



# City of Redwood City

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## Report on Water Quality Relative to Public Health Goals

**PUBLIC WORKS SERVICES DEPARTMENT  
Water Utilities Division**

**July 2019**

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## I. BACKGROUND

The City of Redwood City is required by the California Health and Safety Code to prepare a report regarding Public Health Goals. Section 116470 (b), (c), and (f) of the Health and Safety Code (see Attachment A) specifies that on or before July 1, 1998, and every three years thereafter, public water systems serving more than 10,000 service connections shall prepare a report that is intended to inform the public of any California Public Health Goal (PHG) exceedance that occurred within the prior three years.

A PHG is a *non-enforceable* goal established by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA), and is not to be confused with Maximum Contaminant Level (MCL). An MCL is the *enforceable* level of a contaminant that is allowed in drinking water, and are set by the US Environmental Protection Agency (USEPA) or the California State Water Resources Control Board Division of Drinking Water (DDW).

Section 116470 of the California Health and Safety Code states that, if, a contaminant was detected by a water supplier between 2016 and 2018, at a level exceeding an applicable PHG, the PHG reports are to provide the information required by the law. The required information includes:

1. The identification of each contaminant detected in drinking water that exceeds the applicable PHG.
2. The MCL and PHG as determined by OEHHA for each contaminant identified.
3. The category or type of risk to health that could be associated with each contaminant identified.
4. The best treatment technology commercially available, if any, that could be used to reduce the contaminant level.
5. An estimate of the cost to utilize that treatment if it is appropriate and feasible.
6. A description of the action, if any, public water systems intend to take to reduce the concentration of the contaminant.

Constituents that have a California primary drinking water standard and for which a PHG has been set are to be addressed in the report. Attachment B contains the regulated constituent (lead) for which the City of Redwood City exceeded the PHG. Please note that water containing lead is not delivered to consumers through the City water distribution system, but rather, it is a product of constituents leaching from fixtures containing lead within consumer's homes. A more detailed explanation of this occurrence is given later in the report.

The Code further specifies that a public hearing is to be held for the purpose of accepting and responding to public comment on the report. The hearing can be part of any regularly scheduled meeting. Please also note that in subsection (f) the requirement that maximum contaminant level goals (MCLGs) adopted by the U.S. Environmental Protection Agency (USEPA) must be used if a PHG has not been adopted for a regulated contaminant.

**Guidelines for Preparation of this Report**

The Association of California Water Agencies (ACWA) formed a workgroup which prepared guidelines for water utilities to use in preparing Public Health Goal reports, and these guidelines were used in the preparation of this report.

**Explanation of Terms**

**PHG** - Public Health Goal (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 and are set by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) and are based solely on public health risk considerations.

**MCL** - Maximum Contaminant Levels are set by the U.S. Environmental Protection Agency (USEPA) or the California State Water Resources Control Board Division of Drinking Water (DDW) as the level which is required to be met in water systems. Violations of an MCL can result in a fine, abatement order, or closure of facilities. When the USEPA or DDW adopts an MCL, they take into account such factors as:

1. Analytical methodologies;
2. Effectiveness of available treatment technologies; and
3. Benefits and costs.

**MCLG** - A Maximum Contaminant Level Goals is the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, allowing an adequate margin of safety. MCLGs are non-enforceable public health goals. MCLGs consider only public health and not the limits of detection and treatment technology effectiveness. Therefore, they sometimes are set at levels which water systems cannot meet because of technological limitations.

**DLR** - Detection Level for purposes of Reporting (DLR): Along with an MCL, a regulated contaminant also has a DLR. DDW establishes DLRs at levels that allow it to be confident about a value or quantification being reported and that most laboratories have the analytical capabilities to meet. DLRs are not laboratory-specific and cannot be changed by laboratories. In addition, DLRs do not depend on the analytical method used: thus, the availability of a new or improved analytical method does not automatically result in DLR revision. However, advancements in measuring techniques and instruments have helped many laboratories use detection limits lower than the DLRs for many contaminants in drinking water.

DLRs are used by the DDW to determine compliance with MCLs. If a contaminant is found in a compliance sample at a level above its DLR, it is considered "detected." If a contaminant's DLR is below the PHG or MCLG, it is clear when the PHG/MCLG is exceeded. In contrast, if the DLR is above the PHG or MCLG, it might not be clear when a PHG/MCLG has been exceeded. For the latter cases, the ACWA guidelines state that a concentration reported as

less than the DLR should be considered zero. This approach is consistent with DDW practice for treating non-detected results as zero.

