

**From:** [Carroll, John \(BOS\)](#)  
**To:** [Nancy Wuerfel](#)  
**Cc:** [Mar. Gordon \(BOS\)](#); [Lovett, Li \(BOS\)](#); [tdoudiet@comcast.net](mailto:tdoudiet@comcast.net); [Board of Supervisors. \(BOS\)](#)  
**Subject:** RE: My comments for the GAO meeting, Nov 18, 2021, item #1 Hearing on Civil Grand Jury report - File No. 190785  
**Date:** Wednesday, November 17, 2021 2:25:00 PM  
**Attachments:** [image001.png](#)

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Thank you for your comments.

I am adding your letter to the official file for this hearing, and by copy of this message to the [board.of.supervisors@sfgov.org](mailto:board.of.supervisors@sfgov.org) email address it is being forwarded to the full membership of the Board of Supervisors for their review..

Best to you,

**John Carroll**  
**Assistant Clerk**

Board of Supervisors  
San Francisco City Hall, Room 244  
San Francisco, CA 94102  
(415) 554-4445

**(VIRTUAL APPOINTMENTS)** To schedule a virtual meeting with me (on Microsoft Teams), please ask and I can answer your questions in real time.

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**From:** Nancy Wuerfel <nancenum1@aol.com>  
**Sent:** Tuesday, November 16, 2021 3:39 PM  
**To:** Carroll, John (BOS) <john.carroll@sfgov.org>

**Cc:** Mar, Gordon (BOS) <gordon.mar@sfgov.org>; Lovett, Li (BOS) <li.lovett@sfgov.org>; tdoudiet@comcast.net

**Subject:** My comments for the GAO meeting, Nov 18, 2021, item #1 Hearing on Civil Grand Jury report

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Hi Mr. Carroll,

Please provide my comments to the members of the GAO committee and include a copy in the meeting packet (file 190785).

The meeting of the Government Audit and Oversight Committee, item #1, continues the hearing by the Call of the Chair to followup on the 2019 Civil Grand Jury's report that calls for the City to "Act Now Before it is Too Late: Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water System" (file 190785). This hearing also responds to the BOS resolution 484-19 (file 191029) "declaring State of Urgency to rapidly expand the City's EFWS to protect all neighborhoods in the event of a major earthquake and fire ..." which was enacted on November 27, 2019 **without** Mayor Breed's signature approving the resolution. *I ask the Committee members to take particular note of the Mayor's lack of support to protect both lives and property in ALL City neighborhoods from fires following a major earthquake as stated in the BOS resolution.* The estimated value of city assets is between \$530 billion to \$665 billion and over 880,000 lives are at stake from earthquakes and the fires that will follow (Scawthorn Report).

The BOS received on June 23, 2021 two reports from the San Francisco Public Utilities Commission (SFPUC) on (1) Emergency Firefighting Water System (EFWS) Seawater Supply Report by AECOM, and (2) Fire Following Earthquake Water Requirements Study Report by Professor Charles Scawthorn. The SFPUC requested that the BOS hearing on these reports be delayed from an intended July 2021 hearing because they were "not ready" at that time. The GAO committee hearing on these reports was postponed to November 18, 2021.

The AECOM Report Executive Summary states: "The primary purpose of this pre-feasibility study is to identify the factors that will need to be considered for development of additional seawater supply sources for the EFWS. The goal of the study is not to develop recommendations for siting one or more new seawater pump stations or answer all the questions regarding feasibility; the goal is to document items that will need to be considered in future evaluations."

The Scawthorn Report Conclusion states: "Flow Requirements - The information contained in this study has assumed a range of potential [water] flow rates for new seawater supply sources for the EFWS (ranging from 3,000 gpm to 50,000 gpm) in five geographically dispersed areas around the waterfront of the City. Further

definition of the required firefighting demands (both in terms of quantity and location(s) of supplemental flow) is needed to advance to the next stage of planning and analysis."

The AECOM report also evaluated Flow Requirements and states - without any proof - that "the city can meet post-earthquake fire demands." The report states this can be done with 1) water from Hetch Hetchy 167 miles away that is expected to supply water to the regional water system customers within 24 hours after a major earthquake, 2) after the 10.5 million gallons of water in Twin Peaks reservoir is depleted, the SFPUC will fight fires using customers' locally stored potable water in the city reservoirs, 3) the 2 billion gallons of contaminated water in Lake Merced that may be injected into the potable water mains feeding into Sunset Reservoir to add water to fight fires, and 4) the cisterns that can be accessed by hose tenders or by fire engines if either are available with firefighters to deploy them.

The SFPUC is planning to implement ideas from the AECOM report but has not acknowledged or resolved the following serious problems:

1) The California Water Code Section 73503 requires that "(b) During any interruption in supply caused by earthquake, or other natural or manmade catastrophe, a regional wholesale water supplier [SFPUC] shall distribute water to customers on an equitable basis, to the extent feasible given physical damage to the regional water system, without preference or discrimination based on a customer's geographic location within or outside the boundary of the regional wholesale water supplier." This means that the potable water stored in San Francisco's reservoirs must be shared by law with the peninsula SFPUC customers on an equitable basis during a supply interruption. The Water Code reduces the amount of water the City can rely on for potable uses and firefighting needs, and requires the City to access alternative sources such as seawater to meet firefighting needs.

2) Conveying raw water from Lake Merced to Sunset Reservoir contaminates both the water lines used and the reservoir. The contamination must be disinfected and the mains recertified before potable water can again be transmitted to or stored in Sunset Reservoir. The SFPUC has no procedure for flushing out the contamination to return lines to safely conveying potable water. The SFPUC should now consider an alternative destination for dispensing the Lake Merced water on the westside instead of using Sunset Reservoir. The original independent Auxiliary Water Supply System (AWSS) which is designed to transport non-potable water and seawater to high pressure hydrants can be expanded on the westside for firefighting, and preserves the potable system to serve human needs.

I ask the members of the Government Audit and Oversight Committee to carefully consider my comments at the hearing.

Sincerely,

Nancy Wuerfel

**From:** [Tom Doudiet](#)  
**To:** [Carroll, John \(BOS\)](#)  
**Cc:** [Lovett, Li \(BOS\)](#)  
**Subject:** Documents for the record of GAO meeting on 1/21/21  
**Date:** Wednesday, January 20, 2021 8:51:02 PM  
**Attachments:** [Statement of Retired FFs-4.docx](#)  
[AWSS PDF 52020.pdf](#)

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Mr. Carroll,  
Ms. Lovett, aide to Supervisor Mar, has requested that I send you the two documents (attached) to be entered in the record of the GAO meeting tomorrow, January 21, 2021.  
Thank you.  
Thomas W. Doudiet,  
Assistant Deputy Chief,  
San Francisco Fire Department,  
Retired

December 18, 2020

To: San Francisco Mayor London Breed;  
Hon. Garrett L. Wong, Presiding Judge, San Francisco Superior Court  
Members of the San Francisco Fire Commission;  
Members of the San Francisco Board of Supervisors;  
Members of the Citizens' General Obligation Bond Oversight Committee  
Members of the San Francisco Public Utilities Commission;  
Editor, the *Richmond Review* and the *Sunset Beacon*;  
Editor, *The San Francisco Chronicle*

In July 2019 the San Francisco Civil Grand Jury issued a report, "Act Now Before It Is Too Late: Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water Supply System". The two most important conclusions of that report were that in order to avoid the destruction of major areas of the city by firestorms following the next great Bay Area earthquake: (1) the high-pressure hydrant system, first put into service in 1913, must be expanded to cover all San Francisco neighborhoods; and (2) time is of the essence.

The current guardian of the high-pressure hydrant system, the S.F. Public Utilities Commission (SFPUC), has published plans to build a system in the outer Richmond and outer Sunset Districts that would use drinking water from the north basin of Sunset Reservoir as a primary source of water for this system, which would not be connected to the existing high-pressure hydrant system. Further, it has been indicated that subsequent expansions into other currently unprotected neighborhoods, which might take place in the future, would also use drinking water from municipal reservoirs. This plan is in stark contrast to the long-established use of the City's inexhaustible supply of seawater as the primary water source in the existing high-pressure hydrant system.

The SFPUC's own expert engineering consultant, Dr. Charles Scawthorn, the world's leading scholar of the modeling of the spread of fire following earthquakes in modern urban settings, has predicted that between 70 and 120 fires will occur citywide following a M7.9 earthquake, the model on which the SFPUC has predicated its hydrant system expansion plans. Inasmuch as the SFFD has only 43 staffed fire engines stationed within the city limits, it is obvious that some of the predicted fires will burn unchecked for an indeterminate period of time, and therefore form into conflagrations, particularly in our numerous wood-frame residential neighborhoods, before the SFFD can respond. The result will be that the volume of water that will eventually be required in order to bring these firestorms under control will be incalculably large, and only an inexhaustible water source, such as the Pacific Ocean, will suffice.

In recognition of these facts, 68 retired San Francisco Fire Department Chief Officers, Captains, Lieutenants and Firefighters, whose combined experience represents more than 2,000 years of SFFD service, have jointly issued the following public statement relative to the current plans of the SFPUC to use drinking water in an expanded high-pressure hydrant system:

**"As retired San Francisco Fire Department Chief Officers, Captains, Lieutenants, and Firefighters, we believe that it is our responsibility to emphatically state the following in the interest of public safety:**

**it is completely irrational to assume that drinking water from municipal reservoirs will be adequate to reliably supply a high-pressure, high-volume citywide hydrant system, like the Auxiliary Water Supply System, for fighting multiple simultaneous fires following a major Bay Area earthquake.**

The Hetch-Hetchy drinking water system traverses 167 miles from the Sierras, crosses three major Bay Area earthquake faults, and then closely parallels the San Andreas Fault for 25 miles along the Peninsula, before reaching the City's three terminal reservoirs. To assume that it will remain completely intact following a M7.9 earthquake of unknowable epicenter or duration is a matter of mere conjecture. The reliability of the water supplied to the SFFD to fight post-earthquake fires cannot be left to chance. Given the realities of fighting urban conflagrations, the implementation of the SFPUC's misguided "PEFWS" (drinking water) plan may very well lead to the destruction by fire of entire San Francisco neighborhoods.

Based on our combined 2,000 years of professional firefighting experience, we must clearly state that the only practical solution for supplying a citywide high-pressure hydrant system, when a multitude of post-earthquake fires must be fought, is to use the inexhaustible supply of saltwater that is readily available on three sides of the City. This will require the construction of new high-pressure saltwater pump stations at the northern end of Ocean Beach and at Hunters Point. Following a major earthquake it will be essential to have independent and unlimited water sources for firefighting available in all four quadrants of the City. Therefore, an additional high-pressure pump station at Lake Merced, which contains over one billion gallons of non-potable water, will complete the water supply requirements for an interconnected citywide expansion of the existing high-pressure hydrant system into all San Francisco neighborhoods.

**These new pump stations are the only means by which an inexhaustible water supply can be provided to the expanded hydrant system called for by the Civil Grand Jury's 2019 report. Moreover, this will leave the municipal water supply in the City's reservoirs, where it must be maintained, available for the critically important drinking and sanitation needs of the City's residents following a major earthquake."**

**Mario Ballard, Captain, SFFD, retired**

**James Barden, Division Chief, SFFD, retired** 

**Ray Batz, Firefighter, SFFD, retired**

**Michael Belcher, Firefighter, SFFD, retired**

**Frank T. Blackburn, Division Chief, SFFD, retired** 

**James Blake, Battalion Chief, SFFD, retired**

**Robert Boudoures, Division Chief, SFFD, retired**

**Frank Cardinale, Assistant Deputy Chief, SFFD, retired**

**John Carvajal, Lieutenant, SFFD, retired**

**Michael Castignola, Battalion Chief, SFFD, retired**

**James Cavellini, Division Chief, SFFD, retired** 

**Carl Champion, Captain, SFFD, retired**

**Paul Chin, Assistant Deputy Chief, SFFD, retired** 

**Michael Coleman, Firefighter, SFFD, retired**

**Joe Collins, Lieutenant, SFFD, retired**

**James Connors, Captain, SFFD, retired**

**Ted Corporandy, Battalion Chief, SFFD, retired**

**Paul Crawford, Battalion Chief, SFFD, retired**<sup>[L]</sup><sub>[SEP]</sub>

**Michael Cuddy, Firefighter, SFFD, retired**

**Michael Cunnie, Battalion Chief, SFFD, retired**

**Alberto DaChuna, Division Chief, SFFD, retired**<sup>[L]</sup><sub>[SEP]</sub>

**Thomas W. Doudiet, Assistant Deputy Chief, SFFD, retired**

**Franklin H. Dunn, Battalion Chief, SFFD, retired**<sup>[L]</sup><sub>[SEP]</sub>

**William Emde, Lieutenant, SFFD, retired**

**Harold Gamble, Deputy Chief, SFFD, retired**<sup>[L]</sup><sub>[SEP]</sub>

**Richard J. Gibson, Firefighter, SFFD, retired**

**Lawrence Giovacchini, Battalion Chief, SFFD, retired**

**Steven Green, Captain, SFFD, retired**

**Mark L. Johnson, Lieutenant, SFFD, retired**

**Elliott Kamler, Battalion Chief, SFFD, retired**

**Mark Kearney, Assistant Deputy Chief, SFFD, retired**

**James Lambrechts, Battalion Chief, SFFD, retired**<sup>[L]</sup><sub>[SEP]</sub>

**Gary Leal, Battalion Chief, SFFD, retired**<sup>[L]</sup><sub>[SEP]</sub>

**James Lee, Captain, SFFD, retired**

**Anthony Marelich, Firefighter, SFFD, retired**

**Al Markel, Firefighter, SFFD, retired**

**Dennis Martino, Firefighter, SFFD, retired**

**James Mason, Chief's Aide, SFFD, retired**

**Robert G. McDill, Lieutenant, SFFD, retired**



**Michael McKinley, Battalion Chief, SFFD, retired**

**Michael Morris, Assistant Deputy Chief, SFFD, retired**

**John A. Murphy, Battalion Chief, SFFD, retired**

**Thomas Murray, Captain, SFFD, retired**

**James H. Neil, Lieutenant, SFFD, retired**

**Jack Norton, Battalion Chief, SFFD, retired** SEP

**Timothy O' Brien, Captain, SFFD, retired**

**James J. O'Connor, Captain, SFFD, retired**

**Brendan O'Leary, Assistant Deputy Chief, SFFD, retired**

**Jack O'Leary, Captain, SFFD, retired**

**Steve O'Neill, Firefighter, SFFD, retired**

**Kenneth H. Owen, Lieutenant, SFFD, retired**

**John S. Peoples, Division Chief, SFFD, retired** SEP

**William Richardson, Division Chief, SFFD, retired**

**James Riley, Lieutenant, SFFD, retired**

**Michael Ryan, Battalion Chief, SFFD, retired**

**Patrick G. Ryan, Inspector, SFFD, retired**

**George Saribalis, Lieutenant, SFFD, retired**

**Reid Sheridan, Captain, SFFD, retired**

**William Shore, Captain, SFFD, retired**

**John B. Skance, Firefighter, SFFD, retired**

**Dominic Spinetta, Battalion Chief, SFFD, retired**

**Charles L. Terry, Aide to Chief of Department, SFFD, retired**

**Frank Treanor, Battalion Chief, SFFD, retired**

**Mario Trevino, Chief of Department, SFFD, retired**

**Terry Wallace, Inspector, SFFD, retired**

**Michael A. Walsh, Captain, SFFD, retired**

**W. Urie Walsh, Firefighter, SFFD, retired (68)**

What the Public Utilities Commission  
Doesn't Want You to Know About Fighting Fires  
Following the Next Big Bay Area  
Earthquake



*SAN FRANCISCO-1906*

"San Francisco -- 1906. Overview of San Francisco before the earthquake and fire of April 1906." This photo dates to just one day before the disaster.



