Final Statement of Reasons
Hexavalent Chromium Maximum Contaminant Level (MCL)
Title 22, California Code of Regulations

UPDATE OF INITIAL STATEMENT OF REASONS

The information contained in the Initial Statement of Reasons (ISOR) remains unchanged, except for the following:

- The Department has withdrawn proposed section 64432(p). Withdrawal of the subsection has no regulatory effect because it proposed a new and discrete requirement not addressed in regulation; and withdrawal of the newly proposed text has no effect on existing regulations or the remainder of the proposed regulatory action. The reasons for the decision to withdraw the proposed subsection are provided in the responses to comments on the subsection.
- Section 64465(c) has been revised to refer to "multilingual" as opposed to "bilingual." The change is grammatical in nature and is nonsubstantive in that the revision has no effect on the proposed requirements. Therefore, no subsequent 15-day comment period was necessary for this change.

All contents of the ISOR, with revisions noted above, are hereby incorporated by reference into the Final Statement of Reasons. In addition, this document serves to make the following clarifications with respect to the ISOR:

- On page 27 of the ISOR, the fourth paragraph under the heading, "Section 64447.2, Best Available Technologies (BAT) – Inorganic Chemicals", refers to 'studies' evaluating the performance of best available technologies. The specific studies referenced are: Blute, N. and Wu, Y., 2012, and; NSF International and USEPA, 2004, as listed in the "References" section of the ISOR (pages 34-36).
- The list of references in the "References" section of the ISOR (pages 34-36) represents the list of documents relied upon.

SUMMARY AND RESPONSE TO COMMENTS RECEIVED DURING THE INITIAL NOTICE PERIOD OF AUGUST 23, 2013, THROUGH OCTOBER 11, 2013

This regulation (DPH-11-005) was made available to the public on August 23, 2013, and public comments were accepted until 5:00 pm on October 11, 2013. In anticipation of a request for a public hearing, the Department held two public hearings - one in Sacramento, one in Los Angeles - both on October 11, 2013. In all, the Department received approximately 18,000 written and oral communications providing comments on the proposed regulation.

Due to the large number of comments, it is not practical for the Department to identify each individual comment with its corresponding commentator. Commentators include, but are not limited to, members of the general public (including children), environmental

groups, law firms, public water systems and their representative organizations, politicians, cities, and industrial/trade groups. Attached as an addendum is a document titled "DPH-11-005 – Coded Comment Tables" that provides a detailed account of the comments received. The document was used as a tool to confirm the Department reviewed all comments, summarized the comments, and responded to the comments accordingly, as provided below.

The comments received are summarized below, in order of the sections included in the proposed action, with the Department's response following in italics. The vast majority of the comments were with respect to the proposed MCL, which is identified in section 64431 of the proposed regulatory text. Commentators expressed support for the proposed MCL, as well as strong opposition with some expressing their desire to have a lower MCL and others seeking a higher MCL. For organizational purposes, the Department has attempted to categorize comments and responses per their corresponding issues or concerns.

As a reminder, MCLs are expressed in units of milligrams per liter (mg/L), sometimes referred to as "parts per million" (ppm). At low concentrations, contaminant concentrations are sometimes referenced using units of micrograms per liter (µg/L), also known as "parts per billion" (ppb). For example, the proposed MCL is 0.010 mg/L. This value may also be referred to as 0.010 ppm or, more commonly, 10 ppb, for ease of discussion.

The following is a list of acronyms or abbreviated phrases, used in the subsequent discussions, and their meanings:

- BAT = Best Available Technology
- CWS = Community Water System(s)
- Department = California Department of Public Health
- DLR = Detection Limit for purposes of Reporting
- gpd = gallons per day
- gpcd = gallons per capita per day
- H&S Code = Health and Safety Code
- ISOR = Initial Statement of Reasons
- MCL = Maximum Contaminant Level
- NSF = NSF International
- NSF (60/61) = NSF/ANSI Standards 60 and 61
- NTNCWS = Nontransient Noncommunity Water System(s)
- OEHHA = Office of Environmental Health Hazard Assessment, California Environmental Protection Agency
- [OTH] = Opposed to the MCL, believing it to be too high
- [OTL] = Opposed to the MCL, believing it to be too low
- PG&E = Pacific Gas and Electric Company
- PHG = Public Health Goal
- PHG report = OEHHA's report establishing the PHG titled, "Public Health Goal for Hexavalent Chromium (Cr VI) in Drinking Water "

