

2019 Public Health Goal Report

June 2019

INTRODUCTION

California Health and Safety Code (CHSC) Sections 116365 and 116470 require all public water systems in California serving more than 10,000 service connections to prepare a triennial Public Health Goal (PHG) report. This report is to contain information on 1) the detection of any contaminant in drinking water at a level exceeding a public health goal (PHG) or maximum contaminant level goal (MCLG), 2) the health risk associated with each contaminant exceeding a PHG, and 3) the estimated costs to remove detected contaminants to below the PHG using Best Available Technology (BAT). CHSC Sections 116365 and 116470 are included in this report as Attachment 1.

This 2019 PHG Report is based on water quality analyses performed during calendar years 2016, 2017, and 2018. If certain analyses were not performed during those years, the most recent data was used. Only contaminants that are regulated with a primary drinking water standard and exceeded a PHG or MCLG are required to be addressed in this report. Water quality data was summarized in the Annual Consumer Confidence Reports (CCRs), which were made available to all of Ventura Water's customers on the City's website, <https://ca-ventura.civicplus.com/904/Consumer-Confidence-Report>.

The Association of California Water Agencies (ACWA) prepared suggested guidelines (April 2019) for water utilities to use in preparation of PHG reports. The 2019 ACWA guidelines were used in the preparation of this report and included as Attachment 2.

PUBLIC HEALTH GOAL BACKGROUND

PHGs are developed by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA). A PHG is the level or concentration of a constituent in water which poses no significant health risk if the constituent is consumed over a lifetime. PHGs are established based on human health risk assessments, and are recommended targets. CHSC Section 116365 requires a PHG to be developed for every constituent with a primary maximum contaminant level (MCL). While public water systems must address all MCL exceedances, they are not required to reduce or eliminate any constituent with an PHG exceedance.

CHSC Section 116470(f) also requires the MCLG to be used for comparison if there is no applicable PHG. MCLGs are set by the U.S. Environmental Protection Agency (US EPA) and are similar to PHGs.



Constituents with a MCLG but no PHG include coliform bacteria, individual disinfection by-product constituents, and gross alpha particle activity.

A list of constituents regulated in drinking water with the MCLs, PHGs, and MCLs is included as Attachment 3.

CONSTITUENTS EXCEEDING A PHG OR MCLG

The following constituents and the sources were detected in Ventura Water's system at levels that exceeded the applicable PHGs or MCLGs. Available numerical health risks developed by OEHHA for the constituents are also summarized below. A numerical health risk is typically the risk of cancer estimated based on a daily water intake (2 liters) containing a contaminant at a known concentration (i.e. MCL) every day over the lifetime (70 years) of an adult.

Arsenic – Arsenic is naturally occurring in groundwater. Arsenic concentrations in Ventura Water's sources ranged from non-detect to 4 micrograms per liter ($\mu\text{g/L}$), which is above the PHG of $0.004 \mu\text{g/L}$, but below the MCL of $10 \mu\text{g/L}$. Prolonged exposure to arsenic may increase the risk of cancer. OEHHA has determined that the health risk associated with concentrations above the PHG to be one excess case of cancer per million people. The risk associated with arsenic concentrations above the MCL to be 2.5 excess cases of cancer per 1,000 people over a 70-year lifetime exposure.

Coliform Bacteria – Coliform bacteria are naturally occurring in the environment and can indicate the presence of other pathogenic organisms originating from sewage, livestock, or other wildlife. Total coliform bacteria was detected in the City's distribution system at a maximum monthly percentage of 6.5% in 2016, which exceeded the MCLG of zero. Fecal and E. coli bacteria were not detected in the distribution system from 2016 to 2018. Fecal coliform bacteria are a subset of coliform bacteria that originate from the intestines of warm-blooded animals. E. coli bacteria are one of the most prevalent bacteria found in the feces of warm-blooded animals.

Lead and Copper – The primary source for lead and copper in water is pipe corrosion, and levels of lead and copper vary from differences in plumbing and fixtures. Lead and copper have not been detected in Ventura's water sources. The most recent sampling for lead and copper was conducted in 2017. The 90th percentile concentration of lead was $5.1 \mu\text{g/L}$, which exceeds the PHG of $0.2 \mu\text{g/L}$, but is below the regulatory action level of $15 \mu\text{g/L}$. The 90th percentile concentration of copper was $710 \mu\text{g/L}$, which exceeds the PHG of $0.3 \mu\text{g/L}$, but is below the RAL of $1,300 \mu\text{g/L}$. Prolonged exposure to lead may increase the risk of cancer, or it can cause developmental or cardiovascular neurotoxicity. OEHHA has determined that the health risk associated with lead concentrations above the PHG to be less than one excess case of cancer per million people. The risk associated with lead concentrations above the MCL to be two excess cases of cancer per million people over a lifetime exposure. Exposure to high levels of copper may cause digestive system toxicity. OEHHA has not established a numerical health risk for copper because PHGs for non-carcinogenic constituents 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 (OEHHA, 2019).

Disinfection By-Products – The primary source for disinfection by-products is the chlorination of drinking water. Disinfection by-products form when chlorine combines with natural organic matter in the water. The US EPA has adopted MCLs for the cumulative groups (total trihalomethanes, total haloacetic acids), but there are no MCLGs or PHGs established for these cumulative groups. Alternatively, there is no MCL for individual disinfection by-products, but bromodichloromethane, bromoform, and dichloroacetic acid each have an MCLG of zero. The health risks associated with prolonged exposure to disinfection by-products include an increased risk of cancer and general toxicity. OEHHA has not established numerical health risks for disinfection by-products.

