changed from 2008 to 2009. Ordinance assumed to be initiated on July 1, 2009.
MultiFamily Submetering	ND-9	New Customers: MF	Require all new multi-family units to provide sub-meters on individual units. To help reduce financial impacts on tenants, regulations would be adopted that specify acceptable methods of metering and billing. Ordinance start year changed from 2008 to 2009. Ordinance assumed to be initiated on July 1, 2009.
New CII Equipment	ND-10	New Customers: CII	Offer reduced water and sewer connection fees to new facilities to install water efficient equipment in new facilities that goes above and beyond the building code requirements. Model program after Santa Rosa's BAT program. Ordinance start year changed from 2008 to 2009. Ordinance assumed to be initiated on July 1, 2009.
0.5 gal/flush Urinals in New Buildings	ND-11	New Customers: CII	Require that new buildings be fitted with 0.5 gpf urinals rather than the current standard of 1.0-gal/flush models. Ordinance start year changed from 2008 to 2009. Ordinance assumed to be initiated on July 1, 2009.

*Measures BMP 1a, 1b, 5a, 5b, 14, and Tier 2 3a and 3b, 5a and 5b are all counted as individual measures. These measures were split for more accurate evaluation.

Notes: ND = New Development.
T2 = Tier Two
MF = Residential Multi Family greater than 5 units
CII = Commercial/Industrial/Institutional
T1 = Tier One
SF = Residential Single Family
CONDO = Residential Duplexes and 3 or 4 units
IRR = Dedicated irrigation meters

Measure Assumptions, Unit Costs, Market Penetration

Attachment 1 summarizes all the water savings and cost assumptions for each measure in Program E for MMWD. Do note that the unit costs vary according to the type of account being addressed. For example, a measure might cost a different amount for a residential single family account, than a residential multifamily account.

Comparison of Individual Measures

Tables 6 through 8 present results of conservation measure evaluation for Marin Municipal Water District. Table 6 presents results for Tier One, Table 7 presents results for Tier Two and Table 8 presents results of New Development measures going forward from 2009.

These tables show how much water the measures would save on a 30-year average basis, how much they would cost and what the benefit-cost ratios are *if the measures were run on a stand-alone basis, i.e. without interaction or overlap from other measures that might address the same end use(s).* Note that measures with benefit-cost ratios less than 1.0 are defined to be "not cost-effective". Water savings are shown for 2025. Other key statistics are the cost of water saved in dollars per acre foot ($/AF), and the benefit-cost ratios. Benefits and costs are defined below:

- *Utility benefits and costs:* those benefits and costs that the utility would receive or spend.
- *Community benefits and costs:* community benefits equal utility benefits plus customer energy (cost to heat water) benefits. It is assumed hot water is heated 71 percent by natural gas and 20 percent by electricity and 9 percent by other means. PG&E 2009 residential retail rates are used to compute benefits of customer hot water savings. Community costs include utility and customer costs to implement measures.
- *Water Benefits:* based on the cost of not providing additional water for MMWD.
- *Costs for the utility:* include measure set-up, annual administration, and payment of rebates or purchase of devices or services as specified in the measure design.
- *Customer costs:* include costs of implementing the measure and maintaining its effectiveness over the life of the measure.
- *2025 water savings:* measure average water savings achieved by 2025. It is useful in comparing the relative water savings of the various measures.
- *First 5-year utility cost is the total money needed by MMWD to sponsor the program for the first 5 years.* Included would be the cost of incentives, contracts, materials and utility staff. Annual costs may be approximated by dividing the numbers by five.

NOTE: Individual measure water savings are not additive in Tables 6 through 8 due to measure overlap.

The column headings in Tables 6 through 8 are defined as follows:

- *Water Utility Benefit-Cost Ratio = NPV of Utility of Benefits (based on reduced imported water) divided by NPV of Utility Costs (see above)*
- *Total Community Benefit-Cost Ratio = NPV of Utility Benefits plus Customer Benefits (see above) divided by NPV of Utility plus Customer Costs (see above) where NPV = 30 year present value of annual costs discounted at 3 percent*

- *2025 Water Savings (AFY) = measure average water savings (AF/Yr) where AF/Yr =acre feet per year*
- *Cost of Savings per Unit Volume ($/AF) = NPV of Utility Costs divided by 30-year Average Water Savings * 365 where AF = acre feet*
- *Five Years of Utility Costs (2009-2013) = sum of annual costs for period shown, undiscounted. Note some programs do not start until 2015.*
- *Five Years of Community Costs (2009-2013) = sum of annual costs for period shown, undiscounted. Note some programs do not start until 2015.*

From Tables 6 through 8 the following observations can be made:

- The most cost-effective Tier One measure is the landscape water budgets.
- The most cost-effective Tier Two measure is the San Quentin Toilets, from the utility perspective as there was not direct cost for the program (the entire program was financed and managed by the prison). When the customer costs are considered, as with the community benefit-cost ratio the measure still remains attractive.
- The most cost-effective New Development measures are the High Efficiency Toilets for all new buildings, from the utility perspective.
- For Tier Two conservation the high efficiency toilets, urinals, and landscape and irrigation requirements have low community benefit-cost ratios (which is less than one). This is due to the fact that the rebates for hardware are expensive compared to other programs.
- Eight out of ten Tier One measures, Eight out of ten Tier Two measures, and all eleven of the New Development measures are cost effective from the utility perspective. In total, 27 of the 31 measures evaluated are cost-effective from the total community perspective.
- Eight out of ten of the Tier One measures, six out of ten of the Tier Two measures and six out of eleven of the New Development measures are cost effective from the community perspective, indicating that all other measures have relatively high customer costs. In total, 20 of the 31 measures evaluated are cost-effective from the total community perspective.

Table 6
Tier One Conservation Measure Costs and Savings

Tier One Conservation Measure		Water Utility Benefit-Cost Ratio	Total Commun-ity Benefit-Cost Ratio	2025 Water Savings (AF/Yr)	Cost of Savings per Unit Volume ($/AF)	Five Year Utility Cost 2009 - 2013 Utility Cost ($)	Five Year Utility Cost 2009 - 2013 Total Community Cost ($)
T1-1	BMP 1a Residential Water Surveys-Indoor without AMS	0.79	1.44	NA	$1,648	$451,114	$481,188
	BMP 1a Residential Water Surveys-Indoor with AMS	1.22	2.22	89.1	$710	Program begins in year 2015	Program begins in year 2015
T1-2	BMP 1b Residential Water Surveys-Outdoor without AMS	0.84	0.81	0.0	$1,542	$439,147	$453,786
	BMP 1b Residential Water Surveys-Outdoor with AMS	1.27	1.23	92.8	$678	Program begins in year 2015	Program begins in year 2015
T1-3	BMP 3 UFW Reduction 3.7%	4.16	4.16	1147.0	$244	$2,191,147	$2,191,147
T1-4	BMP 5a Landscape Water Budgets without AMS	6.79	6.79	NA	$182	$272,997	$272,997
	BMP 5a Landscape Water Budgets with AMS	9.72	9.72	395.9	$88	Program begins in year 2015	Program begins in year 2015
T1-5	BMP 5b Large Landscape Conservation Audits	0.57	0.17	2.4	$1,766	$27,208	$89,995
T1-6	BMP 6 Washing Machine Rebate	5.93	8.31	214.6	$172	$431,656	$962,924
T1-7	BMP 7 Public Information	1.58	2.52	155.0	$672	$798,180	$798,180
T1-8	BMP 9 Commercial Water Audits Without AMS	1.95	0.91	90.6	$511	$784,459	$2,353,377
	BMP 9 Commercial Water Audits With AMS	1.44	0.65	190.1	$572	Program begins in year 2015	Program begins in year 2015
T1-9	BMP 14 ULF Toilet Ordinance-Single Family	76.56	38.28	58.0	$15	Program ended in year 2007	Program ended in year 2007
T1-10	BMP 14 ULF Toilet Ordinance-Multifamily	204.52	102.26	19.9	$5	Program ended in year 2007	Program ended in year 2007

Table 7
Tier Two Conservation Measure Costs and Savings

Tier Two Conservation Measure		Water Utility Benefit-Cost Ratio	Total Commun-ity Benefit-Cost Ratio	2025 Water Savings (AF/Yr)	Cost of Savings per Unit Volume ($/AF)	Five Year Utility Cost 2009 - 2013 Utility Cost ($)	Five Year Utility Cost 2009 - 2013 Total Community Cost ($)
T2-1	Rain Sensor Retrofit	2.82	1.54	No savings in 2025 due to measure life of 10 years	$413	$227,618	$417,300
T2-2	San Quentin Toilets	No Utility Cost	7.21	72.9	No Utility Cost	No Utility Cost	$250,000
T2-3a	Residential High Efficiency Toilet Rebates	0.83	0.45	263.4	$1,188	$3,608,402	$6,629,808
T2-3b	CII High Efficiency Toilets Rebates and Direct Install	1.91	1.91	227.3	$507	$1,399,277	$1,399,277
T2-4	Homeowner Landscape Classes Intensive	4.89	0.16	29.6	$197	$85,139	$2,639,316
T2-5	Coin-Op Washer Rebate	3.54	5.54	43.8	$278	$184,595	$369,190
T2-6	Financial Incentives/ Rebates for Irrigation Upgrades	0.59	0.25	489.5	$1,563	$4,687,613	$12,013,551
T2-7	Hotel Retrofit 60% Market Penetration	10.95	7.28	56.5	$85	$43,892	$114,120
T2-8	CII Rebates to Replace Inefficient Equipment	3.29	1.30	29.4	$283	$76,080	$193,126
T2-9	Existing Commercial Urinals Intensive	0.65	0.53	22.5	$1,484	$240,128	$292,903
T2-10	Customer notification through AMS System	1.43	0.14	103.6	$611	Program begins in year 2015	Program begins in year 2015

Table 8
New Development Conservation Measure Costs and Savings

New Development Conservation Measure		Water Utility Benefit-Cost Ratio	Total Commun-ity Benefit-Cost Ratio	2025 Water Savings (AF/Yr)	Cost of Savings per Unit Volume ($/AF)	Five Year Utility Cost 2009 - 2013 Utility Cost ($)	Five Year Utility Cost 2009 - 2013 Total Community Cost ($)
ND-1	Rain-sensor shut off device on irrigation controllers	17.00	3.40	41.9	$53	$22,331	$111,654
ND-2	Smart Irrigation Controller	25.14	0.67	69.9	$36	$25,170	$940,459
ND-3	High Efficiency Toilet (HET)	51.83	0.94	65.8	$19	$25,170	$1,390,822
ND-4	Dishwasher New Efficient	4.56	0.81	12.7	$200	$25,170	$757,402
ND-5	Clothes washing machines requirement for new residential	32.62	2.73	89.6	$28	$25,061	$936,371
ND-6	Hot Water on Demand	27.40	1.13	69.6	$33	$23,005	$1,194,153
ND-7	High efficiency faucets and showerheads	22.55	7.62	62.6	$40	$25,170	$179,397
ND-8	Landscape and irrigation requirements	17.59	0.08	48.9	$52	$25,170	$5,516,904
ND-9	MultiFamily Submetering	43.42	10.00	26.2	$21	$5,534	$49,810
ND-10	New CII Equipment	24.86	5.02	36.3	$37	$13,241	$119,172
ND-11	0.5 gal/flush urinals in new buildings	4.33	0.59	6.0	$217	$13,186	$97,573

6. RESULTS OF CONSERVATION PROGRAM EVALUATION

Figure 6 shows annual average water savings for the revised plumbing code and Programs D and Program E for the years 2005 to 2030.

Figure 6
Conservation Measure Programs - Annual Water Conservation Savings

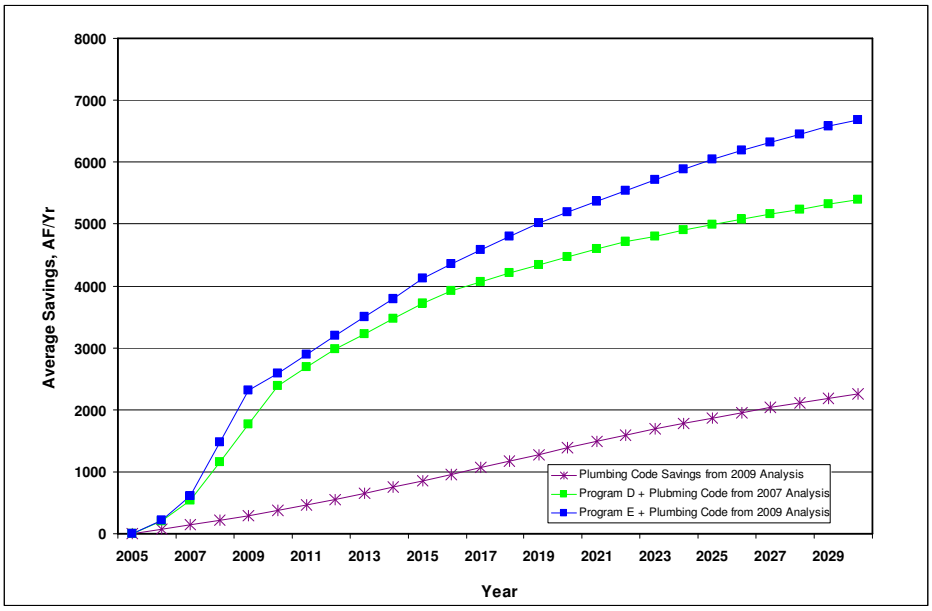


Table 9 and 10 present key evaluation statistics compiled from the DSS model. Assuming all measures are successfully implemented, projected water savings for 2015 and 2030 in acre-feet are shown, as are the costs of achieving this reduction. Table 9 excludes the $19.6 Million cost of installing AMS. Table 10 shows two hypothetical scenarios of a 20% and 40% cost share allocated to the conservation department of installing AMS.

The costs are expressed three ways.

1. Total present value over the 30-year period,
2. The money utilities would need to budget in the first five years (2009-2013) to get new programs underway,
3. The cost of water saved. These costs include costs to complete Tier One measures, as needed. Cost of water saved is presented two ways, just for the utility and for the community (customer plus utility).

These cost parameters are derived from the annual time stream of utility, customer and community costs. The annual costs for Program E are shown in Attachment 2 for three scenarios, without the cost of the AMS system, 20% cost share of the AMS system, and 40% cost share of the AMS system by the conservation department.

The water savings are expressed as a percentage of the projected 2030 demand. The last column indicates the percentage of the new water demand for 2030 that each program could fill. The new water needed by new customers over the next 25 years is the difference between 2005 demand of 31,018 AF/Yr and 2030 demand 32,042 AF/Yr with the plumbing code. The new water needed for MMWD by 2030 is 1,024 AF/Yr (Water needed for new development is for the years 2005 to 2030 which covered the entire study period).

Table 9
Comparison of Long-Term Conservation Programs - Costs and Savings
Without the Cost of the Installation of the AMS System

Conservation Program	Water Utility Benefit-Cost Ratio	2015 Water Savings (AF/Yr)	2025 Water Savings (AF/Yr)	2030 Water Savings (AF/Yr)	2030 Indoor Water Savings (AF/Yr)	2030 Outdoor Water Savings (AF/Yr)	Total Water Savings as a % of Total Production in 2030*	Present Value of Water Utility Costs ($1,000s)	Present Value of Customer Costs ($1,000s)	Present Value of Community Costs ($1,000s)	Five Year Utility Cost 2009-2013 ($1,000s)	Utility Cost of Water Saved ($/AF)	Community Cost of Water Saved ($/AF)	% of Water Needed for New Development (2005 to 2030)
Plumbing Code	NA	858	1,872	2,251	2,251	NA	7.0%	NA	NA	NA	NA	NA	NA	68.7%
Program E	2.22	3,389	4,175	4,302	2,940	1,362	13.5%	$ 43,655	$ 72,463	$ 116,117	$ 15,526	$ 437	$ 1,163	131.4%
Plumbing Code + Program E	2.22	4,247	6,047	6,553	5,191	1,362	20.5%	$ 43,655	$ 72,463	$ 116,117	$ 15,526	$ 437	$ 1,163	200.1%

Notes:

- Present Value is determined using an interest rate of 3%
- Cost of water saved is present value of water utility cost divided by total 30-year water savings.
- Five Year Cost for all above programs is 2009 to 2013
- * % of water saved refers to the demand with the plumbing code
- Community Cost = Customer Cost plus Utility Cost

Table 10
Comparison of Program E Long-Term Conservation Programs
AMS with Cost share of 20% and 40%

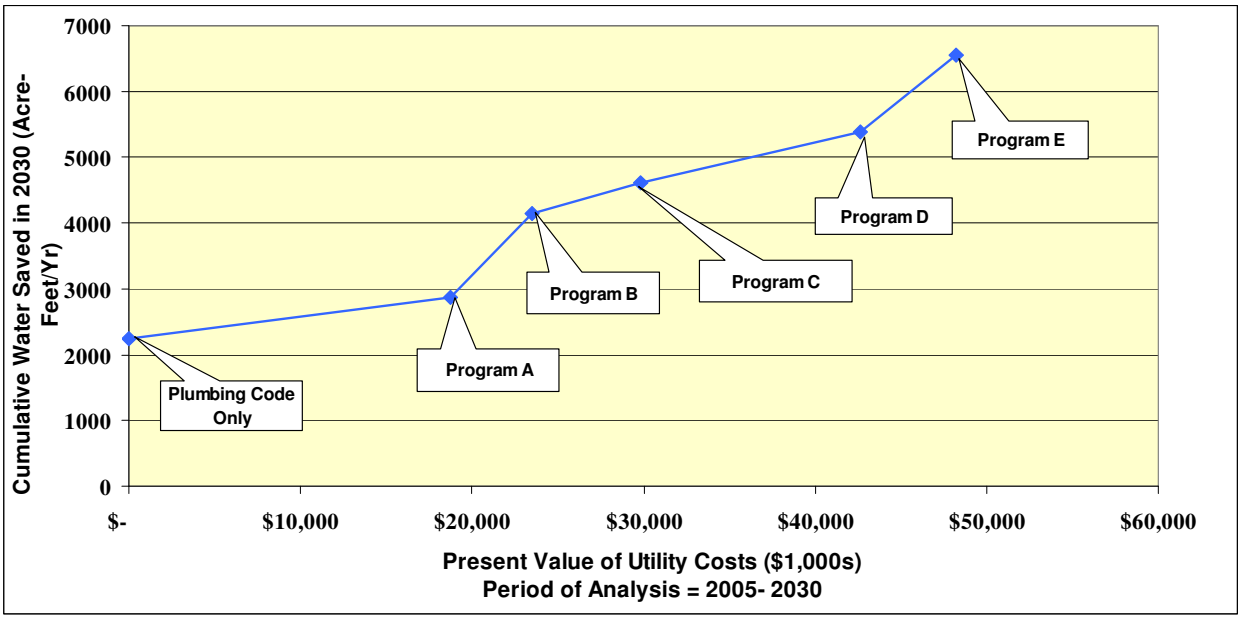
Conservation Program	Water Utility Benefit-Cost Ratio	Present Value of Water Utility Costs ($1,000s)	Present Value of Customer Costs ($1,000s)	Present Value of Community Costs ($1,000s)	Utility Cost of Water Saved ($/AF)	Community Cost of Water Saved ($/AF)
Plumbing Code + Program E, No Cost of AMS	2.22	$ 43,655	$ 72,463	$ 116,117	$ 437	$ 1,163
Plumbing Code + Program E, 20% Cost of AMS	2.09	$ 46,871	$ 72,463	$ 119,334	$ 467	$ 1,189
Plumbing Code + Program E, 40% Cost of AMS	1.96	$ 49,972	$ 72,463	$ 122,435	$ 498	$ 1,220

Notes:

- Present Value is determined using an interest rate of 3%
- Cost of water saved is present value of water utility cost divided by total 30-year water savings.
- Community Cost = Customer Cost plus Utility Cost

Figure 7 shows how marginal returns change as more money is spent to achieve higher water savings. As the figure shows the cost versus saving curve is starting to decline after Program B. This means that the added cost of going from that Program C and D will save less water per unit expenditure. In other words there are diminishing returns when the curve starts to flatten out as Tier Two measures are added to the program. Then going from Program D to Program E the curve increases, showing that the savings increment Program E provides is more cost effective than other increments, with the exception of the increment from Program A to B. The attractiveness of Program E is of course related to the use of an AMS system. The cost of the AMS system is not included in Figure 7 for Program E at the request of MMWD. It was assumed the AMS system would be funded by departments other than conservation. The exact dollar figure for AMS system for the conservation department is unknown at this time, and therefore was not included.

Figure 7
Present Value of Utility Costs versus Cumulative Water Saved in 2030



8. DROUGHT ANALYSIS AND DEMAND HARDENING

The goal of this section is to update the evaluation made in the 2007 Technical Memorandum of the effectiveness of MMWD's existing drought ordinance in a future year, after the implementation of a long-term conservation program. In the prior memorandum Programs B and D were evaluated. In this memorandum Program E is added and Program D is retained for comparison. In addition to the drought analysis, the demand hardening phenomenon was evaluated. The assumed end use reductions were not changed from those shown in Table 9 of the prior 2007 memorandum.

Background

MMWD's existing drought ordinance is a two-stage reduction program. Stages are triggered as water supply (reservoir storage) declines to certain specified threshold levels. For example, when storage falls below 50,000 AF on April 1st a 10 percent rationing is initiated. If storage falls below 40,000 AF on April 1st then a 25 percent rationing is initiated. In the past water use

reductions in drought periods have been achieved by effective public information programs combined with water rate increases. MMWD customers have an excellent record of achieving even more water savings than had been requested or targeted.

Drought Measure Analysis

Figure 8 shows the estimated impact of a simulated two-year drought occurring in 2025, rebounding gradually by 2028, on projected annual average demand through 2030. The graph of demand without plumbing code is included for reference and matches the demand projection found in the 2005 MMWD Urban Water Management Plan. If the drought ordinance is triggered in 2025 and the public is requested to make a 25 percent demand reduction, demand is projected to drop close to 25 percent. Our forecast of this reduction was made with an end use model and assumed customer reductions, considering the customer's ability to reduce water use. It will drop more if a long-term conservation program is in place at the time the drought occurs. The combined reduction of Program D and the drought ordinance is forecasted to be about 36 percent. The more aggressive Program E would cause a demand reduction of about 39 percent under these conditions. These simulated reductions in this report were made to study the impact of demand hardening only. They should not to be confused with demand reductions computed by the MMWD Supply model to balance supply and demand during a repeat of past droughts.

Table 11 shows the combined water savings of the long-term and drought program operating together. If a simulated drought occurs in 2025 the drought ordinance will save not 25% but rather 4 to 4.3 percent less. Said in other terms, the ordinance would only save from 21 to 20.7 percent if the drought ordinance works in conjunction with Program D or E instead of on its own with no conservation program. This occurs because some of the end uses have been reduced by the conservation program and there is less water available for a temporary demand reduction during a drought. In our opinion this estimated demand hardening should not be a key factor in deciding whether to pursue Program D or E. It is cost-effective to save this water over time, rather than leave the "waste" in the system so it can be saved during a future drought. MMWD should consider revising its expectations of the effectiveness or the drought ordinance. If it wants to save say 25 percent on top Program D or E savings then it should ask customers for about 30% reductions so it will net about 25 percent on top of savings from Program D or E.

Figure 8
Simulated Drought Water Savings

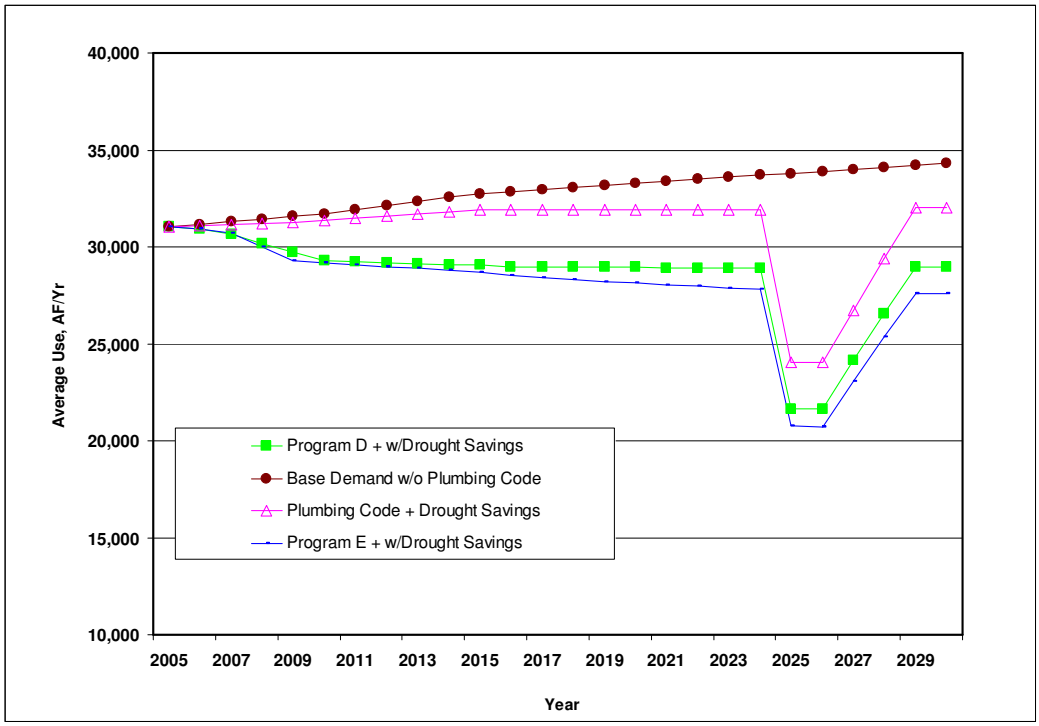


Table 11
Drought Water Savings with Long-Term Program in Place and Amount of Demand Hardening

Scenario	Program Savings Only in 2025, (AF/Yr)	Program + Drought Ordinance Savings in 2025, (AF/Yr)	Percentage Reduction in 2025 Relative to Demand w/o Plumbing Code (%)	Demand Hardening, (Value in Bold Type) (%)
Demand without Plumbing Code + Drought Ordinance	0	8,447	25%	0
Baseline Demand + Plumbing Code	1,872	---	5.5%	---
Baseline Demand + Drought Ordinance	---	9,739	30.5%	25+5.5=30.5 minus 30.5 = **0.0**
Program D	5,035	---	14.9%	---
Program D + Drought Ordinance	---	12,136	35.9%	25+14.9=39.9 minus 35.9= **4.0**
Program E	6,046	---	17.9%	---
Program E + Drought Ordinance	---	13,036	38.6%	25+17.9=42.9 minus 38.6=**4.3**

9. CONCLUSIONS

Relative Savings and Cost-Effectiveness of Programs

Marin Municipal Water District's service area has relatively high portion of residential water use and a significant amount of outdoor water use. Consequently, residential conservation programs produce the most savings. MMWD's service area is not a heavy manufacturing sector so the conservation potential in the nonresidential sector is relatively low. The amount of new growth forecasted for MMWD's area is relatively low so measures directed at new development produce relatively small savings. Because of the high avoided cost of new water, water conservation programs are very cost-effective. Overall conclusions are:

1. As requested by MMWD, Maddaus Water Management researched adding an additional crew for Leak Repair and separately the installation and implementation of an Automated Metering System (AMS). One of the goals of the AMS system would be to find leaks and assist with residential and commercial water audits. Both of these items appear to be good ideas that MMWD can consider in the future to create additional water savings. According to this study results, adding an additional crew dedicated to Leak Repair can save an additional 200 AF/yr (when compared to Program D that has two leak detection crews). After the installation of an AMS system the Leak detection notification (Tier 2 – 10) will save an additional 100 AF/yr.

2. The change in California plumbing code requiring 1.28 gallon per flush High Efficiency Toilets (HETs) and 0.5 gallon per flush urinals by the year 2014 increases savings 306 AF/yr in 2025 (367 AF in 2030). The new legislation was signed by the Governor in October 2007 and therefore was not included in the May 8, 2007 Conservation Technical Analysis.

3. Program E saves 1,057 AF/Yr more water than Program D in the year 2025 (1,168 AF/Yr more in the year 2030). Water savings estimates assume the installation of the AMS system is complete by the end of the year 2014.

4. The cost of Program E has a cost of water saved of $437 / AF (without the cost of the installation of the AMS). The present value utility cost of the entire program is $44 Million. This total cost does include some historical costs back to the year 2006 and concludes at the end of the study period in the year 2030. These costs do not include the installation of the AMS system as the cost, timing, and other parameters have not been decided by MMWD at this time. Additionally, the AMS is not planned to be entirely funded out of the MMWD conservation budget.

5. MMWD has not yet made a decision on the AMS system, specifically the exact installation date and cost of the system that would be assigned to the conservation department. Therefore, the exact cost was excluded from this conservation technical analysis except to run a few hypothetical scenarios to determine approximate cost / benefit ratio and cost of water saved. At the request of MMWD, two scenarios were considered, a 20% and a 40% cost sharing for the conservation department (For example, the conservation department would fund 20% of the entire cost of the AMS system). For these two scenarios it was assumed there would be a 3 year installation in the years 2012, 2013 and 2014. The total cost of the AMS system provided by MMWD was approximately $19.6 Million. Using these parameters, Program E with a 20% cost share of AMS would have a utility cost of water saved of $467 / AF. The present value utility cost of the entire program would be $47

Million. Similarly using these assumed parameters, Program E with a 40% cost of AMS would have a utility cost of water saved of $498 / AF. The present value utility cost of the entire program would be $50 Million.

6. Program D measure assumptions (program length and market penetration rates) were reviewed with the MMWD Staff. Adjustments were made to each measure such that MMWD staff is comfortable with the targeted number of activities at this time. Rain water catchments and gray water systems were added as eligible items under existing Tier 2 – 6 Financial Incentives for Irrigation Upgrades program. Apart from the measure savings listed in Key Finding No. 1, the revisions to the other existing measures and use of the AMS system saves a total of approximately 750 AF/yr in 2025 and 850 AF/yr in 2030.

7. MMWD has made great progress in building a strong foundation for a large conservation program (hiring staff, creating new programs, etc.) in a relatively short amount of time. However, Program D is not yet fully operational at this time. Not all of the projected budget and staff has been committed as of April 2009. Based on this fact, it is too soon to tell whether water savings goals for Program D will be reached. Several years of monitoring Program D including the number of actual program participants and their actual water savings would increase confidence in the ability to forecast higher savings from increased efforts.

8. An update on the assessment of the drought ordinance effectiveness if Program E is implemented was made. The combined savings (average year) from Program D and E from a simulated drought in 2025 are 36 and 39 percent reduction respectively.

9. If a simulated drought occurs in 2025 the drought ordinance will save not 25% but rather 4 to 4.3 percent less. Said in other terms, the ordinance would only save from 21 to 20.7 percent if the drought ordinance works in conjunction with Program D or E instead of on its own with no conservation program. This occurs because some of the end uses have been reduced by the conservation program and there is less water available for a temporary demand reduction during a drought. In our opinion this estimated demand hardening should not be a key factor in deciding whether to pursue Program D or E. It is cost-effective to save this water over time, rather than leave the "waste" in the system so it can be saved during a future drought. The District should consider revising its expectations of the effectiveness or the drought ordinance. If it wants to save say 25 percent on top Program D or E savings then it should ask customers for about 30% reductions so it will net about 25 percent on top of savings from Program D or E.

ATTACHMENTS

Attachment 1 Assumptions for the Measures Evaluated in the DSS Model.
All of Attachment 1 assumptions do not include the hypothetical 20% and 40% cost share of AMS.

Attachment 2 Annual Costs for Programs E for years 2009 to 2030

Attachment 1
Assumptions for Tier One Measures Evaluated for Program E in the DSS Model

	BMP 1a Residential Audits without AMS	BMP 1a Residential Audits with AMS	BMP 1b Residential Audits without AMS	BMP 1b Residential Audits with AMS	BMP 3 Leak Detection and Repair Dedicated 3rd Crew	BMP 5a Water Budgets without AMS	BMP 5a Water Budgets w/AMS
Applicable Customer Classes	SF/CONDO/MF	SF/CONDO/MF	SF/CONDO/MF	SF/CONDO/RMF	System	IRR	IRR
Included in Program Package (Program E)	E	E	E	E	E	E	E
Applicable End Uses	Indoor	Indoor	Outdoor	Outdoor	UFW	Irrigation	Irrigation
Water Use Reductions For Targeted End Uses	5%	7%	10%	12% Outdoor, 35% Leakage	3.7%	15%	20%
Evaluation Start Year	2006	2015	2006	2015	2009	2006	2015
Evaluation End Year	2014	2035	2014	2035	2035	2014	2035
Average Annual Interventions for Years Progam is Running	553 SF, 34 CONDO, 16 RMF	554 SF, 36 CONDO, 17 RMF	553 SF, 34 CONDO, 16 RMF	554 SF, 36 CONDO, 17 RMF	NA	118 IRR	124 IRR
Planned Interventions By End of Program (Accounts)	4,967 SF, 301 CONDO, 143 RMF	11,590 SF, 748 CONDO, 355 MF	4,967 SF, 301 CONDO, 143 RMF	11,590 SF, 748 CONDO, 355 MF	NA	1,063	2,154
Participating Accounts % (Market Penetration Goal,%)*	10%	22%	10%	22%	See comment	81%	154%*
Measure Life (years)	7	10	7	10	Permanent	10	15
Utility Unit Cost for SF/CONDO accounts, $/unit	$ 120.00	$ 120.00	$ 120.00	$ 120.00	NA	-	-
Utility Unit Cost for MF accounts, $/unit	$ 120.00	$ 120.00	$ 120.00	$ 120.00	NA	-	-
Utility Cost	-	-	-	-	$510,600 Per Year 2009 to 2011, $420,144 Per Year 2011 to 2035	$150/account	$50/account
Customer Unit Cost. $/unit	$ 10.00	$ 10.00	$ 5.00	$ 5.00	-	$ -	$ -
Annual Utility Admin & Marketing Cost, % of total annual cost	25%	25%	25%	25%	NA	15%	10%
Affected Units	accounts	accounts	accounts	accounts	NA	Irrigation accounts	Irrigation accounts
Comments	BMP complete for RMF, but MMWD has elected to continue to offer surveys to RMF customers.	MMWD currently plans to run RMF surveys in the future. $10 customer cost assumed because all major items inspected during surveys have a rebate or offer in other programs. $120 cost is a mixture of in house and contracted out audits	MMWD currently plans to run RMF surveys in the future. $120 utility cost is a mixture of in house and contracted out audits. The $5 customer cost is assumed because all major items inspected during surveys have a rebate or offer in other programs. If during the survey, MMWD recommend a irrigation system upgrade, the customer costs would be covered under the Financial Incentives for Irrigation Upgrades, please see measure Tier 2-6.	MMWD currently plans to run RMF surveys in the future. $120 utility cost is a mixture of in house and contracted out audits. The $5 customer cost is assumed because all major items inspected during surveys have a rebate or offer in other programs. If during the survey, MMWD recommend a irrigation system upgrade, the customer costs would be covered under the Financial Incentives for Irrigation Upgrades, please see measure Tier 2-6.	10-year program to reduce UFW to **7.0%**, then annual maintenance	Budgets without the assistance of AMS System using the current plan review process to create budgets. MMWD staff changed cost to $150 per account based on actual cost using current methods	Budgets with assitance of AMS System. The market penetration of 154% is due to the measure life. MMWD must repeat account budgets to keep them current. Based on using fully automated processes to produce and distribute budgets. Please change to $50 based on future methods using automated budget calculation and transfer methods.

SF = Residential Single Family
MF = Residential Multi Family 5 or more unites
IRR = Dedicated irrigation meters
NRSF = New Single Family Homes
COM / BUS= Commercial
INS = Public, buildings / grounds owned by the Water Utility or City
CONDO = Duplexes and 3 or 4 units
IND = Industrial

Attachment 1
Assumptions for Tier One Measures Evaluated for Program E in the DSS Model

	BMP 5b Water Audits	BMP 6 Washer Rebates	BMP 7 Public Education	BMP 9 CII Audits without AMS	BMP 9 CII Audits w/AMS	BMP 14 Toilet Ordinance
Applicable Customer Classes	COM/INS	SF/CONDO	SF/CONDO	COM/INS	COM/INS	SF/MF
Included in Program Package (Program E)	E	E	E	E	E	E
Applicable End Uses	Irrigation	Laundry	All	All	All	Toilet
Water Use Reductions For Targeted End Uses	15%	51%	15%	12%	15% all uses, and 35% on external leaks	60%
Evaluation Start Year	2006	2006	2006	2006	2015	2006
Evaluation End Year	2035	2015	2035	2014	2035	2007
Average Annual Interventions for Years Progam is Running	15 COM, 2 INS	1,328 SF, 81 CONDO	50% of all customers each year. 25,542 SF, 1,678 CONDO	70 COM, 5 INS	74 COM, 6 INS	NA
Planned Interventions By End of Program (Accounts)	261 COM, 37 INS	1,410 rebates per year for 10 years. 14,100 rebates by end of the program	766,253 SF, 48,540 CONDO	560 COM, 42 INS	1,562 COM, 118 INS	5,250 SF, 204 MF
Market Penetration Goal, %	7.2% COM, 13.5% INS	25%	100%	16%	42%	Equals service change rate
Measure Life (years)	10	Permanent	2	Permanent	Permanent	Permanent
Utility Unit Cost for SF/CONDO accounts, $/unit	-	$ 125.00	$ 5.00	-	-	-
Utility Unit Cost for MF accounts, $/unit	-	-	-	-	-	-
Utility Cost	$300/account	-	-	$ 1,000.00	$ 1,000.00	-
Customer Unit Cost. $/unit	$ 1,500.00	$ 200.00	-	$ 2,000.00	$ 2,000.00	$ 125.00
Annual Utility Admin & Marketing Cost, % of total annual cost	30%	30%	25%	50%	50%	$15,600 per year SF, $2,000 per year MF
Affected Units	Assume applies to large landscape accounts	per dwelling unit	per dwelling unit	CII accounts	CII accounts	per toilet
Comments	Audits focus on educating contractors in basic irrigation scheduling and management practices. Renew audits in 2016 and 2026 due to 10 year measure life	BMP 6 complete, but continue to 2015. Lowered penetration rate to 1,400 per year based on current MMWD program goals, but increased length of program to 2015	On-going public education effort including billing notices, advertising and marketing, press releases, and other public outreach methods.	Program ends in 2014, to allow a switch toconducting CII Audits with the help of information from AMS in year 2015.	Start in 2015 after installation of AMS. Assume internal MMWD audit costs.	Ordinance was changed to be a HET rebate program in the year 2007.

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Attachment 1
Assumptions for Tier Two Measures Evaluated for Program E in the DSS Model

Measure	T2 - 1	T2 - 2	T2 - 3a	T2 - 3b	T2 - 4	T2-5
	Rain Sensor Retrofit	**San Quentin Toilets**	**Residential High Efficiency Toilet Rebates**	**CII High Efficiency Toilet Direct Install + Rebates**	**Homeowner Landscape Class**	**Coin-Op Washers Rebate**
Applicable Customer Classes	SF, CONDO	CII Existing	SF, CONDO	MF, COM, INS	SF, CONDO	MF (5 or more units)
Included in Program Package (Program E)	E	E	E	E	E	E
Applicable End Uses	Irrigation	Toilets	Toilet End Use	Toilet End Use	External	Laundry
Water Use Reductions For Targeted End Uses	9%	54%	54%	54%	5%	51%
Evaluation Start Year	2009	2008	2007	2008	2008	2008
Evaluation End Year	2015	2009	2019	2019	2017	2017
Average Annual Interventions for Years Progam is Running	1,022 SF, 63 CONDO	333 toilets per year for 3 years	1,175 SF, 72 CONDO	79 MF, 46 COM and 4 GOV	17 classes per year, 30 attendees per class	37 accounts, 75 washers
Planned Interventions By End of Program (Accounts)	7,152 SF, 439 CONDO	1,000 toilets total	15,274 SF, 941 CONDO	944 MF, 556 COM and 48 GOV	170 classes over 10 years starting in 2009	373 accounts, 745 washers (assumes an average of 2 washers per account)
Market Penetration Goal By End of Program, %	14%	NA	30%	63% RMF, 16% COM, 18% INS	5%	25%
Measure Life, years	10	Permanent	Permanent	Permanent	Permanent	Permanent
Utility Unit Cost for SF/CONDO accounts, $/unit	$ 40.00	--	$ 200.00	$ -	$ 1,000.00	$ -
Utility Unit Cost for MF accounts, $/unit	--	--	$ -	$ 300.00	$ -	$ 400.00
Utility Unit Cost for non-Res accounts, $/unit	--	$ -	$ -	$ 300.00	$ -	$ -
Customer Unit Cost. $/unit	$ 35.00	$ 250.00	$ 150.00	$ -	$500 Condo, $1,000 SF'	$ 500.00
Annual Utility Admin & Marketing Cost, % of total annual cost	10%	0%	25%	15%	10%	25%
Affected Units	dwelling unit	NA	dwelling unit	account	account	account
Comments	Admin and Marketing cost decreased to 10% as MMWD plans to combine the Rain Sensors with Program BMP 1b (External Water Surveys). Extended program to 2015. Cost of regular unit is $14, cost of wireless unit is $43. Assume average cost of $40.	No cost to MMWD, toilets were purchased and program entirely run by San Quentin. $250 is for labor of installation of the toilet. The toilets have been purchased already.	Added Commerical and Institutional categories in year 2009. Start a rebate for $250 then decrease to $150 by end of program. Assume rebate average of $200.	Direct Install program Added Commerical and Institutional categories in year 2009. Cost is $315 per toilet for direct install. Rebate cost is $200. Drop from admin cost from 25% to 15% MMWD Contract out.	Assume $1,000 per class for 30 students per class. Bay Friendly Landscape Progam. Administrative costs include staff time to coordinate with teaching contractors.	Higher efficiency machines save an average of 51% more water than conventional top loading machines

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Attachment 1
Assumptions for Tier Two Measures Evaluated for Program E in the DSS Model

Measure	T2 - 6	T2 - 7	T2-8	T2 - 9	T2 - 10
	Financial Incentives for Irrigation Upgrades	**Hotel Retrofit**	**CII Rebates to Replace Inefficient Equipment**	**Existing High Efficiency Urinal Replacement**	**Install AMS and Leak Detection Customer Notification**
Applicable Customer Classes	SF, CONDO, MF, CII, IRR	COM Existing	COM Existing, INS	COM Existing	SF, CONDO, MF, COM, INS
Included in Program Package (Program E)	E	E	E	E	E
Applicable End Uses	Irrigation	Indoor uses	Process End Use	COM Urinal	Internal and External Leakage
Water Use Reductions For Targeted End Uses	15%	20%	35%	77%	25%
Evaluation Start Year	2007	2008	2008	2007	2015
Evaluation End Year	2025	2022	2022	2025	2030
Average Annual Interventions for Years Progam is Running	681 SF, 115 Condo, 130 MF, 10 COM, 49 IRR, 54INS	72 rooms per year	24 COM, 2 INS	54 COM, (or 108 urinals)	769 SF, 24 MF, 50 CONDO, 57 COM, 4 INS
Planned Interventions By End of Program (Accounts)	12,941 SF, 2,812 Condo, 1,035 MF, 2,462 COM, 929 IRR, 186 INS	1076 rooms (60% of total of 1,802 rooms in MMWD Service Area)	358 COM, 27 INS	1,025 Accounts. Assume average of 2 unrinals per account, total of 2056 urnial replacements by end of program	12,306 SF, 375 MF, 789 CONDO, 891 COM, 67 INS
Market Penetration Goal By End of Program, %	SF 25%, Non-SF 65%	60%	10%	20%	
Measure Life, years	Permanent	0	permanent	0	10
Utility Unit Cost for SF/CONDO accounts, $/unit	$ 350.00	$ -	$ -	$ -	$ 50.00
Utility Unit Cost for MF accounts, $/unit	$ 1,500.00	$ -	$ -	$ -	$ 200.00
Utility Unit Cost for non-Res accounts, $/unit	$ 1,500.00	$ 100.00	$ 500.00	$ 400.00	$ 200.00
Customer Unit Cost. $/unit	$ 1,500.00	$ 200.00	$ 1,000.00	$ 100.00	$ 500.00
Annual Utility Admin & Marketing Cost, % of total annual cost	25%	25%	25%	10%	10%
Affected Units	account	per room	per account	Assume 2 unrinals per CII Account. Assume urinals make up 25% of the total CII toilet fixtures (Koeller & Company, July 2005).	per account
Comments	Measure expanded to include gray water and rain catchment systems, low water use plants and food producing plants. Program length extended to the year 2025	Approximately 1802 rooms in MMWD service area. Assume the $100 average cost per room can replace various pieces of equipment. The cost is only an average to arrive at resonable budget per hotel. Small 2 bedroom hotel, budget would be $200. Large 50 room hotel, budget would be $5,000.	Added institutional category	Increased due to Plumbing code change. Marketing done by manufacturers who do installations. Customer cost assumes some drain line height change.	Cost is to call or e-mail customers if there is a leak. Will be as automated as possible by a computer program, use 1 full time staff person. Cost will be approximately $100,000 per year.

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Attachment 1
Assumptions for New Development Measures Evaluated for Program E in the DSS Model

Measure	ND 1	ND 2	ND 3	ND 4	ND 5	ND 6
	Require Rain Sensors	**Require Smart Irrigation Controllers**	**Require High Efficiency Toilets**	**Require Efficient Dishwashers**	**Require Clothes Washers**	**Require Hot Water on Demand**
Applicable Customer Classes	New SF, New Condo, New MF, New CII	New SF, New Condo, New MF, New CII	New SF, New Condo, New MF, New CII	New SF, New Condo, New MF, New CII	New SF, New Condo, New MF, New CII	New SF, New Condo, New MF, New CII
Included in Program Package (Program E)	E	E	E	E	E	E
Applicable End Uses	Irrigation	Irrigation	Toilet end use	Diswasher end use	Clothes Washer end use	Faucet and shower end use
Water Use Reductions For Targeted End Uses	9%	15%	50 to 55%	34%	50%	14.2 gpd per house
Evaluation Start Year	2009	2009	2009	2009	2009	2009
Evaluation End Year	2030	2030	2030	2030	2030	2030
Planned Interventions By End of Program (Accounts)	100% of new	100% of new	100% of new	100% of new	100% of new	100% of new
Market Penetration Goal By End of Program, %	100% of new	100% of new	100% of new	100% of new	100% of new	100% of new
Measure Life, years	permanent	permanent	permanent	permanent	permanent	permanent
Utility Unit Cost for SF/CONDO accounts, $/unit	$ 12.50	$ 12.50	$ 12.50	$ 12.50	$ 12.50	$ 12.50
Utility Unit Cost for MF accounts, $/unit	$ -	$ -	$ -	$ -	$ -	$ -
Utility Unit Cost for non-Res accounts, $/unit	$ -	$ -	$ -	$ -	$ -	$ -
Customer Unit Cost. $/unit	$ 55.00	$ 500.00	$ 300.00	$ 400.00	$ 500.00	$ 700.00
Annual Utility Admin & Marketing Cost, % of total annual cost	10%	10%	10%	10%	10%	10%
Affected Units	account	account	account	account	account	account
Comments						

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Attachment 1
Assumptions for New Development Measures Evaluated for Program E in the DSS Model

Measure	ND 7	ND 8	ND - 9	ND - 10	ND - 11
	Require High Effiency Faucets & Showerheads	**Require Landscape and Irrigation Requirements**	**Require Multi Family Submetering on New Accounts**	**Reqire Install New CII Equipment for Reduced Connection Fee**	**Require 0.5 Gal/flush Urinals in Bldgs.**
Applicable Customer Classes	New SF, New Condo, New MF, New CII	New SF, New Condo, New MF, New CII	Apartments (5 or more units)	New CII	New CII
Included in Program Package (Program E)	E	E	E	E	E
Applicable End Uses	Faucet and shower end use	Irrigation	Indoor	Com Process	Com Urinal
Water Use Reductions For Targeted End Uses	15%	10%	0%	25%	65 to 75%
Evaluation Start Year	2009	2009	2009	2009	2009
Evaluation End Year	2030	2030	2030	2030	2030
Planned Interventions By End of Program (Accounts)	100% of new	100% of new	100% of new	100% of new	100% of new
Market Penetration Goal By End of Program, %	100% of new	100% of new	100% of new	100% of new	100% of new
Measure Life, years	Permanent	Permanent	Permanent	Permanent	Permanent
Utility Unit Cost for SF/CONDO accounts, $/unit	$ 12.50	$ 12.50	--	$ -	$ -
Utility Unit Cost for MF accounts, $/unit	$ -	$ -	$ -	$ -	$ -
Utility Unit Cost for non-Res accounts, $/unit	$ -	$ -	$ 100.00	$ 100.00	$ 50.00
Customer Unit Cost. $/unit	$ 50.00	$ 3,000.00	$ 1,000.00	$ 1,000.00	$ 400.00
Annual Utility Admin & Marketing Cost, % of total annual cost	10%	10%	25%	25%	25%
Affected Units	account	account	account	account	account
Comments			$100 inspection fee	$100 inspection fee	$50 inspection fee

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Attachment 2
Program E Annual Costs 2009-2030,
No Installation of AMS System Cost

	Program E by Cost Category ($1,000s)		
Year	**Utility**	**Customer**	**Community**
2009	$3,293	$5,096	$8,389
2010	$3,298	$5,100	$8,433
2011	$3,108	$5,678	$8,820
2012	$3,020	$5,579	$8,721
2013	$3,028	$5,586	$8,736
2014	$3,036	$5,592	$8,750
2015	$3,126	$6,499	$9,763
2016	$3,063	$5,122	$8,326
2017	$2,906	$4,805	$7,852
2018	$3,074	$4,696	$7,911
2019	$3,078	$4,700	$7,919
2020	$2,064	$4,092	$6,298
2021	$2,064	$3,963	$6,169
2022	$2,061	$3,944	$7,036
2023	$2,038	$3,907	$6,977
2024	$2,041	$3,910	$6,982
2025	$2,043	$3,912	$6,987
2026	$1,107	$2,457	$3,627
2027	$1,106	$2,459	$3,628
2028	$1,106	$2,460	$3,630
2029	$1,107	$2,461	$3,632
2030	$1,114	$2,462	$3,634

Attachment 2
Program E Annual Costs 2009-2030,
20% AMS System Installation Cost

	Program E by Cost Category ($1,000s)		
Year	**Utility**	**Customer**	**Community**
2009	$3,293	$5,096	$8,389
2010	$3,298	$5,100	$8,399
2011	$3,018	$5,678	$8,695
2012	$4,330	$5,579	$9,910
2013	$4,338	$5,586	$9,924
2014	$4,346	$5,592	$9,938
2015	$3,126	$6,499	$9,626
2016	$3,063	$5,122	$8,185
2017	$2,906	$4,805	$7,711
2018	$3,074	$4,696	$7,770
2019	$3,078	$4,700	$7,778
2020	$2,064	$4,092	$6,157
2021	$2,064	$3,963	$6,027
2022	$2,061	$3,944	$6,004
2023	$2,038	$3,907	$5,945
2024	$2,041	$3,910	$5,950
2025	$2,043	$3,912	$5,955
2026	$1,107	$2,457	$3,565
2027	$1,106	$2,459	$3,564
2028	$1,106	$2,460	$3,566
2029	$1,107	$2,461	$3,568
2030	$1,114	$2,462	$3,576

Attachment 2
Program E Annual Costs 2009-2030,
40% AMS System Installation Cost

	Program E by Cost Category ($1,000s)		
Year	**Utility**	**Customer**	**Community**
2009	$3,293	$5,096	$8,389
2010	$3,298	$5,100	$8,399
2011	$3,018	$5,678	$8,695
2012	$5,640	$5,579	$11,220
2013	$5,648	$5,586	$11,234
2014	$5,656	$5,592	$11,248
2015	$3,126	$6,499	$9,626
2016	$3,063	$5,122	$8,185
2017	$2,906	$4,805	$7,711
2018	$3,074	$4,696	$7,770
2019	$3,078	$4,700	$7,778
2020	$2,064	$4,092	$6,157
2021	$2,064	$3,963	$6,027
2022	$2,061	$3,944	$6,004
2023	$2,038	$3,907	$5,945
2024	$2,041	$3,910	$5,950
2025	$2,043	$3,912	$5,955
2026	$1,107	$2,457	$3,565
2027	$1,106	$2,459	$3,564
2028	$1,106	$2,460	$3,566
2029	$1,107	$2,461	$3,568
2030	$1,114	$2,462	$3,576

Reference 9

Understanding MCE's GHG Emission Factors – Calendar Year 2012

Summary

A key environmental metric for the MCE program is the greenhouse gas (GHG) emissions profile of the MCE supply portfolio. This paper describes the methodology used to calculate GHG emissions rates for the MCE program. Based on this methodology, the calendar year (CY) 2012 GHG emissions rates for the MCE supply portfolio and retail service options are as follows:

Light Green Service (50% Renewable):	**380** lbs CO2e/MWh (CY 2011 = 389 lbs CO2e/MWh)
Deep Green Service (100% Renewable):	**0** lbs CO2e/MWh (CY 2011 = 0 lbs CO2e/MWh)
Total MCE Portfolio:	**373** lbs CO2e/MWh (CY 2011 = 374 lbs CO2e/MWh)

Background

A key tenet of MCE's mission, and a charter objective of the agency, is to reduce energy related greenhouse gas emissions through the development and use of various clean energy resources. As such, MCE has committed to assembling a power supply portfolio that not only exceeds the renewable energy content offered by the incumbent utility, Pacific Gas & Electric Company (PG&E), but also provides customers with a "cleaner" energy alternative, as measured by a comparison of the portfolio GHG emission rate (or emission factor) published by each organization. This comparison will be performed on an annual basis in consideration of each utility's most recently published emission factor. Due to typical timelines affecting the availability of such information, the current comparison (in this case, a comparison focused on CY 2012) will generally reference PG&E data that relates to utility operations occurring 12 to 24 months prior to the current calendar year. This waiting period is necessary to facilitate the compilation of final electric energy statistics (e.g., customer energy use and renewable energy deliveries) and to allow sufficient time for data computation, review, and audit before releasing such information to the public. For example, PG&E's 2012 emission factor was recently published in February 2014 – this is the most current available emission factor for PG&E. Going forward, the timeline associated with PG&E emission factor availability is not expected to change. However, MCE may choose to release subsequent annual emission statistics (for CY 2013 and beyond) as information becomes available, which may precede PG&E's timeline – following PG&E's publication of annual emission statistics, MCE will complete an emission rate comparison. For purposes of this document, the aforementioned emission factor comparison will focus on the 2012 calendar year.