- POE = Point-of-Entry treatment device
- POU = Point-of-Use treatment device
- PWS = Public Water System(s)
- SDWA = Safe Drinking Water Act
- [SN] = Support or neutral regarding the MCL
- SWS = Small Water System(s)
- U.S. EPA = United States Environmental Protection Agency

COMMENTS AND RESPONSES

Section 64213, California Code of Regulations (CCR).

The Department received no comments.

Section 64431, CCR.

Note: The Department received comments on the proposed regulatory action from over 18,000 commentators. The majority of the comments pertained to various issues related to the proposed maximum contaminant level (MCL) for hexavalent chromium, as proposed in section 64431. The commentators included those supporting the proposed MCL, as well as those opposing the proposed MCL based on their position that the proposed MCL is too high or too low. Therefore, to best facilitate the comments and responses, the comments and responses have been divided into various subjects or topics, within headings dependent on whether the comments were supportive (or neutral or unclear) regarding the proposed MCL, or opposed with the opinion the proposed MCL was too high or too low.

Support, Neutral, Misc [SN]

The Department received comments supporting the proposed MCL, as well as comments and miscellaneous inquiries or statements from commentators who appeared neutral or whose opinion could not be determined.

SN-1: Commentators supporting the proposed MCL made the following comments or observations:

- Stated that the proposed MCL is protective of public health and/or is a step forward to protecting public health.
- Thanked and/or supported the Department's efforts and handling of the proposed regulatory action.
- Stated that the proposed MCL is technically feasible, with a commentator claiming their treatment process can treat down to 5 ppb, while another stated their pilot studies indicate they may be able to treat down to 8 ppb.
- Stated that the Department's methodology used to assess the MCL was thoroughly researched, science-based, conservative, and protective of most sensitive populations.
- Stated that the 10 ppb decision was rational.
- Commended the Department for the timely efforts of proposing an MCL so quickly after the PHG was established.
- Appreciated the Department's transparent and collaborative process during the regulatory process.
- Noted that the Department prepared an analysis that was transparent and reproducible in the short time resulting from pressure of litigation following the PHG.

Response: *The Department appreciates the support. Thank you.*

SN-2: Commentators made the following comments:

- Proposed MCL is fine (or will not impact the commentator), but do not go lower (or will be impacted if the MCL is lowered).
- Recommended additional research to refine the risk assessment for low level exposures in drinking water.
- While not specifically expressing opposition to the proposed MCL, stated that they would be supportive of an MCL of 20 ppb to better balance costs.
- Noted support of the proposed MCL, but expressed concern for costs to disadvantaged communities and requested funding for such communities, if not already available.

Response: *No changes to the regulation are required to accommodate these comments. The Department appreciates the support and, with respect to the concern regarding costs to disadvantaged communities and the availability of funding, please see the comments and responses to CF-1 [OTL].*

SN-3: Commentators made the following comments and inquiries:

- "Has there been a Std. Form 399 (Economic and Fiscal Impact Statement) issued for DPH-11-005 Hexavalent Chromium MCL? If so, could you please email me a copy?"
- "Have you found any naturally formed deposits with levels below your current standard that have created a cancer cluster?"
- "Have you proven what the financial impact vs other health and welfare are?"
- "Have you proven that a decrease to your suggested levels will effect [sic] anything?"
- "Have you proven that by lowering your content level recommendation you will not cause other problems?"
- "Have you considered that in fact no matter what you do the air will still be full of chromium-6?"
- "Have you condsidered [sic] that those that are truly concerned about these levels can purchase home systems of their own for less than the financial impact of just one year?"
- "It is up to you do [sic] prove that something is wrong, not for the public to prove that your possible decision is wrong."
- "If you are wrong and the opposition is correct about chromium-6 costs you will have created a new group of haves and have nots. You will have created a group of people that can afford neither food nor water".
- "Can you please advise of the rationale or the source for the estimates of theoretical cancer cases avoided per year given on page 25 of the document [ISOR]?"
- Page 84 of the PHG report gives cross species extrapolations from male mice to humans. The text states the extrapolation is based on the 'ratio of mouse to human body weight to the ¾ power," but the equation uses a power of ¼ . The commentator asks for an explanation.
- Asked why some are unaffected by chrome? This question was from an individual, now 78, claiming to have been greatly exposed to chrome while having worked in the chrome industry for many years, with a normal medical record. The commentator suggested finding out why he is immune to produce a cure.
- Will all the written comments received by the Department be posted on your website? If not, how will they be made available to the public?
- Asked when the public hearing will be held so that he can exercise his rights as a citizen and representative of his taxpayers association. The commentator subsequently sent a message noting that he found the notice with the hearing information and provided a copy, and the commentator subsequently sent comments.
- Provided notice that he is working on commercializing a product that is first generation technology based on a movie, and questioned if it could supplement efforts to remove high levels of chromium from water.

Response: *No changes to the regulation are required to accommodate these comments. The Department views a number of the comments and questions as rhetorical in nature, beyond the scope of the proposed regulatory action, adequately addressed in the ISOR or other responses to comments, misdirected, or subsequently resolved by the commentator. Nevertheless, the Department offers the following responses:*

Pertinent documents related to the regulatory action, such as the Std. 399 and the comments received, are available to the public for review in the rulemaking file. The Department does not anticipate placing the comments on the Department's web site. The Department is not obligated to provide proof of the matters noted, conduct the studies suggested by commentators, nor take into consideration issues beyond those directly related to the proposed action and the Department's legal obligations. The Department is required to adopt an MCL as close to the PHG as technologically and economically feasible, with emphasis on the protection of public health.

The Department is independent of OEHHA and any comments regarding OEHHA or its establishment of the PHG are beyond the scope of the proposed regulatory action. The estimates of theoretical cancer cases avoided is derived from consideration of the cancer risk (as provided in the PHG report), while then applying the cancer risk to the estimated exposed populations at associated concentrations of hexavalent chromium, with the assumption of no risk from hexavalent chromium from the water subsequently being treated.

The Department welcomes new and innovative treatment processes having demonstrated the ability to treat hexavalent chromium.

Oppose – the MCL is too low [OTL]

Health Effects (HE)

HE: Commentators expressed the opinion that the health effects associated with hexavalent chromium are overrated, or that there are no data or studies stating that hexavalent chromium is harmful or poses a significant health risk at the proposed MCL (or other particular levels). For example, one commentator asserted that "there has been no medical data been [sic] submitted or cited to support the proposed standard." In support of commentators' assertions, commentators referred to the following:

- Recent studies indicating that the existing California total chromium MCL of 50 ppb – or even the federal total chromium MCL of 100 ppb – is protective of public health.
- Stating that there is no evidence of increased cancer (or other health concerns) in communities that have hexavalent chromium over the proposed MCL or noting his/her community has been drinking water that exceeds the proposed MCL of 10 ppb all their lives with no impact (often noting that hexavalent chromium is naturally occurring). Some citing the news reporting studies (from California Cancer Registry) of Hinkley area residents having no increased rate of cancer or citing a 2001 study by Northern California Cancer Center of service areas having elevated levels of hexavalent chromium.
- Questioning where the 12 extra cases of cancer are located (in reference to the ISOR noting that the proposed MCL would lead to an estimated total of approximately 12 theoretical cancer cases avoided per year statewide).
- Claiming that no person has ever been diagnosed with cancer due to naturally occurring hexavalent chromium and requesting that the Department, prior to setting the standard, perform a study of areas with naturally occurring hexavalent chromium to determine whether they have increased rates of cancer.
- Claiming that the ISOR states that drinking water over the PHG is not necessarily harmful.
- Stating that health effects are based on high-dose levels, not the low levels found in PWS.

In addition, one commentator stated that the treatment identified by the Department comes with the added risk, of small water systems, of having to store and handle large volumes of caustic chemicals.

