2005 Annual Water Quality Report

Stanford University Utilities Division

Top Quality Water

May 2006

The Stanford Utilities Division is pleased to provide you with the 2005 Annual Water Quality Report. During 2005, the San Francisco Public Utilities Commission (SFPUC) and Stanford University monitored water quality for both source and treated water supplies, and in all cases the water quality was in compliance with the California Department of Health Services (CDHS) and the United States Environmental Protection Agency (US EPA) drinking water requirements. We continue our commitment to provide our customers with safe, high quality drinking water. It is the policy of the Stanford Utilities Division to fully inform its consumers about the water quality standards and typical concentrations.

The Utilities Division manages the storage, distribution, maintenance, and monitoring programs for Stanford's drinking water supply.

Stanford routinely collects water quality samples from various locations within the campus distribution system. The most frequently collected samples are analyzed for coliform bacteria, chlorine residual, and general physical parameters. Additional water quality samples are collected to monitor for additional constituents in compliance with CDHS requirements. A certified laboratory analyzes all samples. Stanford submits monthly reports that include all monitoring results to the CDHS.

SFPUC also collects daily water quality samples from various locations within their transmission system. The samples are analyzed for primary standards that apply to the protection of public health and secondary standards that refer to the aesthetic qualities of water such as taste and odor.

The Stanford Utilities Division also maintains flushing, cross-connections, and backflow prevention programs to ensure a consistent high quality drinking water supply.

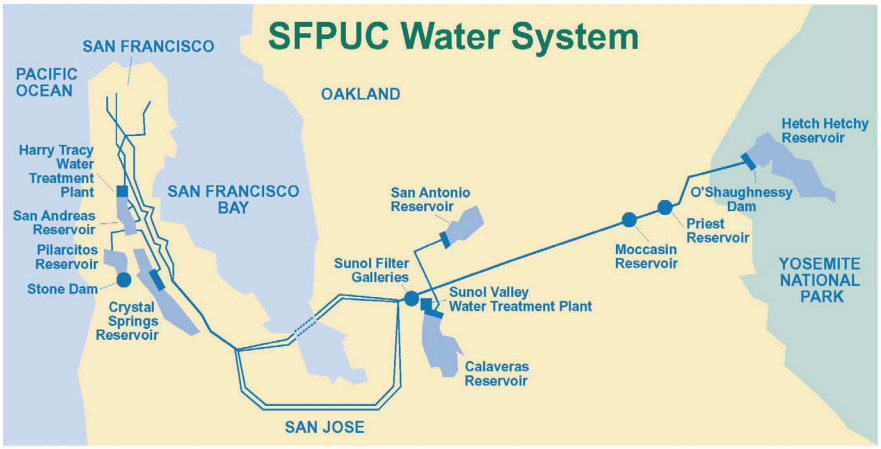
In This Report

Stanford University's Drinking Water Sources

Water supplied to Stanford by the SFPUC comes from three major sources: Hetch Hetchy Watershed in the Sierra Nevada Mountains, and local watersheds in Alameda and San Mateo Counties.

Hetch Hetchy Reservoir

Hetch Hetchy Reservoir, which is the largest reservoir in the SFPUC system, is located in Yosemite National Park. It provided approximately 91 percent of the total water supply in 2005. Spring snowmelt flows down the Tuolumne River and fills the Hetch Hetchy reservoir. The high quality Hetch Hetchy water supply meets all federal and state criteria for watershed protection, disinfection treatment, bacteriological quality and operational standards. As a result, the US EPA and CDHS granted the Hetch Hetchy water source a filtration exemption. This exemption is contingent upon the Hetch Hetchy water quality continuing to meet all filtration avoidance criteria.



Alameda Watershed

The Alameda watershed, spans more than 35,000 acres in Alameda and Santa Clara Counties. Surface water from rainfall and runoff is collected in the Calavaras and San Antonio Reservoirs. Prior to distribution, water from the watershed is treated at the Sunol Valley Water Treatment Plant. This surface water source is supplemented by a small amount of groundwater collected by the Sunol Filter Galleries near the Town of Sunol.