### **Water Quality Data Reviewed for this Report**

Water quality data collected by the City of Redwood City during 2016, 2017, and 2018 for the purpose of determining compliance with drinking water standards were reviewed in order to prepare this PHG report. This data was summarized in our 2016, 2017, and 2018 Annual Water Quality Reports (also known as Consumer Confidence Reports (CCRs)) which were distributed to all of our customers through direct mail, and are available on the City website.

### **Best Available Treatment Technology and Cost Estimates**

Both the USEPA and DDW adopt Best Available Technologies (BATs) for the purpose of reducing contaminant levels below the MCL. While a BAT may identify a process that can reduce the presence of a contaminant, the cost of implementation can be a major factor in deciding whether or not to adopt the process. For a system that is in compliance with MCL levels, cost considerations must be a factor. Striving to keep contaminants below PHG/MCLG levels must be evaluated with costs in mind.

Costs are estimated for the implementation of BATs for each constituent exceeding a PHG or MCLG. The PHGs and MCLGs are set much lower than the MCL, and it is not always possible or feasible to determine what treatment is needed to further reduce a constituent to, or below, the PHG or MCLG. In some cases, such as when the MCLG or PHG is set at zero, there may not be commercially available technology to reach that level. The issue is further complicated because it is often not possible to verify by analytical means that the contaminant has been totally eliminated. In some cases, installing a treatment technology to try and further reduce very low levels of one constituent may, in turn, have adverse effects on other aspects of water quality. This report presents the required cost estimates to implement the BATs to reduce a contaminant to a level at or below the PHG/MCLG.

## **II. CONSTITUENTS DETECTED THAT EXCEED PHG OR MCLG**

In reviewing water quality monitoring data collected during 2016, 2017, and 2018, City of Redwood City staff have concluded that a PHG report is required that addresses the contaminant *lead*. The following section presents a discussion of lead which was detected in customer's homes at levels above the PHG.

### **LEAD**

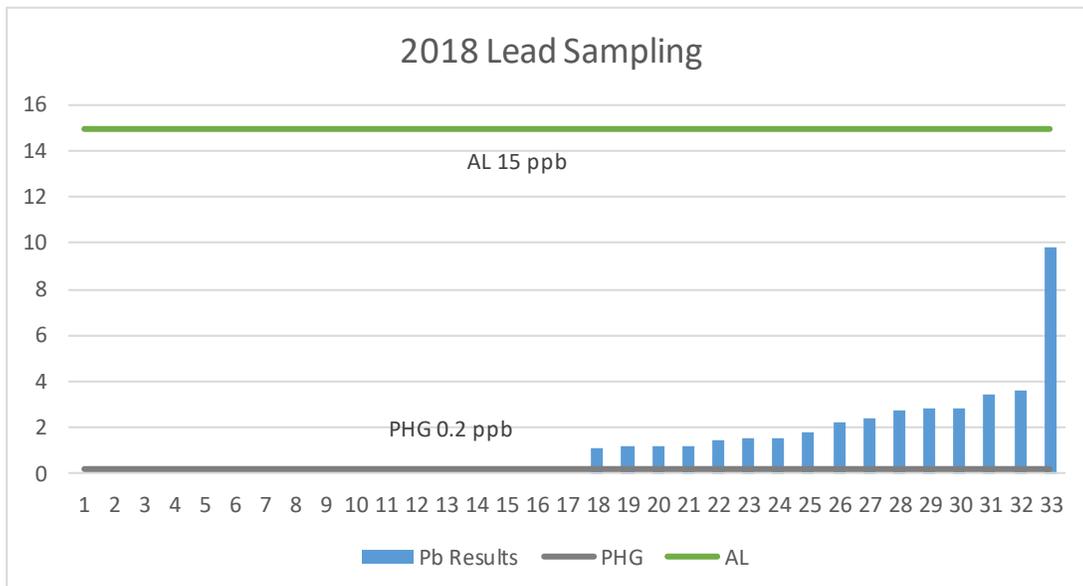
The PHG for lead is 0.2 parts per billion (ppb). Lead enters drinking water primarily through leaching of lead-containing materials in household piping. The corrosion of household plumbing systems such as those containing lead-based solder used to join copper pipe, brass and chrome-plated brass faucets, lead pipe connections from homes to the water

main, brass/bronze water meters, brass/bronze curb valves, and brass/bronze corporation valves can all contribute to lead leaching

Although the City of Redwood City’s water sources are free of lead, several of the homes that participated in Redwood City’s 2018 Lead and Copper Sampling had lead levels that exceeded the PHG of 0.2 ppb. Results from the lead and copper sampling represent the worst case conditions for lead levels in the distribution system. These samples are collected under a first-draw condition; which means that water must sit in the customer’s piping for 6 hours before it is collected. Furthermore, the samples were taken from homes that are considered to be the highest risk locations.

