

2007



Report on Public Health Goals

Orcutt System

Report prepared by
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Public Health Goals - Background

Provisions of the California Health and Safety Code, Section 116470, require public water systems serving more than 10,000 service connections to prepare a report (in plain language) containing information on the "detection" of any contaminants at levels above the Public Health Goals (PHGs) adopted by the State Office of Environmental Health Hazard Assessment (OEHHA) or the additional Maximum Contaminant Level Goals (MCLGs) set by the United States Environmental Protection Agency (USEPA). The first report was required and prepared July 1, 1998 and is required to be revised every three years thereafter.

Golden State Water Company is providing information in conformance with this requirement by providing this revised and updated report at this time. If a constituent was detected in the water supply between 2004 and 2006 at a level exceeding an applicable PHG or MCLG, this report provides health and treatment cost information as required by law.

Regulations and Drinking Water

The USEPA and the California Department of Health Services (CDHS) are responsible for establishing regulations, and setting drinking water standards and goals. These agencies, along with the California Public Utilities Commission (CPUC) set rules and regulations for water systems to follow.

Drinking water goals include MCLGs and PHGs. MCLGs are levels of contaminants in drinking water below which there is no known or expected risk to public health. They are set by the USEPA and allow for a margin of safety. MCLGs are not enforceable drinking water standards. PHGs are water quality goals set by the OEHHA and are recommended target levels and are not required to be met by any public water systems.

Drinking water standards are also known as Maximum Contaminant Levels (MCLs) and Action Levels (ALs). MCLs are the highest level of a contaminant allowed in drinking water. They are set as close to MCLGs and PHGs as are economically and technologically feasible. MCLs are enforceable water quality standards that public water systems must meet. ALs are the concentrations of a contaminant which, if exceeded, triggers treatment or other requirements that the water system must follow.

PHGs and MCLGs are not water quality standards. MCLGs and PHGs are goals identifying extremely small risks. These risks are normally assessed where one person in a million would be at risk to a contaminant. Determinations of health risk at these low levels are frequently theoretical and are based on risk assessments made using assumptions and mathematical extrapolations. Many contaminants are considered to be carcinogenic. The USEPA has set these MCLGs at zero, which cannot be measured by available analytical methods.

The USEPA and CDHS have established Best Available Technologies (BAT) to remove or reduce contaminants to levels at or approaching the PHGs and MCLGs, where technologically feasible. The following information discusses the constituents found in the water served by the water system at or above the MCLGs and PHGs, the established BAT, and the cost estimate to remove the contaminant to the goal levels, where technologically feasible. Please note that accurate cost estimates are difficult, if not impossible, and are highly speculative and theoretical.

Constituents Detected

Inorganic Chemical Contaminants

Arsenic

Arsenic has been detected at levels up to 3.8 micrograms per liter (mg/L) in the ground and surface water supplied to the system. The USEPA MCL is 10 mg/L (effective 1/23/06) and the PHG is 4 nanograms per liter (ng/L). Our water system is in full compliance with the federal drinking water standard for arsenic, but the arsenic level in the system at times exceeds the PHG.

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The category of health risk associated with arsenic, and the reason that a drinking water standard was adopted for it, is that some people who drink water containing arsenic above the MCL over many years may experience skin damage and circulatory system problems and are at a higher risk of getting cancer. The numerical health risk for the PHG of 4 ng/L is one excess cancer case per million people.

The Best Available Technologies (BATs) for removing arsenic to below the MCL are activated alumina, ion exchange, lime softening, coagulation/filtration and reverse osmosis (RO). The most effective method to consistently remove arsenic to below the PHG is to install RO treatment at the select groundwater sites where the water exceeds the PHG. The cost to install and operate RO removal systems to remove arsenic to below the PHG in our Orcutt system would be approximately \$162.4 million annually which includes construction and annual operational cost. This translates into a monthly cost of \$372 per connection for the life of the treatment system.

