Public Health Goal Report 2025

Background

Provisions of the California Health and Safety Code, Section 116470(b) specify that Palmdale Water District (PWD), and other water utilities with more than 10,000 service connections, prepare a special report every three years by July 1st if their water quality measurements have exceeded any Public Health Goals (PHGs). PHGs are non-enforceable goals established by the Cal-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 Goal (MCLG) adopted by United States Environmental Protection Agency (USEPA). Only constituents that have a California primary drinking water standard and for which either a PHG or MCLG has been set are to be addressed.

This report provides information regarding constituents that were detected in PWD's water supply between 2022 and 2024 (3-year data) at a level exceeding an applicable PHG or MCLG. This includes 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 available treatment (BAT) technology that could be used to reduce the constituent level, and an estimate of the cost to install that treatment if appropriate and feasible.

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. These will be addressed in a future required report after a PHG has been adopted.

California Health and Safety Code, Section 116470(b) requires water agencies to prepare a brief report and hold a public meeting for the purpose of accepting and responding to public comments on the report.

What Are Public Health Goals?

PHGs are non-enforceable goals set by OEHHA and are based solely on public health risk considerations. A PHG is the level of a chemical contaminant in drinking water that does not pose a significant risk to health. PHGs are not regulatory standards. 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.

Water Quality Data Considered

All the water quality data collected by PWD between 2022 and 2024 for purposes of determining compliance with drinking water standards were considered. These data were all summarized in our 2022, 2023, and 2024 Annual Consumer Confidence Reports, which were made available to all of our customers by July 1st. of each year and can be found on PWD's website.

Guidelines Followed

The Association of California Water Agencies (ACWA) formed a workgroup, which prepared guidelines for water utilities to use in preparing these newly required reports. The ACWA guidelines were used in the preparation of our report. No guidance was available from state regulatory agencies.

Constituents Detected That Exceed a PHG or a MCLG

Water quality during the years 2022, 2023, and 2024 considered for this report contained no constituents that exceeded state or federal compliance standards. However, there were a few that were detected at levels above the PHG or MCLG. The following is a discussion of these constituents.

Total Coliform

Coliform bacteria are an indicator organism that are naturally present in the environment and are not generally considered harmful. They are used because of the ease in monitoring and analysis. The USEPA and California State Treatment Technique trigger level is no more than 5.0% total coliform-positive (TC-positive) samples in a month, and the USEPA MCLG is zero percent TC-positive every single month.

PWD collected and analyzed between 120 and 150 samples per month for coliform bacteria during 2022-2024, and three months had detections above the MCLG. The maximum percentage of TC-positive samples per month was 0.8%. Our water system is in full compliance with the Federal and State Revised Total Coliform Rule.

Coliform bacteria indicate that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. When more than 5.0% samples are TC-positive in a month, PWD would be required to conduct an assessment to identify problems and to correct any problems found.

Although USEPA set the MCLG for total coliform at zero percent positive, there is no commercially available technology that will guarantee zero percent positive every single month; therefore, the cost of achieving the PHG cannot be estimated.

PWD will continue several programs that are currently in place to prevent contamination of the water supply with microorganisms. These include:

- Disinfection using chlorine and maintaining a chlorine residual throughout the distribution system;
- Monitoring throughout the distribution system to verify the absence of total coliform and the presence of a protective chlorine residual;
- Flushing program in which water pipelines known to have little use are flushed to remove stagnant water and bring in fresh water with a chlorine residual;
- Cross-connection control program that prevents the accidental entry of non-disinfected water into the drinking water system; and
- Perform a Watershed Sanitary Survey every five years pursuant to Title 22, Article 7, §64665

Arsenic

The major sources of arsenic in drinking water are erosion of natural deposits, runoff from orchards, glass and electronics production wastes. The USEPA and California State MCL for arsenic is 10 µg/L, and the California PHG is 0.004 µg/L and USEPA MCLG is zero.

PWD collected and analyzed 24 samples for arsenic during 2022-2024, and two sample results were detected above the PHG. Values ranged from non-detect (ND) to 2.9 µg/L, with an average value of non-detect (ND). All sample results were below the MCL.

The category of health risk for arsenic is carcinogenicity. Carcinogenic risk means capable of producing cancer. Some people who drink water containing arsenic in excess of the MCL over many years may experience skin damage or circulatory system problems and may have an increased risk of getting cancer. Cancer risk at the PHG is 1×10^{-6} (one per million) and, at the California MCL, it is 2.5×10^{-3} (2.5 per thousand). The BATs for arsenic reduction are activated alumina, coagulation/filtration, ion exchange, lime softening, reverse osmosis, electrodialysis, and oxidation/filtration. PWD would likely consider reverse osmosis (RO) for reducing arsenic levels.

Hexavalent Chromium

The major sources of hexavalent chromium in drinking water are erosion of natural deposits, transformation of naturally occurring trivalent chromium to hexavalent chromium by natural processes and human activities such as discharges from electroplating factories, leather tanneries, wood preservation, chemical synthesis, refractory production, and textile manufacturing facilities. The California State MCL for hexavalent chromium is 10 µg/L, and the California PHG is 0.02 µg/L.

PWD collected and analyzed 19 samples for hexavalent chromium during 2022-2024, and 18 sample results were detected above the PHG. Values ranged from non-detect (ND) to 8.8 µg/L, with an average value of 3.6 µg/L. All sample results were below the MCL.

The category of health risk for hexavalent chromium is carcinogenicity. Carcinogenic risk means capable of producing cancer. Some people who drink water containing hexavalent chromium in excess of the MCL over many years may have an increased risk of getting cancer. Cancer risk at the PHG is 1×10^{-6} (one per million) and at the California MCL it is 5×10^{-4} (five per ten thousand). The BATs for hexavalent chromium reduction are ion exchange, reverse osmosis, and reduction/coagulation/filtration. PWD would likely consider ion exchange (IX) with weak base anion resin for reducing hexavalent chromium levels.

Lead and/or Copper

The major sources of copper in drinking water are internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives. There is no MCL for Lead or Copper. Instead, the 90th percentile value of all samples from household taps in the distribution system cannot exceed an Action Level of 0.015 mg/L for lead and 1.3 mg/l for copper. The PHG for lead is 0.0002 mg/L, and the PHG for copper is 0.3 mg/L.

All of our source water samples for lead in 2024 were less than the PHG. Based on the triennial sampling of residences within our distribution system in 2024, our 90th percentile value for copper was 0.42 mg/L, which exceeded the PHG. The 90th percentile value for lead was below the DLR and, therefore, considered to be non-detect, or zero.

The category of health risk for copper is digestive system toxicity (causes nausea, vomiting, diarrhea). Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time may experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years may suffer liver or kidney damage. Numerical health risk data on copper have not yet been provided by OEHHA, the State agency responsible for providing that information.

Our water system is in full compliance with the Federal and State Lead and Copper Rule. To reduce the potential that lead or copper values at consumer taps could exceed the PHG, corrosion control treatment was installed at our treated surface water source.

Based on our extensive sampling, it was determined that, according to State Regulatory Requirements, we meet the Action Levels for Lead and Copper. Therefore, we are deemed by DDW to have "optimized corrosion control" for our system.

In general, optimizing corrosion control is considered to be 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 corrosiveness, such as the pH, hardness, alkalinity, and total dissolved solids, and will take action, if necessary, to maintain our system in an "optimized corrosion control" condition.

Since we are meeting the "optimized corrosion control" requirements, additional corrosion control treatment is not necessary. Therefore, no estimate of cost is included in this report.

While our system did not exceed the Lead PHG or Lead Action Level, it is possible that there may be high lead levels in homes as a result of materials in the home's plumbing. Lead can cause serious health problems, especially for pregnant women and children ages 6 and under. Customers concerned about high lead levels in a home's water should run the water for 30 seconds to 2 minutes before using tap water. It is also recommended that the water in the home be tested. Additional information is available from the Safe Drinking Water Hotline at 1-800-426-4791 or at http://www.epa.gov/lead.

Perchlorate

The major sources of perchlorate in drinking water are solid rocket propellent, fireworks, explosives, flares, matches, and a variety of industries. It usually gets into drinking water as a result of environmental contamination from historic aerospace or other industrial operations that used or use, store, or dispose of perchlorate and its salts. The USEPA and California State MCL for perchlorate is 6 µg/L, and the California PHG is 1 µg/L and USEPA MCLG is zero.

PWD collected and analyzed 69 samples for perchlorate during 2022-2024, and four sample results were detected above the PHG. Values ranged from non-detect (ND) to 3.6 µg/L, with an average value of ND. All sample results were below the MCL.

The category of health risk for perchlorate is endocrine toxicity (affects the thyroid) and developmental toxicity (causes neurodevelopmental deficits). Perchlorate has been shown to interfere with uptake of iodide by the thyroid gland, and to thereby reduce the production of thyroid hormones, leading to adverse effects associated with inadequate hormone levels. Thyroid hormones are needed for normal prenatal growth and development of the fetus, as well as for normal growth and development in the infant and child. In adults, thyroid hormones are needed for normal metabolism and mental function. The BATs for perchlorate reduction are biological fluid bed reactor and ion exchange. PWD would likely consider ion exchange (IX) for reducing perchlorate levels.

Gross Alpha Particle Activity

The major source of gross alpha particle activity in drinking water is from the erosion of natural deposits. Certain minerals are radioactive and may emit alpha radiation. The MCL for gross alpha particle activity is 15 pCi/L, and the MCLG is 0 pCi/L.

PWD collected 6 samples for gross alpha particle activity during 2022-2024, and two sample results were detected above the PHG. Values ranged from ND to 13 pCi/L, with an average value of ND. All sample results were below the MCL.

The category of health risk for gross alpha particle activity is carcinogenicity. Carcinogenic risk means capable of producing cancer. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer. Cancer risk at the MCLG is 0 and at the California MCL is 1×10^{-3} (one per thousand). The BAT for gross alpha particle activity reduction is reverse osmosis (RO).

Gross Beta Particle Activity

The major source of beta particles in drinking water is from decay of natural and man-made deposits. Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. The MCL for gross beta particles is 50 pCi/L, and the MCLG is 0 pCi/L.

Palmdale Water District collected eight samples for gross beta particle activity during 2022-2024, and one sample result was detected above the PHG. Values ranged from ND to 4.6 pCi/L, with an average value of ND. All sample results were below the MCL.

The category of health risk for beta particles is carcinogenicity. Carcinogenic risk means capable of producing cancer. 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. Cancer risk at the MCLG is 0 and at California MCL is 2×10^{-3} (two per thousand). The BATs for gross beta reduction are ion exchange and reverse osmosis. PWD would likely consider reverse osmosis (RO) for reducing gross beta particle activity levels.

Uranium

The major source of uranium in drinking water is from erosion of natural deposits. The MCL for uranium is 20 pCi/L, and the PHG is 0.43 pCi/L.

Palmdale Water District collected 19 samples for uranium during 2022-2024, and eight sample results were detected above the PHG. Values ranged from ND to 3.8 pCi/L, with an average value of ND. All sample results were below the MCL.

The category of health risk for uranium is carcinogenicity. Carcinogenic risk means capable of producing cancer. 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. Cancer risk at the PHG is 1×10^{-6} (one per million) and at the California MCL is 5×10^{-5} (five per hundred thousand). The BATs for uranium reduction are ion exchange, reverse osmosis, lime softening, and coagulation/filtration. PWD would likely consider reverse osmosis (RO) for reducing uranium levels.

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 have been estimated for such technologies. However, since many PHGs and all MCLGs are set much lower than the MCL, it is not always possible nor 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, if not impossible, because it is not possible to verify by analytical means that the 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.

The best available technologies (BATs) to lower the level of the above compounds below the PHG are reverse osmosis and ion exchange. Please note that accurate cost estimates are difficult, if not impossible, and are highly speculative and theoretical. All costs, including annualized capital, construction, engineering, planning, environmental, contingency, and O&M are included, but only very general assumptions can be made for most of these items. Cost estimating guides from the Association of California Water Agencies (ACWA) guidance report were used in determining the estimated cost to implement the BAT.

According to the ACWA Cost Estimates for Treatment Technology BAT, to install and operate a RO system would cost approximately $2.46-$5.37 per 1,000 gallons of water treated. Based on PWD's 2022-2024 production, PWD's treatment capacity is approximately 13 million gallons per day. The estimated annualized capital and operation and maintenance costs, based on the current capacity of 13 million gallons per day, to install and operate a reverse osmosis system at PWD's water treatment plant and 10 of the 22 active wells would be approximately $17.5 million/year for the life of the system. The cost per customer service connection would be approximately $633 per year. There would be additional costs for water conditioning to ensure water treated by reverse osmosis is optimized for distribution system corrosion control.

According to the ACWA Cost Estimates for Treatment Technology BAT, to install and operate an ion exchange system would cost approximately $1.30-$5.68 per 1,000 gallons of water treated. Based on PWD's 2022-2024 production, PWD's treatment capacity is approximately 5 million gallons per day. The estimated annualized capital and operation and maintenance costs, based on the current capacity of 5 million gallons per day, to install and operate an ion exchange system to treat 20 of the 22 active wells would be approximately $9.4 million/year for the life of the system. The cost per customer service connection would be approximately $338 per year.

Recommendation for Further Action

Palmdale Water District's drinking water meets all State of California, 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 Maximum Contaminant Levels 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 clear and may not be quantifiable. Therefore, no action is proposed.

Attachments

No.1 Table of Regulated Constituents with MCLs, PHGs or MCLGs

No.2 Health Risk Information for Public Health Goal Exceedance Reports (Table 1 and Table 2)

No.3 Cost Estimates for Treatment Technologies (Table 1, Table 2 and Table 3)

No.4 Title 22 California Code of Regulations: Best Available Technologies (BATs)

No.5 Palmdale Water District's 2022, 2023 and 2024 Water Quality Data

No.6 Glossary of terms and abbreviations used in the report

ATTACHMENT NO. 1

MCLs, DLRs, and PHGs for Regulated Drinking Water Contaminants

Last Update: November 2024

This table includes:

- California's maximum contaminant levels (MCLs)
- Detection limits for purposes of reporting (DLRs)
- Public health goals (PHGs) from the Office of Environmental Health Hazard Assessment (OEHHA)
- The PHGs for NDMA, PFOA and PFOS (which are not yet regulated in California) are included at the bottom of this table.
- The Federal MCLs for PFOA and PFOS are also listed at the end of this table.

Units are in milligrams per liter (mg/L), unless otherwise noted.

Chemicals with MCLs in 22 CCR §64431 – Inorganic Chemicals

Regulated Contaminant	MCL	DLR	PHG	Date of PHG
Aluminum	1	0.05	0.6	2001
Antimony	0.006	0.006	0.001	2016
Arsenic	0.010	0.002	0.000004	2004
Asbestos (MFL = million fibers per liter; for fibers >10 microns long)	7 MFL	0.2 MFL	7 MFL	2003
Barium	1	0.1	2	2003
Beryllium	0.004	0.001	0.001	2003
Cadmium	0.005	0.001	0.00004	2006
Chromium, Total	0.05	0.01	withdrawn Nov. 2001	1999
Chromium, Hexavalent	0.01	0.0001	0.00002	2011
Cyanide	0.15	0.1	0.15	1997
Fluoride	2	0.1	1	1997
Mercury (inorganic)	0.002	0.001	0.0012	1999 (rev2005)*
Nickel	0.1	0.01	0.012	2001
Nitrate (as nitrogen, N)	10 as N	0.4	45 as NO3 (=10 as N)	2018
Nitrite (as N)	1 as N	0.4	1 as N	2018
Nitrate + Nitrite (as N)	10 as N	--	10 as N	2018
Perchlorate	0.006	0.004	0.001	2015
Selenium	0.05	0.005	0.03	2010
Thallium	0.002	0.001	0.0001	1999 (rev2004)

*OEHHA's review of this chemical during the year indicated (rev20XX) resulted in nochange in the PHG.

