

DRINKING WATER SAFETY IN SAN FRANCISCO

A RESERVOIR OF GOOD PRACTICE

June 2016



Hetch Hetchy Reservoir

Photo: Sheldon Bachus



City and County of San Francisco
Civil Grand Jury, 2015-2016

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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 resulting from its investigations.

Reports of the Civil Grand Jury do not identify individuals by name. Disclosure of information about individuals interviewed by the jury is prohibited. California Penal Code, section 929

STATE LAW REQUIREMENT

California Penal Code, section 933.05

Each published report includes a list of those public entities that are required to respond to the Presiding Judge of the Superior Court within 60 to 90 days as specified.

A copy must be sent to the Board of Supervisors. All responses are made available to the public.

For each finding, the response must:

- 1) agree with the finding , or
- 2) disagree with it, wholly or partially, and explain why.

As to each recommendation the responding party must report that:

- 1) the recommendation has been implemented, with a summary explanation; or
- 2) the recommendation has not been implemented but will be within a set timeframe as provided; or
- 3) the recommendation requires further analysis. The officer or agency head must define what additional study is needed. The Grand Jury expects a progress report within six months; or
- 4) the recommendation will not be implemented because it is not warranted or reasonable, with an explanation.

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SUMMARY

This report focuses on San Francisco's water system and its management by the San Francisco Public Utilities Commission (SFPUC). We found a good water supply/demand outlook and a low risk of lead and other contaminants.

The SFPUC collects, test, monitors, treats and distributes our water. It also champions our responsible usage. Thanks to excellent practices, the drinking water SFPUC delivers to our premises is in adequate supply, well-monitored, high-quality and safe.

BACKGROUND

San Francisco tourists, commuters, and over 2.6 million residents and businesses in the Bay Area receive their drinking water from our San Francisco Public Utilities Commission. As our local water company, SFPUC delivers 60 million gallons of water per day (mgd) to San Francisco. As a regional utility, it has 26 wholesale customers and delivers them an additional 128 mgd through a vast gravity-powered infrastructure, greater in square miles than San Francisco itself. Most of our drinking water comes from Sierra snowpack flowing down into reservoirs along the Tuolumne River, with Hetch Hetchy being the most famous.¹

This Civil Grand Jury toured the entire SFPUC water system and followed the path our water takes from Hetch Hetchy reservoir in Yosemite National Park all the way to San Francisco, including various key treatment facilities in between. The SFPUC hosted the tour for available San Francisco Civil Grand Jury members.

While the US Environmental Protection Agency (US EPA) sets water quality baselines, states can and do exceed them. California certainly does set higher standards, and as a result our State Water Resources Control Board (SWRCB) has authority and sets policies for process control and monitoring. SFPUC delivers a monthly water quality report to the SWRCB. The SFPUC reports that it tested drinking water quality along its transmission and distribution lines over 90,090 times in 2015.² It owns and operates a vast array of test equipment in several facilities, including a mobile lab. Some contaminants, once measured in parts per million, are now measured in parts per quadrillion.³

The US EPA regulates at least 87 drinking water contaminants classified as microorganisms, disinfection byproducts, disinfectants, inorganic chemicals, organic chemicals, and radionuclides.⁴ The SWRCB further regulates additional contaminants, including monitoring contaminants of emerging concern (CECs), unregulated organic and synthetic chemicals identified by the US EPA that may potentially pose future threats.⁵ However, due to the proven quality of San Francisco's water from the Sierra, the SFPUC has received monitoring waivers for

¹ *SFPUC Annual Report Fiscal Year 2014-15*, <http://www.sfwater.org/modules/showdocument.aspx?documentid=8207> Note: The mgd amounts and customers stated have been updated for us by SFPUC.

² *SFPUC Annual Water Quality Report 2015*, <http://sfwater.org/index.aspx?page=634>

The stated amount of 90,090 tests is in addition to the treatment process control monitoring performed by certified operators and online instruments.