**“ A visitor to the immigration station recently wrote in our comment book, ‘History must be known, Even the darkest sides. Knowledge enriches us and gives the advantage of not making the same mistakes twice.’”**

- Buck Gee, President, Board of Directors, Angel Island Immigration Station Foundation



**20.** Ruins of San Francisco, Nob Hill in foreground, viewed from the Lawrence Captive Airs 1,500 feet on May 29, 1906, 41 days after the disaster. #

## San Francisco Hydrants- distinguishing colors



One of 9,000 low pressure hydrants, fed by the domestic water mains, which also have service connections into every building in SF. Engineers tell us that during a major earthquake tens of thousands of these service connections will break. This will result in insufficient pressure in the mains and render the low pressure hydrant system highly inadequate, if not useless, for fighting the multiple conflagrations we must expect.



One of the 1,500 high pressure hydrants of the Auxiliary Water Supply System (AWSS), fed by the Twin Peaks reservoir, the two salt water pump stations , and the fireboats. Most were installed between 1909 and 1913. The system is highly regarded by engineers for its innovative design and great efficiency, but presently it does not serve most of the Richmond, Sunset, or the Bayview Districts, where hundreds of blocks of wood-frame houses present a huge conflagration potential.

## **The SFPUC's Plan for Post-Earthquake Firefighting: Not Based on Reality**

### *-Executive Summary-*

Since 2010, when the Auxiliary Water Supply System (AWSS) of high-pressure, high volume hydrants was taken away from the SFFD and put under the SFPUC, this latter department has largely ignored the intent of the San Francisco voters, expressed in the passage the 2010 and 2014 ESER Bonds. Instead of expanding the System to the fifteen neighborhoods where it has never existed, using the unlimited supply of seawater that exists on three sides of the City and for which the AWSS was logically designed, the SFPUC now plans a two-neighborhood pseudo-firefighting system, using our limited supply of drinking water from the north basin of Sunset Reservoir. However, this plan is not based on rational firefighting requirements.

(1) This “potable AWSS” would exist in only two of the fifteen currently unprotected neighborhoods, and although the Richmond/Sunset pipeline the SFPUC proposes would require at least 30 AWSS hydrants, the discharge rate of this system (14,000 gallons per minute) would supply only three hydrants at full capacity. Given that their own engineering consultant estimates 20 simultaneous post-earthquake fires in these two neighborhoods, this plan supposes that the SFFD will be able to fight 20 fires using only three hydrants. Clearly, this would be impossible.

(2) Sunset Reservoir is one of three City “terminal reservoirs” in which the water is jointly owned with S. F.’s 27 wholesale water customer cities on the Peninsula. Both the State Water Code and minutes of past SFPUC meetings confirm that during a regional disaster the water in these reservoirs must be “shared equitably” with these other cities. According to a statement by the General Manager of the Bay Area Water Supply and Conservation Agency, only 1/3 of this water belongs to San Francisco. A former General Manager of the S. F. Water Department confirmed that, during a disaster, San Francisco might thus be left with as little as 86 million gallons of drinking water, less than a 1 day supply, in all its reservoirs combined.

(3) The SFPUC claims that following a M7.8 earthquake (30 times more powerful than the 1989 Loma Prieta earthquake) Sunset Reservoir can be refilled “within 24 hours”, despite the fact that Hetch Hetchy’s transmission mains to the City cross three major Bay Area earthquake faults and then parallel the San Andreas Fault for 25 miles along the Peninsula. Not only is their claim mere speculation, it is also of no consequence in terms of supplying water for firefighting. Once the initial supply of water to the hydrants runs out, the fires will not wait for the reservoir to be refilled before overtaking the fire lines and consuming our dense wood-frame neighborhoods. The only effective way to combat post-earthquake fires is to use the inexhaustible supply of seawater that exists on three sides of the City.

(4) In the attached report two retired SFFD Chiefs, who have a combined 67 years of firefighting experience, review the SFPUC’s various proposals, for water for post-earthquake firefighting, put forth since 2010. They explain why the SFFD will not be able to use our drinking water supply to effectively contain post-earthquake fires.

*Documentation of all information contained in this report is available upon request.*



**A History of SFPUC Proposals for Water to Fight Post-Earthquake  
Conflagrations in Currently Unprotected Neighborhoods,  
2010-2019, and Conclusions that Must be Drawn Therefrom**

**-Frank T. Blackburn, Assistant Chief, SFFD, Retired-  
-Thomas W. Doudiet, Assistant Deputy Chief, SFFD, Retired-  
March 23, 2019**

- In 2010, after 97 years of SFFD ownership, Mayor Newsom transferred the Auxiliary Water Supply System (AWSS) from the SFFD to the SFPUC.
- A 2010 ballot argument by the San Francisco Democratic Party stated that passage of the Proposition B Earthquake Safety and Emergency Response (ESER) Bond would *“ensure that residents throughout the City would have an emergency water supply for fire protection”* and *“ensure that high-pressure water is available to fight fires and save lives.”*
- In 2014 a second ESER Bond was on the ballot and at the same time **the SFPUC website showed a map illustrating that a full extension of the AWSS was recommended to protect the western and southern neighborhoods**, in which this high-pressure, high-volume firefighting system has never existed.
- When hired engineering consultants AECOM told the SFPUC that the estimated cost of the recommended AWSS extension to the western and southern neighborhoods was \$600 million, the SFPUC told AECOM, **“That’s not going to happen,”** (per Ann Symonds, AECOM engineer, quoted in the *Richmond Review*, November 2017.) According to an email from John Scarpulla, a spokesman for the SFPUC, such decisions are made by an ad hoc group of four people calling themselves as the “Management Oversight Committee”, that determines how capital bond money is expended in relation to the Auxiliary Water Supply System. The four people are: Harlan Kelly, General Manager of the SFPUC; Fire Chief Joanne Hayes-White; Steve Ritchie of the S. F. Water Department; and Mohammed Nuru, Director of DPW. This group has no regular meeting schedule, gives no public notice of its meetings, is not subject to public review, and is not obligated to hear public comment. In other words, everything is decided in secret and behind closed doors.
- In 2016 **representatives of the Water Department (SFPUC) and the SFFD Command Staff told the Board of Supervisors Government Audit and Oversight Committee that**, after careful deliberation, they had jointly concluded that **there was no need to extend the AWSS into the currently unprotected neighborhoods**, and no need to maintain the existing inventory of spare parts for the AWSS hydrants and pipes, because they could instead use ESER Bond money to buy many miles of huge diameter hoses which could theoretically be quickly deployed to fight post-earthquake

fires. They further suggested that the flat-bed trucks that would be used to deploy this hose could be driven by NERT volunteers. Fortunately, members of the Board of Supervisors saw the absurdity of this scheme and expressed their well-founded skepticism. As a result, the plan was dropped.

- In 2017 the SFPUC first proposed using Sunset Reservoir to supply potable water (“co-benefit” pipeline) high-pressure hydrants in a skeleton loop in the Outer Sunset and as far north as Cabrillo Street in the Outer Richmond, which would still have left most of the homes and businesses in these neighborhoods, and all of Sea Cliff, unprotected. When the glaring inadequacy of this proposal was pointed out to them, it was dropped.
- In a December 2017 response to a November 2017 article, that appeared in 10 neighborhood newspapers and was critical of the SFPUC’s handling of the AWSS expansion issue, the heads of the SFPUC, the SFFD, and the DPW jointly stated, “The Auxiliary Water Supply System ... is vital for the protection against the loss of life, homes and businesses during multi-alarm fires”. Presumably, they would include post-earthquake conflagrations in the category of multi-alarm fires.
- In January 2018, Fire Chief Joanne Hayes-White and PUC General Manager Harlan Kelly forwarded to the Board of Supervisors a report entitled “Westside Emergency Firefighting Water System Options Analysis” which included a critique by the SFPUC’s leading AWSS engineering consultant, Dr. Charles Scawthorn. In that critique of the PUC’s report Professor Scawthorn stated the following observation when discussing water sources for post-earthquake firefighting:

**“The Pacific Ocean: it was ironic that San Francisco burnt for three days due to lack of firefighting water, when it is surrounded on three sides by the largest body of water on earth. Construction of a West Side Salt Water Pump Station (WSSWPS) would be very beneficial and eliminate the need for using the potable water in Sunset Reservoir, a precious resource particularly following a major earthquake.”**

Given the clarity of vision expressed in this statement, especially considering that the Fire Chief and the General Manager of the SFPUC wrote the cover letter (1/17/2018) under which this report was forwarded to the Board of Supervisors, it would seem that the SFFD and the SFPUC would find it necessary to incorporate new salt water pump stations into their post-earthquake firefighting plan. However, this was not the case.

- **This report indicated that the plan to be adopted would ignore Dr. Scawthorn’s exceptionally clear statement**, and instead would use an expanded version (designated “Option 12”) of the 2017 potable “co-benefit”

pipeline proposal, and it changed the terminology to “Potable AWSS”. This would have covered more of the Outer Sunset and as far north as Anza Street (in later drawings it was moved to California Street) in the Outer Richmond, but would still leave large areas of both neighborhoods, and all of Sea Cliff, unprotected. Unfortunately, seemingly oblivious to the previous quote on the extreme benefits of building a West Side Salt Water Pump Station, “Option 12” still called for the north basin of Sunset Reservoir to be the only source of water for the plan for the Outer Richmond and Outer Sunset.

- In a front page article in the November 2018 issue of the *Westside Observer* it was disclosed that under State Water Code Section 73503 the water in the three terminal San Francisco reservoirs (Sunset, Merced Manor, and University Mound) is jointly owned by the City and 27 “wholesale water customers” (cities on the Peninsula) and that when a regional disaster occurs the City is legally obligated to share this water “equitably” with these Peninsula cities. As stated in the August 12, 2003 minutes of the San Francisco Public Utilities Commission by the General Manager of the Bay Area Water Supply and Conservation Agency (BAWSCA), **of the 327 million gallons in the three terminal reservoirs (which is 79% of all the water in all San Francisco municipal reservoirs) only 1/3 actually belongs to San Francisco.** Statements from these same SFPUC minutes, by both SFPUC staff and Commissioners, confirm that due to the mandate of the State Water Code, after a major earthquake the City could have as little as 86 million gallons (less than a one-day supply) left in its reservoirs, due to the requirement of back-flowing jointly-owned water down to the Peninsula cities. **(A 2003 Civil Grand Jury report cited these same alarming limitations and called for the expansion of the saltwater AWSS.)** These facts, although known, acknowledged, and recorded in the minutes of the SFPUC fifteen years ago, have never been disclosed in any public discussion of their proposals to use Sunset Reservoir as the sole source of supply for a “potable AWSS” firefighting system in the Outer Richmond and Outer Sunset Districts.
- A consistent response by the SFPUC to the ongoing criticism that Sunset Reservoir, as a sole and limited source of water for post-earthquake firefighting in the western neighborhoods, has been that “the Reservoir can be refilled within 24 hours.” This, of course, is predicated on the belief that **the 167-mile long Hetch-Hetchy transmission mains** will survive the M7.8 earthquake, on which the SFPUC predicates its plan, with no interruption in water supply. However, these **transmission mains cross three major Bay Area earthquake faults** (Greenville, Calaveras, and Hayward), and then cross under the Bay, **before running in close proximity to the San Andreas Fault for 25 miles** up the Peninsula, finally emptying into the three terminal reservoirs (of which Sunset is one). Recall that a M7.8 earthquake is approximately 30 times more powerful than the Loma Prieta earthquake in

1989. **Therefore, the SFPUC's contention that "the reservoir can be refilled within 24 hours" is not fact, but merely speculation. The reliability of a system for post-earthquake firefighting cannot be based on speculation.**

