ATTACHMENT D

Public Health Goals Report Guidelines

Ensuring Compliance with California Health and Safety Code Section 116470(b)

April 2025

ACWA
Association of California Water Agencies

Table of Contents

Background 3

Guidelines 5

Attachment 1 – 2025 PHG Triennial Report for 2022-2024 11

Attachment 2 – Health Risk Information for Public Health Goal Exceedance Reports 16

Attachment 3 – Cost Estimate for Treatment Technologies 35

Attachment 4 – Sample "Hypothetical" Transmittal Memorandum and PHG Report 40

PURPOSE OF THE GUIDELINE

The guideline is intended to help water suppliers complete PHG reports efficiently, allowing resources to be better allocated to other regulatory mandates for safe drinking water. However, suppliers may use their own approach if it better suits their situation.

CONTACT INFORMATION

If you have any questions about these guidelines or any of the attachments, contact **Nick Blair** of ACWA at **NickB@acwa.com** or **916-669-2377**.

Background

Public water systems serving more than 10,000 service connections must prepare a brief, written report in plain language by July 1, 2025 that gives information on the "detection" of any contaminants above the Public Health Goals (PHGs) published by the state's Office of Environmental Health Hazard Assessment (OEHHA). The report must also list the "detection" of any contaminant above the Maximum Contaminant Level Goals (MCLG) set by United States Environmental Protection Agency (U.S. EPA) for all other contaminants until such time as OEHHA has published PHGs for those contaminants.

It is emphasized that the report only needs to provide information on contaminants that a water system has detected at a level exceeding a PHG or a MCLG in its water supplied to the public during the 3-year reporting period.

The purpose of the legislation requiring these reports was to provide consumers with information on levels of contaminants even below the enforceable Maximum Contaminant Levels (MCLs) so they would be aware of potential health risks that might be posed by the presence of these contaminants at levels below the MCLs. Additionally, each water system must provide an estimate of the cost to reduce the contaminant(s) to the PHG (or MCLG if there is no PHG) regardless of how minimal the risk might be.

The guidance herein is intended to assist water suppliers in completing the required PHG reports in a responsible manner without expending excessive amounts of resources that are better used to comply with the many regulatory mandates designed to ensure safe drinking water. However, water suppliers have the discretion to use their own approach if it is more appropriate or specific to their situations.

The following should be considered when preparing the mandated report:

1. The U.S. EPA and the California State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW) establish MCLs at very conservative levels to provide protection to consumers against all but very low to negligible health risks. In other words, MCLs are the regulatory definition of what is "safe." Adopted MCLs are still the criteria for being in compliance, not those proposed or possible in the future, and certainly not MCLGs or PHGs.

2. MCLGs and PHGs are often set at very low levels depending on the established health risk, and in the case of U.S. EPA, MCLGs are also set at zero for some contaminants. Determination of health risk at these low levels is theoretical based on risk assessments with multiple assumptions and mathematical extrapolations. Many contaminants are considered carcinogenic and U.S. EPA's policy is to set the MCLGs at zero because they consider no amount of these contaminants to be without risk. Similarly, U.S. EPA sets the MCLG at zero for microbial contaminants because ingesting one protozoan, virus, or bacterium may cause adverse health effects. It is understood that zero is an unattainable goal and cannot be measured by practically available analytical methods. Note that by regulation, OEHHA cannot set a PHG at zero and must calculate a numerical level to address risk, even though it may be unattainable or impossible to measure.

3. PHGs and MCLGs are not enforceable. The Best Available Technology (BAT) to reach such low levels has not been defined and may not realistically be available. Accurate cost estimates are difficult, if not impossible, and are highly speculative and theoretical. Therefore, they have limited value and may not warrant significant investment of agency time and money.

These reports are unique to California. They are required in addition to the extensive public reporting of water quality information that California water utilities have been doing for many years and in addition to the federally mandated Consumer Confidence Reports (CCRs). Hence, it should be kept in mind that in addition to this required report, each utility will continue reporting annually in great depth on the quality of the water it serves.

Guidance on preparing these reports is needed because the legislative language does not spell out all of the detailed answers to questions that arise. Neither the DDW nor OEHHA have issued any guidelines regarding the report. In fact, while OEHHA has a mandate to determine and provide information on "numerical health risk," they otherwise have no involvement or authority regarding the report.

The DDW is the primary enforcing agency of all provisions of the Health and Safety (H&S) Code relative to the report requirement. DDW requests that utilities report in writing as to how they have complied with the fundamental requirements of this section, which are:

1. Prepare a brief written report,
2. Hold a public hearing (meeting), and
3. Notify DDW that the meeting was held and the report is available.

Guidelines

I. Who must prepare a PHG report?

California H&S Code, Section 116470(b) is clear that a system ONLY needs to do a report IF it has at least 10,000 service connections AND IF it exceeds one or more PHG or MCLG. Also, a public hearing is NOT required if a report does not have to be prepared.