³ One part per million is one part in 10^6 . It is equivalent to one drop of water diluted into 50 liters (13.2 gallons). One part per quadrillion is 1 in 10^{15} . While challenging to comprehend, one part per quadrillion is equivalent one-twentieth of a drop of water diluted into 1,000 Olympic-size swimming pools. Source: wikipedia.org

⁴ US EPA *Table of Regulated Drinking Water Contaminants*, <https://www.epa.gov/ground-water-and-drinking-water/table-regulated-drinking-water-contaminants>

⁵ For information about the US EPA's Unregulated Contaminant Monitoring Rule (UCMR), see the US EPA web page at <http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/>. The intent of the rule is to provide baseline occurrence data that US EPA can combine with toxicological research to make decisions about potential future drinking water regulations.

certain contaminants, because it has been demonstrated they do not occur in our water supply.⁶ We were told there are additional waivers that apply to local area water sources.

The SFPUC does more than monitor our water, it also treats it. SFPUC reports:

Water treatment, including disinfection by ultraviolet light and chlorine, corrosion control by adjustment of the water pH value, fluoridation for dental health protection, and chloramination for maintaining disinfectant residual and minimizing disinfection byproduct formation, is in place to meet the drinking water regulatory requirements.⁷

SFPUC has again received waivers because of the demonstrated quality and source of the water:

[Our] pristine, well protected Sierra water source is exempt from filtration requirements by the US Environmental Protection Agency (US EPA) and State Water Resources Control Board's Division of Drinking Water (SWRCB DDW).⁸

⁶ *SFPUC Annual Water Quality Report 2015*, <http://sfwater.org/index.aspx?page=634> Because a monitoring waiver was received from the SWRCB for some contaminants, they can be checked annually or less.

⁷ *SFPUC Drinking Water Sources and Treatment*, <http://sfwater.org/modules/showdocument.aspx?documentid=7388>

⁸ *Ibid.*

OBJECTIVES

The Civil Grand Jury undertook this investigation to

- assess SFPUC stewardship of our water resources,
- assess SFPUC water safety, and
- identify potential hazards to water safety.

SCOPE AND METHODOLOGY

We gathered the information for this report from interviews of SFPUC officials and technicians, San Francisco Department of Public Health (SFDPH) officials, various City department heads who maintain or monitor our public facilities, and public information. We also visited reservoirs, laboratories, and treatment facilities over a period of 10 months, primarily during the summer of 2015 and the spring of 2016.

We did verify the accreditation of SFPUC laboratories, but we did not audit their proficiency test results or logs. However, we did inquire about the measurements of certain contaminants, as well as general practices and procedures for maintaining quality lab results.

GENERAL DISCUSSION

The Jury was initially very curious about reconciling our aggressive residential construction with our chronic drought. On the supply side, our tour of the San Francisco Public Utilities Commission (SFPUC) regional water system coincided with the peak of our current drought, and we observed reservoir levels. We also discussed strategic alternatives available. We were eventually satisfied when we were told in June, 2016 that SFPUC has plans to manage up to 8.5 more years of drought without drastic rationing. As well, new drinking water sources are coming online. Our City groundwater is currently not used for drinking. Instead it is used for watering Golden Gate, Presidio and Harding Parks. That will change when the San Francisco Groundwater Supply Project is brought online in the fall of 2016, which will provide up to 4 mgd of drinking water from local wells tapping the City's western aquifer.⁹

On the demand side, we learned the surprising fact that San Francisco has *decreased* its water consumption despite an increase in population.¹⁰ Thanks to conservation programs, more efficient fixtures and enthusiastic public cooperation, a San Franciscan currently uses less than half the water of an average Californian (44 vs. 94 gallons per day).¹¹ The Jury was satisfied with SFPUC water stewardship (monitoring, treatment, protection and distribution), as well as the near-term supply/demand outlook.