Response: *The Department has proposed an MCL based on the PHG as mandated by law, and is not obligated or compelled to perform an epidemiological study or consider potential inadvertent risks associated with chemical handling. Appropriate chemical handling to avert potential risks are regulated by other state and federal entities.*

A PHG is a contaminant concentration in drinking water that does not pose a significant risk to health, and is needed for the development of a hexavalent chromium MCL. The PHG is established by OEHHA pursuant to H&S Code section 116365(c), which requires OEHHA to assess the risks to public health posed by a contaminant. Once

established by OEHHA, the Department must use the PHG when it proposes a primary drinking water standard (MCL).

The extrapolation of experimental results from animal studies using high levels of exposures to predict potential risks to people exposed to low exposures over a long period of time is basic to risk assessments used for the regulation of chemicals in the environment.

OEHHA has informed the Department that it is aware of the recent studies. The Department has not been informed that OEHHA intends to proceed with a review of the PHG sooner than its normal five-year review process. As noted in the ISOR, the Department is required by law to establish an MCL for hexavalent chromium. The Department is also required by law to utilize a contaminant's PHG when establishing an MCL. OEHHA established the PHG in 2011. Commentators questioning the evidence of the potential health risks associated with hexavalent chromium are encouraged to read the PHG report, or contact OEHHA to discuss and/or submit studies (such as those from California Cancer Registry, etc.) believed to be relevant.

A PWS is not limited to using the treatment identified by the Department in the ISOR for the purposes of estimating costs pursuant to the requirements of the H&S Code. The most appropriate treatment or means of compliance best suited for a PWS will need to be determined on a case-by-case basis.

Public Health Goal (PHG)

PHG-1: A number of commentators asserted that the public health goal (PHG) is based on outdated information and did not consider the most recent studies, often citing a study by Tox Strategies that concluded the existing total chromium MCL of 50 ppb (or even a higher number) would be protective of public health. The comments often referred to hexavalent chromium converting to trivalent chromium in the human gut and, therefore, not being harmful. Commentators suggested OEHHA will be considering the new science and that the U.S. EPA is including the information in their assessment of hexavalent chromium. Commentators requested the Department take into consideration the new science or wait for OEHHA's review of the science, prior to adopting the proposed MCL. One commentator recommended that the Department send the new science to Erin Brockovich and noted that the World Health Organization has a recommended allowable concentration of 50 ppb for hexavalent chromium.

One commentator incorrectly cited the value of the PHG (e.g., 2 ppb, rather than 0.02 ppb) and questioned how the Department arrived at the value.

Response: *The Department has no discretion with respect to a PHG; the process of establishing a PHG is entirely within the jurisdiction of OEHHA. To the Department's knowledge, OEHHA has not indicated that it intends to proceed with a review of the PHG sooner than its normal five-year review process. As noted in the ISOR, the Department is required by law to establish an MCL for hexavalent chromium. The*

Department is also required by statute (H&S Code section 116365) to utilize a contaminant's PHG when establishing an MCL. OEHHA established the PHG in 2011.

Since evaluating the new science is the responsibility of OEHHA, submitting new science to Erin Brockovich is beyond the purview of the Department. The World Health Organization's 2011 4th edition Guidelines for Drinking Water Quality, establishes a provisional guideline value of 50 ppb for total chromium, with no value specific to hexavalent chromium. Regardless, as noted, the Department is required to utilize OEHHA's PHG as the health-related basis for establishment of an MCL, and not other organizations' assessments or recommendations.

The PHG, which is currently 0.02 ppb, is established by OEHHA, not the Department. OEHHA's PHG report explains how OEHHA arrived at the value.

PHG-2: Commentators questioned the validity of PHG, the process under which it was developed, and science cited by OEHHA in the PHG report. The comments included the following:

- While referring to H&S Code section 57004(b) and attachments with copies of documents from a California public records act request, commentators asserted the PHG was not conducted as required by law in that the peer review was not a legally valid peer review and, therefore, the PHG is also not valid.
- Neither the PHG, nor the MCL, factors in that many people consume bottled or filtered water.
- The one-in-a-million risk associated with PHG is theoretical and is not a verifiable reality.
- States that any population includes individuals susceptible to cancer, likely greater than one-in-a-million but not a substantial portion of the population, and asks if the regulations are intended to protect the 'one-in-a-million' susceptible individual and what the additional costs are to achieve the protection.
- The PHG is based on consumption of 2 liters/day for 70 years; commentators claim no one drinks that much tap water.
- States that the high doses used on mice are not typical of either the current 50 ppb or federal 100 ppb MCL and the human GI tract can attack hexavalent chromium better than the GI tract of mice.