Radionuclides with MCLs in 22 CCR §64441 and §64443 – Radioactivity

Units are picocuries per liter (pCi/L), unless otherwise stated; n/a = not applicable

Regulated Contaminant	MCL	DLR	PHG	Date of PHG
Gross alpha particle activity - OEHHA concluded in 2003 that a PHG was notpractical	15	3	none	n/a
Gross beta particle activity - OEHHA concluded in 2003 that a PHG was notpractical	4 mrem/yr	4	none	n/a
Radium-226	--	1	0.05	2006
Radium-228	--	1	0.019	2006
Radium-226 + Radium-228	5	--	--	--
Strontium-90	8	2	0.35	2006
Tritium	20,000	1,000	400	2006
Uranium	20	1	0.43	2001

Chemicals with MCLs in 22 CCR §64444 – Organic Chemicals

(a) Volatile Organic Chemicals (VOCs)

Regulated Contaminant	MCL	DLR	PHG	Date of PHG
Benzene	0.001	0.0005	0.00015	2001
Carbon tetrachloride	0.0005	0.0005	0.0001	2000
1,2-Dichlorobenzene	0.6	0.0005	0.6	1997 (rev2009)
1,4-Dichlorobenzene (p-DCB)	0.005	0.0005	0.006	1997
1,1-Dichloroethane (1,1-DCA)	0.005	0.0005	0.003	2003
1,2-Dichloroethane (1,2-DCA)	0.0005	0.0005	0.0004	1999 (rev2005)
1,1-Dichloroethylene (1,1-DCE)	0.006	0.0005	0.01	1999
Cis-1,2-Dichloroethylene	0.006	0.0005	0.013	2018
Trans-1,2-Dichloroethylene	0.01	0.0005	0.05	2018
Dichloromethane (Methylene chloride)	0.005	0.0005	0.004	2000
1,2-Dichloropropane	0.005	0.0005	0.0005	1999
1,3-Dichloropropene	0.0005	0.0005	0.0002	1999 (rev2006)
Ethylbenzene	0.3	0.0005	0.3	1997
Methyl tertiary butyl ether (MTBE)	0.013	0.003	0.013	1999
Monochlorobenzene	0.07	0.0005	0.07	2014
Styrene	0.1	0.0005	0.0005	2010
1,1,2,2-Tetrachloroethane	0.001	0.0005	0.0001	2003
Tetrachloroethylene (PCE)	0.005	0.0005	0.00006	2001
Toluene	0.15	0.0005	0.15	1999
1,2,4-Trichlorobenzene	0.005	0.0005	0.005	1999
1,1,1-Trichloroethane (1,1,1-TCA)	0.2	0.0005	1	2006
1,1,2-Trichloroethane (1,1,2-TCA)	0.005	0.0005	0.0003	2006
Trichloroethylene (TCE)	0.005	0.0005	0.0017	2009
Trichlorofluoromethane (Freon 11)	0.15	0.005	1.3	2014
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	1.2	0.01	4	1997 (rev2011)
Vinyl chloride	0.0005	0.0005	0.00005	2000
Xylenes	1.75	0.0005	1.8	1997

(b) Non-Volatile Synthetic Organic Chemicals (SOCs)

Regulated Contaminant	MCL	DLR	PHG	Date of PHG
Alachlor	0.002	0.001	0.004	1997
Atrazine	0.001	0.0005	0.00015	1999
Bentazon	0.018	0.002	0.2	1999 (rev2009)
Benzo(a)pyrene	0.0002	0.0001	0.000007	2010
Carbofuran	0.018	0.005	0.0007	2016
Chlordane	0.0001	0.0001	0.00003	1997 (rev2006)
Dalapon	0.2	0.01	0.79	1997 (rev2009)
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00001	0.000003	2020
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.07	0.01	0.02	2009
Di(2-ethylhexyl) adipate	0.4	0.005	0.2	2003
Di(2-ethylhexyl) phthalate (DEHP)	0.004	0.003	0.012	1997
Dinoseb	0.007	0.002	0.014	1997 (rev2010)
Diquat	0.02	0.004	0.006	2016
Endothal	0.1	0.045	0.094	2014
Endrin	0.002	0.0001	0.0003	2016
Ethylene dibromide (EDB)	0.00005	0.00002	0.00001	2003
Glyphosate	0.7	0.025	0.9	2007
Heptachlor	0.00001	0.00001	0.000008	1999
Heptachlor epoxide	0.00001	0.00001	0.000006	1999
Hexachlorobenzene	0.001	0.0005	0.00003	2003
Hexachlorocyclopentadiene	0.05	0.001	0.002	2014
Lindane	0.0002	0.0002	0.000032	1999 (rev2005)
Methoxychlor	0.03	0.01	0.00009	2010
Molinate	0.02	0.002	0.001	2008
Oxamyl	0.05	0.02	0.026	2009
Pentachlorophenol	0.001	0.0002	0.0003	2009
Picloram	0.5	0.001	0.166	2016
Polychlorinated biphenyls (PCBs)	0.0005	0.0005	0.00009	2007
Simazine	0.004	0.001	0.004	2001
Thiobencarb	0.07	0.001	0.042	2016
Toxaphene	0.003	0.001	0.00003	2003
1,2,3-Trichloropropane	0.000005	0.000005	0.0000007	2009
2,3,7,8-TCDD (dioxin)	3×10^{-8}	5×10^{-9}	5×10^{-11}	2010
2,4,5-TP (Silvex)	0.05	0.001	0.003	2014

Copper and Lead, 22 CCR §64672.3

Values referred to as MCLs for lead and copper are not actually MCLs; instead, they arecalled "Action Levels" under the lead and copper rule

Regulated Contaminant	MCL	DLR	PHG	Date of PHG
Copper	1.3	0.05	0.3	2008
Lead	0.015	0.005	0.0002	2009

Chemicals with MCLs in 22 CCR §64533 – Disinfection Byproducts

Regulated Contaminant	MCL	DLR	PHG	Date of PHG
Total Trihalomethanes	0.080	--	--	--
Bromodichloromethane	--	0.0010	0.00006	2020
Bromoform	--	0.0010	0.0005	2020
Chloroform	--	0.0010	0.0004	2020
Dibromochloromethane	--	0.0010	0.0001	2020
Haloacetic Acids (five) (HAA5)	0.060	--	--	--
Monochloroacetic Acid	--	0.0020	--	--
Dichloroacetic Adic	--	0.0010	--	--
Trichloroacetic Acid	--	0.0010	--	--
Monobromoacetic Acid	--	0.0010	--	--
Dibromoacetic Acid	--	0.0010	--	--
Bromate	0.010	0.0050**	0.0001	2009
Chlorite	1.0	0.020	0.05	2009

**The DLR for Bromate is 0.0010 mg/L for analysis performed using EPA Method 317.0 Revision 2.0, 321.8, or 326.0.

Chemicals with PHGs established in response to DDW requests. These are not currently regulated drinking water contaminants.***

Regulated Contaminant	MCL	DLR	PHG	Date of PHG
N-Nitrosodimethylamine (NDMA)	--	--	0.000003	2006
Perfluorooctanoic acid (PFOA)***	--	--	0.00000007	2024
Perfluorooctane sulfonic acid (PFOS)***	--	--	0.000001	2024

***PFOA and PFOS have US EPA MCLGs and MCLs.

PFOA – MCLG is zero. MCL is 4 ng/L

PFOS – MCLG is zero. MCL is 4 ng/L

ATTACHMENT NO. 2

OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT

Public Health Goals

Health Risk Information for Public Health Goal Exceedance Reports

February 2025

Pesticide and Environmental Toxicology Branch
Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

Health Risk Information for Public Health Goal Exceedance Reports

Prepared by

Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

February 2025

NEW for the 2025 Report: New in this document are newly established Public Health Goals (PHGs) for perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), and five haloacetic acids: monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid.

Background: Under the Calderon-Sher Safe Drinking Water Act of 1996 (the Act), public water systems with more than 10,000 service connections are required to prepare a report every three years for contaminants that exceed their respective PHGs.[1] This document contains health risk information on drinking water contaminants to assist public water systems in preparing these reports. A PHG is the concentration of a contaminant in drinking water that poses no significant health risk if consumed for a lifetime. PHGs are developed and published by the Office of Environmental Health Hazard Assessment (OEHHA) using current risk assessment principles, practices and methods.[2]

The water system's report is required to identify the health risk category (e.g., carcinogenicity or neurotoxicity) associated with exposure to each contaminant in drinking water that has a PHG and to include a brief, plainly worded description of these risks. The report is also required to disclose the numerical public health risk, if available, associated with the California Maximum Contaminant Level (MCL) and with the PHG for each contaminant. This health risk information document is prepared by OEHHA every three years to assist the water systems in providing the required information in their reports.

[1] Health and Safety Code Section 116470(b)
[2] Health and Safety Code Section 116365

Numerical health risks: Table 1 presents health risk categories and cancer risk values for chemical contaminants in drinking water that have PHGs.

The Act requires that OEHHA publish PHGs based on health risk assessments using the most current scientific methods. As defined in statute, PHGs for non-carcinogenic chemicals in drinking water are set at a concentration “at which no known or anticipated adverse health effects will occur, with an adequate margin of safety.” For carcinogens, PHGs are set at a concentration that “does not pose any significant risk to health.” PHGs provide one basis for revising MCLs, along with cost and technological feasibility. OEHHA has been publishing PHGs since 1997 and the entire list published to date is shown in Table 1.

Table 2 presents health risk information for contaminants that do not have PHGs but have state or federal regulatory standards. The Act requires that, for chemical contaminants with California MCLs that do not yet have PHGs, water utilities use the federal Maximum Contaminant Level Goal (MCLG) for the purpose of complying with the requirement of public notification. MCLGs, like PHGs, are strictly health based and include a margin of safety. One difference, however, is that the MCLGs for carcinogens are set at zero because the US Environmental Protection Agency (US EPA) assumes there is no absolutely safe level of exposure to such chemicals. PHGs, on the other hand, are set at a level considered to pose no *significant* risk of cancer; this is usually no more than a one-in-one-million excess cancer risk (1×10^{-6}) level for a lifetime of exposure. In Table 2, the cancer risks shown are based on the US EPA’s evaluations.

For more information on health risks: The adverse health effects for each chemical with a PHG are summarized in a PHG technical support document. These documents are available on the OEHHA website (https://oehha.ca.gov/water/public-health-goals-phgs).

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Alachlor	carcinogenicity (causes cancer)	0.004	NA[5,6]	0.002	NA
Aluminum	neurotoxicity and immunotoxicity (harms the nervous and immune systems)	0.6	NA	1	NA
Antimony	hepatotoxicity (harms the liver)	0.001	NA	0.006	NA
Arsenic	carcinogenicity (causes cancer)	0.000004 (4×10^{-6})	1×10^{-6} (one per million)	0.01	2.5×10^{-3} (2.5 per thousand)
Asbestos	carcinogenicity (causes cancer)	7 MFL[7] (fibers >10 microns in length)	1×10^{-6}	7 MFL (fibers >10 microns in length)	1×10^{-6} (one per million)
Atrazine	carcinogenicity (causes cancer)	0.00015	1×10^{-6}	0.001	7×10^{-6} (seven per million)
Barium	cardiovascular toxicity (causes high blood pressure)	2	NA	1	NA

[1] Based on the OEHHA PHG technical support document unless otherwise specified. The categories are the hazard traits defined by OEHHA for California's Toxics Information Clearinghouse (online at: https://oehha.ca.gov/media/downloads/risk-assessment//gcregtext011912.pdf).
[2] mg/L = milligrams per liter of water, equivalent to parts per million (ppm)
[3] Cancer Risk = Upper bound estimate of excess cancer risk from lifetime exposure. Actual cancer risk may be lower or zero. 1×10^{-6} means one excess cancer case per million people exposed.
[4] MCL = maximum contaminant level.
[5] NA = not applicable. Cancer risk cannot be calculated.
[6] The PHG for alachlor is based on a threshold model of carcinogenesis and is set at a level that is believed to be without any significant cancer risk to individuals exposed to the chemical over a lifetime.
[7] MFL = million fibers per liter of water.

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Bentazon	hepatotoxicity and digestive system toxicity (harms the liver, intestine, and causes body weight effects[8])	0.2	NA	0.018	NA
Benzene	carcinogenicity (causes leukemia)	0.00015	1×10^{-6}	0.001	7×10^{-6} (seven per million)
Benzo[a]pyrene	carcinogenicity (causes cancer)	0.000007 (7×10^{-6})	1×10^{-6}	0.0002	3×10^{-5} (three per hundred thousand)
Beryllium	digestive system toxicity (harms the stomach or intestine)	0.001	NA	0.004	NA
Bromate	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.01	1×10^{-4} (one per ten thousand)
Cadmium	nephrotoxicity (harms the kidney)	0.00004	NA	0.005	NA
Carbofuran	reproductive toxicity (harms the testis)	0.0007	NA	0.018	NA
Carbon tetrachloride	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.0005	5×10^{-6} (five per million)

[8] Body weight effects are an indicator of general toxicity in animal studies.

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Chlordane	carcinogenicity (causes cancer)	0.00003	1×10^{-6}	0.0001	3×10^{-6} (three per million)
Chlorite	hematotoxicity (causes anemia) neurotoxicity (causes neurobehavioral effects)	0.05	NA	1	NA
Chromium, hexavalent	carcinogenicity (causes cancer)	0.00002	1×10^{-6}	0.010	5×10^{-4} (five per ten thousand)
Copper	digestive system toxicity (causes nausea, vomiting, diarrhea)	0.3	NA	1.3 (AL[9])	NA
Cyanide	neurotoxicity (damages nerves) endocrine toxicity (affects the thyroid)	0.15	NA	0.15	NA
Dalapon	nephrotoxicity (harms the kidney)	0.79	NA	0.2	NA
Di(2-ethylhexyl) adipate (DEHA)	developmental toxicity (disrupts development)	0.2	NA	0.4	NA
Di(2-ethylhexyl) phthalate (DEHP)	carcinogenicity (causes cancer)	0.012	1×10^{-6}	0.004	3×10^{-7} (three per ten million)

[9] AL = action level. 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).

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
1,2-Dibromo-3-chloropropane (DBCP)	carcinogenicity (causes cancer)	0.000003 ($3x10^{-6}$)	1×10^{-6}	0.0002	7×10^{-5} (seven per hundred thousand)
1,2-Dichloro-benzene (*o*-DCB)	hepatotoxicity (harms the liver)	0.6	NA	0.6	NA
1,4-Dichloro-benzene (*p*-DCB)	carcinogenicity (causes cancer)	0.006	1×10^{-6}	0.005	8×10^{-7} (eight per ten million)
1,1-Dichloro-ethane (1,1-DCA)	carcinogenicity (causes cancer)	0.003	1×10^{-6}	0.005	2×10^{-6} (two per million)
1,2-Dichloro-ethane (1,2-DCA)	carcinogenicity (causes cancer)	0.0004	1×10^{-6}	0.0005	1×10^{-6} (one per million)
1,1-Dichloro-ethylene (1,1-DCE)	hepatotoxicity (harms the liver)	0.01	NA	0.006	NA
1,2-Dichloro-ethylene, cis	nephrotoxicity (harms the kidney)	0.013	NA	0.006	NA
1,2-Dichloro-ethylene, trans	immunotoxicity (harms the immune system)	0.05	NA	0.01	NA
Dichloromethane (methylene chloride)	carcinogenicity (causes cancer)	0.004	1×10^{-6}	0.005	1×10^{-6} (one per million)

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
2,4-Dichloro-phenoxyacetic acid (2,4-D)	hepatotoxicity and nephrotoxicity (harms the liver and kidney)	0.02	NA	0.07	NA
1,2-Dichloro-propane (propylene dichloride)	carcinogenicity (causes cancer)	0.0005	1×10^{-6}	0.005	1×10^{-5} (one per hundred thousand)
1,3-Dichloro-propene (Telone II®)	carcinogenicity (causes cancer)	0.0002	1×10^{-6}	0.0005	2×10^{-6} (two per million)
Dinoseb	reproductive toxicity (harms the uterus and testis)	0.014	NA	0.007	NA
Diquat	ocular toxicity (harms the eye) developmental toxicity (causes malformation)	0.006	NA	0.02	NA
Endothall	digestive system toxicity (harms the stomach or intestine)	0.094	NA	0.1	NA
Endrin	neurotoxicity (causes convulsions) hepatotoxicity (harms the liver)	0.0003	NA	0.002	NA
Ethylbenzene (phenylethane)	hepatotoxicity (harms the liver)	0.3	NA	0.3	NA
Ethylene dibromide (1,2-Dibromoethane)	carcinogenicity (causes cancer)	0.00001	1×10^{-6}	0.00005	5×10^{-6} (five per million)

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Fluoride	musculoskeletal toxicity (causes tooth mottling)	1	NA	2	NA
Glyphosate	nephrotoxicity (harms the kidney)	0.9	NA	0.7	NA
Haloacetic acids: dibromoacetic acid	carcinogenicity (causes cancer)	0.00003	1×10^{-6}	0.06*	2×10^{-3} (two per thousand)[10]
Haloacetic acids: dichloroacetic acid	carcinogenicity (causes cancer)	0.0002	1×10^{-6}	0.06*	3×10^{-4} (three per ten thousand)[11]
Haloacetic acids: monobromo-acetic acid	musculoskeletal toxicity (causes muscular degeneration)	0.025	NA	0.06*	NA
Haloacetic acids: monochloro-acetic acid	general toxicity (causes body and organ weight changes[8])	0.053	NA	0.06*	NA
Haloacetic acids: trichloroacetic acid	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.06*	6×10^{-4} (six per ten thousand)[12]
Heptachlor	carcinogenicity (causes cancer)	0.000008 (8×10^{-6})	1×10^{-6}	0.00001	1×10^{-6} (one per million)

* For total haloacetic acids (the sum of dibromoacetic acid, dichloroacetic acid, monobromoacetic acid, monochloroacetic acid, and trichloroacetic acid). There are no MCLs for individual haloacetic acids.
[10] Based on 0.060 mg/L dibromoacetic acid; the risk will vary with different combinations and ratios of the other haloacetic acids in a particular sample.
[11] Based on 0.060 mg/L dichloroacetic acid; the risk will vary with different combinations and ratios of the other haloacetic acids in a particular sample.
[12] Based on 0.060 mg/L trichloroacetic acid; the risk will vary with different combinations and ratios of the other haloacetic acids in a particular sample.

