City of Ceres

2019 Public Health Goals Report

Prepared by Water Quality Staff

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Background

The California Health and Safety Code Title 22 Section 116470 (b) specifies that water utilities serving more than 10,000 connections prepare a brief written report every three years that documents detections of any constituents that exceed a Public Health Goal (PHG) in the preceding three years. This report documents the drinking water contaminants in our water supply found to be above a PHGs, or if no PHG, above the Maximum Contaminant Level Goal (MCLG) during calendar years 2015 through 2018.

State law requires the following information to be disclosed in this report:

- Numerical public health risk
- Category or type of health risk
- Best Available Treatment (BAT) technology
- Estimated treatment costs

There are a few constituents that are routinely detected in water systems at levels well below the drinking water standards for which no PHG or MCLG has yet been adopted by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) or the United States Environmental Protection Agency (USEPA) including Total Trihalomethanes. These will be addressed in a future report after a PHG has been adopted.

What are Public Health Goals?

PHGs and MCLGs are non-enforceable goals set by the OEHHA and the USEPA. PHGs are set based solely on public health risk considerations. PHGs are often not practically achievable from an economic and technological point of view. None of the practical risk-management factors that are considered by the USEPA or the California Division of Drinking Water (DDW) in setting drinking water standards for Maximum Contaminant Level's (MCLs) are considered in setting the PHGs. These factors include analytical detection capability, treatment technology availability and costs. However, both the PHGs and MCLGs are useful tools for regulators when determining enforceable standards such as MCLs, that water suppliers are required to meet.

Water Quality Data Considered

All of the water quality data collected by the City between 2015 and 2018 for the purpose of determining compliance with drinking water standards was reviewed for the 2019 Public Health Goal report. This data was summarized in the 2015, 2016, 2017 and 2018 Annual Consumer Confidence Reports which is accessible by visiting the City's website at http://www.ci.ceres.ca.us/169/City-of-Ceres-Water-System-Historical-In or by calling the Public Works Office at (209) 538-5732 and requesting a copy.

Guidelines Followed

The Association of California Water Agencies (ACWA) formed a workgroup which prepared guidelines for water utilities to use in preparing these reports. The ACWA guidelines were updated in 2019 and were utilized in the preparation of this report.

Best Available Treatment Technology and Cost Estimates

Both the USEPA and DDW adopt what are known as Best Available Technologies (BATs), which 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 or 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. 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.

Constituents Detected that Exceed a PHG or a MCLG

The following is a discussion of constituents that were detected in one or more of the calendar years from the City's drinking water source at levels above the PHG, or the MCLG. Many contaminants are considered to be carcinogenic and the USEPA's policy is to set the applicable MCLGs at zero because they consider no amount of these contaminants to be without risk. It is understood by all that zero is an unattainable goal and cannot be measured by the practically available analytical methods. Note that by regulation, OEHHA cannot set a PHG at zero and must calculate a numerical level to address risk, even though it may be unattainable or impossible to measure.

Chemical	Units	MCL	PHG	Result	Sample Date
Arsenic	mg/L(1)	0.01	0.000004	0.005	2018
DBCP	mg/L	0.0002	0.0000017	0.00004	2016
TCP	mg/L	0.000005	0.0000007	0.000034	2017
Uranium	pCi/L(2)	20	0.43	13	2015
(1) Milligrams per liter (mg/L). (2) Picocuries per liter (pCi/L).					

Arsenic

Arsenic is a naturally occurring element in the earth's crust and is very widely distributed in the environment. High levels of arsenic tend to be found more in ground water sources than in surface water sources. The demand on ground water from municipal systems and private drinking water wells may cause water levels to drop and release arsenic from rock formations. Other sources of contaminant in the drinking water include erosion of natural deposits, runoff from orchards, and runoff from glass and electronics production waste. All humans are exposed to microgram quantities of arsenic (inorganic and organic) largely from food and to a lesser degree from drinking water and air.

The MCL for arsenic is 0.010 mg/L (milligrams per liter), with a PHG of 0.000004 (mg/L). The City has detected arsenic in exceedance of the PHG at (13) thirteen wells. The OEHHA has determined that arsenic is a health concern at certain levels of exposure and listed the health risk category as carcinogenicity. The numerical health risk for arsenic above the PHG is 1x10^{-6} which means one excess cancer case per million people exposed.

Both the USEPA and the DDW list the BATs for removing arsenic to below the MCL as activated alumina, ion exchange, lime softening, coagulation/filtration, electrodialysis, oxidation/filtration and reverse osmosis (RO). The most effective method to consistently remove arsenic to below the MCL is to install RO. Currently the City is treating one well at the entry to the distribution system to reduce arsenic levels.