In each calendar year, MCE will endeavor to procure GHG-free energy supplies in sufficient quantities to ensure that MCE provides its customers with an electric energy supply that generates fewer GHG emissions per megawatt hour than the incumbent utility.[1] The noted future purchases of GHG-free energy supplies will be based on reasonable projections of PG&E's emission rate, which will take into consideration planned increases in Renewables Portfolio Standard procurement obligations and other publicly available discussions of PG&E's planned procurement activities and/or projections. Through this ongoing process, MCE will facilitate the procurement (and delivery) of energy supplies that generate fewer GHG emissions per megawatt hour than the incumbent utility.

[1] MCE will complete such purchases to the extent that available GHG-free energy products will not necessitate out-of-cycle rate adjustments or impose material budgetary impacts. If such consequences would result from the incremental procurement of GHG-free energy products, MCE will seek Board approval prior to engaging in related transactions.

About Emission Rates

Portfolio emission rates reflect the proportionate use of various fuel sources and resource types within a utility's supply portfolio. To the extent that selected resources emit GHGs while producing electric energy, such resources will increase the utility's portfolio emission factor (above zero). Conversely, the inclusion of resources that do not emit GHGs will reduce the utility's portfolio emission factor. In general, renewable energy resources, which use fuel sources like wind and sunlight (solar), have been identified as non-polluting or GHG-free. Similarly, hydroelectric and nuclear generators, which do not involve GHG-emitting combustion processes, are also considered to be non-polluting or carbon-neutral (i.e., the net emissions impact associated with electric power production is less than or equal to the status quo). Consistent with its adopted Integrated Resource Plan, MCE does not engage in procurement transactions with nuclear generating facilities and will rely exclusively on renewable energy resources and hydroelectricity to ensure delivery of a comparatively cleaner energy supply.[2]

Because of widely varying opinions and computations focused on the environmental impacts associated with specific generating technologies, it is important to identify an industry-accepted standard when determining the emission impacts attributable to generating facilities included within a utility's supply portfolio. To avoid the potential for perpetual policy and accounting changes that could result from the use of ad hoc (and potentially inaccurate) emission calculations for certain generating resources, MCE decided to incorporate statistics prepared by the California Air Resources Board's (CARB) when determining emissions associated with its energy supply portfolio. In particular, CARB's published emission rate for unspecified sources, or "system power", provides an unbiased, publicly available reference that can be incorporated in instances where specific generating sources cannot be identified. With regard to the aforementioned emission rate for unspecified sources, CARB has assigned a rate of 0.428 metric tonnes carbon dioxide equivalent per megawatt hour (MT CO2e/MWh), or 943.58 pounds CO2e/MWh (lbs CO2e/MWh). This emission rate can be referenced in section 95111(b)(1) of CARB's February 2014 update to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions: http://www.arb.ca.gov/cc/reporting/ghg-rep/regulation/mrr-2013-clean.pdf. Application of standards such as this will facilitate an "apples to apples" comparison of emission factors posted by MCE and other electric utilities, including PG&E.

MCE has also joined The Climate Registry, "a nonprofit collaboration among North American states, provinces, territories and Native Sovereign Nations that sets consistent and transparent standards to calculate, verify and publicly report greenhouse gas emissions into a single registry." Through its membership, MCE has access to the policies, procedures and GHG accounting guidelines endorsed by this organization and can incorporate such guidelines when determining its portfolio emissions factor. Furthermore, for certain MCE customers that are also members of The Climate Registry, MCE has prepared the attached Emission Factor Certification template, which can be used by these customers when completing voluntary reporting efforts to The Climate Registry. Looking ahead, MCE will continue to update (and post on its website) this certification template so that it can be readily accessed and used by MCE customers.

Calculating GHG Emissions from Unspecified Sources

Not all electric energy purchases are associated with specific generating facilities. Many industry contracts identify the use of "system power," a term of art that is regularly used in the utility industry to define electric energy that is produced and delivered to the grid by various generating resources not under contract with particular buyers, instead of specific generating facilities. Such delivery arrangements provide increased flexibility for energy sellers which often results in reduced energy prices for buyers. While there are certain economic and operational

[2] Conversely (and according to its September 2013 Power Content Label bill insert), PG&E's published 2012 power mix included 21% nuclear generation.

efficiencies that may relate to the use of system power, there are also complications that can surface when attempting to quantify GHG emissions associated with energy production from unspecified generating sources. Because many load-serving entities (LSEs) within California rely heavily on the use of system power to fulfill their respective service obligations (for example, PG&E's 2012 Power Content Label indicated the delivery of 21% of total supply from unspecified sources), it is important to identify an emission factor for such deliveries that can be referenced by LSEs when compiling emission statistics. As previously noted, CARB has established an emission factor for unspecified generating sources to facilitate GHG calculations and reporting associated with the use of system power and power purchases from generation "portfolios," which do not create direct relationships between specific electric generators and energy buyers. MCE staff previously engaged CARB in discussions and email exchanges to confirm the appropriate use of this emission rate for all unspecified/system power purchases; CARB advised MCE to use this published emission factor when determining GHG emissions associated with such purchases. Based on MCE's review, CARB did not update the aforementioned emission factor in its current (February 2014) version of the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions. MCE will continue to monitor this item and will update its future emission factor calculations in consideration of any adjustments that may be made by CARB to this statistic.

Identification of a credible, publicly available system power emission factor is particularly relevant for MCE, which relies on the use of system power to meet some of its customers' non-renewable energy requirements. CARB's emission factor for unspecified sources has been applied by MCE when determining total emissions associated with system power purchases. It is also noteworthy that PG&E appears to have applied a similar factor when calculating emissions associated with unspecified generating sources.

Determination of MCE's Total Portfolio Emission Factor

For the 2012 calendar year, MCE's supply portfolio was heavily weighted towards non-carbon emitting resources. In fact, over 60% of MCE's energy supply was attributable to various renewable energy and hydroelectric purchases, which do not emit GHGs. The following table summarizes MCE's aggregate energy purchases, which includes both Light Green and Deep Green sales volumes, for the 2012 calendar year. It is important to note that all "zero carbon" energy volumes are attributable to hydroelectric generating sources located within the Western U.S.

2012	MWh Purchased	% Total
Total Renewable Energy	304,551	53.4%
RPS – Eligible Renewable	166,522	29.2%
Non-RPS Eligible Renewable	138,029	24.2%
Zero Carbon	40,000	7.0%
System Power	225,593	39.6%
Total	570,144	100%

When determining MCE's aggregate portfolio emission factor, the aforementioned CARB statistic of 0.428 metric tons CO2e/MWh was applied to MCE's system energy purchases, which totaled 225,593 MWh during the 2012 calendar year. All other non-emitting resources were assigned an emission factor of zero. As such, MCE's portfolio emissions for the 2012 calendar year totaled 96,554 metric tons or approximately 213 million pounds. These emission totals were divided by MCE's aggregate energy deliveries of 570,144 MWhs, resulting in an MCE portfolio emissions rate of 0.169 metric tons CO2e/MWh, or 373 lbs/MWh, for the 2012 calendar year. The following table provides additional detail regarding these emissions computations for MCE's 2012 supply portfolio.

2012 Calendar Year	MWh Purchased	% Total	Emission Rate (metric tonnes CO2e/MWh)	Total Emissions (metric tonnes)	Emission Rate (lbs CO2e/MWh)	Total Emissions (lbs)
Total Renewable Energy	304,551	53.4%	0.000	0	0	0
RPS – Eligible	166,522	29.2%	0.000	0	0	0
Non-RPS Eligible Renewable	138,029	24.2%	0.000	0	0	0
Zero Carbon	40,000	7.0%	0.000	0	0	0
System Power	225,593	39.6%	0.428	96,554	944	212,864,133
Totals	570,144	100%	0.169	96,554	373	212,864,133

Based on these calculations, it has been determined that MCE's 2012 aggregate portfolio emission factor (of 373 lbs/MWh) was approximately 19% lower than PG&E's reported 2012 emission factor of 445 lbs/MWh.[3]

Determination of MCE's Light Green and Deep Green Emission Factors

While certain stakeholders may be interested in MCE's previously discussed aggregate emission factor, there is also an interest in clearly understanding the specific emission factors associated with MCE's retail supply options: Light Green (minimum 50% renewable energy content) and Deep Green (100% renewable energy content). As such, MCE has calculated product-specific emission factors, which may be useful to certain customers who want to better understand the direct environmental impacts resulting from energy consumption within their respective households and/or businesses. It is important to note that any MCE customer may choose to "zero out" energy-related emissions by voluntarily selecting the Green-e certified Deep Green 100% renewable energy option. For more information regarding Deep Green enrollment, customers are encouraged to visit: www.mceCleanEnergy.com/deepgreen.

Light Green: MCE diligently plans and procures electricity to ensure the cleanest possible power supply for Light Green customers. During the 2012 calendar year, MCE delivered a total of 559,836 MWh to Light Green customers of which 164,461 MWh (29.4% of total) were supplied from qualifying, California Renewables Portfolio Standard ("RPS") eligible sources, including biomass, landfill gas and wind. An additional 129,783 MWh (23.2% of total) were supplied from other wind and solar resources. MCE also delivered 40,000 MWh (7.1% of total) from non-polluting hydroelectric generators. The aforementioned resources, which comprised 59.7% of MCE's total Light Green supply portfolio, were all determined to be carbon-free or carbon-neutral based on specified fuel sources. The balance of Light Green resource requirements were supplied from unspecified sources, or "system power." This CARB emission rate of 943.58 lbs CO2e/MWh was multiplied by total system power deliveries (225,593 MWh, or 40.3% of total), resulting in total Light Green portfolio emissions of approximately 213 million pounds of CO2 equivalent. As this total represented the entirety of emissions associated with MCE's Light Green power supply portfolio, the amount of 213 million pounds of CO2 equivalent was divided by the total delivered Light Green electricity volume of 559,836 MWh, resulting in a 2012 Light Green emission factor of 380 lbs CO2e/MWh.

Deep Green: A voluntary, 100% renewable energy supply option that is available to all customers within the MCE service territory. During the 2012 calendar year, MCE supplied a total of 10,307 MWh to Deep Green customers. A total of 2,061 MWh (20% of total) were supplied from qualifying, California RPS-eligible wind sources. An additional 8,246 MWh (80.0% of total) were supplied from other wind resources, which meet Green-e Energy eligibility requirements – "Green-e is the nation's leading independent certification and verification program for renewable energy and greenhouse gas emission reductions in the retail market," which is administered/monitored

[3] PG&E's final 2012 emission factor, as reported at http://www.pgecurrents.com/2014/02/06/new-numbers-confirm-pge%E2%80%99s-energy-among-the-cleanest-in-nation/.

by the San Francisco-based Center for Resource Solutions.[4] As a result of the 100% renewable energy supply that was delivered to Deep Green customers, the emission factor was determined to be zero lbs CO2e/MWh.

As previously noted, MCE will continue to update subsequent annual emissions factors based on currently available data, including actual energy purchases and CARB's then-effective emission rate for unspecified sources. Any questions regarding this information should be forwarded to info@mceCleanEnergy.com. Additional information regarding MCE's emission factors can be located at www.mcecleanenergy.com.

[4] Information as posted on the Green-e website: http://www.green-e.org/about.shtml.

Advanced Policy Analysis
California's Climate Adaptation Water Strategy: An Analysis of Implications for Individual and Community Rights and Responsibilities
A Study Conducted for the California Climate Adaptation Strategy Working Groups

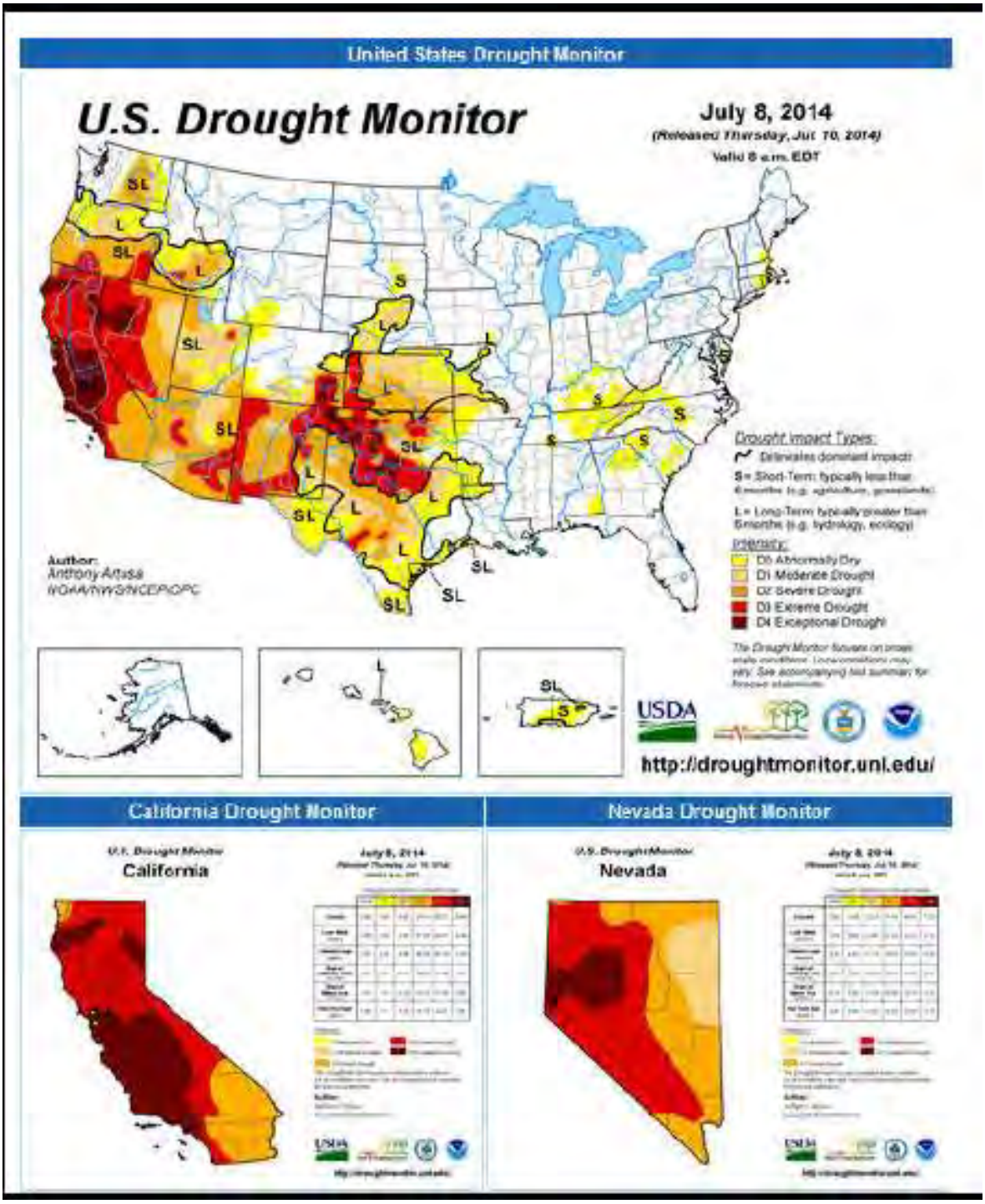
By Sara S. Moore
Berkeley, California
Spring 2009

This analysis was conducted as part of the program of professional education at the Goldman School of Public Policy, University of California at Berkeley. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Goldman School of Public Policy, by the University of California or by any other agency.

Table 2: "Managing an Uncertain Future:" Concerns DWR White Paper Proposed Strategy	*Relevant Concern*
Provide sustainable funding for statewide and Integrated Regional Water Management (Strategy 1)	Small, rural, isolated communities should be provided state support to develop their own IRWM plans
Demand-side management: Aggressively increase water use efficiency. (Strategy 3)	There is a need for ratepayer relief measures for low-income households when water rates adjust upward; however, these measures must be developed without encouraging maladaptation (bad adaptation choices) by households. Additionally, there is a need for the state to encourage utilities to provide more direct installs of water saving devices in low-income households, such as low-flow toilets, which the households couldn't afford themselves
Floods: Practice and promote integrated flood management (integrating it with watershed and fisheries management, etc.) (Strategy 4)	It is expected that there will be flood "sacrifice zones:" there should be plans to develop a policy by which people can be equitably compensated and sustainably resettled
Monitoring: Preserve, upgrade and increase monitoring, data analysis and data management. (Strategy 8)	The state should consider how vulnerable populations will gain access to information on environmental conditions as they shift State monitoring regimes should be designed to help foster public participation from vulnerable populations (who in turn could provide local information that may improve monitoring regimes)
Sea-Level: There is a need to plan for and adapt to sea-level rise. (Strategy 9)	Small, rural, isolated communities on the coast and in the Delta should be provided state support to develop their own sea-level rise adaptation plans (as with IRWM)

Reference 11

U.S. Drought Monitor, NOAA www.cnrfc.noaa.gov/droughtInfo.php



Reference 12

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Home > Climate Change Impacts > **Changes in Precipitation**

Changes in Precipitation

According to the Intergovernmental Panel on Climate Change (IPCC), increasing average global temperatures will result in a number of impacts to the hydrological cycle, including changes in precipitation. Precipitation will be directly impacted by changes in atmospheric circulation and increases in water vapor and evaporation associated with warmer temperatures. This will result in an overall increase in precipitation, though the magnitude of this increase is uncertain.

Precipitation changes are expected to differ from region-to-region, with some areas becoming wetter and others becoming dryer. However, most models agree that precipitation will increase the most over high-latitude regions, while precipitation will decrease in most subtropical areas. Equatorial regions show a high level of uncertainty in forecasting changes in precipitation.

Any change in precipitation amount will result in corresponding regional changes in runoff, thus impacting water supply management regimes. Water resource managers in semi-arid regions will be most vulnerable to changes in precipitation, since runoff and river flows in these areas are particularly sensitive to changes in precipitation. Additionally, changes in average rainfall will impact groundwater recharge rates, thus potentially impacting water supply.

Water resource managers who experience a decrease in precipitation may have to explore new sources of supply, implement demand management activities, or invest in new treatment techniques. Water resource managers who experience an increase in precipitation may need to make infrastructure investments to mitigate an increased risk of flooding and higher reservoir levels, along with developing new treatment processes. However, these resource managers may also benefit from an increase in water supply.

Changes in rain and snowfall can result in a number of impacts for water resource managers that depend on snowpack for water supply, including increases in flooding, decreases in summer water supply, and changes to both groundwater and surface water quality. These impacts may require water resource managers to develop alternative sources of water supply and water treatment and invest in new flood infrastructure.

Changes in Precipitation – California Warmer temperatures will reduce winter snowpack in California's mountains, resulting in an increase in winter runoff and a decrease in spring runoff. This impact is fairly certain, and has been observed in California throughout the last two decades. A shift in seasonal runoff will result in an increase in spring flooding and an increase in summer drought conditions (Hanak and Lund 2008).

Changes in Precipitation – The Alps Precipitation amounts vary widely throughout the Alps. On average, the Alps experience higher precipitation in the north-eastern, north-western, and south-western regions, and lower levels of precipitation in the central and south-western Alps. Climate change simulations predict a decrease in annual precipitation across the mountain range, with predicted decreases in annual precipitation ranging from –1% to –11%. The south-western Alps are forecasted to experience the largest decrease in annual precipitation. (European Environmental Agency 2009) – Regional Climate Change and Adaptation – the Alps

Resources

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Bay Area Drought Relief Program (Bay DRP)

Attachment 4

Work Summary

Association of Bay Area Governments

Proposition 84

Integrated Regional Water Management

2014 Drought Grant Application

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List of Acronyms and Abbreviations

ABAG	Association of Bay Area Governments
AMI	advanced metering infrastructure
AMR	automatic meter reading
Bay DRP	Bay Area Drought Relief Program
BMPs	Best Management Practices
CCC	California Coastal Commission
CCMP	Comprehensive Conservation and Management Plan
CCWD	Contra Costa Water District
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CLP	Cope Lake to Lake I Pipeline
COL-5	Chain of Lakes Well No. 5
CM/GC	construction manager/general contractor
CWA	Clean Water Act
CWD	County Water District
Delta	Sacramento-San Joaquin River Delta

DERWA	Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) Recycled Water Authority
DSRSD	Dublin-San Ramon Services District
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FEMA	Federal Emergency Management Agency
HDPE	high-density polyethylene
HET	high-efficiency toilet
IRWM	Integrated Regional Water Management
IRWMP	Integrated Regional Water Management Plan
IS/MND	Initial Study/ Mitigated Negative Declaration
JPA	joint powers authority
kg/yr	kilograms per year
LCA	Lower Cherry Aqueduct
LCP	Labor Compliance Program
LCWD	Los Carneros Water District
LPS	Local Project Sponsor
MG	million gallon
MMWD	Marin Municipal Water District
MND	Mitigated Negative Declaration
MST	Milliken-Sarco-Tulocay
NEPA	National Environmental Protection Act
NPS	National Park Service
NPDES	National Pollutant Discharge Elimination System
PAC	Powdered Activated Carbon
Prop 84	Proposition 84
Proposal	Bay Area Drought Relief Program, Proposition 84, 2014 Integrated Regional Water Management Drought Grant Application
PSP	Proposal Solicitation Package
RCD	Resource Conservation District
RWQCB	Regional Water Quality Control Board
San Mateo County RCD	San Mateo County Resource Conservation District
SAP	German firm that manufactures software to manage business operations
SCVWD	Santa Clara Valley Water District
SFEP	San Francisco Estuary Partnership
SFPUC	San Francisco Public Utilities Commission
SHPO	State Historic Preservation Officer
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service
WTP	Water Treatment Plant
Zone 7	Zone 7 Water Agency

Introduction

This section contains brief summaries of the anticipated tasks necessary to complete each project in the Bay Area Drought Relief Program (Bay DRP).

Organization of Project Proponent Work Plans

The Bay DRP consists of grant administration and 11 drought preparedness projects geographically spanning all four regions of the Bay Area, with four primary areas of benefit:

- Water Supply Enhancement
- Recycled Water
- Human Right to Water
- Drought Preparedness

To facilitate review, the projects are grouped by primary benefit type, as listed below.

Project Summary Table

Primary Project Benefit	Project ID#	Project Proponent	Project Title
Water Supply Enhancement	1	San Francisco Public Utilities Commission (SFPUC)	Lower Cherry Aqueduct Emergency Rehabilitation Project
	2	Santa Clara Valley Water District (SCVWD)	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment
	3	Zone 7 Water Agency (Zone 7)	Zone 7 Water Supply Drought Preparedness Project
Recycled Water	4	Napa Sanitation District	Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines
	5	SCVWD and City of Sunnyvale	Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline
	6	DERWA*	DERWA Phase 3 Recycled Water Expansion Project
	7	City of Calistoga	Calistoga Recycled Water Storage Facility
Human Right to Water	8	San Mateo County Resource Conservation District (RCD)	Drought Relief for South Coast San Mateo County
	9	Stinson Beach County Water District (CWD)	Stinson Beach Water Supply & Drought Preparedness Plan
Drought Preparedness	10	StopWaste**	Bay Area Regional Drought Relief Conservation Program
	11	Marin Municipal Water District (MMWD)	WaterSMART Irrigation with AMI/AMR
Administration	12	ABAG/SFEP	Grant Administration

**DERWA: Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) Recycled Water Authority*

***This Project will be implemented by a group of 12 project proponents led by Alameda County StopWaste.org (StopWaste). Participating agencies and organizations include: Alameda County Water District, Bay Area Water Supply and Conservation Authority, City of Napa, Contra Costa Water District, EBMUD, MMWD, SFPUC, SCVWD, Solano County Water Agency, Sonoma County Water Agency, StopWaste, and Zone 7.*

Work Summaries are organized by project type and include the following a brief summary of the following tasks (i.e., budget categories), and deliverables for each project:

a) Direct Project Administration,

b) Land Purchase/Easement,

c) Planning/Design/Engineering/Environmental Documentation, and

d) Construction/Implementation.

Work Summaries – Water Supply Enhancement Projects

Project ID#	Project Proponent	Project Title
1	SFPUC	Lower Cherry Aqueduct Emergency Rehabilitation Project
2	SCVWD	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment
3	Zone 7	Zone 7 Water Supply Drought Preparedness Project

Project 1 – Lower Cherry Aqueduct Emergency Rehabilitation Project

Budget Category (a) Direct Project Administration

Task 1 Project Administration: This task consists of the project administration responsibilities, which includes coordinating agency responsibilities and managing cost commitments. This task also includes providing other supporting documentation required for this grant agreement (e.g., financial statements) and a Project Performance Monitoring Plan describing tools to be used to monitor and measure project benefits will be submitted to the State prior to disbursement of grant funds for construction or monitoring activities for this Project. This task is 0% complete.

Task 2 Labor Compliance Program: This task consists of completing the required implementation of a Labor Compliance Program (LCP), if applicable. The LCP will be compliant with Department of Industrial Relations standards and needs to be in place prior to any construction activities covered under this grant agreement. This task is 0% complete.

Task 3 Reporting (0% complete):

- Quarterly Progress Reports: This task consists of preparing progress reports detailing work completed in prior quarter and submittal to ABAG for submittal to the California Department of Water Resources (DWR).
- Invoices: This task consists of preparing quarterly invoices including relevant supporting documentation for submittal to ABAG for submittal to DWR.
- Draft and Final Project Completion Report: This task consists of preparing draft Final Project Completion Report and submitting to ABAG for submittal to DWR for DWR Project Manager's comment and review no later than 90 days after project completion. This task also consists of preparing the Final Report addressing ABAG/DWR's comments.

Category (a) Deliverables:

- Local Project Sponsor Agreement with ABAG
- Financial Statements
- Project Performance Monitoring Plan
- Proof of Labor Compliance Plan, including certified payroll records and copies of worker interviews.
- Quarterly Project Progress Report
- Quarterly Invoices and associated backup documentation
- Draft and Final Project Completion Report

Budget Category (b) Land Purchase/Easement

The project site is located on U.S. Forest Service (USFS) land within SFPUC's right-of-way. No land purchase or easements are necessary. This task does not apply to this project.

Budget Category (c) Planning/Design/Engineering/Environmental Documentation

Task 5 Assessment and Evaluation: This task does not apply to this project.

Task 6 Final Design: Design is approximately 90% complete.

Task 7 Environmental Documentation: This task consists of completing the required approval and compliance under California Environmental Quality Act (CEQA) (Categorical Exemption, which will be issued by San Francisco Planning Department) and National Environmental Policy Act (NEPA) (Environmental Assessment). Note that the selected construction manager/general contractor (CM/GC) will perform pre-construction services as soon as possible before environmental approvals are complete, in order to facilitate design completion and fast-track the construction with early procurement of long lead materials. This task also includes USFS consultation with federally recognized tribes and other interested parties for Section 106 compliance. This task is 50% complete.

Task 8 Permitting: Acquisition of the following federal, state, and local permits and clearances:

U.S. Army Corps of Engineers (USACE) Regional General Permit 60, Section 404f exemption, or Nationwide Permit (80% complete)

Regional Water Quality Control Board (RWQCB) Regional General Permit 60 or letter of concurrence to proceed (80 % complete)

California Department of Fish and Wildlife (CDFW) Emergency Section 1602 Agreement (100% complete)

CDFW Section 2081 Incidental Take Permit (95% complete)

State Historic Preservation Officer (SHPO) Section 106 compliance (80% complete)

Category (c) Deliverables:

- A copy of the final drawings and specifications
- Documentation of CEQA and NEPA approvals
- List of permits and clearances obtained and dates

Budget Category (d) Construction/Implementation

Task 9 Construction Contracting: This task consists of construction contracting including solicitations for bids and awards of contracts. Pre-purchase solicitations are out to bid along with 1st Bid Package. This task is 20% complete.

Task 10 Project Construction/Implementation:

- Mobilization and Site Preparation: This task consists of site staging, site security, installation of temporary construction field offices, temporary sanitary facilities, site best management practices (BMPs), clearing and grubbing, stockpile and material storage designation, and traffic control. This task has not yet begun. Contractor awaiting issuance of formal contract. This task is 0% complete.
- Project Construction: This task includes tunnel cleaning/rehabilitation of the Cherry Creek Diversion Dam access path, installation of 84-inch high-density polyethylene (HDPE) pipe with existing open channel, removal/replacement of existing 78-inch steel pipe, repairs to the Forebay, removal/replacement of portions of concrete at the diversion dam, removal/replacement of sluice and head gates. This task also includes stabilization of existing hazardous slopes, installation of water quality monitoring equipment in the Early Intake Reservoir, installation of Storm Water Pollution Prevention Plan (SWPPP) BMPs, and implementation of quality control measures including special inspections and field testing. This task is 0% complete.
- Performance Testing and Demobilization: This task consists of performance testing and demobilization including stormwater testing for contaminant and turbidity levels, and demobilization and removal of debris and construction spoils from the site, excess materials, temporary sanitary facilities, and equipment. This task is 0% complete.

Task 11 Environmental Compliance/Mitigation/Enhancement: Compliance with general construction measures development and implementation of a stormwater pollution prevention plan (including erosion and sediment control plan), traffic control plan, and a hazardous materials management plan; implementation of environmental mitigation measures to be identified in the NEPA Environmental Assessment, which may include flagging of sensitive areas and biological monitoring during construction. This task is 0% complete.

Task 12 Construction Administration: This task in general consists of overall administration of the construction contract including but not limited to quality assurance, safety oversight, authorizing progress payments, reviewing the contractor's schedule performance including recommendations for recovery if delays occur, managing and coordinating with applicable state and federal agencies (i.e., RWQCB, USFS, National Park Service [NPS], Federal Emergency Management Agency [FEMA], SHPO, CDFWS, USACE) and providing construction inspection and management oversight. This task is 0% complete.

Category (d) Deliverables:

- Bid packages
- Pre-construction, construction, and post-construction photographs
- SWPPP

Project 2 – Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment

Budget Category (a) Direct Project Administration

Task 1 Project Administration: This task consists of the project administration responsibilities, which includes coordinating agency responsibilities and managing cost commitments. This task also includes providing other supporting documentation required for this grant agreement (e.g., financial statements) and a Project Performance Monitoring Plan describing tools to be used to monitor and measure project benefits will be submitted to the State prior to disbursement of grant funds for construction or monitoring activities for this Project. This task is 0% complete.

Task 2 Labor Compliance Program: This Project is an operation conducted at a water treatment facility. LCP requirements do not apply.

Task 3 Reporting (0% complete):

- Quarterly Progress Reports: This task consists of preparing progress reports detailing work completed in prior quarter and submittal to ABAG for submittal to DWR.
- Invoices: This task consists of preparing quarterly invoices including relevant supporting documentation for submittal to ABAG for submittal to DWR.
- Draft and Final Project Completion Report: This task consists of preparing draft Final Project Completion Report and submitting to ABAG for submittal to DWR for DWR Project Manager's comment and review no later than 90 days after project completion. This task also consists of preparing the Final Report addressing ABAG/DWR's comments.

Category (a) Deliverables:

- Local Project Sponsor Agreement with ABAG
- Financial Statements
- Project Performance Monitoring Plan
- Quarterly Project Progress Report
- Quarterly Invoices and associated backup documentation
- Draft and Final Project Completion Report

Budget Category (b) Land Purchase/Easement

The Project takes place at an existing SCVWD-owned property. No land purchase or easement is necessary. This task does not apply to this project.

Budget Category (c) Planning/Design/Engineering/Environmental Documentation

The Project is an operation implemented at a treatment plant. No planning, design, engineering, environmental compliance, or permitting is necessary.

Task 5 Assessment and Evaluation: This task does not apply to this project.

Task 6 Final Design: This task does not apply to this project.

Task 7 Environmental Documentation: The Project is an operation at an existing facility and does not meet the definition of a project under CEQA. This task does not apply to this project.

Task 8 Permitting: This task does not apply to this project.

Budget Category (d) Construction/Implementation

Task 9 Construction Contracting: SCVWD conducted a competitive procurement process to select a powdered activated carbon (PAC) vendor in June 2013. The lowest bidder was selected for a one-year contract. Before the 2013 contract was up, SCVWD solicited bids for a new PAC vendor (April 2014). The bids received were all higher than the 2013 vendor, so their contract was renewed for the 2014 fiscal year. This task is 100% complete.

Task 10 Project Construction/Implementation:

- Mobilization and Site Preparation: This task includes operations labor to offload and manage the PAC feed into the Rinconada Water Treatment Plant (WTP) treatment process. Work includes flushing the system on a daily basis, transferring between feed tanks on a weekly basis, and loading the PAC into tanks on a monthly basis. This task is 45% complete.
- Project Construction/Implementation: The PAC system requires constant maintenance to keep running. Maintenance activities include cleaning out clogged sludge lines, replacing feed lines, repairing pumps, maintaining the chemical control panel and dust collectors. This task is 45% complete.
- Performance Testing: This task consists of collecting and analyzing water quality samples of RWTP influent and treated water on at least a monthly basis. Influent samples will be analyzed for bromide and total organic carbon. Treated water samples will be analyzed for trihalomethanes. This task is 45% complete.

Task 11 Environmental Compliance/Mitigation/Enhancement: This Project is implemented at an existing facility and no impacts result from project implementation. This task does not apply to this project.

Task 12 Construction Administration: Management and oversight of PAC vendor deliveries and plant operations labor is managed as part of the overall Rinconada WTP operations. Management and oversight are documented as part of monthly reporting procedures. As related specifically to monitoring of the PAC system for this grant (through December 2014), this task is 45% complete.

Category (c) Deliverables:

- A copy of vendor procurement procedures and bidding documents
- Monthly Water Quality Reports
- Treated Water Status Reports
- Maintenance Summary Reports

Project 3 – Zone 7 Water Supply Drought Preparedness Project

Budget Category (a) Direct Project Administration

Task 1 Project Administration: This task consists of the project administration responsibilities, which includes coordinating agency responsibilities and managing cost commitments. This task also includes providing other supporting documentation required for this grant agreement (e.g., financial statements) and a Project Performance Monitoring Plan describing tools to be used to monitor and measure project benefits will be submitted to the State prior to disbursement of grant funds for construction or monitoring activities for this Project. This task is 0% complete.

Task 2 Labor Compliance Program: This task consists of completing the required implementation of an LCP. Zone 7 has its own approved LCP that is compliant with Department of Industrial Relations standards and will be implemented for all construction activities covered under the grant agreement. This task will be 100% complete by October 2014 for the Chain of Lakes Well No. 5 (COL-5) Project and is 100% complete for the Cope Lake to Lake I Pipeline (CLP) Project.

Task 3 Reporting (0% complete):

- Quarterly Progress Reports: This task consists of preparing progress reports detailing work completed in prior quarter and submittal to ABAG for submittal to DWR.
- Invoices: This task consists of preparing quarterly invoices including relevant supporting documentation for submittal to ABAG for submittal to DWR.
- Draft and Final Project Completion Report: This task consists of preparing draft Final Project Completion Report and submitting to ABAG for submittal to DWR for DWR Project Manager's comment and review no later than 90 days after project completion. This task also consists of preparing the Final Report addressing ABAG/DWR's comments.

Category (a) Deliverables:

- Local Project Sponsor Agreement with ABAG
- Financial Statements
- Project Performance Monitoring Plan
- Proof of Labor Compliance Plans for each project component, including certified payroll records and copies of worker interviews.
- Quarterly Project Progress Report, quarterly invoices and associated backup documentation
- Draft and Final Project Completion Report

Budget Category (b) Land Purchase/Easement

Task 4 Land Acquisition: The Projects are either located within Zone 7-owned property (CLP Project) or Zone 7 has an access easement and are in the process of purchasing the property (COL-5 Project). This task will be 100% complete for the COL-5 Project in July 2014 and is not applicable to the CLP Project.

Category (b) Deliverables:

- Proof of Title Transfer for property acquisition for the COL-5 Project.

Budget Category (c) Planning/Design/Engineering/Environmental Documentation

Task 5 Assessment and Evaluation: Site surveys, calculations, and cross section drawings were all prepared under this task. Project assessment and feasibility studies for the CLP and COL-5 Projects are 100% complete.

Task 6 Final Design: This task includes 30%, 60%, 90%, and 100% complete designs and construction specifications and final drawings. This task is 100% complete for the COL-5 Project (completed in January 2014) and the CLP Project (completed in March 2014).

Task 7 Environmental Documentation: This task consists of completing the required environmental compliance and environmental documentation. The COL-5 project was included in the Zone 7 Well Master Plan Environmental Impact Report (EIR), certified in 2005. A CEQA Mitigated Negative Declaration (MND) was certified in 2012 for the CLP project. This task is 100% for both projects.

Task 8 Permitting: This task consists of acquisition of all identified federal, state, and local permits. Work includes coordinating and complying with requirements for issuance of a permit. The COL-5 Project requires a well drilling permit issued by Zone 7. No permits are required for the CLP project. This task is 100% for both projects.

Category (c) Deliverables:

- Copy of CEQA environmental documents
- Copies of 100% complete design drawings and specifications
- Copy of permits

Budget Category (d) Construction/Implementation

Task 9 Construction Contracting: Project was not advertised and bid. Due to Zone 7's declaration of a drought emergency, the Zone 7 Board authorized the General Manager to award the design build contracts to CH2MHill (CLP Project) and Conco West/Stantec (COL-5 Project) without competitive bidding. CH2MHill was chosen due to their successful work on prior Zone 7 projects including a pipeline project which included micro-tunneling. Conco-West and Stantec were similarly chosen for their successful work on prior projects. This task is 100% complete for both projects.

Task 10 Project Construction:

- Mobilization and Site Preparation: This task consists of site staging, site security, temporary sanitary facilities, site BMPs, clearing and grubbing, stockpile and material storage designation, and traffic control. This task is 100% complete for both projects.

Project Construction:

- COL-5 Well Project: This task consists of installation of a new well, connections to existing pipelines, treatment system, and disposal system. Project construction was initiated in February 2014 and will be complete in October 2014. This task is 40% complete for the COL-5 Project. Remaining tasks to be completed include completion of well drilling operations, and installation of well discharge piping, and all equipment necessary to operate the well.
- CLP Project: This task consists of installation of approximately 620 feet of pipeline, connections to existing pipelines and lake outfalls. This task also includes purchase or rental of all construction equipment and supplies. This task is 100% complete for the CLP Project; construction of the CLP Project was completed in May 2014.
- Performance Testing and Demobilization: This task consists of performance testing and demobilization including stormwater testing for contaminant and turbidity levels, and demobilization and removal of debris and construction spoils from the site, excess materials, temporary sanitary facilities, and equipment. A photo inventory of the Project site will be prepared prior to construction. This task is 5% complete for the COL-5 Project and 100% complete for the CLP Project.

Task 11 Environmental Compliance/Mitigation/Enhancement: This task consists of construction monitoring to document compliance with general construction measures, compaction testing for all aggregate materials, concrete slump and compression testing, BMP inspections, daily documentation of construction activities including photos, storm water testing for contaminant and turbidity levels, and site restoration. This task is 0% complete for the COL-5 Project and 100% complete for the CLP Project.

Task 12 Construction Administration: This task consists of reviewing the contractor's schedule and performance, managing and coordinating the agencies and contractors involved with the Project, and providing construction inspection and management oversight, including review and approval of inspection reports, pay requests, meeting notes, contractor log submittals, and as-built drawings. This task is 25% complete for the COL-5 Project and 90% complete for the CLP Project (as-built drawings and inspection reports are not complete).

Category (d) Deliverables:

- Copy of Zone 7 Board resolutions authorizing award of design-build contracts
- Pre-construction, construction period, and post-construction photographs
- Certified engineer inspection completion report with final as-built drawings
- A copy of the erosion and sediment control plan
- A copy of the inspection reports and meeting minutes from construction management reports

Work Summaries – Recycled Water Projects

Project ID#	Project Proponent	Project Title
4	Napa Sanitation District	Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines
5	SCVWD and City of Sunnyvale	Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline
6	DERWA	DERWA Phase 3 Recycled Water Expansion Project
7	City of Calistoga	Calistoga Recycled Water Storage Facility

Project 4 –Los Carneros Water District and Milliken Sarco-Tulocay Recycled Water Pipelines

Budget Category (a) Direct Project Administration

Task 1 Project Administration: This task consists of the project administration responsibilities, which includes coordinating agency responsibilities and managing cost commitments. This task also includes providing other supporting documentation required for this grant agreement (e.g., financial statements) and a Project Performance Monitoring Plan describing tools to be used to monitor and measure project benefits will be submitted to the State prior to disbursement of grant funds for construction or monitoring activities for this Project. This task is 0% complete.

Task 2 Labor Compliance Program: This task consists of completing the required implementation of an LCP. The Napa Sanitation District will procure consultant services to implement an LCP that is compliant with Department of Industrial Relations standards and will be implemented for all construction activities covered under the grant agreement. This task is 100% complete for the Milliken-Sarco-Tulocay (MST) Project and 0% complete for the Los Carneros Water District (LCWD) Project.

Task 3 Reporting (0% complete):

- Quarterly Progress Reports: This task consists of preparing progress reports detailing work completed in prior quarter and submittal to ABAG for submittal to DWR.
- Invoices: This task consists of preparing quarterly invoices including relevant supporting documentation for submittal to ABAG for submittal to DWR.
- Draft and Final Project Completion Report: This task consists of preparing draft Final Project Completion Report and submitting to ABAG for submittal to DWR for DWR Project Manager's comment and review no later than 90 days after project completion. This task also consists of preparing the Final Report addressing ABAG/DWR's comments.

Category (a) Deliverables:

- Local Project Sponsor Agreement with ABAG
- Financial Statements
- Project Performance Monitoring Plan
- Proof of Labor Compliance Plans for each project component, including certified payroll records and copies of worker interviews
- Quarterly Project Progress Report
- Quarterly Invoices and associated backup documentation
- Draft and Final Project Completion Report

Budget Category (b) Land Purchase/Easement

Task 4 Land Acquisition: An easement for the MST Project (booster pump station) was obtained and recorded. An easement for a small portion of the LCWD Project alignment will be recorded in July 2014. This task is 100% complete.

Category (b) Deliverables:

- Documentation of property easements.

Budget Category (c) Planning/Design/Engineering/Environmental Documentation

Task 5 Assessment and Evaluation: Site surveys, calculations, and cross section drawings were all prepared under this task. Project assessment and feasibility studies are 100% complete for the MST Project and 95% complete for the LCWD Project.

Task 6 Final Design: This task includes 30%, 60%, 90%, and 100% complete designs and construction specifications and final drawings. This task is 100% complete for the MST Project and 95% complete for the LCWD Project.

Task 7 Environmental Documentation: This task consists of completing the required environmental compliance and environmental documentation. An initial study/mitigated negative declaration (IS/MND) was completed for the LCWD Project in 2013. The MST Project was evaluated as part of the North San Pablo Bay Restoration and Reuse Project (North Bay Water Recycling Program) environmental impact report/environmental impact statement (EIR/EIS) certified/adopted by the U.S. Bureau of Reclamation and North Bay Water Reuse Authority in 2009. This task is 100% complete for both projects.

Task 8 Permitting: This task consists of acquisition of all identified federal, state, and local permits. Work includes coordinating and complying with requirements for issuance of permits from USACE, RWQCB, and CDFW. This task is 100% for the MST Project and 10% complete for the LCWD Project.

Category (c) Deliverables:

- Copy of CEQA environmental documents
- Copies of 100% complete design drawings and specifications
- Copy of permits

Budget Category (d) Construction/Implementation

Task 9 Construction Contracting: This task consists of construction contracting, including solicitations for bids and awards of contracts. The MST Project was bid in May 2014, with Notice to Proceed issued in June 2014 to the selected construction contractors. The LCWD Project will be bid in spring 2015, with contracting completed by April 2015. This task is 100% complete for the MST Project and 0% complete for the LCWD Project.

Task 10 Project Construction:

- Mobilization and Site Preparation: This task consists of site staging, site security, temporary sanitary facilities, site BMPs, clearing and grubbing, stockpile and material storage designation, and traffic control. This task is 0% complete for both projects.

Project Construction:

- *MST Project:* This task involves construction of approximately 5 miles of recycled water pipeline and a booster pump station. Both components will be constructed by two separate contractors under separate contracts; projects will begin at the same time. The expected duration of the booster pump station construction is shorter than that of the pipeline installation. Since the pipeline is needed for booster pump station testing, both construction contracts will be completed at around the same time. The south segment in Imola Avenue (to Fourth Avenue) will be constructed first, providing initial recycled water to the MST area by late 2014 or early 2015. This task will be 5% complete by October 2014.
- *LCWD Project:* This task involves construction of approximately 9 miles of recycled water pipeline. The pipeline will connect the Napa Sanitation District's existing pipeline distribution system located west of the Napa River, and will be constructed from east to west. As segments are constructed and tested, sections of the pipeline will be brought online to provide recycled water to users in the eastern areas while the west pipeline segments are being installed. This task is 0% complete.
- Performance Testing and Demobilization: This task consists of performance testing and demobilization including stormwater testing for contaminant and turbidity levels, demobilization and removal of debris and excess spoils, temporary sanitary facilities, and equipment. A photo inventory of the Project site will be prepared prior to construction. The LCWD and MST pipelines will be tested by the contractor for a 4-hour period at a pressure of 1.5 times more than the maximum working pressure. This task 0% complete for both projects.

Task 11 Environmental Compliance/Mitigation/Enhancement: This task consists of construction monitoring to document compliance with general construction measures, BMP inspections, daily documentation of construction activities including photos, storm water testing for contaminant and turbidity levels, and site restoration. This task 0% complete for both projects.

Task 12 Construction Administration: This task consists of reviewing the contractor's schedule and performance, managing and coordinating the agencies and contractors involved with the Project, and providing construction inspection and management oversight, including review and approval of inspection reports, pay requests, meeting notes, contractor log submittals, and as-built drawings. This task 0% complete for both projects.

Category (d) Deliverables:

- Contractor agreement documentation
- Pre-construction, construction period, and post-construction photographs
- Certified engineer inspection completion report with final as-built drawings
- A copy of the erosion and sediment control plan
- A copy of the inspection reports
- A copy of meeting minutes from construction management reports

Project 5 – Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline

Budget Category (a) Direct Project Administration

Task 1 Project Administration: This task consists of the project administration responsibilities, which includes coordinating agency responsibilities and managing cost commitments. This task also includes providing other supporting documentation required for this grant agreement (e.g., financial statements) and a Project Performance Monitoring Plan describing tools to be used to monitor and measure project benefits will be submitted to the State prior to disbursement of grant funds for construction or monitoring activities for this Project. This task is 0% complete.

Task 2 Labor Compliance Program: This task consists of completing the required implementation of an LCP, if applicable. The LCP will be compliant with Department of Industrial Relations standards and needs to be in place prior to any construction activities covered under this grant agreement. This task is 0% complete.

Task 3 Reporting (0% complete):

- Quarterly Progress Reports: This task consists of preparing progress reports detailing work completed in prior quarter and submittal to ABAG for submittal to DWR.
- Invoices: This task consists of preparing quarterly invoices including relevant supporting documentation for submittal to ABAG for submittal to DWR.
- Draft and Final Project Completion Report: This task consists of preparing draft Final Project Completion Report and submitting to ABAG for submittal to DWR for DWR Project Manager's comment and review no later than 90 days after project completion. This task also consists of preparing the Final Report addressing ABAG/DWR's comments.

Category (a) Deliverables:

- Local Project Sponsor Agreement with ABAG
- Financial Statements
- Project Performance Monitoring Plan
- Proof of Labor Compliance Plan for each project component, including certified payroll records and copies of worker interviews.
- Quarterly Project Progress Report
- Quarterly Invoices and associated backup documentation
- Draft and Final Project Completion Report

Budget Category (b) Land Purchase/Easement

The Project takes place on land within City of Sunnyvale and/or SCVWD-owned property. This task does not apply to this project.

Budget Category (c) Planning/Design/Engineering/Environmental Documentation

Task 5 Assessment and Evaluation: Engineer's Report: For the pipeline project, this task includes preparation of an Engineer's Report, as required by SCVWD Act, for Board approval. This task is 20% complete.

Task 6 Final Design: This task includes preparation of 30%, 60%, 90%, and 100% complete design and cost estimates. Preparing, applying, and obtaining pre-construction permits required for the Project from governing authorities is also included in this task. This task is 0% complete for the recycled water production improvements; 60% design of the pipeline project is 10% complete.

Task 7 Environmental Documentation: This task consists of completing CEQA compliance documentation. An MND was prepared for the pipeline project; this task is 90% complete. The plant improvements are expected to be categorically exempt; this task is 0% complete.

Task 8 Permitting: This work is included in Task 6, above.