San Mateo Watershed

Surface water from rainfall and runoff captured in the 23,000-acre Peninsula Watershed, which is located in San Mateo County, is stored in four reservoirs: Crystal Springs (Lower and Upper), San Andreas, Pilarcitos and Stone Dam. This water source is treated at the Harry Tracy Water Treatment Plant prior to delivery to customers.

Watershed Protection

The SFPUC aggressively protects the natural water resources entrusted to its care by continuously monitoring its watersheds' weather conditions, water turbidity levels, and microbial contaminants. The 2005 annual update of the Watershed Control Program and Sanitary Survey describes the Hetch Hetchy watershed and water supply system, identifies potential sources of contamination in the watershed, discusses the existing and recommended watershed management practices that protect water quality, and summarizes the water quality monitoring conducted in 2005.

The SFPUC also conducts a sanitary survey of local watersheds every five years. The 2005 assessment found that SFPUC watersheds have very low levels of contaminants, which are associated with wildlife and, to a limited extent, human recreational activity.

Water System Improvements

The SFPUC Water System Improvement Program contains many projects to enhance and improve water quality and to meet increasing federal and state regulatory requirements.

Additionally, throughout the system, the SFPUC will upgrade valves and piping, install additional backflow devices, improve sampling and monitoring capabilities, and make other system modifications to comply with new distribution system sanitary standards. For more information about these projects, visit www.sfwater.org Water System Improvements.

Protecting Our Water Quality

Information from the US EPA and the CDHS

In order to ensure that tap water is safe to drink, the US EPA and CDHS prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. CDHS regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

Drinking water (including bottled water) may reasonably be expected to contain at least small amounts of some contaminants, including *Cryptosporidium* and *Giardia*. The presence of small amounts of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the US EPA's Safe Drinking Water Hotline (800) 426-4791.

Contaminants in Drinking Water

The sources of drinking water (both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, which, in some cases, are radioactive and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharge, oil and gas production, mining, or farming.

Radioactive Contaminants can be naturally occurring or the result of oil and gas production and mining activities.

Pesticides and Herbicides, which may originate from a variety of sources such as agricultural, urban storm water runoff, and residential uses.

Organic Chemical Contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural live stock operations, and wildlife.

Cryptosporidium* and *Giardia

Cryptosporidium and *Giardia* are parasitic microbes found in most surface water supplies and can pose a potential health threat. If ingested, either may produce symptoms of diarrhea, stomach cramps, upset stomach, and slight fever.

The SFPUC tests regularly for *Cryptosporidium* and *Giardia* in both source and treated water supplies. Both were occasionally found at very low levels in the SFPUC's water in 2005.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV-AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. US EPA / Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the US EPA's Safe Drinking Water Hotline (800) 426-4791 or Website: *epa.gov/safewater*.

Important Definitions

The adjoining water quality data table summarizes the 2005 sampling results from laboratory analyses of parameters detected in SFPUC's source water supply and Stanford's distribution system. An extensive water sample collection and testing protocol is used at the various water sources throughout the SFPUC transmission system and in the campus distribution system. Both the SFPUC and Stanford monitor for many additional parameters, which were not detected.

The Water Quality Data table contains the name of each substance, the highest level allowed by regulation (MCL), the ideal goals for public health (PHG), the average and range, and the typical sources of such contamination. Footnotes explaining the data and a key to units of measurement are also included.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically or technically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Public Health Goal (PHG): The level of contaminant in drinking water below, which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Maximum Residual Disinfectant Level (MRDL): The level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of disinfectant added for water treatment below, which there is no known or expected risk of health. MRDLGs are set by the USEPA.