Dibromochloropropane

Dibromochloropropane (DBCP) was originally introduced under the trade names Fumazone and Nemagon and was used as a soil fumigant for the control of plant parasitic nematodes. The major agricultural use was on soybeans, cotton, pineapples, and orchards. DBCP is a simple halogenated hydrocarbon that is liquid at room temperature.

The MCL for DBCP is 0.0002 (mg/L), with a PHG of 0.0000017 (mg/L). The OEHHA has determined that DBCP is a health concern at certain levels of exposure and listed the health risk category as carcinogenicity. The numerical health risk for DBCP above the PHG is 1x10^{-6} which means one excess cancer case per million people exposed.

Both the USEPA and the DDW lists the BATs for removing DBCP as treatment with granular activated carbon (GAC) and by packed tower aeration. The most effective method to consistently remove DBCP to below the MCL is to install GAC treatment.

The City has detected DBCP in exceedance of the PHG, but well below the MCL, at (1) one well. However, because that well has concentrations of 1,2,3-Trichloropropane (TCP) well above the MCL for that contaminant and GAC is also the BAT for TCP (see below), the City has installed GAC at the subject well. Consequently, as an ancillary benefit to the TCP treatment process, DBCP is being removed to non-detectable levels at the one source where it was detected above the PHG.

Uranium

Uranium is a naturally occurring radioactive element that is ubiquitous in the earth's crust. Uranium is found in ground and surface waters due to its natural occurrence in geological formations. Due to its abundance in geological formations uranium varies from place to place and is a highly variable source of contamination in drinking water. Since uranium occurs as a trace element it is found in many types of rocks. Other sources of contaminant in the drinking water include phosphate deposits and mine tailings, as well as from run-off of phosphate fertilizers from agricultural land.

The MCL for uranium is 20 pCi/L (picocuries per liter), with a PHG of 0.43 (pCi/L). The City has detected uranium in exceedance of the PHG at (13) thirteen wells. The OEHHA has determined that uranium is a health concern at certain levels of exposure and listed the health risk category as carcinogenicity. The numerical health risk for uranium above the PHG is 1x10^{-6} which means one excess cancer case per million people.

Both the USEPA and the DDW lists the BATs for removing uranium as ion exchange, reverse osmosis (RO), lime softening, or coagulation/filtration. The most effective method to consistently remove uranium to below the MCL is to install RO treatment at the select sources. Since the City is meeting the MCL requirements, it is not recommended to initiate additional treatment methods; which involves the addition of other chemicals that could raise other water quality issues.

1.2.3- Trichloropropane (TCP)

1.2.3-Trichloropropane (TCP) is not found in nature, it is a man-made chemical that was an impurity in soil fumigants used to control nematodes and sold under the brand names D-D, Telone and Telone II. TCP is a chlorinated hydrocarbon with high chemical stability.

The MCL for TCP is 0.000005 (mg/L), with a PHG of 0.0000007 (mg/L). The City has detected TCP in exceedance of both the PHG and MCL at (8) eight wells. The OEHHA has determined that TCP is a health concern at certain levels of exposure and listed the health risk category as carcinogenicity. The numerical health risk for TCP above the PHG is 1x10^{-6} which means one excess cancer case per million people.

DDW lists GAC as the only BAT available for removing TCP contamination from ground water. The City has installed GAC treatment for TCP removal to non-detectable levels at several wells and has plans to install GAC treatment at all wells where TCP has been detected, subject to available resources, with the goal of eliminating all TCP exposure in the City's water system. It is estimated that the cost to install GAC at all (8) eight sites will cost in excess of 43 million dollars.

Cost of Treatment

The cost of treatment can depend upon a number of constraints and factors. They include the type of treatment, the number of separate treatment facilities required, if there are multiple contaminants, and whether they can all be removed with one treatment technology or require multiple technologies. In some circumstances and with some contaminants, the money that would be required for these additional treatment processes might provide greater public health protection benefits if spent on other water system operation, surveillance, new well construction, and monitoring programs. With respect to TCP, which is the most significant water quality problem affecting the City's groundwater supply, the City has installed or is in the process of installing GAC treatment to eliminate detectable concentrations of this contaminant from its system. In an effort to minimize costs to the City and its ratepayers of treating this man-made contaminant, the City is pursuing cost-recovery litigation against the parties responsible for the TCP contamination.

Recommendations for Further Action

The City's TCP treatment project, when completed, will reduce TCP levels to non-detectable levels and will also, as an ancillary benefit, reduce DBCP levels above the PHG (but below the MCL) to non-detectable levels. As for Uranium and Arsenic, to further reduce the levels of these constituents, which are already significantly below the health-based MCLs, would require additional costly treatment processes. The effectiveness of the treatment process to provide any significant reductions in constituent levels at these already low levels is uncertain. Since the health protection benefits of these further hypothetical reductions are not clear and may not be quantifiable; there is no action proposed at this time.