Category (c) Deliverables:

- Engineer's Report with Board approval
- Copies of 30%, 60%, 90%, and final construction design plans, specifications, and cost estimates

- Pump Station Hydraulic Criteria Memorandum
- Design Calculations
- Geotechnical Report
- Hazardous Materials Investigation Report
- Copy of permits (including Caltrans permit and Sunnyvale encroachment permit)
- Copies of CEQA environmental documents

Budget Category (d) Construction/Implementation

Task 9 Construction Contracting: This task consists of construction contracting including solicitation for bids and awards of contracts. Notice to Proceed for the plant improvements is expected to occur in April 2015. Advertising to award the pipeline contract is expected to occur in June 2015. This task is 0% complete.

Task 10 Project Construction:

- Mobilization and Site Preparation: This task consists of siting stockpile and staging areas, site security, temporary sanitary facilities, site BMPs, clearing and grubbing, and traffic control. This task is 0% complete for both projects.
- Project Construction: This task includes initiating project construction, ordering equipment and supplies, assuring permits are in place, and installation of project components. This task is 0% complete for both projects.
- Performance Testing and Demobilization: This task includes taking a photo inventory of the Project site prior to construction. Demobilization activities include removal of: construction spoils and debris from the Project site, excess materials, sanitary facilities, and equipment. This task also includes transferring responsibility back to property owner. This task is 0% complete for both projects.

Task 11: Environmental Compliance/Mitigation/Enhancement: This work is included in Task 12. Costs are not tracked separately.

Task 12: Construction Administration: This task consists of securing contractor performance and payment bonds, reviewing the contractor's schedule and performance, managing and coordinating public inquiries, managing and coordinating all contractor correspondence, maintain detailed project records, and recommending final payment and submittal of all projects for archival. This task also includes inspection of the Project including reporting and project communication. This task is 0% complete.

Category (d) Deliverables:

- District Board approval to advertise
- Bid package and documentation including addendums, preliminary bid results, and notice of award
- Completion of all contract work
- Copy of all construction related plans (e.g., National Pollutant Discharge Elimination System [NPDES], traffic control, hazardous material management)
- Signed contract and notice to proceed
- Pre-, during-, and post-construction photographs
- Certified engineer inspection completion report with final as-built drawings
- A copy of the inspection reports and test results
- A copy of meeting minutes from construction management reports
- Progress payment requests
- Notice of completion and acceptance of work

Project 6 – DERWA Phase 3 Recycled Water Expansion Project

Budget Category (a) Direct Project Administration

Task 1 Project Administration: This task consists of the project administration responsibilities, which includes coordinating agency responsibilities and managing cost commitments. This task also includes providing other supporting documentation required for this grant agreement (e.g., financial statements) and a Project Performance Monitoring Plan describing tools to be used to monitor and measure project benefits will be submitted to the State prior to disbursement of grant funds for construction or monitoring activities for this Project. This task is 0% complete.

Task 2 Labor Compliance Program: This task consists of completing the required implementation of an LCP, if applicable. The LCP will be compliant with Department of Industrial Relations standards and needs to be in place prior to any construction activities covered under this grant agreement. This task is 0% complete.

Task 3 Reporting (0% complete):

- Quarterly Progress Reports: This task consists of preparing progress reports detailing work completed in prior quarter and submittal to ABAG for submittal to DWR.
- Invoices: This task consists of preparing quarterly invoices including relevant supporting documentation for submittal to ABAG for submittal to DWR.
- Draft and Final Project Completion Report: This task consists of preparing draft Final Project Completion Report and submitting to ABAG for submittal to DWR for DWR Project Manager's comment and review no later than 90 days after project completion. This task also consists of preparing the Final Report addressing ABAG/DWR's comments.

Category (a) Deliverables:

- Local Project Sponsor Agreement with ABAG
- Financial Statements
- Project Performance Monitoring Plan
- Proof of LCPs for each project component, including certified payroll records and copies of worker interviews
- Quarterly Project Progress Report
- Quarterly Invoices and associated backup documentation
- Draft and Final Project Completion Report

Budget Category (b) Land Purchase/Easement

The projects are located within public right-of-way and therefore do not require land purchases or easements. This task is not applicable.

Budget Category (c) Planning/Design/Engineering/Environmental Documentation

Task 5 Assessment and Evaluation: Planning documents have been previously prepared; no additional planning studies are necessary. This task is not applicable.

Task 6 Final Design: This task includes 30%, 60%, 90%, and 100% design phases, including conducting surveys, performing calculations, preparing cross-section drawings, preparing construction specifications, and completing construction drawings and specifications for final approval.

- Central Dublin Pipeline: This task is 30% complete.
- West Dublin Pipeline: This task is 20% complete.
- San Ramon Valley Pipeline: This task is 20% complete.

Task 7 Environmental Documentation: This task consists of completing the required environmental compliance and environmental documentation as necessary. All three project components were included in DERWA's San Ramon Valley Recycled Water Program EIR, certified in 1995. DSRSD and EBMUD will each prepare a Notice of CEQA Exemption for their respective project component. This task is 0% complete.

Task 8: Permitting: This task consists of acquisition of all identified local encroachment permits, which will be incorporated into bid documents. Work includes coordinating and complying with requirements for issuance of a permit. No federal or state permits are expected to be required for all three project components. This task is 0% complete for all three projects.

Category (c) Deliverables:

- Copies of 30%, 60% and 90% design drawings and specifications
- A copy of the final drawings and specifications
- Copy of environmental documents as required by CEQA
- Copy of all required permits
- Project Monitoring Plan

Budget Category (d) Construction/Implementation

Task 9 Construction Contracting: This task consists of construction contracting including solicitations for bids and awards of contracts. This task has not begun for any of the three DERWA project components. This task is 0% complete.

Task 10 Project Construction:

- Mobilization and Site Preparation: This task consists of site staging, site security, temporary sanitary facilities, site BMPs, clearing and grubbing, stockpile and material storage designation, and traffic control. This task has not begun for any of the three DERWA project components. This task is 0% complete for all three projects.
- Project Construction:
- *Central Dublin Pipeline Project*: This task consists of installation of approximately 1.5 miles of recycled water pipeline for the Central Dublin ranging in diameter from 4 inches to 10 inches, and connections to existing pipelines. This task also includes all construction equipment and supplies. This task is 0% complete.
- *West Dublin Pipeline Project*: This task consists of installation of approximately 3.7 miles of recycled water distribution pipeline ranging in diameter from 4inches to 8 inches, and connections to existing pipelines. This task also includes all construction equipment and supplies. This task is 0% complete.
- *San Ramon Valley Phase 2 Project*: This task consists of installation of approximately 3.6 miles of recycled water distribution pipeline ranging in diameter from 4 inches to 16 inches. This task also includes all construction equipment and supplies. This task is 0% complete.
- Performance Testing and Demobilization: This task consists of performance testing and demobilization including water testing for contaminant and turbidity levels, and demobilization and removal of debris and construction spoils from the site, excess materials, temporary sanitary facilities, and equipment. This task is 0% complete.

Task 11 Environmental Compliance/Mitigation/Enhancement: This task consists of complying with general construction measures, and creating a stormwater pollution prevention plan and traffic control plan. This task is 0% complete for all three projects.

Task 12 Construction Administration: This task consists of reviewing the contractor's schedule and recommendations, managing and coordinating the agencies and contractors involved with the project, and providing construction inspection and management oversight. This task also entails recommending final payment and submittal of all project files for archiving. This task is 0% complete for all three projects.

Category (d) Deliverables:

- Copy of bid package
- Pre-construction, construction, and post-construction photographs
- Certified engineer inspection completion report with final as-built drawings
- A copy of the stormwater pollution prevention plan, traffic control plan, and inspection reports

Budget Category (a) Direct Project Administration

Task 1 Project Administration: This task consists of the project administration responsibilities, which includes coordinating agency responsibilities and managing cost commitments. This task also includes providing other supporting documentation required for this grant agreement (e.g., financial statements) and a Project Performance Monitoring Plan describing tools to be used to monitor and measure project benefits will be submitted to the State prior to disbursement of grant funds for construction or monitoring activities for this Project. This task is 0% complete.

Task 2 Labor Compliance Program: This task consists of completing the required implementation of an LCP, if applicable. The LCP will be compliant with Department of Industrial Relations standards and needs to be in place prior to any construction activities covered under this grant agreement. This task is 0% complete.

Task 3 Reporting (0% complete):

- Quarterly Progress Reports: This task consists of preparing progress reports detailing work completed in prior quarter and submittal to ABAG for submittal to DWR.
- Invoices: This task consists of preparing quarterly invoices including relevant supporting documentation for submittal to ABAG for submittal to DWR.
- Draft and Final Project Completion Report: This task consists of preparing draft Final Project Completion Report and submitting to ABAG for submittal to DWR for DWR Project Manager's comment and review no later than 90 days after project completion. This task also consists of preparing the Final Report addressing ABAG/DWR's comments.

Category (a) Deliverables:

- Local Project Sponsor Agreement with ABAG
- Financial Statements
- Project Performance Monitoring Plan
- Proof of LCP for each project component, including certified payroll records and copies of worker interviews
- Quarterly Project Progress Reports
- Quarterly Invoices and associated backup documentation
- Draft and Final Project Completion Report

Budget Category (b) Land Purchase/Easement

The Project is located within public right-of-way. No land purchases or easements are necessary. This task is not applicable.

Budget Category (c) Planning/Design/Engineering/Environmental Documentation

Task 5 Assessment and Evaluation: Assessments and evaluations for the Project are 100% complete. See the Bypass Alternative Investigation Report (prepared by Larry Walker Associates in June 2013), geotechnical study (completed in April 2014), and topographic survey (completed in April 2014).

Task 6 Final Design: This task also includes completing the following design phases: 90% and bid set of construction documents including conducting surveys, geotechnical evaluation, performing calculations, cost estimates, schedules and construction drawings and specifications for final approval. 60% design plans, specifications, and cost estimate will be completed by July 2014. Final designs will be completed and approved for construction by the end of October 2014. This task is 75% complete.

Task 7 Environmental Documentation: This task consists of completing the required environmental compliance and environmental documentation necessary for the Project. This Project has been determined to be categorically exempt; cultural and biological resources studies were completed and submitted to the State Clearinghouse in June 2014 and is anticipated after 30-day review to be recorded the end of July. This task is 95% complete.

Task 8 Permitting: This task consists of acquisition of all identified federal, state, and local permits. Work includes coordinating and complying with requirements for issuance of the following permits: CDFW Section 1600 permit, Clean Water Act (CWA) Section 401 permit from the San Francisco RWQCB, CWA Section 402 NPDES Construction General

Permit (through preparation of a SWPPP), CWA Section 404 permit from USACE. The City's consultant has made initial contact with these agencies and the City has had a field meeting with CDFW. The consultant is modifying the design so that several of the permits will not apply to the Project and is working on completing documentation and discussions with these agencies. A SWPPP will be required and will be prepared prior to bidding in December 2014. This task is 50% complete.

Category (c) Deliverables:

- Copies of 60% and 90% design drawings and specifications
- A copy of the final drawings and specifications
- Copy of environmental documents as required by CEQA
- Copy of all required permits

Budget Category (d) Construction/Implementation

Task 9 Construction Contracting: This task consists of construction contracting including solicitations for bids and awards of contracts for the Project. This task is 0% complete.

Task 10 Project Construction (0% complete):

- Mobilization and Site Preparation: This task consists of site staging, site security, temporary sanitary facilities, site BMPs, clearing and grubbing, removal of existing irrigation piping/sprinklers, stockpile and material storage designation, mobilization of equipment for the Project.
- Project Construction: This task consists of earthwork and grading to construct the 20-million-gallon (MG) pond with approximately 100,000 cubic yards of excavation and embankment work. The Project will also entail approximately 200 feet of pipeline, and a small pre-fabricated rail car bridge. This task also includes ordering of all construction equipment and supplies.
- Performance Testing and Demobilization: This task consists of performance testing, stormwater testing, including soil compaction testing, demobilization and removal of debris and construction spoils from the site, excess materials, temporary sanitary facilities, and equipment.

Task 11 Environmental Compliance/Mitigation/Enhancement: This task consists of complying with general construction measures, and creating an erosion and sediment control plan, and a stormwater pollution prevention plan. Construction monitoring tasks include compaction testing for embankment berms, BMP inspections, stormwater testing, and daily documentation of construction activities. Revegetation work includes hydroseeding of all disturbed areas in accordance with CDFW requirements. This task is 0% complete.

Task 12 Construction Administration: This task consists of reviewing the contractor's schedule, and recommendations, managing and coordinating the agencies and contractors involved with the Project, and providing construction inspection and management oversight. This task is 0% complete.

Category (d) Deliverables:

- Copy of bid package
- Pre-construction, construction, and post-construction photographs
- Certified engineer inspection completion report with final as-built drawings
- A copy of the erosion and sediment control plan
- A copy of the stormwater pollution prevention plan
- A copy of the inspection reports and contractor logs
- A copy of meeting minutes from construction management reports and pay requests

Work Summaries – Human Right to Water Projects

Project ID#	Project Proponent	Project Title
8	San Mateo County RCD	Drought Relief for South Coast San Mateo County
9	Stinson Beach County Water District	Stinson Beach Water Supply & Drought Preparedness Plan

Budget Category (a) Direct Project Administration

Task 1 Project Administration: This task consists of the project administration responsibilities, which includes coordinating agency responsibilities and managing cost commitments. This task also includes providing other supporting documentation required for this grant agreement (e.g., financial statements) and a Project Performance Monitoring Plan describing tools to be used to monitor and measure project benefits will be submitted to the State prior to disbursement of grant funds for construction or monitoring activities for this Project. This task is 10% complete.

Task 2 Labor Compliance Program: This task consists of completing the required implementation of an LCP. The LCP will be compliant with Department of Industrial Relations standards and needs to be in place prior to any construction activities covered under this grant agreement. This task is 0% complete.

Task 3 Reporting (0% complete):

- Quarterly Progress Reports: This task consists of preparing progress reports detailing work completed in prior quarter and submittal to ABAG for submittal to DWR review.
- Invoices: This task consists of preparing quarterly invoices including relevant supporting documentation for submittal to ABAG for submittal to DWR.
- Draft and Final Project Completion Report: This task consists of preparing draft Final Project Completion Report and submitting to ABAG for submittal to DWR for DWR Project Manager's comment and review no later than 90 days after project completion. This task also consists of preparing the Final Report addressing ABAG/DWR's comments.

Category (a) Deliverables:

- Local Project Sponsor Agreement with ABAG and Financial Statements related to Project
- Project Performance Monitoring Plan
- Proof of LCP for each project component, including certified payroll records and copies of worker interviews
- Quarterly project progress reports, quarterly invoices and associated backup documentation
- Draft and Final Project Completion Report

Budget Category (b) Land Purchase/Easement

This task is not applicable. All projects would occur through partnerships with private and public landowners.

Budget Category (c) Planning/Design/Engineering/Environmental Documentation

Task 5 Assessment and Evaluation: This task includes water supply, storage and distribution infrastructure and management assessments (including infrastructure inspections and irrigation audits). Assessments have been completed on three of six planned domestic water supply/infrastructure sites (Elements A.1 and B.1). Water supply/irrigation distribution assessments/audits have been completed on eight of 17 planned agricultural sites (Elements A.2 and B.2). These assessments will identify opportunities to repair or replace infrastructure which is failing with more efficient equipment. Assessments will target leaking supply lines, failing or undersized water storage infrastructure, and opportunities to improve water use efficiency and reduce pressures on late summer stream flows. Task 5 is currently 50% complete.

Task 6 Final Design: This task also includes completing the engineering design documents required for permitting purposes. Designs have been completed for domestic infrastructure leak repair at one site, two are in progress, and one is planned (Element A.1). Agricultural irrigation efficiency designs are complete for seven sites, one is under way and five more are planned (13 total for Element A.2). Designs for domestic water storage improvements have been started at two sites (Element B.1). Designs for agricultural water storage improvements have been completed at one of four planned sites (these sites are at the same location as four of the agricultural properties where efficiency upgrades will be made (Element B.2). Task 6 is currently 50% complete.

Task 7 Environmental Documentation: This task consists of completing the required environmental compliance and environmental documentation necessary for the Project. Various levels of environmental documentation will be prepared depending whether CEQA compliance is required. It is not anticipated CEQA compliance will be necessary for

irrigation efficiency projects (Element A.2). It is anticipated CEQA compliance will be required for one domestic water supply site (Element A.1), one domestic storage site (Element B.1), and two agricultural water storage sites (Element B.2). Task 7 is 50% complete.

Task 8 Permitting: This task consists of acquisition of all applicable federal, state, and local permits. Permits may include county grading permits, Coastal Development Permits (California Coastal Commission [CCC]), Lake or Streambed Alteration Agreements (CDFW), and water quality certifications (RWQCB). Permit development for domestic infrastructure leak repairs has been completed at one of four planned sites (Element A.1). Permit development for irrigation efficiency improvements are complete at seven of 13 planned sites (Element A.2). Permit development for domestic water storage projects has been started at two sites (Element B.1). Permit development for agricultural water storage projects has been completed at one of four planned sites (Element B.2). Task 8 is 50% complete.

Category (c) Deliverables:

- Copies of final design drawings and specifications including plans for water supply lines and storage facilities.
- A copy of the final drawings and specifications
- Lists of recommended irrigation efficiency and water storage capacity actions to be implemented
- Copy of environmental documents as required by CEQA
- Copy of all required permits

Budget Category (d) Construction/Implementation

Task 9 Construction Contracting: This task consists of construction contracting including solicitations for bids and awards of contracts for the Project. Construction contracting for domestic infrastructure improvements is complete at one of four Element A.1 sites, seven of 13 Element A.2 sites, and one of four Element B.2 sites. Construction contracting for water residential storage projects is planned for two sites (Element B.1). Task 9 is 50% complete.

Task 10 Project Construction: This task includes the repair of leaky supply lines on four sites (Element A.1), repair of water storage infrastructure on four sites (Element B.2), and the replacement of oversized single speed surface water pumps with variable speed pumps on up to 17 sites (Elements A.1 and A.2, typically one pump per site, a minimum of 10 pumps will be replaced). New or upgraded water storage infrastructure will be constructed to increase the forbearance of surface water withdrawals during the late summer in exchange for storing winter runoff (six sites under Elements B.1 and B.2). Groundwater pumps will be installed on new and existing groundwater wells to increase conjunctive use and reduce pressures on withdrawing surface water (13 sites under Element A.2, a minimum of three pumps will be installed). Construction is complete for one of four Element A.1 sites, seven of 13 Element A.2 sites, and one of four Element B.2 sites. Construction for domestic storage projects is planned at two sites (Element B.1). Task 10 is 50% complete.

Task 11 Environmental Compliance/Mitigation/Enhancement: This task consists of complying with general permit requirements and general construction measures issued for construction of water supply, storage and distribution infrastructure improvements. Tasks will vary for each site and will be carried out by San Mateo County RCD staff and/or qualified consultants. Environmental compliance is complete for one of four Element A.1 sites, seven of 13 Element A.2 sites, and one of four Element B.2 sites. Environmental compliance for domestic storage projects (Element B.1) is planned at two sites. Task 11 is 50% complete.

Task 12 Construction Administration: This task consists reviewing the contractor's schedule, recommendations, managing and coordinating the agencies and contractors involved, and providing construction inspection and management insight. RCD bidding procedures will be followed to secure contractors. The San Mateo County RCD will solicit bids upon completion of water supply, storage and distribution infrastructure improvement designs (Task 6) and initiation of the permitting (Task 8). Construction administration is complete at one of four Element A.1 sites; seven of 13 Element A.1 sites; two Element B.1 sites; and one of four Element B.2 sites. Task 12 is 50% complete.

Category (d) Deliverables:

- Copy of bid documents and executed contracts
- Summary of construction work and documentation showing environmental compliance measures completed during and after construction
- Summary of construction administration tasks (e.g., meeting minutes)

Project 9 – Stinson Beach Water Supply & Drought Preparedness Plan

Budget Category (a) Direct Project Administration

Task 1 Project Administration: This task consists of the project administration responsibilities, which includes coordinating agency responsibilities and managing cost commitments. This task also includes providing other supporting documentation required for this grant agreement and a Project Performance Plan describing tools to be used to monitor and measure project benefits will be submitted to the State prior to disbursement of grant funds for construction or monitoring activities for this Project. This task is 0% complete.

Task 2 Labor Compliance Program: This task consists of completing the required implementation of an LCP, if applicable. The LCP will be compliant with Department of Industrial Relations standards and needs to be in place prior to any construction activities covered under this grant agreement. This task is 0% complete.

Task 3 Reporting (0% complete):

- Quarterly Progress Reports: This task consists of preparing progress reports detailing work completed in prior quarter and submittal to ABAG for submittal to DWR.
- Invoices: This task consists of preparing quarterly invoices including relevant supporting documentation for submittal to ABAG for submittal to DWR.
- Draft and Final Project Completion Report: This task consists of preparing draft Final Project Completion Report and submitting to ABAG for submittal to DWR for DWR Project Manager's comment and review no later than 90 days after project completion. This task also consists of preparing the Final Report addressing ABAG/DWR's comments.

Category (a) Deliverables:

- Local Project Sponsor Agreement with ABAG, Financial Statements and Project Performance Monitoring Plan
- Proof of Labor Compliance Plans for each project component
- Quarterly Project Progress Report, quarterly invoices, and associated backup documentation
- Draft and Final Project Completion Report

Budget Category (b) Land Purchase/Easement

Task 4 Land Acquisition: This Task consists of acquiring land and/or easements needed for implementation of the Project. This task is 5% complete.

Budget Category (c) Planning/Design/Engineering/Environmental Documentation

Task 5 Assessment and Evaluation: This task includes performing initial site assessments, conducting surveys, and performing preliminary calculations.

Project A (2014 Calles Pipeline Replacement Project): This task is 100% complete.

Project B (Patios Pipelines Replacement Project): This task is 20% complete.

Project C (Supplemental Groundwater Supplies): This task includes evaluation of groundwater source capacity, installation of small diameter test wells to evaluate aquifer capacity, evaluation of connections with at least three privately-owned wells, and pursue the development of agreements and easements with private well owners. This task is 10% complete.

Project D (Water Meter Replacements and In-Line Meters): This task includes performing preliminary calculations and surveys associated with leak detection. This task is 20% complete.

Task 6 Final Design: This task includes 30%, 90% and 100% complete designs, and construction specifications, drawings. This task is 100% complete for Project A. This task is 0% complete for Projects B, C, and D.

Task 7 Environmental Documentation: This task consists of completing the required CEQA compliance.

Project A: This Project has been determined to be categorically exempt; this task includes acquisition of a Notice of Exemption. This task is 95% complete.

Projects B, C, and D: This task is 0% complete.

Task 8 Permitting:

Project A: This task consists of completing the required Caltrans encroachment permit requirements. This task is 25% complete.

Projects B and D: No environmental permits are necessary; this task does not apply to Projects B and D.

Project C: This task includes completing the required permit requirements from the County of Marin and California Department of Public Health. This task is 0% complete.

Category (c) Deliverables:

- Feasibility studies and summary reports
- Copies of 30% and 90% design drawings and specifications
- A copy of the final drawings, engineer's cost estimate and Project Manual (bidding/contract documents and specifications)
- Copy of environmental documents as required by CEQA including determinations of Categorical Exemption
- Copy of all required permits

Budget Category (d) Construction/Implementation

Task 9 Construction Contracting: This task consists of construction contracting including requesting for bids be advertised in local newspapers, holding a pre-bid conference including a site investigation, preparing contact addendums (if needed), holding a public bid opening, and issuing the Notice of Award. This task is 25% complete.

Task 10 Project Construction:

Mobilization and Site Preparation: This task will vary by project but generally consists of mobilizing construction equipment, designating staging areas and stockpiling areas. This task is 0% complete.

Project Construction:

Project A: This task consists of replacing 1,300 feet of old/undersized pipeline with new piping and replacing over 40 service laterals. This task is 0% complete.

Project B: This task consists of replacing 1,000 feet of old/undersized pipeline with new piping and replacing over 40 service laterals. This task is 0% complete.

Project C: This task consists of installing 3 three small-diameter test wells, a new groundwater production well, connecting up to 3 private wells to the District's distribution system, and the commencement of a comprehensive leak detection survey. This task is 0% complete.

Project D: This task consists of replacing 700 customer water meters and installation of up to 5 in-line water meters. This task is 0% complete.

Performance Testing and Demobilization: This task consists of performance testing of newly constructed facilities. It also includes demobilization of construction sites, removal of debris and construction spoils from site, excess materials, temporary sanitary facilities, and equipment. This task is 0% complete.

Task 11 Environmental Compliance/Mitigation/Enhancement: This task consists of monitoring of all construction activity for environmental compliance. This task also consists of restoring all construction sites to pre-project conditions. This task is 0% complete.

Task 12 Construction Administration: This task consists of administration activities related to the construction contractor such as verifying contractor insurance and coverage, contacting contractor references, securing contractor performance and payment bonds, releasing the Notice to Proceed, reviewing contractor recommendations and submittals. This task is 0% complete.

Category (d) Deliverables:

- Project Monitoring Plan and proofs pertaining to various construction administration activities and construction management activities (inspection reports, contractor submittals, test results, and logs)

Work Summaries – Drought Preparedness Projects

Project ID#	Project Proponent	Project Title
10	StopWaste	Bay Area Regional Drought Relief Conservation Program
11	MMWD	WaterSMART Irrigation with AMI/AMR

Project 10 – Bay Area Regional Drought Relief Conservation Program

Budget Category (a) Direct Project Administration

Task 1 Project Administration: The Project will be implemented by 12 participating agencies and overseen by the lead project proponent agency, Alameda County StopWaste.org (StopWaste). StopWaste will contract with a third-party Contractor to provide project administration services to all participating agencies. StopWaste will be responsible for contracting with and managing the Contractor, and reviewing quarterly project activity reports and invoices and final reports submitted by participating agencies. Ongoing administration and management of contractor, accounting, and legal work, reviewing work products, approving invoices and quarterly reports, and preparing documents for ABAG review will be conducted by StopWaste for a period of three years (through December 2018).

This task also includes providing supporting documentation required for this grant agreement (e.g., financial statements, etc.) and preparation of a Project Performance Monitoring Plan describing tools to be used to monitor and measure project benefits, which will be submitted to the State prior to disbursement of grant funds for construction or monitoring activities for this Project.

StopWaste will establish Implementation Agreements with all project participants, including negotiations and finalizing agreements with each participating entity that will receive IRWM grant funding. StopWaste will attain approval by the StopWaste Board and each participating entity.

Participating agencies will submit invoices to StopWaste quarterly, with accompanying quarterly reports. StopWaste will submit reports to ABAG in accordance with the format specified by the DWR Grant Agreement and StopWaste's agreement with each participating agency. These invoices will be based on rebate forms and records provided by the participants. StopWaste, with assistance from a consultant, will coordinate invoice submission and maintain records. Electronic records of invoices will be retained at StopWaste, ABAG, and participating agencies will maintain records of supporting documents in hard copy format.

After ABAG receives reimbursement from the State and reimburses StopWaste, StopWaste will disburse funds to participating agencies. Records will be maintained in accordance with generally acceptable accounting principles and practices. The Project Manager, with assistance from a consultant, will track each disbursement and cumulative disbursements to date. This task is 0% complete.

Task 2 Labor Compliance Program: An LCP is not necessary; this task does not apply to this project.

Task 3 Reporting (0% complete):

- Quarterly Progress Reports: This task consists of preparing progress reports detailing work completed in prior quarter and submittal to ABAG for submittal to DWR review.
- Invoices: This task consists of preparing quarterly invoices including relevant supporting documentation for submittal to DWR via ABAG.
- Draft and Final Project Completion Report: This task consists of preparing draft Final Project Completion Report and submitting to DWR via ABAG for DWR Project Manager's comment and review no later than 90 days after project completion. This task also consists of preparing the Final Report addressing ABAG/DWR's comments.

Category (a) Deliverables:

- Local Project Sponsor Agreement with ABAG
- Agreements with Project Participants
- Board approvals for all Project Participants
- Financial Statements
- Project Performance Monitoring Plan
- Quarterly Project Progress Report
- Quarterly Invoices and associated backup documentation
- Draft and Final Project Completion Report

Budget Category (b) Land Purchase/Easement

Not applicable. This Project does not require land purchases or easements.

Budget Category (c) Planning/Design/Engineering/Environmental Documentation

Task 5 Assessment and Evaluation: Not applicable. This Project does not require preparation of assessment and evaluation studies.

Task 6 Final Design: Not applicable. This Project does not require preparation of designs.

Task 7 Environmental Documentation: This Project is not considered a project under CEQA (CEQA Guidelines 15378). A Notice of Exemption will be or has been filed for all project participants.

Task 8 Permitting: Not applicable. This Project does not require permits or regulatory approvals.

Budget Category (d) Construction/Implementation

Task 9 Contracting: The High-Efficiency Toilet (HET)/Urinal Direct Installation Project element will include procurement of professional services. Third-party contracting specifics and structure will vary per agencies, but in general are likely to include the following steps: (1) prepare and issue request for proposal for toilet/urinal supply and installation services or rebate administration, and professional software deployment services; (2) evaluate proposals; (3) select highest-scoring vendor; (4) enter into agreement and award contract. Some agencies already have contractors in place and will not need to solicit for new services. This task is 0% complete.

Task 10 Project Implementation (0% complete):

- Project Marketing: Specific marketing efforts may include: bill inserts, newsletters, electronic, newspaper advertisements, public service announcements, media (websites, blogs, social media platforms, online videos, direct email marketing), displays at retail businesses, and others. Educational elements developed by the project function in part as project marketing for the financial incentive elements. In addition, participating agencies will develop, design and print marketing materials. Agencies will have the flexibility to collaborate to ensure consistent messaging throughout the region.
- Rebate Implementation: This task involves implementation of rebate programs, including processing and issuance of rebates for lawn to landscape conversions, high-efficiency toilets, and high-efficiency washers.
- High-Efficiency Toilet and Urinal Direct Installations: This task involves installation of high efficiency toilets and urinals in primarily multi-family residential, commercial and municipal units. Agencies will develop specific project terms and conditions. This task may include procurement of professional services. Third-party contracting specifics will vary per agencies, but in general are likely to include requests for proposals for installation and inspection services, and contracting with the high-scoring vendors. Some agencies already have contractors in place and will not need to solicit for new services.
- Drought Resistant Soil and Garden Marketplace: This task includes StopWaste's work to develop Lawn to Garden partnerships to market and advertise the program. StopWaste will conduct stakeholder meetings and workshops for the public, and develop website tools for retail partners and water agencies.

Task 11 Environmental Compliance/Mitigation/Enhancement: This task does not apply.

Task 12 Construction Administration: This task does not apply.

Category (d) Deliverables:

- Contract Agreements for third-party contractors and vendors
- Examples of public outreach/ marketing materials
- Examples of rebate applications
- Quarterly numbers of rebates issued, toilet/urinal installations, participants, and square feet of lawn converted
- Lawn to Garden marketing materials, partnership agreements, workshop and meeting notes

Budget Category (a) Direct Project Administration

Task 1 Project Administration: This task consists of the project administration responsibilities, which includes coordinating agency responsibilities and managing cost commitments. This task also includes providing other supporting documentation required for this grant agreement (e.g., financial statements) and a Project Performance Monitoring Plan describing tools to be used to monitor and measure project benefits will be submitted to the State prior to disbursement of grant funds for construction or monitoring activities for this Project. This task is 0% complete.

Task 2 Labor Compliance Program: MMWD will use in-house labor for all construction and field work efforts. An LCP is not necessary; this task does not apply to this project.

Task 3 Reporting (0% complete):

- Quarterly Progress Reports: This task consists of preparing progress reports detailing work completed in prior quarter and submittal to ABAG for submittal to DWR.
- Invoices: This task consists of preparing quarterly invoices including relevant supporting documentation for submittal to ABAG for submittal to DWR.
- Draft and Final Project Completion Report: This task consists of preparing draft Final Project Completion Report and submitting to ABAG for submittal to DWR for DWR Project Manager's comment and review no later than 90 days after project completion. This task also consists of preparing the Final Report addressing ABAG/DWR's comments.

Category (a) Deliverables:

- Local Project Sponsor Agreement with ABAG
- Financial Statements
- Project Performance Monitoring Plan
- Quarterly Project Progress Report
- Quarterly Invoices and associated backup documentation
- Draft and Final Project Completion Report

Budget Category (b) Land Purchase/Easement

This task does not apply to this project.

Budget Category (c) Planning/Design/Engineering/Environmental Documentation

Task 5 Assessment and Evaluation: Scoping for integration with MMWD's SAP enterprise system (software manufactured by German firm SAP to manage business operations) and development of the conceptual designs and project plan will be conducted under this task. This task is 50% complete.

Task 6 Final Design: This task includes preliminary conceptual design, developing a plan and final design for project implementation, and creating a sequential work plan. This task is 80% complete.

Task 7 Environmental Documentation: This task does not apply.

Task 8 Permitting: This task does not apply.

Category (c) Deliverables:

- Conceptual designs
- Final Work Plan

Budget Category (d) Construction/Implementation

Task 9 Contracting: This task consists of contracting including solicitations for bids and awards of contracts for SAP consultant and advanced metering infrastructure/automatic meter reading (AMI/AMR) vendor. This task is 0% complete.

Task 10 Project Implementation (4% complete):

- Outreach: This task consists of working with project irrigation account customers to inform regarding project parameters and establishing new water budgets, and ensuring transition to water efficient irrigation equipment.
- Irrigation Equipment Rebate Program: This task consists of launching and administering a water efficient irrigation equipment rebate program for project irrigation account customers.
- Water Budgets: This task consists of developing and providing new water budgets for each of the 800 project irrigation accounts.
- AMI/AMR Installation: This task consists of installing and configuring the new AMI/AMR hardware and software at 800 project sites and within MMWD's administration center, and field testing to validate system functionality and integration with SAP enterprise system.
- Data Analysis: This task consists of launching the new AMI/AMR system, collecting and analyzing water use data.

Task 11 Environmental Compliance/Mitigation/Enhancement: This task does not apply.

Task 12 Construction Administration: This task consists of reviewing the SAP consultant and AMI/AMR vendor's schedule and recommendations, managing and coordinating MMWD staff and departments involved with the Project, and providing implementation inspection and management oversight. This task is 0% complete.

Category (d) Deliverables:

- Contracts for SAP consultant and AMI/AMR vendor
- Copy of outreach letters and rebate marketing material
- Copy of new water budgets for project irrigation accounts
- Copy of data collected for quarter following launch of project AMI/AMR systems

Work Summaries – Grant Administration

Project ID#	Project Proponent	Project Title
12	ABAG/SFEP	Grant Administration

Project 12 – Grant Administration

Budget Category (a) Direct Project Administration

Task 1 Project Administration: The Bay DRP grant program will be administered by ABAG under Budget Category (d) Construction/Implementation.

Task 2 Labor Compliance Program: Labor compliance program requirements do not apply to grant administration.

Task 3 Reporting: All reporting activities will be conducted under Budget Category (d).

Budget Category (b) Land Purchase/Easement

This task does not apply to grant administration.

Budget Category (c) Planning/Design/Engineering/Environmental Documentation

Task 5 Assessment and Evaluation: This task does not apply to grant administration.

Task 6 Final Design: This task does not apply to grant administration.

Task 7 Environmental Documentation: This task does not apply to grant administration.

Task 8 Permitting: This task does not apply to grant administration.

Budget Category (d) Construction/Implementation

Task 9 Construction Contracting: ABAG will negotiate and finalize an agreement with DWR for the entire duration of the grant program. In tandem with this agreement, ABAG will negotiate and finalize Local Project Sponsor (LPS) agreements with each entity that will receive grant funding under Bay DRP. ABAG will attain approval from the ABAG Executive Board for all agreements and ensure that the governing body of each local project sponsor also does so. Each agency will be expected to execute an agreement before reimbursement is requested or distributed. Within 30-days of Grant Award, ABAG will finalize the updated work plan, monitoring plan, schedule, and budget for the grant agreement with possible assistance from a hired consultant. This task is 0% complete.

Task 10 Project Construction/Implementation (0% complete):

- Issue LPS Agreements: This task includes negotiation and finalization of LPS Agreements with each LPS that will receive IRWM grant funding, and obtain approval by the ABAG Executive Board and the governing body of each local project sponsor. Each LPS Agreement will include standard formatting for reporting project progress and reimbursement requests, dispute resolution, and other conditions specified in the Grant Agreement between ABAG and DWR. A LPS Oversight and Implementation Committee will be formed.
- Quarterly and Final Reports: ABAG with assistance/input from LPSs will prepare and finalize Quarterly Reports. The Reports will be based on quarterly submittals from each LPS during the grant period, be prepared per the format specified in the DWR Grant Agreement, and submitted electronically to DWR. The Quarterly Reports will include key milestones achieved, percent completion on each task identified in the work plan, and accumulated cost to date organized by grant-funded costs and non-State match costs for each project. Quarterly Reports will be posted on an internet site available to all LPSs and DWR. As individual projects near completion, LPSs will submit a Draft Final Project Report containing a description of the actual work completed, the final schedule showing actual versus planned progress, results, lessons learned, and total project costs. ABAG will review and submit the draft reports to DWR in accordance with the DWR Grant Agreement. After DWR review, ABAG will direct LPSs to finalize their project reports. The Final Project Reports will be submitted to DWR within 90 days of DWR verification that all tasks are completed.
- Invoicing and Reimbursements: Reimbursement requests (invoices) will be submitted to DWR quarterly in accordance with the format specified by the DWR Grant Agreement. ABAG will prepare the reimbursement requests based on project invoices provided by the LPSs. Once reviewed, ABAG will submit the reimbursement request to DWR. After ABAG receives reimbursement from the State, funds will be disbursed to LPSs. ABAG will track each disbursement and cumulative disbursements to date. Records will be maintained in accordance with the DWR Grant Agreement and generally acceptable accounting principles and practices. If needed, a consultant may help to coordinate with LPSs, maintain records, and track disbursements.

- Bookkeeping and Auditing: ABAG will maintain financial records as required by the DWR Grant Agreement. Monthly records will include ABAG administration costs to date, reimbursements requested from DWR, reimbursements received from DWR, reimbursements disbursed from ABAG to LPSs, and any outstanding financial issues. These monthly records will be available electronically to LPSs. An independent annual audit, as well as a close out audit, will be performed by an independent Certified Public Accountant, using generally accepted accounting principles. The IRWMP Round 3 (Bay DRP) Prop 84 accounts will be treated similarly to other ABAG accounts during auditing.
- Coordination and Field Verification: The LPS Oversight and Implementation Committee will meet as needed to address outstanding issues and review project issues and progress. Meeting notes will be distributed electronically and maintained on the Project website. ABAG will conduct site visits to verify progress on projects, and coordinate the DWR final inspection for project completion and release of retained funds.
- Project Management: Ongoing administration and management of LPSs and possible contractor(s), accounting, legal work, reviewing work products, approving invoices, and preparing documents for DWR review. At the end of the grant period the files will be stored on the Project website for at least three years.

Task 11 Environmental Compliance/Mitigation/Enhancement: This task does not apply to this project.

Task 12 Construction Administration: This task does not apply to this project.

Category (c) Deliverables:

- Final DWR Grant Agreement
- ABAG Executive Board approval of Grant Agreement
- Final Work Plan, Schedule, and Budget for the Grant Agreement
- Implementation Agreements with all Local Project Sponsors
- Approval from the ABAG Board and the governing body of each Local Project Sponsor
- Consultant contract (if needed)
- Minutes of Oversight and Implementation Committee Meetings
- Quarterly Reports submitted to DWR
- Draft Final and Final Reports submitted to DWR
- Internet site with posted reports
- Invoices submitted to DWR
- Monthly financial reports and audits
- Field inspection documentation

Bay Area Drought Relief Program (Bay DRP)

Attachment 5

Budget Summary

Association of Bay Area Governments

Proposition 84

Integrated Regional Water Management

2014 Drought Grant Application

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List of Acronyms and Abbreviations:

ABAG	Association of Bay Area Governments
AF	acre-feet
AFY	acre-feet per year
AMI	advanced metering infrastructure
AMR	automatic meter reading
BAAQMD	Bay Area Air Quality Management District
BACC	Bay Area Chemical Consortium
Bay DRP	Bay Area Drought Relief Program
CIP	Capital Improvement Program
COL-5	Chain of Lakes Well No. 5
CVP	Central Valley Project
Delta	Sacramento-San Joaquin River Delta
DERWA	Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) Recycled Water Authority
DSRSD	Dublin-San Ramon Services District
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
EIR/EIS	environmental impact report/environmental impact statement

FY	fiscal year
IRWM	Integrated Regional Water Management
JPA	joint powers authority
lb	pound
LCA	Lower Cherry Aqueduct
LCWD	Los Carneros Water District
MG	million gallons
MMWD	Marin Municipal Water District
MST	Milliken-Sarco-Tulocay
NRCS	Natural Resources Conservation Service
PAC	Powdered Activated Carbon
ppm	parts per million
Prop 84	Proposition 84
Proposal	Bay Area Drought Relief Program, Proposition 84, 2014 Integrated Regional Water Management Drought Grant Application
PSP	Proposal Solicitation Package
RWQCB	Regional Water Quality Control Board
San Mateo County RCD	San Mateo Resource Conservation District
SCVWD	Santa Clara Valley Water District
SFEP	San Francisco Estuary Partnership
SFPUC	San Francisco Public Utilities Commission
SRF	State Revolving Fund
SWRCB	State Water Resources Control Board
THMs	trihalomethanes
TOC	total organic carbon
TSS	total suspended solids
WPCP	water pollution control plant
WTP	Water Treatment Plant
Zone 7	Zone 7 Water Agency

Introduction

The Bay Area Drought Relief Program (Bay DRP) is a diverse set of well-considered, widely vetted, and cost-effective solutions to water supply and drought-related issues/needs around the San Francisco Bay Area. In funding this effort, the California Department of Water Resources (DWR) will support the significant investments of the Bay Area's water agencies, public agencies, and non-governmental organizations.

Organization of Project Budget Summaries

The Bay DRP consists of grant administration and 11 drought-preparedness projects geographically spanning all four regions of the Bay Area, with four primary areas of benefit:

- Water Supply Enhancement
- Recycled Water
- Human Right to Water
- Drought Preparedness

To facilitate review, the projects are grouped by primary benefit type, as listed below.

Primary Project Benefit	Project ID#	Project Proponent	Project Title
Water Supply Enhancement	1	San Francisco Public Utilities Commission (SFPUC)	Lower Cherry Aqueduct Emergency Rehabilitation Project
	2	Santa Clara Valley Water District (SCVWD)	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment
	3	Zone 7 Water Agency (Zone 7)	Zone 7 Water Supply Drought Preparedness Project
Recycled Water	4	Napa Sanitation District	Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines
	5	SCVWD and City of Sunnyvale	Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline
	6	DERWA*	DERWA Phase 3 Recycled Water Expansion Project
	7	City of Calistoga	Calistoga Recycled Water Storage Facility
Human Right to Water	8	San Mateo County Resource Conservation District	Drought Relief for South Coast San Mateo County
	9	Stinson Beach County Water District	Stinson Beach Water Supply & Drought Preparedness Plan
Drought Preparedness	10	StopWaste**	Bay Area Regional Drought Relief Conservation Program
	11	Marin Municipal Water District (MMWD)	WaterSMART Irrigation with AMI/AMR
Administration	12	Association of Bay Area Governments (ABAG)/ San Francisco Estuary Partnership (SFEP)	Grant Administration

**DERWA: Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) Recycled Water Authority*

***This Project will be implemented by a group of 12 project proponents led by Alameda County StopWaste.org (StopWaste). Participating agencies and organizations include: Alameda County Water District, Bay Area Water Supply and Conservation Authority, City of Napa, Contra Costa Water District, EBMUD, MMWD, SFPUC, SCVWD, Solano County Water Agency, Sonoma County Water Agency, StopWaste, and Zone 7.*

The total cost of implementing this Proposal is **$111,291,230**. Of this amount, **$53,716,921** (48%) is non–state match funding, **$24,595,886** is other state funding, and **$0** is being requested as a disadvantaged community funding match waiver. A total of **$32,978,423** is being requested under the Proposition 84 Integrated Regional Water Management (IRWM) Drought Grant Program. The Proposal budget summary is shown in **PSP Table 8**, below.

PSP Table 8. Summary Budget

Proposal Title: Bay Area Drought Relief Program (Bay DRP)

	Individual Project Title	(a) Requested Grant Amount	(b) Cost Share: Non-State Fund Source (Funding Match)	(c) Cost Share: Other State Funding Sources	(d) Total Cost	(e) % Funding Match (Col b/Col d)
(a)	Lower Cherry Aqueduct Emergency Rehabilitation Project	$3,000,000	$15,102,790	$0	$18,102,790	83%
(b)	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment	$800,000	$306,221	$0	$1,106,221	28%
(c)	Zone 7 Water Supply Drought Preparedness Project	$3,000,000	$4,290,000	$0	$7,290,000	59%
(d)	Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines	$4,000,000	$4,300,000	$24,595,886	$32,895,886	13%
(e)	Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	$4,000,000	$16,728,910	$0	$20,728,910	81%
(f)	DERWA Phase 3 Recycled Water Expansion Project	$4,000,000	$6,022,662	$0	$10,022,662	60%
(g)	Calistoga Recycled Water Storage Facility	$750,000	$406,156	$0	$1,156,156	35%
(h)	Drought Relief for South Coast San Mateo County	$3,872,000	$1,023,667	$0	$4,895,667	21%
(i)	Stinson Beach Water Supply & Drought Preparedness Plan	$937,452	$312,500	$0	$1,249,952	25%
(j)	Bay Area Regional Drought Relief and Water Conservation Project	$5,993,971	$4,899,015	$0	$10,892,986	45%
(k)	WaterSMART Irrigation with AMI/AMR	$975,000	$325,000	$0	$1,300,000	25%
(l)	Grant Administration	$1,650,000	$0	$0	$1,650,000	0%
(n)	**Proposal Total**	$32,978,423	$53,716,921	$24,595,886	$111,291,230	
(o)	DAC Funding Match Waiver Total *(Not applicable)*	-	-	-	-	-
(p)	**Grand Total**	**$32,978,423**	**$53,716,921**	**$24,595,886**	**$111,291,230**	**48%**

Project budget summaries are presented below for each of the 11 projects included in this Proposal, and for Grant Administration (Project 12). Project budget tables (**PSP Table 7**) illustrate project costs, requested grant support, and funding matches by task category.

Budget summaries for each project included in the Bay DRP are grouped by project benefit type:

- Water Supply Enhancement
- Recycled Water
- Human Right to Water
- Drought Preparedness

For each project, a Budget Summary is provided and PSP Table 7 is completed. Budget Summaries include a brief summary of the following budget categories, cost sharing (funding matches), and a discussion of how the budgets are reasonable:

a) Direct Project Administration,

b) Land Purchase/Easement,

c) Planning/Design/Engineering/Environmental Documentation, and

d) Construction/Implementation.

Budget Summaries – Water Supply Enhancement Projects

This section presents budget summaries for the projects listed below.

Project ID#	Project Proponent	Project Title
1	SFPUC	Lower Cherry Aqueduct Emergency Rehabilitation Project
2	SCVWD	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment
3	Zone 7	Zone 7 Water Supply Drought Preparedness Project

Project 1 – Lower Cherry Aqueduct Emergency Rehabilitation Project

Overview

The grand total cost of the San Francisco Public Utilities Commission's (SFPUC)'s Lower Cherry Aqueduct (LCA) Emergency Rehabilitation Project (Project) is $18,102,790. It includes $25,000 for grant administration, $2,412,510 for Planning/Design/Engineering/Environmental Documentation, and $15,665,280 for Construction/Implementation.

Justification

This Project is the least cost alternative to provide immediate access to more than 150,000 acre-feet (AF) of water supply for the Bay Area region. The cost of the Project is approximately $18.1 million, which translates to $120.66 per AF of raw water. The cost of SFPUC's raw water sold to its wholesale customers was $1,420 per AF in fiscal year (FY) 2013/14. Therefore, the new water supply provided by the LCA is significantly less expensive than current sources of supply. Moreover, it would be difficult, if not impossible, to find another source enabling access to 150,000 AF of potable water in a dry year. Equivalent amounts of conservation would be economically damaging to the Bay Area region. The Project will directly and immediately increase water supply for the region by more than 150,000 AF and will provide ongoing access to storage for potable water. Rehabilitation of the LCA will provide reliable access to the entire Tuolumne River system water supply for the 2.6 million residents served by the SFPUC before the end of calendar year 2014, providing immediate drought relief.

PSP Table 7. Project Budget

Proposal Title: Bay Area Drought Relief Program (Bay DRP)
Project Title: Lower Cherry Aqueduct Emergency Rehabilitation Project
Project serves a need of a DAC?: ☐ Yes ■ No
Funding Match Waiver request? ☐ Yes ■ No

Category		(a) Requested Grant Amount	(b) Cost Share: Non-State Fund Source* (Funding Match)	(c) Cost Share: Other State Fund Source	(d) Total Cost
(a)	Direct Project Administration	$0	$25,000	$0	$25,000
(b)	Land Purchase/Easement	$0	$0	$0	$0
(c)	Planning/Design/Engineering/ Environmental Documentation	$0	$2,412,510	$0	$2,412,510
(d)	Construction/Implementation	$3,000,000	$12,665,280	$0	$15,665,280
(e)	**Grand Total**	**$3,000,000**	**$15,102,790**	**$0**	**$18,102,790**

**Source of funding: SFPUC General Fund*

Project 2 – Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment

Overview

The grand total cost of the Santa Clara Valley Water District's Rinconada Water Treatment Plant (WTP) Powdered Activated Carbon (PAC) Treatment Project (Project) is $1,106,221. Direct Project Administration costs are based on staff experience performing administration tasks for other grants with DWR and the State Water Resources Control Board (SWRCB).

Construction/Implementation costs are based on (1) historic water quality monitoring costs, (2) water plant operator experience with offloading and managing the PAC feed to Rinconada WTP and the contract cost for PAC bulk deliveries, and (3) database records for maintaining the PAC feed system.

SCVWD policies and procedures require a competitive procurement process for most purchases. SCVWD contracted with Norit Americas, the PAC vendor, through SCVWD's standard competitive procurement process for a unit cost of $0.61 per pound (lb). At this rate, the forecast 1,618,292 PAC units required by SCVWD will cost $985,623. SCVWD is a participant in the Bay Area Chemical Consortium (BACC), an informal cooperative of Bay Area water and wastewater agencies working together to purchase chemicals by combining bid solicitations (www.dsrsd.com/your-dollars-at-work/bay-area-chemical-consortium). BACC solicited bids for PAC in April 2014, but all the bids were rejected due to cost. The range of bids for delivery to the South Bay was $0.74/lb to $0.83/lb, more than SCVWD's contract of $0.61/lb with Norit Americas.

SCVWD orders PAC on an as-needed basis, usually in 40,000-lb increments. The maximum PAC storage at Rinconada WTP is 90,000 lb. SCVWD spent $96,065 on deliveries of about 160,000 lb of PAC from February through May 2014. The estimated PAC use for the remainder of the year assumes a 20-parts-per-milion (ppm) dose and adjusted treated-water contract flows (flow after 20% reduction).

