# Triennial Report on Water Quality Relative to Public Health Goals

June 2022

Prepared in Accordance with:
California Health and Safety Code, Section 116470(b)

CONTRA COSTA WATER DISTRICT

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## 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 Environmental Protection Agency's 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). Only constituents that have both a California primary drinking water standard and a PHG or MCLG as of December 31, 2021, are to be addressed in the report.

There are a few constituents that are routinely detected in water systems at levels well below drinking water standards for which no PHG nor MCLG has been adopted by OEHHA or USEPA, including Total Trihalomethanes. These will be addressed in future reports following the adoption of PHGs or MCLGs.

CCWD prepared the last Triennial PHG Report in 2019. The 2022 Triennial PHG Report, due July 1, 2022, covers constituents detected in Contra Costa Water District's (CCWD) water supply during calendar years 2019 through 2021 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.

## What are Public Health Goals?

Public Health Goals (PHGs) are set by OEHHA and are based solely on public health risk considerations. None of the practical risk-management factors that are considered by the USEPA or the State Water Resources Control Board, 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.

## Water Quality Data Considered

All of the water quality data that was collected from CCWD's water system during calendar years 2019, 2020, and 2021 for purposes of determining compliance with drinking water standards were reviewed. The data was summarized in the 2019, 2020, and 2021 Annual Water Quality Reports (AWQRs) that were made available on CCWD's website. Postcards were mailed to all customers with a link to the CCWD website and information on how to request a hard copy of the AWQR if preferred.

## Guidelines Followed

The Association of California Water Agencies (ACWA) formed a workgroup that prepared guidelines for water utilities to use in preparing these reports. The ACWA guidelines were updated in 2022 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 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 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 having an MCL and that were detected in CCWD's drinking water at levels above the PHG, or if no PHG, above the MCLG.

### Bromate

Bromate does not occur naturally in water. Bromate is formed when bromide, which is present in source water, reacts with ozone during the disinfection process. Higher bromate levels can result from higher bromide levels in CCWD source waters or an increase in ozone dose, which is also used to reduce taste and odor producing compounds. The MCL for bromate is 10 micrograms per liter (µg/L). The EPA MCLG for bromate in drinking water is set at 0 µg/L. The PHG is set at 0.1 µg/L. The category of health risk for bromate is carcinogenicity. The numeric health risk based on the California PHG is one excess cancer case per one million population where water is consumed daily for 70 years.

During calendar years 2019 through 2021, CCWD collected monthly samples at the Ralph D. Bollman Water Treatment Plant (WTP) Clearwell Out (CWO), Randall-Bold WTP CWO, and CCWD/City of Brentwood WTP CWO, which are considered entry points to the distribution system. Compliance for facilities using ozone is based on a calculated running annual average (RAA) of monthly samples computed and reported quarterly. A summary of bromate results is shown in Table 1. Bromate values for Bollman WTP ranged from non-detect to 17 µg/L. Values for Randall-Bold ranged from non-detect to 10 µg/L. Bromate values for CCWD/City of Brentwood WTP CWO were not detected above the PHG and are therefore not included in Table 1.

*Table 1: Summary of Disinfection Byproduct Constituents Detected (Bromate)*

| Bromate Sample Location | PHG (µg/L) | MCL (µg/L) | MCLG (µg/L) | DLR (µg/L) | Range | Average |
|---|---|---|---|---|---|---|
| **Bollman WTP CWO** | 0.1 | 10 | 0 | 5 | **ND – 17** | **Non-Detect** |
| **Randall-Bold WTP CWO** | 0.1 | 10 | 0 | 5 | **ND – 10** | **Non-Detect** |

DLR: Detection Level for purposes of Reporting
ND – Non-Detect

People who drink water containing bromate above the MCL throughout their lifetime (70 years) could experience an increased risk of cancer. The BAT for bromate is the control of treatment processes to reduce the production of bromate. As mentioned previously, ozone is not only a disinfectant but also used to reduce taste and odor compounds. The elevated bromate levels discussed in this report were a result of episodically increasing ozone dose to reduce taste and odor during algal blooms rather than disinfection for compliance purposes.

CCWD has implemented several strategies to reduce bromate concentrations, including pH suppression, proactive treatments of source water to manage algal blooms, and new algal control systems installed at Bollman WTP and Randall-Bold WTP. Additionally, CCWD will further optimize the ozonation process by utilizing its ozone quenching system to reduce bromate formation. No additional BAT and associated cost estimate are required.

## Radionuclides

During the calendar years 2019 through 2021, CCWD was required to collect samples and test for radionuclides from source water locations at least once during the three years. Radiological monitoring was performed in 2019 and 2021. In 2003, OEHHA concluded that PHGs for gross alpha and gross beta were not practical. The MCLG set by USEPA for radiological samples is 0 pCi/L. Two radionuclides were above the MCLG: gross alpha particle activity (gross alpha) and gross beta particle activity (gross beta). A summary of these results is shown in Table 2.

*Table 2: Summary of Radiological Constituents Detected*

| Constituent | PHG (pCi/L) | MCL (pCi/L) | MCLG (pCi/L) | DLR (pCi/L) | Range | Average |
|---|---|---|---|---|---|---|
| **Gross Alpha** | None | 15 | 0 | 3 | **ND – 6.7** | **Non-Detect** |
| **Gross Beta** | None | 50 | 0 | 4 | **ND – 9.2** | **Non-Detect** |

pCi/L: Picocuries per liter
ND – Non-Detect

The detected results during this time frame were above the detection limit for reporting (DLR) and were lower than the respective MCLs.

A description of the public health risks, categories of health risks, and the best available treatment technology for each of the detected constituents follows.

## Gross Alpha

The major source of gross alpha particles in drinking water is from the erosion of natural deposits. Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. DDW has set the drinking water standard, MCL, for gross alpha at 15 picoCuries per liter (pCi/L). California OEHHA has determined that it would not be practical to develop a PHG for the category of alpha emitters. However, the MCLG set by the USEPA is 0 pCi/L. The numerical health risk for an MCLG of zero is zero.

Gross alpha was found at two out of ten source water locations tested in 2019 and in 2021. The range of results was from non-detect to 6.7 pCi/L with an average below the detectable level of 3 pCi/L.

Some people who drink water containing gross alpha in excess of the MCL over many years may have an increased risk of getting cancer. The BAT for removal of gross alpha has been identified as ion reverse osmosis.

## Gross Beta

Gross beta in drinking water can occur from natural sources. Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. There are also a number of anthropogenic (man-made) sources, such as radioactive materials used in the medical industry. DDW has set the drinking water

standard for gross beta at 50 pCi/L. California OEHHA has determined that it would not be practical to develop a PHG for the category of beta emitters. However, the MCLG set by the USEPA is 0 pCi/L. The numerical health risk for an MCLG of zero is zero.

Gross beta was was found at two out of ten source water locations tested in 2019 and in 2021. The range of results was from non-detect to 9.2 pCi/L with an average below the detectable level of 4 pCi/L.

Some people who drink water containing gross beta in excess of the MCL over many years may have an increased risk of getting cancer. The BAT for removal of gross beta has been identified as ion exchange and reverse osmosis.

## Recommendations for Further Action

CCWD'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 his time.