

Proposed Hexavalent Chromium Maximum Contaminant Level Administrative Procedure Act Hearing

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August 2, 2023, 1:00 pm



Outline

- Background Information
- Regulatory Proposal
- Cost Estimates
- Economic Feasibility
- Timeline
- Public Comments

Administrative Procedure Act (APA) Hearing

- Objectives
 - Review the intent and key requirements of the proposed hexavalent chromium regulation
 - Provide opportunity for comments on the proposed regulation
- No action on the regulation today
- There will be future opportunities to comment if the regulation changes

Regulation Development

<i>DATE</i>	<i>EVENT</i>
April 2020 to April 2022	Public Workshops regarding: <ul style="list-style-type: none"> • White paper on economic feasibility • Draft treatment costs • CEQA scoping • Administrative draft
March 2022	Release of Administrative Draft
June 16, 2023	Notice of Proposed Rulemaking
August 2, 2023	Public Hearing
August 11, 2023 (noon)	Close of Public Comment Period
TBD	Board Adoption Hearing
TBD	Approved by the Office of Administrative Law
TBD	Effective Date of Regulation

Material Released for Comment Period

- Notice of Proposed Rulemaking
- Proposed Regulation Text
- Initial Statement of Reasons (ISOR)
 - A1: Cost Tables
 - A2: Standardized Regulatory Impact Assessment (SRIA), including Cost Estimating Methodology (CEM)
 - A3: Other Chemicals with MCLs Above PHGs
 - A4: DLR Surveys Summary
 - A5: Cost Estimates for Individual Sources
- CEQA Documentation
 - Draft Environmental Impact Report
 - Notice of Availability
 - Notice of Completion

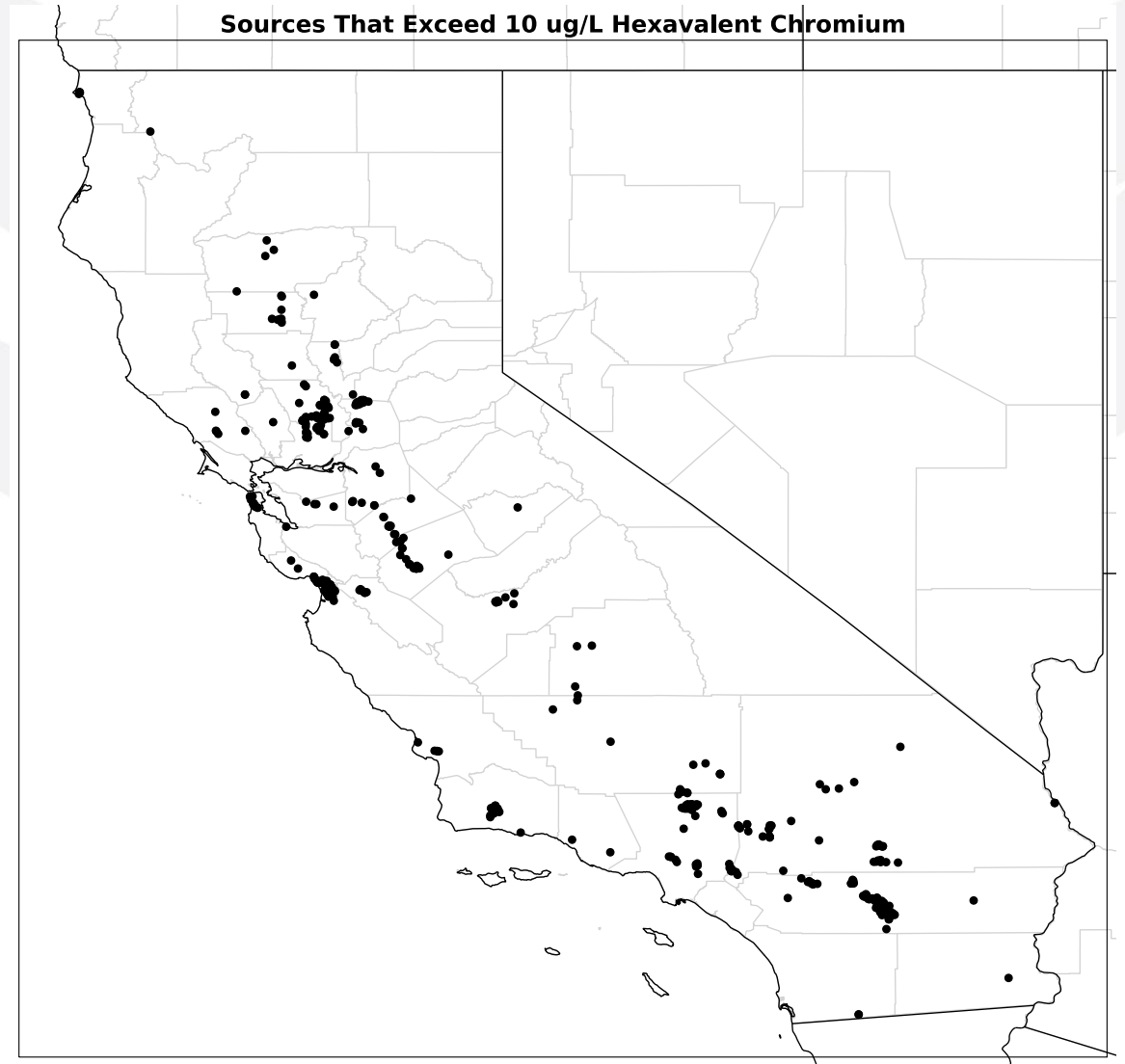
Rulemaking Webpage
bit.ly/Cr6-Rulemaking