Justification

Addition of PAC at Rinconada WTP is justified because of the drought conditions facing SCVWD and its water suppliers. The urgency of providing treated water to SCVWD's customers at a time when water sources and incoming water quality are depleted demands immediate action to prevent exceedance of water quality standards. SCVWD has completed a Planning Study Report documenting alternatives for achieving better trihalomethane (THM) reduction at Rinconada WTP, as well as other objectives. The Planning Study Report identifies a preferred alternative that will be effective at addressing source water quality concerns such as SCVWD is currently experiencing during the drought. The report documents that the upgraded treatment process will include ozone, which is effective at reducing total organic carbon (TOC), a THM precursor. The estimated capital cost of the ozone component is $7,489,000. However, implementation of ozonation at Rinconada WTP cannot be addressed immediately. Supporting documentation for budget estimates will be provided upon request.

PSP Table 7. Project Budget					
Proposal Title: Bay Area Drought Relief Program (Bay DRP) **Project Title:** Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Project serves a need of a DAC?: ☐ Yes ■ No Funding Match Waiver request? ☐ Yes ■ No					
Category		**(a)**	**(b)**	**(c)**	**(d)**
		Requested Grant Amount	**Cost Share: Non-State Fund Source* (Funding Match)**	**Cost Share: Other State Fund Source***	**Total Cost**
(a)	Direct Project Administration	$0	$6,552	$0	$6,552
(b)	Land Purchase/Easement	$0	$0	$0	$0
(c)	Planning/Design/Engineering/ Environmental Documentation	$0	$0	$0	$0
(d)	Construction/Implementation	$800,000	$299,669	$0	$1,099,669
(e)	**Grand Total**	**$800,000**	**$306,221**	**$0**	**$1,106,221**
**Source of funding: SCVWD Water Utility Fund*					

Project 3 – Zone 7 Water Supply Drought Preparedness Project

Overview

The grand total cost of the Zone 7 Water Supply Drought Preparedness Project is $7,290,201. The majority of the Project's budget consists of the design-build contract estimates for design and construction of the Project's two components: the Chain of Lakes Well No. 5 (COL-5 Project) and Cope Lake to Lake I Pipeline (CLP Project). For the COL-5 project, the design-build team fee covers the project design, construction management during construction, completion of as-built drawings, final submittal and project information packet, and warranty items; the contractor's fee includes the purchase of pipe, slide gate, manhole structure, various other minor mechanical appurtenances, and all work associated with the actual construction of the pipeline and all structures. For the CLP project, design work is already complete and construction work includes the construction of a monitoring well, the final supply well, well building, connecting pipelines, pump and motor installation, and installation of various electrical and mechanical components that are required to operate a well of this size. Additional costs associated with the Projects are for staff time to administer the Projects before, during, and after construction. Staff time is also included to cover time spent during the planning and design phase of the Project. Additional costs are associated with the purchase of the land on which the well is located, including legal counsel. The budget includes the cost of a rental generator, including the cost of a Bay Area Air Quality Management District (BAAQMD) permit to operate the generator, until permanent electrical facilities are completed. Surveying costs for the property acquisition are also included in this budget. The budget also includes a specialty consultant hired to provide guidance on these drought emergency projects.

Justification

The COL-5 well was planned to be constructed at a future date and has been accelerated due to the drought. When the COL-1 well was constructed in 2009, the chemical facilities were sized and a connector pipeline was constructed to accommodate a future COL-5 well. Construction of this well is the least cost alternative because the infrastructure necessary to distribute supply pumped from the well is already in place. Placement of the well at another location would not be cost effective and may not achieve the desired groundwater management goals.

For the CLP Project, Zone 7 investigated transferring water by siphon, but the physical characteristics of the site made that option unworkable. Zone 7 also investigated a pump system to move water from one lake to the other. This option had a lower construction cost, but the pump and energy costs associated with this project made it more expensive after a few years. The gravity-fed system proposed for the CLP Project is more reliable and eliminates the need for a pump and ongoing power costs from pumping.

PSP Table 7. Project Budget					
Proposal Title: Bay Area Drought Relief Program (Bay DRP) **Project Title:** Zone 7 Water Supply Drought Preparedness Project Project serves a need of a DAC?: ☐ Yes ■ No Funding Match Waiver request? ☐ Yes ■ No					
Category		**(a)**	**(b)**	**(c)**	**(d)**
		Requested Grant Amount	**Cost Share: Non-State Fund Source* (Funding Match)**	**Cost Share: Other State Fund Source***	**Total Cost**
(a)	Direct Project Administration	$61,727	$88,273	$0	$150,000
(b)	Land Purchase/Easement	$41,151	$58,849	$0	$100,000
(c)	Planning/Design/Engineering/ Environmental Documentation	$287,183	$410,691	$0	$697,874
(d)	Construction/Implementation	$2,609,939	$3,732,387	$0	$6,342,327
(e)	**Grand Total**	**$3,000,000**	**$4,290,000**	**$0**	**$7,290,201**
**Source of funding: Zone 7 Water Agency*					

Budget Summaries – Recycled Water Projects

This section presents budget summaries for the projects listed below.

Project ID#	Project Proponent	Project Title
4	Napa Sanitation District	Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines
5	SCVWD and City of Sunnyvale	Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline
6	DERWA	DERWA Phase 3 Recycled Water Expansion Project
7	City of Calistoga	Calistoga Recycled Water Storage Facility

Project 4 – Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines

Overview

The grand total cost of the Napa Sanitation District's Los Carneros Water District (LCWD) and Milliken-Sarco-Tulocay (MST) Recycled Water Pipelines (Project) is $32,895,886. It includes $144,975 for Direct Project Administration, $80,000 for Planning/Design/Engineering/Environmental Documentation, and $32,670,911 for Construction/ Implementation. Note that all design and engineering costs leading up to the bidding of the Project have not been included in the Project budget, as this work has been completed using funding sources outside of this grant application. The design and engineering costs included here are for engineering services during construction.

The requested grant amount is $4,000,000 to put toward the construction cost. Federal funding will support the Project: $3,300,000 from a U.S. Bureau of Reclamation WaterSMART Grant for the MST portion of the Project; and a $1,000,000 WaterSMART grant that will fund the LCWD portion of the Project.

The remainder of the project cost ($24,595,886) will be provided by State Revolving Fund (SRF) loans. Napa County secured $9,859,434 for the MST project (approved by the State on June 30, 2014). The LCWD has applied for $14,736,452 in SRF loans to cover the remaining costs of the LCWD portion of the Project. Local residents in each area have voluntarily approved property assessments to repay the SRF loans.

The LCWD Project is in the last part of its design phase; therefore, the Project costs are estimates based on the 75% submittal from the design consultant. The costs for the MST Project are based on the actual construction and consultant contracts that have been awarded for this Project. The costs for the MST pipeline were consistent with the engineer's estimates for the Project. The costs on these two Projects are typical and reasonable based on other recently completed pipeline construction projects. Soils in Napa County are highly corrosive, so the pipelines will be installed with cathodic protection. Additionally, the pipelines cross creeks and drainage culverts, requiring pipe bridges and/or trenchless construction methods, methods which can affect project budgets.

Justification

The LCWD Engineering Feasibility Study evaluated all possible supply alternatives. Recycled water was the only viable option and is the least cost alternative. This pipeline was included in the grant application because it will be ready for construction in only a few months, and the benefits derived from the Project (1,250 acre-feet per year [AFY]) will provide significant drought relief.

The MST Project was initially envisioned as a much more extensive and expensive project. The environmental impact report/environmental impact statement (EIR/EIS)[1] was based upon this larger project. Unfortunately, sufficient funding could not be identified. The currently proposed Project constitutes the "backbone" of the larger system and has been optimized to serve the largest users identified; thus, the proposed Project provides the lowest cost per AF. This portion of the pipeline has been designed and bid, and the residents in the MST area have already formed an assessment district to pay for the pipeline as it has been designed. This Project is supported by the local funding source and starts construction in summer 2014, allowing for significant drought relief to residents and properties in an area already impacted by deficient water supplies.

[1] North San Pablo Bay Restoration and Reuse Project (North Bay Water Recycling Program) EIR/EIS certified/adopted by the U.S. Bureau of Reclamation and North Bay Water Reuse Authority in 2009. Available: http://nbwra.org/docs/index.html

PSP Table 7. Project Budget					
Proposal Title: Bay Area Drought Relief Program (Bay DRP) **Project Title:** Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines Project serves a need of a DAC?: ☐ Yes ■ No Funding Match Waiver request? ☐ Yes ■ No					
Category		**(a)**	**(b)**	**(c)**	**(d)**
		Requested Grant Amount	**Cost Share: Non-State Fund Source* (Funding Match)**	**Cost Share: Other State Fund Source***	**Total Cost**
(a)	Direct Project Administration	$0	$0	$144,975	$144,975
(b)	Land Purchase/Easement	$0	$0	$0	$0
(c)	Planning/Design/Engineering/ Environmental Documentation	$0	$0	$80,000	$80,000
(d)	Construction/Implementation	$4,000,000	$4,300,000	$24,370,911	$32,670,911
(e)	**Grand Total**	**$4,000,000**	**$4,300,000**	**$24,595,886**	**$32,895,886**
**Sources of funding: Non-State fund sources consist of $3,300,000 Federal WaterSMART Grant for MST portion, from Title XI – U.S. Bureau of Reclamation; and $1,000,000 Federal WaterSMART Grant for LCWD portion, from Title XI – U.S. Bureau of Reclamation. Other State fund sources include State Revolving Fund (SRF) loans secured by Napa County and the LCWD ($24,595,886 total), to be repaid by local residents through voluntary property assessments.*					

Project 5 – Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline

Overview

The grand total cost of the SCVWD and City of Sunnyvale's Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline (Project) is $20,728,910. The budget is broken down as follows: Sunnyvale Water Pollution Control Plant (WPCP) Production Facilities Improvements: $3,280,000; and new SCVWD Distribution Pipeline and Booster Pump Station: $17,448,910. The WPCP Production Facilities budget was developed by the design consultant and consisted of a detailed cost breakdown of installed costs by cost component (previously referenced; reference supplied as part of submittal). The required improvements include large piping and valving, structural work in existing basins, and control system improvements. Project cost estimates are provided as installed cost, not as unit equipment or material cost. If the grant is awarded to the Project, detailed costs broken out by equipment and material costs can be provided.

This scope of work, together with a constrained construction footprint, translates into a project cost well within an acceptable range for this type of work and includes the following industry-standard plant improvement markups: construction contingency: 15%; design: 15%; and construction management: 14%. The new Distribution Pipeline and Booster Pump Station budget was developed by SCVWD staff whose basis for cost is recently designed and constructed SCVWD facilities of similar size. Distribution and Pump Station Project cost values include the following industry standard pipeline markups: construction contingency: 10%; design: 7%; and construction management: 16%.

The requested grant amount for the Project is $4,000,000. Subtracting the requested grant amount from the Project cost ($20,728,910) leaves a cost match of $16,728,910 or 80% of Project cost. The requested grant amount is allocated as follows: Production Facilities: $1,500,000; and Distribution Facilities: $2,500,000. Subtracting the requested grant amounts results in the following matching costs: Production Facilities: $1,780,000 ($3,280,000 – $1,500,000 grant funding) and Distribution Facilities: $14,948,910 ($17,448,910 – $2,500,000 grant funding). The Sunnyvale WPCP Production Facilities matching cost will be funded by the City of Sunnyvale. The SCVWD Distribution Facilities matching cost will be funded as follows: SCVWD: $6,548,910; Sunnyvale: $2,100,000; CalWater: $1,500,000; and Apple, Inc.: $4,800,000.

Sunnyvale Project funding has been secured through the City's Capital Improvement Program (CIP). SCVWD Project funding has been secured and allocated in the SCVWD's CIP. SCVWD has also negotiated joint funding agreements with Sunnyvale, CalWater, and Apple, Inc. The final funding agreements are scheduled to be submitted to the SCVWD Board for approval and execution in July 2014.

The cost-sharing table on the next page shows these costs broken down further by Project task grouping.

Justification

Alternatives were considered and the current Project was selected because it was preferable to all other considered alternatives. The Local Supply Development/Indirect Potable Reuse strategy has the following characteristics that are preferable to the alternatives considered: The Project provides a local supply of drought-proof water (the other strategies are dependent on hydrologic conditions); maintains local reservoir supplies that are used to meet flow and temperature requirements for fish (by using advanced-treated recycled water for recharge instead of local reservoir supplies); and will improve groundwater quality (because the advanced-treated recycled water is of higher quality than the local and imported supplies currently used for groundwater recharge).

In addition, the Wolfe Road pipeline alignment supports both the local and regional planning efforts to increase use of recycled water and provide future potential opportunities for indirect potable water reuse within Santa Clara County.

PSP Table 7. Project Budget					
Proposal Title: Bay Area Drought Relief Program (Bay DRP) **Project Title:** Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline Project serves a need of a DAC?: ☐ Yes ■ No Funding Match Waiver request? ☐ Yes ■ No					
Category		**(a)** **Requested Grant Amount**	**(b)** **Cost Share: Non-State Fund Source (Funding Match)**	**(c)** **Cost Share: Other State Fund Source**	**(d)** **Total Cost**
(a)	Direct Project Administration	$0	$83,365[a] $12,000[b]	$0	$95,365
(b)	Land Purchase/Easement	$0	$0	$0	$0
(c)	Planning/Design/Engineering/ Environmental Documentation	$0	$602,922[a] $1,102,923[b]	$0	$1,705,845
(d)	Construction/Implementation	$4,000,000	$5,862,623[a] $2,765,077[b] $1,500,000[c] $4,800,000[d]	$0	$18,927,700
(e)	**Grand Total**	**$4,000,000**	**$16,728,910**	**$0**	**$20,728,910**
Sources of funding: *a. SCVWD Capital Improvement Fund* *b. City of Sunnyvale Capital Improvement Fund* *c. CalWater Capital Improvement Fund* *d. Apple, Inc.*					

Project 6 – DERWA Phase 3 Recycled Water Expansion Project

Overview

The grand total cost of the Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) Recycled Water Authority (DERWA) Phase 3 Recycled Water Expansion Project (Project) is $10,022,662. The estimated Project construction cost is $7.2 million. Construction costs were estimated based on recent projects of a similar scale. The requested grant amount is $4 million; grant funds will be used toward construction costs. Non-state funding costs will be paid by DSRSD and EBMUD for their respective Project components.

1. *Central Dublin Pipeline:* Construction cost was estimated based on similar recycled water projects in the Bay Area. Unit costs were developed to estimate the construction cost. Engineering, legal, administrative, and construction management costs were estimated at 30% of the estimated construction cost.
2. *West Dublin Pipeline:* Construction cost was estimated based on similar recycled water projects in the Bay Area. Unit costs were developed to estimate the construction cost. Engineering, legal, administrative, and construction management costs were estimated at 30% of the estimated construction cost. In addition, a contingency factor of 15% was added to the construction estimate for additional construction effort that may be required due to the thicker pavement in San Ramon Road and additional traffic controls or adjusted construction schedule that may be needed to accommodate the high-traffic areas of Amador Valley Boulevard.
3. *San Ramon Valley Recycled Water Pipeline Phase 2:* Construction cost was estimated based on actual construction costs incurred on EBMUD's San Ramon Valley Phase 2B pipeline, as well as the actual costs of two other EBMUD potable water pipeline projects of similar scale. A unit cost was established based on the referenced projects. Other project costs were estimated as a percentage of construction cost: planning and project management, 9%; design, 11%; and construction management, 18%.

Justification

The Project will provide a reliable, drought-proof, long-term water supply and a permanent reduction in Delta water demands. The Project is preferable to all other alternatives considered. DSRSD does not have any other water supply alternatives. The terms of its water supply contract with Zone 7 prohibit DSRSD from purchasing additional water supply outside of Zone 7's service area. EBMUD has a supplemental limited drought-year water supply through its Central Valley Project (CVP) contract; the drought supply is water that is conveyed through the Freeport Diversion Facility at the Sacramento River. The cost to purchase, treat, and convey the dry-year CVP water supply is about $460 per AF. Using a per-AF comparison of supply costs, it is cheaper to purchase CVP water than to construct the Project. However, the lower cost CVP water is limited and is only made available during specific dry-year conditions. The CVP supply is not reliable and is not a long-term supply solution. Additionally, diversions of CVP water adversely affect the Delta.

This Project will provide a permanent, reliable, year-round, locally controlled water supply in response to this drought and future droughts. This recycled water Project will also allow EBMUD and DSRSD to respond to climate change and extreme conditions.

PSP Table 7. Project Budget					
Proposal Title: Bay Area Drought Relief Program (Bay DRP) **Project Title:** DERWA Phase 3 Recycled Water Expansion Project Project serves a need of a DAC?: ☐ Yes ■ No Funding Match Waiver request? ☐ Yes ■ No					
Category		**(a)**	**(b)**	**(c)**	**(d)**
		Requested Grant Amount	**Cost Share: Non-State Fund Source* (Funding Match)**	**Cost Share: Other State Fund Source**	**Total Cost**
(a)	Direct Project Administration	$0	$403,615	$0	$403,615
(b)	Land Purchase/Easement	$0	$0	$0	$0
(c)	Planning/Design/Engineering/ Environmental Documentation	$0	$978,892	$0	$978,892
(d)	Construction/Implementation	$4,000,000	$4,640,155	$0	$8,640,155
(e)	**Grand Total**	**$4,000,000**	**$6,022,662**	**$0**	**$10,022,662**
**Source of funding: DSRSD Water Fund and EBMUD Water Fund*					

Project 7 – Calistoga Recycled Water Storage Facility

Overview

The grand total cost of the Calistoga Recycled Water Storage Facility (Project) is $1,156,156. The estimate includes design/environmental, construction, and administrative services. The City of Calistoga (City) is requesting a grant in the amount of $750,000 for the project. The remaining $406,156 will be the City's contribution toward matching funds for the Project. The City will use its wastewater enterprise funds to provide this match and has the ability to pay this money within its current budget.

Construction costs make up 85% of the total Project costs, while Planning/Design/Engineering makes up about 13% and administrative cost the remaining 2%.

The lifespan of the Project improvements is anticipated to be 75 years. The storage pond will be constructed with native compacted materials and will have very little mechanical/electrical equipment, and is not expected to undergo much wear-and-tear. The estimated cost of Project equipment is less than 1% of the Project (approximately $100,000).

The facility will require maintenance over its lifespan to repair embankments as needed or possible linings (if required) in the future. All of the underground piping will consist of PVC SDR 26 with a 75- to 100-year lifespan; fittings and valves may need to be replaced every 25 years.

Justification

Based on a technical memorandum prepared by Larry Walker Associates in May 2008, the City expects that the Project will cost approximately $1,000,000. In this memo, Larry Walker Associates estimated that storage would cost about $12,000 per AF and, assuming a cost escalation factor of 3% per year, the 2015 pricing is anticipated to be $15,000 per AF. Therefore, a 20-million gallon (MG) or 61-AF pond is estimated to cost $915,000 to build; with design costs of approximately $85,000, the total Project cost is approximately $1,000,000. The City will not know final costs until design is complete and the Project goes out for bid.

Note that at this cost, storage for the earthen bank pond is about $0.05 per gallon. In contrast, a new steel tank costs about $1 per gallon and the cost for the City's recent buried concrete tank, built in 2012, was $4.5 per gallon (very expensive because it was mostly buried). The cost for the earthen pond is 5% of the cost of a steel tank and even less than for concrete, making it the most cost-effective storage solution.

PSP Table 7. Project Budget					
Proposal Title: Bay Area Drought Relief Program (Bay DRP) **Project Title:** Calistoga Recycled Water Storage Facility Project serves a need of a DAC?: ☐ Yes ■ No Funding Match Waiver request? ☐ Yes ■ No					
Category		**(a)**	**(b)**	**(c)**	**(d)**
		Requested Grant Amount	**Cost Share: Non-State Fund Source* (Funding Match)**	**Cost Share: Other State Fund Source***	**Total Cost**
(a)	Direct Project Administration	$0	$26,112	$0	$26,112
(b)	Land Purchase/Easement	$0	$0	$0	$0
(c)	Planning/Design/Engineering/ Environmental Documentation	$68,300	$81,924	$0	$150,224
(d)	Construction/Implementation	$681,700	$298,120	$0	$979,820
(e)	**Grand Total**	**$750,000**	**$406,156**	**$0**	**$1,156,156**
**Source of funding: City of Calistoga wastewater enterprise fund.*					

Budget Summaries – Human Right to Water Projects

This section presents budget summaries for the projects listed below.

Project ID#	Project Proponent	Project Title
8	San Mateo County RCD	Drought Relief for South Coast San Mateo County
9	Stinson Beach County Water District	Stinson Beach Water Supply & Drought Preparedness Plan

Project 8 – Drought Relief for South Coast San Mateo County

Overview

The grand total cost of the San Mateo County Resource Conservation District's (RCD's) Drought Relief for South Coast San Mateo County is $4,895,667, of which the San Mateo County RCD is requesting $3,872,000. The remaining $1,023,667 of the total amount consists of cost-share funds, including federal funding from the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) ($361,685) and U.S. Geological Survey (USGS) ($18,080), contributions from community water suppliers (Cuesta La Honda Guild customer fees $94,500), support from San Mateo County ($500,000), and support from local organizations and foundations: Wildlife Conservation Society ($28,000), National Fish and Wildlife Foundation ($14,902), and Newman's Own Foundation ($6,500). Additional financial support for this Project that is anticipated but not included in the cost-share total is additional leveraged funding, primarily from the NRCS Environmental Quality Incentives Program and private landowner contributions (cash and in-kind).

Overall Project construction costs make up approximately 79% of the total Project budget while Planning/Design/ Engineering tasks make up about 18%, with administrative costs accounting for the remaining 3%. Costs for aspects of the Project that have already been completed are based on actual costs. Domestic water main pipe repairs are based on actual costs for one site and engineers' estimates for three additional sites, which on average break out to approximately 8% for permitting, 30% for materials, and 62% for labor/implementation.

Agricultural water efficiency assessments (Project Element A.2) are estimated to cost approximately $7,200 each (a minimum of 20 to be conducted) based on the average cost of similar assessments previously conducted in the region. Construction of the two domestic water supply Projects (Project Element B.1), Granny Flats ($175,500) and Memorial Park ($1,690,600), are primarily based on estimates provided by engineers. Permitting and environmental monitoring for the Granny Flats Reservoir Project ($23,180) is estimated to be greater than most other Projects of similar scope due to the site's location within an area that may have San Francisco garter snake. Agricultural water supply Project costs (Project Element B.2) are based on actual costs for two sites and contractor/engineer estimates for two other sites, which on average break out to 26% for design and permitting, and 74% for labor/implementation.

Project planning, permitting, design, and administrative costs are based on costs already incurred, or are estimated utilizing the costs already incurred as the basis for estimating the costs for the portions of the Regional Drought Water Management Plan (Project Element C), and domestic water use efficiency efforts (Project Element A.1) that have not yet been completed. For these reasons, the budget amounts are believed to be reasonable.

All elements of the Project have a minimum 20-year lifespan, or the maximum lifespan available for necessary components. For example, drip irrigation lines and high-efficiency sprinkler heads typically last 5-15 years depending on level of use. However the irrigation infrastructure necessary to utilize high-efficiency sprinklers and drip lines, such as variable-frequency pumps, irrigation reservoirs, and supply lines, have a lifespan of at least 20 years.

Justification

Implementation of this project will increase local water supply reliability and delivery of safe drinking water for a region with limited water supply. Repair of water supply and storage infrastructure will result in both immediate and long-term benefits that outweigh cumulative costs associated with having to haul water from other regions during drought periods, when aging water supply lines break, and/or when reservoir water quality renders stored water unusable. Interties with urban water agency infrastructure are cost prohibitive due to distance, so increasing available drinking water supply by purchasing it from other areas is infeasible and not considered a realistic alternative. Trucking water is not a sustainable solution, as it is cost prohibitive and resource intensive. Based on a report from a community member who is already trucking water, the cost to truck water into the area is approximately $1,300 per month for a single household. Furthermore, bottled water also must be purchased for drinking and cooking since it is not possible for the residents to verify that the trucked-in water is potable. For residents who are not part of a community water supply system, the entire cost of trucking water would have to be covered by individual private landowners. This Project is the least-cost alternative because it effectively coordinates water supplies locally and implements Projects that will have the greatest efficiency and supply benefit.

PSP Table 7 – Project Budget					
Proposal Title: Bay Area Drought Relief Program (Bay DRP) **Project Title:** Drought Relief for South Coast San Mateo County Project serves a need of a DAC?: ☐ Yes ■ No Funding Match Waiver request? ☐ Yes ■ No					
Category		**(a)**	**(b)**	**(c)**	**(d)**
		Requested Grant Amount	**Cost Share: Non-State Fund Source*** **(Funding Match)**	**Cost Share: Other State Fund Source ***	**Total Cost**
(a)	Direct Project Administration	$188,540	$0	$0	$188,540
(b)	Land Purchase/Easement	$0	$0	$0	$0
(c)	Planning/Design/Engineering/ Environmental Documentation	$738,704	$162,500	$0	$901,204
(d)	Construction/Implementation	2,944,756	$861,167	$0	$3,805,923
(e)	**Grand Total**	**$3,872,000**	**$1,023,667**	**$0**	**$4,895,667**
**Source of match funding:* Federal grants from NRCS and USGS ($379,765 total) and local grants from San Mateo County $500,000, Cuesta La Honda Guild $94,500, Wildlife Conservation Society $28,000, National Fish and Wildlife Foundation $14,902, and Newman's Own Foundation $6,500.					

Project 9 – Stinson Beach Water Supply & Drought Preparedness Plan

Overview

The grand total cost of the Stinson Beach County Water District's Stinson Beach Water Supply & Drought Preparedness Plan (Plan) is $1,249,952. PSP Table 7, below, presents the requested grant and funding match amounts for the Plan. The total cost represents $937,452 in requested grant funding and $312,500 in match funding from District funds. The cost information is based on detailed budget estimates for the four components of the Plan. In large part, the detailed budget estimates are based on actual expenditures incurred to date for those portions of the Plan that have been completed and engineering cost estimates for those portions of the Plan that have been, and will be, released for competitive bidding by prospective contractors in 2014 and 2015, respectively. Similarly, the Project planning, permitting, design, and administrative costs are based on costs already incurred, or are estimated utilizing the costs already incurred as the basis for estimating the costs for the portions of the Plan that have not yet been completed. For these reasons, the budget amounts are believed to be reasonable, and the District can compile and provide documentation supporting the budget estimates (invoices for engineering and construction, materials and equipment invoices and cost estimates, administrative labor hours) upon request.

Justification

The Plan consists of four separate projects, each of which is justified below:

Project A. 2014 Calles Pipelines Replacement Project:

The Project will directly address drought preparedness in the form of water savings that will be realized from eliminating ongoing leaks and potentially finding and eliminating leaks that have not yet been discovered. The pipeline replacement Project is the only and least cost alternative. Different methods of installing the pipe were evaluated (trenching vs. trenchless) and installation by trenching was determined by the District's engineering consultant to be the least cost alternative, or comparable with the cost for the trenchless installation.

Project B. Patios Pipelines Replacement Project:

Like the Calles Pipelines Replacement Project, this Project will directly address drought preparedness in the form of water savings that will be realized from eliminating ongoing leaks and potentially finding and eliminating leaks that have not yet been discovered. The pipeline replacement Project is the only and least cost alternative. Different methods of installing the pipe were evaluated (trenching vs. trenchless) and installation by trenching was determined by the District's engineering consultant to be the least cost alternative, or comparable with the cost for the trenchless installation.

Project C. Supplemental Groundwater Supplies:

The primary benefit of this Project is increased water supply availability and reliability during dry and drought periods. Use of supplemental groundwater supplies will alleviate potable water demand on surface water supply, thereby providing incidental benefits to fish and wildlife. The new groundwater well and private well connections will supplement the limited surface water and groundwater supplies in the service area, increasing water availability and reliability. The District evaluated 24 water supply options; the groundwater supply option that will be implemented was chosen because of the benefits described above and because it is the least cost alternative.

Project D. Water Meter Replacements and In-Line Meters:

The Project will directly address drought preparedness in the form of water savings that will be realized from customer water meter replacements using new meters with improved technology and remote reading capability such that the District may be able to identify and repair leaks promptly. Additionally, the new customer meters, installed in conjunction with new in-line water meters, will greatly increase the District's ability to identify when and where water losses are occurring within its overall water distribution system. With strategically placed in-line water meters and new customer water meters, the District can perform accurate mass-balance accounting of water losses within isolated sections of its overall water system to determine when and where the losses are occurring and promptly repair or replace leaking pipes.

PSP Table 7. Project Budget					
Proposal Title: Bay Area Drought Relief Program (Bay DRP) **Project Title:** Stinson Beach Water Supply & Drought Preparedness Plan Project serves a need of a DAC?: ☐ Yes ■ No Funding Match Waiver request? ☐ Yes ■ No					
Category		**(a)** **Requested Grant Amount**	**(b)** **Cost Share: Non-State Fund Source* (Funding Match)**	**(c)** **Cost Share: Other State Fund Source***	**(d)** **Total Cost**
(a)	Direct Project Administration	$33,392	$0	$0	$33,392
(b)	Land Purchase/Easement	$7,044	$0	$0	$7,044
(c)	Planning/Design/Engineering/ Environmental Documentation	$139,815	$16,862	$0	$156,677
(d)	Construction/Implementation	$757,201	$295,638	$0	$1,052,839
(e)	**Grand Total**	**$937,452**	**$312,500**	**$0**	**$1,249,952**
**Source of funding: Stinson Beach County Water District*					

Budget Summaries – Drought Preparedness Projects

This section presents budget summaries for the projects listed below.

Project ID#	Project Proponent	Project Title
10	StopWaste	Bay Area Regional Drought Relief Conservation Program
11	MMWD	WaterSMART Irrigation with AMI/AMR

Project 10 – Bay Area Regional Drought Relief Conservation Program

Overview

The grand total cost of the Bay Area Regional Drought Relief Conservation Program (Program) is $10,892,986. Alameda County StopWaste.org (StopWaste) will oversee the administration of the Program (which includes management of 12 project agencies, accounting, and legal work; reviewing work products; approving invoices and quarterly reports; and preparing documents for ABAG review), while project proponents will provide rebates to customers who participate in the Program; each of the 12 agencies/organizations in the Program is responsible for implementing its individual rebate program. Grant and cost-share funding will be used to provide rebates to participating customers in the Program. Project proponents will submit invoices quarterly, with accompanying quarterly reports, to StopWaste in accordance with the format specified by the DWR Grant Agreement and StopWaste's agreement with each participating agency. These invoices will be based on rebate forms and records provided by the project proponents. StopWaste, with assistance from a consultant, will coordinate invoice submission and maintain records. An estimated $230,971 will cover Program Administration efforts by StopWaste.

Program implementation will require $10,892,986 and will be funding by the grant and matching funds from each of the 12 project proponents. This Program provides rebates to reduce water use of the three largest residential and commercial water users: lawns, toilets, and clothes washers, which account for more than 60% of the water use in a typical single-family home. Landscape Rebates will be provided with the goal of replacing 2,281,000 square feet of lawn with climate-appropriate landscaping and drip irrigation. Toilet/Urinal Rebates will be provided to replace approximately 9,364 older, high-volume toilets/ urinals with new high-efficiency models that are EPA WaterSense certified. The Direct Install Program will directly install 6,670 EPA WaterSense-certified high-efficiency toilets and urinals to eligible multi-family and commercial customers. Clothes Washer Rebates will be provided for 25,546 customers to install new, high-efficiency clothes washers.

The Drought-Resistant Soil and Garden Marketplace Project will improve drought resiliency by helping residents sheet-mulch their lawns. As overseen by StopWaste, this Project will convert a minimum of 100 lawns with sheet mulch and reach a minimum of 8,000 consumers over an 18-month period, with a projected water savings of 5 AF.

The Cost Detail Table (following the PSP Table 7 project budget summary) provides detail for the estimated Program costs. Columns A through F show Program costs based on unit costs and the targeted number of rebates (Columns A and B). Columns G and H provide detail on DWR grant costs per unit and as a total, respectively, from requested DWR grant funding. Columns I and J provide detail on agency costs per unit and as a total, respectively, from participating agencies in the Program. Columns K and L provide detail on the percentage of Program costs covered by DWR and participating agencies, respectively. Columns M through R provide detail on water savings and associated cost savings estimates.

Rebate amounts are developed based on a number of factors, including an agency's avoided cost of water, the cost of the fixture being rebated, current and expected market conditions (including codes and standards), estimated water savings, and (most importantly) what rebate amount will move customers to purchase the fixture. The consumer return on investment from installation of fixtures and equipment is considered in assessing an effective incentive level. As an example, a number of agencies had previously set their Lawn to Landscape Conversion rebates at 50 cents per square foot of lawn converted, primarily based on agency avoided cost. However, due to the high cost to replace a lawn with a water-wise landscape, these agencies have increased their rebates to $1 or more per square foot. This new rebate level will result in more customer participation. Project proponents will assess rebate levels on a regular basis and make adjustments as market conditions and other factors change.

The quantity of rebates estimated to be issued by each agency was developed based on historic, current, and anticipated customer demand. Project proponents will aim to meet that demand so that no eligible customers are refused a rebate. Individual agency projections are combined to quantify the number of rebates for the grant.

Conservation projects are the least costly water supply alternatives. At a total project cost of $10,892,986 to reduce consumption by 24,000 AF over the 20-year Project time horizon, the simple average cost per AF saved is equal to $454 ($10,892,986/24,000 AF). The Project-generated energy savings, greenhouse gas reductions, and avoided impacts of non-point-source pollution reduction are value-added benefits but beyond the scope of this benefit/cost analysis.

PSP Table 7. Project Budget					
Proposal Title: Bay Area Drought Relief Program (Bay DRP) **Project Title:** Bay Area Regional Drought Relief Conservation Program Project serves a need of a DAC?: ☐ Yes ■ No Funding Match Waiver request?: ☐ Yes ■ No					
Category		**(a)**	**(b)**	**(c)**	**(d)**
		Requested Grant Amount	**Cost Share: Non-State Fund Source* (Funding Match)**	**Cost Share: Other State Fund Source***	**Total Cost**
(a)	Direct Project Administration	$230,971	$0	$0	$230,971
(b)	Land Purchase/Easement	$0	$0	$0	$0
(c)	Planning/Design/Engineering/ Environmental Documentation	$0	$0	$0	$0
(d)	Construction/Implementation	$5,763,000	$4,899,015	$0	$10,662,015
(e)	**Grand Total**	**$5,993,971**	**$4,899,015**	**$0**	**$10,892,986**

**Sources of funding by project proponents:*

BAWSCA:	$499,438	Zone 7:	$282,112	City Napa:	$228,570
ACWD:	$443,643	Sonoma:	$480,508	SFPUC:	$438,968
EBMUD:	$483,900	Solano:	$415,083	SCVWD:	$890,474
CCWD:	$394,595	Marin:	$306,724	StopWaste:	$35,000

Cost Detail Table: Project 10 Bay Area Regional Drought Relief Conservation Project

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Rebate Type	**Rebate Unit Cost**	**Total Number of Rebates**	**Unit Description**	**Total Rebate Cost**	**Total Agency Labor Cost**	**Total Program Cost**	**DWR Unit Cost**	**DWR Total Cost**	**Agency Unit Cost**	**Agency Total Cost**	**DWR Cost as % of Total**	**Agency Cost as % of Total**	**Total Annual Water Savings (AF/yr)**	**Life of Savings (yrs)**	**Total Life Savings (AF)**	**DWR Cost per AF Saved ($/AF)**	**Agency Cost per AF Saved ($/AF)**	**Total Project Cost per AF Saved ($/AF)**
Landscape Rebates	$1	2,281,000	Per Square Foot	$2,281,000	$482,432	$2,763,432	$0.75	$1,710,750	$0.46	$1,052,682	62%	38%	236	20	4,716	$363	$223	$586
Toilet/Urinal Rebates	$125	9,364	Per Toilet or Urinal	$1,170,500	$330,081	$1,500,581	$75	$702,300	$85.25	$798,281	47%	53%	165	20	3,307	$212	$24	$454
Toilet/Urinal Direct Installation	$350	6,670	Per Toilet or Urinal	$2,334,500	$94,047	$2,428,547	$200	$1,334,000	$164.10	$1,094,547	55%	45%	162	20	3,243	$411	$338	$749
Washer Rebates	$125	25,546	Per Washer	$3,193,250	$641,205	$3,834,455	$75	$1,915,950	$75.10	$1,918,505	50%	50%	625	20	12,509	$153	$153	$307
Education	-	-	-	-	-	$135,000	-	$100,000	-	$35,000	74%	26%	-	-	-	-	-	-
Direct Project Administration	-	-	-	-	-	$230,971	-	**$230,971**	-	-	-	-	-	-	-	-	-	-
Total Conservation Rebate Program				**$8,979,250**	**$1,547,764**	**$10,892,985**		**$5,993,971**		**$4,899,014**	**55%**	**45%**	**1,189**	**20**	**23,775**	**$252**	**$206**	**$458**

Project 11 – WaterSMART Irrigation with AMI/AMR

Overview

The grand total cost of MMWD's WaterSMART Irrigation with AMI/AMR (Project) budget is $1,300,000. The Project budget includes MMWD staff labor to administer the grant and Project implementation; consultant contracts for implementation, including an SAP scoping study and installation of SAP software upgrades; and AMI/AMR vendor contracts to purchase materials. MMWD staff will perform the installation of the AMI/AMR equipment, and a technical consultant will be hired to install and calibrate the monitoring software and provide training for MMWD staff. Grant dollars are budgeted for Project implementation, and cost-share dollars are budgeted for administration, planning and design, and implementation.

Justification

Implementation of the Project will result in the following water supply savings: an average annual reduction in water used for dedicated irrigation meters of 25% (300 AFY), 4,500 AF of supply reduction after 15 years, and savings that will offset local and imported water supplies. Extensive economic and financial analysis using present-value costs and benefits of on-site surveys, equipment rebates, mandatory landscape standards, and professional training have been conducted. The Project is the least cost alternative. During the first 15 years of operation, the Project will save an estimated 4,500 AF of water at an average cost of $250-$500 per AF saved, which compares to approximately $250/AF for water produced locally and over $1,200/AF for the next incremental supply of imported water.

PSP Table 7. Project Budget

Proposal Title: Bay Area Drought Relief Program (Bay DRP)
Project Title: WaterSMART Irrigation with AMI/AMR
Project serves a need of a DAC?: ☐ Yes ■ No
Funding Match Waiver request?: ☐ Yes ■ No

Category		(a) Requested Grant Amount	(b) Cost Share: Non-State Fund Source* (Funding Match)	(c) Cost Share: Other State Fund Source*	(d) Total Cost
(a)	Direct Project Administration	$0	$25,748	$0	$25,748
(b)	Land Purchase/Easement	$0	$0	$0	$0
(c)	Planning/Design/Engineering/ Environmental Documentation	$0	$25,716	$0	$25,716
(d)	Construction/Implementation	$975,000	$273,536	$0	$1,248,536
(e)	**Grand Total**	**$975,000**	**$325,000**	**$0**	**$1,300,000**

**Source of funding: MMWD General Fund*

Budget Summaries – Grant Administration

This section presents the budget summary for the project listed below.

Project ID#	Project Proponent	Project Title
12	ABAG/SFEP	Grant Administration

Project 12 – Grant Administration

Overview

The grand total cost of Grant Administration is $1,650,000. The Bay DRP Administration budget is intended to cover all administrative costs of the Bay DRP program, from negotiating the ABAG-DWR contract and the ABAG-Local Project Sponsor Agreements to managing the various Projects until their conclusion. Further, ABAG will be responsible for record-keeping to respond to audits long after all Bay DRP Projects are complete. The Administration budget adheres to DWR's guidance and does not exceed 5% of the total program cost. The budget includes staff time for ABAG's legal department and accounting department, as well as several project managers who will coordinate with Local Project Sponsors, assuring the timely completion of reporting tasks noted in the work plan. There is no project match associated with Project Administration.

The budget is broken down as follows:

- Legal and Contracting Staff Costs – $274,350
- Accounting, Invoicing Costs, Record-keeping and Auditing Staff – $471,750
- Project Management Staff Costs, including consultants, if needed – $788,900
- ABAG Indirect Costs – $115,000

Justification

Bay DRP includes 11 projects that will provide drought relief to residents of the San Francisco Bay Area and long-term planning for regional drought. The Bay DRP Administration provided by ABAG/SFEP oversees the implementation of grant funding and is the liaison between DWR and participating agencies. These tasks ensure that projects are completed, DWR receives Quarterly Reports, invoicing and record-keeping are current, and other administrative functions are completed.

Table 7. Project Budget

Proposal Title: Bay Area Drought Relief Program (Bay DRP)
Project Title: Grant Administration
Project serves a need of a DAC?: ☐ Yes ■ No
Funding Match Waiver request?: ☐ Yes ■ No

Category		(a) Requested Grant Amount	(b) Cost Share: Non-State Fund Source (Funding Match)	(c) Cost Share: Other State Fund Source	(d) Total Cost
(a)	Direct Project Administration	$0	$0	$0	$0
(b)	Land Purchase/Easement	$0	$0	$0	$0
(c)	Planning/Design/Engineering/ Environmental Documentation	$0	$0	$0	$0
(d)	Construction/Implementation	$1,650,000	$0	$0	$0
(e)	**Grand Total**	**$1,650,000**	**$0**	**$0**	**$1,650,000**

Bay Area Drought Relief Program (Bay DRP)

Attachment 6

Schedule

Association of Bay Area Governments

Proposition 84

Integrated Regional Water Management

2014 Drought Grant Application

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List of Acronyms and Abbreviations

ABAG	Association of Bay Area Governments
AF	acre-feet
AFY	acre-feet per year
AMI	advanced metering infrastructure
AMR	automatic meter reading
Bay DRP	Bay Area Drought Relief Program
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CLP	Cope Lake to Lake I Pipeline
CM/GC	construction manager/general contractor
COL-5	Chain of Lakes Well No. 5
DERWA	Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) Recycled Water Authority
DSRSD	Dublin-San Ramon Services District
DWR	California Department of Water Resources

EBMUD	East Bay Municipal Utility District
EIR	Environmental Impact Report
IRWM	Integrated Regional Water Management
LCWD	Los Carneros Water District
MOA	Memorandum of Agreement
MST	Milliken-Sarco-Tulocay
NEPA	National Environmental Protection Act
NOE	Notice of Exemption
NSD	Napa Sanitation District
PAC	Powdered Activated Carbon
Proposal	Bay Area Drought Relief Program, Proposition 84, 2014 Integrated Regional Water Management Drought Grant Application
PSP	Proposal Solicitation Package
RWQCB	Regional Water Quality Control Board
San Mateo County RCD	San Mateo County Resource Conservation District
SAP	German firm that manufactures software to manage business operations
SCVWD	Santa Clara Valley Water District
SFEP	San Francisco Estuary Partnership
SFPUC	San Francisco Public Utilities Commission
SHPO	State Historic Preservation Officer
SRF	State Revolving Fund
WPCP	Water Pollution Control Plant
Zone 7	Zone 7 Water Agency

Introduction

Detailed schedules for the 11 projects in the Bay Area Drought Relief Program (Bay DRP) Proposal (Proposal) and grant administration (Project 12) are provided in this attachment. An overall Proposal schedule including a roll-up of all 12 project schedules is provided, followed by detailed schedules for each project. For each project, a task summary is provided, followed by a detailed Gantt chart schedule. The summaries describe how the project schedules are realistic, reasonable, and accomplishable. The schedules indicate start dates, end dates, and milestones for each task and linkages/dependencies between tasks. The tasks listed in the schedules align with the same tasks identified and described in the Work Summary (Attachment 4) and Budget Summary (Attachment 5), and use October 16, 2014, as the assumed award date of the grant. All projects will be ready to proceed to construction/implementation by April 1, 2015; all construction bids, if applicable, will be awarded by April 1, 2015. The schedule extends through December 17, 2018; all final reports and invoicing will be complete by December 17, 2018.

In accordance with the Proposal Solicitation Package (PSP), each schedule includes the items listed in the table below. To support the review of the schedules in this attachment, the table below relates how PSP requirements are addressed by task categories, primary tasks, or subtasks.

Task Category	Task	PSP Requirement
Category (a): Direct Project Administration	Task 1 Administration	Project administration
	Task 2 Labor Compliance Program	Implementation of a Labor Compliance Program
	Task 3 Reporting	Development of a Project Monitoring Plan
		Quarterly progress reports and final report submittals
Category (b): Land Purchase/Easement	Task 4 Land Acquisition/Easements	Acquisition of rights-of-way, if required
Category (c): Planning/Design/ Engineering/Environmental Documentation	Task 5 Assessment and Evaluation	Project feasibility studies and project design development
	Task 6 Final Design	Final project plans and specifications
	Task 7 Environmental Documentation	Completion of environmental documentation and CEQA/NEPA compliance
	Task 8 Permitting	Identification and acquisition of all necessary permits
Category (d): Construction/Implementation	Task 9 Construction Contracting	Contractor bid documentation
	Task 10 Construction/Implementation	Construction/implementation start and end dates, including significant milestones
	Task 11 Environmental Compliance/ Mitigation/ Enhancement	Implementation of environmental mitigation or enhancement efforts, if necessary
	Task 12 Construction Administration	Construction administration

Proposal Schedule Summary

The Bay DRP Proposal comprises a geographically diverse and well-integrated implementation program with multiple water supply, recycled water, and drought preparedness benefits for the Bay Area's diverse population. The 11 projects included in the Proposal address impacts resulting from the 2014 drought and projected impacts of future drought or dry-year conditions. These projects are currently in progress or will be ready to proceed to construction/ implementation by April 1, 2015. All projects in the Proposal will be complete by October 2018, with the majority of projects (9 of 11 projects) completed by December 2016 or sooner (two projects will be complete by December 2014, and three projects will be complete by the end of October 2015.)

In accordance with the DWR 2014 IWRM Drought Solicitation Grant Guidelines, no match funding will be claimed for project work conducted prior to January 1, 2010. No grant funding (reimbursement) will be claimed for project work conducted prior to January 18, 2014.

The overall Proposal Gantt chart schedule on the next page extends over multiple pages and includes a summary of each of the 11 project schedules with start and end dates for each task included in the project work plans. Tasks are organized by Budget Categories (a, b, c, and d) that align with the project budget categories presented in Attachment 5 and the Work Plan summaries in Attachment 4. For all projects, the schedules for Task 1 *Project Administration* and the Quarterly Reporting task (Task 3) starts on October 16, 2014, the assumed grant award date.

Tasks that do not apply to a particular project are indicated with "N/A" at the end of the project title.

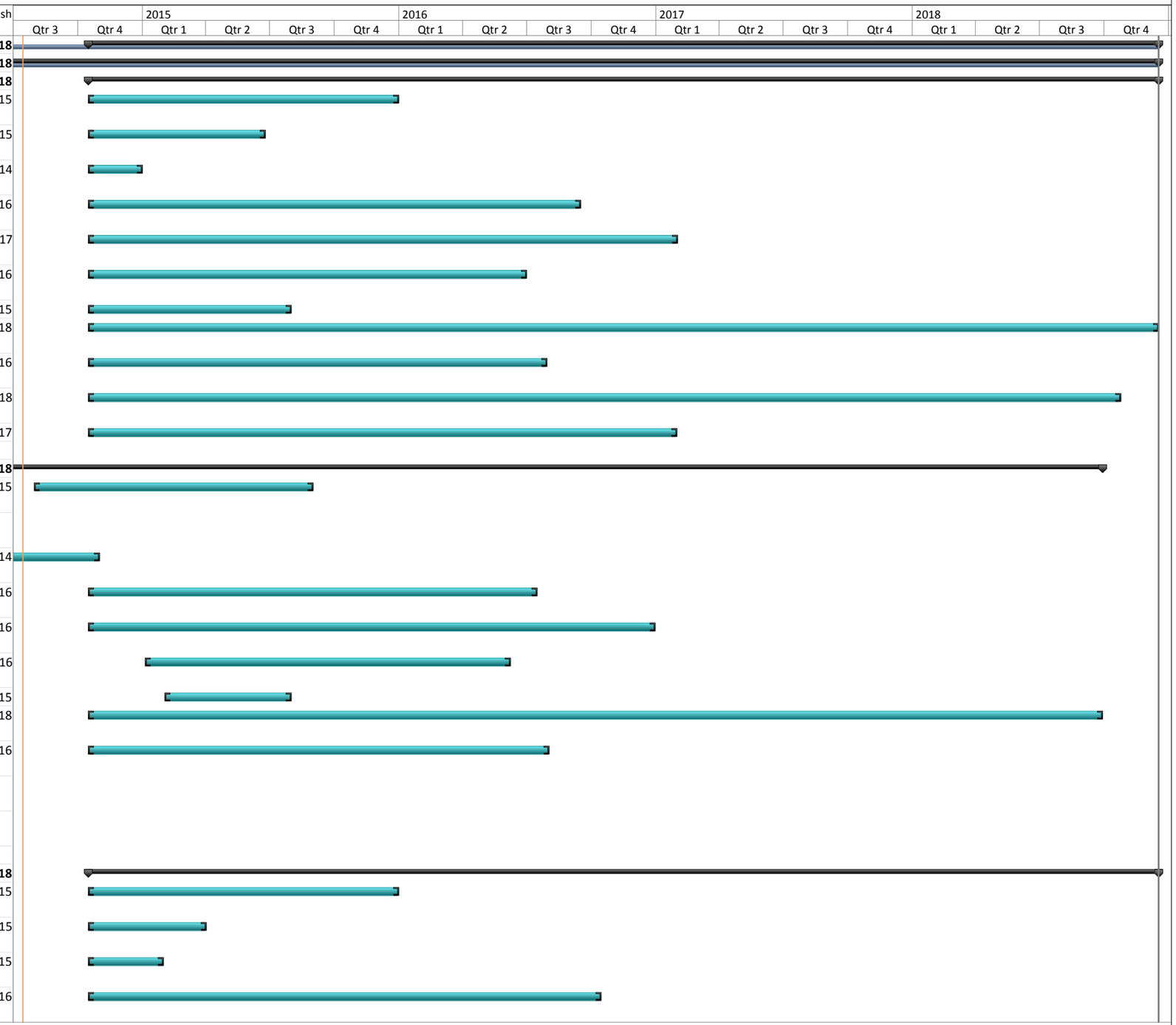
Grant administration support from the Association of Bay Area Governments (ABAG) (Project 12) will begin on the assumed grant award date (October 16, 2014) and extend through December 17, 2018. This schedule includes time needed to prepare final reports and invoicing. Details of the grant administration schedule are shown in Category (d), Task 9 (Construction Contracting) and Task 10 (Project Construction/Implementation).

Overall, the Bay DRP Proposal will address current and projected future drought impacts in the Bay Area Region in a realistic, reasonable, and accomplishable manner. Again, the projects included in the Proposal will be complete and project benefits realized by December 2018 or sooner. The Proposal will be administered by ABAG, which has many years' experience overseeing grants and specific experience overseeing Integrated Regional Water Management (IRWM) Proposition 84 grants from the California Department of Water Resources (DWR). ABAG's grant administration experience will ensure timely and smooth implementation of the Bay DRP.

