SUPPLEMENT TO FORM 399 ECONOMIC IMPACT ANALYSIS

Hexavalent Chromium Maximum Contaminant Level
May 4, 2023

To Note: The numbers presented with headers, when they appear, indicate the associated question(s) in the STD 399 form.

ECONOMIC IMPACT STATEMENT

A. ESTIMATED PRIVATE SECTOR COST IMPACTS

4. Enter the number of businesses that will be created.

The RIMS II model cannot directly estimate the creation or elimination of businesses (it does not distinguish between more firms entering the market or existing firms producing more output). The overall change in jobs represents the net impact, which can be associated with both creation and elimination.

Businesses providing the goods and services needed are likely to expand in size or number. However, the potential changes in water costs will be distributed among many sectors and so are not expected to lead to the creation or elimination of businesses.

6. Enter the number of jobs created:

The modeled net effect on employment is negative and small relative to the California economy.

Describe the types of jobs or occupations impacted:

The types of jobs and occupations impacted include those in the following industries. Testing service providers (e.g., analytical laboratories) and services related to hexavalent chromium water treatment will experience an increased demand from PWS. Laboratories will likely experience an increased demand because of the additional analysis required for hexavalent chromium. Consulting firms, construction firms, and the material and labor industries may also experience an increased demand. The demand for any service related to hexavalent chromium treatment of any kind is also likely to increase.

However, the potential higher water costs will be distributed among many sectors of the economy and will potentially have a slightly negative effect on jobs. The net effect on employment is negative and not significant relative to the California economy.

B. ESTIMATED COSTS

1. What are the total statewide dollar costs that businesses and individuals may incur to comply with this regulation over its lifetime?

Together, PWS will incur annual direct costs of $2 million, $59 million, $138 million, $172 million, $180 million, and $180 million from year 2024 to year 2029, respectively. These direct costs consist of source monitoring costs ($1 million in 2029), which can be at either routine or increased frequencies, depending on the contamination of the source and the type of water being monitored (groundwater or surface water); amortized capital costs ($95.2 million in 2029) which are the upfront treatment costs consisting of equipment, infrastructure, construction activities, and professional services; operations and maintenance costs ($83.3 million in 2029) consisting of disposal, chemicals, labor, energy, and maintenance costs; and costs to prepare compliance plans ($1.8 million in 2024 only). While the lifetime of this regulation is indefinite, the amortization period for capital costs was 20 years. Over 20 years, the regulation will cost $3,591,363,662.

1. c. Initial costs for an individual:

The proposed regulation would not have direct impacts on individuals. It is anticipated that the proposed regulation will have indirect impacts for 5.3 million people (13.6% of California's population). The majority of impacted individuals (4.5 million people) may see monthly water bills increase by up to $20.46, 743,632 individuals may see monthly water bills increase by up to $57.92, and another 93,616 individuals may see monthly water bills increase by up to $121.02. Only 5,047 individuals (0.01% of California's population) are expected to experience water bills that increase by between $121.02 and $463.21 (in 2022 dollars).

2. If multiple industries are impacted, enter the share of total costs for each industry:

To generate RIMS II input values, we first categorize all the industries by North American Industry Classification System (NAICS) name and code that make up the capital costs used in the economic model. Table 1 lists the industries that are directly impacted by compliance-related spending and the annual direct costs in each category after full implementation occurs, except for preparing compliance plans, which is a one-time cost.

Table 1. Direct cost categories with their NAICS category description and the estimated annual direct costs (in 2022 dollars) at full implementation

Direct Cost Category	NAICS Category Description	Annual Direct Cost (2022 dollars)	Share of Total Cost (%)
Monitoring	Architectural, engineering, and related services	1,006,018	0.55
Amortized Capital Costs	Water, sewage and other systems	95,226,624	52.51
Chemicals (O&M Component)	Other basic inorganic chemical manufacturing	18,563,231	10.24
Disposal (O&M Component)	Waste management and remediation services	6,745,262	3.72
Remaining O&M Costs	Water, sewage and other systems	58,027,047	32.00
Preparing Compliance Plans	All other miscellaneous professional, scientific, and technical services	1,775,281	0.98

3. If the regulation imposes reporting requirements, enter the annual costs a typical business may incur to comply with these requirements.

