RIVERSIDE PUBLIC UTILITIES

2025 PUBLIC WATER SYSTEM REPORT ON PUBLIC HEALTH GOALS
California Health and Safety Code
Section 116470(b)

The City of Riverside Public Utilities (RPU) submits the following public water system report on Public Health Goals (PHGs) to satisfy the requirements of the California Health and Safety Code Section 116470(b). An excerpt from the California Health and Safety Code describing the requirements for the PHG report is detailed in Exhibit 1.

Purpose
The purpose of the PHG report is to provide our customers information in addition to the Annual Consumer Confidence Report (CCR) delivered to each customer in June. The PHG report provides additional information on the levels of constituents below the enforceable mandatory Maximum Contaminant Level (MCL) and an estimate of the cost to eliminate any trace of the constituents from drinking water regardless of the level of risk. The PHG report was prepared from data listed in the annual CCRs, which is attached in Exhibit 2. A table of regulated constituents and corresponding MCLs, PHGs, or Maximum Contaminant Level Goals (MCLGs) is provided in Exhibit 3.

RPU is proud to provide its customers with water that meets all federal and state drinking water standards. The PHG report specifies the constituents in RPU drinking water that are above their respective state PHG or federal MCLG during calendar years 2022 to 2024. Both the PHG and MCLG represent non-enforceable goals, at which a theoretical minimal risk to public health is expected. These goals are useful tools for establishing drinking water standards. The PHG report elaborates on the following three important realities of drinking water safety:

- Drinking water in full compliance with existing water quality standards may expose customers to some level of risk, although very low in comparison with other sources of health risk.
- There can be significant costs and technology limitations associated with water treatment to reduce such low risks.
- No large public water system is expected to meet all PHGs and MCLGs.

Definitions
The following definitions are provided to assist in the understanding of this report.

Maximum Contaminant Level or MCL is defined as the highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to their respective PHG or MCLG as is economically and technologically feasible.

Maximum Contaminant Level Goal or MCLG is the level of a contaminant in drinking water below which there is no known or expected risk to human health. MCLGs are non-enforceable health goals.

Public Health Goal or PHG is the concentration of a drinking water contaminant that poses no significant health risk if consumed for a lifetime, based on current risk assessment principles, practices, and methods. PHGs are established by the Office of Environmental Health Hazard Assessment (OEHHA) pursuant to Health & Safety Code §116365(c) for contaminants with MCLs, and for those for which MCLs will be adopted.

Treatment Technology or TT is defined as a required process intended to reduce the level of a contaminant in drinking water.

Action Level or AL is defined as the level at which additional action, as defined by State Water Resources Control Board Division of Drinking Water (DDW), to reduce copper and lead levels and optimize corrosion control.

Detection Limits for purposes of Reporting or DLR is the state designated minimum level at or above which any analytical finding of a contaminant in drinking water resulting from required monitoring.

Best Available Technologies or BAT is defined as the best available technology, treatment techniques, and/or other means available for achieving compliance with the MCL.

ND stands for non-detect. The constituent is below the value set for DLR.

Numeric Health Risk is determined by OEHHA. The risk level is based on long term exposures to low levels of contaminants in drinking water. It is usually stated in terms of additional cancer risk per a stipulated population, e.g., 1×10^{-6} means one excess cancer case per million population.

Part Per Billion or ppb is the weight of a chemical dissolved in a volume of water. One part per billion would be equal to one second in 31 years. ppb = ug/L

Part Per Trillion or ppt is the weight of a chemical dissolved in a volume of water. One part per trillion would be equal to one second in 31,000 years. ppt = ng/L

Picocurie per liter or pCi/L is the measure of the rate of radioactive decay of radon.

Granular Activated Carbon or GAC is a treatment process using granular activated carbon to remove organic contaminants from water by adsorption.

Ion Exchange or IX is a treatment process in which ion contaminants are removed from a liquid phase by contacting a resin that is coated with other ions.

Reverse Osmosis or RO is a treatment process that removes contaminants from water by using pressure to force water molecules through a semipermeable membrane

Applicable PHG or MCLG

There are seven constituents found in the RPU drinking water, which do not meet the applicable PHG or MCLG based on compliance monitoring data from 2022 to 2024, which are summarized in Table 1.

Table 1 – PHG or MCLG Exceedance

Constituent, unit	MCL or (AL)	RPU Average/ (Range)	DLR Detec-tion Limit	PHG or MCLG	Health Risk Category	Numeric Risk @ PHG	Numeric Risk @ MCL	Sources	BAT
Arsenic, ppb	10	2.6/ (ND-6.5)	2	0.004	Cancer	1×10^{-6} (one per million)	2.5×10^{-3} (2.5 per thousand)	Erosion of natural deposits	IX
Chromium, Hexavalent, ppb	10	2.1/ N/A	0.1	0.02	Cancer	1×10^{-6} (one per million)	5×10^{-4} (five per ten thousand)	Industrial/ Erosion of natural deposits	IX & RO
Gross Alpha Particle Activity, pCi/L	15	ND/ (ND-4.7)	3	0	Cancer	0	up to 1×10^{-3} for ^{210}Po	Erosion of natural deposits	IX & RO
Nickel, ppb	100	ND/ (ND-29)	10	12	Developmental toxicity	NA	NA	Erosion of natural deposits	RO
Perchlorate, ppb	6	1.9/ (ND-2.9)	1*	1	Endocrine and developmental toxicity	NA	NA	Industrial	IX
Uranium, pCi/L	20	6.3/ (4.2-11.7)	1	0.43	Cancer	1×10^{-6} (one per million)	5×10^{-5} (five per hundred thousand)	Erosion of natural deposits	IX
Copper 90% Household Tap, ppb	1300	520**/ (ND-980)	50	300	Gastro-intestinal effects	NA	NA	Natural/ Home plumbing	TT

