Water Hardness Explained

What is the difference between hard and soft water?

Hard water contains more minerals than soft water. Calcium carbonate is the mineral most commonly associated with water hardness. This is the same mineral found in many calcium supplements. The calcium in hard water produces the spots you may find on your dishes after washing and reduces the "sudsing" ability of soap.

How is hardness measured?

Water hardness is measured in grains per gallon and milligrams per liter. One grain per gallon (gpg) equals 17.1 milligrams per liter (mg/L) or parts per million (ppm).

How hard is my water?

The hardness of your water is determined by which production facility supplies your drinking water. Generally speaking, water coming from our surface water treatment plants and the Newark Desalination Facility is softer than water from our Blending Facility. To determine the hardness of your water, follow these steps:

- First, find the source of your drinking water by using the map on page 6 of this report.
- Next, use this chart to determine the hardness of your water. Values are expressed as parts per million and grains per gallon as calcium carbonate.

	Treated Surface Water		Blended Water		Desalinated Water	
	Range	Average	Range	Average	Range	Average
ppm	28-95	70	195-250	215	84-105	95
gpg	1.6-5.6	4.1	11.4-14.6	12.6	4.9-6.1	5.6

You can also find the hardness of your water at www.acwd.org under the Water Quality menu item, or you can call the Water Quality Laboratory at (510) 668-6520.

What is ACWD doing to reduce the hardness of my water?

We have completed or are undertaking several projects that will help to reduce system-wide hardness. These include:

Blending: In 2005, we constructed a pipeline that allows us to increase the amount of softer water we blend with local groundwater.

Desalination: We plan to double the capacity of the Newark Desalination Facility to 10 million gallons per day (mgd) by 2009.

Niles/Newark Intertie Pipeline: This pipeline will connect our wellfields with the Newark Desalination Facility, allowing us to improve the blend of softer Hetch Hetchy water at our Blending Facility.

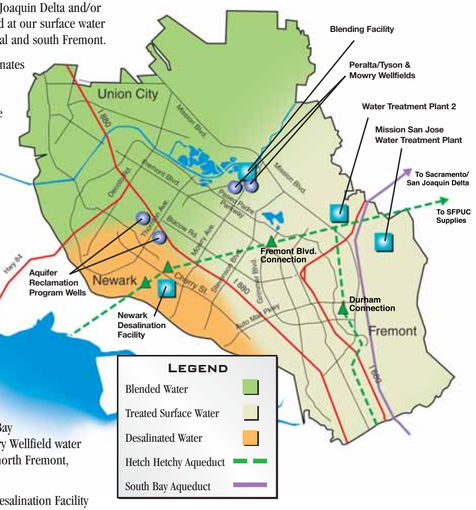
Where Our Water Comes From

ACWD supplies water to the Tri-City area from four sources.

- **Treated surface water** is imported from the Sacramento/San Joaquin Delta and/or Lake Del Valle via the South Bay Aqueduct. This water is purified at our surface water treatment plants and then delivered to customers living in central and south Fremont.
- **Purchased San Francisco water** is surface water which originates in either Hetch Hetchy Reservoir in Yosemite National Park, or locally in Calaveras or San Antonio Reservoirs in the Alameda Creek watershed. Hetch Hetchy water meets all federal and state criteria for watershed protection, disinfection treatment, bacteriological quality, and operational standards and has thus been granted a filtration exemption by the USEPA and the CDHS. Water from the local reservoirs is treated at a water treatment plant. Water from the San Francisco system is delivered through Hetch Hetchy Aqueduct connections in Fremont. Additional connections in Fremont and Newark are opened occasionally for emergency use and to meet peak summer water demands.
- **Blended water** consists of a combination of purchased San Francisco water and local groundwater. Our groundwater supply comes from the Niles Cone Groundwater Basin which underlies the Tri-City area and is replenished through infiltration from local rainwater, runoff from the Alameda Creek watershed, and water from the South Bay Aqueduct. SFPUC water is blended with Peralta/Tyson and Mowry Wellfield water at our Blending Facility and is delivered to customers living in north Fremont, Union City, and parts of Newark.
- **Desalted or desalinated water** is produced at the Newark Desalination Facility (NDF) from brackish (slightly salty) local groundwater. The water produced by the NDF is blended with Aquifer Reclamation Program well water to achieve a more balanced mineral content before being delivered to customers living in Newark.