Response: *The Department is independent of OEHHA and its establishment of the PHG. Any comments regarding OEHHA or their establishment of the PHG are beyond the scope of the proposed regulatory action and should be addressed to OEHHA.*

Environmental Protection Agency (EPA)

EPA-1: Commentators requested that the Department provide a "grace period" or "compliance framework" before implementing the MCL, often referring to U.S. EPA's implementation of its standards (e.g., arsenic). Suggested timeframes ranged from one year to five years, with one commentator implying that a "lawsuit seeking to stay

application of the MCL" will occur if a grace period is not provided. Along with comparisons to U.S. EPA, commentators provided the following as comments or reasons for having a grace period:

- An implementation schedule will prevent customers from being alarmed.
- References impending enforcement actions, water supply shortages, denied will serve letters, and accompanying economic impacts, etc.
- Due to planning, design, construction, financing, exploring cost-effective solutions, negotiation of alternative sources of supply, getting approvals from California Public Utilities Commission, financing approvals, and other time-consuming activities, PWS will not have an opportunity to comply before being in violation.
- Pilot testing and CEQA will require time.
- Claims it is unreasonable for the Department to spend more than a decade to set a standard, but expect PWS to be immediately liable.
- Although an unreasonable delay is not acceptable, the PWS should be allotted the time to ensure the most cost-effective treatment is implemented.
- Hexavalent chromium standards in other parts of the world are much higher, so commentators question why there is a rush to set an MCL.
- Refers to treatment costs lowering over time of grace period, if one was allowed.

Response: *The proposed regulation includes an implementation period. PWS are not required to perform initial compliance monitoring for six months - unless a PWS chooses to perform compliance monitoring sooner or chooses to rely on grandfathered results. In addition, as a chronic inorganic contaminant, compliance with the hexavalent chromium MCL is based on a running annual average of quarterly results. Consequently, a PWS may not be in violation for as long as an additional year or more after the six-month period, unless the hexavalent chromium concentration exceeds the annual maximum before the annual averaging period has concluded. In the Department's view, higher levels of hexavalent chromium should require the quicker action that is inherent in the regulations. The proposed action is historically consistent with the Department's establishment of drinking water standards and, except for the need to be at least as stringent as the U.S. EPA when establishing drinking water standards, the Department is not obligated to establish regulations in the same manner as the U.S. EPA.*

The Department does not believe a lengthy grace period would be in the best interest of public health. Depending on its particular circumstances, a PWS may have various options available for achieving compliance, some of which could be relatively easy to implement. A lengthy grace period likely would delay all compliance activity, including those for which compliance is most easily obtained. The proposed action does not preclude a PWS from applying for an exemption or variance.

The suggested resulting legal implications and actions referenced by commentators are beyond the scope of this regulatory action and should be addressed via the proper legal channels. The Department is mandated by law to establish an MCL.

EPA-2: Commentators referenced new studies that suggest the hexavalent chromium is not harmful at the current U.S. EPA MCL of 100 ppb (via the total chromium MCL) or the current California MCL of 50 ppb (via the total chromium MCL), with some suggesting that the Department adopt a standard of 100 ppb. Similarly, commentators requested that California (the Department) conform with or wait for U.S. EPA's action (or more science or other scientists) and review regarding hexavalent chromium and/or asserts U.S. EPA's process is more rigorous and will include more recent science that OEHHA has not (or requested that the Department wait until new science is vetted or do further studying before setting a standard). Commentators also claimed that the H&S Code requires the Department to consider U.S. EPA's MCL and, therefore, must wait for U.S. EPA to establish an MCL.

Some commentators expressed concern that an MCL that differs from U.S. EPA's would confuse the general public. Commentators also noted that the proposed MCL is one-tenth U.S. EPA's current standard and/or U.S. EPA's standard is good enough for everyone else and should be good enough for California. One commentator suggested that since U.S. EPA "at the same time" increased the national standard from 50 ppb to 100 ppb and there must therefore be differences in interpretation and methodology to come to different conclusions.

