

**CARMICHAEL WATER DISTRICT
REPORT ON WATER QUALITY
RELATIVE TO PUBLIC HEALTH GOALS
JUNE 2025**

BACKGROUND

Provisions of the California Health and Safety Code, Title 22, Section 116470, specify that every three years water utilities larger than 10,000 service connections are required to prepare a special report if their water quality measurements have exceeded any Public Health Goals (PHGs). PHGs are non-enforceable goals established by the California Environmental Protection Agency's (EPA'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 Goals (MCLGs) adopted by USEPA. Constituents with a California primary drinking water standard and for which either a PHG or MCLG has been set are to be addressed.

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 nor MCLG has yet been adopted by OEHHA or USEPA including Total Trihalomethanes. The District will address these constituents in a future required report after PHG adoption.

This report provides the information required by law for a detected constituent in Carmichael Water District's water supply between 2022 and 2024 at a level exceeding an applicable PHG or MCLG,. Included is the numerical public health risk 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 PHGs

PHGs are non-enforceable goals set by the California OEHHA, which is part of California EPA and are based solely on public health risk considerations. A PHG is the level that poses no significant health risk if consumed for a lifetime. None of the practical risk-management factors that are considered by the USEPA or the State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW) in setting drinking water standards (such as MCLs) are considered in setting the PHGs. These factors include analytical detection capability, treatment technology available, and 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 collected by our water system in 2022-2024 for purposes of determining compliance with drinking water standards was considered. The 2022 and 2023 Consumer Confidence Reports, which were delivered to customers in June of 2023 and 2024, respectively, summarized data collected in 2022 and 2023. The 2024 Consumer Confidence Report is scheduled to be delivered in late June 2025. The Consumer Confidence Report also contains useful definitions for PHG, MCLG, MCL, microgram per liter, and milligram per liter.

GUIDELINES FOLLOWED

The Association of California Water Agencies (ACWA) formed a workgroup that prepared guidelines for water utilities to use in preparing this required report. We used the ACWA guidelines in preparing our report.

BEST AVAILABLE TREATMENT TECHNOLOGY AND COST ESTIMATES

Both the USEPA and California Division of Drinking Water (DDW) adopt what are known as Best Available Technologies (BAT), which are the best-known methods of reducing contaminant levels to the Maximum Contaminant Level (MCL). Cost 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. In some cases, installing treatment to try 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 A 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 if no PHG, above the MCLG:

Arsenic:

The PHG for Arsenic is 0.004 micrograms per liter (ug/L or parts per billion). The MCL or drinking water standard for arsenic is 10 ug/L. CWD detected arsenic levels not exceeding the MCL in the discharge from two (2) District Wells. The samples taken in 2023 were:

Willow Park Well – 2.5 ug/L
Winding Way Well – 2.9 ug/L

OEHHA has determined that the health risk associated with arsenic is an increased risk of cancer. Numerical health risk data provided by OEHHA determined the health risk associated with the PHG is one (1) excess case of cancer in a million people and the health risk associated with the MCL is two and a half (2.5) excess cases of cancer in 1,000 people over lifetime of exposure.

The BAT for arsenic is Activated Alumina, Coagulation/Filtration, Lime Softening, Ion Exchange and Reverse Osmosis. Of the technologies listed above, all are expensive and would require more extensive consultation beyond the scope of this report, but for purposes of this report, ion exchange will be selected. If ion exchange treatment were considered for the well discussed above the annualized capital and O&M costs could range from approximately \$299,000 to \$817,000 per year. That would result in an assumed increased cost for each customer ranging from \$25 to \$69 per year. Since the arsenic level is below the MCL the district will continue monitoring Willow Park Well for any changes in arsenic levels.

The cost to purchase additional land required for any of the chosen technologies would be estimated at \$1M.

Tetrachloroethylene (PCE):

The PHG for PCE is 0.06 micrograms per liter (ug/L or parts per billion). The MCL or drinking water standard for PCE is 5 ug/L. CWD detected PCE at discharges from three (3) District Wells. Two of the wells sampled exceeded the MCL in one of the twelve quarterly samples. The average of the quarterly samples taken at La Vista and Garfield Wells within the three-year period 2022-24 were:

La Vista Well – 2.6 ug/L
Garfield Well – 2.7 ug/L

The average of the samples taken at Winding Way Well within the three-year period 2022-24 was:

Winding Way Well – 1.7 ug/L

Six follow up samples are taken following the exceedance samples. The average of those follow up samples must be below the MCL to maintain compliance. The average of the six samples were:

La Vista Well – 3.4 ug/L
Garfield Well – 2.2 ug/L

OEHHA has determined that the health risk associated with tetrachloroethylene (PCE) is an increased risk of cancer. Numerical health risk data provided by OEHHA determined the health risk associated with the PHG is one (1) excess case of cancer in a million people and the health risk associated with the MCL is eight (8) excess cases of cancer in 100,000 people over a lifetime of exposure.