Bay Area Drought Relief Program (Bay DRP)

2014 IRWM Drought Proposal Schedule

ID	Task Name	Duration	Start	Finish
1	**Bay DRP 2014 Drought Proposal Schedule**	**1088 days**	**Thu 10/16/14**	**Mon 12/17/18**
2	**Category (a): Direct Project Administration**	**1261 days**	**Mon 2/17/14**	**Mon 12/17/18**
3	**Task 1 Project Administration**	**1088 days**	**Thu 10/16/14**	**Mon 12/17/18**
4	Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project	316 days	Thu 10/16/14	Thu 12/31/15
5	Project 2: Rinconada Water Treatment Plant Powderec Activated Carbon (PAC) Treatment	180 days	Thu 10/16/14	Wed 6/24/15
6	Project 3: Zone 7 Water Supply Drought Preparedness Project	55 days	Thu 10/16/14	Wed 12/31/14
7	Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines	501 days	Thu 10/16/14	Thu 9/15/16
8	Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	599 days	Thu 10/16/14	Tue 1/31/17
9	Project 6: DERWA Phase 3 Recycled Water Expansion Project	446 days	Thu 10/16/14	Thu 6/30/16
10	Project 7: Calistoga Recycled Water Storage Facility	207 days	Thu 10/16/14	Fri 7/31/15
11	Project 8: Drought Relief for South Coast San Mateo County	1088 days	Thu 10/16/14	Mon 12/17/18
12	Project 9: Stinson Beach Water Supply & Drought Preparedness Plan	467 days	Thu 10/16/14	Fri 7/29/16
13	Project 10: Bay Area Regional Drought Relief Conservation Program	1050 days	Thu 10/16/14	Wed 10/24/18
14	Project 11: WaterSMART Irrigation with AMI/AMR	598 days	Thu 10/16/14	Mon 1/30/17
15	Project 12: Grant Administration - N/A			
16	**Task 2 Labor Compliance Program**	**1205 days?**	**Mon 2/17/14**	**Fri 9/28/18**
17	Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project - N/A	283 days	Thu 7/31/14	Mon 8/31/15
18	Project 2: Rinconada Water Treatment Plant Powderec Activated Carbon (PAC) Treatment - N/A			
19	Project 3: Zone 7 Water Supply Drought Preparedness Project	185 days	Mon 2/17/14	Fri 10/31/14
20	Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines	457 days	Thu 10/16/14	Fri 7/15/16
21	Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	577 days	Thu 10/16/14	Fri 12/30/16
22	Project 6: DERWA Phase 3 Recycled Water Expansion Project	372 days	Mon 1/5/15	Tue 6/7/16
23	Project 7: Calistoga Recycled Water Storage Facility	130 days	Mon 2/2/15	Fri 7/31/15
24	Project 8: Drought Relief for South Coast San Mateo County	1032 days	Thu 10/16/14	Fri 9/28/18
25	Project 9: Stinson Beach Water Supply & Drought Preparedness Plan	468 days	Thu 10/16/14	Mon 8/1/16
26	Project 10: Bay Area Regional Drought Relief Conservation Program - N/A			
27	Project 11: WaterSMART Irrigation with AMI/AMR - N/A			
28	Project 12: Grant Administration - N/A			
29	**Task 3 Reporting**	**1088 days**	**Thu 10/16/14**	**Mon 12/17/18**
30	Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project	316 days	Thu 10/16/14	Thu 12/31/15
31	Project 2: Rinconada Water Treatment Plant Powderec Activated Carbon (PAC) Treatment	120 days	Thu 10/16/14	Wed 4/1/15
32	Project 3: Zone 7 Water Supply Drought Preparedness Project	77 days	Thu 10/16/14	Fri 1/30/15
33	Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines	522 days	Thu 10/16/14	Fri 10/14/16



Bay Area Drought Relief Program (Bay DRP)

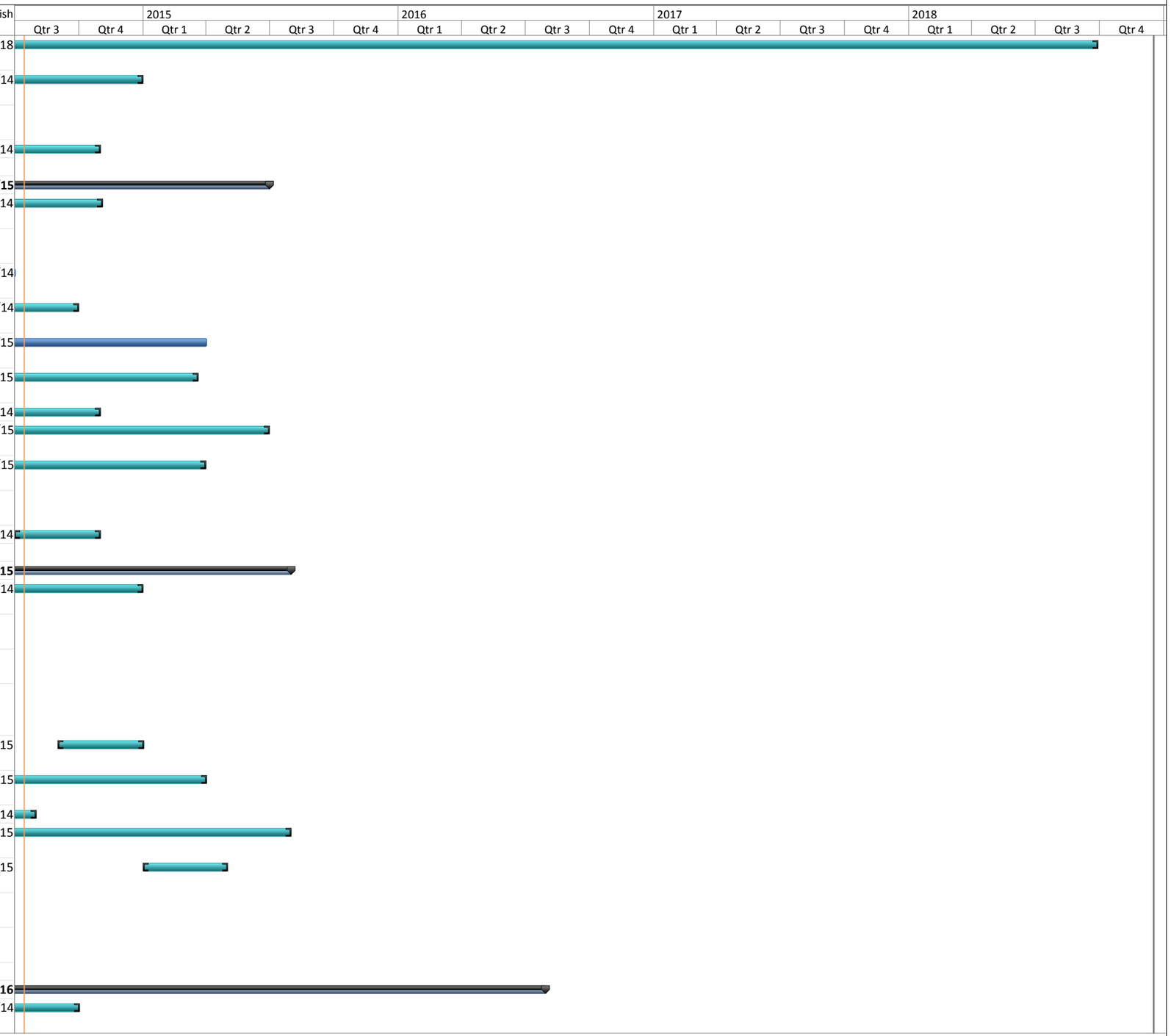
2014 IRWM Drought Proposal Schedule

ID	Task Name	Duration	Start	Finish
34	Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	642 days	Thu 10/16/14	Fri 3/31/17
35	Project 6: DERWA Phase 3 Recycled Water Expansion Project	494 days	Thu 10/16/14	Tue 9/6/16
36	Project 7: Calistoga Recycled Water Storage Facility	228 days	Thu 10/16/14	Mon 8/31/15
37	Project 8: Drought Relief for South Coast San Mateo County	1088 days	Thu 10/16/14	Mon 12/17/18
38	Project 9: Stinson Beach Water Supply & Drought Preparedness Plan	532 days	Thu 10/16/14	Fri 10/28/16
39	Project 10: Bay Area Regional Drought Relief Conservation Program	1032 days	Thu 10/16/14	Fri 9/28/18
40	Project 11: WaterSMART Irrigation with AMI/AMR	642 days	Thu 10/16/14	Fri 3/31/17
41	Project 12: Grant Administration - N/A			
42	**Category (b): Land Purchase/Easement**	**304 days**	**Thu 5/1/14**	**Tue 6/30/15**
43	**Task 4 Land Acquisition**	**304 days**	**Thu 5/1/14**	**Tue 6/30/15**
44	Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project - N/A			
45	Project 2: Rinconada Water Treatment Plant Powderec Activated Carbon (PAC) Treatment - N/A			
46	Project 3: Zone 7 Water Supply Drought Preparedness Project	66 days	Thu 5/1/14	Thu 7/31/14
47	Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines	20 days	Mon 6/2/14	Fri 6/27/14
48	Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline - N/A			
49	Project 6: DERWA Phase 3 Recycled Water Expansion Project - N/A			
50	Project 7: Calistoga Recycled Water Storage Facility - N/A			
51	Project 8: Drought Relief for South Coast San Mateo County - N/A			
52	Project 9: Stinson Beach Water Supply & Drought Preparedness Plan	65 days	Wed 4/1/15	Tue 6/30/15
53	Project 10: Bay Area Regional Drought Relief Conservation Program - N/A			
54	Project 11: WaterSMART Irrigation with AMI/AMR - N/A			
55	Project 12: Grant Administration - N/A			
56	**Category (c): Planning/Design/Engineering/Environmental Documentation**	**2175 days**	**Thu 7/1/10**	**Wed 10/31/18**
57	**Task 5 Assessment and Evaluation**	**2175 days**	**Thu 7/1/10**	**Wed 10/31/18**
58	Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project - N/A			
59	Project 2: Rinconada Water Treatment Plant Powderec Activated Carbon (PAC) Treatment - N/A			
60	Project 3: Zone 7 Water Supply Drought Preparedness Project	20 days	Mon 2/3/14	Fri 2/28/14
61	Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines - N/A			
62	Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	110 days	Mon 9/1/14	Fri 1/30/15
63	Project 6: DERWA Phase 3 Recycled Water Expansion Project - N/A			
64	Project 7: Calistoga Recycled Water Storage Facility	310 days	Mon 3/25/13	Fri 5/30/14

Bay Area Drought Relief Program (Bay DRP)

2014 IRWM Drought Proposal Schedule

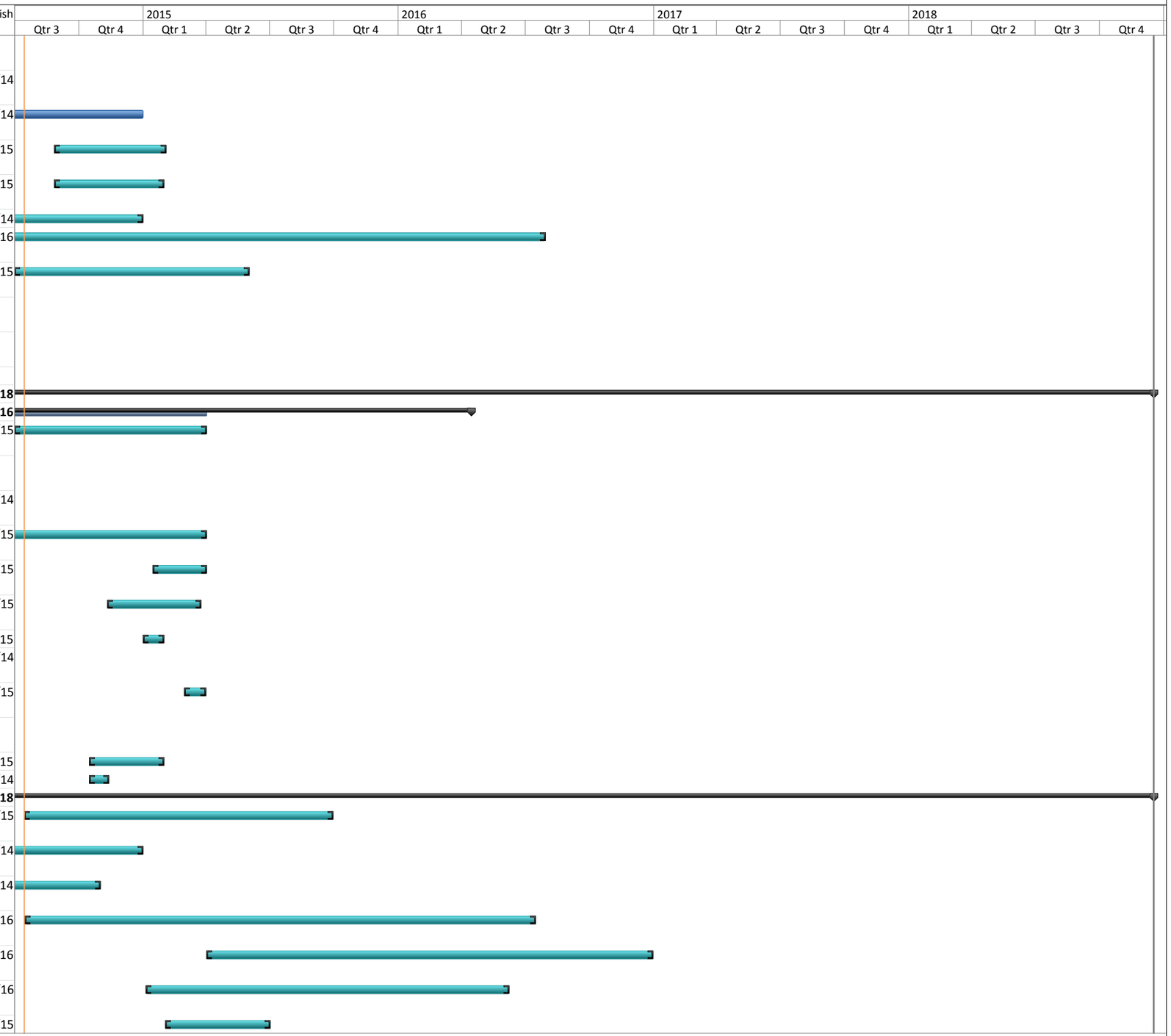
ID	Task Name	Duration	Start	Finish
65	Project 8: Drought Relief for South Coast San Mateo County	2152 days	Thu 7/1/10	Fri 9/28/18
66	Project 9: Stinson Beach Water Supply & Drought Preparedness Plan	197 days	Tue 4/1/14	Wed 12/31/14
67	Project 10: Bay Area Regional Drought Relief Conservation Program - N/A			
68	Project 11: WaterSMART Irrigation with AMI/AMR	218 days	Wed 1/1/14	Fri 10/31/14
69	Project 12: Grant Administration - N/A			
70	**Task 6 Final Design**	**1304 days**	**Thu 7/1/10**	**Tue 6/30/15**
71	Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project - N/A	196 days	Mon 2/3/14	Mon 11/3/14
72	Project 2: Rinconada Water Treatment Plant Powderec Activated Carbon (PAC) Treatment - N/A			
73	Project 3: Zone 7 Water Supply Drought Preparedness Project	87 days	Mon 3/3/14	Tue 7/1/14
74	Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines	87 days	Mon 6/2/14	Tue 9/30/14
75	Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	218 days	Mon 6/2/14	Wed 4/1/15
76	Project 6: DERWA Phase 3 Recycled Water Expansion Project	255 days	Mon 3/31/14	Fri 3/20/15
77	Project 7: Calistoga Recycled Water Storage Facility	154 days	Tue 4/1/14	Fri 10/31/14
78	Project 8: Drought Relief for South Coast San Mateo County	1304 days	Thu 7/1/10	Tue 6/30/15
79	Project 9: Stinson Beach Water Supply & Drought Preparedness Plan	256 days	Tue 4/8/14	Tue 3/31/15
80	Project 10: Bay Area Regional Drought Relief Conservation Program - N/A			
81	Project 11: WaterSMART Irrigation with AMI/AMR	89 days	Tue 7/1/14	Fri 10/31/14
82	Project 12: Grant Administration - N/A			
83	**Task 7 Environmental Documentation**	**1327 days**	**Thu 7/1/10**	**Fri 7/31/15**
84	Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project - N/A	175 days	Thu 5/1/14	Wed 12/31/14
85	Project 2: Rinconada Water Treatment Plant Powderec Activated Carbon (PAC) Treatment - N/A			
86	Project 3: Zone 7 Water Supply Drought Preparedness Project - N/A			
87	Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines - N/A			
88	Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	89 days	Mon 9/1/14	Thu 1/1/15
89	Project 6: DERWA Phase 3 Recycled Water Expansion Project	208 days	Mon 6/16/14	Wed 4/1/15
90	Project 7: Calistoga Recycled Water Storage Facility	134 days	Mon 1/27/14	Thu 7/31/14
91	Project 8: Drought Relief for South Coast San Mateo County	1327 days	Thu 7/1/10	Fri 7/31/15
92	Project 9: Stinson Beach Water Supply & Drought Preparedness Plan	87 days	Thu 1/1/15	Fri 5/1/15
93	Project 10: Bay Area Regional Drought Relief Conservation Program - N/A			
94	Project 11: WaterSMART Irrigation with AMI/AMR - N/A			
95	Project 12: Grant Administration - N/A			
96	**Task 8 Permitting**	**1455 days**	**Mon 1/3/11**	**Fri 7/29/16**
97	Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project - N/A	173 days	Mon 2/3/14	Wed 10/1/14



Bay Area Drought Relief Program (Bay DRP)

2014 IRWM Drought Proposal Schedule

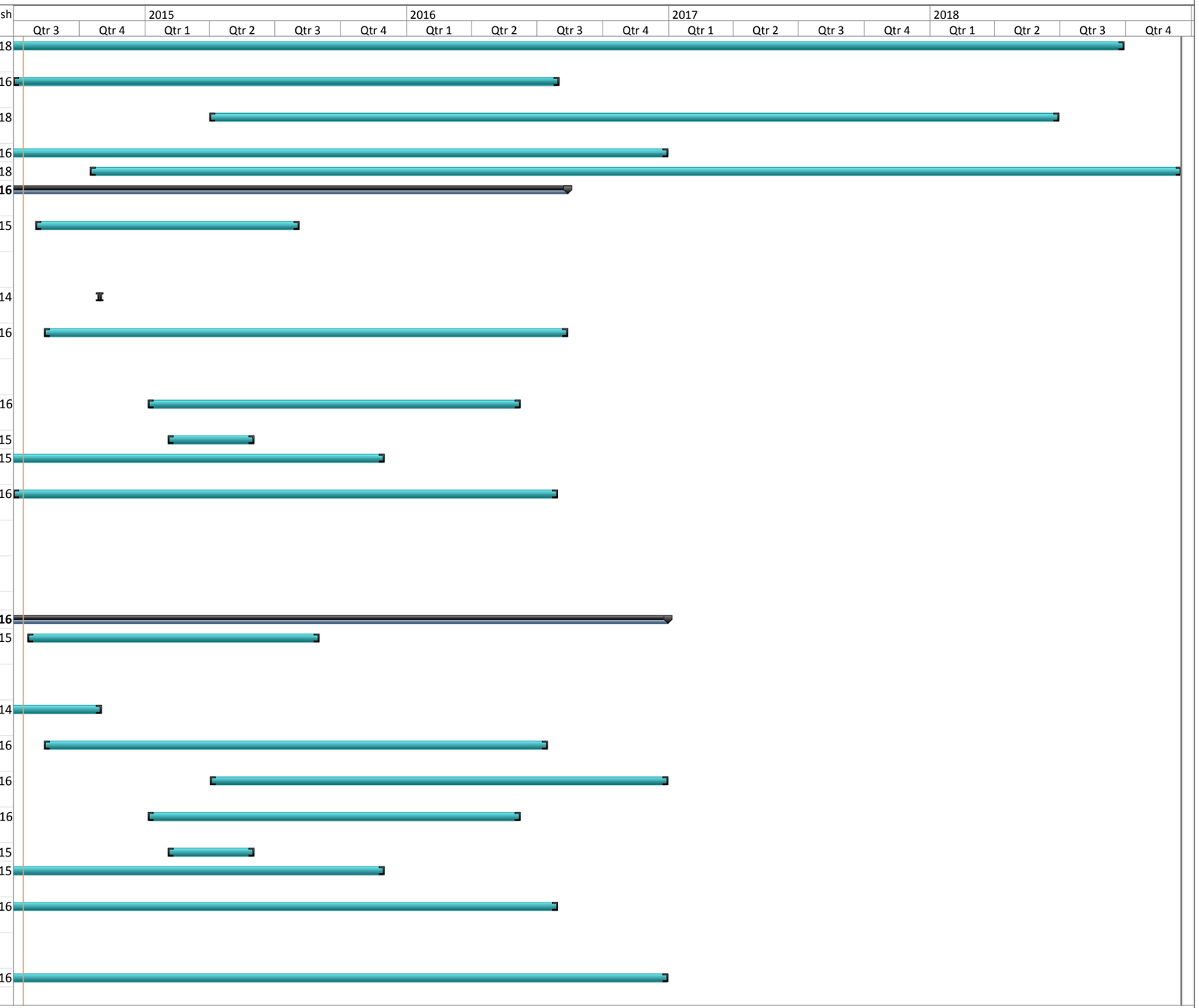
ID	Task Name	Duration	Start	Finish
98	Project 2: Rinconada Water Treatment Plant Powderec Activated Carbon (PAC) Treatment - N/A			
99	Project 3: Zone 7 Water Supply Drought Preparedness Project	74 days	Fri 2/7/14	Wed 5/21/14
100	Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines	153 days	Mon 6/2/14	Wed 12/31/14
101	Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	114 days	Wed 8/27/14	Mon 2/2/15
102	Project 6: DERWA Phase 3 Recycled Water Expansion Project	113 days	Wed 8/27/14	Fri 1/30/15
103	Project 7: Calistoga Recycled Water Storage Facility	197 days	Tue 4/1/14	Wed 12/31/14
104	Project 8: Drought Relief for South Coast San Mateo County	1455 days	Mon 1/3/11	Fri 7/29/16
105	Project 9: Stinson Beach Water Supply & Drought Preparedness Plan	240 days	Tue 7/1/14	Mon 6/1/15
106	Project 10: Bay Area Regional Drought Relief Conservation Program - N/A			
107	Project 11: WaterSMART Irrigation with AMI/AMR - N/A			
108	Project 12: Grant Administration - N/A			
109	**Category (d): Construction/Implementation**	**2076 days**	**Mon 1/3/11**	**Mon 12/17/18**
110	**Task 9 Construction Contracting**	**1379 days**	**Mon 1/3/11**	**Thu 4/14/16**
111	Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project	197 days	Tue 7/1/14	Wed 4/1/15
112	Project 2: Rinconada Water Treatment Plant Powderec Activated Carbon (PAC) Treatment - N/A			
113	Project 3: Zone 7 Water Supply Drought Preparedness Project	33 days	Mon 2/3/14	Wed 3/19/14
114	Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines	240 days	Thu 5/1/14	Wed 4/1/15
115	Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	55 days	Thu 1/15/15	Wed 4/1/15
116	Project 6: DERWA Phase 3 Recycled Water Expansion Project	96 days	Tue 11/11/14	Tue 3/24/15
117	Project 7: Calistoga Recycled Water Storage Facility	22 days	Thu 1/1/15	Fri 1/30/15
118	Project 8: Drought Relief for South Coast San Mateo County	240 days	Wed 5/1/13	Tue 4/1/14
119	Project 9: Stinson Beach Water Supply & Drought Preparedness Plan	23 days	Sun 3/1/15	Tue 3/31/15
120	Project 10: Bay Area Regional Drought Relief Conservation Program - N/A			
121	Project 11: WaterSMART Irrigation with AMI/AMR	77 days	Thu 10/16/14	Fri 1/30/15
122	Project 12: Grant Administration	20 days	Thu 10/16/14	Wed 11/12/14
123	**Task 10 Project Construction/Implementation**	**1947 days**	**Fri 7/1/11**	**Mon 12/17/18**
124	Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project	316 days	Tue 7/15/14	Tue 9/29/15
125	Project 2: Rinconada Water Treatment Plant Powderec Activated Carbon (PAC) Treatment	238 days	Mon 2/3/14	Wed 12/31/14
126	Project 3: Zone 7 Water Supply Drought Preparedness Project	172 days	Thu 3/6/14	Fri 10/31/14
127	Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines	523 days	Wed 7/16/14	Fri 7/15/16
128	Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	457 days	Thu 4/2/15	Fri 12/30/16
129	Project 6: DERWA Phase 3 Recycled Water Expansion Project	372 days	Mon 1/5/15	Tue 6/7/16
130	Project 7: Calistoga Recycled Water Storage Facility	108 days	Mon 2/2/15	Wed 7/1/15



Bay Area Drought Relief Program (Bay DRP)

2014 IRWM Drought Proposal Schedule

ID	Task Name	Duration	Start	Finish
131	Project 8: Drought Relief for South Coast San Mateo County	1891 days	Fri 7/1/11	Fri 9/28/18
132	Project 9: Stinson Beach Water Supply & Drought Preparedness Plan	545 days	Tue 7/1/14	Sun 7/31/16
133	Project 10: Bay Area Regional Drought Relief Conservation Program	848 days	Wed 4/1/15	Fri 6/29/18
134	Project 11: WaterSMART Irrigation with AMI/AMR	719 days	Tue 4/1/14	Fri 12/30/16
135	Project 12: Grant Administration	1088 days	Thu 10/16/14	Mon 12/17/18
136	**Task 11 Environmental Compliance/Mitigation /Enhancement**	**1336 days**	**Fri 7/1/11**	**Fri 8/12/16**
137	Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project	262 days	Fri 8/1/14	Mon 8/3/15
138	Project 2: Rinconada Water Treatment Plant Powderec Activated Carbon (PAC) Treatment - N/A			
139	Project 3: Zone 7 Water Supply Drought Preparedness Project	5 days	Mon 10/27/14	Fri 10/31/14
140	Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines	523 days	Wed 8/13/14	Fri 8/12/16
141	Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline - N/A			
142	Project 6: DERWA Phase 3 Recycled Water Expansion Project	372 days	Mon 1/5/15	Tue 6/7/16
143	Project 7: Calistoga Recycled Water Storage Facility	86 days	Mon 2/2/15	Mon 6/1/15
144	Project 8: Drought Relief for South Coast San Mateo County	1152 days	Fri 7/1/11	Mon 11/30/15
145	Project 9: Stinson Beach Water Supply & Drought Preparedness Plan	544 days	Tue 7/1/14	Fri 7/29/16
146	Project 10: Bay Area Regional Drought Relief Conservation Program - N/A			
147	Project 11: WaterSMART Irrigation with AMI/AMR - N/A			
148	Project 12: Grant Administration - N/A			
149	**Task 12 Construction Administration**	**1436 days**	**Fri 7/1/11**	**Fri 12/30/16**
150	Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project	291 days	Mon 7/21/14	Mon 8/31/15
151	Project 2: Rinconada Water Treatment Plant Powderec Activated Carbon (PAC) Treatment - N/A			
152	Project 3: Zone 7 Water Supply Drought Preparedness Project	172 days	Thu 3/6/14	Fri 10/31/14
153	Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines	503 days	Wed 8/13/14	Fri 7/15/16
154	Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline	457 days	Thu 4/2/15	Fri 12/30/16
155	Project 6: DERWA Phase 3 Recycled Water Expansion Project	372 days	Mon 1/5/15	Tue 6/7/16
156	Project 7: Calistoga Recycled Water Storage Facility	86 days	Mon 2/2/15	Mon 6/1/15
157	Project 8: Drought Relief for South Coast San Mateo County	1152 days	Fri 7/1/11	Mon 11/30/15
158	Project 9: Stinson Beach Water Supply & Drought Preparedness Plan	565 days	Mon 6/2/14	Fri 7/29/16
159	Project 10: Bay Area Regional Drought Relief Conservation Program - N/A			
160	Project 11: WaterSMART Irrigation with AMI/AMR	783 days	Wed 1/1/14	Fri 12/30/16
161	Project 12: Grant Administration - N/A			



Organization of Project Schedules

The Bay DRP consists of grant administration and 11 drought preparedness projects geographically spanning all four regions of the Bay Area, with four primary areas of benefit:

- Water Supply Enhancement
- Recycled Water
- Human Right to Water
- Drought Preparedness

To facilitate review, the projects are grouped by primary benefit type, as listed below.

Primary Project Benefit	Project ID#	Project Proponent	Project Title
Water Supply Enhancement	1	San Francisco Public Utilities Commission (SFPUC)	Lower Cherry Aqueduct Emergency Rehabilitation Project
	2	Santa Clara Valley Water District (SCVWD)	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment
	3	Zone 7 Water Agency (Zone 7)	Zone 7 Water Supply Drought Preparedness Project
Recycled Water	4	Napa Sanitation District	Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines
	5	SCVWD and City of Sunnyvale	Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline
	6	DERWA*	DERWA Phase 3 Recycled Water Expansion Project
	7	City of Calistoga	Calistoga Recycled Water Storage Facility
Human Right to Water	8	San Mateo County Resource Conservation District (RCD)	Drought Relief for South Coast San Mateo County
	9	Stinson Beach County Water District	Stinson Beach Water Supply & Drought Preparedness Plan
Drought Preparedness	10	StopWaste**	Bay Area Regional Drought Relief Conservation Program
	11	Marin Municipal Water District (MMWD)	WaterSMART Irrigation with AMI/AMR
Administration	12	ABAG/ San Francisco Estuary Partnership (SFEP)	Grant Administration

**DERWA: Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) Recycled Water Authority*

***This project is a group of 12 agencies led by Alameda County StopWaste.org (StopWaste). Participating agencies include: Alameda County Water District, Bay Area Water Supply and Conservation Authority, City of Napa, Contra Costa Water District, EBMUD, MMWD, SFPUC, SCVWD, Solano County Water Agency, Sonoma County Water Agency, StopWaste, and Zone 7.*

Schedule Summaries are organized by project type and describe how the project schedules are realistic, reasonable, and accomplishable. The tasks listed in the detailed schedules align with the same tasks identified and described in the Work Summary (Attachment 4) and Budget Summary (Attachment 5), and use October 16, 2014, as the assumed award date of the grant. All projects will be ready to proceed to construction/implementation by April 1, 2015, and final reports and invoicing will be complete by December 17, 2018, or earlier.

Project Schedules – Water Supply Enhancement Projects

Project schedule summaries and detailed Gantt charts are presented in this section for the projects listed below. Project 1 will be complete by the end of August 2015 and Projects 2 and 3 will be complete by December 2014.

Project ID#	Project Proponent	Project Title
1	SFPUC	Lower Cherry Aqueduct Emergency Rehabilitation Project
2	SCVWD	Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment
3	Zone 7	Zone 7 Water Supply Drought Preparedness Project

Project 1 – Lower Cherry Aqueduct Emergency Rehabilitation Project

This SFPUC project is being implemented in two phases. Phase One will clear the aqueduct and do minimal repairs to enable the use of the asset by December 2014. Construction is estimated to commence in August 2014, and SFPUC is aiming to complete Phase One work by December 2014. Phase Two will consist of the more substantial work of pipe installation and permanent tunnel repairs. Phase Two construction will begin in April 2015 and be completed by August 2015.

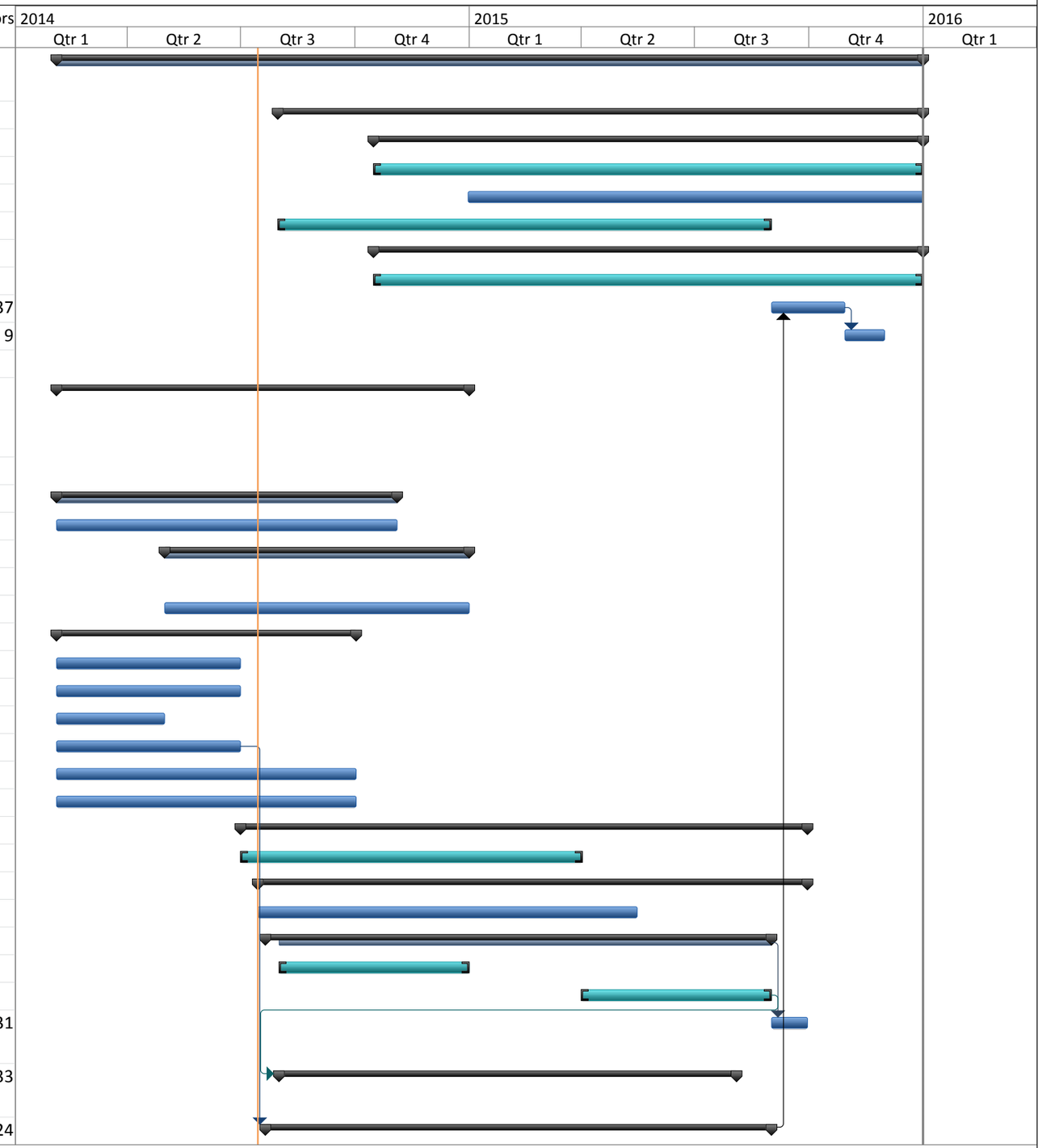
The SFPUC is using an integrated project delivery model to expedite completion of the project. The selected Construction Manager/General Contractor (CM/GC) will perform pre-construction services to facilitate design completion and fast-track the construction with early procurement of long-lead materials. The design of key project elements is approximately 90% complete. The CM/GC has already been selected and a Notice to Proceed for pre-construction services has been issued. Pre-purchase contracts for long-lead pipe materials, sluice gates, and operators have been issued.

All cultural resources and 50% of biological resources field studies and technical reports have been completed. All permit applications have been submitted. Section 106 technical documents and findings have been submitted to the State Historic Preservation Office (SHPO) and a Memorandum of Agreement (MOA) is anticipated by October 2014. An Environmental Assessment has been initiated, with anticipated completion by October 2014. On this basis, the project schedule is realistic, reasonable, and accomplishable.

Bay Area Drought Relief Program

Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project 1: Lower Cherry Aqueduct Emergency Rehabilitation Project**	**499 days**	**Mon 2/3/14**	**Thu 12/31/15**	
2	**Category (a): Direct Project Administration**	**371 days**	**Thu 7/31/14**	**Thu 12/31/15**	
3	**Task 1 Project Administration**	**316 days**	**Thu 10/16/14**	**Thu 12/31/15**	
4	Subtask 1.a Project Administration	316 days	Thu 10/16/14	Thu 12/31/15	
5	Subtask 1.b Invoices	262 days	Wed 12/31/14	Thu 12/31/15	
6	**Task 2 Labor Compliance Program**	283 days	Thu 7/31/14	Mon 8/31/15	
7	**Task 3 Reporting**	**316 days**	**Thu 10/16/14**	**Thu 12/31/15**	
8	Quarterly Reports	316 days	Thu 10/16/14	Thu 12/31/15	
9	Draft Final Report	43 days	Tue 9/1/15	Thu 10/29/15	37
10	Final Report	22 days	Fri 10/30/15	Mon 11/30/15	9
11	**Category (b): Land Purchase/Easement - N/A**				
13	**Category (c): Planning/Design/Engineering/Environmental Documentation**	**238 days**	**Mon 2/3/14**	**Wed 12/31/14**	
14	**Task 5 Assessment and Evaluation - N/A**				
15	**Task 6 Final Design**	**196 days**	**Mon 2/3/14**	**Mon 11/3/14**	
16	100% Design	196 days	Mon 2/3/14	Mon 11/3/14	
17	**Task 7 Environmental Documentation**	**175 days**	**Thu 5/1/14**	**Wed 12/31/14**	
18	CEQA compliance - complete				
19	NEPA compliance	175 days	Thu 5/1/14	Wed 12/31/14	
20	**Task 8 Permitting**	**173 days**	**Mon 2/3/14**	**Wed 10/1/14**	
21	CWA Section 404 (USACE)	106 days	Mon 2/3/14	Mon 6/30/14	
22	CWA Section 401 or WDR (RWQCB)	106 days	Mon 2/3/14	Mon 6/30/14	
23	CDFW Section 1602 Agreement	63 days	Mon 2/3/14	Wed 4/30/14	
24	CDFW Section 2081 Incidental Take Permit	106 days	Mon 2/3/14	Mon 6/30/14	
25	NHPA Section 106 Compliance	173 days	Mon 2/3/14	Wed 10/1/14	
26	ESA Compliance	173 days	Mon 2/3/14	Wed 10/1/14	
27	**Category (d): Construction/Implementation**	**326 days**	**Tue 7/1/14**	**Tue 9/29/15**	
28	**Task 9 Construction Contracting**	**197 days**	**Tue 7/1/14**	**Wed 4/1/15**	
29	**Task 10 Project Construction/Implementation**	**316 days**	**Tue 7/15/14**	**Tue 9/29/15**	
30	Subtask 10.1 Mobilization and Site Preparation	219 days	Tue 7/15/14	Fri 5/15/15	
31	Subtask 10.2 Project Construction	291 days	Mon 7/21/14	Mon 8/31/15	
32	Clearing Aqueduct and Minor Repairs (Phase 1)	109 days	Fri 8/1/14	Wed 12/31/14	
33	Pipe Installation and Tunnel Repairs (Phase 2)	109 days	Wed 4/1/15	Mon 8/31/15	
34	Subtask 10.3 Performance Testing and Demobilization	21 days	Tue 9/1/15	Tue 9/29/15	31
35	**Task 11 Environmental Compliance/Mitigation/Enhancement**	**262 days**	**Fri 8/1/14**	**Mon 8/3/15**	33
37	**Task 12 Construction Administration**	**291 days**	**Mon 7/21/14**	**Mon 8/31/15**	24



Project 2 – Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment

The Project is already being implemented in response to drought conditions and will continue through the remainder of 2014. The Project involves acquiring powdered activated carbon (PAC), inserting it into the wastewater treatment process, and monitoring for water quality. PAC is inserted into the wastewater treatment process on a continuous (monthly) basis for the duration of the Project.

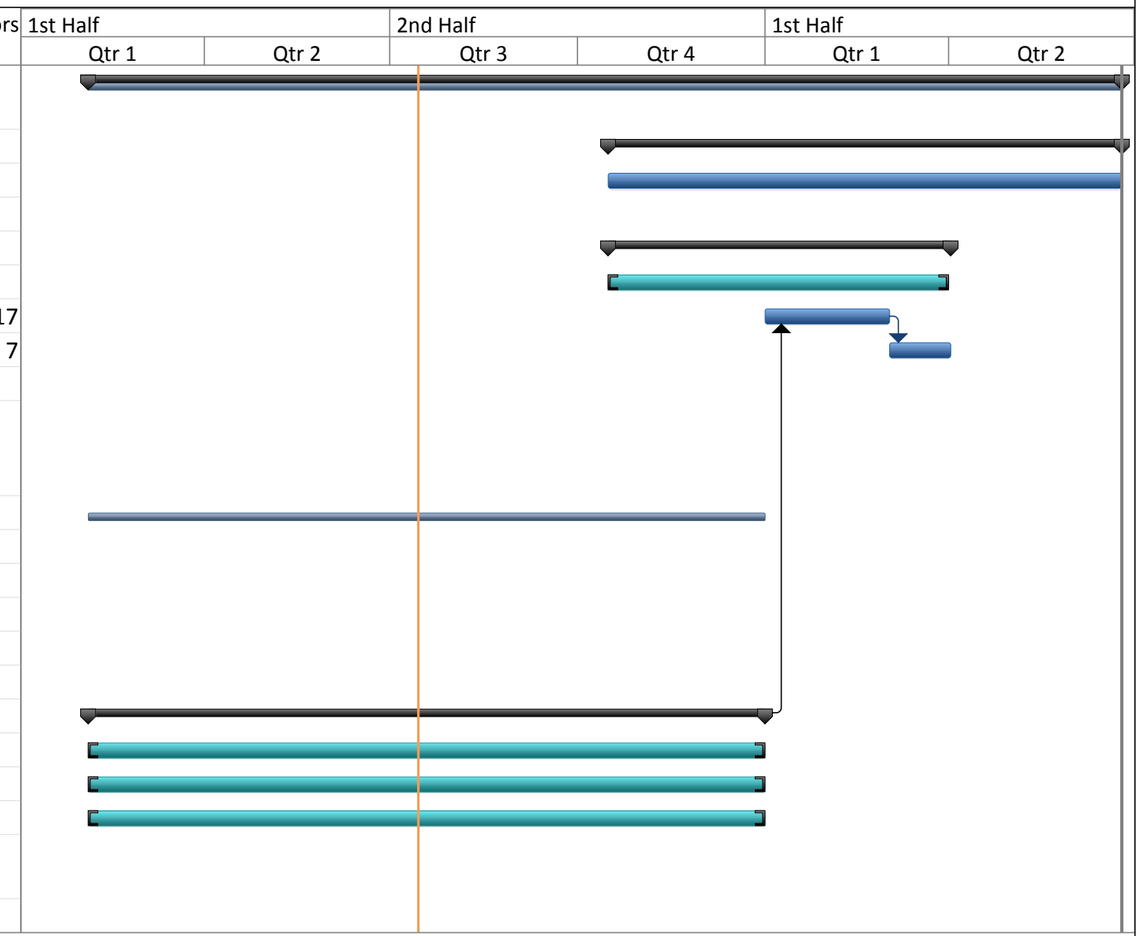
SCVWD entered into a contract with a PAC distributor in April 2014. Offloading and management of the PAC feed, maintenance of the PAC feed system, and monitoring of water quality began in February 2014 and will be complete by December 31, 2014. Key project tasks are at the following stages of completion: monitor water quality, 45% complete; offload and manage PAC feed, 45% complete; and maintain PAC feed system, 45% complete.

Staff resources to conduct project tasks are in place and experienced in their responsibilities. No planning, design, engineering, or environmental documentation is required for the Project. As such, the project schedule is realistic, reasonable, and achievable.

Bay Area Drought Relief Program

Project 2: Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project 2: Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment**	**363 days**	**Mon 2/3/14**	**Wed 6/24/15**	
2	**Category (a): Direct Project Administration**	**180 days**	**Thu 10/16/14**	**Wed 6/24/15**	
3	Task 1 Project Administration	180 days	Thu 10/16/14	Wed 6/24/15	
4	Task 2 Labor Compliance Program - N/A				
5	Task 3 Reporting	120 days	Thu 10/16/14	Wed 4/1/15	
6	Quarterly Reports	119 days	Thu 10/16/14	Tue 3/31/15	
7	Draft Final Report	43 days	Thu 1/1/15	Mon 3/2/15	17
8	Final Report	22 days	Tue 3/3/15	Wed 4/1/15	7
9	**Category (b): Land Purchase/Easement - N/A**				
10	**Category (c): Planning/Design/Engineering/Environmental Documentation - N/A**				
11	**Category (d): Construction/Implementation**				
12	Task 5 Assessment and Evaluation - N/A				
13	Task 6 Final Design - N/A				
14	Task 7 Environmental Documentation - N/A				
15	Task 8 Permitting - N/A				
16	Task 9 Construction Contracting (Task Complete)				
17	**Task 10 Project Construction/Implementation**	**238 days**	**Mon 2/3/14**	**Wed 12/31/14**	
18	Subtask 10.1 Monitor Water Quality	238 days	Mon 2/3/14	Wed 12/31/14	
19	Subtask 10.2 Offload and Manage PAC	238 days	Mon 2/3/14	Wed 12/31/14	
20	Subtask 10.3 Maintain PAC Feed System	238 days	Mon 2/3/14	Wed 12/31/14	
21	Task 11 Environmental Compliance/Mitigation/Enhancement - N/A				
22	Task 12 Construction Administration - N/A				



Project 3 – Zone 7 Water Supply Drought Preparedness Project

The two components of the Zone 7 Water Supply Drought Preparedness Project are on different schedules and at different stages of completion. The Cope Lake to Lake I Pipeline (CLP) Project is complete, with only construction reporting, project monitoring, and DWR contracting for IRWM funding as outstanding tasks. The Chain of Lakes Well No. 5 (COL-5) is under construction and scheduled to be complete in October 2014. The schedule and status for each project component is described further below.

CLP Project: Environmental compliance (California Environmental Quality Act [CEQA]) is 100% complete (completed in 2012). No permits were required for the Project. Final design is 100% complete (completed in March 2014). Project construction is 100% complete (construction was initiated in March 2014 and completed in May 2014). Remaining tasks (construction reporting, project monitoring, DWR contracting) are anticipated to be complete by October 2014.

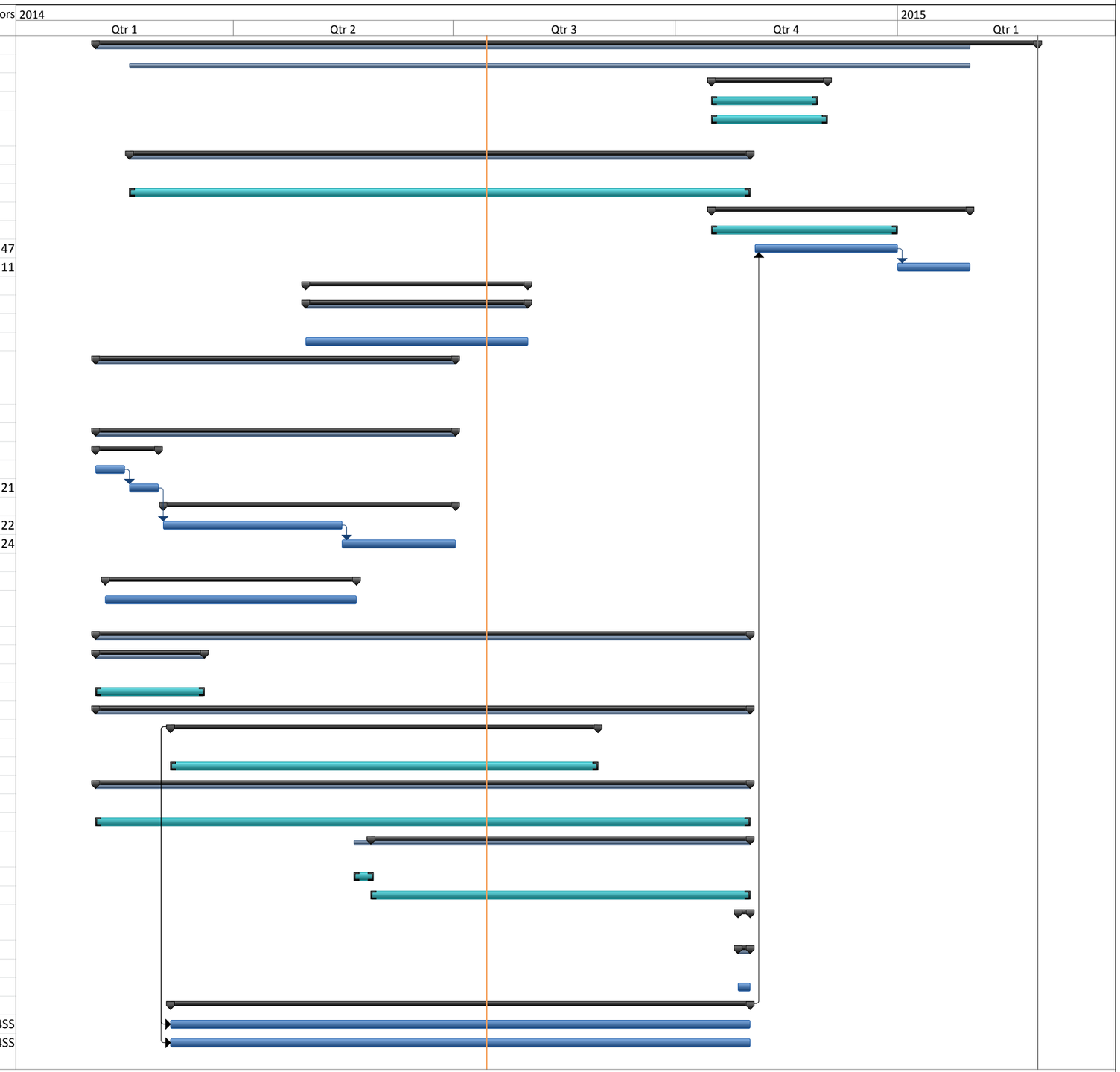
COL-5 Well: Environmental compliance (CEQA) is 100% complete (completed in 2005). Permits were acquired May 21, 2014. As the contract for the project is a design-build contract, the final designs are still pending. 100% design is scheduled to be complete by the end of June 2014. Construction is currently 45% complete and scheduled to be complete in October 2014. Revegetation of the Project site will be conducted the week of October 24, 2014.

As both Project components are well underway, with potential hurdles (i.e., CEQA compliance, permitting) cleared, the overall Project schedule is realistic, reasonable, and accomplishable.