Utilities that do NOT have to do the report may choose to submit an information item to their governing board advising them that no report is required.

This report is required every three years.

II. Wholesalers (<10,000 service connections) are NOT required to do a PHG report.

Wholesalers who do not directly serve more than 10,000 service connections are not required to meet the PHG report requirements of California H&S Code, Section 116470(b).

III. Timing, Notification, Meetings

A. Timing and Meeting: The report must be prepared by July 1, 2025. A public hearing, which can be held as part of any regularly scheduled meeting, should be held sometime after July 1 and prior to reporting to DDW. The public hearing "should be held after the report's completion" so the information is current. The purpose of the hearing is to "accept and respond to" public comment. The governing board or council of public water agencies would also likely approve the staff report at that time. This would represent endorsement by the board of the part of the report where any action (or no action) would be proposed regarding reduction of contaminants to levels lower than required for compliance with MCLs.

B. Notification: There is no requirement to send a copy of the report to the public. Public agencies must "notice" public hearings so this hearing would be subject to the normal notice requirements (i.e., number of days advance, publishing in appropriate newspaper, etc.) The notice would appropriately indicate the report is the subject of the hearing and indicate it is available for the public to review or to get a copy upon request.

(NOTE: Investor-owned utilities will likely have to schedule a special "meeting" since they are not subject to the same meeting notice requirements and may not have any authority to hold a "public hearing" per se. Their notification of the public could however be similar to public agencies (e.g., publication of legal notice in newspaper of general circulation.)

C. Submission of Reports: DDW does not specifically require that a copy of the report be submitted to them.

IV. Interpretations

A. What contaminants must be covered?

A table of relevant current PHGs, MCLGs, MCLs, and Detection Limits for purposes of Reporting (DLRs) is attached to this guidance as **Attachment No. 1**.

1. Only contaminants that have an existing MCL AND were "detected" at a level that "exceeds" the PHG or, where there is no PHG, the Federal MCLG, need to be included in the report. (See guidance below on "detected" and "exceed")

2. All contaminants that, as of December 31, 2024, have Primary Drinking Water Standards (PDWS) set by California or U. S. EPA AND have an equivalent PHG or a MCLG. This includes chemical, microbiological and radiological constituents. PDWS may be either MCLs or Treatment Techniques (TT). For example, the Surface Water Treatment Rule (SWTR) is a TT for the following contaminants: Giardia lamblia, viruses, Cryptosporidium, Legionella and heterotrophic bacteria (HPC). A TT is set when it is not possible to reliably analyze for the contaminant of concern (the SWTR) or when it is not feasible or appropriate to set a numerical standard (e.g., the Lead & Copper Rule).

3. It does NOT include contaminants, such as radon, for which U.S. EPA has considered adopting an MCL, nor does it include any contaminants DDW plans to regulate in the future, nor those with Notification Levels.

   It does NOT include contaminants for which there is no final PHG or MCLG as of December 31, 2024, nor does it include any secondary MCLs (e.g., TDS, SO4, Na, etc.).

B. What data are to be used for the report due by July 1, 2025?

1. It is recommended that the data used should be from the 3 consecutive calendar years prior to the year the report is prepared. For example, the 2025 report would be based on the analytical data from samples taken in 2022, 2023, and 2024. The data should be the same as that used by the drinking water system in determining compliance with DDW requirements. In most cases, this would be after blending or treatment. Individual well data would only be used if the well feeds directly to the distribution system.

2. For utilities that purchase water from another agency or from a wholesaler, it is suggested that the same guidance or ground rules be followed as for the CCRs. If the only source for a retail system is treated water from a wholesaler and that water contains a constituent above a PHG or MCLG, the retailer should use its own distribution system monitoring data. For systems with both their own sources of water and purchased water, the retailer should evaluate its own distribution system compliance monitoring and compare the annual average value with the PHG or MCLG.

C. What do the terms "detect" and "exceed" mean in the context of the required report?

1. Keep in mind that there are no regulations that relate to "meeting" or "complying with" PHGs. The logical approach would be to use the same procedures and requirements that Title 22 of the California Code of Regulations specify for determining compliance with MCLs. For example, if Title 22 or DDW guidance specifies that the average of a group of samples be compared to the MCL for compliance purposes, the same averaging should be used to compare to the PHG or MCLG. For most constituents, compliance with MCLs is measured at the "point of entry" to the distribution system. This means that, for the most part, the analytical results for each well must be evaluated separately and compared to the MCLG or PHG. If wells are blended or treated before delivery to the system, the judgment as to whether there was a "detection exceeding the MCLG or PHG" should be based on the "point of entry" data just as for compliance with MCLs.

2. Be sure to report the PHG (or MCLG) as a number equal to or greater than 1.0 as specified in the State Consumer Confidence Report Guidance for Water Suppliers. It is recommended that all data be converted to match CCR data. **Attachment No. 1** concentration numbers are given as mg/L, unless otherwise noted.