Response: *For responses specific to new studies or new science, please refer to the response to PHG-1 [OTL].*

The Department is not bound by the U.S. EPA's procedures and processes for establishing a drinking water standard, nor must the Department await the outcome of U.S. EPA's findings or the establishment of their MCL. To the contrary, the Department is mandated by law to establish an MCL for hexavalent chromium, and to utilize the contaminant's PHG when establishing the MCL. OEHHA established the PHG in 2011. In addition, H&S Code section 116270(f) states the legislative intent to be establishment of primary drinking water standards that are at least as stringent as those established by U.S. EPA and to establish a program that is more protective of public health than the minimum federal requirements. California currently has over 35 contaminants with MCLs more stringent than EPA's, and the Department is not obligated to wait for U.S. EPA to establish an MCL before moving forward with its own. This is further supported by way of section 116365(b)(2), which requires the Department to ***consider*** *a "national primary drinking water standard for the contaminant,* ***if any****, adopted by the United States Environmental Protection Agency." [emphasis added] The Department finds no compelling reason to delay establishment of a standard for hexavalent chromium or wait for U.S. EPA's evaluation.*

With over 35 contaminants having MCLs more stringent than EPA's, suggestions that there will be confusion among Californians appears unfounded and provides no reason to forego the establishment of an MCL for hexavalent chromium. Moreover, since there is no U.S. EPA established MCL for hexavalent chromium and the Department is required by law to establish a California standard (MCL), it is a practical necessity that the California standard not be the same as the U.S. EPA standard. The Department is unclear about the relevance or accuracy of the commentators' reference to U.S. EPA

increasing the national standard from 50 ppb to 100 ppb, unless referring to U.S. EPA's total chromium standard. Nevertheless, the U.S. EPA is currently considering its first standard specific to hexavalent chromium.

Cost Feasibility (CF):

CF-1: A number of commentators asserted that it is not economically feasible for lower income individuals or families to have their water bills increased by hundreds of dollars, or some reference to water rate increases and that the proposed MCL will directly affect PWS's ability to provide a safe, reliable, and affordable drinking water; with some commentators asserting that costs could drive some districts in disadvantaged communities into bankruptcy or that the cost of compliance would be devastating to budgets, capital improvement plans, master plans, or the general economy of California or local areas. One commentator claimed that there are 65 NTNCWS operating as businesses that would be severely impacted and, therefore, asserts the proposed MCL is not economically feasible and the only reasonable alternative is to withdraw the proposed regulatory action. Similarly, while providing estimates of total cost to NTNCWS, another commentator expressed concern regarding the potential anticipated costs for NTNCWS operating as private businesses.

In support of the opinion that the proposed action is not economically feasible, commentators sometimes noted that the estimated costs for SWS are above typical affordability criteria, while referencing various Median Household Income (MHI) affordability criteria, and that SWS are unfairly and disproportionately impacted. One commentator claimed that none of the proposed MCLs are economically feasible, in part due to methodological errors in the cost/benefit analysis where benefits are inflated and that the result is just a tax on citizens with no benefit.

Some commentators expressed concern that the Department's funding programs are not adequate to help, or that the Department needs to ensure that funding is available. On this topic, commentators claimed or noted:

- Funding dollars goes to acute contaminant compliance before chronic compliance (i.e., there is competition for funds).
- Funding needs to provide for operational costs too.
- Mutual water systems are not eligible for funding.
- Their PWS is prohibited from receiving funding.
- Grant (or low or no interest loan) money should be available to all PWS, including PWS under the Public Utilities Commission, since residents pay taxes, including those in disadvantaged communities.

Commentators also noted that PWS are still unable to comply with the recent arsenic MCL revision due to costly treatment and expressed concern that hexavalent chromium will follow the same path and will worsen the situation. A commentator claimed the use of point-of-use (POU) and point-of-entry (POE) devices are not a viable alternative because their use is limited to three years and that the Department needs to adopt regulations that allow long-term use of POUs and POEs.