Bay Area Drought Relief Program

Project 3: Zone 7 Water Supply Drought Preparedness Project

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project 3: Water Supply Drought Preparedness Project**	**280 days**	**Mon 2/3/14**	**Fri 2/27/15**	
2	**Category (a): Direct Project Administration**				
3	**Task 1 Project Administration**	**34 days**	**Thu 10/16/14**	**Tue 12/2/14**	
4	Subtask 1.1 Contract Management	32 days	Thu 10/16/14	Fri 11/28/14	
5	Subtask 1.2 Project Performance and Monitoring Plan Development	34 days	Thu 10/16/14	Tue 12/2/14	
6	**Task 2 Labor Compliance Program**	**185 days**	**Mon 2/17/14**	**Fri 10/31/14**	
7	CLP - complete				
8	COL-5	185 days	Mon 2/17/14	Fri 10/31/14	
9	**Task 3 Reporting**	**77 days**	**Thu 10/16/14**	**Fri 1/30/15**	
10	Quarterly Reports	55 days	Thu 10/16/14	Wed 12/31/14	
11	Draft Final Report	43 days	Mon 11/3/14	Wed 12/31/14	47
12	Final Report	22 days	Thu 1/1/15	Fri 1/30/15	11
13	**Category (b): Land Purchase/Easement**	**66 days**	**Thu 5/1/14**	**Thu 7/31/14**	
14	**Task 4 Land Purchase/Easement**	**66 days**	**Thu 5/1/14**	**Thu 7/31/14**	
15	CLP - N/A				
16	COL-5	66 days	Thu 5/1/14	Thu 7/31/14	
17	**Category (c): Planning/Design/Engineering/Environmental Documentation**	**107 days**	**Mon 2/3/14**	**Tue 7/1/14**	
18	CLP - complete				
19	COL-5	**107 days**	**Mon 2/3/14**	**Tue 7/1/14**	
20	**Task 5 Assessment and Evaluation**	**20 days**	**Mon 2/3/14**	**Fri 2/28/14**	
21	Subtask 5.1 Assessment and Feasibility Studies	10 days	Mon 2/3/14	Fri 2/14/14	
22	Subtask 5.2 Concept Design (10%)	10 days	Mon 2/17/14	Fri 2/28/14	21
23	**Task 6 Final Design**	**87 days**	**Mon 3/3/14**	**Tue 7/1/14**	
24	Subtask 6.1 90% Design	54 days	Mon 3/3/14	Thu 5/15/14	22
25	Subtask 6.2 100% Design	33 days	Fri 5/16/14	Tue 7/1/14	24
26	**Task 7 Environmental Documentation - N/A**				
27	**Task 8 Permitting**	**74 days**	**Fri 2/7/14**	**Wed 5/21/14**	
28	Subtask 8.1 Other Regulatory or Local Agency Approvals - complete	74 days	Fri 2/7/14	Wed 5/21/14	
29	**Category (d): Construction/Implementation**	**195 days**	**Mon 2/3/14**	**Fri 10/31/14**	
30	**Task 9 Construction Contracting**	**33 days**	**Mon 2/3/14**	**Wed 3/19/14**	
31	CLP - complete				
32	COL-5	33 days	Mon 2/3/14	Wed 3/19/14	
33	**Task 10 Project Construction/Implementation**	**195 days**	**Mon 2/3/14**	**Fri 10/31/14**	
34	**Subtask 10.1 Mobilization and Site Preparation**	**127 days**	**Thu 3/6/14**	**Fri 8/29/14**	
35	CLP - complete				
36	COL-5	127 days	Thu 3/6/14	Fri 8/29/14	
37	**Subtask 10.2 Project Construction**	**195 days**	**Mon 2/3/14**	**Fri 10/31/14**	
38	CLP - complete				
39	COL-5	195 days	Mon 2/3/14	Fri 10/31/14	
40	**Subtask 10.3 Performance Testing and Demobilization**	**113 days**	**Wed 5/28/14**	**Fri 10/31/14**	
41	CLP	6 days	Wed 5/21/14	Wed 5/28/14	
42	COL-5	113 days	Wed 5/28/14	Fri 10/31/14	
43	**Task 11 Environmental Compliance/Mitigation/Enhancement -**	**5 days**	**Mon 10/27/14**	**Fri 10/31/14**	
44	**Subtask 11.1 Re-vegetation**	**5 days**	**Mon 10/27/14**	**Fri 10/31/14**	
45	CLP - N/A				
46	COL-5	5 days	Mon 10/27/14	Fri 10/31/14	
47	**Task 12 Construction Administration**	**172 days**	**Thu 3/6/14**	**Fri 10/31/14**	
48	Subtask 12.1 Construction Administration	172 days	Thu 3/6/14	Fri 10/31/14	34SS
49	Subtask 12.2 Construction Inspection and Management	172 days	Thu 3/6/14	Fri 10/31/14	34SS



Project Schedules – Recycled Water Projects

Project schedule summaries and detailed Gantt charts are presented in this section for the projects listed below. Projects 4, 5, and 7 will be complete by the end of August 2015 and Project 6 will be complete in June 2016.

Project ID#	Project Proponent	Project Title
4	Napa Sanitation District	Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines
5	SCVWD and City of Sunnyvale	Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline
6	DERWA	DERWA Phase 3 Recycled Water Expansion Project
7	City of Calistoga	Calistoga Recycled Water Storage Facility

Project 4 – Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines

Environmental documentation is complete for both the Los Carneros Water District (LCWD) and Milliken-Sarco-Tulocay (MST) recycled water pipeline Projects. Project design is nearly complete for both Projects and a Notice to Proceed has been issued for the MST Project. The schedule and status for each Project is described further below.

LCWD Project: Environmental analysis and documents are 100% complete. Project design is at 95% and will be complete by September 2014. LCWD and the Napa Sanitation District (NSD) are working closely together to ensure that all final comments are incorporated into the final design, and that the consultant provides bid-ready documents by that date. Permits are 10% complete and scheduled to be complete by December 2014. Construction contracting is scheduled to be complete by April 2015. Mobilization and site preparation are scheduled to be complete by May 2015, and construction is scheduled to be complete by May 2016. LCWD has applied for a State Revolving Fund (SRF) loan for the balance of funds necessary for the Project. The assessment district voted on July 2, 2014 and agreed to repay the SRF loans. The only outstanding issue for securing the loan is obtaining the environmental permits.

MST Project: Project design and engineering are 100% complete, along with CEQA compliance. All necessary permits have been obtained. The Project was bid in April/May 2014 and a Notice to Proceed was issued in June 2014 to the construction contractors. Mobilization and site preparation are expected to be completed in August 2014, and construction is scheduled to be completed in December 2015. The contractors have committed to meet the construction schedule in the bid documents, with liquidated damages included in the contract for failure to meet the construction deadlines. Napa County has completed the formation of the Community Facilities District and has begun to collect property taxes toward SRF loan repayment.

The Project plans for both Projects also include hiring a third-party construction management firm to assist with construction inspection services and to provide additional professional assistance in project management. These resources and skills are being applied to these Projects to ensure that construction proceeds according to the established construction schedules; that any issues during construction can be addressed in a timely manner; and that the quality of construction is maintained according to the established plans and specifications.

NSD has experience building recycled water pipelines and has experienced engineers, construction managers, and inspectors on staff to oversee and assist on these Projects. Given that environmental documentation is complete for both Projects and construction is moving forward for the MST Project, the overall Project schedule is realistic, reasonable, and accomplishable.

Bay Area Drought Relief Program

Project 4: Los Carneros Water Milliken-Sarco-Tuolocay Recycled Water Pipelines

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project 4: Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines**	**650 days**	**Thu 5/1/14**	**Wed 10/26/16**	
2	**Category (a): Direct Project Administration**	**530 days**	**Thu 10/16/14**	**Wed 10/26/16**	
3	**Task 1 Administration**	**501 days**	**Thu 10/16/14**	**Thu 9/15/16**	
4	**Subtask 1.a Contract Management**	**501 days**	**Thu 10/16/14**	**Thu 9/15/16**	
5	MST project	334 days	Thu 10/16/14	Tue 1/26/16	
6	LCWD project	501 days	Thu 10/16/14	Thu 9/15/16	
7	**Subtask 1.b Project Performance and Monitoring Plan Development**	**34 days**	**Thu 10/16/14**	**Tue 12/2/14**	
8	MST project	34 days	Thu 10/16/14	Tue 12/2/14	
9	LCWD project	34 days	Thu 10/16/14	Tue 12/2/14	
10	**Task 2 Labor Compliance Program**	**457 days**	**Thu 10/16/14**	**Fri 7/15/16**	
11	MST project	334 days	Thu 10/16/14	Tue 1/26/16	
12	LCWD project	457 days	Thu 10/16/14	Fri 7/15/16	
13	**Task 3 Reporting**	**530 days**	**Thu 10/16/14**	**Wed 10/26/16**	
14	Quarterly Reports	530 days	Thu 10/16/14	Wed 10/26/16	
15	Draft Final Report	43 days	Mon 7/18/16	Wed 9/14/16	54
16	Final Report	22 days	Thu 9/15/16	Fri 10/14/16	15
17	**Category (b): Land Purchase/Easement**	**20 days**	**Mon 6/2/14**	**Fri 6/27/14**	
18	**Task 4 Land Purchase / Easement Acquisition**	**20 days**	**Mon 6/2/14**	**Fri 6/27/14**	
19	MST - complete				
20	LCWD	20 days	Mon 6/2/14	Fri 6/27/14	
21	**Category (c): Planning/Design/Engineering/Environmental Documentation**	**153 days**	**Mon 6/2/14**	**Wed 12/31/14**	
22	**Task 5 Assessment and Evaluation - N/A**				
23	**Task 6 Final Design**	**87 days**	**Mon 6/2/14**	**Tue 9/30/14**	
24	**100% Design**	**87 days**	**Mon 6/2/14**	**Tue 9/30/14**	
25	MST - complete				
26	LCWD	87 days	Mon 6/2/14	Tue 9/30/14	
27	**Task 7 Environmental Documentation - complete**				
28	**Task 8 Permitting**	**153 days**	**Mon 6/2/14**	**Wed 12/31/14**	
29	MST - complete				
30	**LCWD**	**153 days**	**Mon 6/2/14**	**Wed 12/31/14**	
31	Subtask 8.1 CA Fish and Wildlife permit	153 days	Mon 6/2/14	Wed 12/31/14	
32	Subtask 8.2 CWA Section 401	153 days	Mon 6/2/14	Wed 12/31/14	
33	Subtask 8.3 CWA Section 404	153 days	Mon 6/2/14	Wed 12/31/14	
34	**Category (d): Construction/Implementation**	**597 days**	**Thu 5/1/14**	**Fri 8/12/16**	
35	**Task 9 Construction Contracting**	**240 days**	**Thu 5/1/14**	**Wed 4/1/15**	
36	MST	54 days	Thu 5/1/14	Tue 7/15/14	
37	LCWD	23 days	Mon 3/2/15	Wed 4/1/15	
38	**Task 10 Project Construction/Implementation**	**523 days**	**Wed 7/16/14**	**Fri 7/15/16**	
39	**Subtask 10.1 Mobilization and Site Preparation**	**223 days**	**Wed 7/16/14**	**Fri 5/22/15**	
40	MST	20 days	Wed 7/16/14	Tue 8/12/14	36
41	LCWD	38 days	Wed 4/1/15	Fri 5/22/15	
42	**Subtask 10.2 Project Construction**	**465 days**	**Wed 8/13/14**	**Tue 5/24/16**	
43	MST	362 days	Wed 8/13/14	Thu 12/31/15	40
44	LCWD	262 days	Mon 5/25/15	Tue 5/24/16	41
45	**Subtask 10.3 Performance Testing and Demobilization**	**503 days**	**Wed 8/13/14**	**Fri 7/15/16**	
46	MST	380 days	Wed 8/13/14	Tue 1/26/16	43SS
47	LCWD	300 days	Mon 5/25/15	Fri 7/15/16	44SS
48	**Task 11 Environmental Compliance/Mitigation/Enhancement**	**523 days**	**Wed 8/13/14**	**Fri 8/12/16**	
49	Construction Mitigation Monitoring (MST)	380 days	Wed 8/13/14	Tue 1/26/16	43SS
50	Construction Mitigation Monitoring (LCWD)	300 days	Mon 5/25/15	Fri 7/15/16	44SS
51	Re-vegetation (MST and LCWD)	20 days	Mon 7/18/16	Fri 8/12/16	47
52	**Task 12 Construction Administration**	**503 days**	**Wed 8/13/14**	**Fri 7/15/16**	
53	MST	380 days	Wed 8/13/14	Tue 1/26/16	43SS
54	LCWD	300 days	Mon 5/25/15	Fri 7/15/16	44SS

Project 5 – Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline

The SCVWD/Sunnyvale Recycled Water Expansion Project is on schedule and moving forward, with construction of all Project elements to be complete by December 2016 and on line by January 2017.

The design consultant for the Recycled Water Production Improvements at the Sunnyvale Water Pollution Control Plant (WPCP) is under contract and has initiated the design phase. This Project element is currently at 10% complete (as of June 2014) and final designs will be complete by the end of December 2014. The contractor bid opening will be released in February 2015 and the Notice to Proceed for the construction contractor will be issued by April 1, 2015. Project construction will be initiated in April 2015 and be complete in July 2016, a little more than 1 year later.

The WPCP improvements will be constructed on the existing plant site; will not increase overall treatment plant capacity; and are most likely exempt from CEQA review. The construction schedule is driven more by coordination, given that the Project is modifying existing facilities, rather than by construction complexity. The plant's existing treatment system includes 440 acres of ponds. The pond volume is used to facilitate plant shutdowns for up to several days at a time. Plant shutdown is commonly performed by plant staff and operationally is well understood and straightforward. The ability to shut down a treatment plant for days at a time is a unique feature of the Sunnyvale plant facilities. This ability eases construction pressure on existing facilities and is an enabling factor for a straightforward construction project that will be completed as shown in the production schedule.

The new Recycled Water Distribution Pipeline to be constructed down Wolfe Road is anticipated to be relatively straightforward in design and construction. The Project team reviewed past projects of similar size and complexity, along with the availability of current resources, to prepare the Project schedule. The Project administration, planning, design, environmental documentation, and permitting tasks (Category C tasks) related to the conveyance system started in October 2013 and are scheduled to be completed by March 2015. Design of the pipeline is on schedule at 30% complete. Environmental documentation, including CEQA compliance, is ahead of schedule at 90% complete. Construction/ implementation tasks (Category D tasks) are scheduled to occur between March 2015 and December 2016 (approximately 1.5 years for construction).

Project administration will continue through the construction/implementation tasks for both Projects. As the Project continues, the administration team will consistently monitoring its progress and make use of available additional resources, if necessary, to ensure the Project stays on schedule.

Bay Area Drought Relief Program

Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project 5: Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road**	**741 days**	**Mon 6/2/14**	**Fri 3/31/17**	
2	**Category (a): Direct Project Administration**	**643 days**	**Thu 10/16/14**	**Fri 3/31/17**	
3	**Task 1 Administration**	**600 days**	**Thu 10/16/14**	**Tue 1/31/17**	
4	**Subtask 1.1 Project Administration**	**600 days**	**Thu 10/16/14**	**Tue 1/31/17**	
5	Recycled Water Project	459 days	Thu 10/16/14	Mon 7/18/16	
6	New Distribution Pipeline Project	600 days	Thu 10/16/14	Tue 1/31/17	
7	**Subtask 1.2 Project Performance and Monitoring Plan Development**	**34 days**	**Thu 10/16/14**	**Mon 12/1/14**	
8	Project Performance and Monitoring Plan	34 days	Thu 10/16/14	Mon 12/1/14	
9	**Task 2 Labor Compliance Program**	**578 days**	**Thu 10/16/14**	**Fri 12/30/16**	
10	Recycled Water Project	348 days	Wed 4/1/15	Fri 7/29/16	
11	New Distribution Pipeline Project	578 days	Thu 10/16/14	Fri 12/30/16	
12	**Task 3 Reporting**	**643 days**	**Thu 10/16/14**	**Fri 3/31/17**	
13	Quarterly Reports	643 days	Thu 10/16/14	Fri 3/31/17	
14	Draft Final Report	43 days	Mon 1/2/17	Wed 3/1/17	55
15	Final Report	22 days	Thu 3/2/17	Fri 3/31/17	14
16	**Category (b): Land Purchase/Easement - N/A**				
17	**Category (c): Planning/Design/Engineering/Environmental Documentation**	**219 days**	**Mon 6/2/14**	**Wed 4/1/15**	
18	**Task 5 Assessment and Evaluation**	**111 days**	**Mon 9/1/14**	**Fri 1/30/15**	
19	Recycled Water Project - N/A				
20	New Distribution Pipeline - Engineers Report	111 days	Mon 9/1/14	Fri 1/30/15	
21	**Task 6 Final Design**	**219 days**	**Mon 6/2/14**	**Wed 4/1/15**	
22	**Subtask 6.1 30% Design**	**40 days**	**Wed 7/2/14**	**Tue 8/26/14**	
23	Recycled Water Project	40 days	Wed 7/2/14	Tue 8/26/14	
24	New Distribution Pipeline - complete				
25	**Subtask 6.2 60% Design**	**110 days**	**Mon 6/2/14**	**Fri 10/31/14**	
26	Recycled Water Project	40 days	Wed 8/27/14	Tue 10/21/14	23
27	New Distribution Pipeline Project	110 days	Mon 6/2/14	Fri 10/31/14	
28	**Subtask 6.3 90% Design**	**75 days**	**Wed 10/22/14**	**Mon 2/2/15**	
29	Recycled Water Project	50 days	Wed 10/22/14	Mon 12/29/14	26
30	New Distribution Pipeline Project	66 days	Mon 11/3/14	Mon 2/2/15	27
31	**Subtask 6.4 Final Design**	**67 days**	**Tue 12/30/14**	**Wed 4/1/15**	
32	Recycled Water Project	2 days	Tue 12/30/14	Wed 12/31/14	29
33	New Distribution Pipeline Project	42 days	Tue 2/3/15	Wed 4/1/15	30
34	**Task 7 Environmental Documentation**	**90 days**	**Mon 9/1/14**	**Thu 1/1/15**	
35	Subtask 7.1 CEQA Exemption for Recycled Water Project	44 days	Mon 11/3/14	Thu 1/1/15	
36	Subtask 7.2 CEQA Compliance for New Distribution Pipeline project	67 days	Mon 9/1/14	Mon 12/1/14	
37	**Task 8 Permitting**	**115 days**	**Wed 8/27/14**	**Mon 2/2/15**	
38	Recycled Water Project - Update Recycled Water Permit	115 days	Wed 8/27/14	Mon 2/2/15	23
39	New Distribution Pipeline Project -N/A				
40	**Category (d): Construction/Implementation**	**512 days**	**Thu 1/15/15**	**Fri 12/30/16**	
41	**Task 9 Construction Contracting**	**120 days**	**Thu 1/15/15**	**Wed 7/1/15**	
42	Subtask 9.1 Bidding, Notice of Award, and Notice to Proceed - Recycled Water Project	55 days	Thu 1/15/15	Wed 4/1/15	
43	Subtask 9.2 Advertise to Award of Contract - New Distribution Pipeline	87 days	Tue 3/3/15	Wed 7/1/15	
44	**Task 10 Project Construction/Implementation**	**457 days**	**Thu 4/2/15**	**Fri 12/30/16**	
45	**Subtask 10.1 Mobilization and Site Preparation**	**97 days**	**Thu 4/2/15**	**Fri 8/14/15**	
46	Recycled Water Project	32 days	Thu 4/2/15	Fri 5/15/15	42
47	New Distribution Pipeline Project	32 days	Thu 7/2/15	Fri 8/14/15	43
48	**Subtask 10.2 Project Construction**	**425 days**	**Mon 5/18/15**	**Fri 12/30/16**	
49	Recycled Water Project	305 days	Mon 5/18/15	Fri 7/15/16	46
50	New Distribution Pipeline	360 days	Mon 8/17/15	Fri 12/30/16	47
51	**Subtask 10.3 Performance Testing and Demobilization**	**425 days**	**Mon 5/18/15**	**Fri 12/30/16**	
52	Recycled Water Project	305 days	Mon 5/18/15	Fri 7/15/16	
53	New Distribution Pipeline Project	360 days	Mon 8/17/15	Fri 12/30/16	
54	**Task 11 Environmental Compliance/Mitigation/Enhancement - N/A**				
55	**Task 12 Construction Administration**	**457 days**	**Thu 4/2/15**	**Fri 12/30/16**	
56	Recycled Water Project	337 days	Thu 4/2/15	Fri 7/15/16	42
57	New Distribution Pipeline	392 days	Thu 7/2/15	Fri 12/30/16	43

Project 6 – DERWA Phase 3 Recycled Water Expansion Project

The Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) Recycled Water Authority (DERWA) Project is being designed and constructed as three separate Project components:

- Project Component #1: Central Dublin Recycled Water Pipeline
- Project Component #2: West Dublin Recycled Water Pipeline
- Project Component #3: San Ramon Valley Recycled Water Pipeline Phase 2

All three Project components are included in DERWA's San Ramon Valley Recycled Water Program Environmental Impact Report that was certified (and Notice of Determination filed with the County of Alameda) in December 1995. A CEQA Notice of Exemption will be prepared for each of the Project components. Conceptual design of all DERWA Project components is complete; all components are in the 30% design phase. Construction of the DERWA Project is scheduled to occur from January 2015 through May 2016. The following paragraphs provide a schedule overview of each of the Project components.

Project Component #1, the Central Dublin Recycled Water Pipeline, will be the first component to be constructed. Final design will be completed in November 2014. The construction contract will be awarded in December 2014. Construction will occur from January through April 2015.

Construction of this Project component is being accelerated due to the drought. DSRSD has declared a Community Emergency Drought and is, therefore, not required to publicly bid this construction contract (Public Contract Code 22050; DSRSD Policy P500-14-1 Section 2c). Note that the schedule shows a bid period as a placeholder but it will likely not be needed.

Project Component #2, the West Dublin Recycled Water Pipeline, is at 30% design. Final design will be completed in March 2015. The construction contract will be awarded in May 2015. Construction will occur from May 2015 through January 2016.

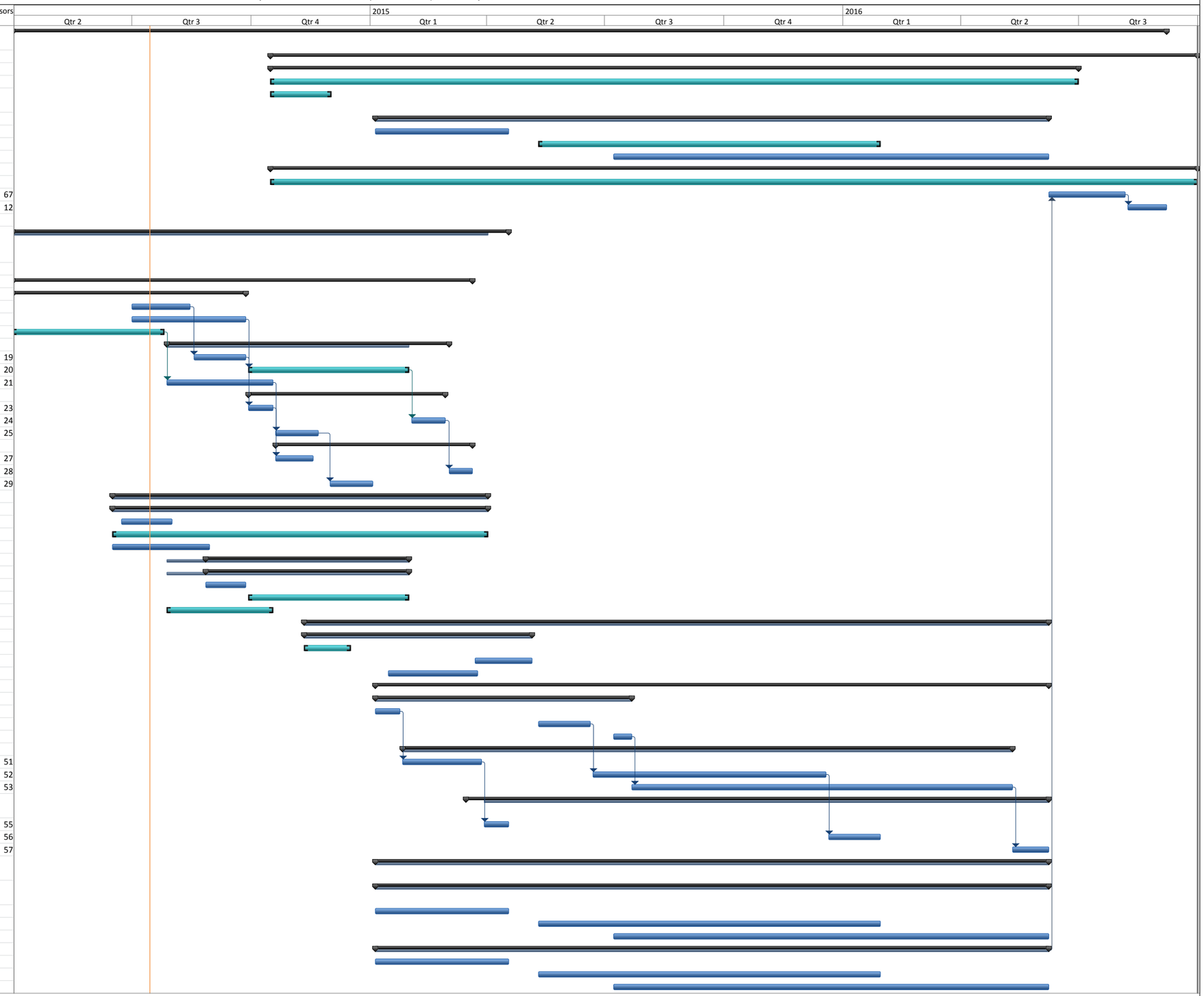
Project Component #3, the San Ramon Valley Recycled Water Pipeline Phase 2, is at 30% design. Final design will be complete in January 2015. The construction contract will be awarded in March 2015. Construction will occur from July 2015 through June 2016. Note that there is a 3-month lag between construction contract award and the start of construction. This lag represents the contractor's lead time to order and receive large (16-inch) diameter pipe for the Project.

This schedule is realistic, reasonable, and accomplishable because both DSRSD and EBMUD have allocated the resources (both monetary and staffing) necessary to implement this Project.

Bay Area Drought Relief Program

Project 6: DERWA Phase 3 Recycled Water Expansion Project

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project 6: DERWA Phase 3 Recycled Water Expansion Project**	**638 days**	**Mon 3/31/14**	**Tue 9/6/16**	
2	**Category (a): Direct Project Administration**	**513 days**	**Thu 10/16/14**	**Fri 9/30/16**	
3	**Task 1 Administration**	**447 days**	**Thu 10/16/14**	**Thu 6/30/16**	
4	Subtask 1.1 Contract Management	447 days	Thu 10/16/14	Thu 6/30/16	
5	Subtask 1.2 Project Performance and Monitoring Plan Development	34 days	Thu 10/16/14	Mon 12/1/14	
6	**Task 2 Labor Compliance Program**	**372 days**	**Mon 1/5/15**	**Tue 6/7/16**	
7	Central Dublin (Project 1)	75 days	Mon 1/5/15	Fri 4/17/15	
8	West Dublin (Project 2)	190 days	Mon 5/11/15	Fri 1/29/16	
9	San Ramon Valley (Project 3)	240 days	Wed 7/8/15	Tue 6/7/16	
10	**Task 3 Reporting**	**513 days**	**Thu 10/16/14**	**Fri 9/30/16**	
11	Quarterly Reports	513 days	Thu 10/16/14	Fri 9/30/16	
12	Draft Final Report	43 days	Wed 6/8/16	Fri 8/5/16	67
13	Final Report	22 days	Mon 8/8/16	Tue 9/6/16	12
14	**Category (b): Land Purchase/Easement - N/A**				
15	**Category (c): Planning/Design/Engineering/Environmental Documentation**	**276 days**	**Mon 3/31/14**	**Fri 4/17/15**	
16	**Task 5 Assessment and Evaluation - N/A**				
17	**Task 6 Final Design**	**256 days**	**Mon 3/31/14**	**Fri 3/20/15**	
18	**Subtask 6.1 30% Design**	**130 days**	**Mon 3/31/14**	**Fri 9/26/14**	
19	Central Dublin (Project 1)	33 days	Tue 7/1/14	Thu 8/14/14	
20	West Dublin (Project 2)	64 days	Tue 7/1/14	Fri 9/26/14	
21	San Ramon Valley (Project 3)	85 days	Mon 3/31/14	Fri 7/25/14	
22	**Subtask 6.2 60% Design**	**157 days**	**Mon 7/28/14**	**Mon 3/2/15**	
23	Central Dublin (Project 1)	30 days	Mon 8/18/14	Fri 9/26/14	19
24	West Dublin (Project 2)	91 days	Mon 9/29/14	Fri 1/30/15	20
25	San Ramon Valley (Project 3)	60 days	Mon 7/28/14	Fri 10/17/14	21
26	**Subtask 6.3 90% Design**	**111 days**	**Mon 9/29/14**	**Fri 2/27/15**	
27	Central Dublin (Project 1)	15 days	Mon 9/29/14	Fri 10/17/14	23
28	West Dublin (Project 2)	20 days	Mon 2/2/15	Fri 2/27/15	24
29	San Ramon Valley (Project 3)	26 days	Mon 10/20/14	Fri 11/21/14	25
30	**Subtask 6.4 100% Design**	**111 days**	**Mon 10/20/14**	**Fri 3/20/15**	
31	Central Dublin (Project 1)	22 days	Mon 10/20/14	Mon 11/17/14	27
32	West Dublin (Project 2)	14 days	Tue 3/3/15	Fri 3/20/15	28
33	San Ramon Valley (Project 3)	25 days	Mon 12/1/14	Fri 1/2/15	29
34	**Task 7 Environmental Documentation**	**209 days**	**Mon 6/16/14**	**Wed 4/1/15**	
35	**Subtask 7.1 CEQA Compliance**	**209 days**	**Mon 6/16/14**	**Wed 4/1/15**	
36	Central Dublin (Project 1)	29 days	Mon 6/23/14	Thu 7/31/14	
37	West Dublin (Project 2)	209 days	Mon 6/16/14	Wed 4/1/15	
38	San Ramon Valley (Project 3)	55 days	Mon 6/16/14	Fri 8/29/14	
39	**Task 8 Permitting**	**114 days**	**Wed 8/27/14**	**Fri 1/30/15**	
40	**Subtask 8.1 Encroachment Permit Conditions**	**114 days**	**Wed 8/27/14**	**Fri 1/30/15**	
41	Central Dublin (Project 1)	23 days	Wed 8/27/14	Fri 9/26/14	
42	West Dublin (Project 2)	91 days	Mon 9/29/14	Fri 1/30/15	
43	San Ramon Valley (Project 3)	60 days	Mon 7/28/14	Fri 10/17/14	
44	**Category (d): Construction/Implementation**	**411 days**	**Tue 11/11/14**	**Tue 6/7/16**	
45	**Task 9 Construction Contracting**	**126 days**	**Tue 11/11/14**	**Tue 5/5/15**	
46	Central Dublin (Project 1)	26 days	Tue 11/11/14	Tue 12/16/14	
47	West Dublin (Project 2)	32 days	Mon 3/23/15	Tue 5/5/15	
48	San Ramon Valley (Project 3)	49 days	Thu 1/15/15	Tue 3/24/15	
49	**Task 10 Project Construction/Implementation**	**372 days**	**Mon 1/5/15**	**Tue 6/7/16**	
50	**Subtask 10.1 Mobilization and Site Preparation**	**142 days**	**Mon 1/5/15**	**Tue 7/21/15**	
51	Central Dublin (Project 1)	15 days	Mon 1/5/15	Fri 1/23/15	
52	West Dublin (Project 2)	30 days	Mon 5/11/15	Fri 6/19/15	
53	San Ramon Valley (Project 3)	10 days	Wed 7/8/15	Tue 7/21/15	
54	**Subtask 10.2 Project Construction**	**337 days**	**Mon 1/26/15**	**Tue 5/10/16**	
55	Central Dublin (Project 1)	45 days	Mon 1/26/15	Fri 3/27/15	51
56	West Dublin (Project 2)	130 days	Mon 6/22/15	Fri 12/18/15	52
57	San Ramon Valley (Project 3)	210 days	Wed 7/22/15	Tue 5/10/16	53
58	**Subtask 10.3 Performance Testing and Demobilization**	**322 days**	**Mon 3/16/15**	**Tue 6/7/16**	
59	Central Dublin (Project 1)	15 days	Mon 3/30/15	Fri 4/17/15	55
60	West Dublin (Project 2)	30 days	Mon 12/21/15	Fri 1/29/16	56
61	San Ramon Valley (Project 3)	20 days	Wed 5/11/16	Tue 6/7/16	57
62	**Task 11 Environmental Compliance/Mitigation/Enhancement**	**372 days**	**Mon 1/5/15**	**Tue 6/7/16**	
63	**Subtask 11.1 General Construction Measures (Construction Mitagation Monitoring)**	**372 days**	**Mon 1/5/15**	**Tue 6/7/16**	
64	Central Dublin (Project 1)	75 days	Mon 1/5/15	Fri 4/17/15	
65	West Dublin (Project 2)	190 days	Mon 5/11/15	Fri 1/29/16	
66	San Ramon Valley (Project 3)	240 days	Wed 7/8/15	Tue 6/7/16	
67	**Task 12 Construction Administration**	**372 days**	**Mon 1/5/15**	**Tue 6/7/16**	
68	Central Dublin (Project 1)	75 days	Mon 1/5/15	Fri 4/17/15	
69	West Dublin (Project 2)	190 days	Mon 5/11/15	Fri 1/29/16	
70	San Ramon Valley (Project 3)	240 days	Wed 7/8/15	Tue 6/7/16	



Project 7 – Calistoga Recycled Water Storage Facility

Environmental review for the project is 95% complete (Notice of Exemption [NOE] filed June 11, 2014) and design is 75% complete. All necessary field studies for cultural, biological, soils, and field topographic surveys for the Project have been completed. Permitting is 50% complete and the City anticipates completion prior to bid time in December 2014. The final "Approved for Construction" plans and specifications (100% complete designs) are anticipated to be completed by October 2014. At that time, the City will proceed to publicly advertise and bid the Project. It is estimated that it will take 3 months to bid, award, and begin construction activities.

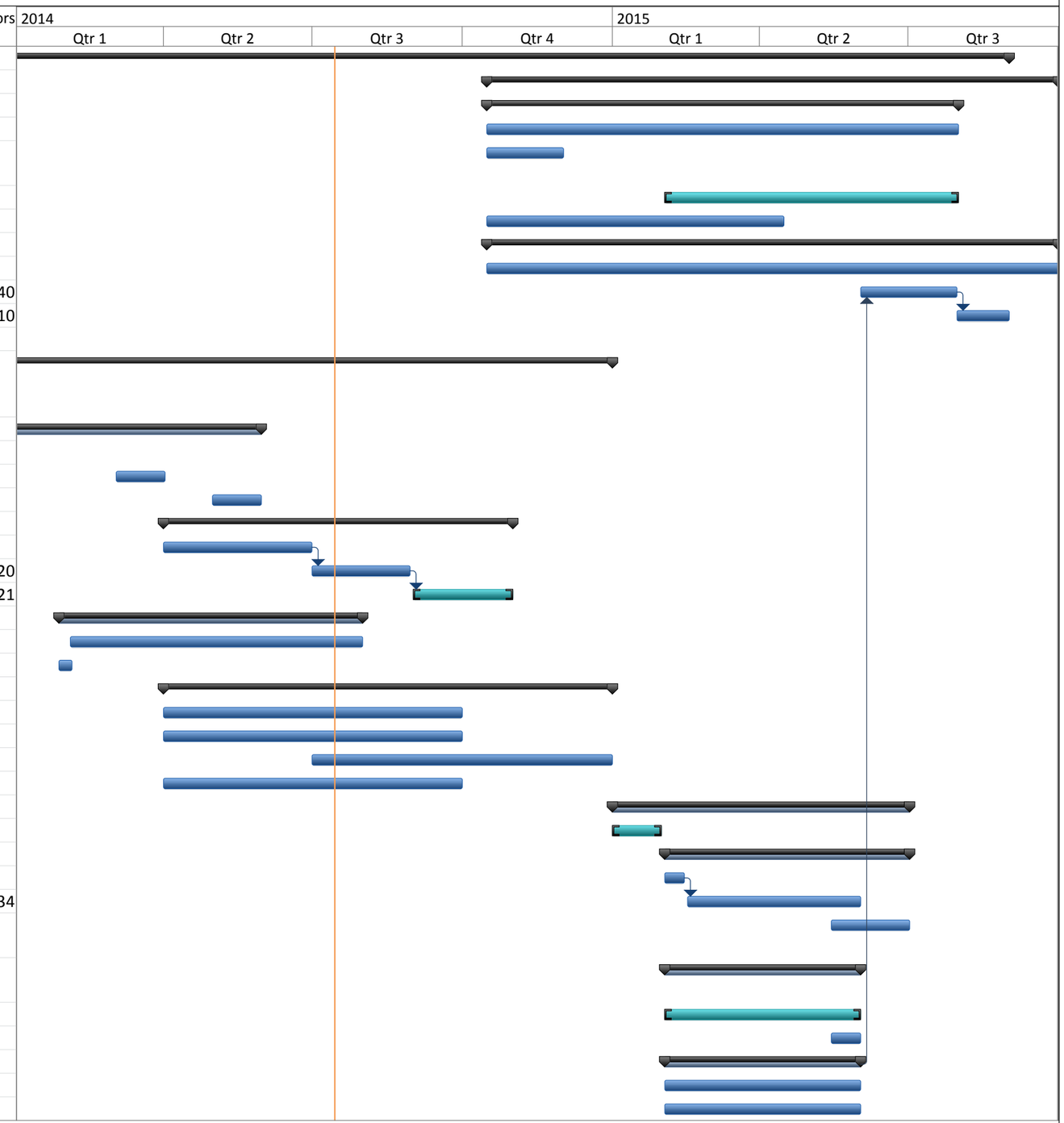
Construction is anticipated to begin in February 2015 and be completed by July 2015. Construction activities are anticipated to take 5 months from start to finish. Project construction will involve use of earthmoving equipment (e.g., scrapers, graders, excavators, dozers) to build the new earthen berms, complete the piping, and install the pre-fabricated rail car bridge. Special inspections related to geotechnical soil compaction tests and observation will be required to ensure the intent of the design is achieved.

The Project's schedule is realistic and reasonable because CEQA review and permitting are nearing completion and Project design is nearly complete (75%). Contractor award is scheduled to occur by the end of January 2015. Calistoga is also operating under discharge requirements issued by the San Francisco Bay Regional Water Quality Control Board (RWQCB) to reduce additional discharges to the Napa River. In response, Calistoga has told the RWQCB that it is proceeding with this Project to meet the discharge requirements in a timely manner to avoid future bypass discharges to the Napa River and San Francisco Bay.

Bay Area Drought Relief Program

Project 7: Calistoga Recycled Water Storage Facility

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project 7: Calistoga Recycled Water Storage Facility**	**637 days**	**Mon 3/25/13**	**Mon 8/31/15**	
2	**Category (a): Direct Project Administration**	**250 days**	**Thu 10/16/14**	**Wed 9/30/15**	
3	**Task 1 Project Administration**	**207 days**	**Thu 10/16/14**	**Fri 7/31/15**	
4	Contract Management	207 days	Thu 10/16/14	Fri 7/31/15	
5	Project Performance and Monitoring Plan Development	33 days	Thu 10/16/14	Mon 12/1/14	
6	**Task 2 Labor Compliance Program**	**130 days**	**Mon 2/2/15**	**Fri 7/31/15**	
7	Labor Compliance Monitoring	130 days	Thu 10/16/14	Wed 4/15/15	
8	**Task 3 Reporting**	**250 days**	**Thu 10/16/14**	**Wed 9/30/15**	
9	Quarterly Reports	250 days	Thu 10/16/14	Wed 9/30/15	
10	Draft Final Report	43 days	Tue 6/2/15	Thu 7/30/15	40
11	Final Report	22 days	Fri 7/31/15	Mon 8/31/15	10
12	**Category (b): Land Purchase/Easement - N/A**				
14	**Category (c): Planning/Design/Engineering/Environmental Documentation**	**464 days**	**Mon 3/25/13**	**Wed 12/31/14**	
15	**Task 5 Assessment and Evaluation**	**311 days**	**Mon 3/25/13**	**Fri 5/30/14**	
16	Subtask 5.1 Assessment and Feasibility Studies	66 days	Mon 3/25/13	Mon 6/24/13	
17	Subtask 5.2 Geotechnical	22 days	Mon 3/3/14	Tue 4/1/14	
18	Subtask 5.3 Topographic Survey	22 days	Thu 5/1/14	Fri 5/30/14	
19	**Task 6 Final Design**	**154 days**	**Tue 4/1/14**	**Fri 10/31/14**	
20	Subtask 6.1 60% Design	65 days	Tue 4/1/14	Mon 6/30/14	
21	Subtask 6.2 90% Design	44 days	Tue 7/1/14	Fri 8/29/14	20
22	Subtask 6.3 Approved for Constuction Documents	45 days	Mon 9/1/14	Fri 10/31/14	21
23	**Task 7 Environmental Documentation**	**135 days**	**Mon 1/27/14**	**Thu 7/31/14**	
24	CEQA compliance	130 days	Mon 2/3/14	Thu 7/31/14	
25	Tribal Notification	6 days	Mon 1/27/14	Mon 2/3/14	
26	**Task 8 Permitting**	**197 days**	**Tue 4/1/14**	**Wed 12/31/14**	
27	Subtask 8.1 FGC Secion 1602	131 days	Tue 4/1/14	Tue 9/30/14	
28	Subtask 8.2 CWA Section 401	131 days	Tue 4/1/14	Tue 9/30/14	
29	Subtask 8.3 CWA Section 402 -SWPPP	132 days	Tue 7/1/14	Wed 12/31/14	
30	Subtask 8.4 CWA Section 404	131 days	Tue 4/1/14	Tue 9/30/14	
31	**Category (d): Construction/Implementation**	**130 days**	**Thu 1/1/15**	**Wed 7/1/15**	
32	**Task 9 Construction Contracting**	**22 days**	**Thu 1/1/15**	**Fri 1/30/15**	
33	**Task 10 Project Construction/Implementation**	**108 days**	**Mon 2/2/15**	**Wed 7/1/15**	
34	Subtask 10.1 Mobilization and Site Preparation	10 days	Mon 2/2/15	Fri 2/13/15	
35	Subtask 10.2 Project Construction	76 days	Mon 2/16/15	Mon 6/1/15	34
36	Subtask 10.3 Performance Testing and Demobilization	34 days	Fri 5/15/15	Wed 7/1/15	
37	**Task 11 Environmental Compliance/Mitigation/Enhancement**	**86 days**	**Mon 2/2/15**	**Mon 6/1/15**	
38	Construction Mitigation Monitoring	86 days	Mon 2/2/15	Mon 6/1/15	
39	Re-vegetation	12 days	Fri 5/15/15	Mon 6/1/15	
40	**Task 12 Construction Administration**	**86 days**	**Mon 2/2/15**	**Mon 6/1/15**	
41	Construction Administration	86 days	Mon 2/2/15	Mon 6/1/15	
42	Construction Inspection and Management	86 days	Mon 2/2/15	Mon 6/1/15	



Project Schedules – Human Right to Water Projects

Project schedule summaries and detailed Gantt charts are presented in this section for the projects listed below. Project 8 will be completed by December 17, 2018, and Project I9 will be completed by the end of July 2016.

Project ID#	Project Proponent	Project Title
8	San Mateo County RCD	Drought Relief for South Coast San Mateo County
9	Stinson Beach County Water District	Stinson Beach Water Supply & Drought Preparedness Plan

Project 8 – Drought Relief for South Coast San Mateo County

The San Mateo County RCD and its primary Project partners (American Rivers, Trout Unlimited, and the Natural Resources Conservation Service) have been some of the key entities in California working to reduce water supply insecurity and conflicts between human and environmental water use needs in rural communities within important Central Coast watersheds. The Project team has the administrative and technical expertise required to fully and successfully implement the proposed Project as planned. Several of the Project elements are well underway, including eight water use efficiency Projects and one water supply storage Project that have already been constructed, and three water supply storage Projects that are currently in the final design development stage. As such, the Project schedule is realistic, reasonable, and achievable.

Provided below is a summary of the Project Schedules for the three elements of the Project: (a) water use efficiency, (b) water supply storage, and (c) regional drought water management.

Water Use Efficiency Element A.1–Domestic: Fixing significant water system leaks and broken pipes

Four cracked or otherwise leaking main water supply lines have been identified for replacement. One of these pipes was repaired in spring 2014 and two others are currently undergoing final design development. Final construction for these two sites will be completed by the end of 2014. A fourth site has been identified and will have planning and design completed by April 2015. Permitting for the fourth site will occur during summer 2015, with construction anticipated to be complete by November 2015. It is anticipated that any additional leaks or breaks will be identified, assessed, and repaired (to the extent funding allows) by December 2015. Overall, this Project element is approximately 35% complete.

Water Use Efficiency Element A.2–Agricultural: On-farm water management operations and infrastructure improvements

Assessments of water use and management have been ongoing in the Project area since 2010, and interest from the community has far outpaced available funding to complete assessments and implement resulting water efficiency, supply, and management recommendations. Irrigation efficiency improvements have already been completed at seven sites, saving 105.85 acre-feet per year (AFY). An assessment at one site is currently under way, and an additional five sites will be completed by March 2015. Improvements to irrigation systems at these sites will begin construction by April 2015, ensuring the majority of water savings (estimated 37 AFY) begin accruing as soon as possible. Overall, this Project element is approximately 55% complete.

Water Supply Storage Element B.1–Domestic:

Preliminary planning and design tasks have already been completed for a water storage system that would serve both San Mateo County Memorial Park and the Redwood Glen community. An initial assessment has already been conducted for Granny Flats Reservoir, a reservoir that provides residential water to the community of La Honda. Overall, this Project element is approximately 10% complete.

Water Supply Storage Element B.2–Agricultural: 0.1 AF of water storage was constructed at one site (part of match funding, complete by August 2014).

Preliminary planning and design have been completed for water storage at three agricultural sites. One site will be constructed in the summer/fall of 2014, creating an additional 1 AF of storage. Final designs will be completed by March 2015. Overall, this Project element is approximately 30% complete.

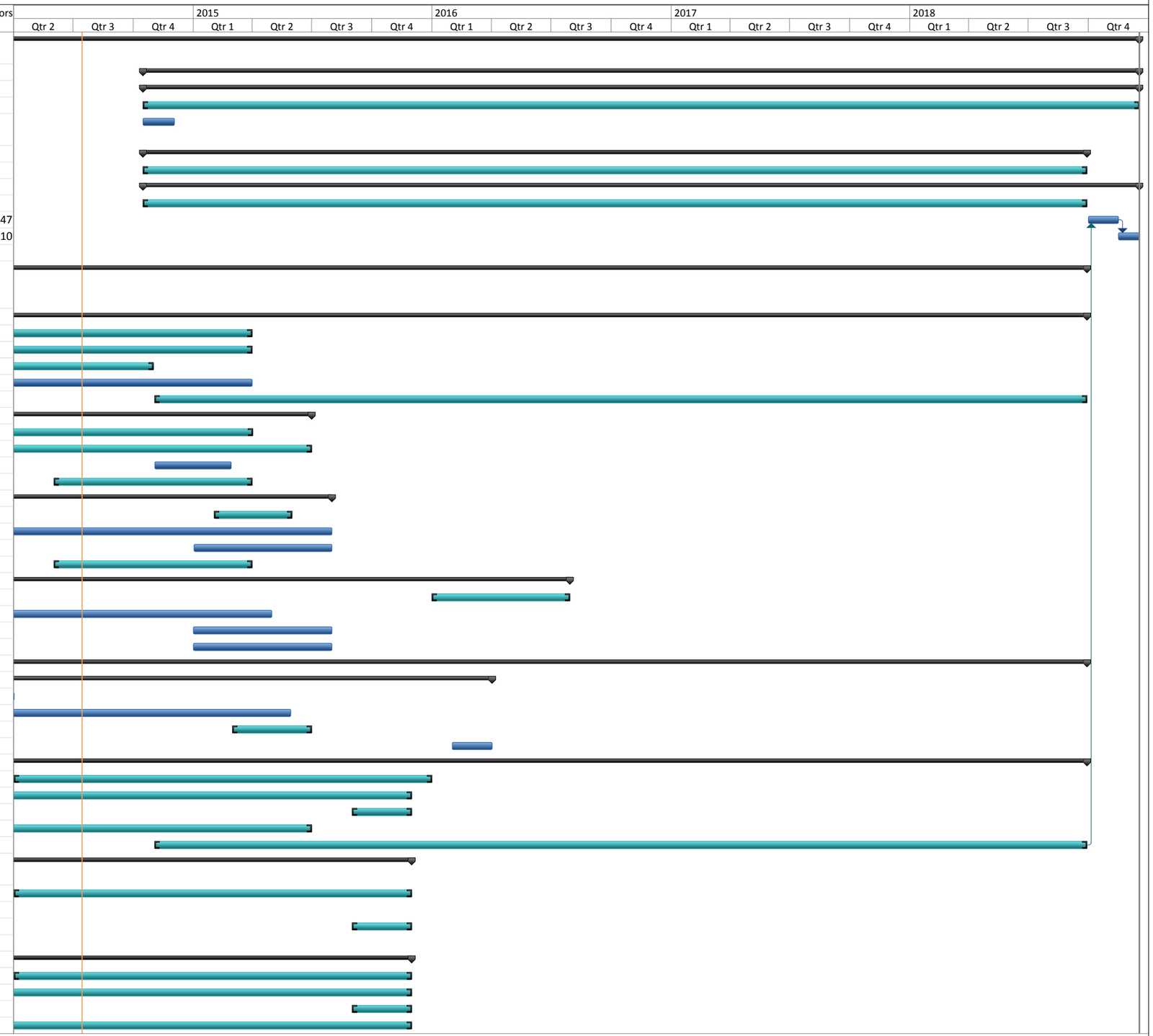
Regional Drought Water Management Element C:

This component involves the development and implementation of a regional emergency water supply coordination strategy. Although this task has yet to be developed in the San Gregorio and Pescadero creek watersheds, already established partnerships, stakeholder forums, and watershed monitoring programs provide a strong foundation on which to build. It is anticipated that this Project component will be initiated in summer 2014 in an effort to promptly address drought impacts that are anticipated to be exacerbated in late summer and early fall. In addition to the development of immediate emergency drought strategies, options and opportunities for addressing more long-term water supply shortages and future drought conditions will begin to be addressed in fall 2014 and will be implemented as needed. Overall, this Project element is 0% complete.