Flint, Michigan's mass lead water contamination tragedy made headlines in January 2016, causing the Jury to wonder whether what happened in Flint could happen here in San Francisco. Our investigation revealed that it could not. In Flint, a water supply source was switched, sending untreated, corrosive water into their lead-laden distribution system which in turn leached lead out of the pipes. The SFPUC reports there are no lead pipes in its main transmission and delivery infrastructure, and no known lead pipes in its service lines (the short lines that run from the main line to a building's water meter). We were told that there probably remain some undiscovered under-street lead service lines and that one or two are found per year.

In delivering water to our buildings, the main water lines usually run under the street. The individual service lines are short runs that branch off from the main line and terminate at the customer water meter. We were assured that it is the policy of the SFPUC to immediately remove any lead service lines when discovered. Because of this, we see little risk of lead contamination to our water supply from SFPUC lines. We discuss lead in water in more detail later in this report.

In fact, due to SFPUC diligent monitoring, treatment, protection and distribution of the water supply, we found little threat of contamination in SFPUC water. SFPUC tests for hundreds of

⁹ SFPUC *San Francisco Groundwater Supply*, http://sfwater.org/bids/projectDetail.aspx?prj_id=322

¹⁰ SFPUC *Water Resources Division Annual Report FY 2014-15*, <http://www.sfwater.org/modules/showdocument.aspx?documentid=8207>

“San Francisco reduce(d) total water demand over the last 15 years despite population growth”

¹¹ Ibid.

contaminants, some of which are analyzed using multiple test methods. The list was examined by the Jury, and due to regulator security concerns it is left unpublished.

In Milwaukee in 1993, the parasite *Cryptosporidium* in drinking water was identified as the cause of illness for hundreds of thousands of people. It also caused several deaths, mostly of people who had AIDS or otherwise compromised immune systems. Given our large HIV+ population, our water quality became of utmost concern. SFPUC confirms the SFPUC water system has not been associated with *any* outbreaks of Cryptosporidiosis (the disease caused by the *Cryptosporidium* parasite). In fact, SFPUC also confirms that SFPUC water has not been associated with *any* outbreaks of waterborne illnesses. *Cryptosporidium* has been documented to State and Federal regulators to be in safe amounts in SFPUC water since 1993. A brief summary can be found in Appendix 1.

In 2008, a [national news article](#) generated concern over chemical contaminants in the water supply.¹² The American Water Works Association Research Foundation tested 20 of the nation's water systems, including San Francisco, for contaminants. Tests were conducted for traces of sixty compounds; those found in medicines, household cleaners and cosmetics. The results were noteworthy because no trace of any of the tested chemicals was found in our drinking water.¹³

It is difficult to substantiate water contaminant information reported by the SFPUC. In fact, we were told that neither the State Water Resources Control Board (SWRCB) nor the US Environmental Protection Agency (US EPA) do it. Instead, SWRCB has set policy that SFPUC labs be accredited by the Environmental Laboratory Accreditation Program (ELAP). To receive accreditation, the labs are regularly inspected. In addition, every six months ELAP uses a third party to prepare special water samples (proficiency samples) for each SFPUC lab to test. The samples are returned to the third party which analyzes the results, and in turn provides results to the SWRCB. Accreditation results are available online.¹⁴ All the labs we inspected are currently accredited.

We inquired about SFPUC lab policies, as well as practices and redundancies to prevent erroneous samples. We were told that sample collectors use vehicles with GPS tracking, and their samples are correlated to SFPUC real-time monitoring stations located across the system. Falsifying a sample is a dismissable offense at SFPUC. All collected samples processed by the lab or the real-time stations are automatically logged into the SFPUC monitoring database. We visited the lab and a real-time monitoring station, and we received an overview of the automated sample logging process.

