

2010



Report on Public Health Goals

San Dimas 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 2007 and 2009 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 (CDPH) 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 CDPH have established Best Available Technologies (BATs) to remove or reduce contaminants to levels at or approaching the PHGs and MCLGs, where technologically feasible. BATs are the best known methods of reducing contaminant levels to the MCL. Costs can be estimated for such technologies. However, since many PHGs and all MCLGs are set much lower than the MCL, it is not always possible nor feasible to determine what treatment is needed to further reduce a constituent downward to or near the PHG or MCLG, many of which are set at zero. Estimating the costs to reduce a constituent to zero is difficult, if not impossible because it is not possible to verify by analytical means that the level has been lowered to zero. Furthermore, while cost estimates can be used to compare the economics of various treatment processes or the costs of major project components, such estimates do not represent the actual construction and operation and maintenance costs of the project. Actual costs are site-specific and must be developed for individual circumstances. Many factors which cannot be generalized influence construction costs. These factors include plant capacity, design criteria, treatment processes, site conditions and land costs, permit costs, climate, competition among bidders and suppliers, and general local and nationwide economic conditions. In some cases, installing treatment to try and further reduce very low levels of one constituent may have adverse effects on other aspects of water quality.

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.

Preparation of Report

The Association of California Water Agencies (ACWA) formed a workgroup which prepared guidelines for water utilities to use in preparing these newly required reports. The ACWA guidelines were used in the preparation of our report. No guidance was available from state regulatory agencies.

Constituents Detected that Exceed PHGs or MCLGs

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 to 5.9 picoCuries/L (pCi/L). The MCL is 15 pCi/L, and the MCLG is 0 pCi/L. The levels detected in the San Dimas System were below the MCL at all times, but exceeded the MCLG in local groundwater and in one of the surface water supplies.

The USEPA has determined that the theoretical health risk associated with the MCLG is zero, and the risk associated with the MCL is one excess case of cancer in 1,000 people over a lifetime exposure for the most potent alpha emitter.

The Best Available Technology (BAT) for the removal of gross alpha in water for large water systems is reverse osmosis (RO). Gross alpha was detected above the MCLG at six groundwater wells, and in the treated surface water purchased from MWDC. The cost of providing treatment using reverse osmosis to reduce gross alpha levels in groundwater and in treated surface water to the MCLG of 0 (and consequently gross beta and uranium below the MCLG and PHG, respectively) was calculated. Because the DLR for gross alpha is 3 pCi/L, treating gross alpha to 0 means treating it to below the DLR of 3 pCi/L. Achieving the water quality goal for gross alpha, gross beta and uranium could range from \$7.0 million to \$22.8 million per year, or between \$436.00 and \$1,415.00 per household per year.

Gross Beta Particle Activity

Gross Beta Particle Activity (gross beta) is naturally occurring in treated surface water purchased from the MWDC, TVMWD and the CIC. Gross beta is not required to be tested in groundwater. Gross beta particle activity has been detected at levels up to 5.2 picoCuries/L (pCi/L) in treated surface water supplied to the system. The MCL is 50 pCi/L, and the MCLG is 0 pCi/L. The levels detected in the San Dimas System were below the MCL at all times, but exceeded the MCLG in all three of the surface water supplies.

The USEPA has determined that the health risk associated with the MCLG is zero, and the risk associated with the MCL is two excess cases of cancer in 1,000 people over a lifetime exposure for the most potent beta emitter.

The Best Available Technology (BAT) for the removal of gross beta in water for large water systems is reverse osmosis (RO). Gross beta was detected above the MCLG in treated surface water purchased from TVMWD, MWDC and CIC. The cost of providing treatment using reverse osmosis to reduce gross alpha levels in groundwater and in treated surface water to the MCLG of 0 (and consequently gross beta and uranium below the MCLG and PHG, respectively) was calculated. Because the DLR for gross alpha is 3 pCi/L, treating gross alpha to 0 means treating it to below the DLR of 3 pCi/L. Achieving the water quality goal for gross alpha, gross beta and uranium could range from \$7.0 million to \$22.8 million per year, or between \$436.00 and \$1,415.00 per household per year.

Uranium

Uranium is naturally occurring in local groundwater and in treated surface water purchased from the MWDC. Uranium has been detected at levels up to 5.0 pCi/L in the local ground and surface water supplied to the system. The MCL is 20 pCi/L and the PHG is 0.43 pCi/L. The levels detected in our system were below the MCL at all times, but exceeded the PHG in local groundwater and one of the surface water supplies.

OEHHA has determined the health risk associated with the PHG is one excess case of cancer in a million people, and the risk associated with the MCL is five excess cases of cancer in 100,000 people over a lifetime exposure.

The Best Available Technology (BAT) for the removal of uranium in water for large water systems is reverse osmosis (RO). Uranium was detected above the PHG at seven groundwater wells, and in the treated surface water purchased from MWDC. The cost of providing treatment using reverse osmosis to reduce gross alpha levels in groundwater and in treated surface water to the MCLG of 0 (and consequently gross beta and uranium below the MCLG and PHG, respectively) was calculated. Because the DLR for gross alpha is 3 pCi/L, treating gross alpha to 0 means treating it to below the DLR of 3 pCi/L. Achieving the water quality goal for gross alpha, gross beta and uranium could range from \$7.0 million to \$22.8 million per year, or between \$436.00 and \$1,415.00 per household per year.

Microbiological Contaminants

Total Coliform Bacteria

Total coliforms are naturally occurring in the environment but can also be an indicator of the presence of other pathogenic organisms originating from sewage, livestock or other wildlife. The San Dimas system collects 40 samples per month from the distribution system and no more than 5% of samples collected in a given month can be positive total coliforms. During 2007—2009, the highest monthly percentage of positive samples was 2.2%. The MCLG for total coliforms is 0%.