Many of the samples collected during the lead and copper sampling tested below the PHG for lead, and lead levels at the sampled locations may be higher than others because of the plumbing material used when these homes were built. The probable reason for the difference in lead concentration at the individual residences can be attributed to the plumbing components at these residences. It may be that some plumbing components at locations with lower levels of lead detected have been replaced with new “low-lead” fixtures. Additionally, beginning January 2010 in California all plumbing fixtures sold and installed for use in a plumbing system intended to convey drinking water are required to be lead free (as required by CA Health & Safety Code 116875).

Values referred to as MCLs for lead are not actually MCLs; instead, they are called "Action Levels" as prescribed in Chapter 17.5 of Title 22, California Health and Safety Code. An MCL for lead is considered to be exceeded when 10% of the samples collected are above the action level. During Redwood City’s 2018 Lead and Copper Sampling all of the samples collected were below the Action Level of 15 ppb. However, 16 of the 33 samples collected tested above the PHG for lead as shown in the figure below.



**Why Lead is Regulated?**

In 1974, Congress passed the Safe Drinking Water Act. This law requires the EPA to determine safe levels of chemicals in drinking water which do, or may cause, health problems. These are non-enforceable levels based solely on possible health risks and exposure.

In 1995 the State of California adopted an Action Level of 15 ppb for lead, and requires the lead concentration in 90 percent of the water samples collected at customer taps not to exceed the Action Level.

The California OEHHA revised the PHG for lead in drinking water from 2 ppb to 0.2 ppb on April 24, 2009, based on new studies relating to the most sensitive health risks.

Since lead contamination generally occurs from corrosion of household lead pipes, it cannot be directly detected or removed by Redwood City. Instead, EPA requires water systems to control the corrosiveness of their water if the level of lead at home taps exceeds the Action Level. The AL for lead has been set at 15 ppb because the EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to control the contaminant should it occur in drinking water at their customers home taps.

**Health Risks**

Lead has multiple toxic effects on human body. The OEHHA revised the PHG for lead in drinking water based on new studies relating to the most sensitive health risks. These are non-carcinogenic, chronic health effects including neurobehavioral effects (decreased intelligence) in children and hypertension in adults. Lead also has the potential to cause kidney disease and cancer; however, the carcinogenic risks are considered smaller than the risks for chronic toxicity. The public health goal of 0.2 ppb was determined from a maximum daily lead intake through water ingestion of 2.86 µg/day, which corresponds to a level of concern for neurobehavioral effects (in children) designated as a decrease of one Intelligence Quotient point.

**Best Available Technology for Lead Elimination**

DDW considers optimizing corrosion controls as the BAT to deal with lead in drinking water. In an evaluation report dated August 4, 2006, the SFPUC concluded that pH adjustment in the San Francisco Regional Water System, which supplies water to Redwood City, is the optimal corrosion control treatment. The report, which was then approved by the DDW, recommends a minimum pH of 8.2 (i.e. the optimal water quality parameter, or OWQP) be maintained throughout the transmission and distribution system. Because Redwood City continues to meet the Action Level for lead and operate the water system with pH greater than 8.2, DDW considers that the City has achieved optimized corrosion control. Therefore, additional corrosion control treatment is not needed.

### **What Consumers can do to Decrease Lead Exposure**

Listed below are some measures consumers can take to reduce exposure to lead:

- Have household water tested for lead.
- Find out whether household pipes contain lead or lead solder.
- Run household water for 15-30 seconds or until it becomes cold before using it for drinking or cooking; this flushes any standing lead from the pipes.
- Avoid cooking with or drinking water from the hot water tap; lead dissolves more easily into hot water.
- **Avoid boiling water to remove lead;** excessive boiling of water makes the lead more concentrated – the lead remains when the water evaporates.
- Replace old fixtures or faucets used for drinking or cooking with new fixtures manufactured and sold in California after January 2010

### **Health Risks**

## **III. SUMMARY AND CONCLUSION**

The drinking water in the City of Redwood City meets all standards established by California State Water Resources Control Board, Division of Drinking Water and USEPA to protect public health. Currently the best available technology is in use to control lead levels in drinking water, and no additional treatment is recommended at this time that could lower the levels of lead in a cost effective manner. However, homeowners may reduce their risk of lead exposure by following some measures to that effect.