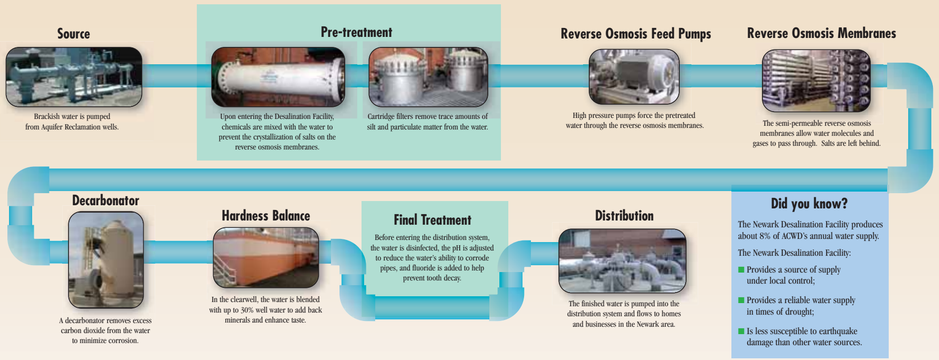
Typical Distribution System Map

Your location in the Tri-City area determines the type of water you receive.



How Your Water Is Purified

ACWD's four water treatment facilities use four distinct processes to purify your water. This diagram illustrates how brackish (slightly salty) groundwater from Aquifer Reclamation Program wells is turned into freshwater at the Newark Desalination Facility using reverse osmosis (RO).



Your Views Are Welcome

Meetings of ACWD's Board of Directors typically begin at 6:00 p.m. on the second Thursday of each month and are open to the public. Meetings are held in the ACWD Board Room at the District's headquarters at 43885 South Grimmer Boulevard in Fremont. Further information regarding the Board meeting schedule can be found on our website at: www.acwd.org/bod_meetings.php5.

If you have any questions or need any more information about the quality of your water, please let us know. We would also appreciate any comments you have about this report. We can be reached by phone at (510) 668-4200, fax (510) 770-1793, on the Internet at www.acwd.org, or by mail at: Alameda County Water District, P.O. Box 5110, Fremont, CA 94537. Dr. Jeannette Weber, our Water Quality Laboratory Supervisor, can be reached at (510) 668-6520. For current water quality information, check the ACWD Water Quality Website at: www.acwd.org/wq_production_report.php5.

ALAMEDA COUNTY WATER DISTRICT

Este reporte contiene información muy importante de su salud y el agua que toma. Tradúzcalo por favor ó hable con alguien que lo entienda bien.

Este relatório contém informações importantes sobre sua água potável. Por favor traduza-o ou fale com alguém que entenda o que está escrito.

Mabalaga ang impormasyong ito. Mangyaring ipasalin ito.

Dieser Report enthält wichtige Informationen Über Ihr Trinkwasser. übersetzen Sie ihn bitte oder sprechen Sie mit jemand, das ihn versteht.

Ce rapport contient de l'information importante concernant votre eau potable. Veuillez le traduire, ou parlez-en avec quelqu'un qui le comprend.

此份有關你的食水報告,內有重要資料和訊息,請找他人為你翻譯及解釋清楚。

Chi tiết này thật quan trọng.
Xin nhờ người dịch cho quý vị.

यह सूचना महत्वपूर्ण है ।
कृपा करके किसी से :इका अनुवाद कराऐं ।

このレポートはあなたの飲料水に関する重要な情報が含まれています。
翻訳するか、レポートの内容を理解できる方に説明してもらってください。

이 안내는 매우 중요합니다.
본인을 위해 번역인을 사용하십시요.

Данный рапорт содержит важную информацию о вашей питьевой воде. Переведите его или проконсультируйтесь с тем, кто его понимает.

این اطلاعیه شامل اطلاعات مهمی راجع به آب آشامیدنی است. اگر نمیتوانید این اطلاعات را بزبان انگلیسی بخوانید لطفاً از کسی که میتواند برای بگیرید تا مطالب را برای شما به فارسی ترجمه کنند.