Copper

Copper has been detected at 0.32 milligrams per liter in water samples collected from customer's taps. The Action Level for copper is 1.3 mg/l, and the PHG is 0.17 mg/L. The levels detected in our system are less than 50% of the MCL, but are slightly over the levels identified by OEHHA as PHGs. Our water system is in full compliance with the Federal and State Lead and Copper Rule. Based on our extensive sampling, it has been determined according to State regulatory requirements that we meet the Action Levels for Lead and Copper. Therefore, we are deemed by CDHS to have "optimized corrosion control" for our system.

The California Department of Health Services (CDHS), which sets drinking water standards, has determined that copper is a health concern at certain exposure levels. Copper, a reddish-brown metal, is often used to plumb residential and commercial structures that are connected to water distribution systems. Copper contaminating drinking water as a corrosion by-product occurs as the result of the corrosion of copper pipes that remain in contact with water for a prolonged period of time. Copper is an essential nutrient, but at high doses it has been shown to cause stomach and intestinal distress, liver and kidney damage, and anemia.

Generally, optimizing corrosion control is considered to be the Best Available Technology (BAT) to prevent copper corrosion. We will continue to monitor our water quality parameters that relate to corrosivity, such as pH, hardness, alkalinity, total dissolved solids, and will take action if necessary to maintain our system in an "optimized corrosion control" condition.

Since we meet the "optimized corrosion control" requirement, it is not prudent to initiate additional corrosion control treatment as it involves the introduction of other chemicals into the system that might create additional water quality issues. Therefore, no estimate of cost has been included.

Radiological Contaminants

Gross Alpha Particle Activity

Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Gross alpha particle activity has been detected at levels up 8.7 pCi/L in the groundwater supplied to the Orcutt System. There is no PHG for gross particle activity. However, the USEPA has established a MCLG level at 0 pCi/L. The MCL for gross alpha particle activity is 15 pCi/L. The levels detected in our system were below the MCL at all times, but were over the level identified by USEPA as the MCLG.

The CDHS and USEPA, which set drinking water standards, have determined that gross alpha particle activity is a health concern at certain levels of exposure. This radiological constituent is a naturally occurring contaminant in some groundwater and surface water supplies. The category of health risk associated with gross alpha particle activity, and the reason that a drinking water standard was adopted for it, is that some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer. The numerical health risk for the MCLG of zero pCi/L is zero. The CDHS and the USEPA set the drinking water standard for gross alpha particle activity at 15 pCi/L in order to reduce the risk of cancer or other adverse health effects.

The Best Available Technology (BAT) identified to treat gross alpha particle activity is reverse osmosis (RO). The most effective method to consistently remove gross alpha particle activity in order to meet the MCLG is to install RO treatment at the select groundwater and surface water connections sites where the water exceeds the MCLG. The cost to install and operate RO removal systems to remove gross alpha particle activity to the MCLG in our Orcutt System would be approximately \$452.9 million annually which includes construction and annual operational cost. This translates into a monthly cost of \$1,038 per connection for the life of the treatment system.

Uranium

Uranium has been detected at 7.6 picoCuries per liter (pCi/L) in groundwater supplied to the system. The CDHS MCL is 20 pCi/L and the MCLG is 0.0 pCi/L. The levels detected in our system were below the MCL at all times, but were over the levels identified by USEPA as MCLGs.

The California Department of Health Services (CDHS), which sets drinking water standards, has determined that uranium is

The California Department of Health Services (CDHS), which sets drinking water standards, has determined that uranium is a health concern at certain levels of exposure. The United States Environmental Protection Agency (USEPA) revised their current regulation in December 2000 and proposed an MCLG of zero for uranium. This radiological constituent is a naturally occurring contaminant in groundwater supplies. Exposure to uranium in drinking water may result in toxic effects to the kidney. This constituent has also been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Constituents that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. CDHS has set the drinking water standard for uranium at 20 picoCuries per Liter (pCi/L) to reduce the risk of cancer or other adverse health effects that have been observed in laboratory animals. Drinking water that meets the CDHS standards is associated with little to none of this risk and is considered safe with respect to uranium.