3. Keep in mind that if a utility determines that a constituent has been found at a level exceeding the PHG or MCLG, a cost estimate is mandated, not just momentarily, or on one sample. In the same way, only when the PHG/MCLG level is clearly exceeded should a cost estimate be calculated and reported.

4. Significant figures, analytical detection limits, reporting limits, and different methods of determining compliance, all affect the assessment of which constituents were "detected" above the PHG or the MCLG.

5. Results that are reported below the state regulatory Detection Limit for Purposes of Reporting (DLR – See California Code of Regulations Title 22, Sections 64432 & 64445.1 and other DDW guidance on compliance reporting) should be treated as 0 (zero) which is accepted DDW practice. U.S. EPA also recommends treating non-detection (ND) as zero.

6. As in all cases of reporting results to the state, the results of analyses should be rounded to reflect the appropriate number of significant figures. (EXAMPLE: For a constituent like PCBs where the MCL is 0.5 ppb and the DLR is 0.5 ppb, how do you determine if you exceeded the MCLG of "zero"? Webster defines "zero" as "having no measurable or otherwise determinable value," which, in effect, is the DLR. So for PCBs, if the average of results for a given well is less than the DLR, the value would be reported as "zero." Note that by regulation, OEHHA cannot set a PHG at zero and must calculate a numerical level to address risk.)

7. In averaging the results for a constituent over a specified period during which some of the data is less than the DLR, the average value obtained should be rounded to the appropriate significant figure before comparing to the PHG or MCLG. (EXAMPLE: If a well were sampled for PCE and 0.6 ppb was found and the resample showed 0.6 ppb, it would constitute a confirmed positive detection. But if 3 additional compliance samples were taken from the well and all had less than 0.5 ppb, which is the DLR, then averaging the 5 samples would give an average of 0.24 ppb, which would be rounded to zero. The average from the well does not exceed the PHG of 0.06 ppb, and no cost estimate would be needed for this well.)

D. What does the term "best available technology" (BAT) mean as used in this portion of the law?

1. While a specific definition of the term is not in the California H&S Code, the accepted meaning in all other sections is that it refers to a technology to achieve compliance with MCLs. In fact, where "best available technology" is listed or explained (Sections 64447, 64447.2 & 64447.4), the usage is "for achieving compliance with the MCLs." This is also true for BAT specified in federal regulations.

2. However, in Section 116470(b)(4), the term refers to "BAT," if any is available on a commercial basis, to remove or reduce the concentration of the contaminant. Specifically, subdivision (b)(5) requires cost estimates of using the technology described in subdivision (b)(4) to "reduce the contaminant...to a level at or below the" PHG (or MCLG).

3. Obviously, where MCLGs are set at zero, there may not be commercially available technology to reach a non-detectable level. This should be clearly stated in the report. Since there is little data readily available to "estimate" cost of treatment to achieve absolute zero levels, rough estimates of "BAT" as defined in law might be used with a clearly written caveat that use of this "BAT" may still not achieve the PHG or MCLG and the costs may be significantly higher to do so.

E. Must the report deal with total coliforms?

Yes. The California Revised Total Coliform Rule (RTCR) became effective in July 2021. The revisions include the new Coliform Treatment Technique requirement replacing the Total Coliform MCL, a new E.coli MCL regulatory limit, and guidance for exceedances and monthly reporting. The Revised Total Coliform Rule establishes a "find-and-fix" approach for investigating and correcting causes of coliform problems within water distribution systems.

F. How should the report deal with *E. coli*?

The federal RTCR included a MCL and MCLG for *E. coli* effective April 1, 2016. The MCLG for *E. coli* is zero (0). DDW adopted a MCL for *E. coli* which became effective July 1, 2021. Even though there is no PHG, *E. coli*. is subject to PHG report requirements because there is a MCLG and a MCL. This includes when a public water system exceeds a coliform TT trigger.

1. The *E. coli* MCL is based on either an *E. coli* positive repeat sample following a total coliform (TC) positive routine sample, a TC-positive repeat sample following an *E. coli* -positive routine sample, failure to collect all required repeat samples following a *E. coli* positive routine sample, or failure to test for *E. coli* when any repeat sample is TC-positive. The public water system should report the number of *E. coli* detections that occurred during the three-year period (2022, 2023, and 2024 for this report). The MCLG of zero is therefore appropriately interpreted as zero samples positive.