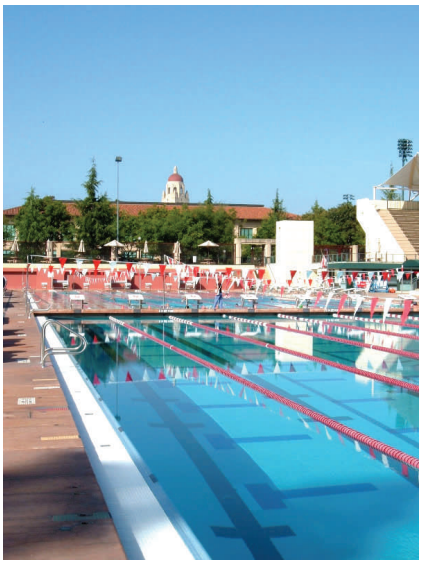
Primary Drinking Water Standard (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Regulatory Action Level (AL): The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements, which a water system must follow.

Treatment Techniques (TT): A required process intended to reduce the level of a contaminant in drinking water.

Waiver: State permission to decrease the monitoring frequency for a particular contami-

Uses of Potable Water



Swimming Pools

Showers

Laboratories

Water Quality Data

Stanford University's Annual Water Quality Data for 2005 (1)

DETECTED CONTAMINANTS

CONSTITUENTS WITH PRIMARY STANDARDS	Unit	MCL	PHG or (MCLG)	Range or Result	Average or (Maximum)	Typical Sources in Drinking Water
TURBIDITY (2)						
Unfiltered Hetch Hetchy Water, max 5 NTU	-	TT	NS	0.25 - 1.00 (3)	(1.74) (4)	Soil run-off
Filtered Water - Sunol Valley WTP, max 1 NTU	-	TT	NS	NA	(0.27)	Soil run-off
95 percentage of time < 0.3 NTU	-	TT	NS	100% (5)	NA	Soil run-off
ORGANIC CHEMICALS (6)						
DISINFECTION BY-PRODUCTS						
Total Trihalomethanes (TTHMs)	ppb	80	NS	11 - 71	(38) (7)	By-product of drinking water chlorination
Total Haloacetic Acids (HAAs)	ppb	60	NS	6 - 47	(24) (7)	By-product of drinking water chlorination
Total Organic Carbon (TOC) (8)	ppm	NS	NS	0.9 - 3.0	2.3	Various natural and man-made sources
DISINFECTION BY-PRODUCTS (Stanford Samples)						
Total Trihalomethanes (TTHMs)	ppb	80	NS	23.3 - 50.3	(35.8) (7)	By-product of drinking water chlorination
Total Haloacetic Acids (HAAs)	ppb	60	NS	14.0 - 33.0	(22.4) (7)	By-product of drinking water chlorination
MICROBIOLOGICAL (Stanford Samples)						
Total Coliform percentage of positives detected in any month	%	≤5	(0)	0	(0)	Naturally present in the environment
INORGANIC CHEMICALS						
Aluminum	ppb	1000	600	6 - 70	38	Erosion of natural deposits
Fluoride (9)	ppm	2.0	1.0	<0.1 - 1.25	1.0	Erosion of natural deposits
Total Chlorine **(Stanford Samples)**	ppm	MRDL=4	MRDLG=4	1.7 - 2.7	(2.2) (7)	Water disinfectant added for treatment

CONSTITUENTS WITH SECONDARY STANDARDS	Unit	SMCL	PHG	Range	Average	Typical Sources in Drinking Water
Chloride	ppm	500	NS	<3 - 25	9	Runoff / leaching from natural deposits
Color	unit	15	NS	<5 - 25 (10)	12	Naturally occurring organic materials
Specific Conductance	µS/cm	1600	NS	25 - 435	155	Substances that form ions when in water
Sulfate	ppm	500	NS	1 - 42	19	Runoff/leaching from natural deposits
Total Dissolved Solids	ppm	1000	NS	20 - 210	116	Runoff / leaching from natural deposits
Turbidity	NTU	5	NS	0.09 - 0.49	0.24	Soil runoff

