BOARD of SUPERVISORS

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MEMORANDUM

Date: June 17, 2022

To: Honorable Members, Board of Supervisors

From: Angela Calvillo, Clerk of the Board

Subject: 2021-2022 CIVIL GRAND JURY REPORT - "Buried Problems and a Buried Process: The Hunters Point Naval Shipyard in a Time of Climate Change" June 15, 2022

We are in receipt of the San Francisco Civil Grand Jury (CGJ) substitute report released Tuesday, June 14, 2022, entitled: **"Buried Problems and a Buried Process: The Hunters Point Naval Shipyard in a Time of Climate Change"** (attached).

Pursuant to California Penal Code, Sections 933 and 933.05, the Board must:

1. Respond to the report within 90 days of receipt, or no later than October 19, 2022.
2. For each finding:
   - agree with the finding or
   - disagree with the finding, wholly or partially, and explain why.
3. For each recommendation indicate:
   - that the recommendation has been implemented and a summary of how it was implemented;
   - that the recommendation has not been, but will be, implemented in the future, with a timeframe for implementation;
   - that the recommendation requires further analysis, with an explanation of the scope of the analysis and timeframe of no more than six months; or
   - that the recommendation will not be implemented because it is not warranted or reasonable, with an explanation.

Pursuant to San Francisco Administrative Code, Section 2.10, in coordination with the Committee Chair, the Clerk will schedule a public hearing before the Government Audit and Oversight Committee to allow the Board the necessary time to review and formally respond to the findings and recommendations.

The Budget and Legislative Analyst will prepare a resolution, outlining the findings and recommendations for the Committee's consideration, to be heard at the same time as the hearing on the report.

Attachment

cc: Honorable Samuel K. Feng, Presiding Judge
Michael Hofman, Foreperson, 2021-2022 San Francisco Civil Grand Jury
Xang Hang, Mayor's Office
Tom Paulino, Mayor's Office
Anne Pearson, Deputy City Attorney
Alisa Somera, Legislative Deputy
Severin Campbell, Budget and Legislative Analyst
Reuben Holober, Budget and Legislative Analyst

Buried Problems and a Buried Process:

The Hunters Point Naval Shipyard
in a Time of Climate Change

June 14, 2022

City and County of San Francisco
Civil Grand Jury
2021-2022

About the Civil Grand Jury

The Civil Grand Jury is a government oversight panel of volunteers who serve for one year. It makes findings and recommendations based on its investigations. Reports of the Civil Grand Jury do not identify individuals by name, and disclosure of information about individuals interviewed by the Jury is prohibited. (California Penal Code §929)

2021-2022 Jurors

Michael N. Hofman, Foreperson

Will McCaa, Foreperson Pro Tem

Sara Miles, Corresponding Secretary

Charles Lai, Recording Secretary

Mark Seielstad, Parliamentarian

Tony An

Rick Crane

Tony David

Phyllis V. Deets

Jason Golz

Cort Gross

Jeanine Jue

Tim Novacic

Cynthia Travis

Joanie van Rijn

Dylan Walker

Jeffrey D. Weitzel

Cover Image from: Pathways Climate Institute and San Francisco Estuary Institute-Aquatic Science Center, "Shallow Groundwater Response to Sea Level Rise in the San Francisco Bay Area: Existing and Future Conditions,"estimated release date 2022

SUMMARY

The Hunters Point Naval Shipyard is a Superfund site on the southeastern shore of San Francisco. The Navy, overseen by EPA and state regulators, has been cleaning up radiological and chemical contamination in the Shipyard for over thirty years. As the cleanup is completed and approved, the Navy has agreed to transfer the property to the City in stages to create San Francisco's biggest housing development. A developer, working with the San Francisco Office of Community Infrastructure and Investment, plans to build thousands of homes at the Shipyard, along with office towers, parks, a school and millions of feet of commercial space.

The Civil Grand Jury began this investigation with a question about the potential impact of groundwater rise due to climate change on the future of the Shipyard. Over the past decade, new coastal adaptation science has emerged to show the ways shallow groundwater reacts to sea level rise. In brief, as the sea level rises, shallow groundwater near the shore rises with it, and can cause flooding, damage infrastructure, and mobilize any contaminants in the soil. The Jury asked if rising groundwater could pose special risks to health and safety in the low-lying, heavily polluted landscape of the Shipyard.

The Jury learned that experts believe the Shipyard's soil and topography make it very likely that shallow groundwater there will be strongly affected by sea level rise. The Jury further found that rising groundwater in the Shipyard could interact in dangerous ways with future infrastructure, and with hazardous toxins the Navy plans to leave buried in the soil.

We wanted to know if this new science and these risks had been taken into account by the City, by OCII, or by the Navy and its regulators. We found that they had not.

To address this lack of information, the Jury recommends that the City hire expert scientists to examine these risks in detail. The City of Alameda set an example with a recent study predicting how shallow groundwater on the island would react to sea level rise, and how rising groundwater might interact with contaminants at different sites. The Jury recommends that San Francisco, acting through the Office of Resilience and Capital Planning, commission a similar independent study specific to the Shipyard, so that future development plans can be informed by a thorough, professional analysis of rising groundwater there.

The Jury also wished to issue recommendations about how such a groundwater study might help improve the Shipyard cleanup. But the Jury cannot issue recommendations to the Navy or to the EPA and state regulators, and so looked for a solution that could come from inside the City. The Jury discovered that the process that governs the cleanup is forbiddingly complex, and essentially invisible within the City. Yet the stakes for San Francisco in that process—for health,

for environmental safety, and for the resilience of future development in the Shipyard—are enormous. But hardly anyone in the City is paying attention.

Within the City, expertise about the Superfund process that governs the cleanup exists only in the San Francisco Department of Public Health's Hunters Point Shipyard Program, a program that until recently had only one employee. Several other departments in the City have familiarity with the science of groundwater rise and might have flagged the risks to the Shipyard, but these departments are unfamiliar with the cleanup and the Superfund process, and do not communicate with SFDPH about the Shipyard.

This leaves the City poorly prepared to address emerging issues such as groundwater rise at the Shipyard—or any other risks the Navy and its regulators may overlook. There is no mechanism in place to discover such issues, to develop a response, or to follow through with the Navy and regulators to a resolution.

The Jury recommends that the Board of Supervisors create, without delay, a permanent Hunters Point Shipyard Cleanup Oversight Committee, made up of representatives from City departments with pertinent expertise. This committee should proactively look out for the City's best interests in the cleanup. It should perform general due diligence, and communicate the City's concerns to the Navy and regulators ahead of major decision-making about the cleanup.

To address the opacity of the Superfund governance process, the Jury recommends that SFDPH create all necessary explanatory materials to support the work of the Shipyard Cleanup Oversight Committee. To ensure that the Committee is informed about key cleanup decision points with enough time to weigh in, the Jury recommends that a representative of SFDPH appear before the Committee frequently for briefing.

Finally, to return to where this report started, the Jury recommends that the Cleanup Oversight Committee review the results of the recommended groundwater rise study, determine what it means for the future of the Shipyard, and respectfully but assertively share the City's position with the Navy, EPA, and state regulators. The intersection of rising ground water and buried contaminants poses a credible risk to human health and well-being. Given the rapidity with which the climate is changing, the City needs to take immediate and sustained action to protect its residents.

An initial report on this subject was issued on June 1, 2022, but has been rescinded, with this substitute report issued. This substitute report changes certain words and/or passages on pages 14, 22, 29, and 31, and in Appendices E and G, from the initial report. These changes have no bearing on any of the Findings or Recommendations, other than to place a later date on certain of the recommendations.

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INTRODUCTION

Like every Civil Grand Jury investigation, this one began with a question. The Jury looked at the Hunters Point Naval Shipyard, a 638-acre Superfund site on the southeastern shore of San Francisco, where the Navy has been cleaning up radiological and chemical contamination for over thirty years. If all goes to plan, once the cleanup is complete, the Shipyard, along with adjacent Candlestick Point, will become the largest redevelopment in San Francisco since the 1906 earthquake, with thousands of homes and millions of square feet of commercial property.

The Jury posed the question: When the sea level rises, what will happen to the shallow groundwater in the residually-contaminated soil under those apartment buildings and office towers? The science is relatively new, but among coastal adaptation experts, this is now understood to be true: as the seas rise, shallow groundwater near the coast will tend to rise with them, and when groundwater rises through polluted soil, it's bad.

This led the Jury to a second question: Have the Navy and the regulators that oversee the cleanup evaluated the risks posed by groundwater rising with sea level rise in the Shipyard? Has the City and County of San Francisco? In both cases, the Jury found that they had not.

The Jury followed this thread and discovered that, within the City, too few people are paying too little attention to the Shipyard cleanup, leaving the City structurally unprepared for any challenging situation related to the cleanup. The City is not actively searching for overlooked risks such as groundwater rise. And the City is not performing sufficient due diligence on the decisions made by the Navy and regulators, to ensure that they are aligned with the interests and priorities of the people of San Francisco.

This is a solvable problem. Those who are not paying attention can be made aware, and the full spectrum of the City's resources can be applied to protecting our interests in the Shipyard cleanup, and making sure the Navy and regulators don't miss anything else in the years to come. And there is still hope that groundwater rise will be addressed in the Shipyard before it is too late.

An initial report on this subject was issued on June 1, 2022, but has been rescinded, with this substitute report issued. This substitute report changes certain words and/or passages on pages 14, 22, 29, and 31, and in Appendices E and G, from the initial report. These changes have no bearing on any of the Findings or Recommendations, other than to place a later date on certain of the recommendations.

BACKGROUND

The Soil and the Poison: How Did They Get There?

The history of the Hunters Point Shipyard begins in 1867, when the first dry dock opened on the peninsula.[1] In 1941, the Navy bought the site, recruited tens of thousands of workers, and turned the Shipyard into a major repair and maintenance facility for warships. Through 1944, the Navy built four new large dry docks, and expanded the peninsula by smashing an adjacent hill into gravel and dumping it into the Bay.[2] Figure 1 shows the work in progress.[3]

Figure 1: The Shipyard Under Construction

San Francisco History Center, San Francisco Public Library

[1] Kelley & VerPlanck Historical Resources Consulting, "Bayview Hunters Point Area B Survey," p 41, prepared for the San Francisco Redevelopment Agency, February 11, 2010
[2] "Bayview Hunters Point Area B Survey," p 93
[3] San Francisco History Center, San Francisco Public Library

In 1946, the United States conducted Operation Crossroads, a pair of atom bomb tests in the Pacific that went wrong, leaving the Navy with dozens of vessels badly contaminated by radioactive fallout. A new laboratory at Hunters Point developed a technique of decontaminating ships by sandblasting them in dry dock, and many of the radioactive vessels ultimately passed through the Shipyard. The laboratory became the Naval Radiological Defense Laboratory (NRDL), which operated until 1969, and was the site of extensive radiological experimentation and research. The Shipyard became a regional hub for the disposal of radioactive waste, with workers packing NRDL's voluminous waste and material from decontaminated ships, as well as material from other nuclear facilities all over the Bay Area, into 47,000 large steel drums and sinking them in the ocean near the Farallon Islands.[4]

In 1974, the Navy ceased operations at the Shipyard, and in 1976 leased the site to Triple A Machine Shop. By 1984, not long after the passage of the Federal Superfund law, the writing was on the wall that the Navy would have to take responsibility for what had been left behind in the Shipyard, and it started taking stock of the mess.[5]

Forty years on, what we now know about the witches' brew in the Shipyard defies easy summarization. Radioactive material had been spilled, burned, or improperly disposed of, and still pollutes the soil, the base landfill, and the Bay.[6] Conventional shipyard operations left behind piles of asbestos, ponds of oil, crushed heavy metals, discarded batteries, spilled acids, and other toxic chemicals.[7] Triple A Machine Shop illegally dumped large amounts of extremely carcinogenic PCBs and heavy metals at the site.[8]

Who Bears the Burden?

The history of the Bayview Hunters Point community in the last century is complex, but two salient trends stand out: what the land was used for, and who lived there. Before World War II, the neighborhood had already been a locale for unpleasant, industrial uses, such as the Shipyard and slaughterhouses. After the war, as industrial real estate became scarce in other parts of the City, the Bayview became a destination for more and dirtier industrial development.