The Best Available Technology (BAT) for treating coliform organisms in drinking water has been determined by USEPA to be disinfection. The San Dimas System already disinfects all the water that is served to the public. Chlorine is used to treat the water because it is an effective disinfectant and residual concentrations can be maintained to guard against biological contamination in the water distribution system.

Coliform bacteria are indicator organisms that are ubiquitous in nature. They are a useful tool because of the ease in monitoring and analysis. The San Dimas System collects weekly samples for total coliforms at various locations in the distribution system and monthly samples at each well. If a positive drinking water sample is found, it indicates a potential problem that needs to be investigated and followed up with additional sampling. It is not at all unusual for a system to have an occasional positive sample. Although USEPA set the MCLG for total coliform at zero percent positive, there is no commercially available technology that will guarantee zero percent positive every single month; therefore, the cost of achieving the PHG cannot be estimated.

The San Dimas System will continue several programs that are now in place to prevent contamination of the water supply with microorganisms. These include:

- Disinfection using chlorine and maintenance of a chlorine residual at every point in the distribution system;
- Monitoring of wells and throughout the distribution system to verify the absence of total coliforms and the presence of a protective chlorine residual;
- A program in which distribution pipelines are flushed with chlorinated system water to remove stagnant water and bring in fresh water with residual disinfectant; and
- A cross-connection control program that prevents the accidental entry of non-disinfected water into the drinking water system.

Inorganic Chemical Contaminants

Arsenic

Arsenic is naturally occurring in treated surface water purchased from the Metropolitan Water District of Southern California (MWDSC) and the Covina Irrigating Company (CIC). During 2007—2009, arsenic was not detected in the San Dimas System groundwater sources or treated surface water purchased from Three Valleys Municipal Water District (TVMWD). Arsenic has been detected at levels up to 4.0 micrograms per liter (ug/L) in treated surface water supplied to the system. The MCL is 10 ug/L and the PHG is 0.004 ug/L. The PHG is less than the detection limit required for reporting the occurrence of arsenic in drinking water, called the DLR, which is 2 ug/L. The arsenic levels detected in our system's source waters were below the MCL at all times, but exceeded the PHG in two of the surface water supplies.

The OEHHA has determined that the health risk associated with the PHG is one excess case of cancer in one million people, and the risk associated with the MCL is two excess cases of cancer per 1,000 people over a 70-year lifetime exposure.

The Best Available Technologies (BATs) for removal of arsenic in water for large water systems are: activated alumina, coagulation/filtration, lime softening, ion exchange, and reverse osmosis. Arsenic was detected above the PHG in water purchased from MWDSC and CIC. The wholesalers are in compliance with the MCL for arsenic. The estimated cost to reduce arsenic levels in the purchased water to below the PHG of 0.004 ug/L using ion exchange was calculated. Because the DLR for arsenic is 2 ug/L, treating arsenic to below the PHG level means treating arsenic to below the DLR of 2 ug/L. There are numerous factors that may influence the actual cost of reducing arsenic levels to the PHG. Achieving the water quality goal for arsenic could range from \$1.3 million to \$1.65 million per year, or between \$85.00 and \$103.00 per household per year.

Lead

Lead in drinking water is generally the result of corrosion of residential plumbing. Every three years as required by the USEPA Lead and Copper Rule, the San Dimas System tests representative residential taps for lead and copper. If more than 10% of these samples exceed the established Action Level (AL), a water system must provide treatment or other requirements to reduce corrosion in the system. The San Dimas System tested for lead and copper in 2008 and the AL for each was not exceeded in more than 10% of the samples. The San Dimas System complies with the Lead and Copper Rule and the system is considered to be optimized for corrosion control. The 90th percentile for lead was 4.4 ug/L, which is below the AL of 15 ug/L but above the PHG of 0.2 ug/L. The 90th percentile for copper was 220 ug/L, which is less than the AL of 1,300 ug/L and also less than the PHG of 300 ug/L.

The OEHHA has determined that the theoretical health risk associated with the PHG is three excess cases of cancer in ten million people, and the risk associated with the AL is 2 excess cases of cancer in a million people over a 70 year lifetime exposure. The lead PHG is not based on cancer risk but is based on neurobehavioral effects in children and hypertension in adults. OEHHA has not established a numerical health risk for these chronic toxicity effects because PHGs for non-carcinogenic chemicals in drinking water are set at a concentration at which no known or anticipated adverse health risks will occur, with an adequate margin of safety.

The USEPA has determined the Best Available Technology (BAT) to reduce lead in drinking water to be corrosion control optimization. This method is capable of bringing a water system into compliance with the AL of lead at 15 ug/L. The San Dimas Water System is already in compliance with the lead AL, meets all state and federal requirements, and is therefore deemed by CDPH to have optimized corrosion control. Further corrosion control optimization would be incapable of achieving the PHG; therefore, the cost of reducing lead to the PHG level cannot be estimated.

The principal reason for this is that the largest source of lead in tap water is the pipe and fixtures in the customer's own household plumbing. Lead has not been detected in the San Dimas System source waters. Factors that increase the amount of lead in the water include homes less than five years old or constructed before 1980; the water supplied to the home is naturally soft or corrosive; or water often sits in the household plumbing for several hours.

The San Dimas System collected extensive lead and copper tap samples in 2005 and again in 2008. The lead levels in over 90% of the most recent samples were below the AL. The San Dimas System will continue to monitor the water quality parameters that relate to corrosivity, such as pH, hardness, alkalinity and total dissolved solids, and will take action if necessary to maintain the water system in an optimized corrosion control condition.