¹² Associated Press, *Pharmaceuticals in Water*, 2008

http://hosted.ap.org/specials/interactives/_national/pharmawater_update/index.html

¹³ *SF's Tap Water Best in Tests*,

<http://www.sfgate.com/green/article/S-F-s-tap-water-best-in-tests-chemists-say-3291449.php>

¹⁴This PDF has some listings that are/may be out of date:

http://www.waterboards.ca.gov/drinking_water/certlic/labs/documents/elap_certified_all_labs.pdf. More current listings can be found searching for "SFPUC" on ELAP's certification lab map:

<http://waterboards.maps.arcgis.com/apps/webappviewer/index.html?id=bd0bd8b42b1944058244337bd2a4ebfa>

We inspected the list of analyzed contaminants (analytes) and inquired about two of the contaminants: Cryptosporidium and Dioxin. Cryptosporidium was intriguing because even neutralized (dead) parasite are counted in the tests. And with Dioxin we were very impressed that chemicals are being monitored at the parts-per-quadrillion sensitivity level (10^{-15}). Currently, contaminants below detection limits for reporting are not shown in the annual report, in accord with regulatory guidance. However, the public would benefit if the complete list of analytes that do not present a security issue could be made available online. It would be reassuring if, for example, drugs such as those mentioned in the earlier referenced 2008 news article¹⁵, were regularly shown not to be present in our water.

SFPUC Response To A Backflow Incident

While it is easy for an outside observer to analyze an obvious problem, such as a water main break, it is up to the SFPUC to report its water system problems. One such problem occurred in March, 2015, when SFPUC operators left a valve open and untreated water was mixed with treated water:

At approximately 4:30 pm on March 3, 2015, raw water derived from San Antonio Reservoir was briefly introduced into the potable portion of the Regional Water System (RWS) through the Alameda Siphon No. 3 located in the Sunol Valley. Within 2 hours the water was conveyed to customer service connections on the west side of the Irvington Tunnels.¹⁶

This 17 minute error created an undertreated “slug” of water that moved through the SFPUC regional water system.

The response to this incident allowed the Jury to observe SFPUC actions, responses and changes made in the face of a recent accident. The SFPUC, through its constant monitoring, discovered that a problem had occurred and within 17 minutes the problem was contained. The SFPUC documented its tracking of the slug, the notification to the downstream customers, problem resolution, and reported the incident to the SWRCB along with a clear statement to all parties that this was caused by human error. SFPUC outlined steps for improvement which were approved by the State. We studied the incident and inquired about each of the following State directives, listing them in Table 1.

¹⁵ Associated Press, Pharmaceuticals in Water, 2008

http://hosted.ap.org/specials/interactives/_national/pharmawater_update/index.html

¹⁶This is the SFPUC response to the first directive of the SWRCB -- to report on the incident.

<http://sfwater.org/cfapps/wholesale/uploadedFiles/SAR%20Incident%20Report%2006-9-15.pdf>

Table 1. SFPUC March 3, 2015 Backflow Incident Directives and Responses

State Directive	SFPUC Response
(Develop an) Emergency Response Action Plan	This is currently in place.
Improve modeling procedures	This has been done and improvements are ongoing.
Provide online Data availability and Training	This has been done and improvements are ongoing.
Additional Data	Two new online monitoring stations are scheduled for 2017.
Staff Training	The primary cause of this incident was an operator’s failure to follow established procedures. We were told the remedial training has been done.
Online Data Verification/Calibration	The problem revealed some equipment was not maintained sufficiently to provide the needed accuracy. This has been addressed.

This table was compiled by the Jury with information from SFPUC and SWRCB.

In its report, SFPUC also detailed its communication to customers while the water slug moved through its system, as well as additional preventative measures it is pursuing now.¹⁷ The regulators have shown no further concern regarding this incident. We were satisfied with the timely and comprehensive response by the SFPUC not only to the incident, but also to the State’s directives.

SFPUC Response to Water Quality Complaints

Unlike contaminants, complaints are easy to analyze. The SFPUC, as our local water company, receives complaints through our 311 system. People can call 311, visit SF311.org, or use the 311 mobile app at any time to report all non-emergency issues regarding water.

We examined SF OpenData¹⁸ and derived a list of complaints that 311 received and referred to SFPUC Water Quality Division for 2016. We met with SFPUC officials, and reviewed all 311 water complaints for April, 2016. Our result are shown in Table 2.

¹⁷ Ibid. See “Additional Preventative Measures” on page 8.