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Heptachlor epoxide	carcinogenicity (causes cancer)	0.000006 (6×10^{-6})	1×10^{-6}	0.00001	2×10^{-6} (two per million)
Hexachloro-benzene	carcinogenicity (causes cancer)	0.00003	1×10^{-6}	0.001	3×10^{-5} (three per hundred thousand)
Hexachloro-cyclopentadiene (HCCPD)	digestive system toxicity (causes stomach lesions)	0.002	NA	0.05	NA
Lead	developmental neurotoxicity (causes neurobehavioral effects in children) cardiovascular toxicity (causes high blood pressure) carcinogenicity (causes cancer)	0.0002	$<1\times10^{-6}$ (PHG is not based on this effect)	0.015 (AL[9])	2×10^{-6} (two per million)
Lindane (γ-BHC)	carcinogenicity (causes cancer)	0.000032	1×10^{-6}	0.0002	6×10^{-6} (six per million)
Mercury (inorganic)	nephrotoxicity (harms the kidney)	0.0012	NA	0.002	NA
Methoxychlor	endocrine toxicity (causes hormone effects)	0.00009	NA	0.03	NA
Methyl tertiary-butyl ether (MTBE)	carcinogenicity (causes cancer)	0.013	1×10^{-6}	0.013	1×10^{-6} (one per million)

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Molinate	carcinogenicity (causes cancer)	0.001	1×10^{-6}	0.02	2×10^{-5} (two per hundred thousand)
Monochloro-benzene (chlorobenzene)	nephrotoxicity (harms the kidney)	0.07	NA	0.07	NA
Nickel	developmental toxicity (causes increased neonatal deaths)	0.012	NA	0.1	NA
Nitrate	hematotoxicity (causes methemoglobinemia)	45 as nitrate	NA	10 as nitrogen (=45 as nitrate)	NA
Nitrite	hematotoxicity (causes methemoglobinemia)	3 as nitrite	NA	1 as nitrogen (=3 as nitrite)	NA
Nitrate and Nitrite	hematotoxicity (causes methemoglobinemia)	10 as nitrogen[13]	NA	10 as nitrogen	NA
N-nitroso-dimethyl-amine (NDMA)	carcinogenicity (causes cancer)	0.000003 (3×10^{-6})	1×10^{-6}	none	NA
Oxamyl	general toxicity (causes body weight effects)	0.026	NA	0.05	NA

[13] The joint nitrate/nitrite PHG of 10 mg/L (10 ppm, expressed as nitrogen) does not replace the individual values, and the maximum contribution from nitrite should not exceed 1 mg/L nitrite-nitrogen.

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Pentachloro-phenol (PCP)	carcinogenicity (causes cancer)	0.0003	1×10^{-6}	0.001	3×10^{-6} (three per million)
Perchlorate	endocrine toxicity (affects the thyroid) developmental toxicity (causes neurodevelop-mental deficits)	0.001	NA	0.006	NA
Perfluorooctane sulfonic acid (PFOS)	carcinogenicity (causes cancer)	1×10^{-6}	1×10^{-6}	NA	NA
Perfluoro-octanoic acid (PFOA)	carcinogenicity (causes cancer)	7×10^{-9}	1×10^{-6}	NA	NA
Picloram	hepatotoxicity (harms the liver)	0.166	NA	0.5	NA
Polychlorinated biphenyls (PCBs)	carcinogenicity (causes cancer)	0.00009	1×10^{-6}	0.0005	6×10^{-6} (six per million)
Radium-226	carcinogenicity (causes cancer)	0.05 pCi/L	1×10^{-6}	5 pCi/L (combined $Ra^{226+228}$)	1×10^{-4} (one per ten thousand)
Radium-228	carcinogenicity (causes cancer)	0.019 pCi/L	1×10^{-6}	5 pCi/L (combined $Ra^{226+228}$)	3×10^{-4} (three per ten thousand)
Selenium	integumentary toxicity (causes hair loss and nail damage)	0.03	NA	0.05	NA

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Silvex (2,4,5-TP)	hepatotoxicity (harms the liver)	0.003	NA	0.05	NA
Simazine	general toxicity (causes body weight effects)	0.004	NA	0.004	NA
Strontium-90	carcinogenicity (causes cancer)	0.35 pCi/L	1×10^{-6}	8 pCi/L	2×10^{-5} (two per hundred thousand)
Styrene (vinylbenzene)	carcinogenicity (causes cancer)	0.0005	1×10^{-6}	0.1	2×10^{-4} (two per ten thousand)
1,1,2,2-Tetrachloro-ethane	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.001	1×10^{-5} (one per hundred thousand)
2,3,7,8-Tetra-chlorodibenzo-*p*-dioxin (TCDD, or dioxin)	carcinogenicity (causes cancer)	5×10^{-11}	1×10^{-6}	3×10^{-8}	6×10^{-4} (six per ten thousand)
Tetrachloro-ethylene (perchloro-ethylene, or PCE)	carcinogenicity (causes cancer)	0.00006	1×10^{-6}	0.005	8×10^{-5} (eight per hundred thousand)
Thallium	integumentary toxicity (causes hair loss)	0.0001	NA	0.002	NA

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Thiobencarb	general toxicity (causes body weight effects) hematotoxicity (affects red blood cells)	0.042	NA	0.07	NA
Toluene (methylbenzene)	hepatotoxicity (harms the liver) endocrine toxicity (harms the thymus)	0.15	NA	0.15	NA
Toxaphene	carcinogenicity (causes cancer)	0.00003	1×10^{-6}	0.003	1×10^{-4} (one per ten thousand)
1,2,4-Trichloro-benzene	endocrine toxicity (harms adrenal glands)	0.005	NA	0.005	NA
1,1,1-Trichloro-ethane	neurotoxicity (harms the nervous system), reproductive toxicity (causes fewer offspring) hepatotoxicity (harms the liver) hematotoxicity (causes blood effects)	1	NA	0.2	NA
1,1,2-Trichloro-ethane	carcinogenicity (causes cancer)	0.0003	$1x10^{-6}$	0.005	2×10^{-5} (two per hundred thousand)
Trichloro-ethylene (TCE)	carcinogenicity (causes cancer)	0.0017	1×10^{-6}	0.005	3×10^{-6} (three per million)

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Trichlorofluoro-methane (Freon 11)	accelerated mortality (increase in early death)	1.3	NA	0.15	NA
1,2,3-Trichloro-propane (1,2,3-TCP)	carcinogenicity (causes cancer)	0.0000007 (7×10^{-7})	$1x10^{-6}$	0.000005 (5×10^{-6})	7×10^{-6} (seven per million)
1,1,2-Trichloro-1,2,2-trifluoro-ethane (Freon 113)	hepatotoxicity (harms the liver)	4	NA	1.2	NA
Trihalomethanes: Bromodichloro-methane	carcinogenicity (causes cancer)	0.00006	$1x10^{-6}$	0.080#	1.3×10^{-3} (1.3 per thousand)[14]
Trihalomethanes: Bromoform	carcinogenicity (causes cancer)	0.0005	$1x10^{-6}$	0.080#	2×10^{-4} (two per ten thousand)[15]
Trihalomethanes: Chloroform	carcinogenicity (causes cancer)	0.0004	$1x10^{-6}$	0.080#	2×10^{-4} (two per ten thousand)[16]

For total trihalomethanes (the sum of bromodichloromethane, bromoform, chloroform, and dibromochloromethane). There are no MCLs for individual trihalomethanes.
[14] Based on 0.080 mg/L bromodichloromethane; the risk will vary with different combinations and ratios of the other trihalomethanes in a particular sample.
[15] Based on 0.080 mg/L bromoform; the risk will vary with different combinations and ratios of the other trihalomethanes in a particular sample.
[16] Based on 0.080 mg/L chloroform; the risk will vary with different combinations and ratios of the other trihalomethanes in a particular sample.

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Trihalomethanes: Dibromochloro-methane	carcinogenicity (causes cancer)	0.0001	$1x10^{-6}$	0.080[#]	8×10^{-4} (eight per ten thousand)[17]
Tritium	carcinogenicity (causes cancer)	400 pCi/L	$1x10^{-6}$	20,000 pCi/L	5×10^{-5} (five per hundred thousand)
Uranium	carcinogenicity (causes cancer)	0.43 pCi/L	1×10^{-6}	20 pCi/L	5×10^{-5} (five per hundred thousand)
Vinyl chloride	carcinogenicity (causes cancer)	0.00005	1×10^{-6}	0.0005	1×10^{-5} (one per hundred thousand)
Xylene	neurotoxicity (affects the senses, mood, and motor control)	1.8 (single isomer or sum of isomers)	NA	1.75 (single isomer or sum of isomers)	NA

[#] For total trihalomethanes (the sum of bromodichloromethane, bromoform, chloroform, and dibromochloromethane). There are no MCLs for individual trihalomethanes.

[17] Based on 0.080 mg/L dibromochloromethane; the risk will vary with different combinations and ratios of the other trihalomethanes in a particular sample.

Table 2: Health Risk Categories and Cancer Risk Values for Chemicals without California Public Health Goals

Chemical	Health Risk Category[1]	US EPA MCLG[2] (mg/L)	Cancer Risk[3] at the MCLG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Disinfection byproducts (DBPs)					
Chloramines	acute toxicity (causes irritation) digestive system toxicity (harms the stomach) hematotoxicity (causes anemia)	4[5,6]	NA[7]	none	NA
Chlorine	acute toxicity (causes irritation) digestive system toxicity (harms the stomach)	4[5,6]	NA	none	NA
Chlorine dioxide	hematotoxicity (causes anemia) neurotoxicity (harms the nervous system)	0.8[5,6]	NA	none	NA
Radionuclides					

[1] Health risk category based on the US EPA MCLG document or California MCL document unless otherwise specified.
[2] MCLG = maximum contaminant level goal established by US EPA.
[3] Cancer Risk = Upper estimate of excess cancer risk from lifetime exposure. Actual cancer risk may be lower or zero. 1×10^{-6} means one excess cancer case per million people exposed.
[4] California MCL = maximum contaminant level established by California.
[5] Maximum Residual Disinfectant Level Goal, or MRDLG.
[6] The federal Maximum Residual Disinfectant Level (MRDL), or highest level of disinfectant allowed in drinking water, is the same value for this chemical.
[7] NA = not available.

Table 2: Health Risk Categories and Cancer Risk Values for Chemicals without California Public Health Goals

Chemical	Health Risk Category[1]	US EPA MCLG[2] (mg/L)	Cancer Risk[3] at the MCLG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Gross alpha particles[8]	carcinogenicity (causes cancer)	0 (^{210}Po included)	0	15 pCi/L[9] (includes radium but not radon and uranium)	up to 1×10^{-3} (for ^{210}Po, the most potent alpha emitter)
Beta particles and photon emitters[8]	carcinogenicity (causes cancer)	0 (^{210}Pb included)	0	50 pCi/L (judged equiv. to 4 mrem/yr)	up to 2×10^{-3} (for ^{210}Pb, the most potent beta-emitter)

[8] MCLs for gross alpha and beta particles are screening standards for a group of radionuclides. Corresponding PHGs were not developed for gross alpha and beta particles. See the OEHHA memoranda discussing the cancer risks at these MCLs at http://www.oehha.ca.gov/water/reports/grossab.html.
[9] pCi/L = picocuries per liter of water.

ATTACHMENT NO. 3

Table 1 – Cost Estimates for Treatment Techologies (2012 ACWA PHG Survey)

No.	Treatment Technology	Source of Information	Estimated Cost 2012 Survey Indexed to 2024* ($/1,000 gallons treated)
1	Ion Exchange	Coachella Valley WD, for GW, to reduce Arsenic concentrations. 2011 costs.	2.68
2	Ion Exchange	City of Riverside Public Utilities, for GW, for Perchlorate treatment.	1.30
3	Ion Exchange	Carollo Engineers, anonymous utility, 2012 costs for treating GW source for Nitrates. Design souce waterconcentration: 88 mg/L NO_3 Design finished water concentration: 45 mg/L NO_3. Does not include concentrate disposal or land cost.	0.98
4	Granular Activated Carbon	City of Riverside Public Utilities, GW sources, for TCE,DBCP (VOC, SOC) treatment.	0.65
5	Granular Activated Carbon	Carollo Engineers, anonymous utility, 2012 costs for treating SW source for TTHMs. Design souce water concentration: 0.135 mg/L. Design finished water concentration: 0.07 mg/L. Does not include concentrate disposal or land cost.	0.47
6	Granular Activated Carbon, Liquid Phase	LADWP, Liquid Phase GAC treatment at Tujunga Wellfield. Costs for treating 2 wells. Treament for 1,1 DCE (VOC). 2011-2012 costs.	1.99
7	Reverse Osmosis	Carollo Engineers, anonymous utility, 2012 costs for treating GW source for Nitrates. Design souce waterconcentration: 88 mg/L NO_3 Design finished water concentration: 45 mg/L NO_3. Does not include concentrate disposal or land cost.	1.05
8	Packed Tower Aeration	City of Monrovia, treatment to reduce TCE, PCE concentrations. 2011-12 costs.	0.58
9	Ozonation+ Chemical addition	SCVWD, STWTP treatment plant includes chemical addition + ozone generation costs to reduce THM/HAAs concentrations. 2009-2012 costs.	0.12
10	Ozonation+ Chemical addition	SCVWD, PWTP treatment plant includes chemical addition + ozone generation costs to reduce THM/HAAs concentrations, 2009-2012 costs.	0.26
11	Coagulation/ Filtration	Soquel WD, treatment to reduce manganeseconcentrations in GW. 2011 costs.	0.98
12	Coagulation/ Filtration Optimization	San Diego WA, costs to reduce THM/Bromate, Turbidity concentrations, raw SW a blend of State Water Project water and Colorado River water, treated at Twin Oaks Valley WTP.	1.12
13	Blending (Well)	Rancho California WD, GW blending well, 1150 gpm, to reduce fluoride concentrations.	0.93
14	Blending (Wells)	Rancho California WD, GW blending wells, to reducearsenic concentrations, 2012 costs.	0.76
15	Blending	Rancho California WD, using MWD water to blend with GW to reduce arsenic concentrations. 2012 costs.	0.91
16	CorrosionInhibition	Atascadero Mutual WC, corrosion inhibitor addition to control aggressive water. 2011 costs.	0.11

* Costs were adjusted from date of original estimates to present using the Engineering News Record (ENR) 20-City average Construction Cost Index of 13,571 for 2024.

Table 2 – Cost Estimates for Treatment Techologies (Other Agencies)

No.	Treatment Technology	Source of Information	Estimated Cost 2012 Survey Indexed to 2024* ($/1,000 gallons treated)
1	Reduction – Coagulation – Filtration	February 28, 2013, Final Report Chromium Removal Research, City of Glendale,CA. 100-2000 gpm. Reduce Hexavalent Chromium to 1 ppb.	2.14 – 13.38
2	IX - Weak Base Anion Resin	February 28, 2013, Final Report Chromium Removal Research, City of Glendale,CA. 100-2000 gpm. Reduce Hexavalent Chromium to 1 ppb.	2.19 – 9.16
3	IX	Golden State Water Co., IX w/disposable resin, 1MGD, Perchlorate removal, built in 2010.	0.67
4	IX	Golden State Water Co., IX w/disposable resin, 1000 gpm, perchlorate removal (Proposed; O&M estimated).	1.47
5	IX	Golden State Water Co., IX with brine regeneration, 500 gpm for Selenium removal, builtin 2007.	9.59
6	GFO/Adsorption	Golden State Water Co., Granular Ferric Oxide Resin, Arsenic removal, 600 gpm, 2 facilities, builtin 2006.	2.51 – 2.67
7	RO	Inland Empire Utilities Agency : ChinoBasin Desalter. RO cost to reduce 800 ppm TDS, 150 ppm Nitrate (as NO_3); approx. 7 mgd.	3.28
8	IX	Inland Empire Utilities Agency : ChinoBasin Desalter. IX cost to reduce 150 ppm Nitrate (as NO_3); approx. 2.6 mgd.	1.82
9	Packed Tower Aeration	Inland Empire Utilities Agency : ChinoBasin Desalter. PTA-VOC air stripping, typical treated flow of approx. 1.6 mgd.	0.55
10	IX	West Valley WD Report, for WaterRecycling Funding Program, for 2.88 mgd treatment facility. IX to remove Perchlorate, Perchlorate levels 6-10 ppb. 2008 costs.	0.76 – 1.08
11	Coagulation Filtration	West Valley WD, includes capital, O&M costs for 2.88 mgd treatment facility – Layne Christensen packaged coagulation Arsenic removal system. 2009-2012 costs.	0.50
12	FBR	West Valley WD/Envirogen design data for the O&M + actual capitol costs, 2.88 mgdfluidized bed reactor (FBR) treatment system, Perchlorate and Nitrate removal, followed by multimedia filtration & chlorination, 2012. NOTE: The capitol cost for the treatment facility for the first 2,000 gpm is $23 million annualized over 20 years with ability to expand to 4,000 gpm with minimal costs in the future. $17 million funded through state and federal grants with the remainder funded by WVWD and the City of Rialto.	2.26 – 2.38

* Costs were adjusted from date of original estimates to present using the Engineering News Record (ENR) 20-City average Construction Cost Index of 13,571 for 2024.