2. If it is determined that the system has exceeded the MCLG of zero for *E. coli*, the following factors are pertinent for deciding what action, if any, is appropriate to consider and for estimating costs:

a. Exceeding zero *E. coli* bacteria at any one time, in and of itself, would not normally constitute the need for any treatment or action.

b. There is no action that could be taken with absolute certainty that could ensure that the system would always have zero *E. coli* every single time.

c. The "best available technology" that is specified for total coliform by DDW in California Code of Regulations Title 22, Section 64447 would also apply to *E. coli* and, for the most part, is already followed by many systems.

d. The one single action that would most likely decrease the possibility of positive *E. coli* detection would be to significantly increase the disinfectant residual. This would likely result in increased disinfection by-products (DBPs). While disinfection protects against acute health risks, such as *E. coli* and Giardia, DBPs can have potentially adverse chronic health risks. The limits to the amount of disinfectant residual allowed in the distribution system are the maximum residual disinfectant levels (MRDLs) as established by the Disinfectants and Disinfection Byproducts Rule (DBPR).

e. Utilities should point out the positive, proactive steps they take to prevent *E. coli* contamination in the distribution system, including preventive maintenance, main flushing, special monitoring, residual maintenance and testing, cross-connection control, etc.

G. How should the report handle the MCLGs of zero for Giardia lamblia, Cryptosporidium, Legionella and viruses?

1. The regulation for pathogenic micro-organisms is a TT (i.e., the SWTR). No monitoring is mandated for the organisms because there are no standardized methods for testing or the analyses are not timely (like virus testing – 30 days) to provide public health protection.

2. For these reasons, since the intent of the TT (SWTR) is to protect against these pathogens, it can properly be assumed that if the SWTR is met, that the utility has met the MCLG because there is no uniform way to assess possible pathogen levels.

3. For utilities doing voluntary monitoring of pathogens (such as Giardia and Cryptosporidium), the results are appropriately considered research or for operational purposes and not for compliance purposes.

H. How should the report deal with Lead and Copper?

1. Any lead or copper values below the respective DLR should be reported as zero.

2. For monitoring lead at the tap, if the 90 percentile lead value is ND, or <0.005 mg/l, then you should assume you do not exceed the lead PHG of 0.2 ppb.

3. For monitoring copper at the tap, if the 90 percentile copper value is not above 300 ppb, then you have not exceeded the copper PHG.

4. Both U.S. EPA and State Water Board have clarified that Action Levels for lead and copper are not MCLs. TT was established in the Lead and Copper Rule and is based on optimized corrosion control. For larger systems with >10,000 service connections, this depends on a series of steps involving sampling, reports, studies, etc.

I. Must the report deal with Total Trihalomethanes (TTHMs) or Haloacetic Acids (HAAS)?

No. MCLG/PHG exceedances must be reported only for those contaminants that have a primary drinking water standard in place and an associated MCLG/PHG. Although U.S. EPA has adopted MCLGs for some individual THMs and HAAS (such as dibromochloromethane or dichloroacetic acid), there are no MCLs in effect for these individual constituents. Likewise, U.S. EPA has adopted MCLs for the cumulative byproduct groups, but there are no MCLGs or PHGs established for the groups. The same is true in California: DDW has adopted MCLs for both cumulative byproduct groups, but there are no PHGs for the groups. Unlike the chlorinated DBPs, individual MCLs and MCLGs/PHGs for bromate and chlorite exist, so they must be included in the report if detected.

J. Must the report deal with per- and polyfluoroalkyl substances (PFAS)?

Yes. There are established US EPA MCLGs and MCLs, as well as PHGs for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). These PFAS meet the criteria of having a primary drinking water standard and a PHG.

Other PFAS have established MCLGs and MCLs, but do not yet have a PHG. These include PFHxS, PFNA, HFPO-DA (commonly known as GenX Chemicals), and Mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS.

K. How should water utilities handle gross alpha and uranium?

When looking at the results of any radionuclide monitoring done in the 3-year period to be covered by the report, there are several things to keep in mind:

As indicated in C.1 of this Guidance, where averaging is done to determine compliance with MCLs, it should also be done in considering PHGs. This is important for radionuclides because compliance is often based on averaging.

Unlike most other constituents, laboratories doing radionuclides report some results that are LOWER than the state DLR. Title 22, 64442 (h)(3)(c) states: "If a sample result is LESS than the DLR in Table 64442, ZERO shall be used to calculate the annual average……" Also, it says for Gross Alpha: "…..1/2 of the DLR shall be used to calculate the annual average."

Where Gross Alpha analyses are used in lieu of analyzing for uranium, Radium 226 or 228, the procedure outlined in Title 22, 64442(f) should be followed. (Note: The 95% confidence limit is often reported by labs as MDA95.)

L. Do utilities have to report detections of hexavalent chromium?

California's hexavalent chromium MCL of 10 parts per billion went into effect on October 1, 2024. There is a DLR of 0.1 and a PHG of 0.02. Therefore, if the average of the water systems' hexavalent chromium values exceeded 0.1 ppb (the DLR), then it must be included in the report.

V. Disclosure of Numerical Public Health Risk Associated with PHGs/MCLs and Identification of Category of Risk

H&S Code, Section 116470(b)(2) requires the report to disclose the numerical public health risk associated with both the maximum contaminant level and public health goal for each contaminant detected in drinking water that exceeds the public health goal, and Section 116470(b)(3) requires an identification of the category of risk to public health associated with exposure to the contaminant. In February 2025, OEHHA published an updated "Health Risk Information for Public Health Goal Exceedance Reports" document. It is included as **Attachment No. 2**. This document contains health risk information on drinking water contaminants to assist public water systems in preparing these reports.