¹⁸ SF OpenData is a repository of the City’s published data. <http://data.sfgov.org/>

Table 2. Water Quality Complaints from 311, April, 2016.

311 Water Complaint	Number of Complaints	Causes
Bad Taste	2	Inconclusive
Black Particles	5	Customer rubber degradation
Cloudy/Milky	9	Plumbing shut down, hydrant hit, or inconclusive
Dirty	16	Nearby construction, water shutdown or SFFD/hydrant activity
Discolored	45	SFPUC water main break, water heater, P.G. & E. construction, other construction, street cleaning, hydrant usage, plumbing shutdown, customer plumbing issue, or inconclusive
Illness	1	Inconclusive
Odor	4	Water heater or internal plumbing issue
TOTAL	82	Total with Cause Identified: 50 (61%) Total Inconclusive: 32 (39%)

This table was compiled by the Jury with information from SF Open Data and SFPUC.

Of the 82 logged complaints, all were resolved. There were 50 (61%) cases resolved with causes identified as being in or nearby to the customer’s premises, including an SFPUC water main break.

The remaining 32 (39%) were deemed inconclusive. The problem might have been resolved, or the customer’s perception of the problem/cause changed. An inconclusive result means that although the problem was addressed, SFPUC could not identify a specific cause of the problem. Illness complaints are referred to the SFDPH for investigation.

As a result of these complaints, the SFPUC collected 27 water samples. We were told that all samples met US EPA and SWRCB drinking water standards.

We were satisfied with SFPUC tracking and resolution of 311 water quality complaints.

Lead In Drinking Water

As mentioned earlier, we have little concern about lead in SFPUC water, and here we present the technical data to substantiate this.

SWRCB sets an Action Level for Lead in water at 15 ppb (parts per billion), over which corrective action should be taken. The US EPA mandates that lead be tested at consumer taps. These taps reside inside buildings with water traveling through local pipes and fixtures. The SFPUC regularly tests 59 taps in San Francisco to monitor the level of lead in its water, and found none over the Action Level.

In 2009, the California Environmental Protection Agency (Cal EPA), which is not a regulator, set a public health goal (PHG) of a lead level in our drinking water to be at or less than 0.2 parts per billion (ppb). The PHG level is 75 times lower (0.2 vs. 15) than the current SWRCB Action Level, showing how ambitious is the goal. Cal EPA states that it sets the PHG down to a level “at which no known or anticipated adverse effects on health will occur, with an adequate margin of safety.”¹⁹

How do SFPUC lead levels compare with regulator and PHG values?

Every three years the SFPUC releases a report comparing its water to the various PHGs, the most recent being 2013.²⁰ In it, SFPUC reports:

Lead [was] exceeding the PHG [Public Health Goal] in customer tap water samples only; it was non-detected in raw and treated water.

SFPUC source water has non-detectable* levels of lead and meets this stringent public health goal for lead safety set by Cal EPA. However, once it travels into our buildings it does not, although the tap samples remain under the regulatory Action Level.

Table 3 shows the various lead levels.

Again, we have little concern about lead in SFPUC water. The report concludes the “probable lead source in these tap samples may be attributed to the plumbing components at these residences”.²¹ Now we can discuss our pipes and fixtures.

Table 3. Lead in SFPUC Drinking Water²²

SWRCB State Regulator Lead Action Level	Cal EPA Lead Public Health Goal (PHG)	SFPUC Lead in raw or treated water measured at the source ²³	SFPUC Tap Testing Lead-In-Water Range	Number of SFPUC monitored taps that tested above the Action Level
15 ppb	0.2 ppb	Non-detectable*	Less than 1 ppb to 10.3 ppb	0

“ppb” is parts per billion. This table was compiled by the Jury using the SFPUC 2015 Annual Water Quality Report and the SFPUC 2013 Public Health Goals Report.

*Non-detectable contaminants were considered to have no PHG exceedance during the reporting period 2010-12.²⁴ However, lead levels under 1 ppb may be reported as undetected, based on a threshold set by the State regulator.

