

## TRIENNIAL PUBLIC HEALTH GOAL REPORT JULY 2019

### Background

The California Health and Safety Code 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. PHGs are non-enforceable goals established by the California Office of Environmental Health Hazard Assessment (“OEHHA”). The law also requires that where OEHHA has not adopted a PHG for a constituent, the water suppliers are to use the Maximum Contaminant Level Goal (“MCLG”) adopted by the United States Environmental Protection Agency (“USEPA”). MCLGs are also non-enforceable goals. Only constituents that have both a California primary drinking water standard and a PHG or MCLG as of December 31, 2018 are to be addressed in the report.

This 2019 Triennial PHG Report covers constituents detected in the City’s water supply during calendar years 2016 through 2018 at a level exceeding an applicable PHG or MCLG and provides the required information for each constituent. Included is the numerical public health risk associated with the Maximum Contaminant Level (“MCL”) and the PHG or MCLG, the category or type of risk to health that could be associated with each constituent, the best 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. In addition to this required report, the City will continue reporting annually in great depth on the quality of the water we serve.

### What are PHGs?

PHGs are set by the OEHHA which is part of the California Environmental Protection Agency (“CalEPA”) and are based solely on public health risk considerations. None of the practical risk-management factors that are considered by the USEPA or the California State Water Resources Control Board (“SWRCB”) Division of Drinking Water (“DDW”) in setting drinking water standards (MCLs) are considered in setting the PHGs. These factors include analytical detection capability, treatment technology available, benefits and costs. The PHGs are not enforceable and are not required to be met by any public water system. MCLGs are the federal equivalent to PHGs.

### How Does OEHHA Establish a Public Health Goal?

The process for establishing a PHG for a chemical contaminant in drinking water is very rigorous. OEHHA scientists first compile all relevant scientific information available, which includes studies of the chemical’s effects on laboratory animals and studies of humans who have been exposed to the chemical. The scientists use data from these studies to perform a health risk assessment, in which they determine the levels of the contaminant in drinking water that could be associated with various adverse health effects. When calculating a PHG, OEHHA uses all the information it has compiled to identify the level of the chemical in drinking water that would not cause significant adverse health effects in people who drink that water every day for 70 years. OEHHA must also consider any evidence of immediate and severe health effects when setting the PHG.

For cancer-causing chemicals, OEHHA typically establishes the PHG at the “one-in-one million” risk level. 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 as a result of exposure to that chemical.



# City of Brentwood Public Works/Operations Division

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## Water Quality Data Considered

All of the water quality data that was collected from the City's water system during calendar years 2016, 2017 and 2018 for purposes of determining compliance with drinking water standards was reviewed. The data was summarized in the 2016, 2017, and 2018 [Annual Water Quality Reports](#) ("AWQRs") that are available on City's [website](#) and emailed to all of our customers each year.

## 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. No formal guidance was available from state regulatory agencies.

## Best Available Treatment Technology and Cost Estimates

Both the USEPA and SWRCB DDW adopt what are known as Best Available Technologies that 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, because it is not possible to verify by analytical 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.

## Constituents Detected that Exceed a PHG or MCLG

The following is a discussion of constituents that were detected in the City's drinking water at levels above the PHG, or if no PHG, above the MCLG.

### 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 small quantities of arsenic (inorganic and organic) largely from food and to a lesser degree from drinking water and air. Some edible seafood may contain higher concentrations of arsenic which are predominantly found in the less acutely toxic organic forms. City wells have an average level of 2 parts per billion (ppb) of arsenic, which is well below the current "not-to-exceed" or MCL limit of 10 ppb of arsenic. The OEHHA has established a PHG of 0.004 ppb. OEHHA has determined arsenic as a carcinogen. OEHHA has a numerical cancer risk of one additional cancer case per million people for the 0.004 micrograms per liter PHG, and 1 in four hundred for the MCL of 10 ug/L.

