CALIFORNIA WATER SERVICE

REPORT ON WATER QUALITY RELATIVE TO PUBLIC HEALTH GOALS

IN THE VISALIA WATER SYSTEM

June 27, 2022

BACKGROUND

Provisions of the California Health and Safety Code (Section 116470 [b]) specify that water systems serving more than 10,000 connections shall prepare a special report by July 1, 2022, if their water exceeds any Public Health Goals (PHGs) after each compliance period. PHGs are non-enforceable goals established by the Cal-EPA's Office of Environmental Health Hazard Assessment (OEHHA). The statute also requires that water suppliers use the Maximum Contaminant Level Goals (MCLGs) adopted by USEPA for constituents for which OEHHA has not adopted a PHG.

There are a few constituents that are routinely detected in water systems, at levels usually well below the drinking water standards, for which no PHG or MCLG has yet been adopted (e.g., Total Trihalomethanes). These constituents will be addressed in a future required report after a PHG has been adopted.

In accordance with the Health and Safety Code (reference 1), if a constituent was detected in the water system's supply during 2019, 2020, or 2021 at a level exceeding an applicable PHG or MCLG, it will be identified in this report. Additional information includes the numerical public health risk associated with the MCL, plus the PHG or MCLG; the category or type of risk to health that could be associated with each constituent; the best available treatment technology that could be used to reduce the constituent level; and an estimate of the cost to install that treatment if it is appropriate and feasible.

WHAT ARE PHGs?

PHGs are set by OEHHA, which is part of Cal-EPA, and are based solely on public health risk considerations. None of the practical risk-management factors that are considered in the rulemaking process by the USEPA or the California State Water Resources Control Board's Division of Drinking Water (DDW) in setting drinking water standards, otherwise known as Maximum Contaminant Levels (MCLs). These factors include analytical detection capability, treatment technology available, benefits, and costs.

PHGs and MCLGs are not mandatory and therefore compliance is not legally required by any public water system.

WATER QUALITY DATA CONSIDERED

All water quality data collected by our water system between 2019 and 2021 to determine compliance with drinking water standards from sources that supplied the water system and not treated to remove to given constituent are reported. This data is also presented in our annual consumer confidence reports, which are electronically available at: https://www.calwater.com/water-quality-reports/.

GUIDELINES FOLLOWED

The Association of California Water Agencies (ACWA) formed a workgroup that prepared guidelines for water utilities to use in preparing these required reports. ACWA guidelines are followed, with the exception reporting all detected compounds with a PHG, even if the constituent does not have an MCL.. No guidance is available from DDW.

BEST AVAILABLE TREATMENT TECHNOLOGY AND COST ESTIMATES

Both the USEPA and DDW adopt 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 feasible to determine what treatment is needed to further reduce a constituent to an established goal. Many established goals are set below analytical detection limits, which means that the level has been lowered to zero. In some cases, installing treatment to further reduce very low levels of one constituent may have adverse effects on other aspects of water quality. Additionally, since there is little data readily available to estimate the cost of treatment to achieve some of the goal levels, use of this "BAT" may still not achieve the PHG or MCLG and the costs may be significantly higher to do so. Costs estimates for treatment were taken from Tables 1 – 3 in the *Suggested Guidelines for Preparation of Required Reports on Public Health Goals to satisfy requirements of California Health and Safety Code Section 116470(b),* prepared by Association of California Water Agencies (ACWA), April 2022.

CONSTITUENTS DETECTED THAT EXCEED A PHG OR MCLG

The following is a discussion of constituents that were detected in one or more of our drinking water sources at levels above the PHG, or alternatively above the MCLG. As previously stated, the numerical

value for PHGs and MCLGs are often set below detectable levels. Therefore, the Detection Limit for Purposes of Reporting (DLR) is provided for each constituent. DLR is the lowest quantity of a substance that can be distinguished within a stated confidence limit, generally one percent. Constituents reported in this section were detected above the method DLR and PHG, and in sources that supplied the system during 2019, 2020 and 2021.

ARSENIC (As)

The PHG for arsenic is 0.004 ppb, and the MCL is 10 ppb. The DLR is 2.0 ppb. Arsenic is detected above the DLR and PHG without treatment in 6 active wells.

The category of health risk for arsenic is carcinogenicity. The numerical cancer health risk for the PHG is one person per one million, and for the MCL it is 2.5 per one thousand people.

BATs for treatment/removal of arsenic are activated alumina, coagulation filtration, ion exchange, lime softening, and reverse osmosis. All of these technologies generate waste that is sometimes classified as hazardous waste. The costs below do not reflect the cost of disposing of hazardous waste.

The estimated cost to install and operate a treatment system that would reliably reduce arsenic concentrations to the PHG would be approximately $2.39/1,000 gallons treated. This would result in an assumed increased cost for each service connection of $91.35 per year.

CADMIUM (Cd)

The PHG for cadmium is 0.04 ppb, and the MCL is 0.005 ppm. Cadmium is detected without treatment in 2 active wells.

The category of health risk for cadmium is chronic toxicity, specifically kidney effects. There is no numerical health risk established for cadmium at the PHG or the MCL. Since cadmium is non-carcinogenic, a cancer risk or health risk could not be calculated by OEHHA for this chemical.