By 1945, over 18,000 workers, a third of them Black, had come to work at the Hunters Point Shipyard, most housed in Navy barracks there or in nearby Bayview. After the war, racist housing policies blocked Black workers and their families from moving to safer, less polluted parts of the City, so many stayed in the shadow of the Shipyard. By 1970, the census counted

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[4] Chen, Kevin, and Gabrielle Hecht, "Naval Radiological Defense Laboratory (NRDL) Briefing Book," Nuclear Insecurity in the Bay Area and Beyond, Stanford University, 2020

[5] US Navy, "'Initial Assessment Study of Hunters PointNaval Shipyard (Disestablished) San Francisco, California,Chapter 2, pp 2-3, Naval Energy and Environmental Support Activity, October 1984

[6] US Navy, "Hunters Point Shipyard History of the Use of General Radioactive Materials, 1939 – 2003 Final Historical Radiological Assessment,"Chapters 6-7, 2003

[7] "Initial Assessment Study of Hunters PointNaval Shipyard (Disestablished) San Francisco, California"

[8] Zamora, Jim Heron and Jane Kay, "Triple A Machine Shop Toxics Case," SFGate, December 9, 1996

over twenty thousand Black residents in Bayview Hunters Point, two thirds of the area's population.[9]

The history of environmental racism in Bayview Hunters Point has been met by a decades-long history of Black-led environmental justice activism. Community leaders have fought not only for responsible cleanup of the Shipyard, but to shut down a dirty power plant,[10] clean up the City's biggest sewage treatment plant,[11] stop industrial dumping,[12] and monitor local air quality.[13] (See Appendix D for an overview of environmental and community activism around Hunters Point.)

But the statistics remain grim. In 2018, the San Francisco Department of Public Health found that Bayview Hunters Point is significantly more at risk of health and environmental catastrophes than other neighborhoods.[14] 27% of the neighborhood is situated within a quarter-mile of a contamination risk, and Bayview Hunters Point residents have worse health outcomes, higher maternal deaths, twice the rate of breast cancer, and three times more "preventable hospitalizations" than other San Franciscans. The California EPA's CalEnviroScreen, a metric combining the pollution burden and social vulnerabilities of communities, shows the most beleaguered census tract in Bayview Hunters Point, just inland of the Shipyard, scoring worse than 92% of census tracts in the entire state.[15] Contamination from the Shipyard is part of a long, toxic history.

The Cleanup and Beyond

On November 21, 1989, the decommissioned Shipyard was added to the National Priorities List;[16] in lay terms, it became a Superfund site. According to the Superfund law, properly known as the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), responsibility for cleaning up the Shipyard lies with the Navy. Section 120 of CERCLA, which covers toxic sites owned by the federal government, obliges the Navy to enter into a formal agreement with the regulators who oversee the cleanup, to establish the ground rules of their working relationship. That agreement[17] was signed by the Regional Administrator

[9] " Bayview Hunters Point Area B Survey," pp 136-143
[10] Fulbright, Leslie, "Big Victory for Hunters Point Activists; As PG&E Closes its Old, Smoky Power Plant, the Neighborhood Breathes a Sigh of Relief," *San Francisco Chronicle,* May 15, 2006
[11] Katz, Mitchell, "Health Programs in Bayview Hunter's Point & Recommendations for Improving the Health of Bayview Hunter's Point Residents," p. 8, San Francisco Department of Public Health, September 19, 2006
[12] Mojadad, Ida, "City Struggles to Rein in Illegal Dumping in Bayview," *SF Weekly*, February 22, 2019
[13] Wolfram, Jessica, "Bayview Air Monitoring Program Helps Residents Breathe Easier," *San Francisco Examiner,* October 8, 2021
[14] "San Francisco Department of Public Health, "The Bayview Hunters Point Community Resilience Assessment," 2018
[15] California Office of Environmental Health Hazard Assessment, "Cal EnviroScreen," October 2021
[16] US Environmental Protection Agency, "National Priorities List Sites"
[17] US Navy, "Federal Facility Agreement for Naval Station Treasure Island, Hunters Point Annex," January 1992

of EPA, Region 9, on January 22nd, 1992. (See Appendix F for more detail on the Superfund legal framework.)

"Federal Facility Agreement signatories" is a very important bit of jargon: when it comes to the cleanup at the Hunters Point Shipyard, the agencies that signed the agreement are the deciders. The Navy makes and carries out the plans for cleanup. The regulators approve the plans and oversee their execution. The Federal Facility signatories for the Hunters Point Shipyard site are:

- the Navy
- the United States Environmental Protection Agency (EPA)
- the California Department of Toxic Substances Control
- the San Francisco Bay Regional Water Quality Control Board

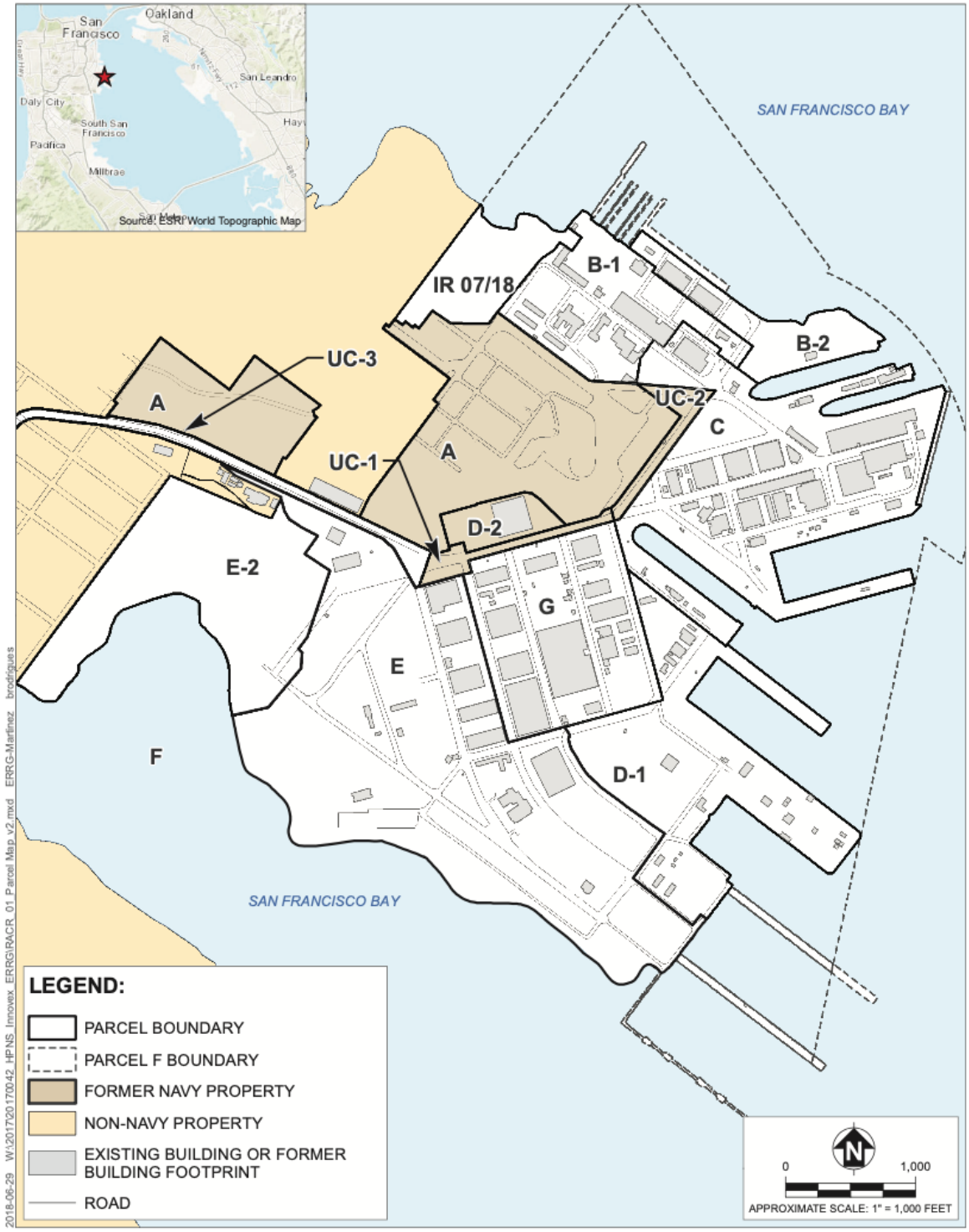
The City and County of San Francisco is not a signatory, and does not have a decision-making role, but SFDPH participates in the process and routinely offers written comment on cleanup documents.

In April of 1992, the Navy divided the 638-acre Shipyard into more manageable administrative units called "parcels"[18] so that it could clean up the Shipyard piece by piece, and transfer each parcel separately to the City once its cleanup was approved. (See Figure 2)

Parcel A sits on top of a hill, the site of former Navy barracks, and so was believed to be relatively clean. Parcels B, C, D, and E sliced up the remainder of the peninsula like a pie. Parcel F was later added to encompass the underwater portion of the site, and the most desirable portion of Parcel D was separated out into Parcel G. Later carve-outs and subdivisions have increased the total number of parcels to north of a dozen.

[18] US Navy, "Final Site Assessment Report, Potentially Contaminated Sites Parcels B,C,D, and E, Naval Station Treasure Island Hunters Point Annex, San Francisco California," p.6.

Figure 2: Parcel Map



Parcel Map

Fourth Five-Year Review of Remedial Actions, Hunters Point Naval Shipyard, San Francisco, California

In January of 1994, the Navy and the San Francisco Redevelopment Agency (SFRA)[19] signed a memorandum of understanding,[20] setting in motion a multi-decade quest to transform the Shipyard into a mini-city in its own right. In 1997, the Board of Supervisors approved SFRA's redevelopment plan[21] for the Shipyard, and in 1999, SFRA selected Lennar Corporation as the master developer.[22]

In April 2004, the City, the Navy, and SFRA signed a Conveyance Agreement[23] to outline a framework for the transfer of each parcel to the City, after the Navy completes the parcel's environmental cleanup and state and federal regulators confirm it is safe. The City is not required to accept any parcel.

The hilltop Parcel A was transferred to the City in December 2004, marking the beginning of Phase I of the redevelopment project, and Lennar soon began construction. After 2012, SFRA's successor agency, the Office of Community Investment and Infrastructure (OCII), took over responsibility for working on Shipyard redevelopment. By 2015, new homeowners were moving into what Lennar branded "The San Francisco Shipyard," advertising "luxury condominiums and townhomes with breathtaking bay views…the ultimate experience in urban living." [24]

In 2016, Lennar restructured the Shipyard project under a new spinoff company, FivePoint Holdings, in which it is an investor.[25] Optimism and grand visions are still the order of the day in promoting Phase II development in the Shipyard's low-lying parcels. FivePoint's 2017 Request for Statements of Interest described its plans for "new infrastructure, state-of-the-art amenities, parks and open space, neighborhood retail centers, and a diverse range of housing and employment opportunities along the picturesque waterfront," calling the Shipyard "the largest redevelopment effort in San Francisco since the 1906 earthquake."[26] OCII's 2018 project update proposed to add hotels, parks, "artist and maker space," and 4.5 million square feet of office

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[19] The San Francisco Redevelopment Agency (SFRA)was incorporated in 1948 under the California Community Redevelopment Law. Though separate from the City and County of San Francisco, the agency carried out redevelopment efforts authorized by the San Francisco Board of Supervisors. All redevelopment agencies were dissolved in 2012 by order of the California Supreme Court. The Office of Community Infrastructure and Investment (OCII) is SFRA's state-approved local successor agency.