- The SFPUC has based its AWSS proposals on a M7.8 earthquake in the Bay Area. The October 1989 Loma Prieta (M6.9) earthquake resulted in 27 fires in San Francisco. One of the SFPUC's primary AWSS engineering consultants, Dr. Charles Scawthorn, has written that a M7.8 earthquake (approximately 30 times more powerful than a M6.9) would produce between 70 and 120 essentially simultaneous fires in San Francisco. **Geographically, the Outer Richmond and Outer Sunset comprise about 1/3 of the City**, and the buildings are made of wood, with no space between them. Factoring in the prevailing winds off the Pacific Ocean, this constitutes a huge conflagration potential. **It is reasonable to assume that, following a M7.8 earthquake these two neighborhoods might have 20 to 30 simultaneous fires, based on Dr. Scawthorn's prediction of post-earthquake fires citywide.** Without acknowledging the large number of fires that must logically be anticipated, the SFPUC continued to insist that the limited supply of potable water from the north basin of Sunset Reservoir would be sufficient to fight conflagrations in the outer Richmond and Sunset Districts. However, neither the SFPUC nor the SFFD had any logical basis or empirical evidence for making this assumption. Indeed, at the designed rate of discharge for the system they proposed (14,000 gallons per minute capacity), only three AWSS hydrants (4,500 gallons per minute capacity) could be fully supplied. **Absurdly, under their "potable AWSS" scheme, this presumed that the SFFD could fight 20 to 30 simultaneous fires with only enough water to supply three AWSS hydrants.**
- By the beginning of 2019, the SFPUC had apparently realized that the water in the north basin of Sunset Reservoir would not be sufficient to control post-earthquake fires in the Outer Richmond and Outer Sunset Districts. An article in the February 2019 *Richmond Review/Sunset Beacon* revealed that they were then proposing that a dedicated AWSS pump station for (non-potable water) be built at Lake Merced and a that 42-inch diameter pipeline would be incorporated into the AWSS for these two districts, and it would join into what had previously been the southernmost east-west "potable AWSS" pipeline from Sunset Reservoir at approximately 33rd Avenue and Ulloa Street. No information was offered in regard to how the non-potable water from Lake Merced would affect the potable water mains that had previously been the only pipes in their plan.
- In recognizing that post-earthquake firefighting will require an enormous amount of water, far in excess of that which would be available from the north basin of Sunset Reservoir alone, and perhaps also recognizing that

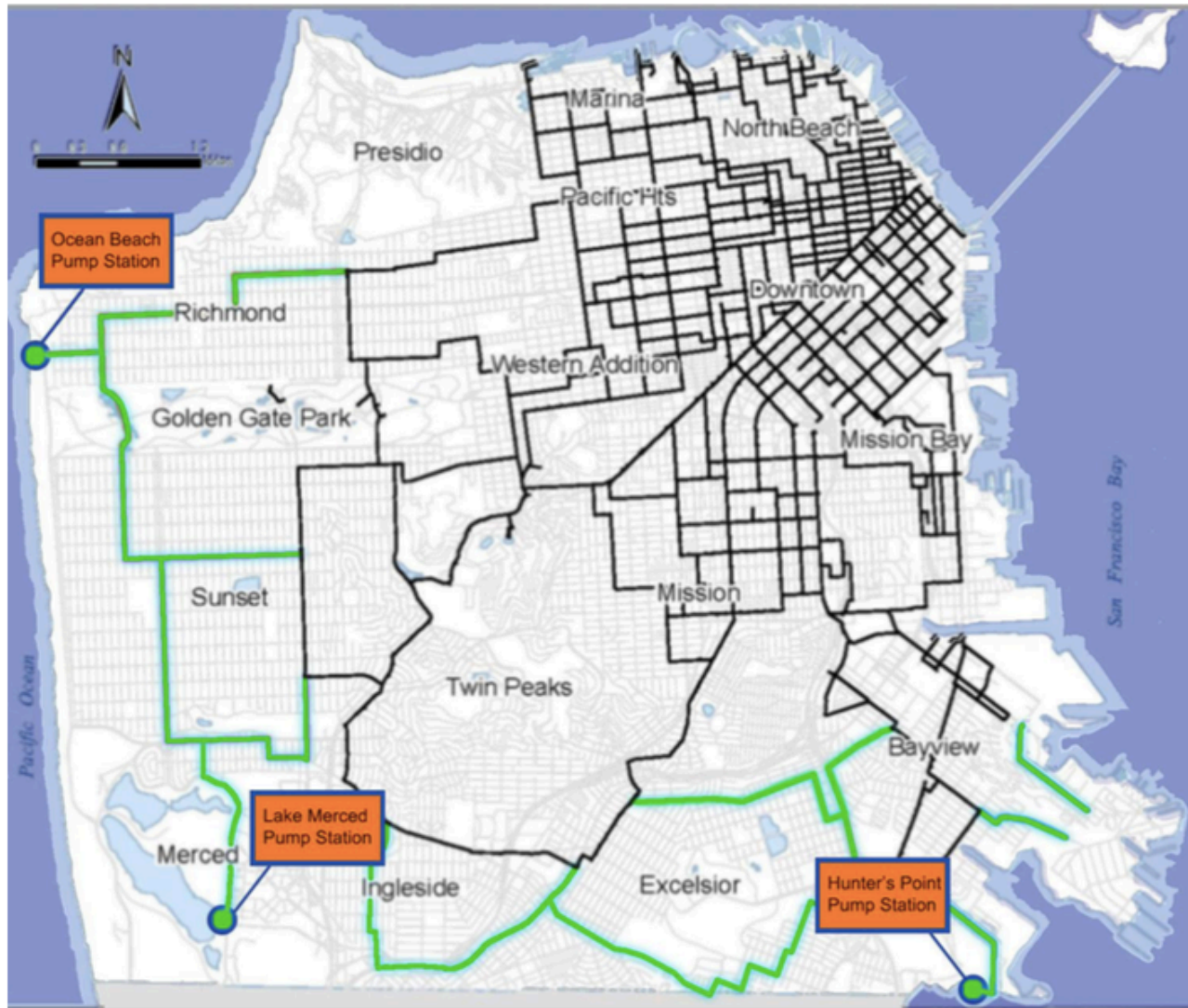
there is a possibility that the Hetch-Hetchy transmission mains might not survive a M7.8 earthquake without damage, **by incorporating the water from Lake Merced (estimated at between 1.2 and 1.9 billion gallons) into the plan, the SFPUC inadvertently brought forth the question of just how significant the water in the Reservoir is for post-earthquake firefighting when compared to the amount of water in Lake Merced.** Even taking the low-end figure of 1.2 billion gallons for Lake Merced, the water that might be available from the north basin of the Reservoir after the State Water Code “equitable sharing” mandate is met, equals an insignificant 2.5% compared to the water in the Lake. Therefore, the obvious question becomes: Does it make any sense at all for us to use our drinking water – our *“precious resource particularly following a major earthquake”* - to fight fires? The answer becomes even more obvious in light of the SFPUC’s engineering consultant’s quote on the benefit of having a West Side Salt Water Pump Station. **Clearly, while the drinking water from Sunset Reservoir is insignificant when compared to the water in Lake Merced, it completely meaningless when compared to the literally inexhaustible water supply from “the largest body of water on earth” – the Pacific Ocean - which is the only source of water that will be adequate to fight post-earthquake fires in all 15 of the currently unprotected neighborhoods.**

- In summary, **since 2016**, when they publicly abandoned the plan recommended by their hired engineering consultants to fully extend the AWSS to all currently unprotected neighborhoods, **the SFPUC has careened from one, often bizarre, piecemeal proposal to another, and has omitted from all public discussion accurate information on the volume of potable water that will be available in the City following a major earthquake. All this has been part of a consistent and concerted effort to avoid an actual extension of the AWSS to the unprotected neighborhoods using the City’s unlimited supply of seawater.** Instead, the SFPUC has attempted to rationalize the use of ESER Bond funds to help pay for reinforced municipal water mains, which clearly will be inadequate to fight post-earthquake conflagrations in the outlying neighborhoods.
- **Nine years after acquiring the AWSS from the SFFD, the SFPUC has failed to advance a comprehensive and technically sound plan to provide an unlimited volume high-pressure source of water for fighting post-earthquake fires in the fifteen currently unprotected neighborhoods.** This egregious failure continues, despite the facts that: **(1) an unlimited supply of ocean and bay water exists on three sides of the City**, literally adjacent to the currently unprotected western and southern neighborhoods; and **(2) the existing AWSS has used the Bay as its primary source of firefighting water since 1913**, and therefore one must assume the required engineering is neither exotic nor mysterious.

- San Francisco is situated directly above a tectonic time bomb at the junction of the North American and Pacific plates, manifested in eight major Bay Area earthquake faults. **The list of inadequate proposals put forth by the SFPUC over the last four years clearly indicates that they have: (1) a dangerous lack of understanding of this geologic fact; (2) no comprehension of the danger that a huge number of simultaneous post-earthquake fires portends; (3) no sense of urgency about providing adequate fire protection to fifteen S. F. neighborhoods that lack AWSS hydrants; (4) no awareness of the tremendous volume of water that is required to defeat the radiated heat (often exceeding 2,500 degrees at ground level) produced during a conflagration; and (5) no appreciation of the speed with which an urban conflagration in wood frame buildings progresses from block to block.**
- At this juncture, it has become apparent that the only entity in the City that can halt the obvious ineptitude displayed by the SFPUC in regard to the future of the AWSS, and hence save the City from inevitable destruction by fire following a large earthquake, is the Mayor (who is also a former Fire Commissioner). The residents of San Francisco must now call upon the Mayor to make a rational, fact-based and forward-looking decision to take the lead in reasserting the long-recognized need to extend the unlimited water supply AWSS to all fifteen of the western and southern neighborhoods.
- The Auxiliary Water Supply System (AWSS) Study (1/23/2009)** conducted by the firm Metcalf and Eddy for the Capital Planning Committee, which represented “significant effort by many staff in San Francisco’s Capital Planning Program, Department of Public Works, Fire Department and Public Utilities Commission,” was a comprehensive and responsible analysis of the condition of the AWSS and the need for its expansion into currently unprotected areas of the City. **The recommendations for AWSS pipeline extensions contained in that report, plus three additional pump stations for non-potable water (at Ocean Beach, Lake Merced and Hunters Point) which the report did not include, should become the basis for establishing a coherent post-earthquake firefighting capability in the outer neighborhoods**
- The SFPUC continues to assert that it would be impossibly difficult to construct AWSS salt water pump stations at Hunters Point and Ocean Beach, which are absolutely necessary to provide adequate emergency water supplies for post-earthquake firefighting in the fifteen currently unprotected neighborhoods. **They choose to ignore the fact that two salt water pump stations have been the primary source of water for the existing AWSS since 1913, as if the public can be made to believe that what could be accomplished over a hundred years ago is somehow impossible today.** Also, the public has been told that “erosion” would be a problem if a salt

water pump station is constructed at Ocean Beach, in spite of the fact that so much sand accumulates on the beach near the end of Balboa Street (the most logical place for the needed AWSS pump station) that it periodically has to be trucked down to the south end of the beach and deposited near the zoo, as was again done only last year. **Thus, erosion is apparently not a problem after all.**

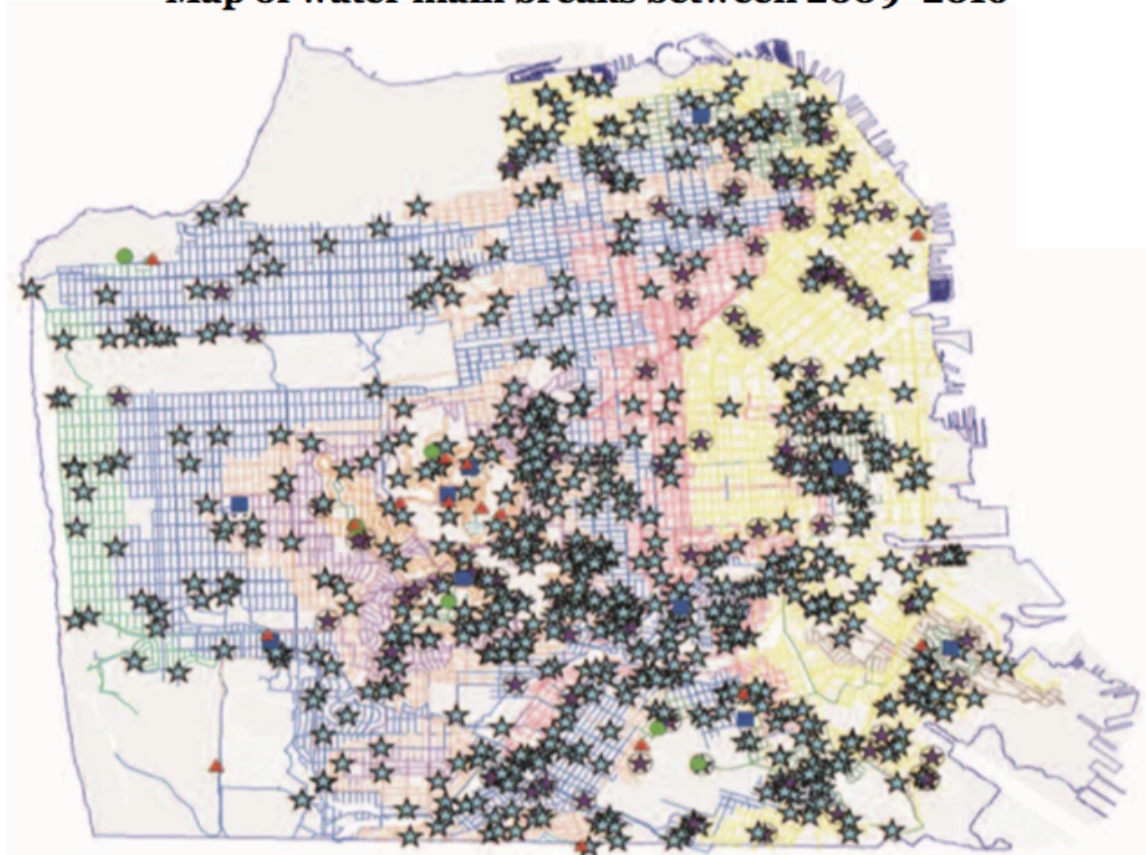
- Further, the SPUC has stated that the Coastal Commission is unlikely to approve a saltwater AWSS pump station for Ocean Beach, despite the fact that this entity has approved a multitude of underground projects under Great Highway in recent decades, including the Richmond Transport/Storage (sewer) System that runs from under Sea Cliff to the south end of Lake Merced and includes a ten foot diameter pipe that runs for over 2,000 feet and has four outfalls into the ocean. By comparison, a six foot diameter intake tunnel, taking water **from** the ocean (for the AWSS saltwater pump station) should be minimally intrusive from the perspective of the integrity of the coast. **The SFPUC's insistence that such a project could not be approved appears to be another tactic to avoid a comprehensive AWSS expansion to the outlying neighborhoods, like the "erosion problem" cited above.**
- **If a comprehensive expansion of the AWSS into the fifteen currently unprotected neighborhoods, using the unlimited supply of seawater that surrounds San Francisco, is not accomplished before the next great Bay Area earthquake strikes, hundreds of square blocks of the City will be destroyed by fire and countless residents, trapped in collapsed buildings, will burn to death.** The SFPUC is clearly not willing to provide the water necessary for the level of fire protection needed to prevent such a disaster.
- **The result of attempting to use drinking water to fight post-earthquake fires, instead of the inexhaustible supply of seawater that is readily available on three sides of the City and which the existing AWSS is designed to use, will inevitably be this: in San Francisco lives and property will be lost on an unimaginable scale to post-earthquake firestorms, and much of the City's tax base will be destroyed, for as long (perhaps decades) as it takes the City to be rebuilt. Unfortunately, these facts, based on history, the geology of the Bay Area, and basic mathematics cannot be altered by the magical thinking of City officials who refuse to deal with reality of the conditions that will result from a M7.9 earthquake.**



This map shows the existing AWSS (black lines) and the necessary extensions (green) into the currently unprotected neighborhoods, as recommended by the 2009 study done for the Capital Bond Committee by the engineering firm of Metcalf & Eddy. The study did not include the three non-potable water pump stations (Ocean Beach, Lake Merced, and Hunter's Point) that will be required to provide the necessary pressure and volume to serve the hydrants along the pipelines in the western and southern neighborhoods. During the 2010 and 2014 ESER Bond campaigns, the voters were led to believe that these extensions of the existing AWSS would take place as a result of the passage of these and subsequent ESER bonds. Following the passage of the 2014 Bond, the SFPUC, without seeking public input, abandoned this plan.