The (BAT) for PCE to reduce the level below the MCL is either Granular Activated Carbon (GAC) or Packed Tower Aeration. Since the PCE average levels at the two district wells are below the MCL, a GAC system would likely be required to reduce the levels below the PHG. It should be pointed out these are theoretical calculations and rough cost estimates. If GAC treatment were considered for the three (3) wells discussed above the annualized capital and O&M costs could range from approximately \$0.97 million to \$2.03 million per year. That would result in an assumed increased cost for each customer ranging from \$82 to \$172 per year. Currently the district proactively monitors all wells quarterly to measure any significant changes in PCE levels.

Hexavalent Chromium:

The PHG for Hexavalent Chromium is 0.02 micrograms per liter (ug/L or parts per billion). The MCL or drinking water standard for Hexavalent Chromium is 10 ug/L. CWD detected Hexavalent Chromium at levels not exceeding the MCL in the discharges from one (1) District Well. The sample taken at the well in 2024 was:

La Vista Well - 1.4 ug/L

OEHHA has calculated a cancer risk associated with exposure to Hexavalent Chromium if that exposure continues for an entire lifetime. Continual exposure to 0.045 nanograms per cubic meter (ng/m³) of Hexavalent Chromium from all sources combined for 30 years could increase cancer risk to 25 in a million. Exposure over shorter periods of time would be associated with much lower cancer risks.

The BAT for Hexavalent Chromium is Coagulation/Filtration, Ion Exchange and Reverse Osmosis. Of the technologies listed above, all are expensive and would require more extensive consultation beyond the scope of this report, but for purposes of this report, ion exchange will be selected. If ion exchange treatment were considered for the well discussed above the annualized capital and O&M costs could range from approximately \$301,000 to \$807,000 per year. That would result in an assumed increased cost for each customer ranging from \$25 to \$68 per year. Since the Hexavalent Chromium level is below the MCL, the District will continue monitoring La Vista Well for any changes in Hexavalent Chromium levels.

Uranium:

The PHG for Uranium (U) is 0.43 picoCuries per liter (pCi/L). The MCL or drinking water standard for Uranium is 20 pCi/L. CWD detected Uranium at levels not exceeding the MCL in the discharges from one (1) District Well. The sample taken at the well in 2023 was:

Barrett School – 2.8 pCi/l

OEHHA's August 2001, "Public Health Goals for Chemicals in Drinking Water: Uranium" summarizes the health effects observed from studies involving human exposure to high levels of U. Non-carcinogenic effects include kidney and liver disease. Lung cancer is the main type of cancer associated with exposure to high levels of U. USEPA has classified U as a "Class A" carcinogen, even though there is no direct evidence that it is carcinogenic in humans. The health effects discussed above appear to be associated with the emission of ionizing radiation from radioactive daughter products. The health effects language in Appendix 64465-C of Title 22, California Code of Regulations states that: "Some people who drink water containing uranium in excess of the MCL over many years may have kidney problems or an increased risk of getting cancer." The numerical health (cancer) risk for drinking water with U at the MCL is 5 in 100,000. The numerical health (cancer) risk for drinking water with U at the PHG is 1 in 1,000,000.

The BAT for Uranium is Coagulation/Filtration, Ion Exchange, Lime Softening and Reverse Osmosis. Of the technologies listed above, all are expensive and would require more extensive consultation beyond the scope of this report, but for purposes of this report, Reverse Osmosis will be selected. If Reverse Osmosis treatment were considered for the well discussed above the annualized capital and O&M costs could range from approximately \$229,000 to \$1.9 million per year. That would result in an assumed increased cost for each customer ranging from \$19 to \$161 per year. Since the Uranium level is below the MCL, the district will continue monitoring Barrett School Well for any changes in Uranium levels.

Perchlorate:

The MCL for Perchlorate is 6 ppb, the PHG is 1 ppb and the capability for laboratory detection level for reporting (DLR) is 1 ppb. Perchlorate both is naturally occurring and a man-made contaminant that is found in groundwater, surface water and soil. Perchlorate-based chemicals are also used in the construction of highway safety flares, fireworks, matches, pyrotechnics, explosives, and common batteries. CWD detected Perchlorate at levels not exceeding the MCL in the discharges from two (2) District Well. The average of the quarterly samples taken at Winding and Garfield Wells within the three-year period 2022-24 were:

Winding Way Well – 1.1 ug/L

Garfield Well – .32 ug/L

OEHHA has determined that perchlorate is associated with endocrine toxicity. However, OEHHA has not identified a cancer risk at the PHG.

The BAT for Perchlorate is Ion Exchange. The technology is expensive and would require more extensive consultation beyond the scope of this report, but for purposes of this report, Ion Exchange will be selected. If Ion Exchange treatment were considered for the well discussed above the annualized capital and O&M costs could range from approximately \$357,000 to \$976,000 per year. That would result in an assumed increased cost for each customer ranging from \$30 to \$83 per year. Currently the district proactively monitors all wells quarterly to measure any significant changes in perchlorate levels.

RECOMMENDATIONS FOR FURTHER ACTION

The drinking water quality of CWD meets all DDW, and USEPA drinking water standards set to protect public health. To further reduce the levels of the constituents identified in this report that are already significantly below the health-based MCLs established to provide “safe drinking water”, additional costly treatment processes would be required. The effectiveness of the treatment processes to provide any significant reductions in constituent levels at these already low values is uncertain. The health protection benefits of these further hypothetical reductions are not at all clear and may not be quantifiable. Therefore, no action is proposed.