The BATs for treatment of cadmium are ion exchange, reverse osmosis, and lime softening. The estimated cost to install and operate a treatment system that would reliably reduce cadmium

concentrations to zero is approximately $2.40/1,000 gallons treated. This would result in an assumed increased cost for each service connection of $20.38 per year.

TETRACHLOROETHYLENE (PCE)

The PHG for PCE is 0.06 ppb, and the MCL is 5 ppb. The DLR is 0.5 ppb. PCE is detected above the DLR and PHG without treatment in 2 active wells.

The numerical health risk for PCE at the PHG is $1x10^{-6}$, which means one excess cancer cases per one million people. The numerical risk at the MCL is $8x10^{-5}$, which means eight excess cancer cases per 100,000 people. The category of health risk associated with PCE is carcinogenicity (cancer).

BATs for the treatment/removal of PCE are granular-activated carbon (GAC) and air stripping. The estimated cost to install and operate a GAC treatment system that would reliably reduce the PCE level to zero would be approximately $1.78/1,000 gallons treated. This would result in an assumed increased cost for each service connection of $15.12 per year.

PERCHLORATE (ClO_{4-})

The PHG for perchlorate is 1 ppb, and the MCL is 6 ppb. The DLR is 4 ppb. Perchlorate is detected above the DLR, and PHG, without treatment in 1 active well.

The category of health risk for perchlorate is endocrine toxicity (affects the thyroid) and developmental toxicity (causes neurodevelopmental deficits). There are no established PHG and MCL cancer health risks. There is no numerical health risk established for perchlorate at the PHG or the MCL. Since perchlorate is non-carcinogenic, a cancer risk or health risk could not be calculated by OEHHA for this chemical. The PHG for perchlorate was established by OEHHA at a level which is believed to be without any significant public health risk to individuals exposed to that chemical over a lifetime.

The BAT for the removal of perchlorate is ion exchange and biological fluidized bed reactor. The estimated cost to install and operate an ion exchange treatment system that would reliably reduce perchlorate concentration is approximately $0.60/1,000 gallons treated. This would result in an assumed increased cost for each service connection of $2.55 per year.

RADIUM 226 AND 228

The PHG for radium 226 is 0.05 pCi/L (picocuries per liter), and 0.019 pCi/L for radium 228. The MCL for the combined 226 and 228 is 5 pCi/L. The Detection Limit for Purposes of Reporting (DLR) for either radium 226 or 228 is 1 pCi/L. Radium 228 is detected without treatment in 1 active well.

The numerical health risk at the PHG is $1x10^{-6}$ and $3x10^{-4}$ at the MCL. The category of health risk associated with radium is carcinogenicity. The reason that a drinking water standard was adopted for it is that some people who drink water containing radium in excess of the MCL over many years may have an increased risk of getting cancer. The non-carcinogenic health effects due to radium include bone necrosis and aplastic anemia.

The BAT for the treatment/removal of radium to concentrations below the MCL is reverse osmosis. Reverse-osmosis technology requires a high-pressure differential across a membrane, and usually requires pre-filtration of the water to remove large particulates.

The estimated cost to install and operate a treatment system that will reliably reduce the radium concentration is approximately $2.40/1000 gallons treated. This would result in an assumed increased cost for each service connection of $10.19 per year.

URANIUM AND GROSS ALPHA PARTICLE ACTIVITY

The PHG for uranium is 0.43 pCi/L (picocuries per liter), and the MCL is 20 pCi/L. Uranium is detected without treatment in 20 active wells.

The numerical health risk at the PHG is $1x10^{-6}$, which means one excess cancer case per one million people from lifetime exposure to uranium in drinking water. The numerical health risk at the MCL is $5x10^{-5}$, which means five excess cancer cases per 100,000 people. There is no California PHG for gross alpha particle activity; however, the MCLG level is set at 0 pCi/L. The MCL is 15 pCi/L. Gross alpha particle activity is detected without treatment in 10 active wells. The category of health risk associated with uranium and gross alpha particle activity is carcinogenicity. The numerical health risk for the MCGL of zero pCi/L is zero.

The BAT for the treatment/removal of uranium is ion exchange. The estimated cost to install and operate an ion exchange treatment system that would reliably reduce the uranium and gross alpha particle activity concentration is approximately $1.63/1,000 gallons treated. This would result in an assumed increased cost for each service connection of $145.37 per year.

RECOMMENDATIONS FOR FURTHER ACTION

The drinking water quality of the Visalia water system meets all State of California DDW, and USEPA drinking water standards set to protect public health. Cal Water will continue to assure the protection of public health by researching and examining emerging treating technologies on an ongoing basis while taking into account health protection benefits and cost.

REFERENCES:

No.1 Excerpt from California Health & Safety Code: Section 116470 (b)

No.2 Table of Regulated Constituents with MCLs, PHGs, or MCLGs

No.3 Visalia Water System's 2019, 2020, and 2021 Consumer Confidence Report

No.4 Health Risk Information for Public Health Goal Exceedance Reports prepared by the Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, February 2019.

No. 5 Suggested Guidelines for Preparation of Required Reports on Public Health Goals to satisfy requirements of California Health and Safety Code Section 116470(b), prepared by Association of California Water Agencies (ACWA), April 2019.