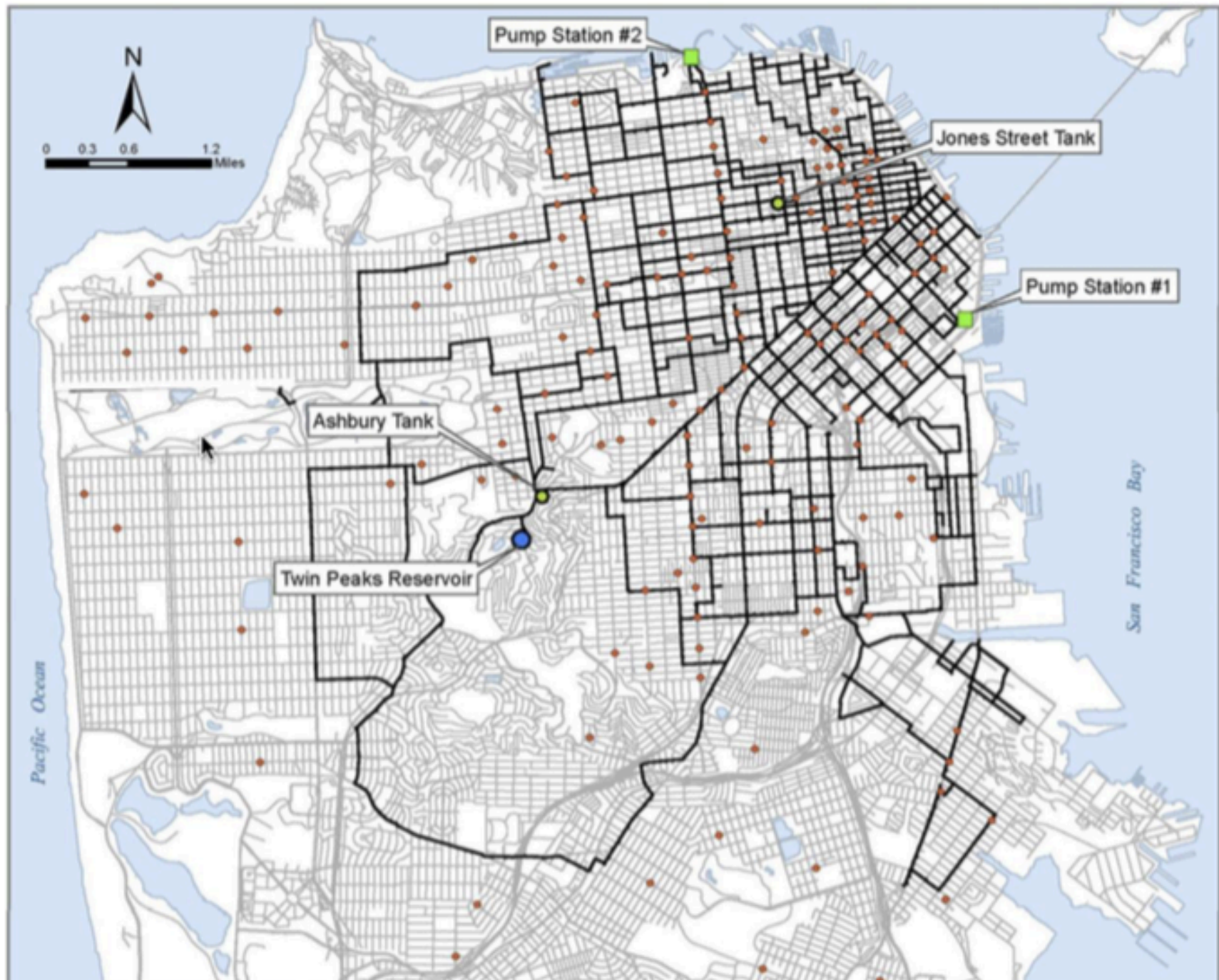


### Map of water main breaks between 2009- 2016

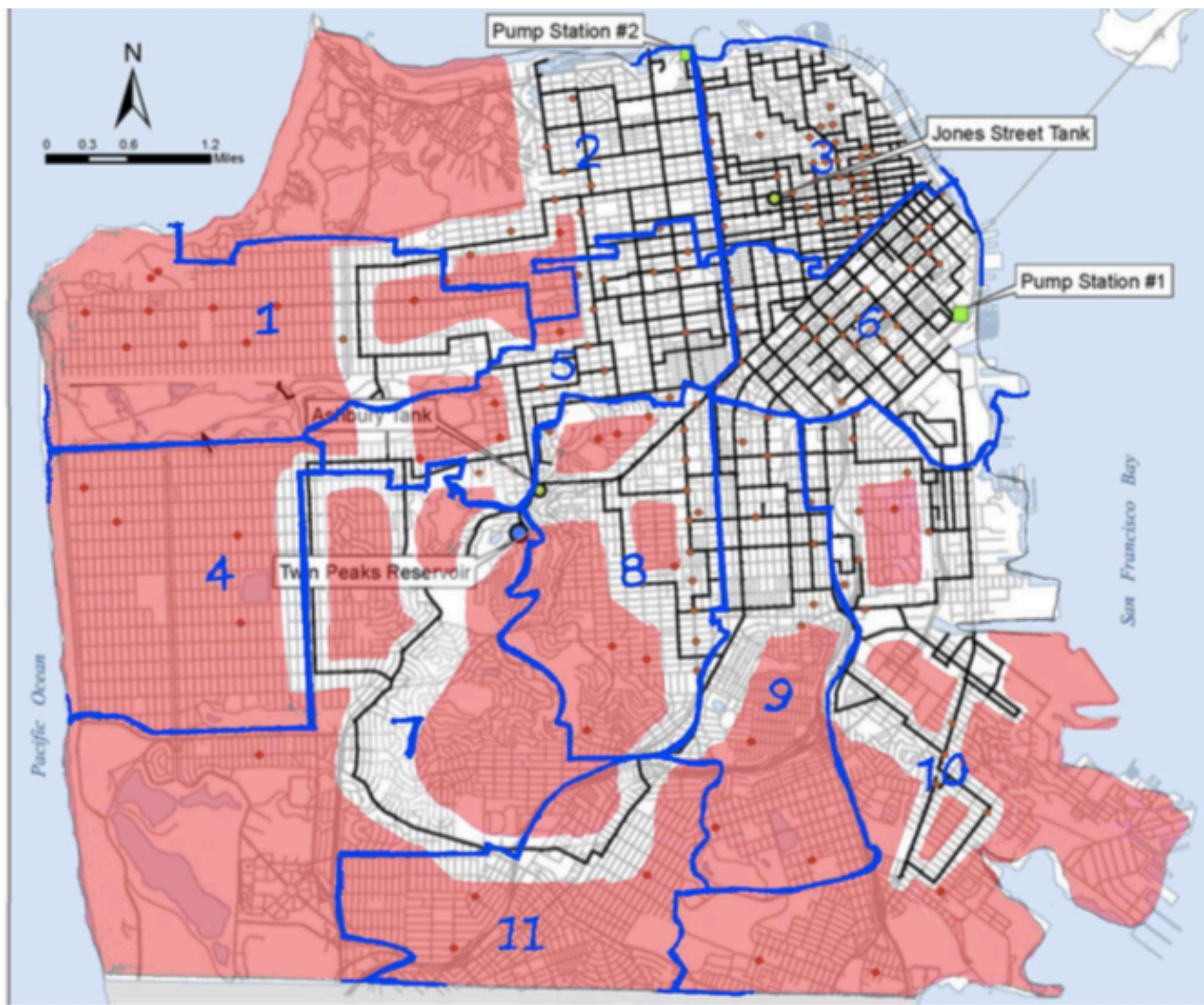


This shows the number of municipal water main breaks in the City over a seven year period, **in the absence of any major earthquakes**. This underscores the vulnerability of the potable water system to catastrophic failure following a major earthquake and explains why the low-pressure hydrant system, which is supplied solely by these municipal water mains, cannot be relied upon for fire fighting after such an event occurs.

# Existing Auxiliary Water Supply System



**Supervisory Districts areas of the City NOT PROTECTED by the current AWSS.**



**An expansion to all 15 neighborhoods will require an unlimited supply of water from the Pacific Ocean.**

**The SFPUC prefers a piecemeal approach and, after nine years of AWSS ownership, has no plan for almost one third of the City.**



**CITY AND COUNTY OF SAN FRANCISCO  
2018-2019 CIVIL GRAND JURY**

**ACT NOW BEFORE IT IS TOO LATE:  
AGGRESSIVELY EXPAND AND ENHANCE  
OUR HIGH-PRESSURE EMERGENCY  
FIREFIGHTING WATER SYSTEM**



“During 2018-2019, for the second time in this century, the San Francisco Civil Grand Jury has issued a report assessing the danger of post-earthquake firestorms to the western and southern neighborhoods of San Francisco that have no Auxiliary Water Supply System high-pressure hydrants. The Executive Summary of their findings and recommendations can be read on the next screen. Access the full report at:

<http://civilgrandjury.sfgov.org/report.html>. “

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## EXECUTIVE SUMMARY

San Francisco is one of the most vulnerable cities in the world, and certainly in the United States, to the risk of fire following an earthquake. In 1906, the City suffered tremendous destruction and devastation from the fires that followed a major earthquake. Over 3,000 people died and approximately 28,000 buildings were destroyed. In 1995, the 6.9-magnitude Kobe, Japan earthquake ignited over 100 fires, with several large conflagrations and major fire damage. We know the question is when, not if, another major earthquake will strike San Francisco and ignite numerous fires.

The Civil Grand Jury believes it is essential that we take prompt and aggressive action to expand and enhance our defenses against the inevitable fires following an earthquake before it is too late. All parts of the City – north and south, east and west, rich and poor, downtown and residential neighborhoods – deserve to be well protected against this catastrophic risk.

Today, the City has a seismically safe high-pressure Auxiliary Water Supply System (AWSS) – separate and distinct from the low-pressure municipal water supply system (MWSS) – that provides excellent firefighting protection to parts of the City. However, large parts of the City, such as the outer Richmond, outer Sunset, and Bayview/Hunters Point, among others, do not have a high-pressure AWSS and are not nearly as well protected.

Plans to develop a seismically safe high-pressure AWSS for the western portions of our City are now moving forward. But even though City leaders have known about this issue for decades, the City still does not have concrete plans or a timeline to provide a more robust emergency firefighting water supply for all parts of the City that need one.

In 2014, the U.S. Geological Survey (USGS) estimated there is a 72 percent chance of one or more magnitude 6.7 or greater earthquakes striking the Bay Area between 2014 and 2043. Earlier this year Mayor London Breed announced that planning for such a disaster is a priority. But at our current pace and funding levels, expansion of a high-pressure AWSS to currently unserved parts of the City will not be completed for another thirty-five (35) years or more—well after the USGS predicts we will be struck by one or more major earthquakes.

The Civil Grand Jury makes the following recommendations, among others which are more fully discussed herein:

- The City should be prepared to fight fires in all parts of the City in the event of a repeat of a 1906 size earthquake;
- The City should aggressively develop a high-pressure, multi-sourced, seismically safe emergency water supply for those parts of the City that don't currently have one, with a target completion date of no later than 2034;
- As an interim measure, the City should immediately replace and expand its inventory of Portable Water Supply System (PWSS) hose tenders, which are comparatively cheap, can be acquired much more quickly than the high-pressure AWSS, and were essential in fighting the 1989 Loma Prieta fire, but are now past their useful life;
- The new PWSS hose tenders should be strategically placed in those areas of the City that do not have a high-pressure, multi-sourced, seismically safe emergency water supply.

## **Business as Usual: City Agencies Will Ignore the Civil Grand Jury's Call for Quick Action to Expand the City's Auxiliary Water Supply System**

By: Frank T. Blackburn, Assistant Chief, SFFD, Retired and Thomas W. Doudiet, Assistant Deputy Chief, SFFD, Retired

The Report of the Civil Grand Jury (July 2019), "*Act Now Before It Is Too Late: Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water System*", should be given the prompt attention of the various City agencies named as respondents. These include the Mayor, the Fire Commissioners, the Fire Chief, and the Public Utilities Commission. That the issue of the citywide expansion of the Auxiliary Water Supply System (AWSS) of high-pressure, high volume hydrants has been unresolved for many decades is an egregious example of dereliction of duty by multiple agencies of the City. Continual postponement of this expansion will result in the destruction by fire of at least half of the City following the next great Bay Area earthquake. The two most essential conclusions of the report are: (1) the AWSS must be expanded to protect all San Francisco neighborhoods; and (2) time is of the essence.