[20] US Navy, "Transmittal of Interim Update for Base Realignment and Closure (BRAC) Cleanup Plan (BCP) of March 1995," p. 12 (ES 6), August 8, 1995

[21] San Francisco Redevelopment Agency, "Hunters Point Shipyard Redevelopment Plan," July 14, 1997

[22] San Francisco Redevelopment Agency, "Resolution No. 68-99 Authorizing An Exclusive Negotiations Agreement With Lennar/Bvhp, Llc, a California Limited Liability Company, for The Hunters Point Shipyard; Hunters Point Shipyard Redevelopment Project Area," June 1, 1999

[23] San Francisco Redevelopment Agency, "Resolution No. 50-2004, Adopting Environmental Findings Pursuant to the California Environmental Quality Act and Authorizing Execution of the Following Documents with the United States Department of the Navy Concerning the Former Hunters Point Naval Shipyard Site," April 21, 2004

[24] https://liveatsfshipyard.com/

[25] Five Point Holdings PR Newswire, "Strategic Combination of FivePoint Holdings Creates Largest Developer of Mixed-Use Communities In Coastal California,"May 4, 201

[26] Gensler for FivePoint Development LLC, "Request for Statements of Interest and Qualifications ("RFQ") for Design, Engineering, & Professional ConsultingServices, SF Shipyard," September 6, 2017

space to "embrace the legacy, authenticity and unique character of the Shipyard as we look to the future and create a model for city-making."[27]

At the time of the original redevelopment plan back in 1997, the hope was that the Shipyard could be cleaned up so completely that people could live there as if it had never been polluted; in Superfund language, it was to be made suitable for "unrestricted use."[28]

But by the time cleanup plans were documented for the parcels beyond Parcel A, around 2009-10, the documents left no doubt that unrestricted use was out of reach. The very rock that had been dumped into the Bay to make the shipyard was poisonous,[29] and some pollutants in the soil and groundwater were so pervasive it was impossible to remove them completely. The plans were adjusted. In developed areas, pavement would be required everywhere to shield people from the toxic dirt. In open spaces, thick layers of clean, imported soil would have to be laid down in order for the parks to be safe. In many areas, new buildings would be required to be fitted with special equipment to divert poisonous vapors away from their interiors.[30]

Then, in a trickle of reports throughout the 2010s,[31] ultimately followed later by criminal convictions and lawsuits,[32] allegations emerged that former employees of Tetra Tech EC, Inc., the Navy contractor responsible for testing and cleaning up radiological contamination in the Shipyard, had been falsifying data. The safety of the Shipyard was thrown into doubt, public trust was damaged, and homeowners who had bought properties in Parcel A sued the developer, claiming they were misled about the extent of contamination.[33] Ultimately, in light of the safety concerns raised, the solution agreed to by the FFA signatories was for the Navy to repeat much of the soil testing, thus delaying the cleanup and the transfer of remaining parcels to the City by years. At the time of this report, only retesting in Parcel G is underway. The cleanup of the Shipyard, which was supposed to be winding down by the early 2020s, will continue for years to come.

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[27] "TheShipyard and Candlestick Project Update," OCII Commission, March 20, 2018
[28] https://www.lawinsider.com/dictionary/unrestricted-use-remedial-action
[29] San Francisco Department of Public Health, "Draft Executive Summary Regarding the Environmental Remediation of the Hunters Point Shipyard," Attachment 8, Attachment 10, April 2010
[30] US EPA, "Hazard Ranking System Subsurface Intrusion Component," January 9, 2017
[31] Nguyen, Vicky, Liz Wagner, Felipe Escamilla, "Contractor Submitted False Radiation Data at Hunters Point," *NBC Bay Area,* October 13, 2014; Brinklow, Adam, "Alleged Radiation Cover-Up at Hunters Point Prompts EPA Investigation," *Curbed SF,* September 22, 2016; Roberts, Chris, "Almost Half of Toxic Cleanup at Hunters Point Shipyard is Questionable or Faked, According to Initial Review," *Curbed SF,* January 26, 2018
[32] US Attorney's Office, District of Northern California, "United States Joins Lawsuits Against Tetra Tech EC Inc. Alleging False Claims In Connection With Shipyard Cleanup," US Department of Justice, October 26, 2018
[33] CBS Bay Area, "Settlement Approved For San Francisco Hunters Point Homeowners In Lawsuit Over Alleged Contamination," April 1, 2022

THE THREAT OF RISING GROUNDWATER

The Basics

Much of the low, flat portion of Hunters Point that extends into the Bay was constructed during World War II, out of a nearby hill that had been pulverized and dumped into the water. When a shoreline is made of such permeable material, salt ocean water soaks in, effectively extending the ocean under the ground. But the soil usually also contains shallow fresh water, from rain and other sources. Because salt water is heavier than fresh, this fresh groundwater floats on top of the saltwater layer underground.

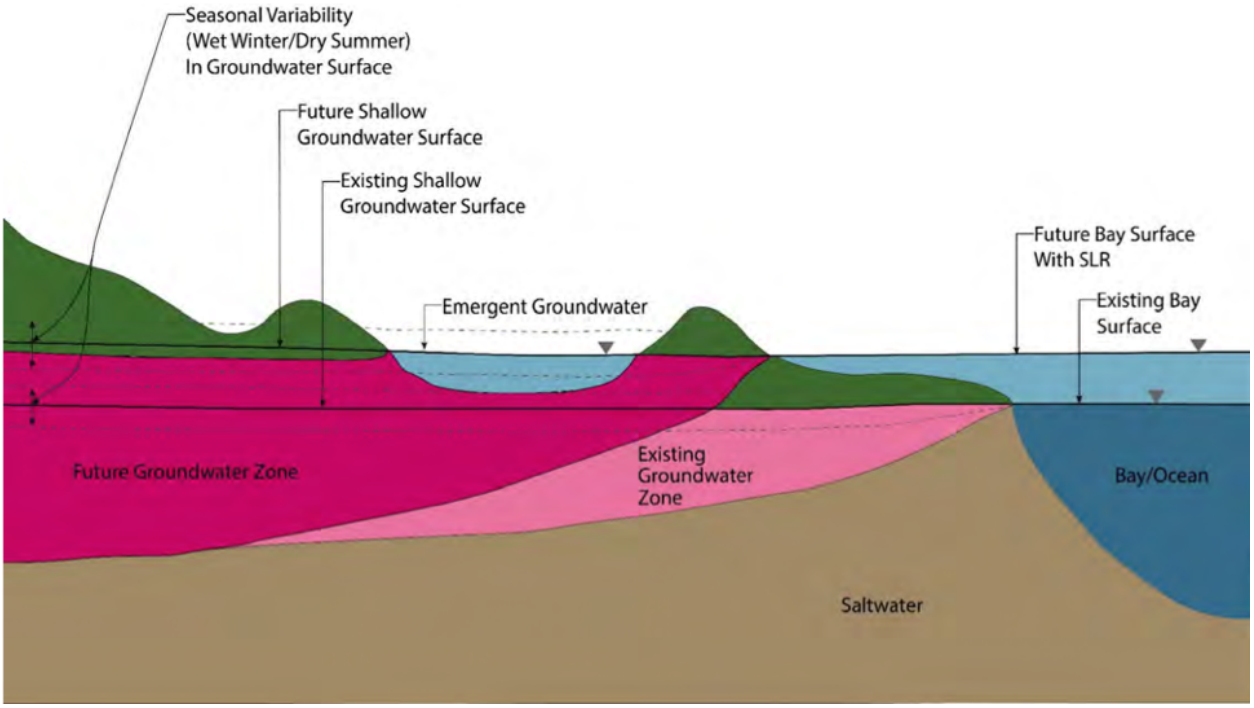
As shown in Figure 3,[34] the shallow groundwater surface near the shore fluctuates with the sea: with the tides on a daily basis, and with sea level rise as the planet warms. When it rises enough, emergent groundwater can be pushed up from the earth—often years before there is overland flooding from the sea itself. Conventional defenses against sea level rise, such as sea walls, offer no protection from flooding from below, and can even exacerbate flooding by creating a barrier that keeps risen groundwater from flowing out.[35] (For more about the effects of sea level rise on groundwater see Appendix A, a selection of general audience media on this subject, and Appendix B, a selection of scholarly articles.)

The first time this concept appears in the scientific literature is in 2007,[36] when the Navy's plans for cleaning up most of the Shipyard were already being prepared. In 2012, a pair of landmark papers about the cases of Honolulu[37] and New Haven[38] explored how groundwater propelled upward by sea level rise could create hazards in urban environments. By 2019, scientists had awakened to the risks rising groundwater posed along the shoreline of the San Francisco Bay,

[34] City of Alameda, "The Response of the Shallow Groundwater Layer and Contaminants to Sea Level Rise," September 2020
[35] Habel, Shellie, Charles H. Fletcher & Tiffany R. Anderson, *et al.* "Sea-Level Rise Induced Multi-Mechanism Flooding and Contribution to Urban Infrastructure Failure," *Scientific Reports,* March 2, 2020
[36] Masterson, John P. and Stephen Garabedian, "Effects of Sea-Level Rise on Ground Water Flow in a Coastal Aquifer System,"pp. 209-217, *Groundwater* 45, no. 2, March-April 2007
[37] Rotzoll, Kolja and Charles H. Fletcher, "Assessment of groundwater inundation as a consequence of sea-level rise," pp 477–481, *Nature Climate Change*, 2013
[38] Bjerklie, David M., John R. Mullaney, Janet R. Stone, Brian J. Skinner, and Matthew A. Ramlow, "Preliminary investigation of the effects of sea-level rise on groundwater levels in New Haven, Connecticut," U.S. Geological Survey Open-File Report 2012–1025, 2012

and two papers —one from UC Berkeley[39] and the other from the US Geological Survey (USGS)[40]—created maps of how sea level rise might affect groundwater along the Bay edge.

Figure 3



City of Alameda, The Response of the Shallow Groundwater Layer and Contaminants to Sea Level Rise

A new Bay Area project[41] builds on the work of the UC Berkeley paper and will release its results in the second half of 2022. This study is the work of the Pathways Climate Institute (Pathways) and the San Francisco Estuary Institute (SFEI), and will produce the most detailed maps to date of the groundwater surface under different sea level rise scenarios in Alameda, Marin, and San Mateo counties, as well as in San Francisco. In San Francisco, the Office of Resilience and Capital Planning (ORCP) has partnered with Pathways and SFEI to support

[39] Plane, Ellen, Kristina Hill, and Christine May, "A Rapid Assessment Method to Identify Potential Groundwater Flooding Hotspots as Sea Levels Rise in Coastal Cities" *Water* 11, no. 11, 2019

[40] Bufus, Kevin M, P. L. Barnard, D. J. Hoover, J. A. Finzi Hart, and C. I. Voss, "Increasing threat of coastal groundwater hazards from sea-level rise in California." pp 946–952 *Nature Climate Change*, 2020

[41] Pathways Climate Institute and San Francisco Estuary Institute-Aquatic Science Center, "Shallow Groundwater Response to Sea Level Rise in the San Francisco Bay Area: Existing and Future Conditions,"estimated release date 2022. See advance study summary here.

mapping the city's groundwater surface—a crucial step in understanding how to plan for sea-level rise in different parts of the city.

The Jury has obtained permission to include a preview of the Pathways+SFEI maps for Hunters Point in this report. Figure 4 shows where the highest annual shallow groundwater surface is currently, and where it would be with a scenario of four feet of sea level rise—well within the range scientists expect to see by the end of the century.[42]

Refer back to Figure 2 for the outlines of Shipyard Parcels C and G, both areas with buried contaminants, and both slated for development. With four feet of sea level rise, the wettest conditions are expected to bring groundwater within three feet of the surface in large portions of these parcels, and the southwest corner of Parcel G is predicted to be surrounded by flooding. Those floodwaters could be poisoned with toxic metals and volatile organic compounds. Throughout the century, as groundwater rises in Parcels C and G (as well as in Parcel B, also planned for development,) buried contaminants that are now dry and stationary could become wet and mobile.