Response: *The Department determined economic feasibility as required by statute. In doing so, the Department used certain assumptions that may not necessarily be applicable to individual PWS or particular groups of PWS. Some water systems may incur costs exceeding those provided in the ISOR, while others may incur less costs utilizing other options for compliance. The costs are not intended to be utilized for water systems to budget or bid costs for treatment, nor to be used for direct comparison to MHI affordability criteria since compliance costs are site-specific.*

As mentioned in the ISOR, the Department recognizes that SWS generally bear a higher cost per household for compliance with drinking water standards than do larger PWS due to economies of scale that are available to larger systems, but not to SWS. However, the Department must adopt a standard as close as possible to the PHG considering only technical and economic feasibility. As discussed in the ISOR, and in general, costs increase as the level of the MCL decreases for drinking water systems of all sizes. The Department has no discretion to set a different "affordable" MCL applicable to SWS that is less protective of public health. Nor does it have the discretion to set a statewide standard that is less protective of public health, but which may be more affordable to SWS. However, unlike the arsenic MCL, a SWS can seek a variance (under H&S Code section 116430) from the hexavalent chromium MCL, allowing extended permitted use of POUs. Use of POEs is not limited to three years. Also, the proposed regulatory action does not preclude a PWS from applying for an exemption pursuant to H&S Code section 116425.

For responses specific to water systems as businesses, please refer to the response to EFIS [OTL].

Concerns regarding Department-administered funding programs and other potential sources of funding are outside the scope of this regulation package.

When the law requires the Department to establish a drinking water standard, as is the case with hexavalent chromium, the Department is without discretion to delay the drinking water standard based on the compliance rate with existing, unrelated regulations.

CF-2: A number of commentators stated that the Department's estimates for cost of treatment were underestimated, often providing their own estimates for potential costs of treatment for their PWS (or referencing other commentators' cost estimates). Commentators' raised concerns in two primary areas: the estimated number of PWS (generally, SWS) that may be impacted by the proposed regulatory action and the assumptions the Department used in determining costs.

With respect to the estimated number of impacted PWS, commentators noted that the Department looked only at hexavalent chromium data, not total chromium, i.e., commentators asserted that for groundwater, total chromium is entirely hexavalent chromium so total chromium could be a surrogate and, in fact, noted that the

Department allowed total chromium monitoring in lieu of hexavalent chromium and commentators referred to the data gap acknowledged in the ISOR by the Department. Additionally, commentators state that the Department did not fully consider the degree of naturally occurring hexavalent chromium (with some citing the ISOR, which acknowledges this) and did not consider most recent occurrence data available in the cost analysis. One commentator suggested that treatment costs for SWS are greater than suggested by the Department and, as a result, the Department does not have the information to evaluate feasibility. In addition, commentators stated that impacts (i.e., costs) should be evaluated at 80 percent of the MCL, rather than at the MCL, since PWS evaluate the need for treatment based on 80 percent of MCL (while sometimes referring to U.S. EPA using 80 percent for its arsenic and/or Stage 2 DBP rules).

With respect to the assumptions the Department used in determining costs, commentators noted the following, while requesting the Department to re-evaluate and revise costs, and have another comment period, despite the time constraints and pressures resulting from the NRDC suit.

- A number of costs were not considered, such as land acquisition, design/bidding/permitting/CEQA costs, operational changes (pumping, energy, etc.), construction costs (including on-site plumbing, sewer connections, etc.), transportation of hazardous wastes (and costs for employee training for handling the waste), pilot testing, staffing costs to revise blending plans and address potential violations, shipping costs for samples, two treatment plants would be needed because combined treatment is not hydraulically possible, replacement of wells in order to centralize treatment (since currently cannot configure), and asserts the cost of resin is more than used by the Department and other estimated direct and indirect costs based on site-specific information that may not parallel actual costs at other sites.
- While comparing with the arsenic rule, notes that the Department used a nine-year duration for hexavalent chromium when performing the compliance analysis and requests the analysis be based on the most recent three-year period or highest three-year period, as they assert arsenic was evaluated and claim that would thereby reflect a higher cost.
- Believes the Department used incorrect estimate of water usage (i.e., should be more than 150 gpd and is not consistent with the Waterworks Standards requiring systems to be designed for peak flow); incorrect design capacity peaking factor (refers to Department of Water Resources Urban Water Management Plan values); and the Department should have used data sheet/annual summaries periodically provided to the Department.
- Asserts that the Department did not account for uncertainty of predicting noncompliance from relying on only one or two sample results.