The Best Available Technology identified to treat uranium is reverse osmosis (RO) treatment. The most effective and economical treatment system is to use RO treatment at select plant sites. We have determined that the cost to install and operate an RO removal system to treat the wells in our Orcutt System in order to meet the PHG levels for all radionuclides would be approximately \$452.9 million a year. This would be approximately \$1,038 per customer per month for the life of the treatment system.

Radium

Radium (chemical symbol Ra) is a naturally-occurring radioactive metal. Its most common isotopes are radium-226, radium 224, and radium-228. Radium is a radionuclide formed by the decay of uranium and thorium in the environment. It occurs at low levels in virtually all rock, soil, water, plants, and animals.

The CDHS and USEPA have set MCLs for the isotopes radium-226 and radium-228 in drinking water. Radium 226 has been detected at levels up 1.2 picoCuries/L (pCi/L) and Radium 228 has been detected at levels up 1.6 pCi/L in the groundwater supplied to the system. The PHG for Radium 226 is 0.05 pCi/L and the PHG for Radium 228 is 0.19 pCi/L. The MCL for combined Radium 226 + 228 is 5 pCi/L. The levels detected in our system were below the MCL at all times, but were over the level identified by DHS as the PHG.

The CDHS and USEPA, which set drinking water standards, have determined that combined radium is a health concern at certain levels of exposure. This radiological constituent is a naturally occurring contaminant in some groundwater and surface water supplies. The category of health risk associated with combined radium, and the reason that a drinking water standard was adopted for it, is that some people who drink water containing radium-226 and/or or radium-228 in excess of the MCL over many years may have an increased risk of getting cancer. The numerical health risk associated with the PHG is one excess cancer case per million people. CDHS and USEPA set the drinking water standard for combined radium at 5 pCi/L to reduce the risk of cancer or other adverse health effects.

The Best Available Technologies (BATs) identified to remove combined radium from drinking water are ion exchange, reverse osmosis (RO), and lime softening. The most effective method to consistently remove radium-226 and radium-228 to the PHG is to install RO treatment at the select groundwater sites where the water exceeds the PHG. The cost to install and operate RO removal systems to remove radium to the PHG in our Orcutt system would be approximately \$75 million annually, which includes construction and annual operational cost. This translates into a monthly cost of \$172 per connection for the life of the treatment system.

Volatile Organic Chemical Contaminants

Tetrachloroethylene

Tetrachloroethylene (PCE) has been detected at 8.4 micrograms per liter (ug/L) in groundwater supplied to the system. The MCL is 5 ug/L, based on an average of two samples, and the PHG is 0.0 mg/L. The levels detected in our system were initially detected above the MCL level in one sample collected from a newly installed groundwater well in 2004. However, the confirmation sample collected from the well within 7 days of the original sample was non-detect for PCE. In addition, all follow-up samples from the well in question have been non-detect.

The California Department of Health Services (CDHS), which sets drinking water standards, has determined that tetrachloroethylene is a health concern at certain levels of exposure. This organic chemical has been a popular solvent, particularly for the dry cleaning industry. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. CDHS has set the drinking water standard for tetrachloroethylene at 0.005 part per million (ppm) to reduce the risk of cancer or other adverse health effects that have been observed in laboratory animals. Drinking water that meets the CDHS standards is associated with little to none of this risk and is considered safe with respect to tetrachloroethylene.

The Best Available Technology identified to treat PCE is Granular Activated Carbon (GAC) absorption. The most effective and economical treatment system is to use GAC treatment at select plant sites. We have determined that the cost to install and operate a PCE removal system to treat the well to reduce PCE below the PHG level would be approximately \$153,000 annually, which includes construction and annual operational cost. This translates into a monthly cost of \$0.35 per connection for the life of the treatment system.

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Summary of Findings

Overall, seven chemicals were detected in our Orcutt System at concentrations above the PHGs. At no time did we ever serve water that contained contaminants above recognized and enforceable MCLs. The drinking water quality of Golden State Water Company's Orcutt System meets all the drinking water standards to protect public health.

If you have any questions about this report, please call us at (800) 999-4033. We are available to answer your questions 24 hours a day, 7 days a week, or visit our website at <http://www.aswater.com>.