What is Hexavalent Chromium?

- A heavy metal used in industrial applications and found throughout the environment
- Chromium has trivalent and hexavalent forms
- Hexavalent chromium causes cancer and kidney/liver toxicity
- Also known as: Chromium-6, Chrome-6, Chromium (hexavalent), Hex Chrome

Occurrence of Hexavalent Chromium

- Detections in 53 of 58 counties, mostly throughout Central Valley
- Counties with highest occurrence:
 - Los Angeles
 - San Bernardino
 - Fresno
 - Riverside
 - Stanislaus
- Presence in groundwater can be naturally occurring or from industrial activities



Sources that exceed 10ug/L Hexavalent Chromium

What are MCL's?

- Maximum contaminant levels (MCLs) are standards limiting concentrations of chemicals in drinking water for protection of public health
- Health and Safety Code section 116365 requires that MCLs be set as close to the public health goal (PHG) as technologically and economically feasible

Why Do We Establish MCLs?

- MCLs are established for protection of public health
- Public health goal (PHG) for hexavalent chromium is 0.02 $\mu\text{g}/\text{L}$
 - Set by Office of Environmental Health Hazard Assessment (OEHHA)
 - PHG of 0.02 $\mu\text{g}/\text{L}$ based on cancer (tumors in the small intestine)
 - Health protective value of 2 $\mu\text{g}/\text{L}$ based on liver toxicity
- Theoretical cancer risk for drinking hexavalent chromium daily for 70 years (2 liters per day) at 10 $\mu\text{g}/\text{L}$ is 1 in 2,000

What are DLR's?

- Detection limit for purposes of reporting (DLR) means the designated minimum level at or above which any analytical finding of a contaminant in drinking water resulting from monitoring required under this chapter shall be reported to the State Board [22 CCR §64400.34]

Why Do We Establish DLRs?

- DLRs protect drinking water quality by assuring confident quantification of chemicals that may adversely affect public health
- Confidently measuring chemicals to the lowest value technologically feasible provides a solid foundation for understanding health impacts, which may be used to prioritize regulations
- To support feasibility analyses for future MCL reviews and potential revisions

Existing Requirements

- Monitoring is required to start within 6 months of the effective date of the regulation
 - Sampling from the previous 2 years may be substituted for initial monitoring if it was performed in accordance with 22 CCR § 64432 (includes requirement to comply with the proposed DLR of 0.1 ug/L)
- Permits must be amended in some cases, including when there is any addition or change in treatment
[\[22 CCR § 64556\]](#)

Regulatory Proposal

Hexavalent Chromium MCL (10 µg/L) and DLR (0.1 µg/L)

- Compliance Schedule
- Consumer Confidence Report and Health Effects Language
- Compliance and Operations Plans
- Analytical Methods
- Best Available Technologies (BAT)
- Affected Entities

Compliance Schedule for MCL

System Size (Service Connections Served)	Regulatory Compliance Date	Earliest Compliance Date
10,000 or more service connections	two years after regulation takes effect	1 January 2026
1,000 to 9,999 service connections	three years after regulation takes effect	1 January 2027
Fewer than 1,000 service connections	four years after regulation takes effect	1 January 2028

Specified Language for the Public

- Consumer Confidence Report – Annual Drinking Water Quality report

- Typical Contaminant Origins

“Discharge from electroplating factories, leather tanneries, wood preservation, chemical synthesis, refractory production, and textile manufacturing facilities; erosion of natural deposit; transformation of naturally occurring trivalent chromium to hexavalent chromium by natural processes and human activity.”