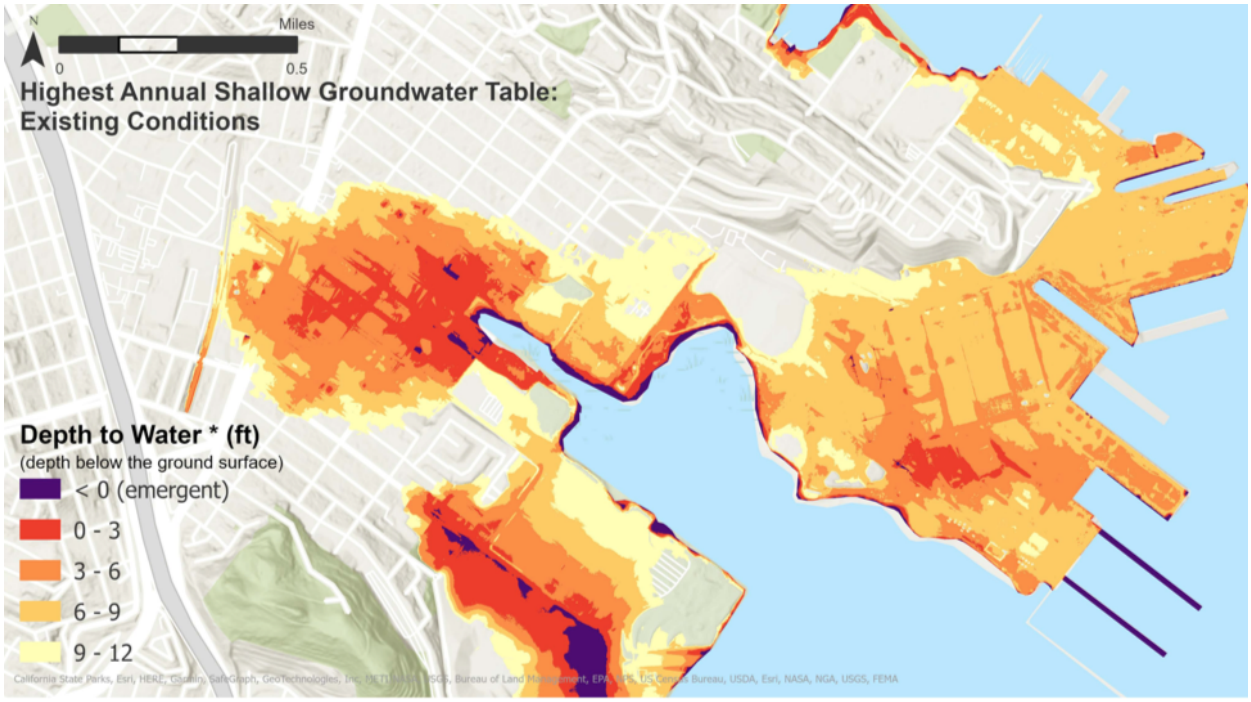
As vivid and alarming as the maps in Figure 4 are, they have significant limitations, and are not adequate for the City to use to inform important decisions about the future of the Shipyard.

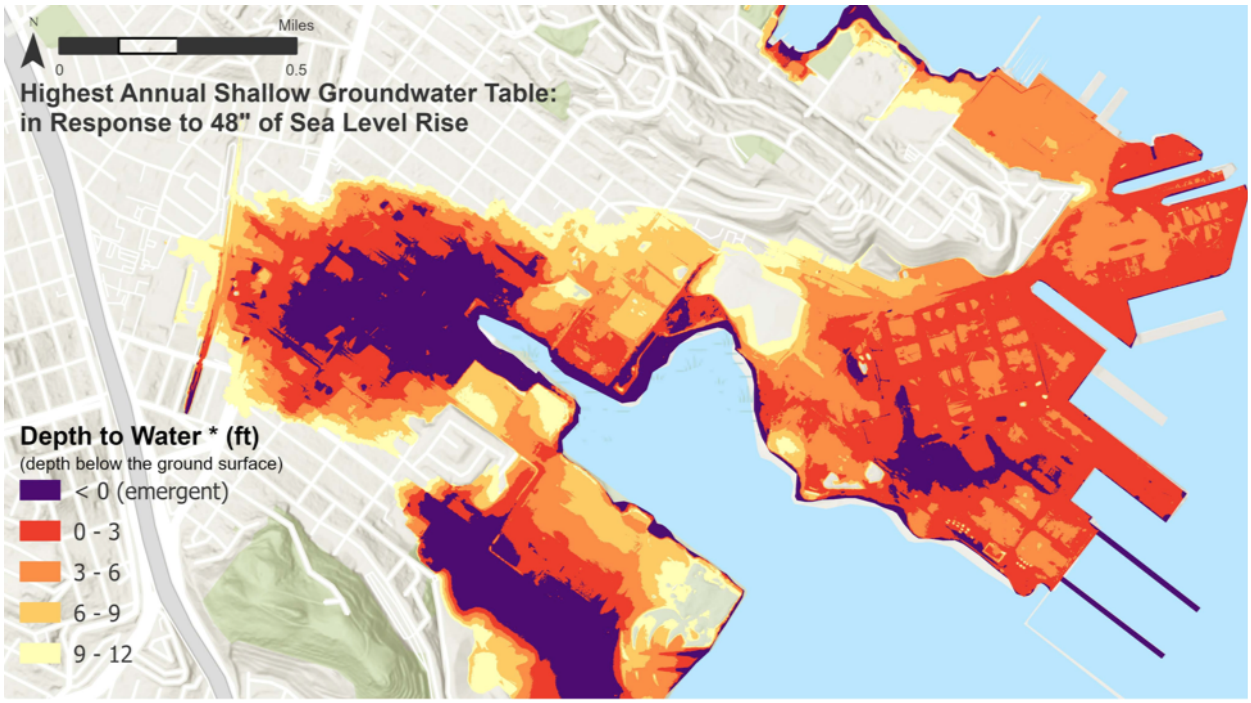
- In the Shipyard, the Pathways+SFEI maps are based on very limited data. Plentiful groundwater data has been generated by the Navy, but it is not made available in a format useful to outside researchers. The Pathways+SFEI maps for the Shipyard are based on data from just two wells.
- The regional nature of the Pathways+SFEI study limits it from taking into account the specific characteristics of the soil in the Shipyard.
- The site cleanup and future development will change the terrain of the Shipyard, and maps are needed that take these changes into account.
- Most crucially, the Pathways+SFEI study does not model groundwater flows in the Shipyard that could predict how soil and groundwater contaminants might move around under different sea level rise scenarios.

With all that's at stake in the Hunters Point Shipyard, the City urgently needs better, more detailed predictions of how groundwater will react to sea level rise at this site.

[42] National Oceanic and Atmospheric Administration, "2022 Sea Level Rise Technical Report, Coastal County Snapshots," U.S. Department of Commerce

Figure 4: Groundwater Rise in the Shipyard





Pathways Climate Institute and San Francisco Estuary Institute-Aquatic Science Center,, "Shallow Groundwater Response to Sea Level Rise in the San Francisco Bay Area: Existing and Future Conditions,"estimated release 2022

Rising Groundwater in the Shipyard: What Could Go Wrong?

Build a peninsula out of fill dirt and crushed rock. Run an oily, messy shipyard on it for decades. Site a radiological research laboratory there. Process thousands of tons of radioactive waste on its way to disposal in the ocean. Put out fires in the landfill, and mop up chemical spills. Then spend decades scrubbing the place clean as best you can, and build a small, new city with thousands of homes, schools, and extensive commercial properties on top of the remains. What could go wrong? What could go wrong if the average height of the water table was three feet higher than assumed, back when all this cleanup and construction was originally planned? What if it were six feet higher? What could go wrong during an extreme precipitation event at the end of a wet winter, supercharged by climate change and rising tides, when the ground cannot hold any more water?

There are so many things that have gone wrong already, both in the toxically burdened Bayview Hunters Point neighborhood and in the Shipyard itself. Anything that could subject the people of this community and the people who will eventually live in the Shipyard to further risks must be taken very seriously.

Earthquakes, Flooding and Infrastructure

Even before toxic and radioactive materials are considered, the lens of straight engineering offers a junk drawer full of problems. Fill soil like that in the Shipyard is at high risk of liquefaction during an earthquake,[43]and rising groundwater can increase the likelihood and severity of liquefaction.[44] Setting aside earthquakes, when groundwater rises and encounters an impermeable surface like pavement, the foundation of a building, or a sewer line, the water pushes up on it as if it were a boat. Pavement can crack and leak under this pressure.[45] Buildings with underground parking garages can float and settle back down, less stable than before.[46] High groundwater can shove around underground infrastructure like sewers, gas mains and storm drains, and the water can remove soil when it drains away again, leading to other structural problems.[47]

Mobilized Contaminants

The Navy and its regulators have deemed it safe to leave some hazardous material buried on site throughout the Shipyard. These decisions did not take into account, however, that every inch of

[43] United States Geological Survey, "Liquefaction Susceptibility," USGS, Earthquakes Hazard Program
[44]. Grant, Alex R,, Anne M. Wein, Kevin M. Befus, Juliette Finzi Hart, Mike T. Frame, Rachel Volentine, Patrick Barnard, and Keith L. Knudsen,"Changes in Liquefaction Severity in the San Francisco Bay Area with Sea-Level Rise," *Geo-Extreme 2021: Climatic Extremes and Earthquake Modeling ,* 2021
[45] May, Christine, A.T. Mohan, O. Hoang, M. Mak, Y Badet, "The Response of the Shallow Groundwater Layer and Contaminants to Sea Level Rise," City of Alameda, September 2020
[46] NYC Economic Development Corporation, "Lower Manhattan Climate Resilience Study,"p. 23, 2019
[47] Chisolm, Elizabeth and John C. Matthews, "Impact of Hurricanes and Flooding on Buried Infrastructure," *Leadership and Management in Engineering* 12 , pp 151-156, 2012

groundwater rise has the potential to bring the water table into contact with previously stationary contaminants. In the areas of the Shipyard where development is planned, pavement is intended to serve as an important line of defense against toxins in the soil.[48] But if the pavement is not elevated well above the future water table, water will eventually batter through the pavement from below, and may carry toxins with it. In areas planned for parks, layers of imported soil are supposed to serve as protection. But if they are not thick enough, the soil will periodically become soaked through with water that may bear contaminants.

Volatile Organic Compounds

The most pernicious toxins that are known to remain in the Shipyard are Volatile Organic Chemicals (VOCs.) Throughout the site, the Navy's remediation plans are to excavate and remove the most concentrated VOC spills, or to chemically treat them in place. But like discarded plastic litter, VOCs get everywhere, and keep turning up in unexpected places for years.

According to Navy plans, any VOCs that remain in the Shipyard's soil and in the groundwater are to be managed with "institutional controls."[49] Institutional controls are active measures that have to be maintained into the future—potentially indefinitely—to maintain safety. They include remedies such as the ongoing monitoring of wells, or requiring "vapor barriers" in buildings to divert vaporized VOCs away from indoor spaces.

Experts the Jury consulted were skeptical of the ability of institutional controls to protect people from VOCs in a time of climate change. VOCs mix easily with water, and as groundwater moves faster, or in new directions, it will carry VOCs with it. If groundwater rises all the way to the surface to cause flooding, VOCs will come along for the ride. And VOCs have a superpower: where sewer lines have been damaged by age, rising groundwater, or earthquakes, water carrying VOCs can leak into the sewers. Toxic vapors can then rise off that water and travel up the pipes into homes and other structures.[50] In the multi-story residential buildings planned for the Shipyard, those toxic vapors would have many stories to rise, and could reach into a large number of bathrooms and sleeping areas.

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[48] See Appendix E for documents. Parcel G ROD, p. 33. Amended Parcel B ROD, Chapter 9, p. 5. Parcel C ROD, p. 56

[49] See Appendix E for documents. Parcel G ROD, p. 42. Amended Parcel B ROD, Chapter 12, p. 11. Parcel C ROD, p. 57

[50] P. Wong-Yim, T.L. Taras, B.K. Davis, M.J. Wade,"Risk Assessment for Sites with Volatile Contaminants in Shallow Groundwater," Appendix E: Cleanup Documentation, California Department of Toxic Substances Control, 2007

Toxic Metals

The Navy's Records of Decision (RODs) for the Shipyard are full of references to "ubiquitous metals"[51] in the fill material that composes much of the peninsula. The most prevalent toxic metals in this fill are manganese and arsenic, and groundwater sits in this material continuously and stews. These metals don't dance around in groundwater like VOCs, but they are mobile enough that the Navy makes numerous references to the risk of groundwater transmitting toxic metals into the Bay.[52] The Jury believes serious study is needed to find out if rising groundwater might also create a pathway for the toxic metals in Shipyard soil to affect human beings— either through flooding, or by pushing the metals up into a cap of previously clean, imported soil.