¹⁹ Cal EPA, Public Health Goals for Chemicals in Drinking Water: Lead, 2009, <http://oehha.ca.gov/media/downloads/water/chemicals/phg/leadfinalphg042409.pdf>

²⁰ SFPUC 2013 Public Health Goals Report, page 11, <http://sfwater.org/cfapps/wholesale/uploadedFiles/2013%20PHG%20Report%20Full%20v6-20-13.pdf>

²¹ Ibid, Page 12, *SFPUC Water Sample Results*

²² SFPUC Annual Water Quality Report, 2015 <http://sfwater.org/index.aspx?page=634>

²³ SFPUC 2013 Public Health Goals Report, page 12, Table 1 <http://sfwater.org/cfapps/wholesale/uploadedFiles/2013%20PHG%20Report%20Full%20v6-20-13.pdf>

²⁴ Ibid, Page 6, Table 1.

Lead In Our Pipes And Fixtures

Water has to travel through our building pipes and fixtures to reach us. While lead piping is no longer common in San Francisco, buildings plumbed before 1988 used lead solder to connect piping. Old fixtures can also leach lead. Pre-1997 faucets can contain up to 8% lead.²⁵ The SFPUC lists “internal corrosion of household water plumbing systems” as the major source of lead in drinking water.²⁶ The plumbing components used in drinking water systems for human consumption in California have only been “lead-free” since 2010.²⁷

Even in the presence of these hazards, however, one can obtain safe drinking water by running the tap long enough to replace water in the pipes with fresh water. SFDPH instructs:

If you are concerned about elevated lead levels in your water, flush your tap for 30 seconds to 2 minutes before using the water, whenever the tap has not been used for several hours.²⁸

No Lead Certification Program

There are no water quality certification programs for buildings. Without such a program, the burden of tap testing falls on the consumer.

We gave drinking fountains special consideration because our anecdotal evidence kept leading to them. We visited City buildings that disabled fountains and provided bottled water. We were told of others. We also learned that the longer the drinking water sits in the plumbing, the more metals, including lead, can leach into the water. With the combination of long periods between usage and small volumes dispensed, older (pre-2010) drinking fountains might deliver water that has higher contaminants than a high-volume tap, such as a faucet.

What can citizens and facilities managers do about testing their tap water? The SFPUC has a program whereby residents may request a lead-in-water test of their drinking water for a fee of \$25.²⁹ Participants in US Department of Agriculture’s Women, Infants, and Children (WIC) program may request the test for free.³⁰

²⁵ Massachusetts Water Resources Authority, *Do faucets contain lead?*

http://www.mwra.state.ma.us/04water/html/Lead_Faucets.htm

²⁶ SFPUC Annual Water Quality Report 2015, <http://sfwater.org/index.aspx?page=634>

²⁷ The plumbing components are considered “lead-free” if the weighted average lead content of the component’s wetted surface area is not more than 0.25%. California AB 1953 “Lead Plumbing” became State law and effective on January 1, 2010. SFPUC Reduction of Lead, *Legislative Action*

<http://sfwater.org/modules/showdocument.aspx?documentid=8732>

²⁸ SFDPH *Childhood Lead Prevention Program*, <https://www.sfdph.org/dph/eh/CEHP/Lead/InfoTenant.asp>

²⁹ SFPUC *Application for Lead Testing Analysis*, <http://sfwater.org/modules/showdocument.aspx?documentid=1175>

³⁰ WIC-enrolled families, access voucher from WIC office and call (415) 551-3000 for scheduling test. Cost is free.

FINDINGS

- F.A.1. The Jury was satisfied with San Francisco Public Utilities Commission (SFPUC) water stewardship as well as the near-term drinking water supply/demand outlook. SFPUC is to be commended.
- F.A.2. We see little risk of lead from SFPUC water lines.
- F.A.3. Currently, drinking water contaminants that are below detection limits for reporting are not shown in the annual water quality report, in accord with regulatory guidance.
- F.A.4. There are no water quality certification programs for buildings. Our public buildings, especially drinking fountains, would benefit from displaying a dated, lead-safe seal/sticker from the SFPUC on our drinking water taps.
- F.A.5. The SFPUC Regional Water System has not been associated with any waterborne illnesses, and since 1993 this has been documented monthly. SFPUC is to be commended.