- Health Effects

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

Specified Language for the Public

If a system exceeds MCL before applicable compliance date, additional language is required in their Consumer Confidence Report:

“Chromium (hexavalent) was detected at levels that exceed the chromium (hexavalent) MCL. While a water system of our size is not considered in violation of the chromium (hexavalent) MCL until [insert applicable compliance date], we are working to address this exceedance and ensure timely compliance with the MCL. Specifically, we are [insert actions taken and planned to ensure compliance by applicable compliance date].”

Compliance Plans

- Systems that exceed the MCL before the compliance date must submit a compliance plan
- Compliance Plans must
 - Be submitted within 90 days of exceedance
 - Ensure compliance by deadline
 - Be implemented by water system once approved

Compliance Plans

- Must include:
 - Proposed method for complying with the MCL
 - Date by which the system will submit final plans and specifications
 - Dates for starting construction and completing construction
 - If a new or modified treatment process is proposed:
 - A pilot study
 - The date by which a treatment **operations plan** will be completed
- Systems can make amendments to their compliance plans
- Systems are required to implement their approved compliance plans

Operations Plan

- Only required for systems proposing a new or modified treatment process
- Must include the following, if applicable:
 - Performance monitoring program
 - Unit process equipment maintenance program
 - How and when each unit process is operated
 - Procedures used to determine chemical dose rates
 - Reliability features
 - Treatment media inspection program
- Must be approved by DDW before treated water is served

Analytical Methods

- DDW has a responsibility to ensure analytical methods used for compliance are appropriate to assess water quality
- EPA Methods 218.6 and 218.7 are capable of reporting concentrations down to **0.1 ug/L** (proposed DLR) while maintaining a high level of confidence
- Confirmed adequate laboratory capacity for demand at the proposed MCL and DLR

Best Available Technologies (BAT)

- Three treatment technologies identified as Best Available Technologies (BAT):
 - Ion exchange
 - Reduction/coagulation/filtration (RCF)
 - Reverse osmosis
- Treatment effectiveness of BATs has been peer reviewed
- Other options may be allowed

Who is Affected?

- **Affected source:** a source with a running annual average that exceeds 10 µg/L between January 1, 2010, and June 21, 2021.
- **Affected system:** a system with at least one affected source
- **Affected population:** all persons within an affected system
- **Affected service connections:** all connections within an affected system

Systems, Sources, Connections, and People affected at MCL of 10 ug/L

System Type	Number of Systems	Number of Sources	Number of Service Connections	Number of People Served
Community	160	412	1,348,147	5,328,938
NTNC	62	72	597	15,638
Wholesalers ¹	4	10	-	197,129

¹Wholesalers do not report the number of connections their water serves once it is sold. The population value for wholesalers is estimated.

Estimated Costs

- Costs estimated generically for California
- Assumed every system would pursue treatment
- Costs broken down per system, source, person, and service connection
- Costs estimated for potential MCLs of 1 to 15, 20, 25, 30, 35, 40, and 45 ug/L
- Treatment costs depend on contamination level
 - Higher source concentrations cause higher treatment costs
 - Source concentrations assumed to be the *highest running annual average (RAA)* of previous 10 years (historical “worst case”)

Cost Assumptions

- Each source exceeding proposed MCL will be
 - treated
 - treated separately
 - treated to concentration equal to 8 ug/L for MCL of 10 ug/L (80% of the MCL)
- Capital costs based on treatment plants capable of treating full source flow to < 1 ug/L
- Operation and maintenance (O&M) costs based on treating source flow from the highest RAA to 80% of the MCL
- Water provided by each source (source flow) =
$$\frac{\text{total system water produced}}{\text{total \# of active sources}}$$

Costs Assumptions

- Land costs excluded
- Sales tax of 7.25% added to capital costs
- All costs adjusted to June 2022 dollars using the Engineering News Record (ENR) Cost Indices
- Average flow (used for O&M costs) calculated using
 - 150 gallons/person/day for community and wholesaler systems
 - 120 gallons/person/day for NTNC systems
- Peak flow (used for capital costs) calculated using a peaking factor of 1.5

