Report on Water Quality Relative to Public Health Goals for 2019-2021

CITY OF POWAY

WATER QUALITY RELATIVE TO PUBLIC HEALTH GOALS

Published June 2022, covering years 2019 - 2021

California Health and Safety Code Section 116470(b)

<u>Background</u>

California Health and Safety Code Section 116470(b) specifies that public water systems with over 10,000 service connections prepare a brief triennial report if their water quality measurements have exceeded Public Health Goals (PHGs). PHGs are non-enforceable goals established by the California Office of Environmental Health Hazard Assessment (OEHHA). The report must also list the detection of any contaminant above the Maximum Contaminant Level Goals (MCLGs) set by the United States Environmental Protection Agency (EPA). Only constituents that have a California primary drinking water standard and for which a PHG or MCLG has been set are addressed in this report. This report covers the years 2019, 2020, and 2021 and follows the Association of California Water Agencies (ACWA) guidelines.

The City of Poway's drinking water quality meets all State and Federal drinking water standards.

Public water systems conduct frequent and extensive tests to ensure the quality of their water. A few constituents are routinely detected at levels well below drinking water standards for which no PHG or MCLG has been adopted. If a constituent was detected in the City of Poway's (City) water supply between 2019 and 2021 at a level exceeding an applicable PHG or MCLG, this report provides information regarding the constituent as required by law, which includes:

- the numerical public health risk associated with the MCL, PHG or MCLG;
- the category or type of risk to health that could be associated with each constituent;
- the best treatment technology available 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 PUBLIC HEALTH GOALS?

Public Health Goals are set by the OEHHA, which is part of the California Environmental Protection Agency (EPA). The PHGs are non-enforceable and are not required to be met by any public water system. MCLGs are the federal equivalent to PHGs.

There is a difference in how each organization categorizes carcinogens. The MCLGs for carcinogens are set at zero because the EPA assumes there is no safe level of exposure to them. Conversely, PHGs are set at a level considered to pose no significant risk of cancer. This is usually denoted as a “one-in-a-million” cancer risk for a lifetime of exposure. At that level, not more than one person in a population of one million people drinking the water daily for 70 years would be expected to develop cancer from exposure to that chemical. Determinations of health risk at these levels are frequently theoretical and have not been quantified or proven through scientific experimentation.

WATER QUALITY DATA

All water quality data collected from the City’s public water system in 2019, 2020, and 2021 for purposes of determining compliance with drinking water standards was considered in this report. The water quality data was summarized in each of the 2019 through 2021 City Water Quality Reports made available to all residents and customers. Water quality data from 2019-2021 considered for this report contained no constituents that exceeded state or federal compliance standards. This report discusses six constituent classifications that were detected above the PHG or MCLG limits.

CONSTITUENTS DETECTED THAT EXCEED A PHG OR MCLG.

Gross Alpha – Radionuclides such as gross alpha particle in water supplies are from erosion of naturally occurring deposits. Gross alpha particle activity is a measure of the total amount of radioactivity in a water sample attributable to the radioactive decay of alpha-emitting elements. The EPAs Maximum Contaminant Level Goal (MCLG) for gross alpha particle activity is zero (0) and the California MCL is 15 picocuries per liter of water (pCi/L). From 2019-2021 samples collected and analyzed ranged from non-detect (ND) to 5.21 pCi/L, with an average of 3.24 pCi/L. Although there is no PHG for Gross Alpha, the MCLG is zero. The health risk category for gross alpha particles is carcinogenicity, which means capable of producing cancer. The numerical health risk for gross alpha, based on the MCL, is one cancer case in a population of one-thousand people exposed over a lifetime for the isotope polonium 210, the most potent alpha emitter.

Gross Beta – Gross Beta particle activity is a measure of the total amount of radioactivity in a water sample attributable to the radioactive decay of natural and man-made deposits. The MCLG for gross beta particle is zero and the State of California is 50 pCi/L. From 2019-2021 gross beta particle was detected and ranged from ND to 4.32 pCi/l. Although there is no PHG for Gross Beta, the MCLG is zero. The health risk category is carcinogenicity. The numerical health risk for Gross Beta, based on the MCL, is two cancer cases in a population of ten-thousand people exposed over a lifetime for the isotope lead 210, the most potent beta emitter.