In their answer to the Grand Jury's finding that the AWSS expansion must be accomplished as soon as possible (since we don't know when the "Big One" will strike, but we do know that in 15 San Francisco neighborhoods there will be no water for the SFFD to use to fight the multiple fires that experts tell us are sure to merge into conflagrations) responding City agencies state the following:

**"As the City considers what is essential to protect San Francisco, it is important to acknowledge our multiple, complex resilience challenges.** These challenges are documented in the Resilient SF strategy (2016) and underlie the strategic efforts of our capital investments as represented in the 10-Year Capital Plan (last updated 2019).

**These challenges are: Earthquakes, Sea Level Rise/Climate Change, Aging Infrastructure, Unaffordability, and Social Inequity.** All of these challenges represent meaningful threats to San Franciscans, their property, and their ability to make a life in the city. **In making decisions about priority investments, San Francisco must keep an eye on all of these challenges, identify the areas of greatest need across them, and make progress on all fronts simultaneously."** [Emphasis added].

**Translation:** All these issues are of vital importance to the quality of life in San Francisco and all must be prioritized when we consider how to spend our public funds, so the AWSS expansion has to fall in line and wait for occasional funding through the Capital Bond process.

Therefore, the responsible City agencies will ignore the Grand Jury's call to rapidly implement a citywide AWSS expansion. Instead serial hybrid, piecemeal, neighborhood by neighborhood mini-expansions will take place using Capital Bond funds as follows: 2020, 2027, 2033, and so on out to 2049. So much for the Grand Jury's call for a complete build-out into all currently unprotected neighborhoods by 2034. Oh, and it gets better – the PUC will be using our Earthquake Safety and Emergency Response Bond funds to build reinforced municipal water mains, not dedicated high-pressure, high-volume AWSS mains using the unlimited supply of seawater that surrounds the City on three sides, and which the existing AWSS has used quite successfully since 1913.

The agenda of the SFPUC is not to provide a system having an inexhaustible supply of water, which is the only plausible means by which the SFFD will be able to control post-earthquake fires, but rather to use Earthquake Bond money to slowly replace their antiquated and fragile drinking water mains. That's why the citywide expansion of the AWSS can't be completed before mid-century – the SFPUC needs to hijack the earthquake bond money slowly, and relegating the AWSS expansion to piecemeal occasional funding, instead of one large dedicated funding source for a comprehensive expansion, will surreptitiously facilitate their agenda. If the "Big One" hits before the piecemeal expansion using drinking water is complete, oh well!

It is ironic that a single bond issue, passed by the voters in 1907, to design and build the original AWSS led to the installation of Twin Peaks Reservoir, 77 miles of high-pressure pipelines, two saltwater pump stations and 887 hydrants. The entire project was designed, completed and put in service in five years, and it is still in service 116 years later. In contrast, the SFPUC has had control of the AWSS for over nine years and no comprehensive expansion plan for the fifteen unprotected neighborhoods has yet to materialize. In fact, even though the Grand Jury has called for such a plan to be completed within a year, the SFPUC now has been given an additional year by the Board of Supervisors to "study the matter". If engineers over a

a hundred years ago, armed with only pencils, paper and slide rules could accomplish what they did in five years, how is it that our modern engineers can't at least copy what was done by 1913 and expand it into the outlying neighborhoods?

The simple answer is that providing a robust, dependable and inexhaustibly sourced high-pressure hydrant system made perfect sense to the engineers who had been eyewitnesses to the destruction of the City by fire in 1906. Their highest priority was to prevent this from ever happening again. The highest priority of the SFPUC seems to be using Earthquake Bond money to replace their decrepit drinking water mains, and telling the public that their substandard approach to expanding the AWSS will suffice when multiple simultaneous fires break out in the western and southern neighborhoods, assuming, of course that the next big earthquake will wait for them to finish their piecemeal projects sometime around 2049.

Hopefully at some future time someone can explain how San Francisco, "The City That Knows How", can get the \$1.7 billion funding to enable the construction of a subway tunnel from South of Market to Chinatown, or can undertake what is said will be a \$5 billion reconstruction of the seawall, but can't figure out how to fund perhaps a \$1 billion citywide expansion of the original AWSS, that will actually enable the SFFD to keep half the City from burning down following the next big earthquake, and save (conservatively) \$140 billion worth of residential housing that exists in the fifteen currently unprotected western and southern neighborhoods.

If 1% of the City's budget were allocated to the comprehensive expansion of the AWSS each year for the next ten years (a total of \$1.2 billion), the urgent recommendations of the Grand Jury could be accomplished, and the entire City would be protected using the inexhaustible supply of seawater that surrounds us (and is literally at the doorstep of those neighborhoods that currently lack protection). Moreover, if we had engineers of the caliber of those that existed in San Francisco a hundred years ago, who understood how post-earthquake fires will literally destroy, in a matter of a few days, a city largely constructed of wood, we could avoid having to learn the history of 1906 all over again, which we surely will if the City agencies are allowed to ignore the recent findings of the Civil Grand Jury.



## Hetch Hetchy Regional Water System Crosses Major Bay Area Earthquake Faults



This map shows that the Hetch Hetchy transmission mains that bring San Francisco's drinking water 167 miles from the Sierras cross three major Bay Area Earthquake faults (before crossing under the Bay) and closely parallel a fourth, the San Andreas Fault, before reaching three terminal reservoirs (Sunset, Merced Manor, and University Mound) in the southern areas of the City. Although the SFPUC states that following a major earthquake Sunset Reservoir "can be refilled within 24 hours," this is clearly not a statement of fact, but mere speculation. Does it make sense to bet the preservation of entire neighborhoods on such pipelines when the entire Pacific Ocean is immediately available for post earthquake firefighting?

### Bay Area Fault Lines



This more complete picture of the numerous Bay Area earthquake faults reveals that San Francisco is in the middle of a wide earthquake fault zone that straddles the intersection of two major tectonic plates, the North American Plate and the Pacific Plate. Thus, it cannot be said with any certainty that San Francisco's domestic water supply will not be interrupted by the next major earthquake. Any contention that we should depend on the domestic water supply for post earthquake firefighting is dangerously short sighted, especially when we have an unlimited supply of seawater on three sides of the City. This is why the City engineers of a century ago wisely chose to make seawater the primary water supply for the Auxiliary Water Supply System, and our last line of defense against post-earthquake conflagrations.

## Richmond District 2019



Feb 6, 2019, Geary Blvd & Parker Street, 1330 hours- gas main rupture. After almost three hours, PG&E was finally able to shut off the flow of gas that fed this fireball. **No AWSS hydrants were available in proximity to the fire.** The supply of water from the low-pressure hydrants in the immediate area of the fire was exceeded by the need to put multiple large streams of water between the fire and the immediately adjacent wood-frame building. It then became necessary for the SFFD to seek additional water from a different series of low-pressure mains several blocks from the fire. **Imagine the situation following a major earthquake with perhaps 50 gas-fueled fires Citywide and the low-pressure hydrant system inoperative due to multiple breaks in the municipal water mains.**

## Santa Rosa 2017



Neighborhood in Northern California recently destroyed by an uncontrolled urban conflagration, due to insufficient water supplies available in the hydrant system. In this case, the fires originated in adjacent rural areas and could not be stopped when they reached the residential area. In the case of post earthquake San Francisco, the fire will originate within the City, due to broken gas lines within buildings and compromised electrical wires, and will not be controlled in the absence of high volume, high pressure supplies of water from an inexhaustible source- the Pacific Ocean. The origins of the fires will be different, but the final result will be the same: only foundations and brick chimneys will remain.

## How Much Water Will Be Needed to Fight Post-Earthquake Fires?

Professor Charles Scawthorn, the SFPUC's leading engineering consultant in matters related to water for post-earthquake firefighting, has predicted that there will be between 70 and 120 simultaneous fires, distributed more or less randomly citywide following a M7.8 earthquake, on which the water plan for post-earthquake firefighting is modeled (a M7.8 is 30 times more powerful than the 1989 Loma Prieta earthquake).

Given that the fifteen neighborhoods that currently have no AWSS protection have 138,000 buildings, the majority of which are wood-frame, and that, geographically, they comprise about half the City, it not unreasonable to assume that there may be 35 to 60 simultaneous fires that will spread rapidly in these fifteen unprotected neighborhoods. **Assuming that the City follows a responsible course of action and completes a comprehensive expansion of AWSS mains and hydrants into these highly vulnerable neighborhoods,**

Question: How many gallons of water will be needed to fight between 35 and 60 simultaneous fires in these neighborhoods of wood-frame buildings?

Answer: The number of gallons that will be needed can't be determined.

Question: Why can't the specific number of gallons that will be needed be determined?

Answer: A multitude of variables are in play when this many fires develop simultaneously.

- The 35 to 60 fires are only the initial situation. Due to the limited number of firefighting units available citywide (43 engines and 19 trucks, only a portion of which will be available in this half of the City), many of these initial, individual fires will not be fought immediately, but will develop into larger fires, encompassing a number of buildings or an entire block, before the SFFD can get to the fire scene.
- The wind conditions at the time of the earthquake will be an important factor in the spread of fires.
- The larger each fire becomes before the SFFD can get to the scene and begin applying water, the more radiant heat will develop, which can lead to buildings on adjacent blocks spontaneously catching fire, even in the absence of wind.
- Therefore, it must be anticipated that not just a number of fires will have to be fought simultaneously, but that a number of conflagrations (firestorms) will have to be fought simultaneously before the post-earthquake fires are brought under control. This will require a continuous and inexhaustible amount of water.
- Thus, it is not possible to quantify that a certain number of gallons will be needed for post-earthquake firefighting, but it is possible to say that the unlimited (inexhaustible) amount of seawater that surrounds San Francisco will be adequate, whereas the use of our comparatively miniscule supply of drinking water to fight post-earthquake fires would be completely superfluous.

**The Pacific Ocean: it was ironic that San Francisco burnt for three days [1906] due to lack of firefighting water, when it is surrounded on three sides by the largest body of water on earth. Construction of a West Side Salt Water Pump Station (WSSWPS) would be very beneficial and eliminate the need for using the potable water in Sunset Reservoir, a precious resource particularly following a major earthquake. - Dr. Charles Scawthorn, (1/5/2018)**

## **Why Cisterns Won't Stop Post-Earthquake Fires**

We might be tempted to ask why the SFFD can't just use the 75,000 gallon cisterns that have been installed in many areas of the City to fight post-earthquake fires in the outlying neighborhoods?

Cisterns are a pre-20<sup>th</sup> Century technology that served as a partial solution to the threat of urban conflagrations before the technology to supply high-pressure, high-volume water to a hydrant system existed.

The problem with cisterns is that each requires two fire engines to use the water to fight a fire, one at the cistern to draw the water out and one at the scene of the fire to boost the pressure for hose streams. In the Outer Richmond and Outer Sunset, for example, the SFFD has a total of six fire engines, so the total number of fires that could be fought using cisterns as a water source in these two neighborhoods is three. With 20 or more post-earthquake fires in these two neighborhoods, as predicted by the SFPUC's expert, the other 17 (or more) would have to burn unchecked, eventually merging into conflagrations. Thus, the problem is not the number or capacity of cisterns, but the limited number of fire engines available.

However, despite a limited number of fire engines, with an inexhaustible water source for AWSS hydrants, and each hydrant capable of taking the place of three fire engines (in terms of pressure and volume), it is possible to control post-earthquake fires.

To: Hon. Dianne Feinstein, United States Senator  
San Francisco Mayor London Breed;  
Hon. Garrett L. Wong, Presiding Judge, San Francisco Superior Court  
Members of the San Francisco Fire Commission;  
Members of the San Francisco Board of Supervisors;  
Members of the San Francisco Public Utilities Commission;  
Editor, the *Richmond Review* and the *Sunset Beacon*;  
Editor, the *San Francisco Chronicle*;

In July 2019 the San Francisco Civil Grand Jury issued a report, "Act Now Before It Is Too Late: Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water Supply System". The two most important conclusions of that report were that in order to avoid the destruction of major areas of the city by firestorms following the next great Bay Area earthquake: (1) the high-pressure hydrant system, first put into service in 1913, must be expanded to cover all San Francisco neighborhoods; and (2) time is of the essence.

The current guardian of the high-pressure hydrant system, the S.F. Public Utilities Commission (SFPUC), has published plans to build a system in the outer Richmond and outer Sunset Districts that would use drinking water from the north basin of Sunset Reservoir as a primary source of water for this system, which would not be connected to the existing high-pressure hydrant system. Further, it has been indicated that subsequent expansions into other currently unprotected neighborhoods, which might take place in the future, would also use drinking water from municipal reservoirs. This plan is in stark contrast to the long-established use of the City's inexhaustible supply of seawater as the primary water supply in the existing high-pressure hydrant system.

The SFPUC's own expert engineering consultant, Dr. Charles Scawthorn, the world's leading scholar of the modeling of the spread of fire following earthquakes in modern urban settings, has predicted that between 70 and 120 fires will occur citywide following a M7.9 earthquake, the model on which the SFPUC has predicated its hydrant system expansion plans. Inasmuch as the SFFD has only 43 staffed fire engines stationed within the city limits, it is obvious that some of the predicted fires will burn unchecked for an indeterminate period of time, and therefore form into conflagrations, particularly in our numerous wood-frame residential neighborhoods, before the SFFD can respond. The result will be that the volume of water that will eventually be required in order to bring these firestorms under control will be incalculably large, and only an inexhaustible water source, such as the Pacific Ocean, will suffice.