*The perchlorate DLR was reduced from 2 ppb to 1 ppb in 2024. | **90th Percentile of 51 samples

Arsenic

The range of arsenic in RPU's water is non-detect (ND) to 6.5 ppb. The average arsenic level is 2.6 ppb. Arsenic is found in water due to erosion of natural deposits in the soil. Compliance with arsenic MCL is achieved by blending water containing ND to low levels of arsenic with waters that have higher levels of arsenic. Arsenic levels are frequently monitored before and after blending and before being distributed to consumers.

The category of health risk associated with arsenic, and the reason that a drinking water standard was adopted for it, is that people who drink water containing arsenic above the MCL throughout their lifetime could experience an increased risk of getting cancer.

Chromium, Hexavalent

Effective October 1, 2024, the State Water Board adopted the Hexavalent Chromium MCL Regulation requiring monitoring of hexavalent chromium. During this reporting period hexavalent chromium was sampled one time with a result of 2.1 ppb. Compliance with hexavalent chromium MCL is achieved by blending water containing ND to low levels of hexavalent chromium with waters that have higher levels of hexavalent chromium. Hexavalent chromium levels are monitored before and after blending and before being distributed to consumers.

The category of health risk associated with hexavalent chromium, and the reason that a drinking water standard was adopted for it, is that people who drink water containing hexavalent chromium above the MCL throughout their lifetime could experience an increased risk of getting cancer.

Gross Alpha Particle Activity

Gross Alpha particle activity ranges from ND to 4.7 pCi/L. The average gross alpha level is ND pCi/L. Gross alpha is found due to erosion of natural deposits in the soil. Similar to arsenic, concentrations of gross alpha particle activity is blended with water from domestic wells with little or no trace of gross alpha particle activity to comply with the 15 pCi/L drinking water standard. Gross alpha particle activity is monitored weekly at a designated distribution compliance location.

The category of health risk associated with gross alpha particle activity, and the reason that a drinking water standard was adopted for it, is that people who drink water containing gross alpha particle activity above the MCL throughout their lifetime could experience an increased risk of getting cancer.

Nickel

The range of nickel in RPU's water is non-detect (ND) to 29 ppb. The average nickel level is ND. Nickel is found in water due to erosion of natural deposits in the soil. Compliance with the nickel MCL is achieved by blending water containing ND to low levels of nickel with waters that have higher levels of nickel. Nickel levels are frequently monitored before and after blending and before being distributed to consumers.

The category of health risk associated with nickel, and the reason that a drinking water standard was adopted for it, is that people who drink water containing nickel above the MCL throughout their lifetime could experience an increased risk of developmental toxicity.

Perchlorate

The range of perchlorate in RPU's water is non-detect (ND) to 2.9 ppb. The average perchlorate level is 1.9 ppb. Compliance with the perchlorate MCL is achieved by a combination of ion exchange treatment and blending water. Perchlorate levels are frequently monitored at the well site, within the treatment plants, before and after blending and before being distributed to consumers. Note: the DLR for perchlorate was reduced from 2 ppb to 1 ppb in 2024.

The category of health risk associated with perchlorate, and the reason that a drinking water standard was adopted for it, is that people who drink water containing perchlorate above the MCL

throughout their lifetime could experience an increased risk of endocrine and developmental toxicity.

Uranium

The range of uranium level in RPU's water is 4.2 pCi/L to 11.7 pCi/L. The average is 6.3 pCi/L. Uranium is found due to erosions of natural deposits in the soil. Compliance with the uranium MCL is achieved by blending. Uranium is analyzed on a weekly basis at a designated compliance location.

The category of health risk associated with uranium, and the reason that a drinking water standard was adopted for it, is that people who drink water containing uranium above the MCL throughout their lifetime could experience an increased risk of getting cancer.

Copper (at the tap)

RPU delivers drinking water, which has no detectable level of copper before it is served to homes. Since 1992, RPU has participated in EPA's Lead and Copper First Flush Household Tap Monitoring Program and demonstrated compliance with the Action Levels for lead and copper. This monitoring occurs every three years and requires testing from customer's indoor water faucets. The most recent results showed a range of copper levels at the tap from non-detect (ND) to 980 ppb from 51 samples. The 90^{th} percentile of samples was of 520 ppb.