Uranium – Uranium is a natural-occurring radioactive element that is ubiquitous in geological formations and the earth’s crust. Uranium is found in ground and surface waters due to erosion of natural deposits. The MCL for uranium is 20 pCi/L and PHG is 0.43 pCi/L. Samples collected from 2019-2021 contained values that ranged from non-detect (ND to 2.6 pCi/L), with all samples below the MCL. The health risk category for uranium is carcinogenicity. The numerical health risk for uranium, based on the PHG, is one cancer case in a population of one-million people exposed over a lifetime. The actual cancer risk may be lower or zero. These detections do not constitute a violation of drinking water regulations or indicate the water was unsafe to drink.

Arsenic – Arsenic is a naturally occurring element in the earth's crust and is very widely distributed in the environment. All humans are exposed to microgram quantities of arsenic (inorganic and organic) largely from food (25 to 50 µg/day) and to a lesser degree from drinking water and air. In certain geographical areas, natural mineral deposits may contain large quantities of arsenic and this may result in higher levels of arsenic in water. Waste chemical disposal sites may also be a source of arsenic contamination of water supplies. The main commercial use of arsenic in the U.S. is in pesticides, herbicides and wood preservatives. Misapplication or accidental spills of these materials could result in contamination of nearby water supplies. Arsenic does not have a tendency to accumulate in the body at low environmental exposure levels. The levels of arsenic that most people ingest in food and water (ca. 50 µg/day) have not been considered to be of health concern. The MCL for arsenic is 10 ppb and the PHG is 0.004 ppb. From 2019-2021 samples collected and analyzed from untreated surface water have detected arsenic above the PHG and below the MCL of 10 ppb.

The category of health risk associated with arsenic is carcinogenicity (causes cancer). The Office of Environmental Health Assessment has set the PHG at 0.004 ppb. The PHG is based on a level that will result in not more than one excess cancer case in 1 million people who drink 2 liters daily of this water for 70 years. The actual cancer risk may be lower or zero. The numerical health risk associated with the MCL is 2.5 cases per thousand people exposed.

<u>Total Trihalomethanes (TTHM)</u> – A predominant group of chlorinated drinking water byproducts, trihalomethanes can occur as a result of the reaction between natural organic matter in drinking water and chlorine added as a disinfectant. TTHMs describe four disinfection by-products: bromoform, chloroform, bromodichloromethane, and dibromochloromethane. There are no MCLs for individual trihalomethanes. However, there are PHGs of 0.4 ppb for chloroform, 0.5 ppb for bromoform, 0.06 ppb for bromodichloromethane and 0.1 ppb for dibromochloromethane. The MCL for TTHMs combined is 80 ppb. The TTHM combined average from 2019-2021, 57.4 ppb is below the state MCL and the range was between 26.7 ppb-64.9 ppb. The PHG for bromoform is 0.0005mg/l, chloroform 0.0004 mg/l, bromodichloromethane 0.00006 mg/l, and dibromochloromethane 0.0001mg/l.

Bromoform was detected and ranged from non-detected (ND) to 0.00646 mg/l from 2019-2021, exceeding the PHG of 0.0005 mg/l. Chloroform was detected and ranged from non-detected to 0.020 mg/l from 2019-2021, exceeding the PHG of 0.0004mg/l. Bromodichloromethane was detected and ranged from ND to 0.020 mg/l from 2019-2021, exceeding the PHG of 0.0006 mg/l. Dibromochloro-methane was detected and ranged from ND to 0.020 mg/l from 2019-2021, exceeding the PHG of 0.0001 mg/l

The health risk for trihalomethanes is carcinogenicity. The basis for this health risk measurement is the state MCL for combined trihalomethanes of 0.080 mg/l (80 ppb). The risk measurement will vary with different combinations and ratios of trihalomethanes in a particular sample. The health risk at the PHG is one cancer case per million people exposed over a lifetime. The actual cancer risk may be lower or zero.

<u>Lead and Copper</u> – There is no MCL for lead or copper. However, it is required that 90% of samples taken from household taps in the distribution system cannot exceed an Action Level (AL) of 0.015 mg/l for lead and 1.30 mg/l for copper. One sample taken in July 2019, with a recorded reading of 0.078 mg/l, exceeded the lead AL of 0.015 mg/l and the PHG of 0.0002 mg/l. The copper AL of 1.3 mg/l was not exceeded. The PHG of copper of 0.30 mg/l was exceeded with recorded readings in July 2019 of 0.319 mg/l and 0.315 mg/l.