Paper Workarounds

Then there is the curious case of Parcel G, which is expected to be the next parcel transferred to the City. In 2009, a Record of Decision stated that Parcel G would be mostly restricted from residential use, though the developer had recently created new plans for residential development throughout the parcel.

Under the aegis of the Office of Community Infrastructure and Investment, a creative solution was devised in 2016. A Feasibility Study[53] divided Parcel G into fifty-foot by fifty-foot grid squares. In each grid square, if a soil sample taken earlier in the process contained any one of twelve dangerous chemicals in concentrations higher than a chosen threshold, that square failed the test, and was restricted from residential use. In some cases, when the failing soil sample was directly surrounded on all sides by passing samples, only the immediate area of the failing soil sample was restricted.[54] Despite a scattering of dangerous chemicals known to be in the soil, consultants working for OCII had found a way to clear almost all of Parcel G for residential development.

Under this solution, the dense neighborhood of apartment buildings and condo towers planned for Parcel G will be shot through with patches—from the size of a parking space to the size of a few basketball courts—where, on paper, it is deemed unsafe for people to live. The argument the Feasibility Study seems to make is that the real protection will come from required covers of pavement or clean soil, and that restricted grid squares are just a bureaucratic workaround to adhere to the letter of the rules.[55] But under conditions of rising groundwater, soil contaminants may not stay put in the restricted grid squares, and flooding may carry them right up to the surface, onto the sidewalks where children play. That paper workaround needs to be revisited in the light of a credible prediction of future groundwater behavior.

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[51] See Appendix E for documents. Amended Parcel B ROD, Chapter 1, p. 4; US Navy, "Explanation of Significant Differences to the Final Record of Decision for Parcel G", p. 5, April 18, 2017. Parcel C ROD, p. 18

[52] See Appendix E for documents. Parcel C ROD, p. 13 Parcel G ROD, p. 23, 42

[53] Langan Engineering, "Feasibility Assessment for Evaluating Areas with Residential Land Use Restrictions, Parcel G, Hunters Point Naval Shipyard," Office of Community Infrastructure and Investment, November 30, 2016

[54] "Feasibility Assessment,"p. 22, pp 27-28.

[55] "Feasibility Assessment," p. 23

Unexpected Conditions

The most worrisome risks that rising groundwater poses in the Shipyard, though, are the ones we don't yet know about—and aren't necessarily looking for. The Hunters Point Naval Shipyard Risk Management Plan[56] is a document describing the procedures that must be followed during construction in the Shipyard, to minimize the risks posed by the hazardous materials there, and it explicitly acknowledges that more dangers could be hiding in the soil. The Plan's Appendix E, the "Unexpected Condition Response Plan," is a 28-page sub-document describing what to do if workers find something in the dirt that wasn't supposed to be there.

> *By way of example, Unexpected Conditions may include visibly discolored soil and/or contaminated groundwater in an area not previously identified by the Navy, soil and/or groundwater exhibiting a strong chemical odor in an area not previously identified by the Navy, unexpected subsurface structures (e.g., pits, sumps, underground storage tanks, etc.), radioactive materials, material potentially presenting an explosive hazard (MPPEH), and/or other visual or olfactory evidence of a historical release at a location not previously identified by the Navy.*[57]

The Shipyard was, after all, a shipyard. It was also home to a radiological research laboratory, from which the Navy has documented first-hand accounts of radioactive materials being mishandled.[58] Radioactive ships were decontaminated via sandblasting in the open air. Tons of radioactive waste from other nuclear facilities were brought to the Shipyard to be prepared for disposal. A radioactive deck marker turned up buried in a supposedly clean parcel near newly built homes.[59] The Navy has not tested every inch of soil in the Shipyard, nor is there any plan to do so; it's to be expected that additional dangerous materials lurk underground where the Navy didn't look. That's why there is a 28-page, break-glass-in-case-of-emergency manual about what to do if a backhoe operator stumbles onto something that literally smells bad, is explosive—or worse.

The implicit assumption in this entire risk management strategy is that anything that remains in the soil won't become a problem unless someone digs it up. In a world of rapid climate change, in which groundwater is rising into previously dry soil, that assumption no longer works.

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[56] Geostyntec Consultants, "Risk Management Plan for Hunters Point Naval Shipyard, San Francisco, California," 2019

[57] "Risk Management Plan," Appendix E, p E-1

[58] US Navy, "Hunters Point Shipyard History of the Use of General Radioactive Materials, 1939 – 2003 Final Historical Radiological Assessment," Chapter 6, 2004.

[59] Heenan, Catherine, "Highly radioactive object found at former Hunters Point Naval Shipyard," *KRON News,* September 14, 2018

Some of the risks described in this section may not manifest as serious problems in the decades to come, and possibly many of them won't. But with cancer-causing chemicals and radioactive materials, only one thing needs to go wrong. Two or three things going wrong can add up to a disaster.

Many of these risks can be avoided with foresight. It is critical that decisions about the Shipyard's future safety are informed with the best predictions science can provide about how shallow groundwater there will react to sea level rise.

Finding 1:

In the Hunters Point Shipyard, shallow groundwater rising with sea level rise and residual hazardous substances pose serious but poorly understood risks that should concern the City and County of San Francisco, the Navy, future developers, future property owners, and future residents.

Groundwater Rise and the Navy's Cleanup Plans

These serious risks have not been accounted for by the Navy in designing its remedies. They have not been accounted for, either, by the other Federal Facility Agreement (FFA) signatories.

The Records of Decision in which the Navy described its selected remedies for cleaning up the Shipyard were published mostly in 2009-10, before all but the earliest scientific literature about groundwater rise was published. Even years later, as the body of literature grew, new RODs and revisions to old ones still lacked any mention of groundwater rise. (See Appendix E.)

The Superfund law requires reviews of cleanups every five years at sites where hazardous materials remain, to ensure that remedies have been designed and carried out appropriately.[60] The most recent Five-Year Review for Hunters Point was published in 2019.[61] Had the Navy considered the new risks of rising groundwater, revisions to its previous plans would have appeared there, most likely in answers to two questions in the Technical Assessment section.

Question B in the section is, *"Are the exposure assumptions, toxicity data, cleanup levels, and [remedial goals] used at the time of the remedy still valid?"* In its answer, the Navy does not mention any new exposure pathways related to groundwater rise.[62] Question C is, *"Has any other information come to light that could call into question the protectiveness of the remedy?"* Here, the Navy muses about whether it needs to make any changes to its plans in light of updated sea level rise guidance from the State of California—and concludes that it does not.[63]

[60] US Environmental Protection Agency, "Superfund: Five Year Reviews," updated March, 2021
[61] US Navy, "Final Fourth Five Year Review," Section Six, July 2019
[62] "Final Fourth Five Year Review," pp 6-14
[63] " Final Fourth Five Year Review," pp 6-16

The Jury spoke with several individuals from directly involved regulatory agencies, and with leading experts deeply ensconced in studying groundwater rise in the Bay Area. All confirmed that, aside from some glimmers of awareness at regulatory agencies, groundwater rise has not yet been meaningfully considered in the cleanup at the Hunters Point Shipyard.

Finding 2:

The Federal Facility Agreement signatories have neglected to investigate how groundwater rise may lessen the effectiveness of the Navy's cleanup at the Hunters Point Shipyard Superfund site.

The Groundwater Maps San Francisco Needs

Much like Hunters Point, the island of Alameda is low-slung and home to a decommissioned Naval facility. Among the communities along the Bay shore concerned with groundwater rise, the City of Alameda has led the way in improving upon approximate regional models with high-quality, locale-specific, actionable analysis. As an input to its 2020 Climate Action and Resiliency Plan, Alameda commissioned a detailed, professional study[64] of how sea-level rise will affect shallow groundwater and soil contamination on and around the island. The study's authors diligently extracted local groundwater data from multiple sources to create a detailed map of the groundwater surface under the wettest, most flood-prone current conditions. They then performed rigorous modeling to predict how that groundwater surface would rise under a progressively more severe set of sea-level rise scenarios. The study then evaluated the future risks posed by groundwater flooding in known areas of contaminated soil, providing the planners of Alameda with high-quality analysis to use in preparing their community for sea level rise. (See Appendix C for a selection of reports and planning documents by cities, states and regions that address groundwater rise.)

In support of its cleanup efforts at the Shipyard, the Navy has already sunk dozens of groundwater monitoring wells. The City must persuade the Navy to make that water level data available to expert, independent scientists. The City should follow Alameda's lead and commission a study to create detailed maps of the groundwater surface at the Shipyard site under different sea-level rise scenarios. It should take into account planned changes to the site, such as shoreline structures and the addition of clean soil, and carefully map projected groundwater flows and the locations of known contaminants.

The Navy and other Federal Facility Agreement signatories should consider this new information in their updated planning. But even if they do not, the City must act. It is critical for the City and OCII to understand these forecasts in order to inform decisions about development, to make

[64] City of Alameda, "The Response of the Shallow Groundwater Layer and Contaminants to Sea Level Rise," 2020

Hunters Point as safe and resilient as possible, and to know where to watch out for trouble in the future.

Recommendation 1:

By September 1st, 2022, the Mayor and/or the City Administrator should direct the Office of Resilience and Capital Planning, in collaboration with the Department of Public Health, to commission and manage an independent, third-party study of Hunters Point Shipyard to predict the future shallow groundwater surface, groundwater flows, and potential interactions of groundwater with hazardous materials and planned modifications to the site under multiple sea level rise scenarios.

Recommendation 2:

The Mayor and the Board of Supervisors should collaborate to provide funding for the study recommended in R1, in the Fiscal Year 22-23 budget, or by October 1st, 2022.

Thanks to its involvement in the forthcoming Pathways+SFEI Shallow Groundwater project, ORCP has institutional knowledge of groundwater rise and existing relationships with outside experts. The Jury believes ORCP is the best City agency to take responsibility for this study.

The Jury wishes to emphasize that this research must be conducted with utmost impartiality and thoroughness by experts familiar with the science of groundwater rise in contaminated soil. San Francisco has understandably placed great importance on the future development of the Shipyard. It cannot cut corners in an era of climate change, as it carefully weighs all risks to the health and safety of the city's people.

A DISCONNECT IN THE CITY

Information is power, especially good information. But outcomes depend on what the City does with it. Within the City, perhaps findings from the recommended groundwater study may eventually inspire updates to codes for construction and infrastructure in the Shipyard. But most urgently, the Jury believes that good new groundwater rise information needs to be considered by decision-makers in the cleanup.

To make that happen, the City must engage fully with the cleanup governance process. The Shipyard cleanup is governed by the Federal Facility Agreement signatories: the Navy, EPA, the California Department of Toxic Substances Control, and the San Francisco Bay Regional Water Quality Control Board. The City does not get a veto or a vote in decisions about the cleanup. To bring groundwater rise—or any other issue it considers important—to the attention of the signatories, the City must use diplomacy and persuasion, strategic engagement, and its own written comments on cleanup documents.

A Steep Hill

The first problem identified by this report is that rising groundwater threatens to damage the future infrastructure of the Shipyard and expose future residents to hazardous substances. And that neither the City, OCII, nor the signatories are paying sufficient attention to these risks.

But if the City is aware of the risks rising groundwater poses elsewhere in San Francisco, why is it not paying attention in the Shipyard? This question leads to the second, more essential problem identified in this report.

A fundamental challenge posed by the Shipyard is that the process which governs the cleanup is arcane and very difficult to understand. Dozens of documents are generated every year, all written in dense technical jargon, and overwhelming for the uninitiated to navigate or to even locate. The workflow in which these documents exist is equally daunting. And yet the process is critical to understand if the City is to persuade the FFA signatories to consider its perspective on groundwater rise—or on other important issues. For someone with knowledge of the process, there are windows of opportunity and avenues of approach the City can use to productively engage with the signatories.[65] But for most of the City, the cleanup governance process is inaccessible, even invisible.

However, hidden inside this impenetrable system, the signatories are engaging with important questions that concern anyone who might someday live in the Shipyard. They should certainly concern the leaders of San Francisco.

[65] In 2016-2017, OCII worked with the signatories to modify the ROD for Parcel G to make most of the parcel available for residential development.