While this regulation does impose a reporting requirement, it is in the form of a compliance plan that should be submitted in the first year of implementation. The cost to prepare the compliance plan is estimated at $7,619 per system, and it is a one-time cost. Except for the compliance and operations plans, the regulation is not anticipated to impose reporting requirements of any significance beyond already existing reporting requirements. PWS are already required to monitor for certain constituents and report the results to the State Water Board, and this regulation would add hexavalent chromium to that list. Any costs for analytical reporting are already included in the monitoring cost estimate. Therefore, there are no ongoing annual costs for reporting requirements.

C. ESTIMATED BENEFITS

1. Briefly summarize the benefits of the regulation, which may include among others, the health and welfare of California residents, worker safety and the State's environment.

The primary benefits of the proposed regulation are improved public health through the improvement of drinking water quality. The main beneficiaries would be those served by PWS whose current concentration of hexavalent chromium is greater than the proposed

MCL. Hexavalent chromium, even at low levels, can cause both cancer and noncancer health effects. The health benefits are the reduction in adverse health effects from hexavalent chromium in drinking water, as discussed below. While the reduction in cancer cases can be estimated, the reduction in noncancer cases (mainly liver toxicity) cannot be estimated due to limits in the science of noncancer effects.

Additional benefits are the increased public confidence in the safety of California's public drinking water from hexavalent chromium concentrations above the MCL and public assurance that exposure to hexavalent chromium in drinking water is at the lowest level technologically and economically feasible.

The typical business will benefit from having cleaner drinking water, which may translate to health benefits and healthcare cost savings for customers or employees, as well as savings on bottled water, to the degree people are avoiding or treating tap water due to hexavalent chromium. This could lead to increased spending on goods and services for things other than healthcare or bottled water. These effects cannot currently be quantified. Small businesses will experience the benefits listed above for typical businesses.

For an MCL of 10 μg/L, approximately 898 cancer cases will be avoided over 70 years statewide. There is currently no established and approved methodology for the Water Board to use to quantify a monetized benefit for reducing cancer risk. Therefore, while staff calculated avoided cancer cases based on OEHHA (2011), there is no methodology to monetize these benefits. This document therefore does not include an assessment of the monetary benefit of these reductions.

Additional nonquantifiable health benefits are expected in the form of reduced cases of liver toxicity and a reduction in adverse effects in the liver and blood forming tissues (OEHHA, 2011). Concentrations of hexavalent chromium below 2 μg/L protect against these noncancer effects. However, because the noncancer effects of hexavalent chromium are nonlinear, the number of cases caused by any particular concentration above 2 μg/L cannot be quantified. An average reduction of 32.4% in hexavalent chromium concentrations is expected for the 5.5 million people affected by this regulation.

The treatment for hexavalent chromium may in some cases provide a secondary benefit by removing other contaminants in drinking water. For example, treatment through ion exchange may remove trace levels of other inorganic contaminants, such as uranium and arsenic, that may be present in some public water system wells. The health concerns associated with such contaminants would be reduced. The magnitude of this secondary benefit is likely to be relatively low and cannot be estimated based on currently available data.

As noted above, another benefit of adopting an MCL is that it may improve public perception of the safety of the drinking water supply, potentially resulting in a lower

demand for home water treatment systems and a decreased rate of consumption of bottled water.[1] The purchase of bottled water, which costs $52 to $107 per month for a 3-person household,[2] is a burden, especially for those with lower incomes. In addition, increased confidence in the tap water may reduce consumption of sweetened beverages in place of water.

Individuals also benefit from the Consumer Confidence Report language, which is intended to inform the public of the major origins or sources of the contaminant and the health effects of that contaminant. Because the language makes sure that the public are all aware of the sources of hexavalent chromium and the health effects, it provides consistent statewide quality of information between PWS and their customers, which is essential to communities trusting the water they are served.

2. Are the benefits the result of specific statutory requirements or goals developed by the agency based on broad statutory authority? Explain.

The benefits are the result of goals developed by the agency based on broad statutory authority. HSC 116365 requires that the MCL be set at the lowest level technologically and economically feasible (down to the PHG), with a primary emphasis on public health. The PHG is set by the Office of Environmental Health Hazard Assessment (OEHHA).