In recognition of these facts, nineteen retired San Francisco Fire Department Chief Officers, who cumulatively represent more than 575 years of SFFD service, have jointly issued the following public statement relative to the current plans of the SFPUC to use drinking water in an expanded high-pressure hydrant system:

**"As retired San Francisco Fire Department Chief Officers, we believe that it is our responsibility to emphatically state the following: it is irrational to assume that drinking water from municipal reservoirs will be adequate to reliably supply a high-pressure, high-volume citywide hydrant system, like the Auxiliary Water Supply System, for fighting multiple simultaneous fires following a major Bay Area earthquake.**

The Hetch-Hetchy drinking water system crosses three major Bay Area earthquake faults and then closely parallels the San Andreas Fault for 25 miles along the Peninsula before reaching the City's three terminal reservoirs. To assume that it will remain completely intact following a M7.9 earthquake of unknowable epicenter or duration is a matter of mere conjecture. The reliability of the water supplied to the SFFD to fight post-earthquake fires cannot be left to chance. Given the realities of fighting urban conflagrations, the implementation of the SFPUC's misguided "PEFWS" (drinking water) plan may very well lead to the destruction by fire of entire San Francisco neighborhoods.

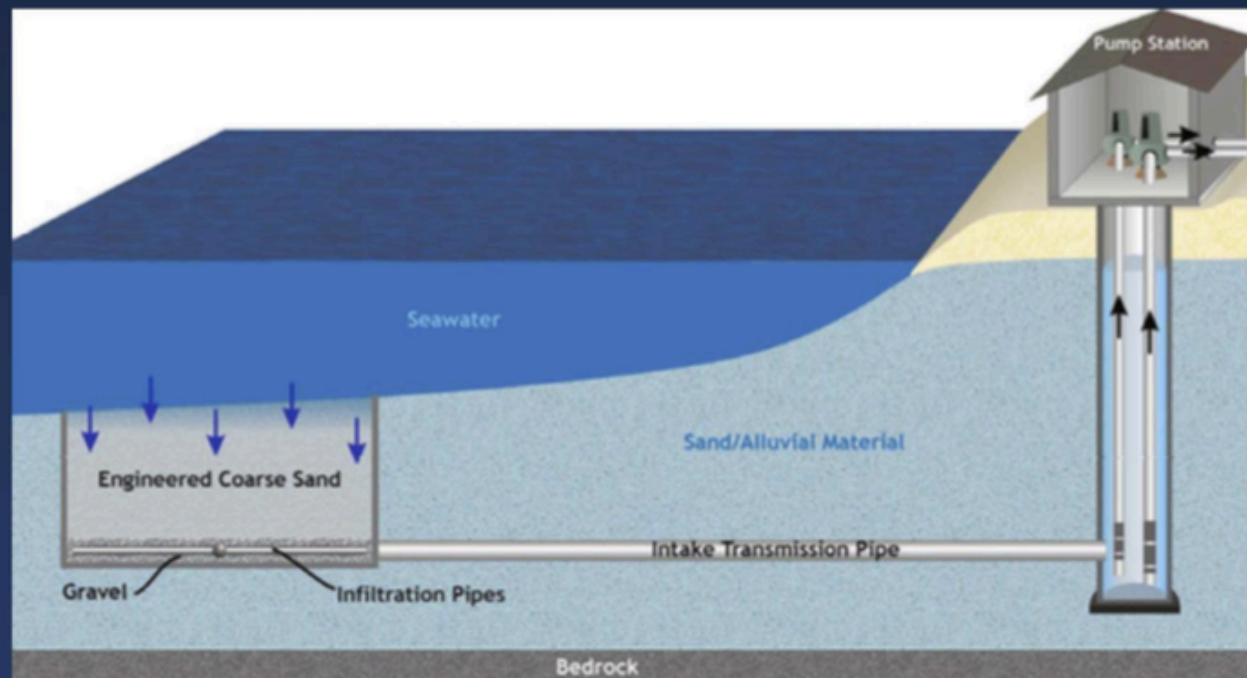
Based on our professional experience, we believe the only practical solution for supplying such a hydrant system when a multitude of post-earthquake fires must be fought is to use the inexhaustible supply of saltwater that exists adjacent to, and is readily available on, three sides of the City. This will necessitate the construction of new high-pressure saltwater pump stations at the northern end of Ocean Beach and at Hunters Point. Following a major earthquake it will be essential to have independent and unlimited water sources for firefighting available in all four quadrants of the City. Therefore, an additional high-pressure pump station at Lake Merced, which contains non-potable water, will complete the water supply requirements for an interconnected citywide expansion of the existing high-pressure hydrant system into all San Francisco neighborhoods. These new pump stations are the only means by which an inexhaustible water supply can be provided to the expanded hydrant system called for by the Civil Grand Jury's 2019 report. Moreover, this will leave the municipal water supply in the City's reservoirs, where it must be maintained, available for the critically important drinking and sanitation needs of the City's residents following a major earthquake."

May 9, 2020

James Barden, Division Chief, SFFD, retired  
Frank T. Blackburn, Division Chief, SFFD, retired  
Frank Cardinale, Assistant Deputy Chief, SFFD, retired  
James Cavellini, Division Chief, SFFD, retired  
Paul Chin, Assistant Deputy Chief, SFFD, retired  
Paul Crawford, Battalion Chief, SFFD, retired  
Alberto DaChuna, Division Chief, SFFD, retired  
Thomas W. Doudiet, Assistant Deputy Chief, SFFD, retired  
Franklin H. Dunn, Battalion Chief, SFFD, retired  
Harold Gamble, Deputy Chief, SFFD, retired  
Elliott Kamler, Battalion Chief, SFFD, retired  
James Lambrechts, Battalion Chief, SFFD, retired  
Gary Leal, Battalion Chief, SFFD, retired  
Michael Morris, Assistant Deputy Chief, SFFD, retired  
Jack Norton, Battalion Chief, SFFD, retired  
Brendan O'Leary, Assistant Deputy Chief, SFFD, retired  
John S. Peoples, Division Chief, SFFD, retired  
Mario Trevino, Chief of Department, SFFD, retired  
Frank Treanor, Battalion Chief, SFFD, retired



## Desalination Plant Design - Suitable for High Pressure Hydrant System Water Supply



Kennedy/Jenks Consultants  
Engineers & Scientists

Engineering design for a saltwater intake pump station, based on the same principles used for desalination plants, already approved by the Coastal Commission for use in Southern California. Such a design is minimally invasive to the environment and would provide simple and direct access to the inexhaustible supply of saltwater that is immediately adjacent to the fifteen unprotected neighborhoods. This is essentially the same design that has been used in the two existing AWSS pump stations since 1913. These should be built at the north end of Ocean Beach and at Hunters Point, which would complete the requirements for geographically diverse and interconnecting inexhaustible sources of water supply for all four quadrants of the City.

**From:** [Morten](#)  
**To:** [Mar, Gordon \(BOS\)](#)  
**Cc:** [Carroll, John \(BOS\)](#); [Dick Morten](#); [Nancy Wuerfel](#); [Tom Doudiet](#)  
**Subject:** Proposed addition to 2020 EFWS Bond Issuance  
**Date:** Monday, January 18, 2021 1:07:38 PM

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This message is from outside the City email system. Do not open links or attachments from untrusted sources.

January 17, 20

TO: Supervisor Gordon Mar

FROM: Dick Morten

SUBJECT: Proposed addition to 2020 EFWS Bond Issuance

Gordon, As I recall, the first time we talked when you were running for supervisor I told you of my advocacy to create a formal capital planning program. Voters adopted a Capital Planning ordinance which worked well for the first couple of bonds because each measure listed the projects to be financed. Over time voters were asked to approve a "Blank Check" because no projects were listed. This is true for the ESER 2020 bond component for Emergency Fire Fighting System (EFFS).

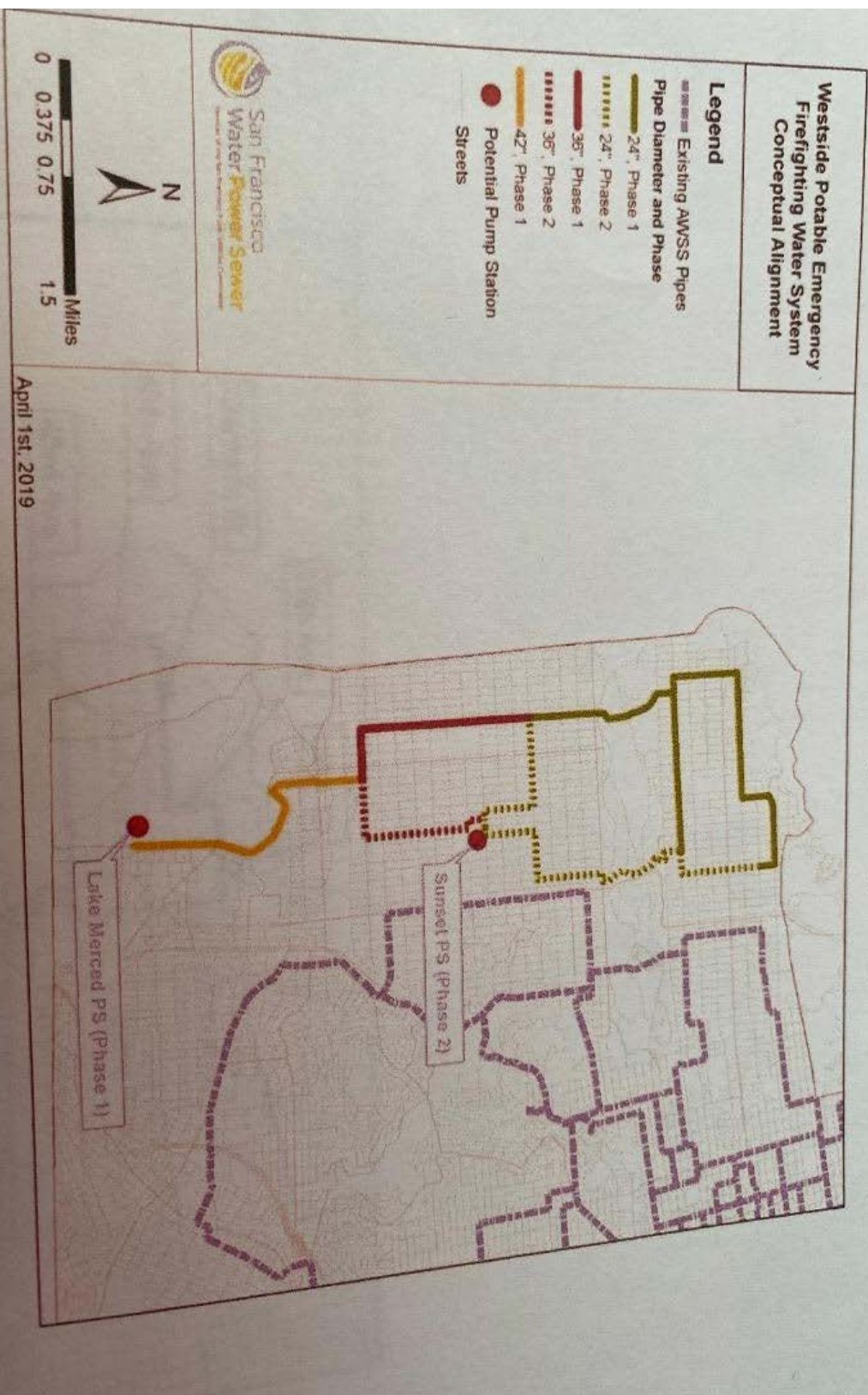
To remedy this situation I recommend the following language be inserted for the \$20 million bond issuance for the EFFS:

Emergency Firefighting Water System (SFPUC): planning, design, bid process, and partial construction **for Phase 1 of the Westside Emergency Fire Fighting System according to the updated conceptual Westside EFWS Alignment (SFPUC April 1st 2019 Diagram) and manifold projects at Fort Mason and Pier 33 1/2.**

The bold type insert allows the Board of Supervisors and the public to know the specific project and what should be accomplished and monitor implementation of the \$20 million EFFS bond issuance. It reduces the Blank Check nature of the initial EFFS bond issuance.

Please see the 2019 EFWS PUC Conceptual Alignment

**Exhibit 4: Westside EFWS Conceptual Alignment**



Source: SFPUC

**From:** [aeboken](#)  
**To:** [Mar, Gordon \(BOS\)](#); [Peskin, Aaron \(BOS\)](#); [Haneystaff \(BOS\)](#); [Calvillo, Angela \(BOS\)](#); [Somera, Alisa \(BOS\)](#); [Carroll, John \(BOS\)](#)  
**Subject:** GAO Meeting 7/16/20 Public Comment  
**Date:** Thursday, July 16, 2020 11:25:01 AM

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TO: GAO Committee members, Clerk of the Board

Please be advised that I was prepared to give public comment during the GAO hearing on the Civil Grand Jury report Act Now Before It's Too Late..

I was viewing the hearing on SFGovTV to see the PowerPoint presentation and hear Supervisor Mar's questions then immediately switched over to the call in line.

By then it appears that it was too late. I was unable to comment on the item.

I then spoke with the Clerk of the Committee to express my displeasure.

He did listen to my feedback. He also stated that the item would come before the GAO again in 6 months. My response was that my comments were time sensitive and the 6 month hearing would be too late.

Below are the Public Comments that I intended to make.

Eileen Boken with SPEAK and CSFN.

Speaking on my own behalf.

First I would correct the SFPUC presentation. Hetch Hetchy is the \*initial\* supply not the \*primary\* supply of the Emergency Firefighting Water System. This information comes directly from a retired firefighter familiar with the system.

Next, expanding the Emergency Firefighting Water System aka AWSS to the Westside already has a shovel-ready project.

This is Phase 2 aka Phase B of the L-Taraval Muni Forward project. This phase goes from Taraval and Sunset to Ulloa and Forestside.

As the L-Taraval project includes the replacement of water and sewer lines, Phase 2 could be amended to include dedicated, high pressure, high volume, non-potable water AWSS.

AWSS on Taraval and Ulloa has the support of SPEAK, the Coalition for San Francisco Neighborhoods, the Taraval Parkside Merchants aka POPS and the Great

West Portal Neighborhood Association.

Regarding the 10-Year Capital Plan, comments were submitted opposing the 10-Year Capital Plan as currently drafted.