What does it mean for a parcel of land to be safe for people to live on? What does it mean for it to be safe to go to work there? If a community is safe only if certain rules are followed, how can we be sure those rules will be enforced, today and in the future? There are an infinity of such questions that could be asked as the cleanup proceeds. Some are addressed directly by the signatories, others implicitly, and many are not considered at all. But it is very difficult to follow the signatories' thinking by reading the documents.

The Navy is obligated to engage in community outreach and make an effort to help the public understand the answers to some of these questions. But a City leader trying to understand the priorities of cleanup decision-makers, or a resident who isn't satisfied with an answer from a Navy representative, or a City employee trying to determine exactly what risks have been considered—that person has a steep hill to climb.

Finding 3:

The process governing the cleanup at the Shipyard encompasses decisions and value judgments that matter to all San Franciscans, but the extremely technical nature of the process inhibits City leaders and citizens alike from understanding it, or even knowing what is at stake.

Roles and Responsibilities

Inside the City, the Hunters Point Shipyard Program in SFDPH is the only entity with significant experience with the process governing the Shipyard cleanup. Other City departments have little if any responsibility in the Shipyard. Most of the Shipyard remains Navy property, and even after it is transferred it will be a redevelopment area with special rules.

Those City departments with domain knowledge about groundwater rise do not engage with the process by which decisions are made about the Shipyard cleanup. Because the process is functionally invisible, there is no prompt for those departments to ask questions, or to reach out and invite someone who knows about the Shipyard cleanup to join in their groundwater rise discussions.

These obstacles are not confined to groundwater rise. Take any sphere where the City has roles to play in an ordinary neighborhood: water and sewer infrastructure, planning, building, climate change adaptation, the environment, and more. The departments, offices, and programs responsible for this range of work have little incentive to ask if the problems they think about every day are also problems in the Shipyard. If they did ask, the daunting entry into understanding the cleanup governance process might well dissuade them before they got an answer. It might never occur to them that their expertise could be applied to solving problems in the Shipyard.

Finding 4:

Despite the enormous stakes of the process governing the Shipyard cleanup, there is little understanding of the process throughout the City, or of how the City can influence this process.

The Disconnect

For thirty years, SFDPH has worked with the signatories on the cleanup, sending a representative to the monthly meetings prescribed by the Federal Facility Agreement and issuing written comments on cleanup documents. It has done so with minimal staff and little input or participation from other experts in the City. Over time, SFDPH's role in the Shipyard cleanup has evolved organically into a detail-oriented focus on the technical aspects of the cleanup governance process, and on enforcing City health codes related to the Shipyard.

In the case of groundwater rise, SFDPH's health-oriented mandate, limited Shipyard Program staffing, and its narrow, technical approach to the cleanup process were not sufficient to spot this emerging risk. Because the City departments with the relevant expertise were not involved with the Shipyard, the City was not prepared to catch the oversight when the FFA signatories, following their rigorous, regimented process, also failed to take notice of the risk.

Beyond groundwater rise, the City is exposed to *any* future mistake, overlooked issue, or questionable decision the signatories might make that is outside the skill set of SFDPH's Hunters Point Shipyard Program. So long as the full spectrum of the City's expertise is not proactively brought to bear, the City cannot properly look out for the important interests San Franciscans have in the Shipyard cleanup.

Finding 5:

The City and County of San Francisco is poorly prepared to discover new information pertinent to the Shipyard cleanup, to proactively look for risks and problems overlooked or under-prioritized by the Federal Facility Agreement signatories, or to develop responses to new information or problems.

Taking a Position

Looking out for the interests of San Francisco in the Shipyard cleanup also means the City must take a position about what it wants out of the cleanup, and express that position effectively to the signatories. Through SFDPH's Shipyard Program, the City has well-developed relationships with the signatories and can communicate with them informally in meetings and phone calls, or formally in comments on cleanup documents. But with most of the City disengaged from the

cleanup, there is no working group that can synthesize the City's position so that it can be conveyed.

For the City to articulate a well-considered stance about the Shipyard cleanup is not a simple matter. Difficult material needs to be digested; diverse perspectives need to be voiced and debated. When the City takes a strong position, as it should on the issue of groundwater rise, its concerns are likely to be just the beginning of a lengthy dialogue with the signatories, and will require follow-through.

The City's inability to adopt a position and convey it directly to the signatories was evident after the scandal involving former employees of Tetra Tech EC, Inc, the Navy contractor responsible for testing and cleaning up radioactive materials at the Shipyard, who were revealed to have been falsifying data. In 2016, Mayor Ed Lee and Malia Cohen, then Supervisor for District 10, where the Shipyard is located, sent a strongly-worded letter to the head of the EPA:[66]

> *The safety of our residents and workers is paramount, and we are committed to a thorough cleanup at the Hunters Point Naval Shipyard. This cleanup must be done in a way that protects the public health of our residents and the environment….San Francisco will not accept the transfer of any land until federal and state regulators are satisfied that the land is clean and safe, and our own Department of Public Health validates that decision.*

Had the City been comprehensively engaged in the cleanup governance process, this strong opening from the Mayor and Supervisor Cohen could have been followed by more specific messaging, delivered not to distant Washington D.C., but to the actual case workers in the Bay Area doing the hard negotiations about how to proceed in the aftermath of the scandal. This messaging could have been delivered via the very same channels the signatories use to communicate with each other.

For those paying attention, the following years saw EPA expressing pointed displeasure at the Navy in its written comments on major documents.[67] [68] The City could have used its own written comments to support the EPA's calls for better transparency from the Navy and more thorough corrective measures. But there was no venue in which key stakeholders in the City could convene to articulate a position, and the City missed the opportunity to weigh in with the signatories about what must happen to have a better, more accurate testing process.[69]

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[66] "Letter from San Francisco Mayor Ed Lee and District 10 Supervisor Malia Cohen to Environmental Protection Agency Regarding Investigation into Cleanup at the Former Hunters Point Naval Shipyard," September 19, 2016
[67] US Navy, "Final Fourth Five Year Review, Appendix F, p. 1, July 2019
[68] Parcel G Removal Site Evaluation Work Plan, Appendix A, Attachment 2.1, EPA Recommendations for Task Specific Plan for Parcel G, p. 1
[69] SFDPH's comments on these documents can be found at: "Final Fourth Five Year Review, Appendix F, p. 44. Parcel G Removal Site Evaluation Work Plan, Appendix A, "Responses to Comments," p. 24.

Finding 6:

No proactive mechanism exists for the City and County of San Francisco to articulate its interests and concerns about the cleanup to the Federal Facility Agreement signatories, nor does a mechanism exist for the City to monitor progress towards obtaining satisfactory responses to such interests and concerns from the signatories.

THE JURY'S REMEDY

The Jury believes that the essence of the City's disconnect from the Shipyard cleanup lies in the lack of attention paid to it by leaders throughout the City. And if they did pay attention, the Superfund process would demand a great investment of effort to understand. To address the first part of the problem, the Jury's recommendation is to create a serious and effective body whose explicit purpose is paying attention to the cleanup.

Recommendation 3:

By October 1st, 2022, the Board of Supervisors should pass an ordinance to create a permanent Hunters Point Shipyard Cleanup Oversight Committee that includes the Controller or their designee, relevant technical experts from the Public Utilities Commission and the Department of Public Works, and representatives from other relevant City departments, to perform due diligence on behalf of the City and County of San Francisco into the Federal Facility Agreement signatories' decision-making, and to prepare an agenda of questions and requests to be communicated to the signatories by the Department of Public Health in advance of major cleanup document releases.

In light of the widespread poor understanding of the cleanup governance process highlighted in Finding 4, the Jury offers the following discussion to help the Board create an effective oversight committee as quickly as possible, and aid the inaugural members of the committee as they begin their work.

The Jury believes this permanent Hunters Point Shipyard Cleanup Oversight Committee should:

Perform Due Diligence on Major Cleanup Documents on Behalf of the City

The heartbeat of the Superfund process is documentation. If there are important things happening in the cleanup, they will be described in a document. If there is an important upcoming issue that the committee wishes to weigh in on, the venue to engage with the signatories is the process

surrounding the documents concerning that issue. The Committee should complement the detailed-oriented review performed by SFDPH with a big-picture assessment of how new developments in the cleanup interact with the interests of San Francisco. The documents are difficult to understand, but Recommendation 4 offers a solution to that problem.

A partial list of important documents that the committee should consider reviewing if they appear on the schedule are:

- The Fifth Five-Year Review (scheduled for 2023)
- Documents that modify existing Records of Decision (Amendments and "Explanations of Significant Differences")
- The Record of Decision for Parcel F (the parcel in the Bay)
- Retesting Work Plans for Parcels B, C and D (correcting for the falsification in testing performed by former employees of Tetra Tech EC, Inc.)
- Findings of Suitability for Transfer

Work with SFDPH to Communicate with the FFA Signatories

After familiarizing itself with the content of a draft or upcoming document, the Committee may have questions, concerns, or priorities to communicate to all the signatories. The Committee may invite signatories to speak with it directly, but often it will be appropriate to communicate via the existing channel of SFDPH's Shipyard Program, especially for matters that require extended discussion. The Committee should coordinate with SFDPH on written comments on documents.

Periodically Update a Standing Position on the Cleanup

The Jury believes that even when the Committee finds little to disagree with in an important cleanup document, it should make a written statement of its priorities and standing goals for the cleanup, and that SFDPH should include these in written comment on that document.

When an issue demands a stronger position, such as in the case of groundwater rise or a crisis such as the scandal involving the falsification of testing data, the committee may also refer the issue to the Board of Supervisors and the Mayor, so that the City's elected leaders are empowered to make a well-informed response on behalf of the City.

Routinely Look for What is Missing from the Documents

It should not be forgotten that the issue of groundwater rising with sea level rise is not discussed in the cleanup documents. The committee should periodically undertake exercises to apply its members' expertise and knowledge of San Francisco to spot important issues the signatories overlooked.

The Committee's Members

The Jury sees the Shipyard Cleanup Oversight Committee as a vehicle to give City departments that are currently disengaged from the cleanup a responsibility to pay attention. As such, the Jury believes that the committee should be composed mostly or entirely of representatives from relevant City departments. As a starting point, the Jury suggests:

- Departments that employ people with expertise relevant to the cleanup, broadly defined
- Departments whose responsibilities in the Shipyard, even decades in the future, will be affected by the presence of contaminants in the soil and groundwater

To this end, the Jury named the Department of Public Works and the Public Utilities Commission in the recommendation as departments that clearly meet both criteria. The Jury also named the Office of the Controller as a center of excellence for impartial oversight in the City. Other departments the Board might consider include:

- The Office of Resilience and Capital Planning
- The Port
- The Planning Department
- The Mayor's Office of Housing and Community Development
- The Department of the Environment
- The Department of Public Health, not limited to the Shipyard Program

An Upcoming Milestone and the Need for Urgency

Five-Year Reviews are important milestones in the Superfund process calendar, when the signatories re-examine the continued suitability of cleanup actions that were decided upon in the past. As it is a time of reflection and discussion for the signatories, this is probably the best window of opportunity for the City to engage with them. It is certainly the best opportunity to persuade the signatories to consider the impact of groundwater rise on their remedial actions in the Shipyard.

The scheduled date given to the Jury for the draft version of the Fifth Five-Year Review is April 18th, 2023, although that date may slip. The Jury strongly urges the Board of Supervisors to pass the Shipyard Cleanup Oversight Committee ordinance and populate the committee with all due urgency, so that the Committee has time to orient itself and become familiar with the issues in time to inform its comments on the Fifth Five-Year Review draft.

Lifting the Fog

If the Jury could direct recommendations to the Navy, it would have some stern words about the importance of writing cleanup documents in plain English so they are comprehensible to any reasonably well-informed lay reader.

But whether or not the Navy does a better job, the City must address the incomprehensibility of the Superfund process so it is not an obstacle to the Shipyard Cleanup Oversight Committee's work.

Recommendation 4:

By October 1st, 2022, the Mayor should direct the Department of Public Health to support the Cleanup Oversight Committee in its due diligence function by providing explanatory materials and briefings about cleanup governance documents and the discourse among Federal Facility Agreement signatories, as well as additional materials at the request of the Committee.