The lead and copper sample data for this report was taken from the 2019 Lead and Copper Report submitted to the State Water Resources Control Board Division of Drinking Water (DDW). Thirty-two locations were sampled from single family household taps. Samples were collected on July 8, 15, 22, 2019. 90th percentile lead level at those locations was 0.0010 mg/l and 90th percentile copper level was 0.1330 mg/l. The lead level of samples taken collectively falls below the 90th percentile. The copper level is below the action level as well represented as the 90th percentile level collectively. Special re-samples were taken at one location that provided this anomaly in August 2019. The lead results of the samples ranged from non-detected (ND) to 0.00186 mg/l and the copper results were recorded as 0.00767 mg/l - 0.034 mg/l. All the special re-sample results were below the action levels of lead at 0.015 mg/l and copper at 1.3 mg/l. The public health goals of copper 0.3 mg/l and lead .0002 mg/l were not exceeded.

The action levels for copper and lead refer to a concentration measured at the tap. Much of the copper and lead in drinking water is derived from household plumbing (The Lead and Copper Rule, Title 22, California Code of Regulations (CCR) section 64672.3). The category of health risk for lead is developmental neurotoxicity (causes neurobehavioral effects in children), cardiovascular toxicity (causes high blood pressure) and carcinogenicity (causes cancer). The category of health risk for copper is digestive system toxicity (causes nausea, vomiting, diarrhea). The numerical health risk for lead at the MCLG is one person in a million per a lifetime of exposure. At the California MCL the health risk is one cancer case per million people exposed. At the California MCL the actual cancer risk may be lower or zero. The numerical health risk for copper at the California MCL is two cancer cases per million people per a lifetime of exposure.

Our public water system complies with the federal and state Lead and Copper Rule Regulations. Based on our sampling it was determined, according to state regulatory requirements, that the City meets the Action Levels for lead and copper. Therefore, we are deemed by DDW to have "optimized corrosion control" for our distribution system. In general, optimizing corrosion control is the best available technology to deal with corrosion issues and with any lead or copper findings. We continue to monitor our water quality parameters that relate to corrosivity, such as pH, hardness, alkalinity, total dissolved solids and, if necessary, will take additional action to continue to maintain our system in an "optimized corrosion control" condition. Since we are meeting the "optimized corrosion control" requirements, it is not prudent to initiate additional corrosion control treatment, as it involves the addition of chemicals that could raise additional water quality issues. Therefore, no estimate of cost has been included.

BEST AVAILABLE TREATMENT TECHNOLOGY AND COST ESTIMATES

Both the EPA and DDW adopt best available technologies which are the best methods of reducing contaminant levels to the MCL. It is not always possible or feasible to determine what treatment is needed to further reduce a constituent downward towards 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 a 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.

Reverse osmosis (RO) is the best available technology to lower the level of the detected constituents listed in this report below the associated PHGs since the levels are already below the MCL. Please note that accurate cost estimates are difficult, if not impossible, and are highly speculative and theoretical. Cost estimating guides from ACWA guidance report were used in determining the estimated cost to implement the best available technologies. According to the ACWA Cost Estimates for Treatment Technologies Survey, to install and operate an RO system could cost between approximately $2.20-$4.80 per 1,000 gallons of water treated. The Lester J. Berglund Water Treatment Plant (WTP) production capacity is 24 million gallons per day. The estimated annualized cost to install and operate a RO system at the water treatment plant could cost between $19,000,000 and $42,000,000. The cost per customer service connection, assuming 14,000 service connections and the full capacity utilized at the WTP would range from $1,357- $3,000 per service connection annually. There would be additional costs for water conditioning to ensure water treated by RO is optimized for distribution system corrosion control. Costs including annualized capital, construction, engineering, planning, environmental, contingency, and O&M are included, but only very general assumptions can be made without extensive research and assessment by a qualified professional engineering firm.

RECOMMENDATIONS FOR FURTHER ACTION

All constituents discussed in this report were detected below the health based MCLs established for “safe drinking water.” To reduce those levels even further would require a substantial undertaking of engineering analysis and cost estimating. The review would take into consideration multiple variables, including alternative advanced treatment methods such as RO and ultrafiltration. The effectiveness of additional or alternative treatment processes to provide any significant reductions in constituent levels is uncertain. The health protection benefits of further hypothetical reductions are not clear and may not be quantifiable. The City spends approximately $3,500,000 annually on conventional water treatment, including operation and maintenance of the WTP and chemicals for disinfection and conventional treatment.

Therefore, since the City’s drinking water meets all state and federal standards set to protect public health, no additional action is proposed.

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