Table 3 – Cost Estimates for Treatment Techologies (Updated 2012 ACWA Cost of Treatment)

No.	Treatment Technology	Source of Information	Estimated Cost 2012 Survey Indexed to 2024* ($/1,000 gallons treated)
1	Granular Activated Carbon	Malcolm Pirnie estimate for California Urban Water Agencies, large surface water treatment plants treating water from the State Water Project to meet Stage 2 D/DBP and bromate regulation, 1998	0.77 – 1.47
2	Granular Activated Carbon	Carollo Engineers, estimate for VOC treatment (PCE), 95% removal of PCE, Oct. 1994,1900 gpm design capacity	0.36
3	Granular Activated Carbon	Carollo Engineers, est. for a large No. Calif. surf. water treatment plant (90 mgd capacity) treating water from the State Water Project, to reduce THM precursors, ENR construction cost index = 6262 (San Francisco area) – 1992	1.69
4	Granular Activated Carbon	CH2M Hill study on San Gabriel Basin, for135 mgd central treatment facility for VOC and SOC removal by GAC, 1990	0.66 – 0.96
5	Granular Activated Carbon	Southern California Water Co. – actual data for "rented" GAC to remove VOCs (1,1-DCE), 1.5 mgd capacity facility, 1998	3.03
6	Granular Activated Carbon	Southern California Water Co. – actual data for permanent GAC to remove VOCs (TCE), 2.16 mgd plant capacity, 1998	1.96
7	Reverse Osmosis	Malcolm Pirnie estimate for California Urban Water Agencies, large surface water treatment plants treating water from the State Water Project to meet Stage 2 D/DBP and bromate regulation, 1998	2.28 – 4.35
8	Reverse Osmosis	Boyle Engineering, RO cost to reduce 1000 ppm TDS in brackish groundwater in So. Calif., 1.0 mgd plant operated at 40% of design flow, high brine line cost, May 1991	5.37
9	Reverse Osmosis	Boyle Engineering, RO cost to reduce 1000 ppm TDS in brackish groundwater in So. Calif., 1.0 mgd plant operated at 100% of design flow, high brine line cost, May 1991	3.31
10	Reverse Osmosis	Boyle Engineering, RO cost to reduce 1000 ppm TDS in brackish groundwater in So. Calif., 10.0 mgd plant operated at 40% of design flow, high brine line cost, May 1991	3.58
11	Reverse Osmosis	Boyle Engineering, RO cost to reduce 1000 ppm TDS in brackish groundwater in So. Calif., 10.0 mgd plant operated at 100% of design flow, high brine line cost, May 1991	2.77
12	Reverse Osmosis	Arsenic Removal Study, City of Scottsdale, AZ – CH2M Hill, for a 1.0 mgd plant operated at 40% of design capacity, Oct. 1991	8.99
13	Reverse Osmosis	Arsenic Removal Study, City of Scottsdale, AZ – CH2M Hill, for a 1.0 mgd plant operated at 100% of design capacity, Oct. 1991	5.31
14	Reverse Osmosis	Arsenic Removal Study, City of Scottsdale, AZ – CH2M Hill, for a 10.0 mgd plant operated at 40% of design capacity, Oct. 1991	3.97

* Costs were adjusted from date of original estimates to present using the Engineering News Record (ENR) 20-City average Construction Cost Index of 13,571 for 2024.

Table 3 (Continued) – Cost Estimates for Treatment Techologies (Updated 2012 ACWA Cost of Treatment)

No.	Treatment Technology	Source of Information	Estimated Unit Cost 2012 ACWA Survey Indexed to 2024* ($/1,000 gallons treated)
15	Reverse Osmosis	Arsenic Removal Study, City of Scottsdale, AZ – CH2M Hill, for a 10.0 mgd plant operated at 100% of design capacity, Oct. 1991	2.46
16	Reverse Osmosis	CH2M Hill study on San Gabriel Basin, for135 mgd central treatment facility with RO to remove nitrate, 1990	2.48 – 4.35
17	Packed Tower Aeration	Analysis of Costs for Radon Removal... (AWWARF publication), Kennedy/Jenks, for a 1.4 mgd facility operating at 40% of design capacity, Oct. 1991	1.42
18	Packed Tower Aeration	Analysis of Costs for Radon Removal... (AWWARF publication), Kennedy/Jenks, for a 14.0 mgd facility operating at 40% of design capacity, Oct. 1991	0.76
19	Packed Tower Aeration	Carollo Engineers, estimate for VOC treatment (PCE) by packed tower aeration, without off-gas treatment, O&M costs based on operation during 329 days/year at 10% downtime, 16 hr/day air strippingoperation, 1900 gpm design capacity, Oct. 1994	0.38
20	Packed Tower Aeration	Carollo Engineers, for PCE treatment by Ecolo-Flo Enviro-Tower air stripping, without off-gas treatment, O&M costs based on operation during 329 days/year at 10% downtime, 16 hr/day air stripping operation, 1900 gpm design capacity, Oct. 1994	0.39
21	Packed Tower Aeration	CH2M Hill study on San Gabriel Basin, for135 mgd central treatment facility – packed tower aeration for VOC and radon removal, 1990	0.63 – 1.01
22	Advanced Oxidation Processes	Carollo Engineers, estimate for VOC treatment (PCE) by UV Light, Ozone, Hydrogen Peroxide, O&M costs based on operation during 329 days/year at 10% downtime, 24 hr/day AOP operation, 1900 gpm capacity, Oct. 1994	0.75
23	Ozonation	Malcolm Pirnie estimate for CUWA, large surface water treatment plants using ozone to treat water from the State Water Project to meet Stage 2 D/DBP and bromate regulation, *Cryptosporidium* inactivation requirements,1998	0.17 – 0.36
24	Ion Exchange	CH2M Hill study on San Gabriel Basin, for 135 mgd central treatment facility – ion exchange to remove nitrate, 1990	0.82 – 1.08

* Costs were adjusted from date of original estimates to present using the Engineering News Record (ENR) 20-City average Construction Cost Index of 13,571 for 2024.

ATTACHMENT NO. 4

§ 64447. Best Available Technology (BAT)--Microbiological Contaminants. 22 CA ADC § 64447

Barclays Official California Code of Regulations

Barclays California Code of Regulations
Title 22. Social Security
Division 4. Environmental Health
Chapter 15. Domestic Water Quality and Monitoring Regulations
Article 12. Best Available Technologies (BAT)

22 CCR § 64447

§ 64447. Best Available Technology (BAT)--Microbiological Contaminants.

Currentness

The technologies identified by the State Board as the best available technology (for a public water system serving more than 10,000 persons), affordable technology (for a public water system serving 10,000 or fewer persons), treatment techniques, or other means available for achieving compliance with the *E. coli* MCL are as follows:

(a) Protection of wells from fecal coliform contamination by appropriate placement and construction;

(b) Maintenance of a disinfectant residual throughout the distribution system;

(c) Proper maintenance of the distribution system including appropriate pipe replacement and repair procedures, main flushing programs, proper operation and maintenance of storage tanks and reservoirs, cross connection control, and continual maintenance of positive water pressure in all parts of the distribution system;

(d) Filtration and/or disinfection of approved surface water, in compliance with Section 64650, or disinfection of groundwater, in compliance with Section 64430, using strong oxidants such as chlorine, chlorine dioxide, or ozone; and

(e) For a system using groundwater, compliance with the groundwater portion of a Drinking Water Source Assessment and Protection Program, conducted according to the Drinking Water Source Assessment Protection Program, California Department of Health Services, January 2000, which is incorporated by reference.

Credits

NOTE: Authority cited: Sections 116271 and 116375, Health and Safety Code. Reference: Sections 116350 and 116370, Health and Safety Code.

HISTORY

1. Repealer of article 5.6 heading and section, new article 12, and renumbering and amendment of former section 64430 to section 64447 filed 9-8-94 as an emergency; operative 9-8-94 (Register 94, No. 36). A Certificate of Compliance must be transmitted to OAL by 1-6-95 or emergency language will be repealed by operation of law on the following day. For prior history, see Register 88, No. 51.

2. Repealer of article 5.6 heading and section, new article 12, and renumbering and amendment of former section 64430 to section 64447 refiled 1-3-95 as an emergency; operative 1-3-95 (Register 95, No. 1). A Certificate of Compliance must be transmitted to OAL by 5-3-95 or emergency language will be repealed by operation of law on the following day.

3. Repealer of article 5.6 heading and section, new article 12, and renumbering and amendment of former section 64430 to section 64447 refiled 4-26-95 as an emergency; operative 4-26-95 (Register 95, No. 17). A Certificate of Compliance must be transmitted to OAL by 8-24-95 or emergency language will be repealed by operation of law on the following day.

4. Certificate of Compliance as to 4-26-95 order transmitted to OAL 5-5-95 and filed 6-19-95 (Register 95, No. 25).

5. Change without regulatory effect amending first paragraph and NOTE filed 6-2-2015 pursuant to section 100, title 1, California Code of Regulations (Register 2015, No. 23).

6. Amendment of section and NOTE filed 5-28-2021; operative 7-1-2021 (Register 2021, No. 22).

This database is current through 5/30/25 Register 2025, No. 22.

Cal. Admin. Code tit. 22, § 64447, 22 CA ADC § 64447

END OF DOCUMENT

§ 64447.2. Best Available Technologies (BATs) -- Inorganic Chemicals.

22 CA ADC § 64447.2

Barclays Official California Code of Regulations

Effective: October 1, 2024

Barclays California Code of Regulations
Title 22. Social Security
Division 4. Environmental Health
Chapter 15. Domestic Water Quality and Monitoring Regulations
Article 12. Best Available Technologies (BAT)

Effective: October 1, 2024

22 CCR § 64447.2

§ 64447.2. Best Available Technologies (BATs) -- Inorganic Chemicals.

Currentness

The technologies listed in Table 64447.2-A are the best available technology, treatment techniques, or other means available for achieving compliance with the MCLs in Table 64431-A for inorganic chemicals.

Table 64447.2-A
Best Available Technologies (BATs) Inorganic Chemicals

	Chemical	***Best Available Technologies (BATs)***
	Aluminum	10
	Antimony	2, 7
	Arsenic	1, 2, 5, 6, 7, 9, 13
	Asbestos	2, 3, 8
	Barium	5, 6, 7, 9
	Beryllium	1, 2, 5, 6, 7
	Cadmium	2, 5, 6, 7
	Chromium (hexavalent)	5, 7, 14
	Chromium (total)	2, 5, 6[a], 7
	Cyanide	5, 7, 11
	Fluoride	1
	Mercury	2[b], 4, 6[b], 7[b]
	Nickel	5, 6, 7
	Nitrate	5, 7, 9
	Nitrite	5, 7
	Perchlorate	5, 12
	Selenium	1, 2[c], 6, 7, 9
	Thallium	1, 5

[a] BAT for chromium III (trivalent chromium) only.

[b] BAT only if influent mercury concentrations <10 µg/L.

[c] BAT for selenium IV only.

Key to BATs in Table 64447.2-A:

1 = Activated Alumina

2 = Coagulation/Filtration (not BAT for systems <500 service connections)

3 = Direct and Diatomite Filtration

4 = Granular Activated Carbon

5 = Ion Exchange

6 = Lime Softening (not BAT for systems <500 service connections)

7 = Reverse Osmosis

8 = Corrosion Control

9 = Electrodialysis

10 = Optimizing treatment and reducing aluminum added

11 = Chlorine oxidation

12 = Biological fluidized bed reactor

13 = Oxidation/Filtration

14= Reduction/Coagulation/Filtration

Credits

NOTE: Authority cited: Sections 116271, 116293(b), 116350 and 116375, Health and Safety Code. Reference: Section 116370, Health and Safety Code.

HISTORY

1. New section filed 9-8-94 as an emergency; operative 9-8-94 (Register 94, No. 36). A Certificate of Compliance must be transmitted to OAL by 1-6-95 or emergency language will be repealed by operation of law on the following day. For prior history, see Register 88, No. 51.

2. New section refiled 1-3-95 as an emergency; operative 1-3-95 (Register 95, No. 1). A Certificate of Compliance must be transmitted to OAL by 5-3-95 or emergency language will be repealed by operation of law on the following day.

3. New section refiled 4-26-95 as an emergency; operative 4-26-95 (Register 95, No. 17). A Certificate of Compliance must be transmitted to OAL by 8-24-95 or emergency language will be repealed by operation of law on the following day.

4. Certificate of Compliance as to 4-26-95 order including amendment of section heading, first paragraph and Table 64447.2-A transmitted to OAL 5-5-95 and filed 6-19-95 (Register 95, No. 25).

5. Amendment of Table and NOTE filed 4-17-2000; operative 5-17-2000 (Register 2000, No. 16).

6. Amendment of section and NOTE filed 9-18-2007; operative 10-18-2007 (Register 2007, No. 38).

7. Amendment of Table 64447.2-A and amendment of NOTE filed 10-29-2008; operative 11-28-2008 (Register 2008, No. 44).

8. Amendment of section and NOTE filed 5-28-2014; operative 7-1-2014 (Register 2014, No. 22).

9. Change without regulatory effect amending Table 64447.2-A filed 9-11-2017 pursuant to section 100, title 1, California Code of Regulations (Register 2017, No. 37).

10. Amendment of section and NOTE filed 7-24-2024; operative 10-1-2024 (Register 2024, No. 30).

This database is current through 5/30/25 Register 2025, No. 22.

Cal. Admin. Code tit. 22, § 64447.2, 22 CA ADC § 64447.2

END OF DOCUMENT

Home Table of Contents

§ 64447.3. Best Available Technologies (BATs) -- Radionuclides.

22 CA ADC § 64447.3

Barclays Official California Code of Regulations

Barclays California Code of Regulations
Title 22. Social Security
Division 4. Environmental Health
Chapter 15. Domestic Water Quality and Monitoring Regulations
Article 12. Best Available Technologies (BAT)

22 CCR § 64447.3

§ 64447.3. Best Available Technologies (BATs) -- Radionuclides.

Currentness

The technologies listed in tables 64447.3-A, B and C are the best available technology, treatment technologies, or other means available for achieving compliance with the MCLs for radionuclides in tables 64442 and 64443.

Table 64447.3-A
Best Available Technologies (BATs) Radionuclides

Radionuclide	***Best Available Technology***
Combined radium-226 and radium-228	Ion exchange, reverse osmosis, lime softening
Uranium	Ion exchange, reverse osmosis, lime softening, coagulation/filtration
Gross alpha particle activity	Reverse osmosis
Beta particle and photon radioactivity	Ion exchange, reverse osmosis

Table 64447.3-B
Best Available Technologies (BATs) and Limitations for Small Water Systems Radionuclides

Unit Technologies	***Limitations (see footnotes)***	***Operator Skill Level Required***		***Raw Water Quality Range and Considerations***
1. Ion exchange	(a)	Intermediate		All ground waters; competing anion concentrations may affect regeneration frequency
2. Point of use, ion exchange	(b)	Basic		All ground waters; competing anion concentrations may affect regeneration frequency
3. Reverse osmosis	(c)	Advanced		Surface waters usually require pre-filtration
4. Point of use, reverse osmosis	(b)	Basic		Surface waters usually require pre-filtration
5. Lime softening	(d)	Advanced		All waters

6. Green sand filtration	(e)	Basic	All ground waters; competing anion concentrations may affect regeneration frequency
7. Co-precipitation with barium sulfate	(f)	Intermediate to advanced	Ground waters with suitable quality
8. Electrodialysis/electrodialysis reversal	(g)	Basic to intermediate	All ground waters
9. Pre-formed hydrous manganese oxide filtration	(h)	Intermediate	All ground waters
10. Activated alumina	(a), (i)	Advanced	All ground waters; competing anion concentrations may affect regeneration frequency
11. Enhanced coagulation/filtration	(j)	Advanced	Can treat a wide range of water qualities

Limitation Footnotes:

[a] The regeneration solution contains high concentrations of the contaminant ions, which could result in disposal issues.

[b] When point of use devices are used for compliance, programs for long-term operation, maintenance, and monitoring shall be provided by systems to ensure proper performance.

[c] Reject water disposal may be an issue.

[d] The combination of variable source water quality and the complexity of the water chemistry involved may make this technology too complex for small systems.

[e] Removal efficiencies can vary depending on water quality.

[f] Since the process requires static mixing, detention basins, and filtration, this technology is most applicable to systems with sufficiently high sulfate levels that already have a suitable filtration treatment train in place.

[g] Applies to ionized radionuclides only.

[h] This technology is most applicable to small systems with filtration already in place.

[i] Chemical handling during regeneration and pH adjustment may be too difficult for small systems without an operator trained in these procedures.

[j] This would involve modification to a coagulation/filtration process already in place.

Table 64447.3-C
Best Available Technologies (BATs) for Small Water Systems by System Size Radionuclides

Compliance Technologies for System Size Categories Based On Population Served			
	25-500	*501-3,300*	*3,301-10,000*
		Unit Technologies	
Contaminant	*(Numbers Correspond to Table 64447.3-B)*		
Combined radium-226 and radium-228	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9
Gross alpha particle activity	3, 4	3, 4	3, 4
Beta particle activity and photon radioactivity	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4
Uranium	1, 2, 4, 10, 11	1, 2, 3, 4, 5, 10, 11	1, 2, 3, 4, 5, 10, 11

Credits

NOTE: Authority cited: Section 116370, Health and Safety Code. Reference: Section 116350, Health and Safety Code.

HISTORY

1. New section filed 5-12-2006; operative 6-11-2006 (Register 2006, No. 19).

This database is current through 5/30/25 Register 2025, No. 22.