3. What are the total statewide benefits from this regulation over its lifetime?

The majority of the benefits discussed in section C.1 are difficult to quantify. However, for an MCL of 10 ug/L, approximately 898 cancer cases will be avoided over 70 years.

4. Briefly describe any expansion of businesses currently doing business within the State of California that would result from this regulation.

Businesses that sell water treatment equipment (specifically for Reduction-Coagulation-Filtration (RCF) and ion exchange) are expected to expand within the State of California as a result of this regulation. In addition, analytical laboratories will likely experience an increased demand because of the additional analysis required for hexavalent chromium. Consulting firms, construction firms, and the material and labor industries may also experience an increased demand. The demand for any service related to hexavalent chromium treatment of any kind is also likely to increase. If the installation of treatment increases classification ratings for PWS (22 CCR 64413.1(b)(5) and (7)), there may also be an increased demand for high-level operators.

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[1] Bottled water is not specifically tested for hexavalent chromium and may not be safer to drink than tap water. However, some people prefer drinking bottled water when they are concerned about the safety of tap water.

[2] These costs are calculated in the SRIA, Section I.7.

PWS costs are paid for by household water bills and, in some cases, through grants, bonds or loans. As such, it is not expected that any PWS would shut down as a result of the regulation.

The set of entities that buy water from affected PWS may face higher charges for water and, depending on their situations, will be able to pass on those higher costs to their customers. This is negligible in macroeconomic terms, but may impact some entities.

D. ALTERNATIVES TO THE REGULATION

1. List alternatives considered and describe them below / 2. Summarize the total statewide costs and benefits from this regulation and each alternative considered

The State Water Board individually analyzed three alternatives to the proposed MCL (1, 8, and 12 ug/L) in section F of the SRIA (ISOR Attachment 2). However, a total of 20 alternatives were evaluated in the cost-effectiveness analysis (1 through 15, 20, 25, 30, 35, 40, and 45 ug/L).

No benefits were reported in D.2 because the benefits cannot be quantified. The costs reported in D.2 and E.3 are annual costs at full implementation, not total costs (the lifetime of the regulation is indefinite).

3. Briefly discuss any quantification issues that are relevant to a comparison of estimated costs and benefits for this regulation or alternatives.

Please refer to D.1 and D.2. While the avoided cancer cases can be estimated for the proposed regulation and its alternatives, the avoided noncancer cases cannot be estimated due to limits in the science of noncancer effects. This reduction in cancer and noncancer cases will lead to public health benefits in the form of healthcare cost savings, which also cannot be estimated due to the uncertainty and wide range of costs. There is currently no established and approved methodology for the Water Board to use to quantify a monetized benefit for reducing cancer risk. Therefore, the benefits of this regulation cannot be quantified in dollars.

E. MAJOR REGULATIONS

2. Briefly describe each alternative, or combination of alternatives, for which a cost-effectiveness analysis was performed:

Please refer to D.1 and D.2.

3. For the regulation, and each alternative just described, enter the estimated total cost and overall cost-effectiveness ratio:

A cost-effectiveness analysis was performed for 20 alternative MCLs, available in section F.4 of the SRIA (ISOR Attachment 2). Based on this analysis, it is cost-effective to place the MCL down to 10 µg/L, but not lower.

5. Briefly describe the increase or decrease of investment in the State:

The results of the SRIA show that, once adjustments are made, but while the one-time capital costs are still being amortized, the impact on investment (capital costs) per year will be an increase of almost $95 million, in 2022 dollars. That investment will lead to an increase in gross output of $157 million and an increase in value added of $97 million, both in 2022 dollars. These impacts are insubstantial compared to California's roughly $3 trillion annual economy.

Briefly describe the incentive for innovation in products, materials, or processes:

Establishing an MCL for hexavalent chromium will lead to systems installing treatment technologies capable of removing hexavalent chromium from their water. As more hexavalent chromium treatment systems are implemented, more data will be available on the effectiveness of different types of treatment under different circumstances (including differing water quality types). Systems will look for both effective technologies and inexpensive technologies, which will drive innovation for hexavalent chromium water treatment technologies.

Benefits of the regulations:

Please refer to C.1.