"هذا التقرير يحتوي على معلوماً ت مهمّة تتعلق بمياه الشفة (أو الشرب).
ترجم التقرير , أو تكلم مع شخص يستطيع أن يفهم التقرير."

ਇਸ ਰਿਪੋਰਟ ਵਿਚ ਤੁਹਾਡੇ ਪੀਣ ਵਾਲੇ ਪਾਣੀ ਵਾਰੇ ਬਹੁਤ ਜਰੂਰੀ ਸੂਚਨਾ ਹੈ। ਇਸ ਨੂੰ ਪੜ੍ਹੋ ਜਾਂ ਜੋ ਸਜਨ ਇਸ ਨੂੰ ਸਮਝ ਸਕਦੇ ਹਨ, ਉਸ ਕੋਲੋਂ ਸਮਝੋ।

ACWD
ALAMEDA COUNTY WATER DISTRICT
43885 South Grimmer Blvd.
Fremont, CA 94538

2006
WATER QUALITY REPORT

Dear ACWD Customer:

This report summarizes the results of the approximately 70,000 analyses conducted on your drinking water during 2006. Im pro ud to report that your water consistently met or surpassed all federal and state drinking water standards for public health and safety over the course of the year. To learn more about the quality of your drinking water, turn to the following pages:

Paul Piraino
General Manager

A Message from the USEPA and the California Department of Health Services

A Note About Drinking Water

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. These contaminants enter water as it travels over the surface of the land or through the ground, dissolving substances that are naturally present in the environment or picking up substances resulting from the presence of animals or human activity. The presence of contaminants does not necessarily indicate that water poses a health risk.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the California Department of Health Services (CDHS) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health. CDHS regulations are in many cases more stringent than federal ones. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (800-426-4791).

A Note to the Immuno-compromised

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. USEPA/Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Comprehensive Water Quality Monitoring

ACWD works diligently to ensure that your water meets or surpasses all state and federal drinking water standards. This is a comprehensive effort that includes monitoring and testing for many types of contaminants that may be present in source water (i.e., water before treatment), including:

- Microbials, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganics, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides, that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic chemicals, including synthetic and volatile organic chemicals that are byproducts of industrial processes and petroleum production, or that may come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- Radioactive contaminants, that can be naturally occurring or be the result of oil and gas production and mining activities.

Laboratory analysts use instruments such as the gas chromatograph/mass spectrometer to ensure the safety of your drinking water.

Highly trained analysts in our state-certified laboratory are committed to conducting these tests under a stringent Quality Assurance/Quality Control (QA/QC) program. Through written procedures, work instructions, and detailed record maintenance, the QA/QC program ensures the quality of the analytical data produced by the laboratory. Analysts collect samples daily from the distribution system, treatment facilities, and water sources to ensure the high quality of the water you drink. Very few of the more than 180 substances we tested for were actually found in our water and in all cases we were in compliance with federal and state standards.

Drinking Water Source Assessment

Drinking Water Source Assessments are conducted to determine how vulnerable drinking water sources are to contamination. Assessments have been completed for all of ACWD's water sources.

- The San Francisco Public Utilities Commission (SFPUC), which administers the Hetch Hetchy system, completed its assessment in 2000. It was found that SFPUC watersheds are vulnerable to contaminants associated with wildlife and, to a limited extent, human recreational activity. Historically, the levels of contaminants have been very low in the watersheds.
- The South Bay Aqueduct (SBA) source assessment was completed in 2002. This source is most vulnerable to agricultural drainage, wastewater treatment plant discharges, urban runoff, recreational usage of the water, and cattle grazing. In addition, seawater intrusion contributes salt and bromide to the water supply.
- ACWD's assessment of local groundwater sources was also completed in 2002. These sources are most vulnerable to existing and historic gas stations, known contaminant plumes, confirmed leaking underground storage tanks, dry cleaners, metal plating/finishing/fabricating, and sewer collection.

Drinking Water Source Assessments have been completed for all of ACWD's water sources, including the South Bay Aqueduct.

Although ACWD water sources are vulnerable to potentially contaminating activities, our treatment and blending facilities purify your tap water to the strict standards set by federal and state regulatory agencies. Complete assessments may be reviewed at ACWD headquarters located at 43885 South Grimmer Boulevard in Fremont. To have a summary of the assessments sent to you, contact Laura Hidas at (510) 668-6516.