Cost Assumptions

- All systems will need to prepare both compliance and operations plans (this is likely an over-estimate)
 - Compliance plans estimated to take an average of 10 hours to prepare (\$762)
 - Operations plans will take an average of 90 hours to prepare (\$6,857)
- Costs based on median engineering salary of \$113,200 x 1.4 to account for the costs of benefits and employment taxes

Model to Estimate Costs

- Costs were estimated for
 - Each source with a RAA higher than the MCL
 - Most common expected treatment types: SBA, WBA, RCF
 - Including different treatment assumptions for each flow range
- Treatment type with the lowest estimated cost was used
- Costs estimated using sources in Documents Relied Upon
 - Available at bit.ly/Cr6-Rulemaking-File

Estimated Annual Costs for MCL at 10 ug/L

All cost tables are available in ISOR Attachment 1



Community Water Systems

Per	Fewer than 100 SC	100 to 199 SC	200 to 999 SC	1,000 to 4,999 SC	5,000 to 9,999 SC	10,000 or more SC	Average	Attachment 1 Table #
Source	\$57,645	\$86,343	\$173,011	\$405,343	\$620,623	\$608,937	\$419,092	8A
System	\$69,732	\$117,180	\$276,817	\$1,293,979	\$1,861,868	\$3,437,549	\$1,079,163	7.2A
SC (household)	\$1,622	\$808	\$647	\$466	\$255	\$91	\$128	9.2A
Person	\$443	\$279	\$60	\$136	\$67	\$23	\$32	10.2A
Volume Treated (kgal)	\$10	\$6	\$5	\$4	\$3	\$3	\$3	11.3A

SC = Service Connections

Pop = People

NTNC Water Systems

Per	Fewer than 50 Pop	50 to 99 Pop	100 to 199 Pop	200 to 399 Pop	400 to 999 Pop	1,000 or more Pop	Average	Attachment 1 Table #
Source	\$47,889	\$48,810	\$54,150	\$71,526	\$136,118	\$180,364	\$71,303	8B
System	\$51,081	\$48,810	\$59,072	\$93,877	\$217,789	\$180,364	\$82,803	7.2B
SC	\$25,541	\$14,286	\$3,249	\$11,644	\$72,596	\$2,973	\$8,599	9.2B
Volume Treated (kgal)	\$28	\$16	\$9	\$7	\$6	\$5	\$8	Calculated from 11.2B

Breakdown of Cost Impacts on Individuals

- 13.6% of California residents may see water bill increases as a result of the hexavalent chromium MCL
 - 11.5% may see monthly water bill increases up to \$20
 - 1.9% may see monthly water bill increases up to \$58
 - Less than 0.3% may see higher water bill increases
- For the largest systems (those with at least 10,000 connections), the average and median monthly water bill increase is \$8

Estimated Costs

- Are not the actual costs systems will face when complying with the MCL
- Capital costs were amortized at 7% over 20 years
- Most systems would see less than \$50 increase in monthly household water bills
- State financial assistance may be available
- Systems with fewer than 200 connections may be eligible to use Point-of-Use (POU) or Point-of-Entry (POE) devices for compliance

How is the level of an MCL determined?

Step 1: What level can we measure to?

0.1 $\mu\text{g/L}$

Step 2: What level can we treat to?

as low as $\sim 1 \mu\text{g/L}$

Step 3: What treatment level is economically feasible?

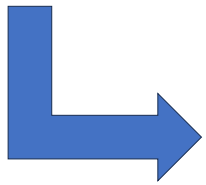
10 $\mu\text{g/L}$

Technological Feasibility

Economic Feasibility

Technological Feasibility

- Hexavalent chromium can be measured to 0.1 µg/L
- Hexavalent chromium can be treated to 1 µg/L



Therefore, the MCL of 10 µg/L is technologically feasible.

Economic Feasibility

- Included in consideration of economic feasibility:
 - Estimated compliance costs (total, per system, per source, per connection, per person, per unit of water)
 - Median and maximum monthly household cost increases
 - Types and sizes of affected systems
 - Information for affected systems in the 2022 Drinking Water Needs Assessment
 - Impacts of future planned regulations
 - Analysis of household cost increases by system size
 - Variability of unit costs at alternative MCLs
 - Cost-effectiveness

Economic Feasibility

- Proposed **MCL is economically feasible:**
 - 4.7 of the 5.3 million affected people would only see monthly cost increases of \$8
- There are **sufficient resources available** to potentially mitigate the challenge of compliance for the systems that are already struggling.