FISCAL IMPACT STATEMENT

A. FISCAL EFFECT ON LOCAL GOVERNMENT

2. Additional expenditures in the current State Fiscal Year NOT reimbursable by the State

There are 82 PWS that have sources contaminated with hexavalent chromium above 10 µg/L that are operated by local governments (usually a city, county, or district). Each system that exceeds the MCL will also be required to prepare a Hexavalent Chromium MCL Compliance Plan and an associated operations plan, which is a one-time cost estimated at $7,619 per system. Additionally, together the local governments will incur annual costs of $148,446,636, consisting of monitoring costs, amortized capital costs, and operations & maintenance costs. This workload is expected to be absorbed by existing local government personnel and resources, and the costs are expected to be passed on to ratepayers.

6. Other. Explain

The capital costs and ongoing material costs (e.g., chemicals) experienced by PWS will generally be subject to sales tax.[3] Therefore, the proposed regulation is expected to have an impact on sales tax revenues. Sales tax rates in California have three parts: the state tax rate, the local tax rate, and any district tax rate that may be in effect. The minimum sales tax in California is 7.25%. Local and district tax rates range from 0.10% to 1.00%, and some areas may have more than one district tax in effect (CDTFA, 2022a).

To estimate the increase in sales tax revenues due to the proposed regulation, the appropriate sales tax rate (discussed below in each section) was multiplied by the cost of goods (not including services) in the capital and O&M costs, which consisted of capital equipment, chemical, and resin purchases. Generally, services that do not result in a tangible good are exempt from sales tax in California. While capital costs in previous sections were annualized, these sales tax calculations assumed that tax would be collected only when the initial purchases were made, which was assumed to be in 2025, 2026, or 2027 for capital costs, depending on the compliance schedule and the size of the system. O&M costs were assumed to be incurred annually starting in the year the corresponding capital costs were incurred.

To estimate the impact of the proposed regulation on local sales tax revenue, tax rates were obtained for California cities and counties (CDTFA, 2022b), and the average incremental local tax rate was calculated from those values, relative to the state's 7.25%. The average incremental local sales tax rate is 0.94%, which was assumed for all years in this analysis. Local sales tax revenues are expected to increase by $3.2 million in 2025, $1.7 million in 2026, $0.6 million in 2027, and $0.2 million in each subsequent year.

B. FISCAL EFFECT ON STATE GOVERNMENT

1. Additional expenditures in the current State Fiscal Year. (Approximate)

State Water Resources Control Board

It is estimated that an average of 35 hours of the Division of Drinking Water (DDW) of the State Water Board staff time will be needed to review and respond to each set of compliance and operations plans, and the hourly cost to employ a water resource control engineer (including overhead) is $91 per hour. However, only 2 of the 35 hours are expected to be used to review the compliance plan in the first year, and the remaining time is expected to be spent on the operations plan in future years. Given that 233 PWS

[3] Because all affected PWS are in California, it is assumed that they will be purchasing equipment and materials from California and that these purchases are subject to both state and local taxes.

are expected to submit compliance plans in the first year, DDW staff will spend 466 hours to review them, which corresponds to a total cost of $42,262.

Other State Water Agencies

Only one PWS that is expected to exceed the MCL is owned by a state agency (the University of California), and the agency will incur costs if treatment is necessary to comply with the MCL. Each system that exceeds the MCL will also be required to prepare compliance and operations plans, which is a one-time cost estimated at $7,619 per system, $762 of which is expected to be spent on the compliance plan in the first year. Additionally, the agency will incur annual costs of $95,419. No other significant direct or indirect impacts on other state agencies associated with the adoption of this MCL have been identified.

Combined, the State Water Resources Control Board and University of California will incur a cost of $43,024. The University of California will incur ongoing annual costs of $95,419.

4. Other. Explain

Please refer to B.1 above.

As discussed for local sales tax, much of the capital cost spending and some of the O&M cost spending by PWS includes purchases of goods, and sales tax will generally apply to such purchases. The proposed regulation is therefore expected to have an impact on the state's sales tax revenue. As previously mentioned, the sales tax rate in California is 7.25%. State sales tax revenues are expected to increase by $24.1 million in 2025, $13.2 million in 2026, $4.5 million in 2027, and $1.4 million in each subsequent year.