The description for the Emergency Firefighting Water System specifies the potable water option. This appears both in the line item description and in the full description.

This is despite the Board's commitment to exploring other options as well as exploring the potable water option.

Sent from my Verizon, Samsung Galaxy smartphone

**From:** [Morten](#)  
**To:** [Mar, Gordon \(BOS\)](#); [Peskin, Aaron \(BOS\)](#); [Haney, Matt \(BOS\)](#); [Carroll, John \(BOS\)](#)  
**Cc:** [Elsbernd, Sean \(MYR\)](#); [Nancy Wuerfel](#); [Tom Doudiet](#); [Carroll, Maryellen \(DEM\)](#); [Strong, Brian \(ADM\)](#); [Dick Morten](#)  
**Subject:** Comments on the Emergency Firefighting Water System (EFWS) Fiscal Year 2019/2020 Annual Report  
**Date:** Tuesday, July 14, 2020 7:08:16 PM

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This message is from outside the City email system. Do not open links or attachments from untrusted sources.

July 14, 2020

TO: Supervisors Mar, Peskin and Haney  
FROM: Dick Morten  
SUBJECT: Comments on the Emergency Firefighting Water System (EFWS) Fiscal Year 2019/2020 Annual Report

It is a fact the major firefighting tool of the Fire Department is:  
UNLIMITED WATER.

It is astonishing that for decades the Fire Department has not aggressively pursued unlimited fire fighting water. There are ample incidents (Marina and Loma Prieta fires, Pier 45 and other wharf side fires, Mission Bay and Squat and Gobble fires) where the department has had to use unlimited water supply resources found in the Auxiliary Water Supply System (AWSS). The department's mission certainly must include obtaining adequate fire fighting water resources. No other city department has that responsibility.

Transfer of AWSS to the SFPUC does not eliminate the obligation for SFFD to demand citywide expansion of multi-resource (domestic, saltwater and lake water) unlimited water supplies for firefighting. The Fire Commission, two Civil Grand Jury reports, Mayor's Office, CAPPs report, voter approved Bonds and numerous other calls to action have been ignored by the Fire Department. Why?

The Report by changing the title of the system to deliver high pressure firefighting water from Auxiliary Water Supply System (AWSS) to Emergency Fire Water System (EFWS) deliberately obfuscates the fact that EFWS *does not* deliver unlimited seismically safe firefighting water supply to neighborhoods citywide.

The Report ignores the Board of Supervisors Resolution identifying "Preparedness" as an integral objective of this Report. Does it really take a year to rattle off a list of projects, yet ignore Preparedness as a report goal?

The Report was to have four department authors. Only SFPUC and SFFD submit the Report. Where are the response of Department of Emergency

Management and Office of Capital Planning?

The Report does not provide any program to provide unlimited, high pressure fire fighting water to non-AWSS districts. Where is the study for adding a saltwater pump station at Ocean Beach as required by the BOS resolution? Where does the Report discuss a Bayview saltwater pump station or a pump station at Lake Merced (designated by the State as firefighting water without a method to access this resource) to provide unlimited water? When will we become serious about developing unlimited high pressure fire fighting water? Does the Fire Department care?

The Report totally fails to implement the major recommendation of the 2019 Civil Grand Jury:

The City should aggressively develop a high-pressure, multi-sourced, seismically safe emergency water supply for those parts of the City that don't currently have one, with a target completion date of no later than 2034;

The Report does not map the ESER Bond projects, especially any expansion of high pressure firefighting water citywide. It must be a conscious effort to not map Bond projects because it would show the abject failure to implement the three ESER bond measures that promised voters citywide AWSS expansion. Granted, Bond funds have been expended to upgrade the existing AWSS system, but upgrades do not expand the fire protection coverage to the remainder of 13 non-AWSS districts that are without unlimited, high-pressure firefighting water. Where is the Resolution's required "detailed analysis of emergency firefighting water needs by district?"

Don't these districts warrant AWSS coverage?

The Report ignores the Local Hazard Mitigation Plan citation from the City's consultant, Applied Technology Council, who reported on post earthquake firefighting in San Francisco. The Council's citation is included verbatim in the Plan with a critical exception that *dropped* the report's discussion of firefighting water and the recommendation for a third AWSS pump station *"to provide additional water supply for post earthquake Firefighting, particularly for the western and southern portions of the City."* Why?

Is there a pattern developing of avoidance to address unlimited high pressure water supply from saltwater, domestic and fresh water resources? The answer is yes!

The Report fails to identify any projects for the recently approved ESER Bond. Leaving out specific projects left the voters without any idea what would be built. Instead voters were asked to approve a "Blank Check". This leaves projects to the inept SFPUC and SFFD to conduct needs assessment, establish project priorities, conduct environmental analysis, cost estimation, develop, etc. For years these same departments have stonewalled expansion of AWSS citywide. Now they have Bond monies to do what they want. Where is the evidence that they are to be trusted to deliver on AWSS promises? Will the City continue to deceive the voters

and jeopardize our neighborhoods!

The Report doesn't provide any insight as to why SFPUC and its accomplice, SFFD, slow walk to the point of ignoring decades of Grand Jury and other reports calling for the expansion of AWSS citywide. Why is there such an aversion?

The Report has an over-reliance on the domestic/Hetch Hetchy water supply system. Yes, billions have been spent to seismically strengthen the Hetch Hetchy water system while the domestic system remains prone to major rupture even under normal circumstances today. Imagine the broken domestic pipe system feeding hydrants after a major quake. Scary!

The Report's Hetch Hetchy over-reliance ignores the fact that the SFPUC, through the state Water Code 73500, is required to share our locally stored water in an emergency (e.g., earthquake) from the three Terminal Reservoirs located in the city with our peninsula customers. This means water to fight fires in San Francisco will be seriously compromised by a legal obligation to send water south. Why doesn't the Report address this legal obligation?

Imagine citywide urban conflagrations following a major earthquake. The recent Pier 45 fire was quelled by about half the on duty firefighters utilizing AWSS assets (hose tenders, high pressure saltwater AWSS hydrants, fire boats) that are largely confined to the northeast part of the city. It is likely significantly more damage and potential injury and loss of life could have happened without AWSS. How will the raging earthquake generated fires be contained?

Pier 45 is a microcosm of the earthquake fire borne disaster awaiting San Francisco. Our collective complacency will be noted in any After Action Report. We have been warned time after time with no action.

The Report the mentions the recently adopted 10 Year Capital Plan without any discussion of AWSS expansion. Not including the AWSS expansion means no money for AWSS expansion.

It is dereliction of duty to not have unlimited high pressure firefighting water in a 10 year capital plan which incidentally impacts directly other city preparedness plans.

The Report does not address how the city would deal with concurrent major disasters such as earthquake, pandemic and wildfires that impacts the region and state or other unforeseen incidents. It is a lack of imagination for the Report to fail to consider the responses required for two or more simultaneous major disasters. Using the city's domestic water supply system is folly leaving the city without abundant firefighting water and compromising drinking water supplies. Without an independent citywide AWSS program our worst nightmares could be upon us.

Lastly, the Report is silent on a key 2019 Civil Grand Jury recommendation:



As an interim measure, the City should immediately replace and expand its inventory of Portable Water Supply System (PWSS) hose tenders, which are comparatively cheap, can be acquired much more quickly than the high-pressure AWSS, and were essential in fighting the 1989 Loma Prieta fire, but are now past their useful life;

While the City is coping with a Pandemic budget it should not ignore the necessity of acquisition of PWSS units in the forthcoming budget. Without these PWSS units the city remains extremely vulnerable to dangerous urban conflagration potentially killing and injuring thousands while destroying residential and commercial structures as well as our tax base. San Francisco cannot afford such a destructive event when there are opportunities to mitigate the earthquake's seismic power.

It is time for the Board of Supervisors to seize the initiative from the bureaucracy which has failed citizens for decades. Hold city departments accountable for delivering on Bond promises made to voters and the Civil Grand Jury to expand AWSS citywide. Do it today!

Dick Morten

**From:** [Nancy Wuerfel](#)  
**To:** [Carroll, John \(BOS\)](#)  
**Subject:** Fwd: Comments on "Fiscal Year 2019-2020 Annual EFWS Report" - GAO committee meeting July 16, 2020  
**Date:** Wednesday, July 15, 2020 9:02:45 AM

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John Carroll:

I am resending this email since there may have been a problem with the first one. Please let me know if you have any questions.

Thanks,  
Nancy Wuerfel

-----Original Message-----

From: Nancy Wuerfel <nancenumber1@aol.com>  
To: gordon.mar@sfgov.org <gordon.mar@sfgov.org>; aaron.peskin@sfgov.org <aaron.peskin@sfgov.org>; matt.haney@sfgov.org <matt.haney@sfgov.org>; john.carroll@sfgov.org <john.carroll@sfgov.org>  
Cc: MayorLondonBreed@sfgov.org <MayorLondonBreed@sfgov.org>  
Sent: Tue, Jul 14, 2020 7:04 pm  
Subject: Comments on "Fiscal Year 2019-2020 Annual EFWS Report" - GAO committee meeting July 16, 2020

Supervisors:

- 1) The city report reveals the lack of interest by the city departments named to respond to the Board's resolution declaring a "State of Urgency" to preserve the well being and safety of the city's inhabitants by EFWS preparedness to a major earthquake and fire. Please note the subject line of the annual report sent to the Board does not reference "preparedness" in the title, nor is this report "consolidated" with DEM, Office of Resilience and Capital Planning (ORCP), SFFD, and SFPUC. Only the latter two departments are included in the report.
- 2) Six months of planning time have been wasted in doing nothing to address the really important issues outlined by the Board. The resolution summarizes what must be done to respond to our State of Urgency to protect all neighborhoods in the event of a major earthquake and fire that threatens the entire city. The city report demonstrates the departments' unwillingness even to acknowledge the serious jeopardy that San Francisco is in, as stated in the Civil Grand Jury 2019 report, because we are not prepared to fight fires following an earthquake for a lack of unlimited water and the infrastructure to deliver auxiliary water citywide.
- 3) The city report does not show that any planning is underway NOW :
  - a) to develop a plan due on 12/31/21 describing a comprehensive EFWS action plan;
  - b) to complete a study due on 6/30/21 for adding an EFWS saltwater pump station on the western side of SF;
  - c) to complete a detailed analysis due on 6/30/21 of emergency firefighting water

needs by neighborhood; and

d) to analyze by 6/30/22 whether to propose a separate bond for development and implementation of EFWS projects.

All four city departments named must make it a top priority to produce the plans, study, and analyses by the deadlines in the BOS resolution.

4) Both ORCP and DEM are responsible for addressing the Board's preparation issues. ORCP has already failed to recognize in their revised 2019 Hazard Mitigation Plan the possibility of two disasters happening simultaneously and to propose how to handle dual mitigations. We are now in a pandemic and a major earthquake could happen any time, but ORCP has ignored planning for a concurrence of both catastrophes. DEM also has not commented on how they will accommodate all the new homeless victims displaced by fires following an earthquake, along with the existing homeless people, if there is not enough water to suppress the fires burning down the wooden residential buildings. Does DEM have a plan for the increased volume of homeless people while experiencing a pandemic? This level of complex planning takes time, and both ORCP and DEM need to start their work today.

5) The existence of the current Covid-19 pandemic is no excuse to exonerate all four city departments from beginning to comply with the Board's resolution to prepare for the State of Urgency. Indeed, city departments agreed back in the fall of 2019 to implement some of the Jury's recommendations and those departments should have already begun their planning to comply with the Jury's report to "Act Now Before It Is Too Late." The clear urgency to prepare for disaster predates the Board's actions and Covid-19.

6) The Capital Plan must include prioritizing funds for expanding the independent AWSS and accessing unlimited water. The Mayor should understand that her efforts to address the homeless crisis will need to also include preserving the existing housing that we now have by not allowing it to be consumed by earthquake-ignited fires from broken gas lines and uncontrolled conflagrations. The Mayor should use the G.O. Bond funding slot in the 2024 Capital Plan intended for homelessness to include funding to preserve housing from destruction by fire, as prescribed in the Board's resolution.

7) In Board Resolution 422-19 to the Presiding Judge of the Superior Court for the Civil Grand Jury, there is a reference to the city's commitment to purchase five PWSS hose tenders. The Board was told there was funding for this equipment in the FY 2019-2020 approved budget. The city report does not even mention that the Mayor cut two hose tenders from the budget, nor is there mention if the order for the first hose tender previously approved has been actually been placed. The PWSS equipment is essential to provide water in the many areas of the city that do not have access to the independent AWSS system.

8) The Mayor is essential to resolving our State of Urgency by :

a) immediately restoring the funds promised through both local and state level actions to purchase of five hose tenders; and

b) prioritizing funding for expansion of the independent AWSS and accessing unlimited water by building new pump stations as part of the 2024 G.O. Bond now being developed for homelessness, or as part of a separate G.O. Bond issued specifically for preparing to fight fires following an earthquake. If partial funding for fire suppression is achieved locally by the city, then we will be in a position to apply for additional money from state and federal sources.

9) I ask that the Government Audit and Oversight Committee recommend to the full Board of Supervisors that a new resolution be drafted to focus the four city departments on their responsibility to complete the planning they have agreed to perform to the Board in resolution 484-19 and to the Jury's Presiding Judge in resolution 422-19, and to urge them to comply with the requirements for the reports due on 6/30/21 .

Thank you for considering my comments.

Sincerely,

Nancy Wuerfel

**From:** [Tom Doudiet](#)  
**To:** [Mar. Gordon \(BOS\)](#); [Peskin, Aaron \(BOS\)](#); [Haney, Matt \(BOS\)](#); [Carroll, John \(BOS\)](#)  
**Subject:** Analysis of 2019-2020 Annual EFWS System Report YES!  
**Date:** Tuesday, July 14, 2020 2:34:08 PM  
**Attachments:** [Business As Usual 2.0.pdf](#)

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## RE: Analysis of 2019-2020 Annual EFWS System Report

Dear Supervisors:

The report of June 25, 2020, by the SFFD and the SFPUC, in response to BOS Resolution No. 484-19, which called for "**a consolidated annual report to the Board of Supervisors on the state of the City's EFWS preparedness for a major earthquake and fire and planned funding from the ten-year Capital Plan for EFWS...**" , to be issued jointly by **four city agencies**, appears to be an attempt to avoid a frank discussion of the concerns raised by the July 2019 Civil Grand Jury Report in regard to the dismal level of the City's preparedness to meet the inevitable demands of fighting post-earthquake conflagrations in the fifteen San Francisco neighborhoods in which no AWSS hydrants currently exist.