Reverse osmosis, and GFO/Adsorption are the water treatment technologies available for achieving compliance with the MCL for arsenic. It could cost the City over \$6.5 million in capital costs including annual operation and maintenance costs to reduce the arsenic levels of all its well water to the PHG level of 0.004 ppb.

### Gross Alpha Particle Activity

Radionuclides such as gross alpha in water supplies are from erosion of natural deposits. The term radionuclide refers to naturally occurring elemental radium, radon, uranium, and thorium. Each of those elements has an unstable atomic nucleus that spontaneously decays producing ionizing radiation. Gross



alpha is defined as the sum total of these radionuclides. Exposure to ionizing radiation in concentrations exceeding the MCL may have carcinogenic (cancer causing), mutagenic (causing mutation of cells) or teratogenicity (causing abnormalities in offspring) effects. The USEPA's MCLG for gross alpha particle is zero picocuries per liter (pCi/L), and the California MCL is 15 pCi/L. The City wells have an average level of gross alpha of 3 pCi/L. Any levels detected were below MCL at all times. Health risk category based on experimental animal testing data evaluated in the USEPA MCLG document and California MCL has determined gross alpha particle as a carcinogen. The USEPA's MCLG for gross alpha is zero and a cancer risk of 1 additional case per million people for the DDW MCL of 15 pCi/L. *Note: Cancer Risk = Theoretical 70-year lifetime excess cancer risk at a statistical confidence limit. Actual cancer risk may be lower or zero.*

Reverse osmosis is the water treatment technology available for achieving compliance with the MCL for gross alpha particle activity. Removal and reduction via reverse osmosis could be achieved at a cost of about \$9 million to the City including annual operation and maintenance costs.

### Gross Beta Particle Activity

Certain minerals are radioactive and may emit a form of radiation known as photons and beta radiation. The City wells have an average level of gross beta particle activity of 3 pCi/L. There is no PHG for gross beta particle activity. The MCLG is zero picocuries per liter (pCi/L), and the MCL is 50 pCi/L. The levels detected in the City system were below the MCL at all times, but were over the level identified by the USEPA as the MCLG. The DDW and USEPA, which set drinking water standards, have determined that gross beta particle activity is a health concern at certain levels of exposure. This radiological constituent is a naturally occurring contaminant in some ground water and surface water supplies. The category of health risk associated with gross beta particle activity, and the reason that a drinking water standard was adopted for it, is that some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer. The numerical health risk for the MCLG of zero pCi/L is zero. DDW and USEPA set the drinking water standard for gross beta particle activity at 50 pCi/L to reduce the risk of cancer or other adverse health effects.

The Best Available Treatment Technologies identified to treat gross beta particle activity are ion exchange and reverse osmosis. The most effective method to consistently remove beta and photon emitters to the MCLG is to install reverse osmosis treatment at the select ground water and surface water connection sites where the water exceeds the MCLG. The cost to install and operate reverse osmosis removal systems to remove beta and photon emitters to the MCLG in the City water system would be about \$9 million which includes construction and annual operational costs. This could be accomplished concurrently with Gross Alpha.

### Recommendations for Further Action

The City's drinking water quality meets all DDW and USEPA drinking water standards set to protect public health. The levels of constituents identified in this report are already significantly below the health-based MCLs established to provide safe drinking water. Further reductions in these levels would require additional costly treatment processes and the ability of these processes to provide significant additional reductions in constituent levels is uncertain. In addition, the health protection benefits of these possible reductions are not at all clear and may not be quantifiable. Therefore, no action is proposed at this time.

If you have any questions about this report, please contact City of Brentwood Public Works/Operations-Water Operations Division at (925) 516-6000, Monday through Friday between the hours of 7:00 a.m. to 3:30 p.m., or visit the City of Brentwood website at <http://www.brentwoodca.gov/gov/pw/water/reports.asp>.