Bay Area Drought Relief Program

Project 8: Drought Relief for South Coast San Mateo County

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project 8: Drought Relief for South Coast San Mateo County**	**2208 days**	**Thu 7/1/10**	**Mon 12/17/18**	
2	**Category (a): Direct Project Administration**	**1088 days**	**Thu 10/16/14**	**Mon 12/17/18**	
3	**Task 1 Project Administration**	**1088 days**	**Thu 10/16/14**	**Mon 12/17/18**	
4	Contract Management	1088 days	Thu 10/16/14	Mon 12/17/18	
5	Project Performance and Monitoring Plan Development	34 days	Thu 10/16/14	Tue 12/2/14	
6	**Task 2 Labor Compliance Program**	**1032 days**	**Thu 10/16/14**	**Fri 9/28/18**	
7	Labor Compliance Monitoring	1032 days	Thu 10/16/14	Fri 9/28/18	
8	**Task 3 Reporting**	**1088 days**	**Thu 10/16/14**	**Mon 12/17/18**	
9	Quarterly Reports	1032 days	Thu 10/16/14	Fri 9/28/18	
10	Draft Final Report	34 days	Mon 10/1/18	Thu 11/15/18	47
11	Final Report	22 days	Fri 11/16/18	Mon 12/17/18	10
12	**Category (b): Land Purchase/Easement - N/A**				
14	**Category (c): Planning/Design/Engineering/Environmental Documentation**	**2152 days**	**Thu 7/1/10**	**Fri 9/28/18**	
15	**Task 5 Assessment and Evaluation**	**2152 days**	**Thu 7/1/10**	**Fri 9/28/18**	
16	Subtask 5.1 Element A.1	325 days	Wed 1/1/14	Tue 3/31/15	
17	Subtask 5.2 Element A.2	1233 days	Sat 7/10/10	Tue 3/31/15	
18	Subtask 5.3 Element B.1	871 days	Fri 7/1/11	Fri 10/31/14	
19	Subtask 5.4 Element B.2	1239 days	Thu 7/1/10	Tue 3/31/15	
20	Subtask 5.5 Element C	1020 days	Mon 11/3/14	Fri 9/28/18	
21	**Task 6 Final Design**	**1304 days**	**Thu 7/1/10**	**Tue 6/30/15**	
22	Subtask 6.1 Element A.1	283 days	Mon 3/3/14	Wed 4/1/15	
23	Subtask 6.2 Element A.2	1304 days	Thu 7/1/10	Tue 6/30/15	
24	Subtask 6.3 Element B.1	85 days	Mon 11/3/14	Fri 2/27/15	
25	Subtask 6.4 Element B.2	217 days	Mon 6/2/14	Tue 3/31/15	
26	**Task 7 Environmental Documentation**	**1327 days**	**Thu 7/1/10**	**Fri 7/31/15**	
27	Subtask 7.1 Element A.1	86 days	Mon 2/2/15	Sun 5/31/15	
28	Subtask 7.2 Element A.2	1327 days	Thu 7/1/10	Fri 7/31/15	
29	Subtask 7.3 Element B.1	151 days	Fri 1/2/15	Fri 7/31/15	
30	Subtask 7.4 Element B.2	217 days	Mon 6/2/14	Tue 3/31/15	
31	**Task 8 Permitting**	**1455 days**	**Mon 1/3/11**	**Fri 7/29/16**	
32	Subtask 8.1 Element A.1	151 days	Fri 1/1/16	Fri 7/29/16	
33	Subtask 8.2 Element A.2	1129 days	Mon 1/3/11	Thu 4/30/15	
34	Subtask 8.3 Element B.1	152 days	Thu 1/1/15	Fri 7/31/15	
35	Subtask 8.4 Element B.2	152 days	Thu 1/1/15	Fri 7/31/15	
36	**Category (d): Construction/Implementation**	**2020 days**	**Mon 1/3/11**	**Fri 9/28/18**	
37	**Task 9 Construction Contracting**	**1370 days**	**Mon 1/3/11**	**Fri 4/1/16**	
38	Subtask 9.1 Element A.1	240 days	Wed 5/1/13	Tue 4/1/14	
39	Subtask 9.2 Element A.2	1150 days	Mon 1/3/11	Fri 5/29/15	
40	Subtask 9.3 Element B.1	87 days	Mon 3/2/15	Tue 6/30/15	
41	Subtask 9.4 Element B.2	45 days	Mon 2/1/16	Fri 4/1/16	
42	**Task 10 Project Construction/Implementation**	**1891 days**	**Fri 7/1/11**	**Fri 9/28/18**	
43	Subtask 10.1 Element A.1	457 days	Wed 4/2/14	Thu 12/31/15	
44	Subtask 10.2 Element A.2	1152 days	Fri 7/1/11	Mon 11/30/15	
45	Subtask 10.3 Element B.1	65 days	Tue 9/1/15	Mon 11/30/15	
46	Subtask 10.4 Element B.2	1043 days	Fri 7/1/11	Tue 6/30/15	
47	Subtask 10.5 Element C	1020 days	Mon 11/3/14	Fri 9/28/18	
48	**Task 11 Environmental Compliance/Mitigation/Enhancement**	**1152 days**	**Fri 7/1/11**	**Mon 11/30/15**	
49	Subtask 11.1 Element A.1	434 days	Wed 4/2/14	Mon 11/30/15	
50	Subtask 11.2 Element A.2	293 days	Fri 7/1/11	Tue 8/14/12	
51	Subtask 11.3 Element B.1	65 days	Tue 9/1/15	Mon 11/30/15	
52	Subtask 11.4 Element B.2	184 days	Fri 7/1/11	Wed 3/14/12	
53	**Task 12 Construction Administration**	**1152 days**	**Fri 7/1/11**	**Mon 11/30/15**	
54	Subtask 12.1 Element A.1	434 days	Wed 4/2/14	Mon 11/30/15	
55	Subtask 12.2 Element B.2	1152 days	Fri 7/1/11	Mon 11/30/15	
56	Subtask 12.3 Element B.1	65 days	Tue 9/1/15	Mon 11/30/15	
57	Subtask 12.4 Element B.2	1152 days	Fri 7/1/11	Mon 11/30/15	



Project 9 – Stinson Beach Water Supply & Drought Preparedness Plan

Provided below is a summary of the Project Schedules for the four Projects contained in the Stinson Beach Water Supply and Drought Preparedness Plan. The schedules and scheduled dates for completion are realistic, reasonable, and accomplishable (barring unforeseen circumstances), primarily because one of the Projects is nearing construction (Project A, Calles Pipelines Replacement Project), and planning and design work have already begun on the other three Projects.

Project A. 2014 Calles Pipelines Replacement Project (April 1, 2014 – October 31, 2014):

The plans and specifications for this Project are 100% complete; the Project was released for competitive bidding in May 2014; CEQA matters will be completed in July 2014; and construction of the Project is anticipated to be complete by the end of October 2014. Overall, this Project is approximately 50% complete.

Project B. Patios Pipelines Replacement Project (April 1, 2015 – July 31, 2015):

The District has begun procuring certain materials for this Project and is starting work on the plans and specifications. The District expects construction to begin on this Project before April 2015, and construction of the Project is scheduled for completion by July 2015. Overall, this Project is approximately 10% complete.

Project C. Supplemental Groundwater Supplies (April 1, 2015 – July 31, 2016):

The District has already initiated discussions with private well owners in regard to the potential use of private wells in emergency situations. The District and its consultant are planning to pump-test two existing private wells in July or August 2014 and are developing plans for emergency connections to the private wells as a supplemental source of water supply in drought or emergency water supply conditions. For new wells as a permanent source of supplemental water supply, preliminary design plans and permitting may be undertaken as early as July 2014 and commencement of Project construction by or before April 2015 is scheduled, with completion planned by July 2016. Work pertaining to the evaluation of groundwater capacity in the greater area surrounding the District has also commenced. Overall, this Project is approximately 10% complete.

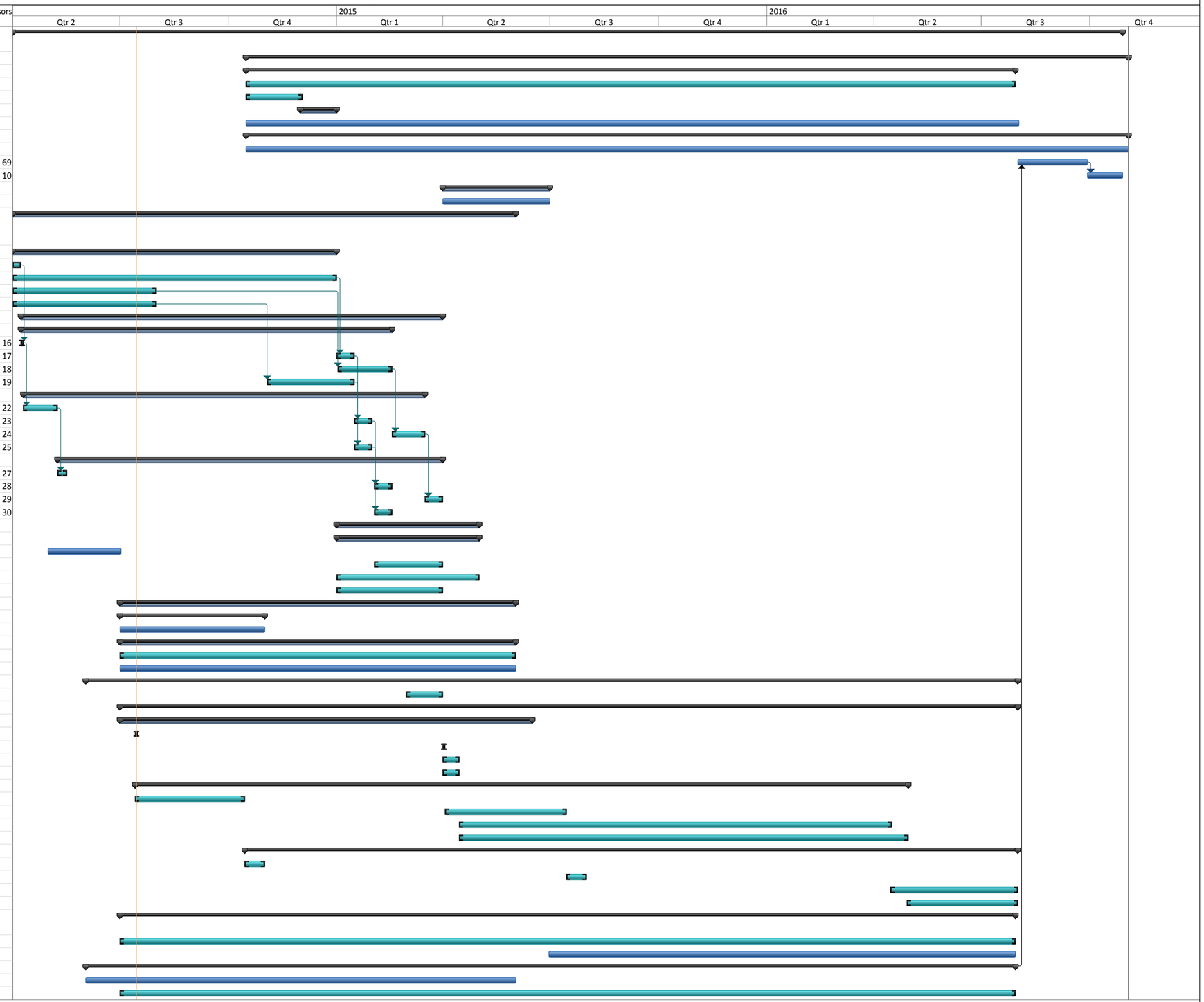
Project D. Water Meter Replacements and In-line Meters (April 1, 2015 – July 31, 2016):

The District has begun design considerations for this Project and is investigating types of meters and proposed locations for new water meter installations that would allow the District to isolate areas of its water distribution system for leak evaluation. The District could begin meter installations as soon as Project funding could be made available. The District will begin construction by or before April 2015, and all meter replacements and installations should be completed in about 1 year from the start date. Overall, this Project is approximately 20% complete.

Bay Area Drought Relief Program

Project 9: Stinson Beach Water Supply & Drought Preparedness Plan

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project 9: Stinson Beach Water Supply & Drought Preparedness Plan**	**674 days**	**Tue 4/1/14**	**Fri 10/28/16**	
2	**Category (a): Direct Project Administration**	**535 days**	**Thu 10/16/14**	**Wed 11/2/16**	
3	**Task 1 Project Administration**	**467 days**	**Thu 10/16/14**	**Fri 7/29/16**	
4	Contract Management	467 days	Thu 10/16/14	Fri 7/29/16	
5	Project Performance Plan	34 days	Thu 10/16/14	Tue 12/2/14	
6	**Task 2 Labor Compliance Program**	**23 days**	**Mon 12/1/14**	**Wed 12/31/14**	
7	Labor Compliance Monitoring	468 days	Thu 10/16/14	Mon 8/1/16	
8	**Task 3 Reporting**	**535 days**	**Thu 10/16/14**	**Wed 11/2/16**	
9	Quarterly Reports	535 days	Thu 10/16/14	Wed 11/2/16	
10	Draft Final Report	43 days	Mon 8/1/16	Wed 9/28/16	69
11	Final Report	22 days	Thu 9/29/16	Fri 10/28/16	10
12	**Category (b): Land Purchase/Easement**	**65 days**	**Wed 4/1/15**	**Tue 6/30/15**	
13	**Task 4 Land Purchase/Easement Acquisition**	65 days	Wed 4/1/15	Tue 6/30/15	
14	**Category (c): Planning/Design/Engineering/Environmental Documentation**	**305 days**	**Tue 4/1/14**	**Mon 6/1/15**	
15	**Task 5 Assessment and Evaluation**	**197 days**	**Tue 4/1/14**	**Wed 12/31/14**	
16	Project A	5 days	Tue 4/1/14	Mon 4/7/14	
17	Project B	197 days	Tue 4/1/14	Wed 12/31/14	
18	Project C	88 days	Tue 4/1/14	Thu 7/31/14	
19	Project D	88 days	Tue 4/1/14	Thu 7/31/14	
20	**Task 6 Final Design**	**256 days**	**Tue 4/8/14**	**Tue 3/31/15**	
21	**Subtask 6.1 30% Design**	**225 days**	**Tue 4/8/14**	**Mon 2/16/15**	
22	Project A	2 days	Tue 4/8/14	Wed 4/9/14	16
23	Project B	11 days	Thu 1/1/15	Thu 1/15/15	17
24	Project C	32 days	Fri 1/2/15	Mon 2/16/15	18
25	Project D	54 days	Mon 11/3/14	Thu 1/15/15	19
26	**Subtask 6.2 90% Design**	**243 days**	**Thu 4/10/14**	**Mon 3/16/15**	
27	Project A	21 days	Thu 4/10/14	Thu 5/8/14	22
28	Project B	11 days	Fri 1/16/15	Fri 1/30/15	23
29	Project C	20 days	Tue 2/17/15	Mon 3/16/15	24
30	Project D	11 days	Fri 1/16/15	Fri 1/30/15	25
31	**Subtask 6.3 100% Design**	**233 days**	**Fri 5/9/14**	**Tue 3/31/15**	
32	Project A	6 days	Fri 5/9/14	Fri 5/16/14	27
33	Project B	11 days	Mon 2/2/15	Mon 2/16/15	28
34	Project C	11 days	Tue 3/17/15	Tue 3/31/15	29
35	Project D	11 days	Mon 2/2/15	Mon 2/16/15	30
36	**Task 7 Environmental Documentation**	**87 days**	**Thu 1/1/15**	**Fri 5/1/15**	
37	**CEQA compliance**	**87 days**	**Thu 1/1/15**	**Fri 5/1/15**	
38	Project A	44 days	Thu 5/1/14	Tue 7/1/14	
39	Project B	42 days	Mon 2/2/15	Tue 3/31/15	
40	Project C	87 days	Thu 1/1/15	Fri 5/1/15	
41	Project D	64 days	Thu 1/1/15	Tue 3/31/15	
42	**Task 8 Permitting**	**240 days**	**Tue 7/1/14**	**Mon 6/1/15**	
43	**Project A**	**89 days**	**Tue 7/1/14**	**Fri 10/31/14**	
44	Caltrans encroachment permit	89 days	Tue 7/1/14	Fri 10/31/14	
45	**Project C**	**240 days**	**Tue 7/1/14**	**Mon 6/1/15**	
46	County of Marin	240 days	Tue 7/1/14	Mon 6/1/15	
47	California Department of Health	240 days	Tue 7/1/14	Mon 6/1/15	
48	**Category (d): Construction/Implementation**	**565 days**	**Mon 6/2/14**	**Sun 7/31/16**	
49	**Task 9 Construction Contracting**	**23 days**	**Sun 3/1/15**	**Tue 3/31/15**	
50	**Task 10 Project Construction/Implementation**	**544 days**	**Tue 7/1/14**	**Sun 7/31/16**	
51	**Mobilization and Site Preparation**	**250 days**	**Tue 7/1/14**	**Mon 6/15/15**	
52	Project A	2 days	Mon 7/14/14	Tue 7/15/14	
53	Project B	2 days	Wed 4/1/15	Thu 4/2/15	
54	Project C	10 days	Wed 4/1/15	Tue 4/14/15	
55	Project D	10 days	Wed 4/1/15	Tue 4/14/15	
56	**Project Construction**	**470 days**	**Mon 7/14/14**	**Fri 4/29/16**	
57	Project A	67 days	Mon 7/14/14	Tue 10/14/14	
58	Project B	73 days	Fri 4/3/15	Tue 7/14/15	
59	Project C	263 days	Wed 4/15/15	Fri 4/15/16	
60	Project D	273 days	Wed 4/15/15	Fri 4/29/16	
61	**Performance Testing and Demobilization**	**468 days**	**Wed 10/15/14**	**Sun 7/31/16**	
62	Project A	13 days	Wed 10/15/14	Fri 10/31/14	
63	Project B	13 days	Wed 7/15/15	Fri 7/31/15	
64	Project C	77 days	Fri 4/15/16	Sun 7/31/16	
65	Project D	67 days	Fri 4/29/16	Sun 7/31/16	
66	**Task 11 Environmental Compliance/Mitigation/Enhancement**	**544 days**	**Tue 7/1/14**	**Fri 7/29/16**	
67	Construction Monitoring	544 days	Tue 7/1/14	Fri 7/29/16	
68	Re-vegetation	284 days	Tue 6/30/15	Fri 7/29/16	
69	**Task 12 Construction Administration**	**565 days**	**Mon 6/2/14**	**Fri 7/29/16**	
70	Construction Administration	261 days	Mon 6/2/14	Mon 6/1/15	
71	Construction Inspection and Management	544 days	Tue 7/1/14	Fri 7/29/16	



Project Schedules – Drought Preparedness Projects

Project schedule summaries and detailed Gantt charts are presented in this section for the projects listed below. Project 10 will extend through the end of June 2018. Project 11 will be complete at the end of December 2016.

Project ID#	Project Proponent	Project Title
10	StopWaste	Bay Area Regional Drought Relief Conservation Program
11	MMWD	WaterSMART Irrigation with AMI/AMR

Project 10 – Bay Area Regional Drought Relief Conservation Program

The proposed Project is supported by well-established planning and implementation infrastructure. Bay Area agencies and organizations have implemented conservation projects for many decades, and project development investments have occurred for many of these projects that will support and strengthen ongoing regional implementation efforts.

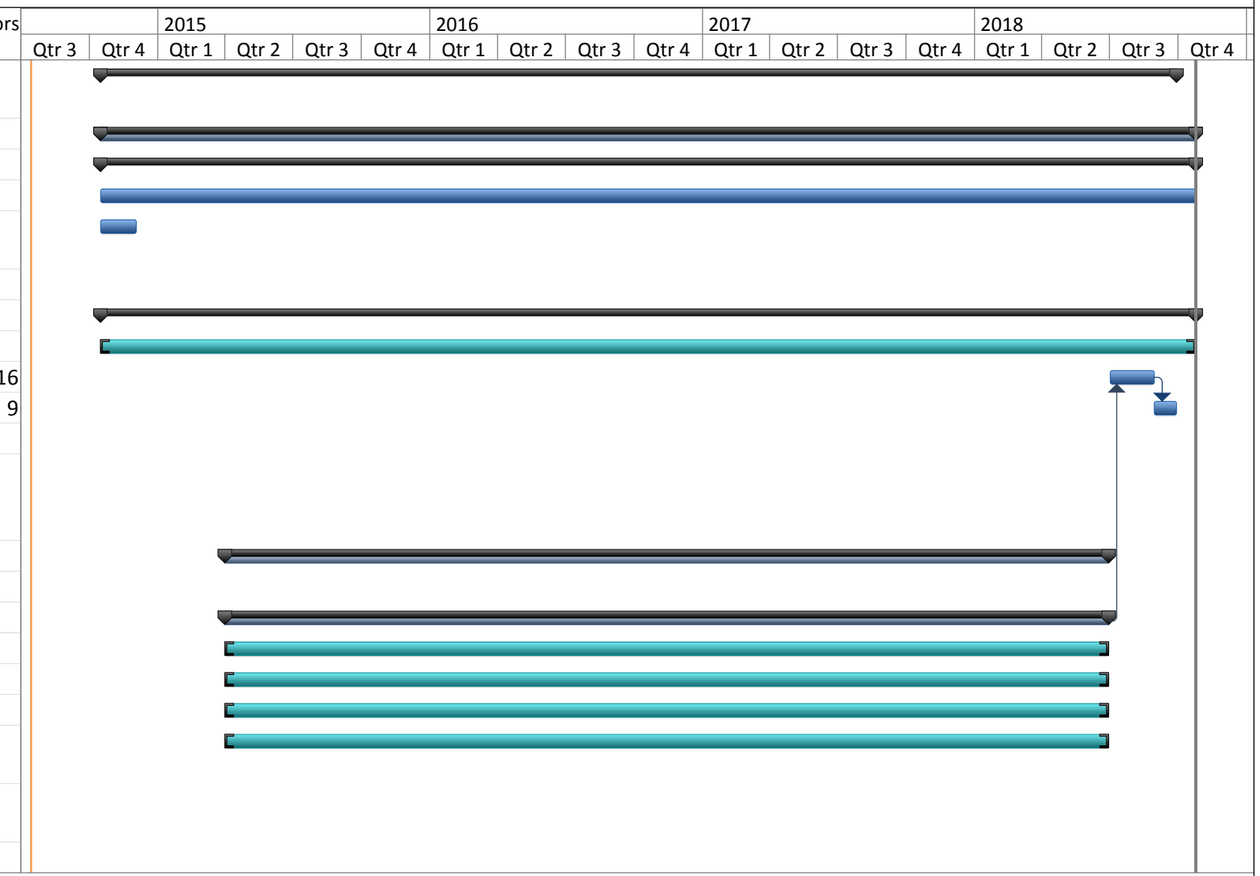
Each of the participating Project partners has the complete organizational support of their respective agencies, including the administrative, technical, and financial resources required to fully and successfully implement the proposed Project as planned.

The individual rebate Project elements will operate until all program funds are expended, or through June 2018. The retail partnerships and website tool elements in the Drought Resistant Soil and Garden Marketplace Project will continue through June 2018. The first stakeholder meetings will be scheduled in early spring 2015 and 2016. The professional training and networking events will be scheduled in spring and fall 2016 after the in-store displays are completed.

Bay Area Drought Relief Program

Project 10: Bay Area Regional Drought Relief Conservation Program

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project 10: Bay Area Regional Drought Relief Conservation Program**	**1032 days**	**Thu 10/16/14**	**Fri 9/28/18**	
2	**Category (a): Direct Project Administration**	**1050 days**	**Thu 10/16/14**	**Wed 10/24/18**	
3	**Task 1 Project Administration**	**1050 days**	**Thu 10/16/14**	**Wed 10/24/18**	
4	Contract Management	1050 days	Thu 10/16/14	Wed 10/24/18	
5	Project Perfomrance and Monitoring Plan Development	34 days	Thu 10/16/14	Tue 12/2/14	
6	**Task 2 Labor Compliance Program -N/A**				
7	**Task 3 Reporting**	**1050 days**	**Thu 10/16/14**	**Wed 10/24/18**	
8	Quarterly Reports	1050 days	Thu 10/16/14	Wed 10/24/18	
9	Draft Final Report	43 days	Mon 7/2/18	Wed 8/29/18	16
10	Final Report	22 days	Thu 8/30/18	Fri 9/28/18	9
11	**Category (b): Land Purchase/Easement - N/A**				
13	**Category (c): Planning/Design/Engineering/Environmental Documentation - N/A**				
14	**Category (d): Construction/Implementation**	**848 days**	**Wed 4/1/15**	**Fri 6/29/18**	
15	**Task 9 Construction Contracting - N/A**				
16	**Task 10 Project Construction/Implementation**	**848 days**	**Wed 4/1/15**	**Fri 6/29/18**	
17	Subtask 10.1 Program Marketing	848 days	Wed 4/1/15	Fri 6/29/18	
18	Subtask 10.2 Rebate Implementation	848 days	Wed 4/1/15	Fri 6/29/18	
19	Subtask 10.3 HET and Urnial Direct Installations	848 days	Wed 4/1/15	Fri 6/29/18	
20	Subtask 10.4 Drought Resistant Soil and Garden Marketplace	848 days	Wed 4/1/15	Fri 6/29/18	
21	**Task 11 Environmental Compliance/Mitigation/Enhancement - N/A**				
23	**Task 12 Construction Administration N/A**				



Project 11 – WaterSMART Irrigation with AMI/AMR

MMWD is ready to launch full implementation of the MMWD WaterSMART Irrigation with advanced metering infrastructure (AMI)/ automatic meter reading (AMR) Project as soon as a funding award is announced. No permits or environmental review are needed, and implementation will be completed within approximately 18 months from the agreed-upon start date. MMWD staff will perform the installation of the equipment, and a technical consultant will be hired to install and calibrate the monitoring software and provide training for MMWD staff. The MMWD WaterSMART Irrigation with AMI/AMR Project is fully developed, with conceptual design and Project planning complete, the SAP (business operation management software) scoping element already underway, and final detailed implementation design largely complete. The schedule is realistic, reasonable, and accomplishable because no foreseeable obstacles have been identified, and the Project is already underway and ready to accelerate to full implementation upon notification of a funding award.

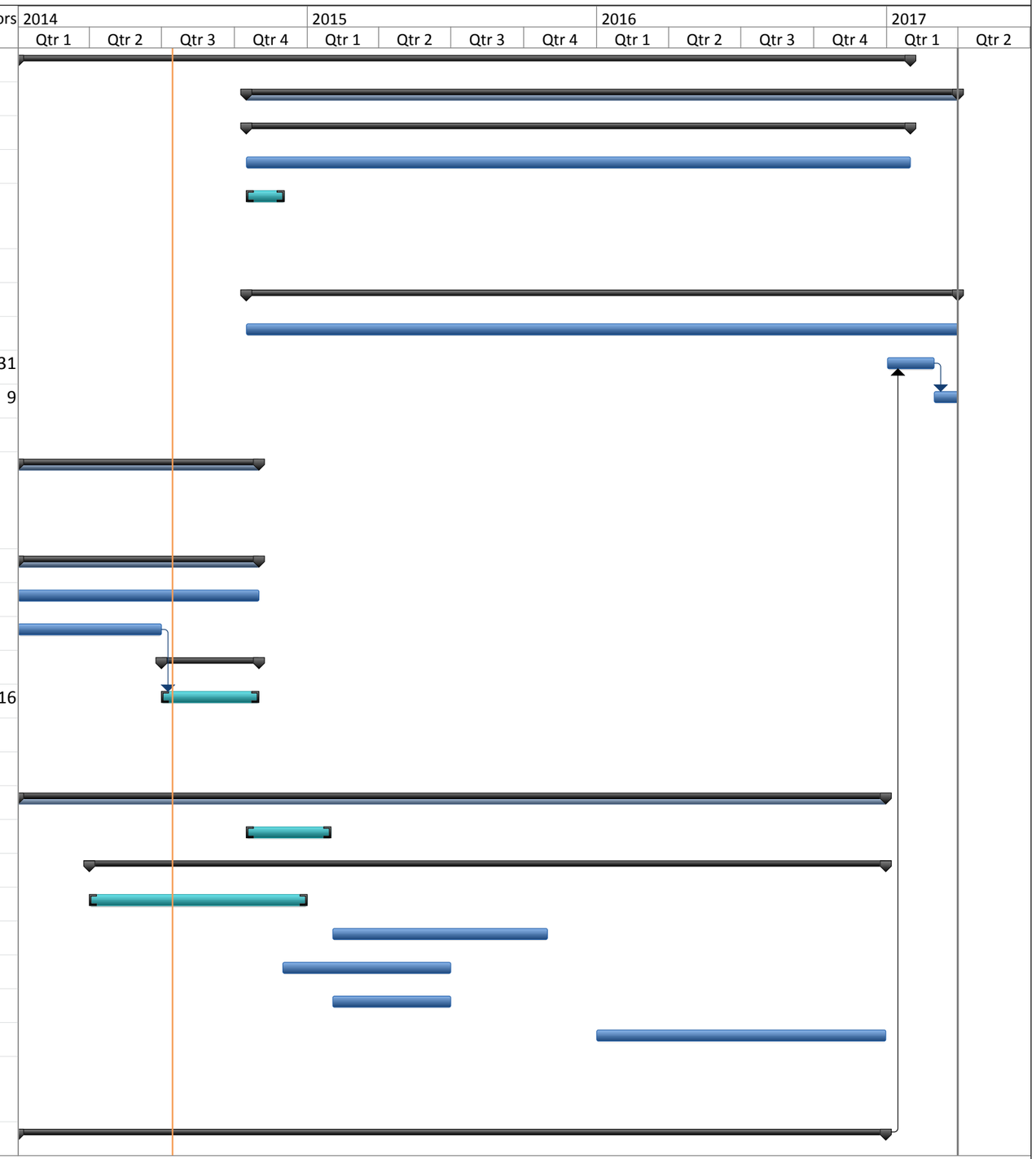
Project Implementation (chronological):

Project planning and design (80% complete)	Jan-Oct 2014
Outreach (water budgets and project notification letters to irrigation accounts)	April-Dec 2014
Advertise RFP's for SAP Consultant Services and AMR vendor/subcontractor	Oct-Nov 2014
Deliver site information forms to collect data for water budgets	April-Dec 2014
Complete contract negotiations, award contracts to consultants, vendors	Dec 2014-Jan 2015
Marketing and outreach campaign for irrigation equipment rebates	Feb-Oct 2015
Implement irrigation equipment rebate program	Feb-Oct 2015
SAP Scoping Study (50% complete)	Jan –Oct 2014
Staff completes and delivers water budgets to irrigation customers	May-June 2015
Purchase AMI/AMR hardware and software	Feb-May 2015
AMI/AMR site installations and data configuration	Feb-May 2015
Complete AMR hardware installation at all project sites	May 2015
Conduct data and field test trials to validate AMI/AMR system functionality	May-June 2015
Acquisition and storage of electronic meter reading data	June 2015-(ongoing)
Configuration of SAP system software	Feb-May 2015
Go live – all services functional for customer use	June 2015
Electronic meter data analysis	Jan 2016-(ongoing)

Bay Area Drought Relief Program

Project 11: WaterSMART Irrigation with AMI/AMR

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project 11: WaterSMART Irrigation with AMI/AMR**	804 days	**Wed 1/1/14**	**Mon 1/30/17**	
2	**Category (a): Direct Project Administration**	**642 days**	**Thu 10/16/14**	**Fri 3/31/17**	
3	**Task 1 Project Administration**	**598 days**	**Thu 10/16/14**	**Mon 1/30/17**	
4	Contract Management	598 days	Thu 10/16/14	Mon 1/30/17	
5	Project Performance and Monitoring Plan Development	34 days	Thu 10/16/14	Tue 12/2/14	
6	**Task 2 Labor Compliance Program - N/A**				
7	**Task 3 Reporting**	**642 days**	**Thu 10/16/14**	**Fri 3/31/17**	
8	Quarterly Reports	642 days	Thu 10/16/14	Fri 3/31/17	
9	Draft Final Report	43 days	Mon 1/2/17	Wed 3/1/17	31
10	Final Report	22 days	Thu 3/2/17	Fri 3/31/17	9
11	**Category (b): Land Purchase/Easement - N/A**				
13	**Category (c): Planning/Design/Engineering/Environmental Documentation**	**218 days**	**Wed 1/1/14**	**Fri 10/31/14**	
14	**Task 5 Assessment and Evaluation**	**218 days**	**Wed 1/1/14**	**Fri 10/31/14**	
15	Subtask 5.1 SAP System Scoping	218 days	Wed 1/1/14	Fri 10/31/14	
16	Subtask 5.2 Preliminary Design	129 days	Wed 1/1/14	Mon 6/30/14	
17	**Task 6 Final Design**	**89 days**	**Tue 7/1/14**	**Fri 10/31/14**	
18	100% Design	89 days	Tue 7/1/14	Fri 10/31/14	16
19	**Task 7 Environmental Documentation - N/A**				
20	**Task 8 Permitting - N/A**				
21	**Category (d): Construction/Implementation**	**783 days**	**Wed 1/1/14**	**Fri 12/30/16**	
22	**Task 9 Construction Contracting**	**77 days**	**Thu 10/16/14**	**Fri 1/30/15**	
23	**Task 10 Project Construction/Implementation**	**719 days**	**Tue 4/1/14**	**Fri 12/30/16**	
24	Subtask 10.1 Outreach	197 days	Tue 4/1/14	Wed 12/31/14	
25	Subtask 10.2 Irrigation Equipment Rebate Program	195 days	Mon 2/2/15	Fri 10/30/15	
26	Subtask 10.3 Water Budgets	152 days	Mon 12/1/14	Tue 6/30/15	
27	Subtask 10.4 AMI/AMR Installation	107 days	Mon 2/2/15	Tue 6/30/15	
28	Subtask 10.5 Data Analysis	261 days	Fri 1/1/16	Fri 12/30/16	
29	**Task 11 Environmental Compliance/Mitigation/Enhancement - N/A**				
31	**Task 12 Construction Administration**	**783 days**	**Wed 1/1/14**	**Fri 12/30/16**	



Project Schedules – Grant Administration

A project schedule summary and a detailed Gantt chart are presented in this section for grant administration. Grant administration efforts will extend through December 17, 2018.

Project ID#	Project Proponent	Project Title
12	ABAG/SFEP	Grant Administration

Project 12 – Grant Administration

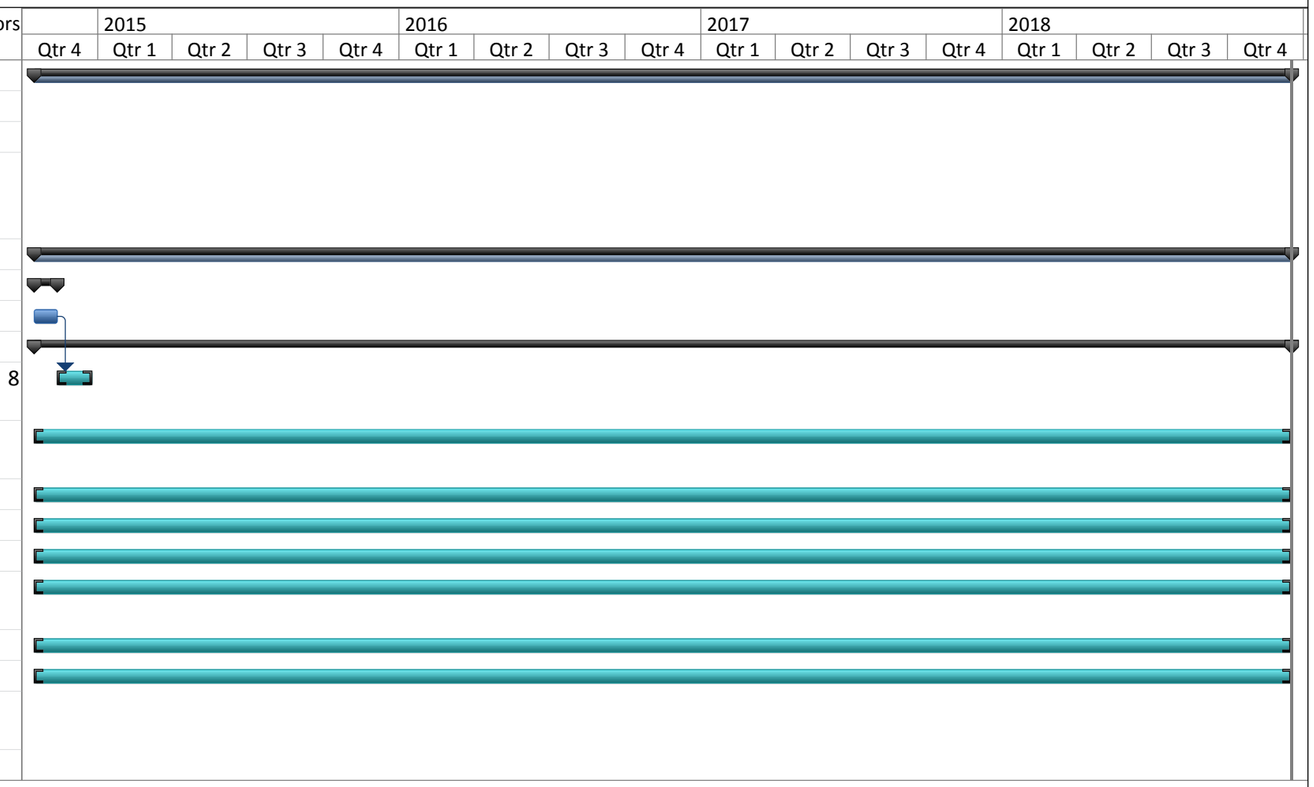
The project schedule for administration of the Bay DRP program begins when DWR notifies ABAG that the region's proposal has been selected for funding and is complete when the last Local Project Sponsor completes their final project report. The anticipated schedule, based upon DWR's schedule noted in the Proposal Solicitation Package is as follows:

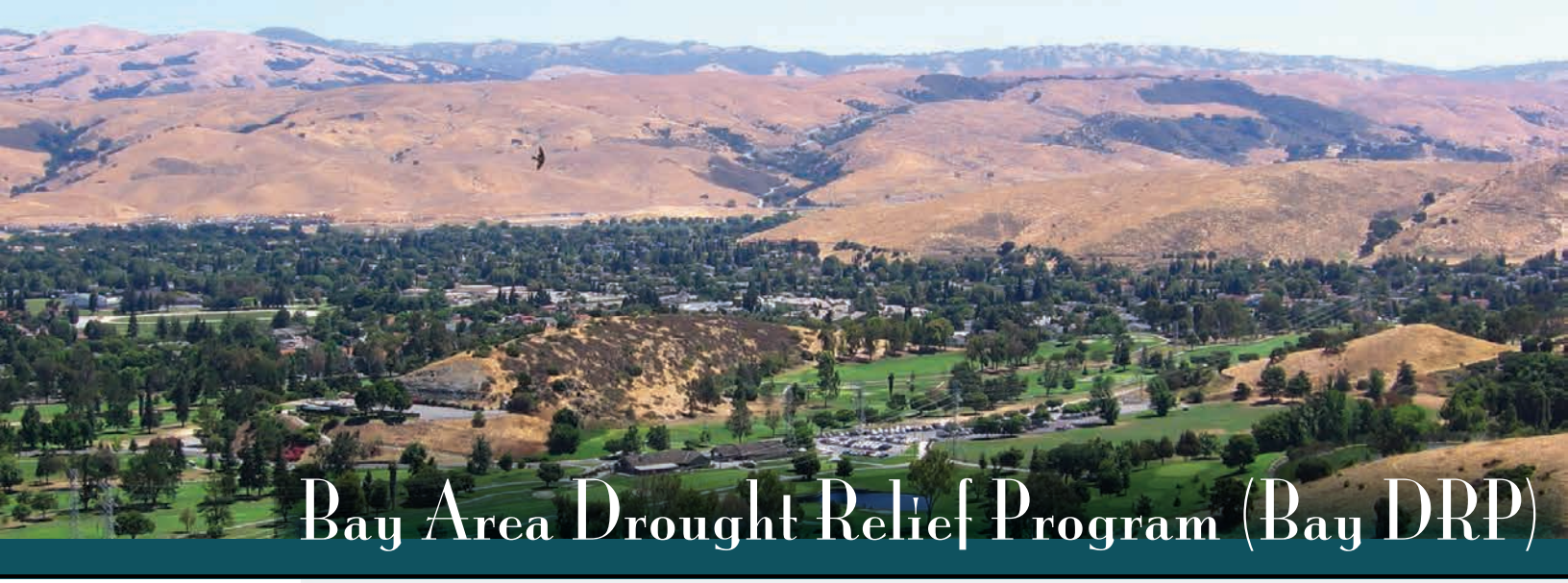
- Negotiate contract with DWR – October to November 2014
- Negotiate Local Project Sponsor Agreements with Local Project Sponsors – October to December 2014
- Local Project Sponsor Committee Meetings – At project award, and as needed throughout the term of the grant
- Quarterly Reports – Submitted 45 days following the end of the quarter (i.e., March, June, September, December)
- Final Project Reports – Submitted 90 days following the conclusion of individual projects, and signed off by DWR
- Invoicing – Submitted 90 days following the end of the quarter (i.e., March, June, September, December)
- Reimbursement of Local Project Sponsors – Submitted within 30 days of receipt of payment from DWR
- Bookkeeping and auditing – throughout the term of the grant
- Field Verification – As projects are completed and/or as needed to assure that projects are on schedule
- Project Management – throughout the term of the grant

Bay Area Drought Relief Program

Project 12: Grant Administration

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project 12: Grant Administration**	**1088 days**	**Thu 10/16/14**	**Mon 12/17/18**	
2	**Category (a): Direct Project Administration - N/A**				
3	**Category (b): Land Purchase/Easement - N/A**				
5	**Category (c): Planning/Design/Engineering/Environmental Documentation - N/A**				
6	**Category (d): Construction/Implementation**	**1088 days**	**Thu 10/16/14**	**Mon 12/17/18**	
7	**Task 9 Construction Contracting**	**20 days**	**Thu 10/16/14**	**Wed 11/12/14**	
8	Subtask 9.1 DWR Contracting	20 days	Thu 10/16/14	Wed 11/12/14	
9	**Task 10 Project Construction/Implementation**	**1088 days**	**Thu 10/16/14**	**Mon 12/17/18**	
10	Subtask 10.1 Issue Local Project Sponsor Agreements	30 days	Thu 11/13/14	Wed 12/24/14	8
11	Subtask 10.2 Quarterly, Draft Final, and Final Reports	1088 days	Thu 10/16/14	Mon 12/17/18	
12	Subtask 10.3 Invoices	1088 days	Thu 10/16/14	Mon 12/17/18	
13	Subtask 10.4 Reimbursement	1088 days	Thu 10/16/14	Mon 12/17/18	
14	Subtask 10.5 Bookkeeping and Auditing	1088 days	Thu 10/16/14	Mon 12/17/18	
15	Subtask 10.6 Coordination, Support and Records	1088 days	Thu 10/16/14	Mon 12/17/18	
16	Subtask 10.7 Field Verification	1088 days	Thu 10/16/14	Mon 12/17/18	
17	Subtask 10.8 Project Management	1088 days	Thu 10/16/14	Mon 12/17/18	
18	**Task 11 Environmental Compliance/Mitigation/Enhancement - N/A**				
20	**Task 12 Construction Administration - N/A**				





Bay Area Drought Relief Program (Bay DRP)

Attachment 7

Program Preferences

Association of Bay Area Governments

Proposition 84

Integrated Regional Water Management

2014 Drought Grant Application

Introduction 1
Project 1. Lower Cherry Aqueduct Emergency Rehabilitation Project 1
Project 2. Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment 2
Project 3. Zone 7 Water Supply Drought Preparedness Project 3
Project 4. Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines 3
Project 5. Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline 4
Project 6. DERWA Phase 3 Recycled Water Expansion Project 5
Project 7. Calistoga Recycled Water Storage Facility 5
Project 8. Drought Relief for South Coast San Mateo County 6
Project 9. Stinson Beach Water Supply & Drought Preparedness Plan 7
Project 10. Bay Area Regional Drought Relief Conservation Program 8
Project 11. WaterSMART Irrigation with AMI/AMR 9

List of Acronyms and Abbreviations

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACWD	Alameda County Water District
AF	acre-feet
AFY	acre-feet per year
AMI	advanced metering infrastructure
AMR	automatic meter reading
BACWA	Bay Area Clean Water Agencies
BAWSCA	Bay Area Water Supply and Conservation Authority
Bay DRP	Bay Area Drought Relief Program
BOD	biological oxygen demand
CBOD	carbonaceous biochemical oxygen demand
CC	Coordinating Committee
CCMP	Comprehensive Conservation and Management Plan
CCWD	Contra Costa Water District
CLP	Cope Lake to Lake I Pipeline
Coalition	Western Recycled Water Coalition
COL-	Chain of Lakes Well No.
CVP	Central Valley Project
DAC	Disadvantaged Community
DBPs	disinfection byproducts
Delta	Sacramento-San Joaquin River Delta
DERWA	Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) Recycled Water Authority

DSRSD	Dublin-San Ramon Services District
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
GWMP	groundwater management plan
IRWM	Integrated Regional Water Management
IRWMP	Integrated Regional Water Management Plan
JPA	joint powers authority
kg/yr	kilograms per year
LCA	Lower Cherry Aqueduct
LCWD	Los Carneros Water District
LEED	Leadership in Energy and Environmental Design
MGD	million gallons per day
MMWD	Marin Municipal Water District
MST	Milliken-Sarco-Tulocay
PAC	Powdered Activated Carbon
Prop 84	Proposition 84
Proposal	Bay Area Drought Relief Program, Proposition 84, 2014 Integrated Regional Water Management Drought Grant Application
PSP	Proposal Solicitation Package
RWQCB	Regional Water Quality Control Board
San Mateo County RCD	San Mateo Resource Conservation District
SCVWD	Santa Clara Valley Water District
SFEP	San Francisco Estuary Partnership
SFPUC	San Francisco Public Utilities Commission
SWDU	Statements of Water Diversion and Use
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
THMs	trihalomethanes
TOC	total organic carbon
TSS	total suspended solids
USGS	U.S. Geological Survey
WTP	water treatment plant
Zone 7	Zone 7 Water Agency

Introduction

The Bay Area Drought Relief Program (Bay DRP), 2014 Integrated Regional Water Management (IRWM) Drought Grant Application (Proposal) and its 11 high-priority projects comprise a geographically diverse and well-integrated implementation program with multiple water supply, water quality, habitat improvement, and socio-economic benefits. This attachment demonstrates that this Proposal includes significant, dedicated, and well-defined projects that meet multiple Program Preferences of the California Department of Water Resources' (DWR's) 2014 IRWM Drought Grant Solicitation Guidelines. This attachment describes the specific Program Preferences met by each of the projects, the certainty that the projects meet the Program Preferences, and the breadth and magnitude to which the Program Preferences are met. **Table 7-1** lists the projects by identification number and identifies which Program Preferences are met by the project. **Table 7-2** (located on the last page of this Attachment) is based on Table 1 of the IRWM Grant Program 2014 Drought Guidelines and provides more detail about which specific statewide priorities are met by each project.

Table 7-1. IRWM Plan Program Preferences by Project

Project ID #	Regional Projects or Programs	Integrative Project within a Hydrologic Region Identified	Resolves Regional Water-related Conflicts	Supports One or More CALFED Bay-Delta Program Objectives	Addresses Critical Water Supply/ Water Quality Needs of a DAC within the Region	Integrates Water Management with Land Use Planning	Helps Reduce Reliance on the Sacramento-San Joaquin Delta for Water Supply	Addresses Statewide Priorities
1	♦		♦		♦			♦
2			♦	♦				♦
3			♦	♦			♦	♦
4	♦		♦			♦		♦
5	♦	♦	♦	♦	♦	♦	♦	♦
6	♦	♦	♦	♦		♦	♦	♦
7	♦		♦	♦			♦	♦
8			♦					♦
9			♦					♦
10	♦	♦	♦	♦	♦	♦	♦	♦
11			♦			♦		♦

Project 1. Lower Cherry Aqueduct Emergency Rehabilitation Project

Certainty for Meeting the Program Preferences

The San Francisco Public Utilities Commission (SFPUC) owns and operates the Hetch Hetchy Regional Water System, which provides water supply to approximately 2.6 million residents in San Francisco, San Mateo, Santa Clara, and Alameda counties. The Lower Cherry Aqueduct (LCA) in the Upper Tuolumne River watershed has been used in the past by SFPUC to supplement water supply in dry years, providing proven benefits through previous instances of use. The LCA Emergency Rehabilitation Project will restore an aging and damaged connection from the Cherry and Eleanor reservoirs into the San Francisco Regional Water System. This Project will directly and immediately increase water supply for all of SFPUC's customers by more than 150,000 acre-feet (AF) and provide *ongoing* access to 273,500 AF of storage for potable water.

The LCA Emergency Rehabilitation Project will add to the SFPUC's limited supply, which will benefit all of its customers, including low-income and residents of disadvantaged communities. SFPUC's service area includes East Palo Alto, which is a Disadvantaged Community. In addition, by providing access to a reliable water source, this Project will relieve water-related conflicts in the Bay Area region by reducing the hardship posed by the drought.

Breadth and Magnitude of Meeting Program Preferences

The proposed project has regional breadth and will continue to provide benefits over the course of its 25-year projected life span. The LCA Emergency Rehabilitation Project will directly and immediately increase water supply for all of SFPUC's 2.6 million customers by more than 150,000 AF and provide ongoing access to potable water storage. It will ensure that SFPUC can continue making full deliveries to its customers and will reduce the need for further rationing if dry conditions persist. The Project will contribute to long-term water supply reliability and system resiliency and will ease pressure on SFPUC customers' other sources, such as the Santa Clara Valley Water District's (SCVWD's) groundwater reserves. The Project will also enable long-term operational flexibility and adaptive management of water supplies under changing climate conditions.

How the Project Will Address Human Right to Water Policy

SFPUC serves more than 2.6 million customers across four Bay Area counties. Due to aging infrastructure and damage caused by the 2013 Rim Fire, the LCA system is currently unable to reliably convey water supply to SFPUC's water delivery system. The LCA Emergency Rehabilitation Project will rehabilitate and improve the LCA system and allow SFPUC to access up to 150,000 AF of potable water supply from Cherry Reservoir and Lake Eleanor. This will increase the reliability of SFPUC's limited supply of safe, clean, affordable, and accessible water, benefiting all of its customers, including those who are low-income and residents of disadvantaged communities. This Project is well aligned with the goals of AB 685.

Project 2. Rinconada Water Treatment Plant Powdered Activated Carbon (PAC) Treatment

Certainty for Meeting the Program Preferences

Source water quality for imported supplies treated at the Rinconada Water Treatment Plant (WTP) has deteriorated since the drought declaration in January 2014. Increased TDS, bromides, TOC, and taste and odor compounds threaten formation of trihalomethanes (THMs) and exceed drinking water standards. Powdered activated carbon (PAC) has been proven to be effective in reducing these threats and is the least cost alternative for ensuring safe drinking water supply to Santa Clara County. RWTP is the only plant on the west side of Santa Clara Valley Water District's (SCVWD's) treated water system, so it is a critical supply source for retailers. This Project will ensure compliance with drinking water standards for local supply sources and reliable delivery of safe drinking water to users in Santa Clara County.

This Project will reduce water-related conflicts by enabling SCVWD to provide Rinconada WTP retailers with treated water that meets drinking water standards during a time when surface supplies in the region are limited. By treating Delta-conveyed supplies of poor quality, the Project supports operations that meet multiple objectives of the CalFED Bay-Delta Program. Also, the Project addresses Statewide Priorities, particularly those regarding protecting surface water and groundwater quality.

Breadth and Magnitude of Meeting Program Preferences

This Project will have immediate benefits for Santa Clara County. The Rinconada WTP supplies potable water to the following west valley water retailers: City of Sunnyvale, City of Santa Clara, City of Mountain View, San Jose Water Company, and California Water Service Company. The Rinconada WTP treats water from a wide variety of sources – Central Valley Project, South Bay Aqueduct, and local sources. Traditionally, the Rinconada WTP has used PAC in summer months to remove taste and odor compounds but RWTP has not needed it previously for THM treatment. Without the continued use of PAC throughout 2014, however, it is likely that the SCVWD and its retailer water agencies will not meet THM requirements.

The water retailers have limited alternative sources. Use of PAC is the only method available to ensure reliable potable water delivery to west Santa Clara County during this year's drought and future drought years. This Project ensures that drinking water meets water quality standards for more than 500,000 residents by allowing SCVWD to treat more than 39,000 AF of water.

How the Project Will Address Human Right to Water Policy

Over one-half million people depend on the treated water from the Rinconada WTP as their primary source of drinking water. Implementation of this Project will ensure continued delivery of safe, clean, affordable, and accessible water supply for consumption and use, including Disadvantaged Community (DAC) block groups. SCVWD serves and manages its water supplies in a manner that provides high-quality and safe supplies regardless of customers' economic status. This level of SCVWD commitment is in alignment with the goals and aspirations of AB 685.

Project 3. Zone 7 Water Supply Drought Preparedness Project

Certainty for Meeting the Program Preferences

This Project resolves regional water conflicts and reduces reliance on Delta water supply by increasing the availability of groundwater in the Livermore-Amador Valley. This Project involves two main components: a new pipeline to capture groundwater that was previously discharged out of the system, and a new well to provide additional drought relief. This Project will allow Zone 7 to access critical water supplies from the groundwater basin, including capturing "lost" groundwater that was previously pumped by mining companies and discharged to the Arroyo Mocho stream, where it then became inaccessible for potable use. With this project, Zone 7 will be able to redirect the groundwater to a holding reservoir via the new Cope Lake to Lake I Pipeline (CLP) (located at the Chain of Lakes), where the water can later be used for recharge back into the groundwater basin. This retained recharge water will now assist Zone 7 to maintain more sustainable groundwater supplies and allow for additional supply when surface water deliveries are reduced.