RECOMMENDATIONS

- R.A.1. No recommendation.
- R.A.2. No recommendation.
- R.A.3. In the interest of transparency, all drinking water contaminants analyzed (analytes) that do not pose a public security issue should be disclosed in the SFPUC Water Quality Annual Report.
- R.A.4. SFPUC should create a water quality certification program for buildings, offering at least a dated, lead-safe seal/sticker on/near the fixture and visible to the consumer.
- R.A.5. No recommendation.

CONCLUSION

The Jury researched and explored several aspects of our drinking water — quality, safety, supply and demand. We found the SFPUC stewardship of the City's water system and supporting resources to be more than satisfactory.

REQUEST FOR RESPONSES

Findings and Required Response Matrix

FINDING	RESPONDER
F.A.1. The Jury was satisfied with San Francisco Public Utilities Commission (SFPUC) water stewardship as well as the near-term drinking water supply/demand outlook. SFPUC is to be commended.	Office of the Mayor, BOS
F.A.2. We see little risk of lead from SFPUC water lines.	Office of the Mayor, BOS
F.A.3. Currently, drinking water contaminants that are below detection limits for reporting are not shown in the annual water quality report, in accord with regulatory guidance.	SFPUC Water Enterprise
F.A.4. There are no water quality certification programs for buildings. Our public buildings, especially drinking fountains, would benefit from displaying a dated, lead-safe seal/sticker from the SFPUC on our drinking water taps.	SFPUC Water Enterprise
F.A.5. The SFPUC Regional Water System has not been associated with any waterborne illnesses, and since 1993 this has been documented monthly. SFPUC is to be commended.	Office of the Mayor, BOS

Recommendations and Required Response Matrix

RECOMMENDATION	RESPONDER
R.A.1. No recommendation.	
R.A.2. No recommendation.	
R.A.3. In the interest of transparency, all drinking water contaminants analyzed (analytes) that do not pose a public security issue should be disclosed in the SFPUC Water Quality Annual Report.	SFPUC Water Enterprise
R.A.4. SFPUC should create a water quality certification program for buildings, offering at least a dated, lead-safe seal/sticker on/near the fixture and visible to the consumer.	SFPUC Water Enterprise
R.A.5. No recommendation.	

Reports issued by the Grand Jury do not identify individuals interviewed. Penal Code section 929 requires that reports of the Grand Jury not contain the name of any person or facts leading to the identity of any person who provides information to the Grand Jury.

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Note: The amounts of gallons and customers stated in this report were for us by SFPUC.

Annual Water Quality Report 2015, <http://sfwater.org/index.aspx?page=634>

Note: The stated amount of 90,090 tests is in addition to the treatment process control monitoring performed by certified operators and online instruments.

Drinking Water Sources and Treatment, <http://sfwater.org/modules/showdocument.aspx?documentid=7388>

San Francisco Groundwater Supply, http://sfwater.org/bids/projectDetail.aspx?prj_id=322

Response to the First Directive of the State Water Resources Control Board
<http://sfwater.org/cfapps/wholesale/uploadedFiles/SAR%20Incident%20Report%206-9-15.pdf>

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Other Water or Health Agencies

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SFDPH *Cryptosporidiosis Fact Sheet*, March 2009
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US EPA *Unregulated Contaminant Monitoring Rule* <http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/>

Environmental Laboratory Accreditation Program (ELAP), *Certified Laboratories as of 1/21/2016*.
http://www.waterboards.ca.gov/drinking_water/certlic/labs/documents/elap_certified_all_labs.pdf
Note: The PDF or its listings may be out of date. More current SFPUC lab listings can be found searching for “SFPUC” on ELAP’s certification lab map:
<http://waterboards.maps.arcgis.com/apps/webappviewer/index.html?id=bd0bd8b42b1944058244337bd2a4ebfa>

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Wikipedia, *Metric Prefix*, https://en.wikipedia.org/wiki/Metric_prefix
Note: Used for describing one part in a quadrillion (ppq).