VI. Cost Estimates

The most difficult aspect of the required report is estimating the cost of treatment. Agencies are urged to keep in mind that because of the advisory nature of the report, the non-enforceable aspect of PHGs and MCLGs, and the highly speculative applicability of technology to achieve "zero" levels, only very preliminary cost estimating is appropriate and necessary. Agencies should be consistent in approach for approximation, averaging, and rounding.

Remember that a cost estimate is only required for a constituent if you determine that it was "detected" above the PHG or MCLG. If the MCLG is zero and the result (after approximation, averaging, rounding) is less than the DLR, no cost estimate is needed. (Remember that many DLRs are LOWER than the PHG, so "detection" above the DLR does not necessarily mean that it is above the PHG.)

The cost estimates should not be low estimates because that would give a mistaken impression that achieving "zero" levels would have a lower price tag when the amount of uncertainty and unknowns would be very high. Given the uncertainties, it might be appropriate to consider reporting a range of costs.

For the 2025 guidance, ACWA is providing a revision of its previous treatment cost information.

Attachment No. 3 to this guidance includes several tables which provide "ranges" of costs for installing and operating several treatment technologies. These data have been gathered from a variety of sources and represent estimates for different size systems, different sources, and different constituents targeted for reduction by the treatment.

Table 1 represents the results of a 2012 ACWA Survey of its member agencies. This has been revised using the average 2024 ENR (Engineering News-Record) Cost Index.

Table 2 includes data from several agencies that was gathered separately from the 2012 ACWA survey. This has been revised using the average 2024 ENR Cost Index.

Table 3 is treatment cost data from previous ACWA Guidance documents with the costs updated to 2024. This has been revised using the average 2024 ENR Cost Index.

The law specifies that the report should only "estimate the aggregate cost and the cost per customer of utilizing the technology" to reduce the level down to the PHG. There is no specification of what is to be estimated: initial construction cost, annualized costs of construction and O&M, or another way of expressing cost. It is suggested that each utility may do it the way they report other costs. (EXAMPLES: 1. Initial Cost of Construction, including % increases for each of design, planning, CEQA, permitting, contingency, etc. = $10 million, or $1,000 per customer, plus an ongoing O&M cost of $1 million, or $100 per customer, forever; 2. Annualized Cost of Construction plus O&M = $2 million, or $200 per customer.)

All possible technologies do not have to be evaluated for each constituent to compare costs. For example, if granular activated carbon (GAC) and reverse osmosis (RO) are both possible treatment technologies to try to lower the level of a particular contaminant to the "zero" PHG/MCLG level, it is appropriate to specify and estimate costs for the technology that would likely be used, keeping in mind there are significant uncertainties based on a variety of factors. If the utility has multiple contaminants to address in the report, one technology (i.e., RO) may address them all, so a cost estimate for RO only could suffice.

General "order of magnitude" estimates are adequate. It is assumed that ALL costs including capital, land, construction, engineering, planning, environmental, contingency and operations and maintenance (O&M) costs should be included but general assumptions can be made for most of these items.

If a system chooses to do its own cost estimating rather than use the costs in Attachment No. 3, it is recommended that generally available cost estimating guides be used such as from U.S. EPA, WRF, AWWA, ASCE, or textbooks, manuals, journals.

The following is a list of references that might be used:

1. Implementation of Arsenic Treatment Systems, Part 1. Process Selection; American Water Works Association (AWWA) Research Foundation and U.S. E.P.A, Published by AWWA RF and AWWA, 2002,
2. Implementation of Arsenic Treatment Systems, Part 2: Design Considerations, Operation and Maintenance, AWWA Research Foundation, Published by AWWA RF and AWWA, 2002,
3. State-of-Science on Perchlorate Treatment Technologies, Final Report for Water Research Foundation project #4359, 2011,
4. An Assessment of the State of Nitrate Treatment Alternatives, AWWA, June 2011, Chad Siedel and Craig Gorman, Jacobs Engineering Group, Inc.,
5. Performance and Cost Analysis of Arsenic Treatment in California, October 2009, JAWRA, UC Davis, Hilkert, Young, Green and Darby.

U.S. EPA includes cost data in the Federal Register for each regulation when it is proposed or adopted. (NOTE: U.S. EPA estimates generally do not consider state- specific concerns and some costs have been known to be underestimated in the past so costs should be increased appropriately and based on utility experience.) The experience of other utilities in your area that have installed treatment to meet MCLs or data reported in journals is valuable as well.

Utilities may also choose to have their engineering consultants prepare these very general cost estimates.