Gross Alpha – Gross alpha particle activity is naturally occurring in groundwater. Gross alpha concentrations ranged from 3.1 to 14.9 picocuries per liter (pCi/L), which is above the MCLG of zero, but below the MCL of 50 pCi/L. Prolonged exposure to gross alpha may increase the risk of cancer. OEHHA has determined that the risk associated with gross alpha concentrations above the MCL to be 1 excess case of cancer per 1,000 people over a lifetime exposure to the most potent alpha emitter.

Selenium – Selenium is naturally occurring in groundwater. Selenium concentrations ranged from non-detect to 44 µg/L, which is above the PHG of 30 µg/L, but below the MCL of 50 µg/L. Prolonged exposure to selenium may cause hair loss or nail damage. OEHHA has not established a numerical health risk for selenium because PHGs for non-carcinogenic constituents 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 (OEHHA, 2019).

Uranium – Uranium is naturally occurring in groundwater. Uranium concentrations ranged from 2.7 to 13.9 pCi/L, which is above the PHG of 0.43 pCi/L, but below the MCL of 20 pCi/L. Prolonged exposure to uranium may increase the risk of cancer. OEHHA has determined that the health risk associated with concentrations above the PHG to be 1 excess case of cancer per million people. The risk associated with uranium concentrations above the MCL to be 5 excess cases of cancer per 100,000 people over a lifetime exposure.

BEST AVAILABLE TECHNOLOGIES

CHSC Section 116470(b)(4) requires a description of the best available technology (BAT) to remove or reduce the concentrations of the constituents identified above. BATs, and the estimated costs of implementing the BATs, are described below.

Coliform Bacteria – The BAT for treating coliform organisms in drinking water is disinfection. Ventura Water already disinfects all water served to the its customers. To verify the disinfection, Ventura Water collects weekly samples at various locations throughout the distribution system for coliform analysis. Any samples positive for total coliform are immediately investigated and additional sampling is

conducted. Coliform bacteria are ubiquitous in the environment, and it is not unusual for a water system to have an occasional positive sample. Other measures in place to prevent contamination of the water supply with coliform bacteria include disinfectant boosting, pipeline flushing, which replaces stagnant water with fresh water with disinfectant in pipelines with minimal use, cross-connection control, and backflow prevention. Cross connection control and backflow prevention also prevents the entry of stagnant water into the drinking water distribution system.

Lead and Copper – The BAT to reduce lead and copper in drinking water is corrosion control optimization. Lead and copper results from the triennial sampling in 2017 show that Ventura’s drinking water complies with the Federal Lead and Copper Rule and is considered to have optimized corrosion control. Additional corrosion control would be incapable of achieving the PHG, because a primary source of lead and copper in drinking water is the pipe and plumbing fixtures in residential household plumbing. Other factors that can increase lead and copper in water include:

- Household faucets or fittings made of brass;
- Copper and/or lead plumbing materials;
- Homes constructed between 1983 and 1988, containing copper plumbing with the potential for lead-based solder;
- Soft or corrosive water; and
- Water held stagnant in household plumbing.

Lead and copper have not been detected Ventura’s water sources. In addition to triennial lead and copper testing, Ventura Water monitors other water quality parameters related to corrosivity, such as pH, hardness, alkalinity, and dissolved solids, and will take additional action as necessary to optimize corrosion control in its water system.

Arsenic, Gross Alpha, Selenium, and Uranium – The only BAT available for the removal of gross alpha radioactivity in water for large water systems is reverse osmosis (RO), which can also effectively remove uranium, arsenic, and selenium. The cost of providing treatment using RO to reduce gross alpha, uranium, arsenic, and selenium in water is estimated to range from \$11,000,000 to \$13,600,000 per year, or between \$400 and \$500 per service connection per year.

Disinfection By-Products – Current treatment technologies used to reduce disinfection by-products in water consist of operational adjustments to chlorination processes and water distribution, and routine monitoring. In addition, granular activated carbon (GAC) or RO could further reduce the levels of disinfection by-products in water. However, disinfection by-products can be formed throughout the distribution system, and water treatment processes would be incapable of achieving the MCLG of zero for bromoform, bromodichloromethane, and dichloroacetic acid.



RECOMMENDATIONS FOR FURTHER ACTION

Ventura Water’s drinking water quality meets all State of California and US EPA drinking water standards set to protect public health. To further reduce the levels of constituents identified in this report, additional costly treatment processes would be required. In addition, the effectiveness of the treatment processes to provide any significant reductions in constituent levels is not certain. The health protection benefits of further reductions in these constituents are not clear and may not be quantifiable in order to justify the costs. Therefore, no action is required or proposed.

Attachment 1 – State of California Health and Safety Code Sections 116365 and 116470

References

Association of California Water Agencies (ACWA), *“Suggested Guidelines for Preparation of Required Reports on Public Health Goals (PHGs) to satisfy requirements of California Health and Safety Code Section 116470(b),”* April 2019.

Office of Environmental Health Hazard Assessment (OEHHA), California Environmental Protection Agency, *“Health Risk Information for Public Health Goal Exceedance Reports,”* February 2019.