The category of health risk for copper is gastrointestinal irritation. According to OEHHA no cancer risk is calculated for chemicals considered "non-carcinogens." For non-carcinogens, an exact numerical public health risk cannot be calculated.

Treatment Options and Cost

RPU has not developed a plan to provide treatment and reduce levels of arsenic, hexavalent chromium, gross alpha particle activity, nickel, perchlorate, uranium, and copper in its drinking water to zero. Staff will develop plans and a cost benefit analysis on how to reduce the levels of these constituents should new regulations be developed.

Arsenic

Ion Exchange (IX) treatment is one of several best available technologies (BATs) for arsenic treatment. The estimated cost to install and operate a centralized IX treatment system that would reliably reduce arsenic levels to zero would range from $16 to $53 million per year. This would result in an assumed increased cost for each customer of $245 to $802 per year.

Chromium, Hexavalent

The BAT for hexavalent chromium is Reverse Osmosis. The estimated cost to install and operate a centralized RO treatment system that would reliably reduce the hexavalent chromium to zero would range from be $56 to $219 million a year. This would result in an assumed increase cost for each customer of $835 to $3,293 per year.

Gross Alpha Particle Activity
The BAT for gross alpha is Reverse Osmosis. The estimated cost to install and operate a centralized RO treatment system that would reliably reduce the gross alpha particle activity to zero would range from be $56 to $219 million a year. This would result in an assumed increase cost for each customer of $835 to $3,293 per year.

Nickel
The BAT for nickel is Reverse Osmosis. The estimated cost to install and operate a centralized RO treatment system that would reliably reduce nickel to zero would range from be $56 to $219 million a year. This would result in an assumed increase cost for each customer of $835 to $3,293 per year.

Perchlorate
The BAT for perchlorate is IX, which is currently used at four of our treatment plant locations. Additional treatment would be needed to meet the PHG of 1 ppb. This would result in an assumed increase cost for each customer of up $464 per year.

Uranium
Ion Exchange (IX) treatment is one of several BATs for uranium treatment. The estimated cost to install and operate a centralized IX treatment system that would reliably reduce uranium levels to zero would range from $16 to $53 million per year. This would result in an assumed increased cost for each customer of $245 to $802 per year

Copper
Our water is in full compliance with the Federal and State Lead and Copper Rule and deemed to have “optimized corrosion control,” RPU is following the BAT for copper. Therefore, RPU will continue to monitor our water quality parameters that relate to corrosivity, such as pH, hardness, alkalinity, and total dissolved solids. Thus, no estimate of cost has been included.

Numeric Health Risk
The numeric public health risk associated with the MCL for each contaminant identified and the numeric public health risk associated with the PHG for that contaminant are to be determined by the Office of Environmental Health Hazard and Assessment (OEHHA) pursuant to California Health and Safety Code Section 113670.

According to OEHHA, the cancer risk level is based on a theoretical 70-year lifetime excess cancer risk at the statistical confidence limit. Actual cancer risk may be lower or zero. Cancer risk is stated in terms of excess cancer cases per million (or fewer) populations, e.g., 1×10^{-4} means one hundred excess cancer cases per million constituents.

For more information on health risk please contact the OEHHA website at https://oehha.ca.gov/ Also the Safe Drinking Water Hotline at 1.800.426.4791 offers additional information for customers on drinking water.

Category of Risk to Public Health
The category of risk to public health is summarized in Table 1 and discussed briefly in the sections for each constituent.

Health Effects Language
The State Water Resources Control Board DDW provides an explanation of potential adverse health effects for synthetic organic and inorganic chemicals pursuant to Section 64465. RPU provides this information for your knowledge and benefit for the constituents, which did exceed the PHG or MCLG.

Arsenic: “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.”

Chromium, Hexavalent: “Some people who drink water containing hexavalent chromium in excess of the MCL over many years may have an increased risk of getting cancer.”

Gross Alpha: “Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.”

Nickel: “Some people who drink water containing nickel in excess of the MCL over many years may experience liver and heart effects.”

Perchlorate: “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.”

Uranium: “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.”

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 in excess of the action level over a period of years may suffer liver or kidney damage. People with Wilson’s disease should consult their personal doctor.”

Best Available Technology (BAT)

Section 64447.4 Title 22 California Code of Regulations lists the best available technology (BAT), treatment technologies, or other means available for achieving compliance with the MCLs for organic chemicals. Section 64671 lists the TT for Copper. The BATs and TT are listed for the constituents of concern in Table 1.

Recommendations for Further Action

The drinking water quality provided by RPU meets all Federal and State drinking water standards set to protect public health. To further reduce the levels of the constituents identified in this report that are already significantly below the health-based MCLs established to provide “safe drinking water,” additional costly treatment processes would be required. The effectiveness of the treatment processes to provide any significant reductions in constituent levels at these already low values is uncertain. Therefore, no action is proposed.

Source Water Assessment

In 2024, RPU completed a comprehensive Source Water Assessment of its drinking water sources, which is available to the public. The continual development and implementation of protective measures and policies is a standard practice conducted by RPU to preserve our valuable drinking water resources for future generations.