Recommendation 5:

By October 1st, 2022, the Mayor and the Board of Supervisors should collaborate to ensure that funding is available to generate the material specified in R4, in the Fiscal Year 22-23 budget or by October 1st, 2022, and in future budgets.

The Jury suggests that the Committee be empowered to specify to the Department of Public Health what explanatory materials it requires to support its due diligence work. These materials would benefit not only the Committee, but other relevant entities in the City, and interested members of the general public as well.

The Jury expects that, in practice, the briefings and materials would be generated by the environmental consultants who already work with OCII and SFDPH's Shipyard Program and routinely review cleanup governance documents. Recommendation 5 is to provide funding for this work.

Tracking Progress

When the Committee makes a request of the Federal Facility Agreement signatories, what follows may not be a simple, transactional answer, but an extended process of consultation and discussion. The Shipyard Program in the Department of Public Health should represent the City in that process, and must keep the Committee updated frequently on the progress of the talks.

Recommendation 6:

From October 1st, 2022 and going forward, whenever there are outstanding questions and requests to the Federal Facility Agreement signatories, and especially during the lead-up to major cleanup document releases, a member of the management chain overseeing the Hunters Point Shipyard Program in the Department of Public Health should appear before the Shipyard Cleanup Oversight Committee at regular intervals to report on discussions with the Federal Facility Agreement signatories.

Closing the Loop

If the Jury's recommendations are adopted, soon after the Shipyard Cleanup Oversight Committee convenes, a detailed study of the groundwater in the Shipyard under different sea level rise scenarios will fall into its inbox. The Committee should study and evaluate this material, and prepare a statement about what it wants the signatories to consider and respond to. It should share that statement with the Mayor, the Board of Supervisors, and the Department of Public Health, to ensure that the Federal Facility Agreement signatories receive this analysis with the unified moral authority of the City and County of San Francisco behind it.

Recommendation 7:

By March 1st, 2023, the Hunters Point Shipyard Cleanup Oversight Committee should prepare a report on its recommended requests for the Federal Facility Agreement signatories based on the groundwater study recommended in R1, and deliver that report to the Board of Supervisors, the Mayor, and the Department of Public Health.

As noted above, the best venue in the Superfund process to address important new information is the Five-Year Review, and the scheduled date for the next draft Review is April 18th, 2023. If that schedule holds, there will be a short time to move forward with both the groundwater rise study and the Committee, and to socialize the City's concerns about groundwater rise with the signatories ahead of comments on the Review.

The Jury encourages those City departments who are members of the Committee and have experience with groundwater rise to communicate their own knowledge of the issue to other Committee members as soon as possible, so that the Committee as a whole has a shared understanding of groundwater rise, and is prepared to evaluate the study's maps.

The Jury encourages the Department of Public Health to begin communicating with the signatories as soon as the groundwater rise study is commissioned, to create the most receptive atmosphere possible for the results.

CONCLUSION

In the early part of this century, there was little anticipation of how much could go wrong at the Hunters Point Shipyard. No one imagined that the low-lying, more polluted parcels would still be unready for transfer to the City in 2022. No one thought the City would need to be so vigilant in the cleanup process for so long, or that the City would need to put in place a mechanism to ensure such vigilance.

In the course of the Jury's investigation, we did not identify any City department that was failing to perform the tasks expected of it with regard to the cleanup. But thirty years in, it is clear that those expectations are much too low. Plans have gone terribly awry; serious new issues have been overlooked, and far too few people have been paying attention. As the cleanup continues for another decade or more, more things will go wrong, more mistakes will be made, and the situation will keep changing.

The Jury began this investigation by looking at the risks that rising groundwater poses in the Shipyard. Rising groundwater should be the first issue the awakened City successfully takes to the Federal Facility Agreement signatories for action.

It should not be the last. The next time something goes wrong, the next time something is overlooked, the City must be prepared to engage fully—for the sake of those who live in Bayview Hunters Point today, and for all the individuals and families who will live in the Shipyard over the next century.

METHODOLOGY

The Jury's research included extensive reading on the Hunters Point Shipyard. All our sources are cited in the report footnotes. See also Appendix E, for a guide to cleanup documentation, and Appendix F, for an outline of the Superfund legal framework governing the cleanup.

The Jury conducted interviews with current and former representatives of the Federal Facilities Agreement signatories, the Office of Community Infrastructure and Investment, and relevant departments in the City and County of San Francisco.

The Jury conducted interviews with representatives of community and non-profit groups; see Appendix D for a list of groups involved in the debate.

The Jury did extensive research on the emerging science of groundwater rise. All our sources are cited in the footnotes. See also Appendix A for additional general-audience reports, Appendix B for additional scientific papers, and Appendix C for municipal and Bay Area regional plans that address groundwater rise.

The Jury interviewed leading scientists and researchers in the field, and attended a two-day regional conference on the science and implications of sea level rise around the Bay, including groundwater rise.

FINDINGS AND RECOMMENDATIONS

Findings

F1: In the Hunters Point Shipyard, shallow groundwater rising with sea level rise and residual hazardous substances pose serious but poorly understood risks that should concern the City and County of San Francisco, the Navy, future developers, future property owners, and future residents.

F2: The Federal Facility Agreement signatories have neglected to investigate how groundwater rise may lessen the effectiveness of the Navy's cleanup at the Hunters Point Shipyard Superfund site.

F3: The process governing the cleanup at the Shipyard encompasses decisions and value judgments that matter to all San Franciscans, but the extremely technical nature of the process inhibits City leaders and citizens alike from understanding it, or even knowing what is at stake.

F4: Despite the enormous stakes of the process governing the Shipyard cleanup, there is little understanding of the process throughout the City, or even that the City can influence this process.

F5: The City and County of San Francisco is poorly prepared to discover new information pertinent to the Shipyard cleanup, to proactively look for risks and problems overlooked or under-prioritized by the Federal Facility Agreement signatories, or to develop responses to new information or problems..

F6: No proactive mechanism exists for the City and County of San Francisco to articulate its interests and concerns about the cleanup for the Federal Facility Agreement signatories, nor does a mechanism exist for the City to monitor progress towards obtaining satisfactory responses to such interests and concerns from the signatories.

Recommendations

R1: By September 1st, 2022, the Mayor and/or the City Administrator should direct the Office of Resilience and Capital Planning, in collaboration with the Department of Public Health, to commission and manage an independent, third-party study of Hunters Point Shipyard to predict the future shallow groundwater surface, groundwater flows, and potential interactions of groundwater with hazardous materials and planned modifications to the site under multiple sea level rise scenarios. (F1)

R2: The Mayor and the Board of Supervisors should collaborate to provide funding for the study recommended in R1, in the Fiscal Year 22-23 budget, or by October 1st, 2022. (F1)

R3: By October 1st, 2022, the Board of Supervisors should pass an ordinance to create a permanent Hunters Point Shipyard Cleanup Oversight Committee that includes the Controller or their designee, relevant technical experts from the Public Utilities Commission and the Department of Public Works, and representatives from other relevant City departments, to perform due diligence on behalf of the City and County of San Francisco into the Federal Facility Agreement signatories' decision-making, and to prepare an agenda of questions and requests to be communicated to the signatories by the Department of Public Health in advance of major cleanup document releases. (F4, F5, F6)

R4: By October 1st, 2022, the Mayor should direct the Department of Public Health to support the Cleanup Oversight Committee in its due diligence function by providing explanatory materials and briefings about cleanup governance documents and the discourse among Federal Facility Agreement signatories, as well as additional materials at the request of the Committee. (F3)

R5: By October 1st, 2022, the Mayor and the Board of Supervisors should collaborate to ensure that funding is available to generate the material specified in R4, in the Fiscal Year 22-23 budget or by October 1st, 2022, and in future budgets. (F3)

R6: From October 1st, 2022 and going forward, whenever there are outstanding questions and requests to the Federal Facility Agreement signatories, and especially during the lead-up to major cleanup document releases, a member of the management chain overseeing the Hunters Point Shipyard Program in the Department of Public Health should appear before the Shipyard Cleanup Oversight Committee at regular intervals to report on discussions with the Federal Facility Agreement signatories. (F6)

R7: By March 1st, 2023, the Hunters Point Shipyard Cleanup Oversight Committee should prepare a report on its recommended requests for the Federal Facility Agreement signatories based on the groundwater study recommended in R1, and deliver that report to the Board of Supervisors, the Mayor, and the Department of Public Health. (F2)

REQUIRED AND INVITED RESPONSES

Required Responses

Pursuant to California Penal Code §933 and §933.05, the Jury requests responses to the following Findings and Recommendations from these City institutions.

From the Office of the Mayor within 60 days:

F1, F2, F3, F4, F5
R1, R2, R4, R5, R6, R7

From the San Francisco Board of Supervisors within 90 days:

F4, F5, F6
R2, R3, R7

Invited Responses

The Jury requests responses to the following Recommendations from these City departments within 60 days.

From the Office of the City Administrator: R1

From the Office of Resilience and Capital Planning: R1

From the Department of Public Health: R4, R6

Appendix A: General Audience Media

A selection of additional recent reporting on groundwater rise and its consequences, written for a general audience

Alameda Sun, "City Leading Bay Area in Studying Impacts of Sea Level Rise Locally," December 3, 2020

Hershey, Cole, "The Coming Tide: North Bay Cities Grapple With Sea Level Rise," *Pacific Sun,* March 16, 2021

Hill, Kristina, "Groundwater and Sea Level Rise," PowerPoint presentation, November 2019

Klivens, Laura, "Groundwater Beneath Your Feet Is Rising With the Sea. It Could Bring Long-Buried Toxic Contamination With It;" *KQED,* December 15,2020

Klivens, Laura, "Near Coasts, Rising Seas Could Also Push Up Long-Buried Toxic Contamination," *NPR Morning Edition,* February 8, 2021

Pierre-Louis, Kendra,"How rising groundwater caused by climate change could devastate coastal communities," *MIT Technology Review,* December 13, 2021

Romero, Ezra David, "How Rising Sea Levels Could Push Up a 'Toxic Soup' Into Bay Area Neighborhoods," *KQED,* April 8, 2022

Stock, Stephen, Robert Campos, Mark Villareal, and Michael Horn, "Toxins Long Buried May Surface as Groundwater Rises," *NBC Bay Area,* November 4, 2021

Tada, Grace Mitchell, "The Sea Beneath Us," *Bay Nature Magazine,* Spring 2019

Tada, Grace Mitchell, "The Rising Tide Underfoot," *Hakai Magazine,* November 17, 2020

Wisckol, Martin, "Why Groundwater Flooding is Becoming a Threat to Coastal Cities as Sea Levels Rise," *Orange County Register,* September 16, 2021

Xia, Rosanna, "Some California Cities Think They're Safe from Sea Level Rise. They're Not, New Data Shows,"*Los Angeles Times,* August 17,2020

Appendix B: Scientific Papers

A selection of additional scientific papers on groundwater rise with sea-level rise, and on groundwater rise in contaminated sites

Barnard, Patrick, "USGS Coastal Storm Modeling System (CoSMoS) Groundwater Mapping," Pacific Coastal and Marine Science Center, August 18, 2020

Bjerklie, David, John R. Mullaney, Janet Radway Stone, Brian J. Skinner, and Matthew A. Ramlow, "Preliminary investigation of the effects of sea-level rise on groundwater levels in New Haven, Connecticut," United States Geological Survey, 2012

Carter, Jacob, Casey Kalman, "A Toxic Relationship: Extreme Coastal Flooding and Superfund Sites," *Union of Concerned Scientists*, July 28, 2020

Habel, Shellie, Charles Fletcher, Tiffany Anderson, and Philip Thompson, "Sea-Level Rise Induced Multi-Mechanism Flooding and Contribution to Urban Infrastructure Failure," *Scientific Reports 10,* March 2020

May, Christine, "Coastal Hydrology: Rising Groundwater and Sea-Level Rise," *Nature Climate Change,Vol. 10, October 2020, pp 889-891*

Plane, Ellen, Kristina Hill, and Christine May, "A Rapid Assessment Method to Identify Potential Groundwater Flooding Hotspots as Sea Levels Rise in Coastal Cities" *Water* 11, no. 11, May 2019