VII. Sample Hypothetical Report

Attachment No. 4 is a comparable attempt to show what a PHG-required report might look like for a "hypothetical" water system that serves more than 10,000 service connections and had one or more PHG/MCLG exceedances in the three-year period ending December 31, 2015, as an example. It is NOT the only way the report might be done. The sample is based on these guidelines. If there appears to be a conflict between the sample and the guidelines, the guidelines should be followed.

Attachment 1

2025 PHG Triennial Report for 2022-2024

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)	$3x10^{-8}$	$5x10^{-9}$	$5x10^{-11}$	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 2

Health Risk Information for Public Health Goal Exceedance Reports

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 toprepare a report every three years for contaminants that exceed their respective PHGs.[1] This document contains health risk information on drinking water contaminantsto 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. There port 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)	7MFL[7] (fibers>10 microns in length)	1×10^{-6}	7MFL (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.

Office of Environmental Health Hazard Assessment
Water Toxicology Section
February 2025

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 (causesleukemia)	0.00015	1×10^{-6}	0.001	7×10^{-6} (seven per million)
Benzo[a]pyrene	carcinogenicity (causescancer)	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	$1{\times}10^{-6}$	0.0001	$3{\times}10^{-6}$ (three per million)
Chlorite	hematotoxicity (causes anemia) neurotoxicity (causes neurobehavioral effects)	0.05	NA	1	NA
Chromium, hexavalent	carcinogenicity (causes cancer)	0.00002	$1{\times}10^{-6}$	0.010	$5{\times}10^{-4}$ (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	$1{\times}10^{-6}$	0.004	$3{\times}10^{-7}$ (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).

Office of Environmental Health Hazard Assessment
Water Toxicology Section
February 2025 17

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
Haloaceticacids: dibromoacetic acid	carcinogenicity (causes cancer)	0.00003	1×10^{-6}	0.06*	2×10^{-3} (two per thousand)[10]
Haloaceticacids: dichloroacetic acid	carcinogenicity (causes cancer)	0.0002	1×10^{-6}	0.06*	3×10^{-4} (three per ten thousand)[11]
Haloaceticacids :monobromo-acetic acid	musculoskeletal toxicity (causes muscular degeneration)	0.025	NA	0.06*	NA
Haloaceticacids :monochloro-acetic acid	general toxicity (causes body and organ weightchanges[8])	0.053	NA	0.06*	NA
Haloaceticacids: 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, dichloroaceticacid, monobromoaceticacid, monochloroacetic acid, and trichloroacetic acid). There are no MCLs for individual haloacetic acids.

[10] Basedon0.060 mg/L dibromoacetic acid; the risk will vary with different combinations and ratios of the other haloacetic acids in a particular sample.

[11] Basedon0.060 mg/L dichloroacetic acid; the risk will vary with different combinations and ratios of the other haloacetic acids in a particular sample.

[12] Basedon0.060 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 neuro behavioral 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
Methyltertiary-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-phe-nol (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-octanoi-cacid (PFOA)	carcinogenicity (causes cancer)	$7×10^{-9}$	$1×10^{-6}$	NA	NA
Picloram	hepatotoxicity (harms the liver)	0.166	NA	0.5	NA
Polychlorinatedbi-phenyls (PCBs)	carcinogenicity (causes cancer)	0.00009	$1×10^{-6}$	0.0005	$6×10^{-6}$ (six per million)
Radium-226	carcinogenicity (causes cancer)	0.05pCi/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}	8pCi/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) endocrne 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 (Freon113)	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)	400pCi/L	$1x10^{-6}$	20,000 pCi/L	5×10^{-5} (five per hundred thousand)
Uranium	carcinogenicity (causes cancer)	0.43pCi/L	1×10^{-6}	20pCi/L	5×10^{-5} (five per hundred thousand)
Vinylchloride	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 dibromochloro-methane). 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)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Disinfection by products (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)[2]	Cancer Risk[3] at the PHG	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)	upto2×10^{-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 3

Cost Estimates for Treatment Technologies
(Includes Annualized Capital and O&M Costs)

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 4

Sample "Hypothetical" Transmittal Memorandum and PHG Report

SAMPLE TRANSMITTAL MEMORANDUM TO GOVERNING BOARD

NOTE: It is suggested that the Report take the form of a communication to the utility's Governing Board or management since the report does not have to be submitted to any government oversight agency. It is suggested that a transmittal memo from staff to the Board should succinctly summarize the report and indicate what action is needed, which as a minimum includes the scheduling of a public hearing and the formal public notice of the hearing.

TO: Governing Board, SoftWater Public Water Utility District

FROM: Betty Bestwater, General Manager

SUBJECT: Required Report on Public Health Goals

Attached for your approval is the final draft of a report prepared by staff comparing our district's drinking water quality with public health goals (PHGs) adopted by California EPA's Office of Environmental Health Hazard Assessment (OEHHA) and with maximum contaminant level goals (MCLGs) adopted by the US EPA. PHGs and MCLGs are not enforceable standards and no action to meet them is mandated.

