GOLDEN STATE WATER COMPANY SAN DIMAS

2019 Public Health Goals Report

Pursuant to Section 116355 of the California Health and Safety Code

2019 Public Health Goals (PHGs) Report

Golden State Water Company-San Dimas System

1.0 Introduction

Under the Calderon-Sher Safe Drinking Water Act of 1996, public water systems in California serving greater than 10,000 connections must prepare a report containing information on 1) detection of any contaminant in drinking water at a level exceeding a Public Health Goal (PHG) 2) estimate of costs to remove detected contaminants to below the PHG using Best Available Technology (BAT), and 3) health risks for each contaminant exceeding a PHG. This report must be made available to the public every three years. The initial PHGs Report was due on July 1, 1998, and subsequent reports are due every three years thereafter.

The 2019 PHGs Report has been prepared to address the requirements set forth in Section 116470 of the California Health and Safety Code. It is based on water quality analyses during calendar years 2016, 2017, 2018 or, if certain analyses were not performed during those years, the most recent data available. The PHGs Report has been designed to be as informative as possible, without unnecessary duplication of information contained in the Consumer Confidence Report, which is made available to customers by July 1st of each year.

There are no regulations explaining requirements for the preparation of PHGs reports. A workgroup of the Association of California Water Agencies (ACWA) Water Quality Committee has prepared suggested guidelines for water utilities to use in preparing PHGs reports. The ACWA guidelines were used in the preparation of our report. These guidelines include tables of cost estimates for BAT. The State of California (State) provides ACWA with numerical health risks and category of health risk information for contaminants with PHGs. This health risk information is appended to the ACWA guidelines.

2.0 California Drinking Water Regulatory Process

California Health and Safety Code Section 116365 requires the State to develop a PHG for every contaminant with a primary drinking water standard or for any contaminant the State is proposing to regulate with a primary drinking water standard. A PHG is the level which poses no significant health risk if consumed for a lifetime. The process of establishing a PHG is a risk assessment based strictly on human health considerations. PHGs are recommended targets and are not required to be met by any public water system.

The State office designated to develop PHGs is the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA). The PHG is then forwarded to the State Water Resource Control Board, Division of Drinking Water (DDW) for use in revising or developing a Maximum Contaminant Level (MCL) in drinking water. The MCL is the highest level of a contaminant that is allowed in drinking water. State MCLs cannot be less stringent than federal MCLs and must be as close as is technically and economically

feasible to the PHGs. DDW is required to take treatment technologies and cost of compliance into account when setting an MCL. Each MCL is reviewed at least once every five years.

Total chromium and two radiological contaminants (gross alpha particle and gross beta particle) have MCLs but do not yet have designated PHGs. For these contaminants, the Maximum Contaminant Level Goal (MCLG), the federal U.S. Environmental Protection Agency (USEPA) equivalent of PHGs, is used in the 2019 PHGs Report.

N-Nitrosodimethylamine (NDMA) has a PHG of 3 nanograms per liter (ng/l), but is not regulated in drinking water with a primary drinking water standard. Bromodichloromethane, bromoform, and dichloroacetic acid are three disinfection byproducts that have federal MCLGs of zero but are not individually regulated with primary drinking water standards. According to the ACWA guidance and instructions from DDW, these four chemicals do not have to be included in the 2019 PHGs Report because they do not have an existing MCL.

3.0 Identification of Contaminants

Section 116470(b)(1) of the Health and Safety Code requires public water systems serving more than 10,000 connections to identify each contaminant detected in drinking water that exceeded the applicable PHG. Section 116470(f) requires the MCLG to be used for comparison if there is no applicable PHG.

Golden State Water Company (Golden State Water) - San Dimas System has approximately 16,033 service connections. From 2016 to 2018, Golden State Water's water supplies included local groundwater, and treated surface water purchased from Covina Irrigating Company (CIC) and Three Valleys Municipal Water District (TVMWD), which includes surface water treated by TVMWD and Metropolitan Water District of Southern California (MWDSC). The following constituents were detected at one or more locations within the drinking water system at levels that exceeded the applicable PHGs or MCLGs.

- Arsenic is naturally occurring in treated surface water purchased from CIC.

- Copper in drinking water is generally the result of corrosion of residential plumbing. Every three years as required by the USEPA Lead and Copper Rule, Golden State Water tests representative residential taps for lead and copper.

- Gross Alpha Particle Activity (gross alpha) is naturally occurring in local groundwater and treated surface water purchased from TVMWD and CIC.

- Gross Beta Particle Activity (gross beta) is naturally occurring in treated surface water purchased from TVMWD.