Cal. Admin. Code tit. 22, § 64447.3, 22 CA ADC § 64447.3

END OF DOCUMENT

ATTACHMENT NO. 5

Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550
661-947-4111

BOARD OF DIRECTORS

W. Scott Kellerman
Division 1

Don Wilson
Division 2

Gloria Dizmang
Division 3

Kathy Mac Laren-Gomez
Division 4

Vincent Dino
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General Manager
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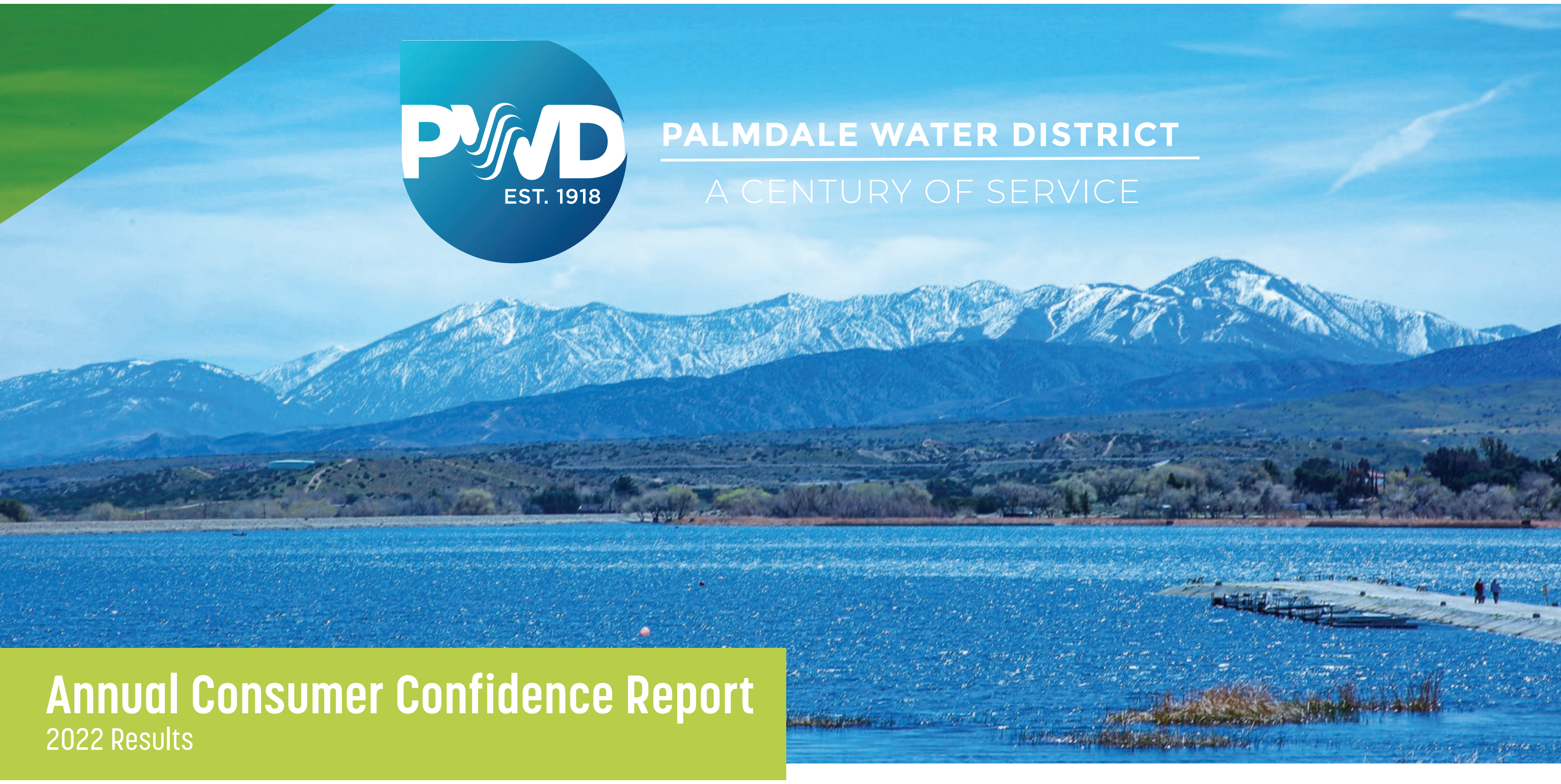


Annual Consumer Confidence Report
2022 Results

Our mission is to provide high-quality water to our current and future customers at a reasonable cost.

Questions or comments on the contents of this report are encouraged. Please contact Operations Manager Mynor Masaya at 661-947-4111 x1185 or Water Quality & Regulatory Affairs Supervisor Amanda Thompson at 661-947-4111 x1178, Monday through Thursday, 8:00 a.m. to 6:00 p.m.

ATTENCION RESIDENTES!
Esta publicación está disponible en español en nuestro sitio web en palmdalewater.org. Para obtener una copia impresa en español, visite nuestra oficina o llame al 661-947-4111.

STATE OF OUR WATER

For the first time since 2006, the Department of Water Resources' State Water Project (SWP) allocation is at 100%. It is the result of epic rain and snowstorms that started this past winter and continued into the spring. The snow levels in the mountains of northern California, where the SWP water originates, have set records and erased the drought in the state.

What does this mean for Palmdale Water District (PWD)? With 100% SWP allocation, PWD will receive 21,300 acre-feet (AF), or 6.8 billion gallons, of water this year. Annually, PWD customers require an average of a little less than 20,000 AF. Unlike a year ago when SWP allocation was 5% and nearly the entire state of California was in a severe drought, PWD is pleased with the availability of water. Along with surface water from the SWP, the Littlerock Reservoir is supplying PWD with water. This is helping the local aquifer and wells recover from extensive pumping due to the lack of surface water in the past few years.

PWD is fortunate to have the Littlerock Reservoir, which stores rain and snowmelt from the San Gabriel Mountains. It is always the first choice of use because the only cost is in its treatment. Since the beginning of January, water from the reservoir has been flowing via the 8.5-mile Palmdale Ditch to Lake Palmdale where it is stored before entering the Leslie O. Carter Water Treatment Plant.

It is our hope that you will thoroughly review this annual report that gives you transparency into the quality of the water provided by PWD. We are proud to use granular activated carbon at the Leslie O. Carter Water Treatment Plant as an additional treatment process to remove certain chemicals that may form carcinogens or give the water an unfavorable taste or smell. It is a process almost identical to a Brita® filter, improving the quality of your drinking water while being less expensive than bottled water.

While we are no longer in a drought and PWD has rescinded all water conservation mandates, we ask you to keep water conservation in mind and continue using water wisely. The extreme weather conditions that have become the norm can easily leave us with parched reservoirs sooner than expected.

Let's pledge to continue to *Save Water Today for Our Tomorrow.*

Don Wilson (PWD Board President)
Dennis D. LaMoreaux (PWD General Manager)

The Palmdale Water District is pleased to announce 100% regulatory compliance in 2022 and is confident its drinking water is of the highest quality.

This Consumer Confidence Report is a snapshot of PWD's 2022 water quality and will provide you with a better understanding of the excellent quality of your drinking water. This report includes details about where your water comes from, what it contains, and how it compares to drinking water standards as set by the state of California. We are committed to providing you with this information because informed customers are our best allies. Stringent water-quality testing is performed before the water is delivered to consumers. Last year, PWD completed more than 18,000 tests for over 80 regulated contaminants. Only ten primary standard contaminants were detected in 2022, and all were at levels below the Maximum Contaminant Level allowed by the state.

Last year, PWD completed more than

18,000

tests for over 80 regulated contaminants.

Please take the time to review this Consumer Confidence Report and Water Quality Data Chart to become an informed consumer. The Water Quality Data Chart is divided into two standards – Primary and Secondary. Primary standards are set to protect public health from contaminants in water that may be immediately harmful to humans or affect their health if consumed for long periods of time. Secondary standards govern aesthetic qualities of water, such as taste, mineral content, odor, color, and turbidity.

How to contact PWD:

- Attend Board of Directors meetings the second and fourth Mondays of each month. Board meetings start at 6:00 p.m. and are held at the PWD office, 2029 East Avenue Q, Palmdale.
- Call 661-947-4111 with questions about PWD or to file a water quality complaint.
- Call 661-947-4111 x5002 for information on water-use efficiency, including conservation and water education.

For more information, visit our website at palmdalewater.org.

OUR WATER SUPPLY

PWD acquires its water from one of three sources or a combination of these sources.

1. Surface water from the State Water Project (SWP/CA Aqueduct)

This water source begins in northern California, flows into the Delta near Sacramento, and is pumped south to Lake Palmdale. PWD is entitled to take a maximum of 21,300 acre-feet, or 6.9 billion gallons of water, per year. Based on the amount of rain & snowfall in the Sierra Nevada mountains and the amount of water stored in northern California reservoirs, PWD is granted a percentage of the annual entitlement. In 2022, PWD received 4,204 acre-feet from the SWP/CA Aqueduct. The water is drawn from the SWP/CA Aqueduct and stored in Lake Palmdale prior to treatment.

2. Surface water from Littlerock Reservoir

Littlerock Dam was built in 1924 and renovated in 1994 to strengthen the dam and increase the reservoir capacity to 3,500 acre-feet, or 1.1 billion gallons of water. In 2022, PWD diverted 3,619 acre-feet from this source. Littlerock Reservoir is fed by natural runoff from snowpacks in the local San Gabriel Mountains and from rainfall. The water is then transferred from Littlerock Reservoir to Lake Palmdale through a ditch connecting the two bodies of water for storage prior to treatment.

3. Groundwater

Groundwater is pumped from the Antelope Valley groundwater basin through 22 wells. In 2022, PWD pumped 8,540 acre-feet. This water is treated with chlorine before being pumped directly into the distribution system.

All three sources are constantly tested and treated in compliance with all applicable regulations to ensure high-quality water and dependability of the water system. The Palmdale Water District delivered approximately 53% surface water and 47% groundwater to its consumers in 2022.

SOURCES OF DRINKING WATER

The sources of drinking water, both tap and bottled, include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- **Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.**
- **Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.**
- **Pesticides and herbicides that may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.**
- **Organic chemical contaminants, including synthetic and volatile organic chemicals, that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.**
- **Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.**

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (U.S. EPA) and the State Water Resources Control Board (State Water Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. State Water Board regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

DRINKING WATER SOURCE ASSESSMENT AND PROTECTION PROGRAM

Palmdale Water District's Sanitary Survey, including a Source Water Assessment of surface waters, was updated in 2017 in compliance with state of California regulations. The assessment of surface water sources included Littlerock Reservoir and Lake Palmdale. A Groundwater Assessment and Protection Program was completed in January of 1999, and a Wellhead Protection Plan was completed in November 2000.

PWD's drinking water sources are considered most vulnerable to the following activities associated with contaminants detected in the water supply: illegal activities, such as unauthorized dumping; recreation; highways; railroads; and sewer collection systems. A comprehensive source water protection program can prevent contaminants from entering the public water supply, reduce treatment costs, and increase public confidence in the quality, reliability and safety of drinking water.

You can help prevent water contamination and pollution by properly disposing of trash and waste materials.

Remember, many common household products can contaminate surface and groundwater supplies. Anything you throw in the trash, dump on the ground, pour down the drain, or wash down the driveway can eventually reach water sources and cause contamination.

The Sanitary Survey, Source Water Assessment, Groundwater Assessment, and Wellhead Protection Plan are available for review on PWD's website at palmdalewater.org or at PWD's office by calling Assistant General Manager Adam Ly at 661-947-4111 x1062.

THE WATER QUALITY DATA CHART LISTS ALL DRINKING WATER CONTAMINANTS DETECTED DURING THE 2022 CALENDAR YEAR.

The presence of these contaminants in the water does not necessarily indicate the water poses a health risk. PWD tests for many contaminants in addition to those listed in the chart. Test results for these additional contaminants were all "Non-Detected" (ND) and are not required to be included in the chart. The state allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. As a result, some of the data, though representative of the water quality, is more than one year old. Unless otherwise notes, the data presented in this chart is from testing performed January 1 to December 31, 2022.

Parameter Treatment Techniques	Regulation	Meets Standard?	MRL	Sample Frequency	Water Treatment Plant		PHG (MCLG)	Typical Source of Contaminant
					Level Found			
Turbidity	TT = 1 NTU	Y	0.1	Continuous	0.1		NA	Soil Runoff
	TT = 95% of monthly samples ≤0.3 NTU	Y	NA		100% ≤ 0.3 NTU			

Turbidity is a measure of the cloudiness of the water. We measure it because it is a good indicator of the effectiveness of our filtration system.

Disinfection Byproduct Precursors								
Control of DBP Precursor (TOC)	TT = ratio of actual TOC removal to required TOC removal shall be ≥ 1	Y	1	Monthly	2.2 - 3.2	2.8	NA	Various natural and manmade sources

Parameter Primary Standards	MCL or [MRDL]	Meets Standard?	MRL	Sample Frequency	Distribution System		PHG (MCLG) [MRDLG]	Typical Source of Contaminant
Microbiological					Highest Monthly Percentage			
Total Coliform Bacteria (State Revised Total Coliform Rule)	No more than 5.0% of monthly samples are positive	Y	NA	Weekly	0.8%		(0)	Naturally present in the environment
Disinfectant Residual					All Sample Range	RAA		
Chlorine (as Cl2)	[4.0 mg/L]	Y	0.1	Weekly	ND - 2.0	1.0	[4]	Drinking water disinfectant added for treatment
Disinfection Byproducts (DBPs)					All Sample Range	Highest RAA		
TTHMs (Total Trihalomethanes)	80 µg/L	Y	0.5	Quarterly	3 - 89	55	NA	Byproduct of drinking water disinfection
HAA5 (Sum of 5 Haloacetic Acids)	60 µg/L	Y	2	Quarterly	ND - 13	8		

Parameter Primary Standards	MCL	Meets Standard?	DLR	Sample Frequency* Surface Water / Groundwater	Treated Surface Water Plant Effluent Summary Sampled in 2022		Groundwater Summary Results from Wells Sampled in 2022		PHG (MCLG)	Typical Source of Contaminant
					Range	Average	Range	Average		
Inorganic Chemicals										
Arsenic	10 µg/L	Y	2	Annually / Triennially	NA	ND	ND - 3	ND	0.004	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
Chromium (Total)	50 µg/L	Y	10	Annually / Triennially	NA	ND	ND - 20	ND	(100)	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Fluoride (naturally occurring)	2.0 mg/L	Y	0.1	Quarterly/ Quarterly	NA	0.2	ND - 0.6	0.2	1	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
Nitrate (as Nitrogen)	10 mg/L	Y	0.4	Quarterly/ Quarterly	NA	ND	ND - 6	1	10	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Radioactivity										
Gross Alpha Particle Activity	15 pCi/L	Y	3	**See comment	NA	13	ND - 6	ND	(0)	Erosion of natural deposits
Uranium	20 pCi/L	Y	1	***See comment	NA	ND	ND - 4	2	0.43	

Tap Monitoring Lead & Copper	Action Level	Meets Standard?	DLR	Lead and Copper Rule Sampled in 2021		Lead Testing in Schools Sampled in 2018			PHG	Typical Source of Contaminant
				Range	90th Percentile	No. of schools requesting lead sampling	Range	Average		
Lead	15 µg/L	Y	5	50 sites sampled; 0 sites over AL	ND	29	88 sites sampled; 0 sites over AL	ND	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper	1.3 mg/L	Y	0.05	50 sites sampled; 0 sites over AL	0.5	NA	NA	NA	0.3	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

Parameter	MCL	Meets Standard?	DLR	Sample Frequency* Surface Water/ Groundwater	Treated Surface Water Plant Effluent Summary Sampled in 2022		Groundwater Summary Results from Wells Sampled in 2022		Typical Source of Contaminant
					Range	Average	Range	Average	
Secondary Standards - Inorganic Chemicals									
Chloride	500 mg/L	Y	5	Quarterly/ Quarterly	88 - 110	101	ND - 109	28	Runoff; leaching from natural deposits; seawater influence
Odor-Threshold	3 units	Y	1	Weekly / Triennially	NA	1	ND - 2	ND	Naturally occurring organic materials
Specific Conductance	1600 µS/cm	Y	2	Annually / Triennially	NA	620	240 - 820	424	Substances that form ions when in water; seawater influence
Sulfate	500 mg/L	Y	5	Quarterly/ Quarterly	51 - 80	66	18 - 147	42	Runoff; leaching from natural deposits; industrial wastes
Total Dissolved Solids (TDS)	1000 mg/L	Y	10	Annually / Triennially	NA	340	150 - 470	255	Runoff/leaching of natural deposits
Turbidity	5 units	Y	0.1	Annually / Triennially	NA	0.2	ND - 0.4	ND	Soil Runoff
Additional Constituents Analyzed									
Boron	NL = 1 mg/L	Y	0.1	Annually / Triennially	NA	0.2	NA	ND	Erosion of natural deposits
Vanadium	NL = 50 µg/L	Y	3	Annually / Triennially	NA	ND	8 - 34	16	
Alkalinity	(NA) mg/L	NA	20	Weekly / Triennially	51 - 85	72	76 - 180	117	Dissolved as water passes through deposits which contain carbonate, bicarbonate, and hydroxide compounds
Calcium	(NA) mg/L	NA	1	Annually / Triennially	NA	32	11 - 72	39	Dissolved as water passes through limestone deposits
Chromium (Hexavalent)	(NA) µg/L	NA	1	Quarterly / Quarterly	NA	ND	ND - 13	4	Steel and pulp mill discharges, chrome plating, natural erosion
Hardness	(NA) gpg	NA	0.1	Weekly / Triennially	6 - 7	7	2 - 13	7	Sum of polyvalent cations present in the water, generally magnesium and calcium. The cations are usually naturally occurring.
Magnesium	(NA) mg/L	NA	0.1	Annually / Triennially	NA	7	0.4 - 13	6	Dissolved as water passes through magnesium-bearing minerals
pH	(NA) units	NA	0.1	Continuous / Triennially	6.9 - 7.3	7.0	7.3 - 8.4	8.0	Generally natural changes due to interactions with the environment
Potassium	(NA) mg/L	NA	1	Annually / Triennially	NA	2	ND - 3	ND	Leaching from natural deposits
Sodium	(NA) mg/L	NA	1	Annually / Triennially	NA	74	19 - 79	40	Generally naturally occurring salt present in water

Special Testing	MCL	Meets Standard?	MRL	Sample Frequency	Effluent & Dist. System		Groundwater		Environmental Source
					Range	Average	Range	Average	
UCMR 4 (Sampled in 2018 - 2019)									
HAA5	(NA) µg/L	NA	NA	Special	0.4 - 8.9	5.2	-	-	Byproduct of drinking water disinfection
HAA6Br	(NA) µg/L	NA	NA	Special	ND - 20	12	-	-	Byproduct of drinking water disinfection
HAA9	(NA) µg/L	NA	NA	Special	0.4 - 22	13	-	-	Byproduct of drinking water disinfection
Manganese	50 µg/L	Y	0.4	Special	ND - 3.4	1.4	ND - 2.1	ND	Leaching from natural deposits

* Wells are sampled every 3 years except for Chloride, Fluoride, Nitrate and Sulfate, which are sampled quarterly.
** Sampled between 2014 and 2022. Individual sites are sampled every 6 or 9 years. Range is from individual sample results.
*** Sample collected only when Gross Alpha Activity exceeds 5 pCi/L.