SB 1307 (Calderone-Sher; effective 1-1-97) added new provisions to the California Health and Safety Code which mandate that a report be prepared by July 1, 1998, and every three years thereafter. The attached report is intended to provide information to the public in addition to the annual Consumer Confidence Report (CCR) mailed to each customer.

Our water system complies with all of the health-based drinking water standards and maximum contaminant levels (MCLs) required by the California Division of Drinking Water and the US EPA. No additional actions are recommended. [If staff plans to recommend any action to further lower constituent levels, these actions should be noted here.]

The new law requires that a public hearing be held (which can be part of a regularly scheduled public meeting) for the purpose of accepting and responding to public comment on the report. This public hearing will be scheduled as part of our regular board (or council, etc) meeting scheduled for [Date & Time] and will be noticed as required for public hearings.

[Signature]

General Manager

SAMPLE PHG REPORT TO GOVERNING BOARD

Note: The names, data, and analytical values cited in this sample report are hypothetical and each utility would need to substitute its own data and adjust the comments accordingly. The constituents discussed are only examples of some that water utilities may have to address in this report. This is not the only way the report can be structured

Background

Provisions of the California Health and Safety Code (Reference No. I) specify that larger (> I0,000 service connections) water utilities prepare a special report by July I, 2016 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 MCLGs adopted by US EPA. Only constituents which have a California primary drinking water standard and for which either a PHG or MCLG has been set are to be addressed. (Reference No. 2 is a list of all regulated constituents with the MCLs and PHGs or MCLGs.)

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.

The new law specifies what information is to be provided in the report. (See Reference No. I)

If a constituent was detected in the District's water supply between 2013 and 2015 at a level exceeding an applicable PHG or MCLG, this repo11 provides the information required by the law. Included is the numerical public health risk associated with the MCL and the PHG or MCLG, the category or type of risk to health that could be associated with each constituent, the best treatment technology available that could be used to reduce the constituent level, and an estimate of the cost to install that treatment if it is appropriate and feasible.

(Note: If "numerical health risk" data is not available from OEHHA, insert the following: "OEHHA is required to provide numerical health risk information, but has not done so in time to include it in this report").

What Are PHGs?

PHGs are set by the California Office of Environmental Health Hazard Assessment (OEHHA) which is part of Cal-EPA and are based solely on public health risk considerations. None of the practical risk-management factors that are considered by the US EPA or the California Division of Drinking Water in setting drinking water standards (MCLs) are considered in setting the PHGs. These factors include analytical detection capability, treatment technology available, benefits and costs. The PHGs are not enforceable and are not required to be met by any public water system. MCLGs are the federal equivalent to PHGs.

Water Quality Data Considered

All of the water quality data collected by our water system between 2013 and 2015 for purposes of determining compliance with drinking water standards was considered. This data was all summarized in our 2013, 2014, and 2015 Consumer Confidence Reports which were mailed to all of our customers in [xxx]. (Reference No. 3)

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.

Best Available Treatment Technology and Cost Estimates

Both the US EPA and DDW adopt what are known as BATs or Best Available Technologies which are the best known methods of reducing contaminant levels to the MCL. Costs can be estimated for such technologies. However, since many PHGs and all MCLGs are set much lower than the MCL, it is not always possible 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.

Constituents Detected That Exceed a PHG or a MCLG

The following is a discussion of constituents that were detected in one or more of our drinking water sources at levels above the PHG, or if no PHG, above the MCLG.

Trichloroethylene (TCE)

There is no PHG for TCE but the MCLG set by the US EPA is zero. The MCL or drinking water standard for TCE is 0.005 mg/l. We have detected TCE in 2 of our 20 wells at a level of 0.002 mg/l in Well No. I and at 0.003 mg/l in Well No. 8. The levels detected were below the MCLs at all times. The category of health risk associated with TCE, and the reason that a drinking water standard was adopted for it, is that people who drink water containing TCE above the MCL throughout their lifetime could experience an increased risk of getting cancer. DDW says that "Drinking water which meets this standard (the MCL) is associated with little to none of this risk and should be considered safe with respect to TCE." *(NOTE: This language is taken ji-om the DDW Blue Book of drinking water law and regulations, Section 64468.2, Title 22, CCR.)* The numerical health risk for a MCLG of zero is zero. The BAT for TCE to lower the level below the MCL is either Granular Activated Carbon (GAC)or Packed Tower Aeration (PTA). Since the TCE level in these two wells is already below the MCL, GAC with a long empty bed contact time (EBCT) would likely be required to attempt to lower the TCE level to zero. The estimated cost to install and operate such a treatment system on both Wells No. I and No. 8 that would reliably reduce the TCE level to zero would be approximately [$xxx] initial construction cost with additional O&M cost of [$xxx] per year. This would result in an assumed increased cost for each customer of [$xxx] per year.