## **IV. ATTACHMENTS:**

- A. Excerpt from California Health & Safety Code: Section 116470 (b), (c), (d), (e), and (f)
- B. Table of Regulated Constituent with MCL and PHG

*NOTE: This publication is meant to be an aid to the staff of the CDHS Drinking Water Program and cannot be relied upon by the regulated community as the State of California's representation of the law. The published codes are the only official representation of the law. Refer to the published codes whenever specific citations are required.*

## **Health and Safety Code §116470**

(a) As a condition of its operating permit, every public water system shall annually prepare a consumer confidence report and mail or deliver a copy of that report to each customer, other than an occupant, as defined in Section 799.28 of the Civil Code, of a recreational vehicle park. A public water system in a recreational vehicle park with occupants as defined in Section 799.28 of the Civil Code shall prominently display on a bulletin board at the entrance to or in the office of the park, and make available upon request, a copy of the report. The report shall include all of the following information:

(1) The source of the water purveyed by the public water system.

(2) A brief and plainly worded definition of the terms "maximum contaminant level," "primary drinking water standard," and "public health goal."

(3) If any regulated contaminant is detected in public drinking water supplied by the system during the past year, the report shall include all of the following information:

(A) The level of the contaminant found in the drinking water, and the corresponding public health goal and primary drinking water standard for that contaminant.

(B) Any violations of the primary drinking water standard that have occurred as a result of the presence of the contaminant in the drinking water and a brief and plainly worded statement of health concerns that resulted in the regulation of that contaminant.

(C) The public water system's address and phone number to enable customers to obtain further information concerning contaminants and potential health effects.

(4) Information on the levels of unregulated contaminants, if any, for which monitoring is required pursuant to state or federal law or regulation.

(5) Disclosure of any variances or exemptions from primary drinking water standards granted to the system and the basis therefor.

(b) On or before July 1, 1998, and every three years thereafter, public water systems serving more than 10,000 service connections that detect one or more contaminants in drinking water that exceed the applicable public health goal, shall prepare a brief written report in plain language that does all of the following:

(1) Identifies each contaminant detected in drinking water that exceeds the applicable public health goal.

(2) Discloses the numerical public health risk, determined by the office, associated with the maximum contaminant level for each contaminant identified in paragraph (1) and the numerical public health risk determined by the office associated with the public health goal for that contaminant.

(3) Identifies the category of risk to public health, including, but not limited to, carcinogenic, mutagenic, teratogenic, and acute toxicity, associated with exposure to the contaminant in drinking water, and includes a brief plainly worded description of these terms.

(4) Describes the best available technology, if any is then available on a commercial basis, to remove the contaminant or reduce the concentration of the contaminant. The public water system may, solely at its own discretion, briefly describe actions that have been taken on its own, or by other entities, to prevent the introduction of the contaminant into drinking water supplies.

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(5) Estimates the aggregate cost and the cost per customer of utilizing the technology described in paragraph (4), if any, to reduce the concentration of that contaminant in drinking water to a level at or below the public health goal.

(6) Briefly describes what action, if any, the local water purveyor intends to take to reduce the concentration of the contaminant in public drinking water supplies and the basis for that decision.

(c) Public water systems required to prepare a report pursuant to subdivision (b) shall hold a public hearing for the purpose of accepting and responding to public comment on the report. Public water systems may hold the public hearing as part of any regularly scheduled meeting.

(d) The department shall not require a public water system to take any action to reduce or eliminate any exceedance of a public health goal.

(e) Enforcement of this section does not require the department to amend a public water system's operating permit.

(f) Pending adoption of a public health goal by the Office of Environmental Health Hazard Assessment pursuant to subdivision (c) of Section 116365, and in lieu thereof, public water systems shall use the national maximum contaminant level goal adopted by the United States Environmental Protection Agency for the corresponding contaminant for purposes of complying with the notice and hearing requirements of this section.

(g) This section is intended to provide an alternative form for the federally required consumer confidence report as authorized by 42 U.S.C. Section 300g-3(c).

**MCLs, DLRs, and PHGs for Regulated Drinking Water Contaminants**  
 (Units are in milligrams per liter (mg/L), unless otherwise noted.)

**Last Update: March 13, 2019**

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 \(OEHHA\)](#)

Also, the PHG for NDMA (which is not yet regulated) is included at the bottom of this table.

For comparison:  
[Federal MCLs and Maximum Contaminant Level Goals \(MCLGs\) \(US EPA\)](#)

Regulated Contaminant	MCL	DLR	PHG	Date of PHG
<b>Copper and Lead, 22 CCR §64672.3</b>				
<i>Values referred to as MCLs for lead and copper are not actually MCLs; instead, they are called "Action Levels" under the lead and copper rule</i>				
Copper	1.3	0.05	0.3	2008
Lead	0.015	0.005	0.0002	2009

MCL	MCLG
1.3	1.3
0.015	zero