Economic Feasibility

- **No significant cost savings for small systems at alternative MCL values**, without substantial reductions in protections to public health
- In addition, estimated costs are based on **conservative assumptions**, and for those smallest systems that might find the regulation most economically burdensome, there are ways to mitigate those costs, including the use of POU/POE and consolidations with nearby systems.

Timeline

<i>DATE</i>	<i>EVENT</i>
11 August 2023 (noon)	Close of formal comment period
16 June 2024	Deadline to complete rulemaking process
1 October 2024	Latest regulation effective date
After effective date	Compliance plans due within 90 days of MCL exceedances (may require up to 4 quarters of sampling to determine)
2 years after effective date (2026)	PWS \geq 10,000 service connections compliance deadline
3 years after effective date (2027)	1,000 to 9,999 service connections compliance deadline
4 years after effective date (2028)	Less than 1,000...

Written Comments

Public Comment Deadline – **11 August 2023 at noon**

Written comments can be sent via email to:

commentletters@waterboards.ca.gov

Subject line: "SWRCB-DDW-21-003: Hexavalent Chromium MCL"

OR

Courtney Tyler, Clerk to the Board

State Water Resources Control Board

P.O. Box 100, Sacramento, CA 95812

All comments will be made public

Thank You

Public Comments before August 11

commentletters@waterboards.ca.gov

Drinking Water Rulemaking Questions

melissa.hall@waterboards.ca.gov

Project Website:

bit.ly/Cr6Webpage

Email List – *Drinking Water Program Announcements:*

bit.ly/SWR_CB_Email_SignUp

Draft EIR for Hexavalent Chromium

Kim Niemeyer
Office of Chief Counsel



Division of Drinking Water, August 2, 2023

Environmental Analysis Requirements

- CEQA Guidelines §15187 and Pub. Res. §21159 require analysis include reasonably foreseeable:
 - Environmental impacts of the methods of compliance;
 - Feasible mitigation measures; and
 - Alternative means of compliance
- Does not have to include site specific analysis, but reasonable range of environmental, economic and technical factors, populations, geographic areas, and specific sites.

Reasonably Foreseeable Means of Compliance

Best Available Technology (BAT) is reasonably foreseeable means of compliance with the regulation. BAT includes:

- Ion Exchange (Strong Base and Weak Base)
- Reduction-Coagulation-Filtration
- Reverse Osmosis

Alternative Means of Compliance

- Blending contaminated water with other existing uncontaminated sources
- Drilling new groundwater well
- Increasing reliance on surface water
- Purchasing water from, or consolidating with, another water system
- Using stannous chloride treatment

Sources of Information for Determining Impacts

- Division of Drinking Water's extensive experience
- Outreach to public water systems treating for hex chrome
- Review of environmental documents prepared for hex chrome treatment projects
- Comparison of location of known exceedances with datasets to assess environmental settings and potential impacts

Potential Impacts

- Related to monitoring
- Related to BAT
 - Construction
 - Operational impacts
- Related to Alternative Means of Compliance
- Cumulative Impacts
- Growth Inducing Impacts
- Alternatives Analysis

Impacts Analysis

- EIR cannot quantify impacts associated with implementation of any specific project.
- Too speculative to assume size, type and location of potential compliance projects.
- EIR recognizes potential for impacts.
- Identifies potential mitigation that lead or responsible agencies could require to avoid impacts.
- EIR takes conservative approach and finds most impacts significant and unavoidable.

Public Water Systems Can Use EIR to Prepare Own Focused EIRs

- Public Resources Code 21159.1 allows use of focused EIRs.
- Discussion of impacts is limited to project-specific effects that were not discussed in the in this EIR.
- Focused EIR does not have to discuss growth-inducing or cumulative impacts.
- Discussion of alternatives can be limited to discussion of alternative means of compliance with regulation

Comments

- Draft EIR is available online (bit.ly/cr6-rulemaking), at district offices, CalEPA building, and at county law library downtown.
- State Water Board will certify EIR and any make any necessary findings prior to adoption of the regulations.
- Comment period on the Draft EIR runs same as that on the regulations and related documents (Aug 11th at noon)

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Subject line:

“Comment Letter - DEIR Hexavalent Chromium MCL”

OR

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All comments will be made public

Public Comments