E. coli

In July 2021, the California Revised Total Coliform Rule became effective. The revisions included the new Coliform Treatment Technique requirement replacing the Total Coliform MCL, and a new *E. coli* MCL regulatory limit. The purpose for the revisions was to provide the public with increased protection against microbial pathogens in drinking water served by public water systems. A water system is in violation of the *E. coli* MCL if any of the following trigger levels occur:

1. *E. coli*-positive repeat sample following total coliform-positive routine sample
2. Total coliform-positive repeat sample following an *E. coli* routine sample
3. Failure to collect all required repeat samples following an *E. coli*-positive routine sample
4. Failure to test for *E. coli* when any repeat sample is total coliform-positive

Coliform bacteria are an indicator organism that are ubiquitous in nature and are not generally considered harmful. They are used because of the ease in monitoring and analysis. However, the presence of *E. coli* bacteria indicates that the water may be contaminated with human or animal wastes. These bacteria can make people sick and are a particular concern for those with weakened immune systems.

In the month of October 2021, we collected 120 samples from our distribution system for coliform analysis. One of these samples had tested positive for total coliform bacteria and was absent for *E. coli* bacteria. However, the repeat sample we had conducted tested positive for both total coliform bacteria and *E. coli* bacteria; we had exceeded the *E. coli* MCL. In coordinating with our local regulating agency, we initiated a Tier 1 public notification (Boil Water Order) and conducted a Level 2 assessment to identify the cause of the *E .coli*-positive sample. The cause was determined to be (insert cause of contamination) and the following corrective actions were taken [insert corrective actions taken].

Alternative No. 1: "We are working closely with our regional water supplier and have instituted new disinfection procedures to provide for a slightly higher disinfectant residua l. Our disinfectant is chloramines. This increase has been carefully studied before it was implemented. This careful balance of treatment processes used is essential to continue supplying our customers with safe drinking water."

Alternative No. 2: "We add chlorine at our sources to assure that the water served is microbiologically safe. The chlorine residual levels are carefully controlled to provide the best health protection without causing the water to have undesirable taste and odor or increasing the disinfection byproduct level. This careful balance of treatment processes is essential to continue supplying our customers with safe drinking water."

Other equally important measures that we have implemented include: an effective cross-connection control program, maintenance of a disinfectant residua l throughout our system, an effective monitoring and surveillance program and maintaining positive pressures in our distribution system. Our system has already taken all of the steps described by DDW as "best available technology" for colifom1 bacteria in Section 64447, Title 22, CCR.

(Note: Jf a utility is planning to initiate different treatment or new programs, these should be described and cost estimates could be included.)

Lead and/or Copper

There is no MCL for Lead or Copper. Instead the 90th percentile value of all samples from house hold 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 0.002 mg/l. The PHG for copper is 0.17 mg/l.

The category of health risk for lead is damage to the kidneys or nervous system of humans. The category of health risk for copper is gastrointestinal irritation. Numerical health risk data on lead and copper have not yet been provided by OEHHA, the State agency responsible for providing that information. (Note: If OEHHA provides this information prior to completion of a utility's report, it should be inserted here.)

All of our source water samples for lead and copper in 200 were less than the PHG. Based on extensive sampling of our distribution system in 200, our 90th percentile value for lead was 0.006 mg/l and for copper was 0.18 mg/l.

Our water system is in full compliance with the Federal and State Lead and Copper Rule. Based on our extensive sampling, it was determined according to State regulatory requirements that 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 corrosivity, such as the pH, hardness, alkalinity, total dissolved solids, and will take action if necessary to maintain our system in an "optimized corrosion control" condition.

Alternative No. 1: Since we are meeting the "optimized corrosion control" requirements, it is not prudent to initiate additional corrosion control treatment as it involves the addition of other chemicals and there could be additional water quality issues raised. Therefore, no estimate of cost has been included.

Alternative No. 2: To further reduce the potential that lead (or copper) values at consumer taps would exceed the PHO, corrosion control treatment could be installed at all of our sources at an estimated initial cost of [$xxx] and an ongoing annual O&M cost of [$xxx] which would be equivalent to [$xxx] per service connection.

Recommendations For Further Action

The drinking water quality of the SoftWater Public Water Utility District meets all State of California, DDW and US EPA 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 at all clear and may not be quantifiable .Therefore, no action is proposed.

Optional additional language: "The money that would be required for these additional treatment processes might provide greater public health protection benefits if spent on other water system operation, surveillance, and monitoring programs."

References

No. 1 Excerpt from Calif Health & Safety Code: Section 116470 (b)

No. 2 Table of Regulated Constituents with MCLs, PHGs or MCLGs

No. 3 SoftWater Public Water Utility District's 2013, 2014 and 2015 Water Quality Reports

No. 4 Glossary of terms and abbreviations used in report *(Optional)*

ACWA
Association of California Water Agencies

980 9th Street, Suite 1000, Sacramento, CA 95814
www.acwa.com