EDUCATIONAL INFORMATION AND POSSIBLE DRINKING WATER CONTAMINANTS:

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791). Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

NITRATE: In the Primary Standards Inorganic Chemicals section of the chart for Nitrate (as Nitrogen), treated surface water is ND . In the groundwater column, the range is ND to 6 mg/L, and the average is 1 mg/L. The State Water Boad requires annual sampling if results are less than 50% of the MCL. If the result from any one source is greater than 50% of the MCL, then sampling must be done quarterly at that source. PWD samples all its wells on a quarterly basis (4 times per year) even when they test below 50% of the MCL. The numbers expressed on the chart are derived from quarterly sampling of all PWD wells, except those that are out of service.

Health effects of Nitrate: Nitrate in drinking water at levels above 10 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 10 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity.

Lead and Copper: Palmdale Water District is required to draw new sample sets of tap samples for lead and copper every 3 years. The last samples were taken in 2021 (50 samples). The 90th percentile results of ND for lead and 0.5 ppm for copper are well within the AL of 15 ppb for lead and the AL of 1.3 ppm for copper. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. PWD is responsible for providing high-quality drinking water, but is unable to control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you do so, you may wish to collect the flushed water and reuse it for another beneficial purpose, such as watering plants.

If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (1-800-426-4791) or at http://www.epa.gov/lead.

Health Effects of Lead: Infants and children who drink water containing lead in excess of the action level may experience delays in their physical or mental development. Children may show slight deficits in attention span and learning abilities. Adults who drink this water over many years may develop kidney problems or high blood pressure.

Health Effects of Copper: Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time may experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years may suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

DEFINITIONS:

The following definitions of key terms are provided to help you understand the data used in this report.

Detection Limit for purposes of Reporting (DLR): The smallest concentration of a contaminant that can be measured and reported. DLRs are set by State Water Board (same as MRL, Minimum Reporting Level, set by USEPA).

Locational Running Annual Average (LRAA): The running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of samples taken at a particular monitoring location.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Minimum Reporting Level (MRL): A set concentration that is acceptable to the data user and the laboratory as long as reliable measurement is achieved.

Notification Level (NL): State guidelines developed by State Water Board that addresses the concentration of a contaminant which, if exceeded, triggers public notification.

Primary Drinking Water Standard (PDWS): MCLs, MRDLs and treatment techniques (TTs) for contaminants that affect health, along with their monitoring and reporting requirements.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California EPA.

Regulatory Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Running Annual Average (RAA): The running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected.

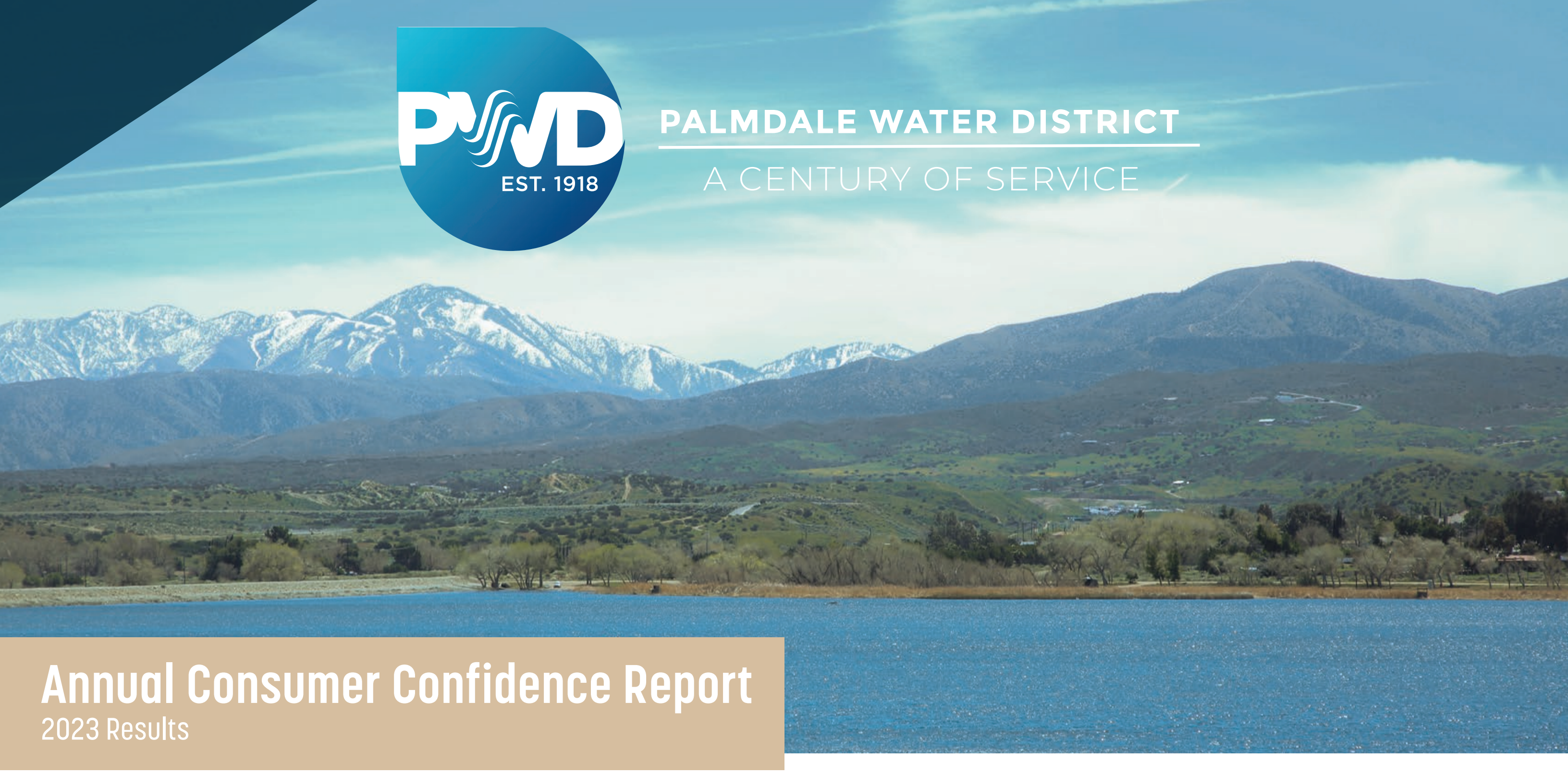
Secondary Drinking Water Standard (SDWS): MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect the health at the MCL level.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Unregulated Contaminant Monitoring (UCMR): Unregulated contaminant monitoring helps USEPA and the State Water Board to determine where certain contaminants occur and whether the contaminants need to be regulated.

ADDITIONAL ABBREVIATIONS USED IN WATER QUALITY DATA CHART:

< Less Than
> Greater Than
NA: Not Applicable
ND: Not detectable or Non-Detected at testing limit (DLR or MRL)
TOC: Total Organic Carbon
gpg: grains per gallon (a unit of water hardness)
mg/L: milligrams per liter or parts per million (ppm)
NTU: Nephelometric Turbidity Units
pCi/L: picocuries per liter (a measure of radiation)
µg/L: micrograms per liter or parts per billion (ppb)
µS/cm: microsiemens per centimeter (a measure for conductivity)



Annual Consumer Confidence Report

2023 Results

Our mission is to provide high-quality water to our current and future customers at a reasonable cost.

Questions or comments on the contents of this report are encouraged. Please contact Operations Manager Joseph Marcinko at 661-947-4111 x1185 or Water Quality & Regulatory Affairs Supervisor Amanda Thompson at 661-947-4111 x1178, Monday through Thursday, 8:00 a.m. to 5:00 p.m.

ATTENCION RESIDENTES!
Esta publicación está disponible en español en nuestro sitio web en palmdalewater.org. Para obtener una copia impresa en español, visite nuestra oficina o llame al 661-947-4111.

Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550
661-947-4111

BOARD OF DIRECTORS

THE WATER QUALITY DATA CHART LISTS ALL DRINKING WATER CONTAMINANTS DETECTED DURING THE 2023 CALENDAR YEAR.

The presence of these contaminants in the water does not necessarily indicate the water poses a health risk. PWD tests for many contaminants in addition to those listed in the chart. Test results for these additional contaminants were all "Non-Detected" (ND) and are not required to be included in the chart. The state allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. As a result, some of the data, though representative of the water quality, is more than one year old. Unless otherwise noted, the data presented in this chart is from testing performed January 1 to December 31, 2023.

Parameter Treatment Techniques	Regulation	Meets Standard?	MRL	Sample Frequency	Water Treatment Plant		PHG (MCLG)	Typical Source of Contaminant
					Level Found			
Turbidity	TT = 1 NTU	Y	0.1	Continuous	0.1		NA	Soil Runoff
	TT = 95% of monthly samples ≤0.3 NTU	Y	NA		100% ≤ 0.3 NTU			
Turbidity is a measure of the cloudiness of the water. We measure it because it is a good indicator of the effectiveness of our filtration system.								
Disinfection Byproduct Precursors								
Control of DBP Precursor (TOC)	TT = ratio of actual TOC removal to required TOC removal shall be ≥ 1	Y	1	Monthly	2.2 - 3.2	2.8	NA	Various natural and man-made sources

Parameter Primary Standards	MCL or [MRDL]	Meets Standard?	MRL	Sample Frequency	Distribution System		PHG (MCLG) [MRDLG]	Typical Source of Contaminant
Disinfectant Residual					All Sample Range	RAA		
Chlorine (as Cl2)	[4.0 mg/L]	Y	0.1	Weekly	ND - 2.0	1.1	[4]	Drinking water disinfectant added for treatment
Disinfection Byproducts (DBPs)					All Sample Range	Highest RAA		
TTHMs (Total Trihalomethanes)	80 µg/L	Y	1	Quarterly	2 - 79	65	NA	Byproduct of drinking water disinfection
HAA5 (Sum of 5 Haloacetic Acids)	60 µg/L	Y	2	Quarterly	ND - 12	10		

Parameter Primary Standards	MCL	Meets Standard?	DLR	Sample Frequency Surface Water / Groundwater	Treated Surface Water Plant Effluent Summary Sampled in 2023		Groundwater Summary Results from Wells Sampled in 2021-2023		PHG (MCLG)	Typical Source of Contaminant
					Range	Average	Range	Average		
Inorganic Chemicals										
Arsenic	10 µg/L	Y	2	Annually / Triennially	NA	ND	ND - 3	ND	0.004	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
Chromium (Total)	50 µg/L	Y	10	Annually / Triennially	NA	ND	ND - 20	ND	(100)	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Fluoride (naturally occurring)	2.0 mg/L	Y	0.1	Quarterly/ Quarterly	0.1 - 0.2	0.2	ND - 0.5	0.2	1	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
Nitrate (as Nitrogen)	10 mg/L	Y	0.4	Quarterly/ Quarterly	NA	ND	ND - 7	2	10	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Perchlorate	6 µg/L	Y	2	Annually/ Annually	NA	ND	ND - 4	ND	1	Used in solid rocket propellant, fireworks, explosives, flares, matches, and a variety of industries
Radioactivity										
Gross Alpha Particle Activity	15 pCi/L	Y	3	Varied[1]	NA	13	ND - 3	ND	(0)	Erosion of natural deposits
Gross Beta Particle Activity[3]	50 pCi/L	Y	4	Quarterly / WAIVED	ND - 5	ND	NA	ND	(0)	Decay of natural and man-made deposits
Uranium	20 pCi/L	Y	1	Varied[2]	NA	ND	ND - 4	ND	0.43	Erosion of natural deposits

Tap Monitoring Lead & Copper	Action Level	Meets Standard?	DLR	Lead and Copper Rule Sampled in 2021		Lead Testing in Schools Sampled in 2018			PHG	Typical Source of Contaminant
				Range	90th Percentile	No. of schools requesting lead sampling	Range	Average		
Lead	15 µg/L	Y	5	50 sites sampled; 0 sites over AL	ND	29	88 sites sampled; 0 sites over AL	ND	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper	1.3 mg/L	Y	0.05	50 sites sampled; 0 sites over AL	0.5	NA	NA	NA	0.3	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

Parameter	MCL	Meets Standard?	DLR	Sample Frequency Surface Water/ Groundwater	Treated Surface Water Plant Effluent Summary Sampled in 2023		Groundwater Summary Results from Wells Sampled in 2021-2023		Typical Source of Contaminant
					Range	Average	Range	Average	
Secondary Standards - Inorganic Chemicals									
Chloride	500 mg/L	Y	5	Quarterly/ Quarterly	61 - 100	79	ND - 105	29	Runoff; leaching from natural deposits; seawater influence
Odor-Threshold	3 units	Y	1	Weekly / Triennially	NA	1	ND - 2	ND	Naturally occurring organic materials
Specific Conductance	1600 µS/cm	Y	2	Annually / Triennially	NA	590	240 - 820	417	Substances that form ions when in water; seawater influence
Sulfate	500 mg/L	Y	5	Quarterly/ Quarterly	19 - 60	38	12 - 143	40	Runoff; leaching from natural deposits; industrial wastes
Total Dissolved Solids (TDS)	1000 mg/L	Y	10	Annually / Triennially	NA	300	150 - 470	251	Runoff/leaching of natural deposits
Turbidity	5 units	Y	0.1	Annually / Triennially	NA	0.3	ND - 0.4	ND	Soil Runoff
Additional Constituents Analyzed									
Boron	NL = 1 mg/L	Y	0.1	Annually / Triennially	NA	0.2	NA	ND	Erosion of natural deposits
Vanadium	NL = 50 µg/L	Y	3	Annually / Triennially	NA	ND	8 - 36	17	
Alkalinity	(NA) mg/L	NA	20	Weekly / Triennially	55 - 74	63	76 - 180	115	Dissolved as water passes through deposits which contain carbonate, bicarbonate, and hydroxide compounds
Calcium	(NA) mg/L	NA	1	Annually / Triennially	NA	31	11 - 72	38	Dissolved as water passes through limestone deposits
Chromium (Hexavalent)	(NA) µg/L	NA	1	Quarterly / Quarterly	NA	ND	ND - 12	4	Steel and pulp mill discharges, chrome plating, natural erosion
Hardness	(NA) gpg	NA	0.1	Weekly / Triennially	5 - 6	5	2 - 13	7	Sum of polyvalent cations present in the water, generally magnesium and calcium. The cations are usually naturally occurring.
Magnesium	(NA) mg/L	NA	0.1	Annually / Triennially	NA	8	0.4 - 13	6	Dissolved as water passes through magnesium-bearing minerals
pH	(NA) units	NA	0.1	Continuous / Triennially	6.8 - 7.4	7.1	8.0 - 8.4	8.2	Generally natural changes due to interactions with the environment
Potassium	(NA) mg/L	NA	1	Annually / Triennially	NA	3	ND - 3	ND	Leaching from natural deposits
Sodium	(NA) mg/L	NA	1	Annually / Triennially	NA	72	19 - 79	40	Generally naturally occurring salt present in water

Special Testing	MCL	Meets Standard?	MRL	Sample Frequency	Effluent & Dist. System		Groundwater		Environmental Source
					Range	Average	Range	Average	
UCMR 4 (Sampled in 2018 - 2019)									
HAA5	(NA) µg/L	NA	NA	Special	0.4 - 8.9	5.2	NA	NA	Byproduct of drinking water disinfection
HAA6Br	(NA) µg/L	NA	NA	Special	ND - 20	12	NA	NA	Byproduct of drinking water disinfection
HAA9	(NA) µg/L	NA	NA	Special	0.4 - 22	13	NA	NA	Byproduct of drinking water disinfection
Manganese	50 µg/L	Y	0.4	Special	ND - 3.4	1.4	ND - 2.1	ND	Leaching from natural deposits

[1] Sampled between 2015 and 2023. Individual sites are sampled every 3, 6 or 9 years. Range is from individual sample results.
[2] Sampled at least once every 9 years and when Gross Alpha Activity exceeds 5 pCi/L.
[3] The State Water Resources Control Board considers 50 pCi/L to be the level of concern for beta particles.