Associated Press, *Pharmaceuticals in Water*, 2008
http://hosted.ap.org/specials/interactives/_national/pharmawater_update/index.html

San Francisco Chronicle/sfgate.com, *SF’s Tap Water Best in Tests*,
<http://www.sfgate.com/green/article/S-F-s-tap-water-best-in-tests-chemists-say-3291449.php>

APPENDIX 1 - CRYPTOSPORIDIUM

Cryptosporidium treatment in water is worth understanding, especially in San Francisco.

In April 1993, approximately 400,000 people in Milwaukee, Wisconsin became ill from drinking their city's water. While almost all recovered, it was quickly observed that those with compromised immune systems were at serious risk.³¹ An intestinal parasite called Cryptosporidium³² was found to be responsible, and health departments and water utilities had to quickly learn how to kill or neutralize this chlorine-resistant organism.

Cryptosporidium was a known pathogen in the 1950's and first identified in humans in 1976. It is easily spread animal-to-human or human-to-human via contaminated hands and/or water. First associated with traveler's diarrhea, the US Centers for Disease Control (CDC) documented it in 1982 as causing outbreaks of diarrhea in people with compromised immune systems.

The SFPUC water system is not associated with *any* outbreaks of Cryptosporidiosis (the disease caused by the Cryptosporidium parasite). Since 1993, SFPUC has partnered with health agencies which have documented to California Department of Health Services (CDHS) and US EPA that Cryptosporidium in SFPUC drinking water is at safe amounts.³³ This is impressive work by SFPUC in light of the fact that the Cryptosporidium was not regulated at the time—The first regulation was in 1996 as an amendment to the US Safe Drinking Water Act (SDWA).³⁴

The multi-agency Bay Area Cryptosporidiosis Surveillance Project (CSP) was formed in 1996. *All* online CSP quarterly or annual reports confirm “No system-wide, drinking water associated cryptosporidiosis outbreaks were detected, nor were any other common exposures identified among cases.”³⁵ (Wording varies slightly in early reports.) Reports available online begin in 2004, yet contain information dating back to 1996.

In 2011, SFPUC installed ultraviolet (UV) light downstream from its Hetch Hetchy reservoirs to inactivate Cryptosporidium and perform primary disinfection before chlorination.³⁶ It is useful to know that dead (treated and thus non-viable) Cryptosporidium are not harmful, yet test methods often combine the live and dead into one result.

³¹ Minnesota Department of Health website *Cryptosporidium*, <http://www.health.state.mn.us/divs/eh/water/factsheet/com/cryptosporidium.html>

³² Ibid. “The principle source of Cryptosporidium contamination is believed to be animals, both domestic and wild.”

³³ Documenting this in 1993 was performed as a requirement of a filtration waiver application to the California Department of Health Services, which was approved June 17, 1993. It was subsequently approved by the US EPA on October 29, 1993. The SFDPH confirms SFPUC drinking water has had no waterborne outbreaks of disease, and also that since 2003 it has sent SFPUC a monthly notice of such.

³⁴ SFDPH *Cryptosporidiosis Fact Sheet*. See Page 17 of the PDF.

After the 1996 SWDA amendment, three subsequent US EPA water treatment rules followed in 1998, 2002 and 2006. https://www.sfdph.org/dph/files/EHSdocs/ehsWaterdocs/Cryptosporidiosis_Document_Collection.pdf

³⁵ *Cryptosporidiosis Surveillance Project Archive*, https://www.sfdph.org/dph/files/EHSdocs/ehsWaterdocs/Crypto/Cryptosporidiosis_Surveillance_Project_Reports_Archive.pdf Note: The 2015 report was not online as of this writing, but was confirmed verbally at SFDPH.

³⁶ SFPUC *Questions Regarding Drinking Water Disinfection, June 2013* <http://www.sfwater.org/modules/showdocument.aspx?documentid=4131>