**First** , the report comes from only two of the four City agencies identified by the BOS resolution as participants in the reporting process, with the DEM and the Office of Resilience and Capital Planning apparently not participating.

**Second** , the report in no way addresses the most urgent concerns expressed by the CGJ report, Findings F4, F5, F6, and F11, with which the BOS resolution specifically agreed.

**Third** , instead of reporting on any progress having been made toward planning for a comprehensive expansion of the AWSS hydrant system into the currently unprotected neighborhoods, the report merely summarizes current SFPUC mini-projects either planned, under construction or completed, none of which bear on the two most critical issues identified by the CGJ (lack of a citywide high-pressure hydrant system and urgency of completion).

**Fourth** , the report devotes many pages to chronicling SFFD drills and table-top discussions, including the names and unit numbers of participants, as well as routine maintenance, such as dredging in front of the saltwater intake tunnel for Pump Station #1 and replacing the chains that are attached to hydrant caps. It further details that 5" hose (PWSS) drills are being conducted, presumably with the three or four thirty-year old units that have yet to be replaced, and recounts that the Fireboat *St. Francis* was used at the recent Pier 45 fire. While all of these activities are necessary for the routine functioning of the SFFD, **none of these activities is in any way germane to the issue of the expansion of the AWSS into the currently unprotected neighborhoods.** One can only assume that devoting the majority of the pages of a nine page report to such non-essential information, when the BOS has requested a **serious** annual report on the progress toward addressing the concerns raised by the Civil Grand Jury, appears to be a sophomoric attempt to disguise a lack of progress toward a meaningful plan for a comprehensive AWSS expansion.

**Fifth** , I would be remiss if I did not correct a false statement on the part of the SFPUC and the SFFD. In regard to the source of water for the AWSS hydrants, the statement has been repeatedly made, and is repeated again in the present report, that: "**The primary source of water is the SFPUC's Hetch Hetchy regional water system, which supplies water to one reservoir and two storage tanks.**" This is not a factual statement. The fact is that the Hetch Hetchy water is **not** the primary source of water, but only the **initial** source of water (some 11.5 million gallons total). After the two saltwater pump stations and the **three** fireboats (not two fireboats, as the report incorrectly states) are engaged, they can pump a combined 88,000 gallons **per minute** into the AWSS hydrant system. Therefore, clearly, **the primary (main) source of water for the high-pressure hydrant system is NOT Hetch Hetchy water, but saltwater.** Such off-handed inaccuracies on the part of the two agencies that should be taking the

findings of the Civil Grand Jury report most seriously is unacceptable.

I have attached a commentary that appeared in several neighborhood newspapers in those districts that are not protected by the high-pressure hydrant system. It was published in January 2020, following the official response by various City agencies to the findings of the Civil Grand Jury report. I include it here because I believe the Board of Supervisors must be aware of the game-plan that the SFPUC is following in regard to avoiding the expeditious completion of the AWSS expansion called for by the CGJ. I believe that it will shed light on the reason that Fiscal Year 2019-2020 Annual EWFS Report is so lacking in substance.

Thomas W. Doudiet,  
Assistant Deputy Chief,  
San Francisco Fire Department,  
Retired

## **Business as Usual: City Agencies Will Ignore the Civil Grand Jury's Call for Quick Action to Expand the City's Auxiliary Water Supply System**

Frank T. Blackburn, Assistant Chief, SFFD, Retired

Thomas W. Doudiet, Assistant Deputy Chief, SFFD, Retired

The Report of the Civil Grand Jury (July 2019), "*Act Now Before It Is Too Late: Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water System*", should be given the prompt attention of the various City agencies named as respondents. These include the Mayor, the Fire Commissioners, the Fire Chief, the Public Utilities Commission. That the issue of the citywide expansion of the Auxiliary Water Supply System (AWSS) of high-pressure, high volume hydrants has been unresolved for many decades is an egregious example of dereliction of duty by multiple agencies of the City. Continual postponement of this expansion will result in the destruction by fire of at least half of the City following the next great Bay Area earthquake. The two most essential conclusions of the report are: (1) the AWSS must be expanded to protect all San Francisco neighborhoods; and (2) time is of the essence.

In their answer to the Grand Jury's finding that the AWSS expansion must be accomplished as soon as possible (since we don't know when the "Big One" will strike, but we do know that in 15 San Francisco neighborhoods there will be no water for the SFFD to use to fight the multiple fires that experts tell us are sure to merge into conflagrations) responding City agencies state the following:

**"As the City considers what is essential to protect San Francisco, it is important to acknowledge our multiple, complex resilience challenges.** These challenges are documented in the Resilient SF strategy (2016) and underlie the strategic efforts of our capital investments as represented in the 10-Year Capital Plan (last updated 2019). **These challenges are: Earthquakes, Sea Level Rise/Climate Change, Aging Infrastructure, Unaffordability, and Social Inequity.** All of these challenges represent meaningful threats to San Franciscans, their property, and their ability to make a life in the city. **In making decisions about priority investments, San Francisco must keep an eye on all of these challenges, identify the areas of greatest need across them, and make progress on all fronts simultaneously."**

Translation: All these issues are of vital importance to the quality of life in San Francisco and all must be prioritized when we consider how to spend our public funds, so the AWSS expansion has to fall in line and wait for occasional funding through the Capital Bond process.

Therefore, the responsible City agencies will ignore the Grand Jury's call to rapidly implement a citywide AWSS expansion. Instead serial hybrid, piecemeal, neighborhood by neighborhood mini-expansions will take place using Capital Bond funds as follows: 2020, 2027, 2033, and so on out to 2049. So much for the Grand

Jury's call for a complete build-out into all currently unprotected neighborhoods by 2034. Oh, and it gets better – the PUC will be using our Earthquake Safety and Emergency Response Bond funds to build reinforced municipal water mains, not dedicated high-pressure, high-volume AWSS mains using the unlimited supply of seawater that surrounds the City on three sides, and which the existing AWSS has used quite successfully since 1913.

The agenda of the SFPUC is not to provide a system having an inexhaustible supply of water, which is the only certain means by which the SFFD will be able to control post-earthquake fires, but rather to use Earthquake Bond money to slowly replace their antiquated and fragile drinking water mains. That's why the citywide expansion of the AWSS can't be completed before mid-century – the SFPUC needs to hijack the earthquake bond money slowly, and relegating the AWSS expansion to piecemeal occasional funding, instead of one large dedicated funding source for a comprehensive expansion, will surreptitiously facilitate their agenda. If the "Big One" hits before the piecemeal expansion using drinking water is complete, oh well!

It is ironic that a single bond issue, passed by the voters in 1907, to design and build the original AWSS led to the installation of Twin Peaks Reservoir, 77 miles of high-pressure pipelines, two saltwater pump stations and 887 hydrants. The entire project was designed, completed and put in service in five years, and it is still in service 116 years later. In contrast, the SFPUC has had control of the AWSS for over nine years and no comprehensive expansion plan for the fifteen unprotected neighborhoods has yet to materialize. In fact, even though the Grand Jury has called for such a plan to be completed within a year, the SFPUC now has been given an additional year by the Board of Supervisors to "study the matter". If engineers over a hundred years ago, armed with only pencils, paper and slide rules could accomplish what they did in five years, how is it that our modern engineers can't at least copy what was done by 1913 and expand it into the outlying neighborhoods?

The simple answer is that providing a robust, dependable and inexhaustibly sourced high-pressure hydrant system made perfect sense to the engineers who had been eyewitnesses to the destruction of the City by fire in 1906. Their highest priority was to prevent this from ever happening again. The highest priority of the SFPUC seems to be using Earthquake Bond money to replace their decrepit drinking water mains, and telling the public that their substandard approach to expanding the AWSS will suffice when multiple simultaneous fires break out in the western and southern neighborhoods, assuming, of course that the next big earthquake will wait for them to finish their piecemeal projects sometime around 2049.

Hopefully at some future time someone can explain how San Francisco, "The City That Knows How", can get the \$1.7 billion funding to enable the construction of a subway tunnel from South of Market to Chinatown, or can undertake what is said will be a \$5 billion reconstruction of the seawall, but can't figure out how to fund perhaps a \$1 billion citywide expansion of the original AWSS, that will actually enable the SFFD to keep half the City from burning down following the next big



earthquake, and save (conservatively) \$140 billion worth of residential housing that exists in the fifteen currently unprotected western and southern neighborhoods.

If 1% of the City's budget were allocated to the comprehensive expansion of the AWSS each year for the next ten years (a total of \$1.2 billion), the urgent recommendations of the Grand Jury could be accomplished, and the entire City would be protected using the inexhaustible supply of seawater that surrounds us (and is literally at the doorstep of those neighborhoods that currently lack protection). Moreover, if we had engineers of the caliber of those that existed in San Francisco a hundred years ago, who understood how post-earthquake fires will literally destroy, in a matter of a few days, a city largely constructed of wood, we could avoid having to learn the history of 1906 all over again, which we surely will if the City agencies are allowed to ignore the recent findings of the Civil Grand Jury.

TO THE BOARD OF SUPERVISORS  
FROM JAMES DALESSANDRO -  
September 19, 2019: File # #190786

AUTHOR OF "1906" and FILM MAKER OF "THE DAMNEDEST, FINEST RUINS"

DEAR SUPERVISORS: At five o'clock on the afternoon of April 19, 1906 - 36 hours after the catastrophic San Andreas fault rupture - 5 ships of the U.S. Navy's Pacific Squadron arrived at the Golden Gate to face a mountain of flames 1,500 feet high.

Utilizing their ships' massive steam pumps and an unlimited supply of saltwater, they stopped the fire along the entire Embarcadero - crucial to our rebuilding. They stopped the flames from leaping Van Ness Avenue, sparing the scant housing stock of Pacific Heights, the Fillmore, Sunset and Richmond Districts. They evacuated 100,000 desperate people on the waterfront. Over 38 hours, they pumped several hundred MILLION gallons of saltwater to check the fire's spread and save untold numbers of lives.

On October 17, 1989, following the Loma Prieta Earthquake, another naval vessel - our Fireboat Phoenix - pumped salt water onto the Marina fire for 14 hours, delivering 5 ½ MILLION gallons of salt water. It almost certainly prevented a repeat of 1906. Think of that for a moment, please - 5 ½ MILLION GALLONS OF SALT WATER to stop a single fire of only ¼ of a city block. If they had not stopped it there - where and how would they have stopped it?

So where are we today?

Despite 10's of millions of dollars from bond issues, provided overwhelmingly by San Francisco voters over the previous decades, 15 neighborhoods - 400,000 citizens - have no auxiliary, high-pressure water system to save homes, business, or lives. Why? Because the Public Utility Commission, which now controls the Auxiliary Water Supply System, has proposed one preposterous alternative after another to avoid expanding the AWSS. To further exacerbate our jeopardy, they have failed to maintain the EXISTING AWSS to where one seriously doubts its ability to function in an emergency.

Instead of expanding the AWSS, the PUC first proposed to buy 15 miles of cumbersome 12-inch hose. That was to be rolled out by the 24 on duty firefighters in the Sunset and Richmond Districts BEFORE they started fighting fires or rescuing citizens. Supervisor Peskin and others stopped that absurdity.

So now the PUC - instead of expanding the High Pressure SALTWATER SYSTEM with 3 pumping stations along the Bay and Pacific Ocean - is proposing that we commingle the POTABLE DRINKING WATER of the Sunset Reservoir with the brackish, POLLUTED WATER OF LAKE MERCED. The minute the Lake Merced Water enters

the MUNICIPAL WATER SUPPLY SYSTEM at least 400,000 people will be candidates for a wide variety of water born diseases.

Perhaps members of the PUC could drink unfiltered Lake Merced water for a week or two and let us all know how they fare? Or tell us how they plan to defend the massive lawsuits by our neighbors in the South Bay – who own 2/3rds of Sunset Reservoir's drinking water.

As you sit here today, the massive diesel pumping stations that supply the EXISTING AWSS – one station at Fort Mason, the other directly beneath the office of the Fire Chief on Townsend Street – are without an attendant capable of activating the system to supply salt water to the downtown's EXISTING high pressure hydrants.

The other parts of the EXISTING system, the levers and gates inside Jones Street on Nob Hill, which control nearly 12 million gallons of water from the Twin Peaks and Ashbury Heights Tanks – has not had an attendant on site in more than 20 years.

The PUC allegedly has someone somewhere who will control those massive Jones Street gates and valves and high-pressure water flow by means of a laptop computer. It is unclear what he or she knows about fire fighting, or how he or she would receive information on where that water is needed. It is also unclear if that system can deliver water, since some firefighters have stated the lack of regular flushing and maintenance has left hydrants clogged with sediment.

And now, our Mayor, a former Fire Commissioner, has cut \$100,000 from the NERT budget – Neighborhood Emergency Response Team - curtailing the training of volunteers willing to risk their lives to rescue their neighbors.

I urge the Board of Supervisors to immediately appoint a Blue Ribbon Commission comprised of people who understand the science of fire suppression, and care about what happens to this city and its citizens. A Commission who will challenge the Public Utilities Commission and over ride the unconscionable support from some, but not all senior members of the Fire Department, past and present. The neglect and delays have pushed this city, its citizens and visitors to the brink of catastrophe.

The recent findings of the 2019 Civil Grand Jury, crying ACT NOW, come with an ominous footnote. Their findings echo those of the 2003 Civil Grand Jury. And of bond issues dating back to 1986 and 1908. The neglect of our current system by the PUC, and their preposterous ideas to further endanger us all, must be stopped.

It appears, dear Board, that the task is yours as the last vestige of hope and sanity.

James Dalessandro