LEAD AND COPPER RULE STUDY (Stanford Samples)	Unit	AL	PHG	Range	90th Percentile (10)	Typical Sources in Drinking Water
Copper (51 samples collected)	ppb	1300	170	<10 - 120	40 (11)	Corrosion of household plumbing systems
Lead (51 samples collected)	ppb	15	2	<2.0 - 3.0	<2.0 (12)	Corrosion of household plumbing systems

OTHER WATER QUALITY PARAMETERS	Unit	NL	Range	Average
Alkalinity (as $CaCO_3$)	ppm	NS	6 - 150	54
Boron	ppb	1000	16 - 168	73
Calcium	ppm	NS	3 - 30	16
Hardness (as $CaCO_3$)	ppm	NS	8 - 150	56
Fluoride (source water)	ppm	NS	<0.1 - 0.2	0.1
Magnesium	ppm	NS	<0.5 - 12.3	6.6
pH	unit	NS	7.6 - 9.8	8.9
Potassium	ppm	NS	<0.5 - 1.4	0.8
Silica	ppm	NS	4.4 - 7.2	6.3
Sodium	ppm	NS	3 - 26	15

Key:		
</≤	=	less than / less than equal to
TT	=	Treatment Technique
AL	=	Action Level
NA	=	Not Applicable
NL	=	Notification Level
NS	=	No Standard
NTU	=	Nephelometric Turbidity Unit
ppb	=	parts per billion
ppm	=	parts per million
µS/cm	=	microSiemens/centimeter

(1) All results met State and Federal drinking water regulations. Sampling performed by SFPUC, unless otherwise specified.
(2) Turbidity is the water clarity indicator; it also indicates the quality of the water and the treatment system efficiency.
(3) Results are based on monthly average turbidities measured at Tesla Portal.
(4) Turbidity is measured every four hours. This is a maximum single measurement result.
(5) This is the minimum percentage of time that the filtered water turbidity is less than 0.3 NTU.
(6) DHS has approved SFPUC's request for a waiver of 35 additional synthetic organic chemicals.
(7) This is the highest quarterly running annual average value.
(8) TOC is a precursor for disinfection by-product formation. Data are obtained from effluent monitoring at Sunol Valley Water Treatment Plant.
(9) Data includes both Stanford University and SFPUC data points. Please see information on page 6 regarding fluoridation.
(10) The 90th percentile levels of lead and copper must not be greater than the action levels.
(11) In 2004, no residences were over the copper Action Level at consumer taps. Customer tap sampling is required again in 2007.
(12) In 2004, no residences were over the lead Action Level at consumer taps. Customer tap sampling is required again in 2007.

Fluoride

Fluoridation adjusts the naturally occurring fluoride concentration in drinking water to an ideal level for protecting teeth. Fluoridated drinking water benefits people of all ages by preventing tooth decay. San Francisco and many of its water customers in the Bay Area Water Supply & Conservation Agency have fluoridated their drinking water for many years to protect dental health. Stanford Utilities provided fluoridation to Stanford's domestic water supply until October 21, 2005. On November 1, 2005, the SFPUC began supplying fluoridated water to its entire suburban wholesale service area (2.4 million customers) including Stanford University. This change has not impacted Stanford's excellent water quality. Stanford University's domestic water continues to be safe and high quality as it is delivered to campus customers.

Este informe contiene información muy importante sobres el agua que toma. Llame a Stanford University 650-725-8030 sí necesita ayuda en español.

Contact Information

US EPA Drinking Water Homepage:
www.epa.gov/safewater/ or
Safe Drinking Water Hotline
(800) 426-4791

CDHS Drinking Water Program Homepage:
www.dhs.ca.gov/ps/ddwem/technical/dwp/dwpindex.htm

SFPUC's Homepage: sfwater.org

Stanford's Utilities Water Homepage:
facilities.stanford.edu/environment

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