Rodriguez, Ozzy, "Adapting Superfund Remedial Plans for Climate Change," Environmental Law Program, Harvard Law School, March 12, 2021

Rotzoll, Kolja, Charles H. Fletcher, "Assessment of groundwater inundation as a consequence of sea-level rise," *Nature Climate Change*, 2012

Appendix C: Municipal and Regional Planning for Groundwater Rise

A selection of city, state and regional reports and planning documents addressing groundwater rise

Adapting to Rising Tides, "Contaminated Lands," *San Francisco Bay Conservation and Development Commission,* 2021

Bay Area Council, "California Resilience Challenge Spotlight: Keeping the Groundwater at Bay," July 31, 2020

California Coastal Commission, "Critical Infrastructure at Risk: Sea Level Rise Planning Guidance for California's Coastal Zone," August 2021

California Legislative Analyst's Office, "What Threat Does Sea-Level Rise Pose to California," August 2020

City of Alameda, "The Response of the Shallow Groundwater Layer and Contaminants to Sea Level Rise," September 2020

City of Alameda, "Climate Adaptation and Hazard Mitigation Plan," November 2021

County of San Mateo, US Geological Survey, Silvestrum, and SF Bay Conservation and Development Commission, "Bay Area Groundwater and Sea level Rise Workshop Summary," November 13, 2019

2019-2020 Marin County Civil Grand Jury, "Climate Change: How Will Marin Adapt?", September 11, 2020

SeaChange San Mateo County, Office of Sustainability "Sea Level Rise Vulnerability Assessment," March 2018

SeaChange San Mateo County, "The Shallow Groundwater Layer and Sea Level Rise: Description of Approaches," November 2019

Segura, Martin, "Sea Level Rise and Chemical Contamination," Department of Health Hazard Evaluation and Emergency Response, State of Hawaii, May 20, 2021

Appendix D: Community and Environmental Advocacy Groups

A selection of groups active in the debate over the Hunters Point Shipyard

Bayview Hunters Point Community Advocates; archives at UCSF Industry Documents Collection

Committee to Bridge the Gap

Greenaction

Marie Harrison Community Foundation

Public Employees for Environmental Responsibility

Southeast Alliance for Environmental Justice (1995-2001)

Appendix E: Cleanup Documentation

A guide to documents about the Hunters Point Naval Shipyard cleanup

List of Hunters Point Entries in EnviroStor
EnviroStor is the California Department of Toxic Substance Control's online data management system for tracking cleanup, permitting, enforcement, and investigation efforts at hazardous waste facilities and sites with known or suspected contamination issues. For any parcel entry, click "**Site/Facility Docs"** to see the list of documents about that parcel.
The documents below can help illuminate key points in the process for Hunters Point.

Parcel B
US Navy, "Final Amended Record of Decision, Parcel B," January 14, 2009

Parcel C
US Navy, "Final Record of Decision for Parcel C," September 30, 2010

Parcel D-1
US Navy, "Final Record of Decision for Parcels D-1 and UC-1," July 24, 2009

Parcel E
US Navy, "Final Record of Decision for Parcel E," December 2013
ROD for non-landfill areas
US Navy, "Final Record of Decision for Parcel E-2," November 2012
ROD for landfill areas

Parcel G
As described in page 21 of this report, Parcel G's original Record of Decision was modified so that almost all the parcel could be deemed suitable for residential development.

US Navy, "Final Record of Decision for Parcel G," February 18, 2009
Explains "durable cover," and states that ubiquitous metals and contaminants are to be left in place; places restrictions on residential use

Langan Engineering and Environmental Services, "Feasibility Assessment for Evaluating Areas with Residential Land Use Restrictions, Parcel G," Office of Community Infrastructure and Investment,November 30, 2016
Analysis proposing changes to allow residential use in most of Parcel G

US Navy, "Explanation of Significant Differences for the Final Record of Decision for Parcel G,"April 18, 2017

US Navy, “Final Parcel G Removal Site Evaluation Work Plan, ” June, 2019
Radiological retesting plan for Parcel G

US Navy, “Final Fourth Five-Year Review,” July 2019

Appendix F: Superfund Legal Framework

Following the environmental disaster at Love Canal in the 1970s,[70] lawmakers in the United States decided that reforms at the federal level were needed to address the most contaminated sites in the country. While existing legislation enabled the Environmental Protection Agency (EPA) to manage chemical substances, there was an unmet need for accountability and the regulation of waste sites. In 1980, Congress enacted the Comprehensive Environmental Response, Compensation and Liability Act, (CERCLA) known as the Superfund program, to establish liability at toxic waste sites and create a framework for cleaning up contamination.

CERCLA introduced financial deterrents to polluters through establishing strict liability for contamination—whether it occurred prior to or after the 1980 legislation— in cases where hazardous waste has been or will be released and costs will be incurred. Such costs include cleanup expenses, health screenings, damage to natural resources, and costs related to the investigation and remediation of polluted areas.

In the case of the Hunters Point Naval Shipyard (HPNS,) a site owned and operated by the federal government during and after the release of hazardous waste, liability is outlined by Section 120 of CERCLA. Section 120 states that federal agencies are subject to Superfund liability and must comply with all outlined requirements at their sites, including preliminary assessment, site investigation, remedial investigation, feasibility studies, records of decision, remedial design, remedial actions, community engagement, and long-term operation and maintenance. [71]

HPNS was deactivated as a Naval facility in 1974. Hazardous chemicals, along with radioactive contamination, were identified at HPNS in 1986, and the EPA placed the site on the National Priorities List (making it a Superfund site) in 1989.[72] In 1992, a Federal Facilities Agreement (FFA) was signed by the Navy and regulators: EPA, California's Department of Toxic Substances Control (DTSC,) and the San Francisco Bay Regional Water Quality Control Board (Water Board.)[73]

The Federal Facilities Agreement establishes the Navy's responsibility for the Shipyard's cleanup, and provides a framework in which signatories will certify the Navy's compliance with

[70] Environmental Protection Agency, "Superfund: CERCLA Overview," updated February 4, 2022
[71] Environmental Protection Agency, "Federal Facilities-Military Base Closures; Application of CERCLA Section 120"
[72] US Environmental Protection Agency, "National Priorities List Sites"
[73] US Navy, "Federal Facility Agreement for Naval Station Treasure Island, Hunters Point Annex," January 1992

federal and California law. The FFA, in principle, ensures that past and present contamination at HPNS will be investigated and action will be taken to "protect the public health, welfare and the environment" in each of the Shipyard's parcels. The Navy will undertake and pay for all testing, feasibility studies and remediation actions at HPNS, in accordance with applicable regulations. The FFA requires all work to be performed under the supervision of a qualified professional engineer, a certified engineering geologist, or a registered geologist with hazardous waste cleanup expertise. All the Navy's documents related to the HPNS cleanup are subject to review and comment by the EPA, DTSC and the Water Board.

Appendix G: Hunters Point Shipyard Litigation

A selection of litigation related to the Hunters Point Naval Shipyard

In 2018, two supervisors of the radiation control technicians working for Tetra Tech EC, Inc. at the Shipyard pled guilty to falsifying remediation records, and were sentenced to eight months in prison. Several related cases, and other lawsuits connected to the Shipyard, remain in litigation.

Case: *United States of America v. Tetra Tech EC, Inc.*
Filed: August 19, 2013
Court: U.S. District Court for the Northern District of California

Brought on behalf of the United States of America, alleging that Tetra Tech EC, Inc. acted negligently in its oversight of testing specialists, who did not have adequate qualifications and did not meet requirements for radiological testing practices. The suit alleges that Tetra Tech EC, Inc. defrauded the government by certifying that minimum standards and procedures for nuclear remediation services were met as part of its contractual obligations.
These are allegations; the case is actively being litigated at the time of this report.

Case: *United States ex rel. Jahr, et al. v. Tetra Tech, EC, Inc., et al., United States ex rel. Smith v. Tetra Tech EC, Inc., et al., and United States ex rel. Wadsworth v. Tetra Tech EC, Inc.*
Filed: October 26, 2018
Court: U.S. District Court for the Northern District of California

This is a group of consolidated whistleblower cases brought on behalf of the United States of America, under the *qui tam* provisions of the False Claims Act, alleging that Tetra Tech EC, Inc. misrepresented the source of soil samples from Hunter's Point Naval Shipyard and falsified results of radiological surveys conducted at the site.
These are allegations; the case is actively being litigated at the time of this report.

Case: *Bayview Hunters Point Residents et al v. Tetra Tech EC, Inc. et al*
Filed: March 18, 2019
Court: U.S. District Court for the Northern District of California

Brought on behalf of residents of Bayview Hunters Point, alleging that Tetra Tech EC, Inc. acted negligently in its radiological testing practices and falsified results, putting residents relying on accurate representation in harm's way. The case also names Lennar/Five Point Holdings, the developer at Hunters Point Shipyard.
These are allegations; the case is actively being litigated at the time of this report.

Case: *Pennington, et.al v. Tetra Tech, Inc.; Tetra Tech Ec, Inc.; Lennar Corporation; Hps1 Block 50 Llc; Hps1 Block 51 Llc; Hps1 Block 53 Llc; Hps1 Block 54 Llc; Hps1 Block 56/57 Llc; Hps Development Co.; Five Point Holdings, Llc; Bill Dougherty; Andrew Bolt; Emile Haddad; And Does 1-100, Motion for Preliminary Approval of Pennington Plainfiffs' Class Settlement with Homebuilder Defendants*
Filed: August 14, 2020
Court: U.S. District Court for the Northern District of California

This motion for settlement grew out of an initial lawsuit from 2018 against Lennar, Five Point Holdings, and Tetra Tech EC, Inc., et al. by four homeowners in Parcel A, which grew to include 662 plaintiffs in 347 condominium and townhouse units at the Shipyard.
The $6.3 million settlement agreement between FivePoint Holdings and homeowners was approved in April 2022. Tetra Tech EC, Inc. denied any wrongdoing, and is not part of the settlement.

Case: *Five Point Holdings, LLC et al v. Tetra Tech, Inc. et al*
Filed: February 27, 2020
Court: U.S. District Court for the Northern District of California

Brought on behalf of the developers building a mixed-use community at Hunters Point Naval Shipyard, on land (Parcel A,) which had been remediated by the Navy and then transferred to the City of San Francisco. The case alleges negligent testing practices and fraud to cover them up by Tetra Tech EC, Inc. resulted in economic damage and delay for the developer's planned use of the site.
These are allegations; the case is actively being litigated at the time of this report.

Case: *Abbey v. United States of America, Department of the Navy*
Filed: September 14, 2020
Court: U.S. District Court for the Northern District of California

Brought on behalf of officers and employees of the San Francisco Police Department (SFPD) alleging that the Navy acted negligently in not accurately disclosing the degree of radioactive and hazardous substances present at Building 606 in the Hunter's Point Naval Shipyard site. The suit alleges that the Navy represented Building 606 as safe for use, and that hundreds of SFPD employees worked there from 1997 to the present, incurring harm.
These are allegations; the case is actively being litigated at the time of this report.

Case: *Tetra Tech EC, Inc. et al v. United States Environmental Protection Agency et al*
Filed: November 17, 2020
Court: U.S. District Court for the Northern District of California

Brought on behalf of Tetra Tech EC, Inc., alleging that the U.S. Environmental Protection Agency acted unlawfully in its declaration of the Final Parcel G Removal Site Evaluation Work Plan for the Former Hunters Point Naval Shipyard (June 2019.) The case alleges that no explanation for the change was articulated to Tetra Tech EC, Inc., the declaration relied on unproven allegations, and contrary evidence was not considered at time of declaration.
These are allegations; the case is actively being litigated at the time of this report.

Case: *Mothers Against Toxic Housing, Inc. et al v. United States Environmental Protection Agency et al*
Filed: August 3, 2021
Court: Contra Costa County Superior Court

Brought on behalf of a group of community organizations alleging that the City of Richmond violated California environmental standards when approving the Campus Bay Project mixed-use development plan, and ignored scientific data about rising sea levels.
These are allegations; the case is actively being litigated at the time of this report.