EDUCATIONAL INFORMATION AND POSSIBLE DRINKING WATER CONTAMINANTS:

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791). Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

NITRATE: In the Primary Standards Inorganic Chemicals section of the chart for Nitrate (as Nitrogen), treated surface water is ND . In the groundwater column, the range is ND to 7 mg/L, and the average is 2 mg/L. The State Water Boad requires annual sampling if results are less than 50% of the MCL. If the result from any one source is greater than 50% of the MCL, then sampling must be done quarterly at that source. PWD samples all its wells on a quarterly basis (4 times per year) even when they test below 50% of the MCL. The numbers expressed on the chart are derived from quarterly sampling of all PWD wells, except those that are out of service.

Health Effects of Nitrate: Nitrate in drinking water at levels above 10 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 10 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity.

Lead and Copper: Palmdale Water District is required to draw new sample sets of tap samples for lead and copper every 3 years. The last samples were taken in 2021 (50 samples). The 90th percentile results of ND for lead and 0.5 ppm for copper are well within the AL of 15 ppb for lead and the AL of 1.3 ppm for copper. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. PWD is responsible for providing high-quality drinking water, but is unable to control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you do so, you may wish to collect the flushed water and reuse it for another beneficial purpose, such as watering plants.

If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (1-800-426-4791) or at http://www.epa.gov/lead.

Health Effects of Lead: Infants and children who drink water containing lead in excess of the action level may experience delays in their physical or mental development. Children may show slight deficits in attention span and learning abilities. Adults who drink this water over many years may develop kidney problems or high blood pressure.

Health Effects of Copper: Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time may experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years may suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

DEFINITIONS:

The following definitions of key terms are provided to help you understand the data used in this report.

Detection Limit for purposes of Reporting (DLR): The smallest concentration of a contaminant that can be measured and reported. DLRs are set by State Water Board (same as MRL, Minimum Reporting Level, set by USEPA).

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Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

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Running Annual Average (RAA): The running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected.

Secondary Drinking Water Standard (SDWS): MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect the health at the MCL level.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Unregulated Contaminant Monitoring (UCMR): Unregulated contaminant monitoring helps USEPA and the State Water Board to determine where certain contaminants occur and whether the contaminants need to be regulated.

ADDITIONAL ABBREVIATIONS USED IN WATER QUALITY DATA CHART:

< Less Than

> Greater Than

NA: Not Applicable

ND: Not detectable or Non-Detected at testing limit (DLR or MRL)

TOC: Total Organic Carbon

gpg: grains per gallon (a unit of water hardness)

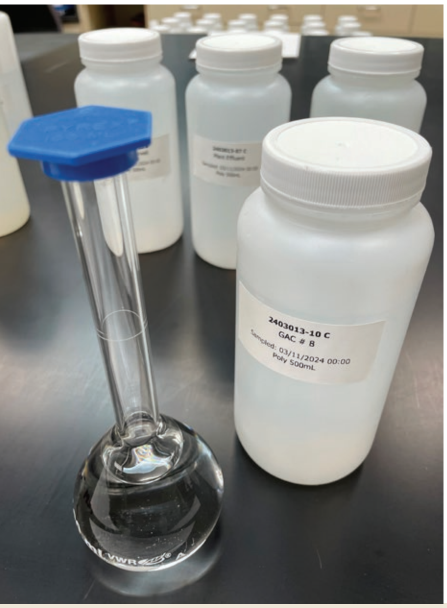
mg/L: milligrams per liter or parts per million (ppm)

NTU: Nephelometric Turbidity Units

pCi/L: picocuries per liter (a measure of radiation)

µg/L: micrograms per liter or parts per billion (ppb)

µS/cm: microsiemens per centimeter (a measure for conductivity)



STATE OF OUR WATER

As a Palmdale Water District (PWD) customer, you are receiving clean, high-quality water for you and your family. During 2023, the water provided to you met all federal and state safe drinking water regulations. This Consumer Confidence Report, which is updated and published annually, gives you detailed information about required water quality testing and their results.

This report also gives a snapshot of PWD's water sources and the amount supplied by each during the year. Last year, when 100% of the State Water Project allocation was received, PWD had more than enough to meet customers' needs. The excess allowed for over 6,000 acre-feet to be rolled over to 2024. With the State Water Project allocation at 40%, a full Littlerock Reservoir, and groundwater wells, there will be no shortage of water for the remainder of this year.

Fortunately, storms these past two winters have restored much of the state's reservoirs, including the Littlerock Reservoir, that were nearly depleted during the severe droughts. For PWD, it has depended on the reservoir at the Littlerock Dam for part of its water supply for the past 100 years. Since June 1, 1924, when the Littlerock Dam was completed, it has supplied water to PWD and the Littlerock Creek Irrigation District (LCID).

For the past century, the Littlerock Dam and Reservoir has played an important role in the growth and success of Palmdale, Littlerock and other communities in the southern Antelope Valley. On June 1, 2024, PWD and LCID celebrated the foresight of its predecessors who had the vision to build a monumental structure that still serves its original purpose of storing water and controlling floods.

We are thankful for the Littlerock Dam and Reservoir, a healthy water supply, and for your trust in us as we continue to provide you with high-quality water.

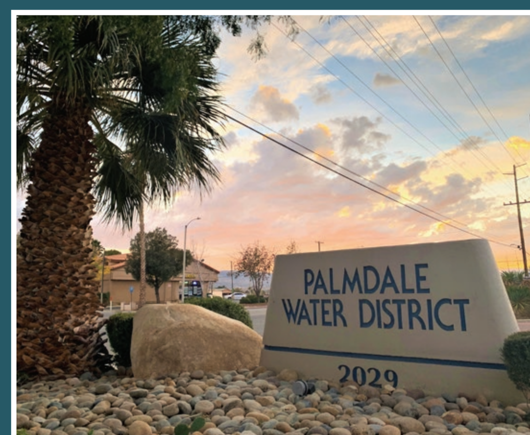
Kathy Mac Laren-Gomez (PWD Board President)
Dennis D. LaMoreaux (PWD General Manager)

The Palmdale Water District is pleased to announce 100% regulatory compliance in 2023 and is confident its drinking water is of the highest quality.

This Consumer Confidence Report is a snapshot of PWD's 2023 water quality and will provide you with a better understanding of the excellent quality of your drinking water. This report includes details about where your water comes from, what it contains, and how it compares to drinking water standards as set by the state of California. We are committed to providing you with this information because informed customers are our best allies. Stringent water-quality testing is performed before the water is delivered to consumers. Last year, PWD completed more than 15,000 tests for over 80 regulated contaminants. Only 11 primary standard contaminants were detected in 2023, and all were at levels below the Maximum Contaminant Level allowed by the state.

Last year, PWD completed more than **15,000** tests for over 80 regulated contaminants.

Please take the time to review this Consumer Confidence Report and Water Quality Data Chart to become an informed consumer. The Water Quality Data Chart is divided into two standards – Primary and Secondary. Primary standards are set to protect public health from contaminants in water that may be immediately harmful to humans or affect their health if consumed for long periods of time. Secondary standards govern aesthetic qualities of water, such as taste, mineral content, odor, color, and turbidity.



How to contact PWD:

- Attend Board of Directors meetings the second and fourth Mondays of each month. Board meetings start at 6:00 p.m. and are held at the PWD office, 2029 East Avenue Q, Palmdale.
- Call 661-947-4111 with questions about PWD or to file a water quality complaint.
- Call 661-947-4111 x5002 for information on water-use efficiency, including conservation and water education.

For more information, visit our website at palmdalewater.org.

OUR WATER SUPPLY

PWD acquires its water from one of three sources or a combination of these sources.

1. Surface water from the State Water Project (SWP/CA Aqueduct)

This water source begins in northern California, flows into the Delta near Sacramento, and is pumped south to Lake Palmdale. PWD is entitled to take a maximum of 21,300 acre-feet, or 6.9 billion gallons of water, per year. Based on the amount of rain & snowfall in the Sierra Nevada mountains and the amount of water stored in northern California reservoirs, PWD is granted a percentage of the annual entitlement. In 2023, PWD received 7,268 acre-feet from the SWP/CA Aqueduct. The water is drawn from the SWP/CA Aqueduct and stored in Lake Palmdale prior to treatment.

2. Surface water from Littlerock Reservoir

Littlerock Dam was built in 1924 and renovated in 1994 to strengthen the dam and increase the reservoir capacity to 3,500 acre-feet, or 1.1 billion gallons of water. In water year 2023 (October 2022 - September 2023), PWD diverted 4,827 acre-feet from this source. Littlerock Reservoir is fed by natural runoff from snowpacks in the local San Gabriel Mountains and from rainfall. The water is then transferred from Littlerock Reservoir to Lake Palmdale through a ditch connecting the two bodies of water for storage prior to treatment.

3. Groundwater

Groundwater is pumped from the Antelope Valley groundwater basin through 22 wells. In 2023, PWD pumped 4,177 acre-feet. This water is treated with chlorine before being pumped directly into the distribution system.

All three sources are constantly tested and treated in compliance with all applicable regulations to ensure high-quality water and dependability of the water system. The Palmdale Water District delivered approximately 75% surface water and 25% groundwater to its consumers in 2023.

SOURCES OF DRINKING WATER

The sources of drinking water, both tap and bottled, include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- **Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.**
- **Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.**
- **Pesticides and herbicides that may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.**
- **Organic chemical contaminants, including synthetic and volatile organic chemicals, that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.**
- **Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.**

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (U.S. EPA) and the State Water Resources Control Board (State Water Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. State Water Board regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

DRINKING WATER SOURCE ASSESSMENT AND PROTECTION PROGRAM

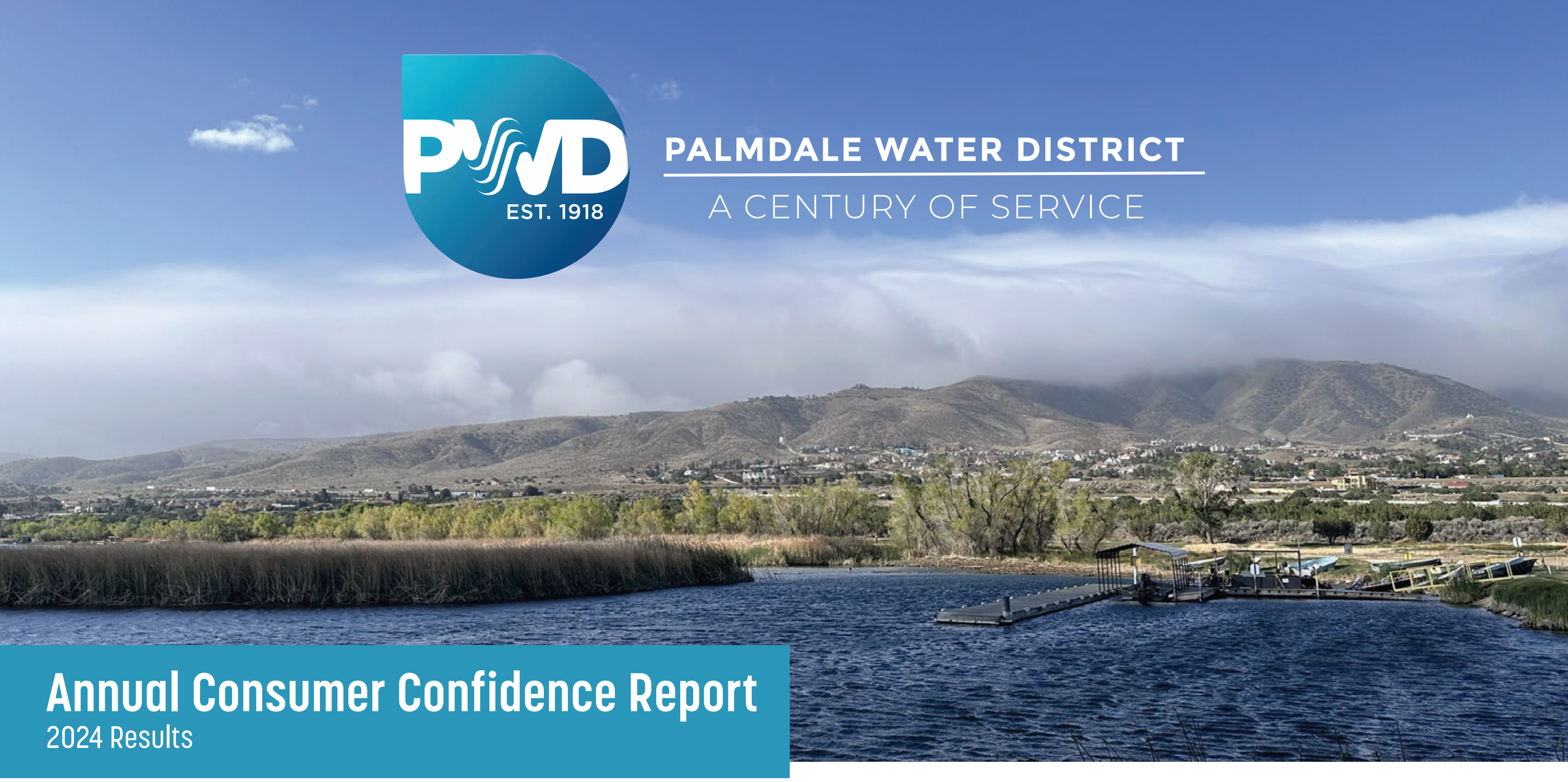
Palmdale Water District's Sanitary Survey, including a Source Water Assessment of surface waters, was updated in 2023 in compliance with state of California regulations. The assessment of surface water sources included Littlerock Reservoir and Lake Palmdale. A Groundwater Assessment and Protection Program was completed in January of 1999, and a Wellhead Protection Plan was completed in November 2000.

PWD's drinking water sources are considered most vulnerable to the following activities associated with contaminants detected in the water supply: illegal activities, such as unauthorized dumping; recreation; highways; railroads; and sewer collection systems. A comprehensive source water protection program can prevent contaminants from entering the public water supply, reduce treatment costs, and increase public confidence in the quality, reliability and safety of drinking water.

You can help prevent water contamination and pollution by properly disposing of trash and waste materials.

Remember, many common household products can contaminate surface and groundwater supplies. Anything you throw in the trash, dump on the ground, pour down the drain, or wash down the driveway can eventually reach water sources and cause contamination.

The Sanitary Survey, Source Water Assessment, Groundwater Assessment, and Wellhead Protection Plan are available for review on PWD's website at palmdalewater.org or at PWD's office by calling Assistant General Manager Adam Ly at 661-947-4111 x1062.



PALMDALE WATER DISTRICT

A CENTURY OF SERVICE

Annual Consumer Confidence Report

2024 Results

Our mission is to provide high-quality water to our current and future customers at a reasonable cost.

Questions or comments on the contents of this report are encouraged. Please contact Operations Manager Joe Marcinko at 661-947-4111 x1185 or Water Quality & Regulatory Affairs Supervisor Amanda Thompson at 661-947-4111 x1178, Monday through Thursday, 8 a.m. to 5 p.m.

ATTENCION RESIDENTES!
Esta publicación está disponible en español en nuestro sitio web en palmdalewater.org. Para obtener una copia impresa en español, visite nuestra oficina o llame al 661-947-4111.

Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550
661-947-4111

BOARD OF DIRECTORS

THE WATER QUALITY DATA CHART LISTS ALL DRINKING WATER CONTAMINANTS DETECTED DURING THE 2024 CALENDAR YEAR.

The presence of these contaminants in the water does not necessarily indicate the water poses a health risk. PWD tests for many contaminants in addition to those listed in the chart. Test results for these additional contaminants were all "Non-Detected" (ND) and are not required to be included in the chart. The State allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. As a result, some of the data, though representative of the water quality, is more than one year old. Unless otherwise noted, the data presented in this chart is from testing performed January 1 to December 31, 2024.

Parameter	Regulation	Meets Standard?	MRL	Sample Frequency	Water Treatment Plant		PHG (MCLG)	Typical Source of Contaminant
Filter Turbidity					Maximum Result			
Turbidity	TT = 1 NTU	Y	0.1	Continuous	0.1		NA	Soil Runoff
	TT = 95% of monthly samples ≤0.3 NTU	Y	NA		100% ≤ 0.3 NTU			

Turbidity is a measure of the cloudiness of the water. We measure it because it is a good indicator of the effectiveness of our filtration system.