- Uranium is naturally occurring in local groundwater and in treated surface water purchased from the CIC and TVMWD.

Table 1 shows the applicable PHG or MCLG; and MCL or Action Level (AL) for each contaminant identified above. Copper is regulated by an AL, not an MCL, and is tested from samples collected at selected customers' indoor faucets or taps. The AL is the concentration of lead, which if exceeded in more than 10 percent of the tap samples, triggers treatment or other requirements that a water system must follow. Table 1 shows the 90th percentile concentration of copper observed during the most recent round of at-the-tap sampling. Table 1 includes the maximum, minimum, and average concentrations of each contaminant which exceeds a PHG in drinking water supplied by Golden State Water in calendar years 2016 to 2018.

4.0 Numerical Public Health Risks

Section 116470(b)(2) of the Health and Safety Code requires disclosure of the numerical public health risk, determined by OEHHA, associated with the MCLs, ALs, PHGs and MCLGs. Available numerical health risks developed by OEHHA for the contaminants identified above are shown on Table 1. Only numerical risks associated with cancer-causing chemicals have been quantified by OEHHA.

Arsenic - OEHHA has determined the health risk associated with the PHG is one excess case of cancer in a million people. USEPA has determined the risk associated with the MCL is 2.5 excess cases of cancer in 1,000 people over a lifetime exposure.

Copper – OEHHA has not established a numerical health risk for copper 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.

Gross Alpha - OEHHA has not established a PHG. USEPA has established an MCLG of 0. USEPA has determined the risk associated with the MCL is 1 excess case of cancer in 1,000 people over a 70 -year exposure for the most potent alpha emitter.

Gross Beta - OEHHA has not established a PHG. USEPA has established an MCLG of 0. USEPA has determined the risk associated with the MCL is 2 excess case of cancer in 1,000 people over a 70-year exposure for the most potent beta emitter.

Uranium - OEHHA has determined the health risk associated with the PHG is one excess case of cancer in a million people. USEPA has determined the risk associated with the MCL is 5 excess cases of cancer in 100,000 people over a 70-year exposure.

5.0 Identification of Risk Categories

Section 116470(b)(3) of the Health and Safety Code requires identification of the category of risk to public health associated with exposure to the contaminant in drinking water, including a brief, plainly worded description of those terms. The risk categories and definitions for the contaminants identified above are shown on Table 1.

6.0 Description of Best Available Technology

Section 116470(b)(4) of the Health and Safety Code requires a description of the BAT, if any is available on a commercial basis, to remove or reduce the concentrations of the contaminants identified above. The BATs are shown on Table 1.

7.0 Costs of Using Best Available Technologies and Intended Actions

Section 116470(b)(5) of the Health and Safety Code requires an estimate of the aggregate cost and cost per customer of utilizing the BATs identified to reduce the concentration of a contaminant to a level at or below the PHG or MCLG. In addition, Section 116470(b)(6) requires a brief description of any actions the water purveyor intends to take to reduce the concentration of the contaminant and the basis for that decision.

Arsenic - The 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 treated surface water from CIC. All drinking water supplies comply with the MCL for arsenic. The estimated cost to reduce arsenic levels to below the PHG of 0.004 µg/l using ion exchange was calculated. Because the Detection Limit for the purpose of Reporting (DLR) for arsenic is 2 µg/l, treating arsenic to below the PHG level means treating arsenic to below the DLR of 2 µg/l. There are numerous factors influencing the actual cost of reducing arsenic levels to the PHG. Achieving the water quality goal for arsenic could cost approximately $337,000 per year, or $21 per service connection per year.

Copper – USEPA has determined the BAT to reduce copper in drinking water to be corrosion control optimization. This method is capable of bringing a water system into compliance with the AL of copper at 1,300 µg/l. Golden State Water's water system is already in compliance with the copper AL, meets all State and federal requirements, and is therefore deemed by DDW to have optimized corrosion control. Further corrosion control optimization would be incapable of achieving the PHG; therefore, the cost of reducing copper to the PHG level cannot be estimated.

The principal reason for this is that the largest source of copper in tap water is the pipe and fixtures in the customer's own household plumbing. Copper has not been detected in the Golden State Water's source waters. Factors that increase the amount of copper in the water include:

- Household faucets or fittings made of brass;
- Copper plumbing materials;
- Homes less than 5 years old or constructed before 1980;
- Water supplied to the home is naturally soft or corrosive; or
- Water often sits in the household plumbing for several hours.

Golden State Water collected extensive lead and copper tap samples in 2017. The copper levels in over 90 percent of the most recent samples were below the AL. Golden State Water 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.