Breadth and Magnitude of Meeting Program Preferences

This Project also includes a new well, Chain of Lakes Well No. 5 (COL-5), which will provide access to up to 2 million gallons per day (MGD) of groundwater supply to meet the demands of Zone 7's retailers. Current well production is not adequate to supply 100% of the retailer demands through groundwater pumping alone. The CLP will allow Zone 7 to capture up to 15 MGD of water previously discharged to the Arroyo Mocho by mining companies.

How the Project Will Address Human Right to Water Policy

This Project will help ensure that residents of the Livermore-Amador Valley continue to have access to "safe, clean, and affordable water adequate for human consumption, cooking and sanitary purposes." Without this Project, continuing drought conditions could put the public in jeopardy of not having access to such water.

Project 4. Los Carneros Water District and Milliken-Sarco-Tulocay Recycled Water Pipelines

Certainty for Meeting the Program Preferences

The Napa Sanitation District has a well-established recycled water production and distribution system that currently delivers up to 2,000 AF of recycled water per year. The District is completing the expansion of its recycled water infrastructure (not part of this grant application) to increase production from 2,000 AFY to 3,700 AFY of recycled water. This will provide the necessary recycled water to meet water demands through the new Milliken-Sarco-Tulocay (MST) and Los Carneros Water District (LCWD) recycled water pipeline distribution systems (which are included in this grant application). These pipelines will directly resolve water supply issues for agricultural users in the MST and LCWD areas, and they will increase potable water availability through reduced groundwater extraction for agricultural uses in these areas. As the County has already established a "no net increase of groundwater use" planning policy in the MST area, any amount of recycled water used to offset groundwater use has a direct impact on groundwater availability for potable uses. This Project supports the state goal of increased recycled water use by at least 1 million AFY by 2020 and 2 million AFY by 2030, and to substitute as much recycled water for potable water as possible by 2030.

Breadth and Magnitude of Meeting Program Preferences

The Napa Sanitation District is part of the North Bay Water Reuse Authority, a coalition of 10 member agencies in the North Bay area working together on a regional scale to develop recycled water production and distribution projects to serve the communities of Marin, Sonoma, and Napa counties.

The Napa Sanitation District is committed to the recovery and beneficial reuse of wastewater for recycled water purposes. This Project will serve recycled water to water-deficient areas for decades to come. These Projects are part of a Phase 1 project to increase recycled water distribution to these areas. Future projects are being planned to

increased production, storage, and delivery of recycled water. These pipelines in the MST and LCWD areas serve as the backbone of the distribution system into these geographic areas, with future distribution expansion (Phase 2) reliant upon these Projects.

How the Project Will Address Human Right to Water Policy

In the MST area, these recycled water projects will reduce the use of groundwater for irrigation and agricultural purposes in areas that are groundwater deficient and under increasing potable water pressure. As these areas rely on groundwater for their potable water supplies, the use of recycled water as an alternative makes additional water available for potable uses.

In the LCWD area, a dozen residents must truck in water each summer. Introducing recycled water will go a long way toward addressing this problem. Additionally, minimizing groundwater extractions will assist in mitigating saline intrusion effects. All of these benefits lead to better and more reliable access to adequate potable water for human consumption, cooking, and sanitary purposes.

Project 5. Sunnyvale Continuous Recycled Water Production Facilities and Wolfe Road Pipeline

Certainty for Meeting the Program Preferences

This Project is consistent with SCVWD's Water Supply and Infrastructure Master Plan, which presents the strategy for achieving water supply reliability in Santa Clara County, including the South sub-region. It integrates efforts by SCVWD and Sunnyvale to expand recycled water use to support conjunctive management and water supply reliability and efforts to reduce nutrient loading to San Francisco Bay. The agencies are entering into partnership agreements that specify roles and responsibilities to ensure continued integration and cooperation.

The Project has been developed through a partnership that includes Apple, the City of Cupertino, the City of Sunnyvale, California Water Service Company, and SCVWD. The Apple 2 Campus will be certified through the Leadership in Energy and Environmental Design program (LEED-certified), incorporating water efficiency measures and the use of recycled water. The development of the Project is consistent with both land and water use planning.

This Project resolves water-related conflicts by increasing the availability of recycled water. Recycled water development in the South sub-region reduces reliance on Delta-conveyed supplies. The region relies on Delta-conveyed supplies for 40% of its needs. Recycled water provides in-lieu groundwater recharge as part of SCVWD's conjunctive use program. The Project will also construct a pipeline and expand recycled water treatment capacity into the City of Cupertino and the California Water Service Company service area. Recycled water is also a drought-proof supply that will help the South sub-region adapt to climate change. Further, local non-potable recycled water production has a lower energy intensity than imported water supplies, so developing recycled water instead of importing additional water avoids greenhouse gas emissions. Recycled water use protects water quality by reducing pollutant loading to San Francisco Bay.

Breadth and Magnitude of Meeting Program Preferences

The Project is a Western Recycled Water Coalition (Coalition) project. Constructing Coalition projects will provide multiple benefits: developing more than 120,000 AFY of dry-year yield; providing drought-tolerant, sustainable water supplies for industry, agriculture, landscape, and wetlands enhancement; improving surface water quality; and saving energy. Increases in non-potable recycled water use correlate directly to reductions in pollutant discharges to San Francisco Bay. This integrated Project will benefit water quality in San Francisco Bay as well as improve water supply reliability throughout the South sub-region.

Reduced reliance on imported water supplies from the Delta reduces water demand conflicts throughout the State. Reducing nutrient loading to San Francisco Bay benefits the entire Bay Area. The Project is consistent with SCVWD's 2012 Water Supply and Infrastructure Master Plan, which calls for 30,000 AFY of non-potable recycled water use and 20,000 AFY of potable reuse. This partnership between industry, land use agencies, and water agencies has broad applicability throughout the region. Improved and more efficient conjunctive management, recycled water use, and greenhouse gas emissions avoidance in the South sub-region meet multiple statewide priorities.

How the Project Will Address Human Right to Water Policy

SCVWD, the primary water resources management agency in Santa Clara County, serves 1.9 million residents and 200,000 commuters. SCVWD serves and manages its water supplies in a manner that provides high-quality and safe

supplies regardless of customers' economic status. This level of SCVWD commitment is in alignment with the goals and aspirations of AB 685. This Project specifically provides additional recycled water that equitably increases everyone's regional potable water reliability. The Project will also add sustainable water supplies for everyone in the county into the future.

Project 6. DERWA Phase 3 Recycled Water Expansion Project

Certainty for Meeting the Program Preferences

DERWA is an interagency partnership formed in 1995 between Dublin-San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD) to provide a regional drought-resistant water supply for irrigation while preserving drinking water and the environment. This recycled water Project integrates the reduction of wastewater discharge to the San Francisco Bay and offsets the use of limited potable water with recycled water. DERWA began operations in 2006. In 2013, DERWA delivered more than 3,900 AF of recycled water to customers in the East Bay. DERWA and its member agencies are invested in the long-term development of recycled water in the region and continue to plan for expansion of the regional system. DERWA Sales and Supply Agreements have 40-year term limits that began in 2003. EBMUD's Mokelumne River supply is a tributary to the Delta and DSRSD diverts from the Delta. This recycled water project reduces impacts to Delta to the benefit and health of the Delta environment and helps to reduce regional water conflicts. Land use planning is carefully coordinated to ensure the availability of a reliable water supply. This Project provides a water supply of 867 AFY that permanently reduces potable water demands for non-potable uses.

Breadth and Magnitude of Meeting Program Preferences

The proposed Project has regional breadth that spans two counties and several cities and will have increasing magnitude over the years. The Project will contribute to long-term water supply reliability, recycled water availability, reduction of demand on the Delta, and reduction of pollution to the San Francisco Bay. This Project will have lasting, positive effects on the environment.

Both DSRSD's and EBMUD's water supplies are associated with the Delta. DSRSD's water supply comes from the State Water Project (SWP), which diverts water from the Delta; EBMUD's water supply comes from the Mokelumne River, a tributary to the Delta. Implementation of this Project will reduce diversions from the Delta, thereby contributing to an improved Delta ecosystem and increasing flows to downstream users in the Central Valley, an area severely impacted by flow reductions in the Delta. Recycled water provides a long-term, drought-proof water supply that increases water supply reliability and availability for DSRSD and EBMUD. This Project will provide 867 AFY of recycled water supply, permanently reducing potable water demands by an equivalent amount. This Project will also reduce nutrient loading to the San Francisco Bay, reducing total nitrogen by 38.5 metric tons per year, total dissolved solids by 7 metric tons per year, and carbonaceous biological oxygen demand (CBOD) by 4 metric tons per year.

How the Project Will Address Human Right to Water Policy

This recycled water project will offset the use of limited potable water supply for non-potable uses and preserve it for drinking water for the benefit of all DSRSD and EBMUD ratepayers in Alameda and Contra Costa counties, including low-income ratepayers or disadvantaged communities, as shown in Figure 2-15 on page 2-42 of the 2013 Bay Area IRWM Plan. This recycled water project contributes to DERWA's (DSRSD's and EBMUD's) long-term recycling goal, which will reduce the need for severe rationing during prolonged droughts. DSRSD and EBMUD as water agencies have the responsibility to provide water that meets regulatory standards to about 1.38 million water customers (1.35 million EBMUD water customers, 77,250 DSRSD water customers).

Project 7. Calistoga Recycled Water Storage Facility

Certainty for Meeting the Program Preferences

The City of Calistoga in Napa County receives half of its water supply from the SWP. The Calistoga Recycled Water Storage Facility Project will enhance recycled water production and storage to provide increased recycled water supply for urban and agricultural use. Increasing recycled water supply will have a conjunctive benefit in that it will reduce reliance on existing SWP sources and water-related regional conflicts. Recycled water provides a sustainable local water supply source that reduces reliance on imported and local water supplies (Delta, surface water, and

groundwater) and improves water quality in the Napa River and ultimately the San Francisco Bay (reduced wastewater discharges, improved ecosystem).

Bay Area agencies and organizations have implemented recycled water programs for many decades. This Project will support and strengthen ongoing regional implementation efforts for recycled water programs.

Breadth and Magnitude of Meeting Program Preferences

Calistoga currently delivers about 26% of its annual water demand from recycled water. This Project will allow the City to increase recycled water supply by another 14% (an increase of about 25 AFY to an average of 205 AFY). Not only will this Project continue to supply the existing recycled water demand, it will allow the City to run the recycled water system year-round (an estimated increase of 7%, or 13 AFY) and supply new customers (estimated to increase by 7%, or 12 AFY).

The proposed Project has regional breadth and will increase in magnitude in future years. The Project will contribute to long-term water supply reliability, recycled water availability, and habitat restoration. The new storage facility will allow the City to store water rather than discharge it to the Napa River during low flow/drought conditions when dilution ratios cannot be met, thereby protecting riparian habitat that may be sensitive to effluent constituents at higher concentrations. The Project will reduce treated-water effluent discharge to the Napa River/San Francisco Bay by 61 AFY. This will reduce nutrient loading to the Napa River/San Francisco Bay as follows: biological oxygen demand (BOD), 379 kilograms per year (kg/yr); total suspended solids (TSS), 341 kg/yr; and total nitrogen, 1,514 kg/yr.

How the Project Will Address Human Right to Water Policy

This Project meets Objective 13 - Ensure Equitable Distribution of Benefits of AB 685. Unlike larger municipalities, Calistoga has a small population base that pays for its significant operations, capital replacement, and aging infrastructure costs. Calistoga currently has the highest water and sewer rates in Napa County, which make its utility rates disproportionately high. The same treatment standards to provide safe and clean water to customers are required of cities regardless of their population.

Recycled water is one of the most reliable water sources available in Calistoga. Recycled water comes from the most sustainable source, treated wastewater. Treated wastewater will never go away; people will always flush their toilets, wash dishes and clothes, and take showers that generate this extremely valuable resource. Upon processing this wastewater through a treatment plant, this resource can be utilized as a continuous, sustainable source in lieu of potable water and groundwater use for irrigation purposes. With increased storage, the City will have the ability to operate its recycled water system 365 days per year, rather than the 8 months (240 days) per year of current operations. It is estimated that this Project will increase water supply reliability by 14% (an increase of about 25 AFY to an average of 205 AFY).

Project 8. Drought Relief for South Coast San Mateo County

Certainty for Meeting the Program Preferences

The Project improves drought preparedness, water supply reliability, and reliability of safe drinking water within the south coast region of San Mateo County. The Project helps rural communities, which rely entirely on local water supplies, to meet their water use needs while also protecting critical instream habitat for salmonids and other aquatic species.

This Project addresses critical water supply issues in 2014 and beyond by (1) developing and implementing a regional emergency water supply coordination plan to extend water supplies and coordinate actions among various local entities to reduce water shortages and provide a local plan of action in the event that residents run out of water; (2) fixing significant water system leaks and broken pipes; (3) improving water conveyance and storage facilities; and (4) increasing water supply and drought resiliency for domestic, agricultural, and environmental water use by implementing water use efficiency improvements and strategic water diversion management on farms.

The Project addresses critical water supply and water quality issues throughout the Pescadero-Butano and San Gregorio creek watersheds; implementation of this project will increase local water supply reliability and delivery of safe drinking water for the region.

Breadth and Magnitude of Meeting Program Preferences

The U.S. Drought Monitor designated the southern half of the Bay Area (including the Project area) as an area of Exceptional Drought. Groundwater supplies in the region are limited by the local geology, so most water is acquired from the region's creeks and springs by pumps and wells adjacent to these waterways. Based on more than 35 years of streamflow data from the U.S. Geological Survey (USGS) gages located on San Gregorio Creek (USGS 11162570) and Pescadero Creek (USGS 11162500), stream flows recorded to date in these watersheds during 2014 are approximately 8% and 7% of average, respectively.

This Project will improve both immediate and long-term water supply and water quality reliability: it will provide a more reliable drinking water supply to the approximately 4,050 residents and 9,000 park visitors in the south San Mateo coast region. This Project is estimated to generate about 14 million gallons of water per year in the form of additional water supply and 51 million gallons of water per year in reduced water demand due to improved water storage and distribution efficiencies. This volume of water represents approximately 22% of the estimated domestic water supply allocations for all residents in the area. Additionally, the locations of water supply projects and the reduced summer diversion rates (from improved water pumping management practices) and amounts will augment in-stream flows that are critical to summer salmonid rearing. Modifications in pumping rates will reduce local stream impairments by as much as 65% during low flow periods.

If this Project is not implemented, residents will continue to truck in potable water, which will increase greenhouse gas emissions; the popular San Mateo County Memorial Park campground will remain closed; and agricultural water users in the area will be forced to fallow fields. In addition, if water diversion pumping and low flow conditions continue at the current rates, salmonid populations, including federally listed endangered and threatened species, will be increasingly at risk.

How the Project Will Address Human Right to Water Policy

This Project addresses the Human Right to Water Policy by improving water reliability and ensuring that residents, migrant farmworkers, at-risk youth at residential care facilities, and others residing or visiting some of the most rural communities within San Mateo County have access to potable water. Rural water suppliers within San Mateo County's south coast region are isolated from other water purveyors and water sources; potable and agricultural water supplies in the region depend entirely on local surface water and groundwater sources.

The distance from municipal water supply infrastructure located elsewhere in the Bay Area makes the development of water system interties infeasible because the high costs of infrastructure and maintenance are not financially feasible with only a small customer fee base. Some residents have already begun trucking in water from other areas. Without emergency drought relief funding, many residents will be in danger of having no water supply, and trucking in water from other areas is expected to increase. Implementation of this Project will ensure that the Project area will have sufficient clean, affordable, and accessible water for human consumption, cooking, and sanitary purposes.

Project 9. Stinson Beach Water Supply & Drought Preparedness Plan

Certainty for Meeting the Program Preferences

The Project involves construction of a new groundwater well and connections to privately owned wells to increase water supply and reliability. The Project also includes pipeline replacements and water meter installations and replacements to identify and fix leaks in the Stinson Beach County Water District's water system. The groundwater supply components of the Project will increase local water supply reliability and safe drinking water.

The Project will provide direct environmental benefits from more efficient water supply use and distribution, and reducing the need to extract surface water supplies during drought and emergency periods. This Project is supported by a well-established planning and implementation infrastructure. Bay Area agencies and organizations have implemented conservation programs for many decades, and this Project will support and strengthen ongoing regional implementation efforts.

Breadth and Magnitude of Meeting Program Preferences

The new groundwater well and connections to existing wells will increase the District's water supply by 10 million gallons per year (MGY), which represents nearly 18% of the District's total annual water production. The pipeline

replacement Projects and the water metering efforts will alleviate approximately 5 MGY of lost supply due to leaks, and the groundwater well Projects will provide 10 MGY of drought and emergency supplemental groundwater supply.

The proposed Project has regional breadth and will have increasing magnitude over the years. This Project will have lasting, positive effects on the environment. The Project will contribute to long-term water supply reliability and improvements for fish and wildlife by allowing for as much as 15 MGY of increased in-stream creek flows.

How the Project Will Address Human Right to Water Policy

This Project addresses the AB 685 principles that pertain to facilitating access by rural communities to state funds for infrastructure improvements and safe, clean, affordable, and accessible water supplies.

The District and its service area are isolated from other cities and large water agencies in the greater San Francisco Bay Area and Marin County, and the isolated service area contains very limited sources of surface water and groundwater water supplies. There are no existing or feasible possibilities for intertie connections or water transfers with other water agencies, and surface water and groundwater supplies available from the small coastal drainages are very limited. The District's surface water sources are small creeks that drain the coast side of Bolinas Ridge. Groundwater resources are very limited in size and capacity, consisting primarily of small alluvial groundwater deposits at the mouths of two creeks that drain the Bolinas Ridge and smaller amounts of groundwater in the fractured rock and sandstone formations that form the Bolinas Ridge. These limited supply sources are highly vulnerable to climatic conditions and seasonal water shortages resulting from large numbers of summer vacationers. These limited water resources are also shared with anadromous fish.

The popular Stinson Beach and parks surrounding the town attract thousands of visitors daily during the summer months. The primary challenge facing the District is meeting peak water demand while also maintaining creek flows for fish and wildlife. On average, over the past 10 years, the District produces approximately 55 MGY of water (approximately 170 AFY). Seasonal water production ranges from approximately 3.0 MG (9 AF) per month in the winter to more than 6 MG (18 AF) per month in the summer.

Project 10. Bay Area Regional Drought Relief Conservation Program

Certainty for Meeting the Program Preferences

The 12 proponents of this project (12 implementing agencies and organizations) serve the entire Bay Area population, and this Project will accelerate the region's ability to respond to the statewide drought emergency. The Project will also lessen dependency on water supplies from the Bay/Delta, improve watershed ecosystems, and reduce energy consumption and greenhouse gases throughout the region. The Project focus is regional water conservation and involves the integration of stakeholders, institutions, and resources across the Bay Area.

Breadth and Magnitude of Meeting Program Preferences

This Project will achieve immediate and long-term drought relief, reducing demand on limited water supplies by approximately 1,200 AFY for a 20-year project total of approximately 24,000 AF. The Project will resolve water-related conflicts by improving landscape irrigation efficiencies and reducing non-point-source pollution. In addition, the breadth and magnitude of the Project will lessen energy demands by approximately 8,780 MWh and reduce greenhouse gas emissions by approximately 3.5 million pounds of CO_2 annually, for a project total of approximately 176,000 MWh and 60 million pounds of CO_2, respectively. Furthermore, the Project will ensure water availability for environmental demands and human consumption, and will reduce reliance on supply from the Delta by saving Delta diversions of approximately 840 AFY, for a Project total of approximately 16,800 AF.

The Project will reduce water demands for agencies that derive their supplies from the Delta and, as a result, will leave additional supplies for the Delta to provide increased dilution of pollutants to support a healthier ecosystem. More efficient use of water supply will improve flow to aquatic ecosystems and help habitat restoration. The resulting water savings from the Project will help reduce diversions from the Delta and upstream of the Delta, allowing more in-stream flows on a year-round basis. Additionally, landscape Projects promoting use of native and drought-tolerant plantings that require fewer nutrients and less water will help reduce urban runoff and water quality impacts to water bodies.

Implementing parallel agency Projects will provide data and feedback from which to evaluate and compare the effectiveness of incentive Projects among the diverse populations of the region. Working within a regional framework

will help improve the pricing, structure, and quality control of incentive Projects and support water-related regional planning and land use goals.

This Project will reduce not only potable water use but wastewater processing as well. Less water and wastewater to pump and treat, in turn, will reduce energy consumption and the associated greenhouse gas emissions. By reducing overall water use, energy demand and costs associated with the pumping of raw water, treatment plant operation, the distribution of finished, potable water, and wastewater collection and treatment are all likewise reduced. Reduction in treatment process chemicals also means less energy needed to produce and transport the chemicals.

How the Project Will Address Human Right to Water Policy

This Project increases water security and equity for all Bay Area customers, including low-income residents and residents of disadvantaged communities. Impacts to potable water supply caused by wasteful discretionary use in landscape irrigation and indoor consumption will be reduced, thereby increasing accessibility to an adequate supply of safe, clean, and affordable water for human consumption. This Project supports the Human Right to Water Policy, although it does not provide new water supplies to an area or a population previously lacking high-quality drinking water.

Project 11. WaterSMART Irrigation with AMI/AMR

Certainty for Meeting the Program Preferences

MMWD has implemented similar projects and programs for many decades, and development investments have occurred for elements of the Project that will support and facilitate overall Project implementation. In addition, the Project addresses landscape water use directly, which is consistent with the California Urban Water Conservation Council's statewide effort to develop a new norm in landscapes in California.

Breadth and Magnitude of Meeting Program Preferences

Immediate and long-term drought relief will be achieved by reducing demand on limited water supplies by approximately 300 AFY, for a 15-year project total of approximately 4,500 AF. The Project will resolve water-related conflicts by improving landscape irrigation efficiencies and reducing non-point-source pollution, lessening energy demands, and reducing greenhouse gas emissions, ensuring water availability for environmental demands and human consumption.

This Project will provide direct benefits to drought relief and water supply through conservation measures, including advanced metering infrastructure (AMI) and automatic meter reading (AMR) hardware and software, and landscape irrigation equipment upgrades. The Project will also provide cross-functional benefits. For example, water-efficient landscape and irrigation controller rebates provide direct benefits to receiving water bodies through reduced irrigation overspray and runoff, and the use of natural plantings that require fewer nutrients provides benefits to water quality. Therefore, this Project is expected to contribute to a reduction in concentration of water quality contaminants.

More efficient use of water supply will improve flow to aquatic ecosystems and improve wildlife habitat, as well as freeing up potable supply. The Project also supports environmental stewardship by promoting water use efficiency in the landscape, eliminating runoff onto pavement, and reducing the use of chemical fertilizers, herbicides, and pesticides.

The Project will enhance water supply reliability because the ability to respond to supply shortages due to emergency, regulatory, or drought conditions will be improved through the reduction of normal demand requirements that will result from implementing this Project.

How the Project Will Address Human Right to Water Policy

This Project increases water security and equity for all MMWD customers. Impacts to potable water supply caused by wasteful and discretionary use in landscape irrigation will be reduced, thereby increasing accessibility to an adequate supply of safe, clean, and affordable water for human consumption. This Project supports the Human Right to Water Policy but does not provide new water supplies to an area or a population previously lacking high-quality drinking water.

Table 7-2. Consistency of Projects with Statewide Priorities

Project ID #	Statewide Priorities																																									
	Drought Preparedness					Use and Reuse Water More Efficiently						Climate Change Response Actions								Environmental Stewardship					Practice Integrated Flood Management					Protect Surface Water and Groundwater Quality			Improve Tribal Water and Natural Resources	Ensure Equitable Distribution of Benefits					
												Adaptation				Greenhouse Gases		Reduction of Energy Consumption																						
	Promote water conservation, conjunctive use, reuse, and recycling	Improve landscape and agricultural irrigation efficiencies	Achieve long-term reduction of water use	Efficient groundwater basin management	Establish system interties	Increase urban and agricultural water use efficiency measures such as conservation and recycling	Capture, store, treat, and use urban stormwater runoff	Incorporate and implement low impact development (LID) design features, techniques, and practices to reduce or eliminate stormwater runoff	Improve the water supply reliability of the Sacramento-San Joaquin Delta	Reduce reliance on the Sacramento-San Joaquin Delta	Expand water supply reliability consistent with adopted plans	Advance and expand conjunctive management	Use and reuse water more efficiently	Water management system modifications to address anticipated climate change impacts	Establish migration corridors, re-establish river-floodplain hydrologic continuity, reintroduce anadromous fish, and enhance and protect upper watershed forests and meadows	Reduce energy consumption	Use cleaner energy sources to move and treat water	Water use efficiency	Water recycling	Water system energy efficiency	Reuse runoff	Watershed improvement	Floodplain improvement	Instream function improvement	Sustaining water and flood management ecosystems	Protect, restore, and enhance Delta ecosystem	Better emergency preparedness and response	Improved flood protection	More sustainable flood and water management systems	Enhanced floodplain ecosystems	LID techniques that store and infiltrate runoff while protecting groundwater	Protect and restore surface water and groundwater quality to safeguard public and environmental health and secure water supplies for beneficial uses	Salt/nutrient management planning as a component	Include access to safe drinking water to small DACs and for areas that have been identified as nitrate high-risk areas	Development of Tribal Consultation, collaboration, and access to funding for water programs and projects	Increase the participation of small and disadvantaged communities in the IRWM process	Develop multi-benefit projects considering affected disadvantaged communities and vulnerable populations	Projects that address safe drinking water and wastewater treatment needs of DACs	Address and consider the Human Right to Water needs	Address critical water supply or quality needs of California Native American Tribes	Help meet State policies intended to provide access to safe, clean, and affordable water
1					♠							♠		♠																						♠		♠		♠
2	♠			♠					♠			♠																				♠							♠		♠
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10	♠	♠	♠			♠		♠	♠	♠	♠	♠	♠	♠		♠		♠			♠		♠									♠	♠				♠				♠
11	♠	♠	♠			♠					♠		♠	♠		♠		♠			♠		♠	♠								♠	♠								♠

Proposal Full View

Print

APPLICANT INFORMATION

Organization Name *	Association of Bay Area Governments
Tax ID	942832478
Point Of Contact *	

Division/Address List:	San Francisco Estuary Partnership		
Address1:	PO Box 2050	**Address2:**	1515 Clay Street
City:	Oakland	**State:**	CA
Zip:	94604		

First Name:	Jennifer	**Last Name:**	Krebs
Email:	jkrebs@waterboards.ca.gov	**Phone (Direct):**	5106222315

Point Of Contact Position Title *	Principal Environmental Planner
Proposal Name *	Bay Area Drought Relief Program (Bay DRP)
Proposal Objective*	The Proposal Objective as determined by the Bay Area IRWM Coordinating Committee (CC) is to implement eleven high priority projects selected from the Bay Area IRWM Plan to provide immediate drought relief and meet the San Francisco Regional IRWM Plan Objectives as well as DWR?s evaluation criteria for this funding round. The Bay Area Drought Relief Program (Bay DRP) projects comprise a geographically diverse and well-integrated implementation program that will provide major drought relief benefits to the Bay Area?s diverse population. These projects include water supply enhancement (emphasizing both large scale benefits and communities most in need) recycling, and effective drought preparedness measures across the region. The projects were unanimously approved as a package for funding by the Bay Area IRWM Coordinating Committee at its May 28, 2014 meeting. The projects will implement multi-objective improvements in all parts of the region. They incorporate a range of water management elements and address drought-related regional and subregional needs. Alameda, Contra Costa, Santa Clara, San Mateo, and San Francisco counties are experiencing ?exceptional drought? conditions, while Marin, Sonoma, Napa and Solano counties in the North Bay are under ?extreme drought? conditions (National Drought Mitigation Center 2014). Emergency water shortage proclamations have been issued by the cities of St. Helena, Calistoga, and American Canyon in Napa County, the County of Sonoma,

	the Sonoma County Water Agency, the Alameda County Water District, the Zone 7 Water Agency, and the City of Mountain View. The Bay DRP, if funded, will go a long way to meeting the region?s current drought related needs and objectives.

BUDGET

Other Contribution	24595886
Local Contribution	49055236
Federal Contribution	4661685
Inkind Contribution	0
Amount Requested *	32978423
Total Project Cost *	111291230

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	37	**MM:**	41	**SS:**	29
Longitude *	**DD (+/-):**	-122	**MM:**	18	**SS:**	36
Longitude/Latitude Clarification	Center of San Francisco Bay Area Region		**Location**		San Francisco Bay	
County*	Alameda,Contra Costa,Marin,Napa,San Francisco,San Mateo,Santa Clara,Solano,Sonoma					
Ground Water Basin						
Hydrologic Region						
Watershed	15:Marin Coastal,16:San Mateo, 17:Bay Bridges, 18:SouthBay, 19:Santa Clara, 20:San Pablo, 21:Suisun					

LEGISLATIVE INFORMATION

Assembly District*	10th Assembly District,11th Assembly District,14th Assembly District,15th Assembly District,16th Assembly District,17th Assembly District,18th Assembly District,19th Assembly District,20th Assembly District,22nd Assembly District,24th Assembly District,25th Assembly District,27th Assembly District,28th Assembly District,29th Assembly District,30th Assembly District,4th Assembly District
Senate District*	10th Senate District,11th Senate District,13th Senate District,15th Senate District,17th Senate District,2nd Senate District,3rd Senate District,7th Senate District,8th Senate District

US Congressional District*	District 11 (CA),District 12 (CA),District 13 (CA),District 14 (CA),District 15 (CA),District 17 (CA),District 18 (CA),District 19 (CA),District 2 (CA),District 20 (CA),District 3 (CA),District 5 (CA),District 9 (CA)

Project Information

PROJECT NAME: PROJECT 7: CALISTOGA RECYCLED WATER STORAGE FACILITY

PROJECT 7: CALISTOGA RECYCLED WATER STORAGE FACILITY

Implementing Organization	Calistoga, City of
Secondary Implementing Organization	
Proposed Start Date	3/25/2013
Proposed End Date	8/31/2015
Scope Of Work	
Project Description	
Project Objective	

PROJECT BENEFITS INFORMATION

No records found.

BUDGET

Other Contribution	0
Local Contribution	406156
Federal Contribution	0
Inkind Contribution	0
Amount Requested*	750000
Total Project Cost*	1156156

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	38	**MM:**	34	**SS:**	42
	DD					

Longitude*	**(+/-):**	-122	**MM:**	34	**SS:**	45
Longitude/Latitude Clarification			**Location**		City of Calistoga	
County*	Napa					
Ground Water Basin	Napa-Sonoma Valley-Napa Valley					
Hydrologic Region	San Francisco Bay					
Watershed	20:San Pablo					

LEGISLATIVE INFORMATION

Assembly District*	4th Assembly District
Senate District*	3rd Senate District
US Congressional District*	District 5 (CA)

PROJECT NAME: PROJECT 8: DROUGHT RELIEF FOR SOUTH COAST SAN MATEO COUNTY

PROJECT 8: DROUGHT RELIEF FOR SOUTH COAST SAN MATEO COUNTY

Implementing Organization	San Mateo County Resource Conservation District
Secondary Implementing Organization	
Proposed Start Date	7/1/2010
Proposed End Date	12/17/2018
Scope Of Work	
Project Description	
Project Objective	

PROJECT BENEFITS INFORMATION

No records found.

BUDGET

Other Contribution	0
Local Contribution	643902
Federal Contribution	379765

Inkind Contribution	0
Amount Requested*	3872000
Total Project Cost*	4895667

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	37	**MM:**	18	**SS:**	19
Longitude*	**DD (+/-):**	-122	**MM:**	17	**SS:**	10
Longitude/Latitude Clarification			**Location**		Southern San Mateo County, near La Honda	
County*	San Mateo					
Ground Water Basin	Pescadero Valley,San Gregorio Valley					
Hydrologic Region	San Francisco Bay					
Watershed	16:San Mateo					

LEGISLATIVE INFORMATION

Assembly District*	24th Assembly District
Senate District*	13th Senate District
US Congressional District*	District 18 (CA)

PROJECT NAME: PROJECT 11: WATERSMART IRRIGATION WITH AMI/AMR

PROJECT 11: WATERSMART IRRIGATION WITH AMI/AMR

Implementing Organization	Marin Municipal Water District
Secondary Implementing Organization	
Proposed Start Date	1/1/2014
Proposed End Date	1/30/2017
Scope Of Work	
Project Description	
Project Objective	

PROJECT BENEFITS INFORMATION

No records found.

BUDGET

Other Contribution	0
Local Contribution	325000
Federal Contribution	0
Inkind Contribution	0
Amount Requested*	975000
Total Project Cost*	1300000

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	37	**MM:**	56	**SS:**	9
Longitude*	**DD (+/-):**	-122	**MM:**	31	**SS:**	4
Longitude/Latitude Clarification			**Location**		MMWD service area	
County*	Marin					
Ground Water Basin	Novato Valley,Ross Valley,Sand Point Area					
Hydrologic Region	San Francisco Bay					
Watershed	17:Bay Bridges, 20:San Pablo					

LEGISLATIVE INFORMATION

Assembly District*	10th Assembly District
Senate District*	2nd Senate District
US Congressional District*	District 2 (CA)

PROJECT NAME: PROJECT 9: STINSON BEACH WATER SUPPLY & DROUGHT PREPAREDNESS PLAN

PROJECT 9: STINSON BEACH WATER SUPPLY & DROUGHT PREPAREDNESS PLAN

Implementing Organization	Stinson Beach County Water District

Secondary Implementing Organization	
Proposed Start Date	4/1/2014
Proposed End Date	10/28/2016
Scope Of Work	
Project Description	
Project Objective	

PROJECT BENEFITS INFORMATION

No records found.

BUDGET

Other Contribution	0
Local Contribution	312500
Federal Contribution	0
Inkind Contribution	0
Amount Requested*	937452
Total Project Cost*	1249952

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	37	**MM:**	53	**SS:**	59
Longitude*	**DD (+/-):**	-122	**MM:**	38	**SS:**	23
Longitude/Latitude Clarification			**Location**		Town of Stinson Beach	
County*	Marin					
Ground Water Basin						
Hydrologic Region	San Francisco Bay					
Watershed	15:Marin Coastal					

LEGISLATIVE INFORMATION

Assembly District*	10th Assembly District
Senate District*	2nd Senate District

US Congressional District*	District 2 (CA)

PROJECT NAME: PROJECT 10: BAY AREA REGIONAL DROUGHT RELIEF CONSERVATION PROGRAM

PROJECT 10: BAY AREA REGIONAL DROUGHT RELIEF CONSERVATION PROGRAM

Implementing Organization	StopWaste
Secondary Implementing Organization	
Proposed Start Date	10/16/2014
Proposed End Date	9/28/2018
Scope Of Work	
Project Description	
Project Objective	

PROJECT BENEFITS INFORMATION

No records found.

BUDGET

Other Contribution	0
Local Contribution	4899015
Federal Contribution	0
Inkind Contribution	0
Amount Requested*	5993971
Total Project Cost*	10892986

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	37	**MM:**	47	**SS:**	48
Longitude*	**DD (+/-):**	-122	**MM:**	15	**SS:**	58
Longitude/Latitude Clarification			**Location**		Entire San Francisco Bay Region	

County*	Alameda,Contra Costa,Marin,Napa,San Francisco,San Mateo,Santa Clara,Solano,Sonoma
Ground Water Basin	Arroyo Del Hambre Valley,Castro Valley,Clayton Valley,Downtown,Islais Valley,Livermore Valley,Lobos,Marina,Napa-Sonoma Valley-Napa Valley,Napa-Sonoma Valley-Sonoma Valley,Novato Valley,Pittsburg Plain,Ross Valley,Sacramento Valley-Solano,San Joaquin Valley-Tracy,San Rafael Valley,San Ramon Valley,Sand Point Area,Santa Clara Valley-East Bay Plain,Santa Clara Valley-Niles Cone,Santa Clara Valley-Santa Clara,South San Francisco,Suisun-Fairfield Valley,Visitacion Valley,Westside,Ygnacio Valley
Hydrologic Region	San Francisco Bay
Watershed	15:Marin Coasta, 16:San Mateo, 17:Bay Bridges, 18:South Bay, 19:Santa Clara, 20:San Pablo, 21:Suisun

LEGISLATIVE INFORMATION

Assembly District*	10th Assembly District,11th Assembly District,14th Assembly District,15th Assembly District,16th Assembly District,17th Assembly District,18th Assembly District,19th Assembly District,20th Assembly District,22nd Assembly District,24th Assembly District,25th Assembly District,27th Assembly District,28th Assembly District,29th Assembly District,2nd Assembly District,30th Assembly District,4th Assembly District
Senate District*	13th Senate District,15th Senate District,2nd Senate District,3rd Senate District,7th Senate District
US Congressional District*	District 11 (CA),District 12 (CA),District 13 (CA),District 14 (CA),District 15 (CA),District 17 (CA),District 18 (CA),District 19 (CA),District 2 (CA),District 20 (CA),District 3 (CA),District 5 (CA),District 9 (CA)

PROJECT NAME: PROJECT 6: DERWA PHASE 3 RECYCLED WATER EXPANSION PROJECT

PROJECT 6: DERWA PHASE 3 RECYCLED WATER EXPANSION PROJECT

Implementing Organization	DSRSD-EBMUD Recycled Water Authority (DERWA)
Secondary Implementing Organization	
Proposed Start Date	3/31/2014
Proposed End Date	9/6/2016
Scope Of Work	

Project Description	
Project Objective	

PROJECT BENEFITS INFORMATION

No records found.

BUDGET

Other Contribution	0
Local Contribution	6022662
Federal Contribution	0
Inkind Contribution	0
Amount Requested*	4000000
Total Project Cost*	10022662

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	37	**MM:**	43	**SS:**	0
Longitude*	**DD (+/-):**	-121	**MM:**	55	**SS:**	36
Longitude/Latitude Clarification			**Location**		Cities of San Ramon and Dublin	
County*	Alameda,Contra Costa					
Ground Water Basin	Livermore Valley					
Hydrologic Region	San Francisco Bay					
Watershed	20: San Pablo					

LEGISLATIVE INFORMATION

Assembly District*	16th Assembly District
Senate District*	7th Senate District
US Congressional District*	District 15 (CA)

PROJECT NAME: PROJECT 12: GRANT ADMINISTRATION

PROJECT 12: GRANT ADMINISTRATION

Implementing Organization	Association of Bay Area Governments
Secondary Implementing Organization	
Proposed Start Date	10/16/2014
Proposed End Date	12/17/2018
Scope Of Work	
Project Description	
Project Objective	

PROJECT BENEFITS INFORMATION

No records found.

BUDGET

Other Contribution	0
Local Contribution	0
Federal Contribution	0
Inkind Contribution	0
Amount Requested*	1650000
Total Project Cost*	1650000

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	37	**MM:**	41	**SS:**	29
Longitude*	**DD (+/-):**	122	**MM:**	18	**SS:**	36
Longitude/Latitude Clarification	Center of San Francisco Bay Area Region		**Location**		San Francisco Bay	
County*	Alameda,Contra Costa,Marin,Napa,San Francisco,San Mateo,Santa Clara,Solano,Sonoma					
Ground Water Basin	Arroyo Del Hambre Valley,Castro Valley,Clayton Valley,Downtown,Islais Valley,Livermore Valley,Lobos,Marina,Napa-Sonoma Valley-Napa Valley,Napa-Sonoma Valley-Sonoma Valley,Novato Valley,Pescadero Valley,Pittsburg Plain,Ross Valley,Sacramento Valley-Solano,San Gregorio Valley,San Joaquin Valley-Tracy,San Rafael Valley,San Ramon Valley,Sand Point Area,Santa Clara Valley-East Bay Plain,Santa Clara Valley-Niles Cone,Santa Clara					

	Valley-Santa Clara,South San Francisco,Suisun-Fairfield Valley,Visitacion Valley,Westside,Ygnacio Valley
Hydrologic Region	San Francisco Bay
Watershed	15:Marin Coastal,16:San Mateo, 17:Bay Bridges, 18:SouthBay, 19:Santa Clara, 20:San Pablo, 21:Suisun

LEGISLATIVE INFORMATION

Assembly District*	10th Assembly District,11th Assembly District,14th Assembly District,15th Assembly District,16th Assembly District,17th Assembly District,18th Assembly District,19th Assembly District,20th Assembly District,22nd Assembly District,24th Assembly District,25th Assembly District,27th Assembly District,28th Assembly District,29th Assembly District,30th Assembly District,4th Assembly District
Senate District*	10th Senate District,11th Senate District,13th Senate District,15th Senate District,17th Senate District,2nd Senate District,3rd Senate District,7th Senate District,8th Senate District
US Congressional District*	District 11 (CA),District 12 (CA),District 13 (CA),District 14 (CA),District 15 (CA),District 17 (CA),District 18 (CA),District 19 (CA),District 2 (CA),District 20 (CA),District 3 (CA),District 5 (CA),District 9 (CA)

PROJECT NAME: PROJECT 1: LOWER CHERRY AQUEDUCT EMERGENCY REHABILITATION PROJECT

PROJECT 1: LOWER CHERRY AQUEDUCT EMERGENCY REHABILITATION PROJECT

Implementing Organization	San Francisco Public Utilities Commission
Secondary Implementing Organization	
Proposed Start Date	2/3/2014
Proposed End Date	12/31/2015
Scope Of Work	
Project Description	
Project Objective	

PROJECT BENEFITS INFORMATION

No records found.

BUDGET

Other Contribution	0
Local Contribution	15102790
Federal Contribution	0
Inkind Contribution	0
Amount Requested*	3000000
Total Project Cost*	18102790

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	37	**MM:**	55	**SS:**	54
Longitude*	**DD (+/-):**	-119	**MM:**	53	**SS:**	49
Longitude/Latitude Clarification			**Location**		Lower Cherry Aqueduct (Hetch Hetchy Regional Water System)	
County*	San Francisco					
Ground Water Basin						
Hydrologic Region	San Francisco Bay					
Watershed	17:Bay Bridges					

LEGISLATIVE INFORMATION

Assembly District*	17th Assembly District,19th Assembly District
Senate District*	11th Senate District
US Congressional District*	District 12 (CA)

PROJECT NAME: PROJECT 2: RINCONADA WATER TREATMENT PLANT POWDERED ACTIVATED CARBON (PAC) TREATMENT

PROJECT 2: RINCONADA WATER TREATMENT PLANT POWDERED ACTIVATED CARBON (PAC) TREATMENT

Implementing Organization	Santa Clara Valley Water District
Secondary Implementing Organization	

Proposed Start Date	2/3/2014
Proposed End Date	6/24/2015
Scope Of Work	
Project Description	
Project Objective	

PROJECT BENEFITS INFORMATION

No records found.

BUDGET

Other Contribution	0
Local Contribution	306221
Federal Contribution	0
Inkind Contribution	0
Amount Requested*	800000
Total Project Cost*	1106221

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	37	**MM:**	15	**SS:**	24
Longitude*	**DD (+/-):**	-121	**MM:**	58	**SS:**	59
Longitude/Latitude Clarification			**Location**		Rinconada Water Treatment Plant	
County*	Santa Clara					
Ground Water Basin	Santa Clara Valley-Santa Clara					
Hydrologic Region	San Francisco Bay					
Watershed	19:Santa Clara					

LEGISLATIVE INFORMATION

Assembly District*	28th Assembly District
Senate District*	15th Senate District
US Congressional District*	District 18 (CA)

PROJECT NAME: PROJECT 3: ZONE 7 WATER SUPPLY DROUGHT PREPAREDNESS PROJECT

PROJECT 3: ZONE 7 WATER SUPPLY DROUGHT PREPAREDNESS PROJECT

Implementing Organization	Zone 7 Water Agency
Secondary Implementing Organization	
Proposed Start Date	2/3/2014
Proposed End Date	2/27/2015
Scope Of Work	
Project Description	
Project Objective	

PROJECT BENEFITS INFORMATION

No records found.

BUDGET

Other Contribution	0
Local Contribution	4290000
Federal Contribution	0
Inkind Contribution	0
Amount Requested*	3000000
Total Project Cost*	7290000

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	37	**MM:**	41	**SS:**	29
Longitude*	**DD (+/-):**	-121	**MM:**	50	**SS:**	54
Longitude/Latitude Clarification			**Location**		Livermore Valley, between cities of Livermore and Pleasanton	
County*	Alameda					

Ground Water Basin	Livermore Valley
Hydrologic Region	San Francisco Bay
Watershed	21: Suisun

LEGISLATIVE INFORMATION

Assembly District*	16th Assembly District
Senate District*	7th Senate District
US Congressional District*	District 15 (CA)

PROJECT NAME: PROJECT 4: LOS CARNEROS WATER DISTRICT AND MILLIKEN-SARCO-TULOCAY RECYCLED WATER PIPELINES

PROJECT 4: LOS CARNEROS WATER DISTRICT AND MILLIKEN-SARCO-TULOCAY RECYCLED WATER PIPELINES

Implementing Organization	Napa Sanitation District
Secondary Implementing Organization	
Proposed Start Date	5/1/2014
Proposed End Date	10/26/2016
Scope Of Work	
Project Description	
Project Objective	

PROJECT BENEFITS INFORMATION

No records found.

BUDGET

Other Contribution	24595886
Local Contribution	0
Federal Contribution	4300000
Inkind Contribution	0
Amount Requested*	4000000
Total Project Cost*	32895886

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	38	**MM:**	14	**SS:**	25
Longitude*	**DD (+/-):**	-122	**MM:**	19	**SS:**	37
Longitude/Latitude Clarification	Coordinates listed for Los Carneros Water District		**Location**		Napa County, near City of Napa	
County*	Napa					
Ground Water Basin	Napa-Sonoma Valley-Napa Valley					
Hydrologic Region	San Francisco Bay					
Watershed	20:San Pablo					

LEGISLATIVE INFORMATION

Assembly District*	4th Assembly District
Senate District*	3rd Senate District
US Congressional District*	District 5 (CA)

PROJECT NAME: PROJECT 5: SUNNYVALE CONTINUOUS RECYCLED WATER PRODUCTION FACILITIES AND WOLFE ROAD PIPELINE

PROJECT 5: SUNNYVALE CONTINUOUS RECYCLED WATER PRODUCTION FACILITIES AND WOLFE ROAD PIPELINE

Implementing Organization	Santa Clara Valley Water District
Secondary Implementing Organization	City of Sunnyvale
Proposed Start Date	6/2/2014
Proposed End Date	3/31/2017
Scope Of Work	
Project Description	
Project Objective	

PROJECT BENEFITS INFORMATION

No records found.

BUDGET

Other Contribution	0
Local Contribution	16728910
Federal Contribution	0
Inkind Contribution	0
Amount Requested*	4000000
Total Project Cost*	20728910

GEOGRAPHIC INFORMATION

Latitude *	**DD (+/-):**	37	**MM:**	25	**SS:**	6
Longitude*	**DD (+/-):**	-122	**MM:**	1	**SS:**	15
Longitude/Latitude Clarification			**Location**		City of Sunnyvale	
County*	Santa Clara					
Ground Water Basin	Santa Clara Valley-Santa Clara					
Hydrologic Region	San Francisco Bay					
Watershed	18:South Bay					

LEGISLATIVE INFORMATION

Assembly District*	24th Assembly District
Senate District*	13th Senate District
US Congressional District*	District 17 (CA)

Section : Applicant Information and Questions Tab

APPLICANT INFORMATION AND QUESTIONS TAB

Q1. Project Representative

Provide the name and details of the person responsible for signing and executing the grant agreement for the applicant. Persons that are subcontractors to be paid by the grant cannot be listed as the Project Director.

Ezra Rapport, Executive Director of the Association of Bay Area Governments (ABAG) 101 8th Street

Oakland, CA 94607-4707

Q2. Project Manager

Provide the name and contact information of the Project Manager from the applicant agency or organization that will be the day-to-day contact on this application.

Jennifer Krebs, Principal Environmental Planner ABAG/San Francisco Estuary Partnership 1515 Clay Street, Suite 1400, Oakland, CA 94612 Email: jennifer.krebs@waterboards.ca.gov Tel: 510-622-2315

Q3. Funding Area Information

Provide the IRWM funding area(s) in which projects are located.

San Francisco Bay funding area

Q4. DAC Waiver Cost Share Request

Are you applying for a DAC cost share waiver? If yes, fill out Attachment 8.

a) ○ Yes
b) ◉ No

Q5. Responsible Regional Water Quality Control Board(s) (RWQCB):

List the name of the RWQCB in which your Proposal is located. For a region that extends beyond one RWQCB boundary, list the name of each Board.

San Francisco Bay Regional Water Quality Control Board (Region 2)

Q6. Eligibility

The Implementation Grant Program requires a minimum funding match of 25% of total project cost unless there is a DAC project included in the proposal. Are your matching funds less than 25%? If so, please explain.

Yes, the Bay Area Drought Relief Program Implementation Grant includes a minimum funding match of 25% of the total project cost.

Q7. Eligibility

Does the application represent an IRWM Region approved in the RAP? To verify, see RAP website: http://www.water.ca.gov/irwm/grants/rap.cfm.

a) ◉ Yes
b) ○ No

If yes, include the name of the IRWM Region. If no, please explain.

San Francisco Bay IRWM Region

Section : Appplication Attachments Tab

Application Attachments Tab

Attachment 1: Authorization and Eligibility Requirements

Upload "Authorizing" documentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att1_DG_Eligible_1of11.pdf

Upload "Eligible Applicant" documentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att1_DG_Eligible_2of11.pdf

Upload "Acknowledgement Form – Submittal of Additional Information" documentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att1_DG_Eligible_3of11.pdf

Upload "Adopted IRWM Plan and Proof of Formal Adoption" documentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att1_DG_Eligible_4of11.pdf

Upload "Project and Consistency with an adopted IRWM Plan" documentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att1_DG_Eligible_5of11.pdf

Upload "Urban Water Management Compliance" documentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att1_DG_Eligible_6of11.pdf

Upload "Agricultural Water Management Compliance" documentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att1_DG_Eligible_7of11.pdf

Upload "Surface Water Diverter Compliance" documentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att1_DG_Eligible_8of11.pdf

Upload "Groundwater Management Compliance" documentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att1_DG_Eligible_9of11.pdf

Upload "CASGEM Compliance" documentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att1_DG_Eligible_10of11.pdf,Att1_DG_Eligible_10of11.zip

Upload "Water Conservation Programs and Measures" docmentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att1_DG_Eligible_11of11.pdf

Attachment 2: Drought Impact

Upload "Drought Impact" docmentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments:
Att2_DG_Impact_1of3.pdf,Att2_DG_Impact_2of3.pdf,Att2_DG_Impact_3of3.pdf

Attachment 3: Project Justification

Upload "Project Justification" docmentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments:
Att3_DG_ProJust_3of3.pdf,Att3_DG_ProJust_1of3.pdf,Att3_DG_ProJust_2of3.pdf

Attachment 4: Work Summary

Upload "Work Summary" docmentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att4_DG_WorkSummary_1of1.pdf

Attachment 5: Budget Summary

Upload "Budget Summary" docmentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att5_DG_Budget_1of1.pdf

Attachment 6: Schedule

Upload "Schedule" docmentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att6_DG_Schedule_1of1.pdf

Attachment 7: Program Preferences

Upload "Program Preferences" docmentation here. This attachment is mandatory.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.

Last Uploaded Attachments: Att7_DG_Preference_1of1.pdf

Attachment 8: Disadvantaged Community Assistance

Upload "Disadvantaged Community Assistance" documentation here. This attachment is optional.

Ensure file name is consistent with Section V of the 2014 IRWM Drought Grant PSP.