Parameter	Regulation	Meets Standard?	MRL	Sample Frequency	Water Treatment Plant		PHG (MCLG)	Typical Source of Contaminant
Disinfection Byproduct Precursors								
Control of DBP Precursor (TOC)	TT = ratio of actual TOC removal to required TOC removal shall be ≥ 1	Y	NA	Monthly	2.0 - 3.3	2.7	NA	Various natural and man-made sources

Parameter	Regulation or MCL	Meets Standard?	MRL	Sample Frequency	Distribution System		PHG (MCLG) [MRDLG]	Typical Source of Contaminant
Microbiological					Highest Monthly Percentage			
Total Coliform Bacteria	TT = No more than 5.0% of monthly samples are positive	Y	NA	Weekly	0.8%		0	Naturally present in the environment
Disinfectant Residual					Range	RAA		
Chlorine (as Cl2)	MRDL = 4.0 mg/L	Y	0.1	Weekly	0.4 - 1.9	1.2	[4]	Drinking water disinfectant added for treatment
Disinfection Byproducts (DBPs)					Range	Highest LRAA		
TTHMs (Total Trihalomethanes)	80 µg/L	Y	1	Quarterly	ND - 75	59	NA	Byproduct of drinking water disinfection
HAA5 (Sum of 5 Haloacetic Acids)	60 µg/L	Y	2	Quarterly	ND - 13	9		

Parameter	Regulation	Meets Standard?	DLR	Sample Frequency	Customer Taps		PHG	Typical Source of Contaminant
Lead and Copper Rule					No. Samples	90th Percentile		
Lead	AL = 15 µg/L	Y	5	Triennially	50; none over AL	ND	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper	AL = 1.3 mg/L	Y	0.05	Triennially	50; none over AL	0.4	0.3	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

Parameter	MCL	Meets Standard?	DLR	Sample Frequency Surface Water / Groundwater	Treated Surface Water Sampled in 2024		Groundwater Sampled in 2022-2024		PHG (MCLG)	Typical Source of Contaminant
					Range	Average	Range	Average		
Inorganic Chemicals										
Arsenic	10 µg/L	Y	2	Annually / Triennially	NA	ND	ND - 3	ND	0.004	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
Chromium (Total)	50 µg/L	Y	10	Annually / Triennially	NA	ND	ND - 20	ND	(100)	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Chromium (Hexavalent)	10 µg/L	Y	0.1	Annually / Triennially	NA	ND	0.5 - 9	4	0.02	Erosion of natural deposits; transformation of naturally occurring trivalent chromium to hexavalent chromium by natural processes and human activities such as discharges from electroplating factories, leather tanneries, wood preservation, chemical synthesis, refractory production, and textile manufacturing facilities
Fluoride (naturally occurring)	2.0 mg/L	Y	0.1	Quarterly/Quarterly	0.1 - 0.2	0.1	ND - 0.5	0.2	1	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
Nitrate (as Nitrogen)	10 mg/L	Y	0.4	Quarterly/Quarterly	NA	ND	ND - 7	2	10	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Perchlorate	6 µg/L	Y	2	Annually/ Annually	NA	ND	ND - 1	ND	1	Used in solid rocket propellant, fireworks, explosives, flares, matches, and a variety of industries. It usually gets into drinking water as a result of environmental contamination from historic aerospace or other industrial operations that used or use, store, or dispose of perchlorate and its salts.
Radioactivity										
Gross Alpha Particle Activity	15 pCi/L	Y	3	Varied[1]	NA	13	ND - 5	ND	0	Erosion of natural deposits
Uranium	20 pCi/L	Y	1	Varied[2]	NA	ND	ND - 4	ND	0.43	Erosion of natural deposits

Parameter	MCL	Meets Standard?	DLR	Sample Frequency Surface Water / Groundwater	Treated Surface Water Sampled in 2024		Groundwater Sampled in 2022-2024		PHG (MCLG)	Typical Source of Contaminant
					Range	Average	Range	Average		
Inorganic Chemicals										
Chloride	500 mg/L	Y	5	Quarterly/ Quarterly	60 - 79	68	ND - 64	25	NA	Runoff; leaching from natural deposits; seawater influence
Odor-Threshold	3 units	Y	1	Weekly / Triennially	1 - 2	1	ND - 2	ND	NA	Naturally occurring organic materials
Specific Conductance	1600 µS/cm	Y	2	Annually / Triennially	NA	440	240 - 820	419	NA	Substances that form ions when in water; seawater influence
Sulfate	500 mg/L	Y	5	Quarterly/ Quarterly	19 - 30	26	10 - 101	38	NA	Runoff; leaching from natural deposits; industrial wastes
Total Dissolved Solids (TDS)	1000 mg/L	Y	10	Annually / Triennially	NA	250	150 - 470	251	NA	Runoff/leaching of natural deposits
Turbidity	5 units	Y	0.1	Annually / Triennially	NA	0.2	ND - 0.4	ND	NA	Soil Runoff
Additional Constituents Analyzed										
Vanadium	NL = 50 µg/L	Y	3	Annually / Triennially	NA	ND	8 - 48	18	NA	Erosion of natural deposits
Alkalinity	(NA) mg/L	NA	20	Weekly / Triennially	64 - 78	70	76 - 180	115	NA	Dissolved as water passes through deposits which contain carbonate, bicarbonate, and hydroxide compounds
Calcium	(NA) mg/L	NA	1	Annually / Triennially	NA	30	11 - 72	37	NA	Dissolved as water passes through limestone deposits
Hardness	(NA) gpg	NA	0.1	Weekly / Triennially	5.0 - 6.6	5.9	1.7 - 13	6.9	NA	Sum of polyvalent cations present in the water, generally magnesium and calcium. The cations are usually naturally occurring.
Magnesium	(NA) mg/L	NA	0.1	Annually / Triennially	NA	9.1	0.4 - 13	6.1	NA	Dissolved as water passes through magnesium-bearing minerals
pH	(NA) units	NA	0.1	Continuous / Triennially	6.8 - 7.8	7.2	8.0 - 8.4	8.2	NA	Generally natural changes due to interactions with the environment
Potassium	(NA) mg/L	NA	1	Annually / Triennially	NA	3	ND - 3	ND	NA	Leaching from natural deposits
Sodium	(NA) mg/L	NA	1	Annually / Triennially	NA	44	19 - 79	40	NA	Generally naturally occurring salt present in water

UCMR 5	Regulation	Meets Standard?	MRL	Sample Frequency Surface Water / Groundwater	Treated Surface Water Sampled in 2024 - 2025		Groundwater Sampled in 2024		PHG (MCLG)	Typical Source of Contaminant
					Range	Average	Range	Average		
PFBS [Perfluorobutanesulfonic acid]	NL = 500 ng/L	NA	3	Special	NA	ND	ND - 5	ND	NA	PFAS are a group of synthetic chemicals used in a wide range of consumer products and industrial applications including: non- stick cookware, water-repellent clothing, stain-resistant fabrics and carpets, cosmetics, firefighting foams, electroplating, and products that resist grease, water, and oil.
PFHxA [Perfluorohexanoic acid]	(NA) ng/L	NA	3	Special	NA	ND	ND - 6	ND	NA	
PFPeA [Perfluoropentanoic acid]	(NA) ng/L	NA	3	Special	NA	ND	ND - 5	ND	NA	

[1] Sampled between 2016 and 2024. Individual sites are sampled every 3, 6, or 9 years. Range is from individual sample results.
[2] Sampled at least once every 9 years and when Gross Alpha Activity exceeds 5 pCi/L.

EDUCATIONAL INFORMATION AND POSSIBLE DRINKING WATER CONTAMINANTS:

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791). Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

NITRATE: In the Primary Standards Inorganic Chemicals section of the chart for Nitrate (as Nitrogen), treated surface water is ND . In the groundwater column, the range is ND to 7 mg/L, and the average is 2 mg/L. The State Water Boad requires annual sampling if results are less than 50% of the MCL. If the result from any one source is greater than 50% of the MCL, then sampling must be done quarterly at that source. PWD samples all its wells on a quarterly basis (four times per year) even when they test below 50% of the MCL. The numbers expressed on the chart are derived from quarterly sampling of all PWD wells, except those that are out of service.

Health Effects of Nitrate: Nitrate in drinking water at levels above 10 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 10 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity.

Lead and Copper: Palmdale Water District is required to draw new sample sets of tap samples for lead and copper every three years. The last samples were taken in 2024 (50 samples). The 90th percentile results of ND for lead and 0.4 ppm for copper are well within the AL of 15 ppb for lead and the AL of 1.3 ppm for copper. Lead can cause serious health effects in people of all ages, especially pregnant people, infants (both formula-fed and breastfed), and young children. Lead in drinking water is primarily from materials and parts used in service lines and in home plumbing. Palmdale Water District is responsible for providing high-quality drinking water and removing lead pipes but cannot control the variety of materials used in the plumbing in your home. Because lead levels may vary over time, lead exposure is possible even when your tap results do not detect lead at one point in time. You can help protect yourself and your family by identifying and removing lead materials within your home plumbing and taking steps to reduce your family's risk. Using a filter, certified by an American National Standards Institute accredited certifier to reduce lead, is effective in reducing lead exposures. Follow the instructions provided with the filter to ensure the filter is used properly. Use only cold water for drinking, cooking, and making baby formula. Boiling water does not remove lead from water. Before using tap water for drinking, cooking, or making baby formula, flush your pipes for several minutes. You can do this by running your tap, taking a shower, doing laundry or a load of dishes. If you have a lead service line or galvanized requiring replacement service line, you may need to flush your pipes for a longer period.

If you are concerned about lead in your water and wish to have your water tested, contact Palmdale Water District (661-947-4111). Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available at https:www.epa.gov/safewater/lead.

PWD has prepared a Lead Service Line Inventory and information can be found on our website: https://www.palmdalewater.org/water-quality/lsli/

DEFINITIONS:

The following definitions of key terms are provided to help you understand the data used in this report.

Detection Limit for purposes of Reporting (DLR): The smallest concentration of a contaminant that can be measured and reported. DLRs are set by State Water Board (same as MRL, Minimum Reporting Level, set by USEPA).

Locational Running Annual Average (LRAA): The running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of samples taken at a particular monitoring location.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

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NTU: Nephelometric Turbidity Units

pCi/L: picocuries per liter (a measure of radiation)

µg/L: micrograms per liter or parts per billion (ppb)

µS/cm: microsiemens per centimeter (a measure for conductivity)

STATE OF OUR WATER

Once again, Palmdale Water District (PWD) is proud to share with the 127,000-plus people it serves that they received clean, high-quality water in 2024. Based on numerous tests throughout the year, our water met all federal and state safe drinking water regulations. This positive news is what our team strives for every day while ensuring water flows uninterrupted to each of you in our District.

As government regulations increase, PWD is committed to doing its part to meet guidelines. We have staff collecting and testing water throughout our 187-square-mile boundaries nearly every day. These consistent samplings ensure that there is always a watchful eye on the quality of the water you are receiving.

The charts in this Consumer Confidence Report (CCR) may not be the easiest to understand due to their scientific nature. If you need clarification or assistance, please know that PWD's laboratory staff are available to answer your questions. Our hope is that more of our customers take an interest in understanding their water quality and the origins of the water supply.

This CCR also serves as a platform for us to inform you of PWD's sources of water. As of spring, the allocation from the State Water Project is 50%. Although we did not have a wet winter locally, the northern Sierra Nevada had a snowy season, and heavy rain in Northern California filled many reservoirs. With the state's allocation, pumping rights, Littlerock Reservoir's supply and carryover water from last year, PWD will not be restricting water use this year.

The last time drought restrictions were enforced was in 2022, following three straight years of dry weather. But the unpredictable climate has become the norm and planning for our water future is critical. We are currently constructing the Pure Water Antelope Valley (AV) Demonstration Facility, which will purify recycled water for potable use.

We look forward to introducing you to Pure Water AV and showing you the technology that will make it possible for us to use a new source of water to continue serving you the clean water you need and expect.

Kathy Mac Laren-Gomez (PWD Board President)
Dennis D. LaMoreaux (PWD General Manager)

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This Consumer Confidence Report is a snapshot of PWD's 2024 water quality and will provide you with a better understanding of the excellent quality of your drinking water. This report includes details about where your water comes from, what it contains, and how it compares to drinking water standards as set by the state of California. We are committed to providing you with this information because informed customers are our best allies. Stringent water-quality testing is performed before the water is delivered to consumers. Last year, PWD completed more than 15,000 tests for over 80 regulated contaminants. Only 12 primary standard contaminants were detected in 2024, and all were at levels below the Maximum Contaminant Level allowed by the state.

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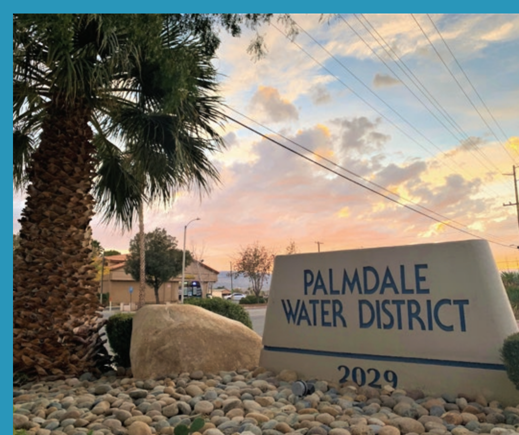
Please take the time to review this Consumer Confidence Report and Water Quality Data Chart to become an informed consumer. The Water Quality Data Chart is divided into two standards – Primary and Secondary. Primary standards are set to protect public health from contaminants in water that may be immediately harmful to humans or affect their health if consumed for long periods of time. Secondary standards govern aesthetic qualities of water, such as taste, mineral content, odor, color, and turbidity.



How to contact PWD:

- Attend Board of Directors meetings the second and fourth Mondays of each month. Board meetings start at 6 p.m. and are held at the PWD office, 2029 East Avenue Q, Palmdale.
- Call 661-947-4111 with questions about PWD or to file a water quality complaint.
- Call 661-947-4111 x5002 for information on water-use efficiency, including conservation and water education.

For more information, visit our website at palmdalewater.org.

OUR WATER SUPPLY

PWD acquires its water from one of three sources or a combination of these sources.

1. Surface water from the State Water Project (SWP/CA Aqueduct)

This water source begins in northern California, flows into the Delta near Sacramento, and is pumped south to Lake Palmdale. PWD is entitled to take a maximum of 21,300 acre-feet, or 6.9 billion gallons of water, per year. Based on the amount of rain & snowfall in the Sierra Nevada mountains and the amount of water stored in northern California reservoirs, PWD is granted a percentage of the annual entitlement. In 2024, PWD received 7,196 acre-feet from the SWP/CA Aqueduct. The water is drawn from the SWP/CA Aqueduct and stored in Lake Palmdale prior to treatment.

2. Surface water from Littlerock Reservoir

Littlerock Dam was built in 1924 and renovated in 1994 to strengthen the dam and increase the reservoir capacity to 3,500 acre-feet, or 1.1 billion gallons of water. In water year 2024 (October 2023 - September 2024), PWD diverted 5,326 acre-feet from this source.Littlerock Reservoir is fed by natural runoff from snowpacks in the local San Gabriel Mountains and from rainfall. The water is then transferred from Littlerock Reservoir to Lake Palmdale through a ditch connecting the two bodies of water for storage prior to treatment.

3. Groundwater

Groundwater is pumped from the Antelope Valley groundwater basin through 22 wells. In 2024, PWD pumped 5,362 acre-feet. This water is treated with chlorine before being pumped directly into the distribution system.

All three sources are constantly tested and treated in compliance with all applicable regulations to ensure high-quality water and dependability of the water system. The Palmdale Water District delivered approximately 71% surface water and 29% groundwater to its consumers in 2024.

SOURCES OF DRINKING WATER

The sources of drinking water, both tap and bottled, include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- **Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.**
- **Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.**
- **Pesticides and herbicides that may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.**
- **Organic chemical contaminants, including synthetic and volatile organic chemicals, that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.**
- **Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.**

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (U.S. EPA) and the State Water Resources Control Board (State Water Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health.

DRINKING WATER SOURCE ASSESSMENT AND PROTECTION PROGRAM

Palmdale Water District's Sanitary Survey, including a Source Water Assessment of surface waters, was updated in 2023 in compliance with state of California regulations. The assessment of surface water sources included Littlerock Reservoir and Lake Palmdale. A Groundwater Assessment and Protection Program was completed in January of 1999, and a Wellhead Protection Plan was completed in November 2000.

PWD's drinking water sources are considered most vulnerable to the following activities associated with contaminants detected in the water supply: illegal activities, such as unauthorized dumping; recreation; highways; railroads; and sewer collection systems. A comprehensive source water protection program can prevent contaminants from entering the public water supply, reduce treatment costs, and increase public confidence in the quality, reliability and safety of drinking water.

You can help prevent water contamination and pollution by properly disposing of trash and waste materials.

Remember, many common household products can contaminate surface and groundwater supplies. Anything you throw in the trash, dump on the ground, pour down the drain, or wash down the driveway can eventually reach water sources and cause contamination.

The Sanitary Survey, Source Water Assessment, Groundwater Assessment, and Wellhead Protection Plan are available for review on PWD's website at palmdalewater.org or at PWD's office by calling Assistant General Manager Scott Rogers at 661-947-4111 x1020.

ATTACHMENT NO. 6

GLOSSARY OF TERMS AND ABBREVIATIONS

ACWA:	Association of California Water Agencies
BAT:	Best Available Technology to achieve compliance with an MCL
DDW:	Division of Drinking Water
DLR:	Detection Limit for Reporting Purposes; set by SWRCB
MCL:	Maximum Contaminant Level; set by SWRCB and USEPA
MCLG:	Maximum Contaminant Level Goal; set by USEPA
MGD:	Million Gallons per Day
OEHHA:	Office of Environmental Health Hazard Assessment (State of California)
PHG:	Public Health Goal; set by OEHHA
SWRCB:	State Water Resources Control Board
USEPA:	United States Environmental Protection Agency
mg/L:	milligrams per liter or parts per million
pCi/L:	picocuries per liter
µg/L:	micrograms per liter or parts per billion