Gross Alpha, Gross Beta, and Uranium - The only BAT for the removal of gross alpha in water for large water systems is reverse osmosis, which can also remove gross beta and uranium, if detected. Gross alpha was detected above the MCLG at five groundwater wells and in treated surface water from CIC and TVMWD. Gross beta was also detected above the MCLG in treated surface water from TVMWD. Uranium was detected above the PHG at all of Golden State Water's groundwater wells and in the treated surface water from CIC and TVMWD. 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 $2,856,000 to $24,340,000 per year, or between $178 and $1,521 per service connection per year.

All Contaminants - In addition, a cost estimate to treat all water produced or purchased by Golden State Water using reverse osmosis to remove all the contaminants detected above the PHGs or MCLGs was calculated. Most of contaminants listed in Table 1 may be removed to non-detect levels by reverse osmosis, except copper. Copper can be introduced and detected anywhere in the distribution system. As shown on Table 1, achieving the water quality goals for all contaminant, except for copper, using reverse osmosis could range from $2,856,000 to $24,340,000 per year, or between $178 and $1,521 per service connection per year.

For additional information, please contact Mr. Alex Chakmak, Water Quality Engineer at (800) 999-4033, or write to Golden State Water Company, 401 S. San Dimas Canyon Road, San Dimas, CA 91773.

TABLE 1
2019 PUBLIC HEALTH GOALS REPORT
GOLDEN STATE WATER COMPANY - SAN DIMAS SYSTEM

PARAMETER	UNITS OF MEASUREMENT	PHG OR (MCLG)*	MCL OR (AL)	DLR	CONCENTRATION		CATEGORY OF RISK	CANCER RISK AT PHG OR MCLG	CANCER RISK AT MCL	BEST AVAILABLE TECHNOLOGIES	AGGREGATE COST PER YEAR	COST PER SERVICE CONNECTION PER YEAR
					VALUE	RANGE						
INORGANIC CHEMICALS												
Arsenic	µg/l	0.004	10	2	<2	ND - 10	C	1×10^{-6}	2.5×10^{-3}	AA,C/F,E,IE,LS,O/F,RO	$337,000 (a)	$21 (a)
Copper (b)	µg/l	300	(1,300)	50	450		G	NA	NA	CC	(c)	(c)
RADIOLOGICAL												
Gross Alpha Particle Activity	pCi/l	(0)	15	3	<3	ND - 5.9	C	0	1×10^{-3}	RO	$2,856,000 - $24,340,000 (d)	$178 - $1,521 (d)
Gross Beta Particle Activity	pCi/l	(0)	50	4	<4	ND - 6	C	0	2×10^{-3}	IE, RO	--	--
Uranium	pCi/l	0.43	20	1	1.9	ND - 5.1	C	1×10^{-6}	5×10^{-5}	RO	--	--
ALL CONTAMINANTS	--	--	--	--	--	--	--	--	--	RO	$2,856,000 - $24,340,000 (e)	$178 - $1,521 (e)

* MCLGs are shown in parentheses. MCLGs are provided only when no applicable PHG exists.

RISK CATEGORIES
C (Carcinogen) = A substance that is capable of producing cancer.
G (Gastrointestinal Effects) = A substance that may adversely affect the gastrointestinal tract after short-term exposure.

NOTES
PHG = Public Health Goal
MCL = Maximum Contaminant Level
MCLG = Maximum Contaminant Level Goal
NA = Not Appplicable or Available
ND = Not Detected
NR = Not Required
µg/l = micrograms per liter or parts per billion
pCi/l = picoCuries per liter
DLR = Detection Limit for Purposes of Reporting
< = Value is less than the DLR

TREATMENT/CONTROL TECHNOLOGIES
AA = Activated Aluminum
CC = Corrosion Control
C/F = Coagulation/Filtration
E = Electrodialysis
IE = Ion Exchange
LS = Lime Softening
O/F = Oxidation/Filtration
RO = Reverse Osmosis

(a) Estimated cost to remove arsenic using IE.
(b) An action level has been established for copper. The action level is exceeded if the 90th percentile concentration in samples collected throughout the distribution system is higher than the action level. The table shows the 90th percentile concentration of the most recent group of samples collected.
(c) Cost could not be estimated
(d) Estimated cost to remove gross alpha particle activity using RO, which also removes gross beta particle activity and uranium.
(e) Assuming treating the entire production by RO, which can remove all contaminants listed in the above table to below the detectable levels, except for copper, which can be detected anywhere in the distribution system.