2006 Water Quality Information

The chemists and technicians in ACWD's state certified laboratory performed approximately 70,000 chemical and bacteriological analyses on your water during 2006. The results revealed that very few of the more than 180 substances we tested for were found in your water. In all cases, your water was in compliance with federal and state standards for public health and safety. There are two types of standards we are required to meet:

Primary Drinking Water Standards set limits for substances in water that may be harmful to humans if consumed in excess. They include MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Secondary Drinking Water Standards deal with aesthetic qualities such as taste and odor which relate to consumer acceptance rather than health factors.

A summary of key results for 2006 is presented in the following charts. Technical terms and abbreviations used in the charts are explained below.

Definitions

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 technologically 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 U.S. Environmental Protection Agency.

Maximum Residual Disinfectant Level (MRDL): The level of 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 to health. MRDLs are set by the U.S. Environmental Protection Agency.

Notification Level (NL): CDHS health-based advisory levels used to provide information to public water systems and others about unregulated contaminants in drinking water. Unregulated contaminant monitoring helps the EPA and the CDHS to determine where certain contaminants occur and whether the contaminants need to be regulated.

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

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

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

Abbreviations

mg/L: Milligrams per liter (which is equal to parts per million).

µg/L: Micrograms per liter (which is equal to parts per billion).

ppm: Parts per million (which is equal to milligrams per liter).

ppb: Parts per billion (which is equal to micrograms per liter).

pCi/L: Picocuries per liter (a measure of radioactivity).

µmhos/cm: Micromhos/centimeter

NTU: Nephelometric turbidity units

ND: The substance could not be found at the minimum amount that can be detected.

NA: Non-Applicable.

Primary Drinking Water Standards

Parameters	Units	Primary MCL or [MRDL]	(PHG) (MCLG) or [MRDLG]	Treated Surface Water (1)		Purchased San Francisco Water (1)		Blended Water (1)		Desalinated Water (1)		Major Sources
				Range	Average	Range	Average	Range	Average	Range	Average	
Aluminum	ppm	1	(0.6)	ND		ND - 0.09	ND	ND		ND		Erosion of natural deposits
Barium	ppm	1	(2)	ND		ND		0.12 - 0.13	0.13	ND		Erosion of natural deposits
Fluoride (naturally occurring) (2)	ppm	2	(1)	0.06 - 0.12	0.09	0.10 - 0.20	0.10	0.13 - 0.30	0.22	0.10 - 0.26	0.16	Erosion of natural deposits
Fluoride (treated water) (2)	ppm	2	(1)	Average = 0.94 (Range 0.1 - 1.2)								Water additive that promotes strong teeth
Disinfectant Residual (as Cl_2) (3)	ppm	[4]	[4]	Annual Average(4) = 2.0 (Range of individual detections: 0.07 - 3.10)								Disinfectant residual
5 Haloacetic Acids (HAA5) (5)	ppb	60	NA	Highest RAA (6) = 18 (Range of individual detections: ND - 56)								Disinfection by-product
Nitrate (as NO_3)	ppm	45	(45)	ND - 3.1	ND	ND		3.1 - 6.5	4.3	5.5 - 11.6	8.2	Runoff from fertilizer use, erosion of natural deposits
Nitrate + Nitrite (as Nitrogen N)	ppm	10	(10)	ND - 0.7	ND	ND		0.7 - 1.5	0.97	1.3 - 2.6	1.8	Runoff from fertilizer use, erosion of natural deposits
Total Trihalomethanes (TTHMs) (7)	ppb	80	NA	Highest RAA (6) = 30 (Range of individual detections: ND - 62)								Disinfection by-product
Turbidity (8)	NTU	TT = 0.3 (12)	NA	0.02 - 0.14	0.04	NA	NA	Not subject to the turbidity monitoring requirement				Soil Runoff
		TT = 5.0 (13)	NA	NA	NA	0.13 - 1.13	0.32					

Lead and Copper Sampling Program	Units	Action Level (11)	(PHG)	Range	90th Percentile Value	Number of Samples Collected	Number of Samples above AL	Typical Sources in Drinking Water
Copper (12)	ppm	1.3	(0.17)	ND - 1.3	1.0	73	0	Corrosion of household plumbing systems
Lead (12)	ppb	15	(2)	0.4 - 70.1	9.8	73	4	Corrosion of household plumbing systems

Secondary Drinking Water Standards

Parameters	Units	Secondary MCL	Treated Surface Water		Purchased San Francisco Water		Blended Water		Desalinated Water		Major Sources
			Range	Average	Range	Average	Range	Average	Range	Average	
Aluminum	ppb	200	ND		ND - 85.5	ND	ND		ND		Erosion of natural deposits
Chloride	ppm	500	27 - 44	35	2 - 9	6	52 - 71	62	62 - 85	77	Runoff/leaching from natural deposits; seawater influence
Manganese	ppb	50	ND - 30	6	ND		ND		ND		Leaching from natural deposits
Specific Conductance	µmhos / cm	1600	194 - 410	304	38 - 174	85	585 - 722	647	469 - 620	558	Substances that form ions when in water; seawater influence
Total Dissolved Solids	ppm	1000	117 - 209	171	32 - 94	54	330 - 378	361	233 - 313	260	Naturally occurring minerals and metals
Sulfate	ppm	500	18 - 50	27	ND - 17	6	45 - 54	48	25 - 29	26	Naturally occurring minerals

Other Water Quality Parameters

Parameters	Units	NL	Treated Surface Water		Purchased San Francisco Water		Blended Water		Desalinated Water		Major Sources
			Range	Average	Range	Average	Range	Average	Range	Average	
Alkalinity	ppm as $CaCO_3$	NA	36 - 102	73	20 - 64	35	178 - 228	199	114 - 124	119	Naturally occurring mineral
Calcium	ppm	NA	7 - 19	14	2 - 15	7	46 - 51	49	14 - 19	17	Naturally occurring mineral
Hardness	ppm as $CaCO_3$	NA	28 - 95	70	4 - 59	26	195 - 250	215	84 - 105	95	Naturally occurring mineral
Magnesium	ppm	NA	3 - 15	9	0.3 - 5	2	21 - 23	22	9 - 14	11	Naturally occurring mineral
pH	units	NA	8.4 - 9.7	9.0	9.1 - 9.5	9.2	7.7 - 7.8	7.8	8.1 - 8.5	8.3	Naturally occurring mineral
Potassium	ppm	NA	0.9 - 2.2	1.6	0.2 - 1.0	0.5	1.8 - 1.9	1.8	0.8 - 0.9	0.9	Naturally occurring mineral
Sodium	ppm	NA	13 - 48	34	5 - 16	9	55 - 66	61	74 - 84	79	Naturally occurring mineral

(1) Refer to the "Distribution System Map" (page 6) to determine the type of water you receive based on your location.

(2) ACWD treats your water by adding fluoride to the naturally occurring level in order to help prevent dental caries in consumers. The fluoride levels in treated water are maintained within a range of 0.8 - 1.4 ppm, as required by State regulations.

(3) Disinfectant residual in the distribution system consists of combined chlorine (chloramines); results are reported as Cl_2.

(4) For disinfectant residual the annual average for 2006 is reported.

(5) Five Haloacetic Acids is the sum of monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid.

(6) Compliance is based on a running annual average (RAA) of distribution system samples collected in 4 quarters.

(7) Total Trihalomethanes is the sum of chloroform, bromodichloromethane, dibromochloromethane, and bromoform.

(8) Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness. Turbidity is measured in NTUs (nephelometric turbidity units).

(9) Treatment Technique performance standard: 0.3 NTU for filtered water in 95% of the measurements taken each month and shall not exceed 1.0 NTU at any time. The treated surface water met this standard 100% of the time.

(10) Treatment Technique performance standard: 5 NTU for unfiltered water. The purchased SFPUC water met this standard 100% of the time.

(11) Compliance is based on 90th percentile values, which should be less than the action levels (AL's).

(12) Due to consistently favorable sampling results, CDHS approved reduced lead and copper monitoring to every 3 years. Results reported here were collected by ACWD in 2006. The next sampling round is scheduled for 2009.