Response: *As a general statement: The purpose of the Department determining estimated average treatment costs is to provide values useful to the Department in determining the extent to which an MCL is economically feasible. The values presented in the regulation package are estimates based on the costs of a particular BAT, as mandated by statute. The Department recognizes that some water systems may incur costs exceeding those provided, while others may incur significantly less costs utilizing*

other means of compliance or treatment. The costs are not intended to be utilized for water systems to budget and/or bid costs for treatment.

Regarding the estimated number of impacted PWS, the Department used hexavalent chromium source water quality data submitted to the Department up to December 31, 2009, which data were accessed in October 1, 2010. The Department recognizes that additional data may have been more recently submitted, however, it is necessary, as a practical matter, to conduct analysis against a static rather than dynamic data set. As an example, the cost estimate for the MCL for arsenic was based on water quality data submitted up to the end of 2002, while the MCL was not proposed until April 2008. Due at least in part to the nature of state rulemaking procedures, the development of estimated costs cannot be a dynamic process, where the most recent data can be used to continually update the cost estimates during the regulatory process. Thus, a certain point in time has to be chosen that will define the data set for purposes of estimating cost.

The Department reviewed the study used in the Jacob's estimate, which was submitted or referenced by a number of commentators. Although we agree that the study suggests a strong relationship between hexavalent chromium and total chromium in groundwater sources, the authors also indicate that there is some scatter in the data. That is, there are a fair number of sources where the relationship does not hold and where, in some cases, hexavalent chromium represents only a small amount of the total chromium present. In addition, as indicated in the ISOR, between 1997 and 2000, the Department carried out a study to determine if there was a relationship between hexavalent chromium and total chromium in groundwater sources. A total of 29 sources were sampled. Although the sample size was small compared to the number of sources analyzed in the study provided by commentators, the results suggested that there was not always a direct relationship between hexavalent chromium and total chromium. The Department found the percent of hexavalent chromium to total chromium in these sources ranged from 8 percent to 100 percent. Given that a direct relationship between hexavalent chromium and total chromium is only suggestive and there can be variability as both the Department and commentators' study indicate, we do not believe that it is appropriate to assume that all total chromium in groundwater sources is solely the contribution of hexavalent chromium. The Department agrees that its cost estimates did not account for the uncertainty of predicting noncompliance. Some PWS considered to be noncompliant in the Department's analysis, based on available data, may not ultimately be noncompliant, while other PWS considered compliant may ultimately be noncompliant.

The Department does not agree with the assertion that there is a generally accepted practice of applying a 20 percent margin of safety for implementation of treatment, which would lower the threshold concentration for estimating costs to 8 ppb. The Department appreciates that some PWS may take such a proactive approach, but there is no basis for including those sources with hexavalent chromium levels between 8 ppb and the proposed MCL in estimating the treatment costs of the proposed regulation, when such levels would not require any action. It should be noted that the estimated operations and maintenance costs for the proposed hexavalent chromium MCL

considered a resin change-out trigger, where resin is assumed to be changed-out when the lag vessel exceeds 80 percent of potential hexavalent chromium MCL (ISOR, page 18 of 36). This trigger serves as an operational safety margin on the performance of the treatment plant and is consistent with the approach used in the federal Arsenic Rule and federal Stage 2 Disinfectants and Disinfection By-Products Rule.

As discussed in the ISOR, the state Unregulated Contaminant Monitoring Rule (UCMR) monitoring for hexavalent chromium was required from January 3, 2001, through December 21, 2002, which is a two-year period. Given the amount of time that passed before OEHHA's adoption of a hexavalent chromium PHG in 2011, and the fact that some water systems continued to monitor their sources for hexavalent chromium and may have had results with hexavalent chromium detections, the Department included hexavalent chromium detections from January 1, 2003, through December 31, 2009. This was to ensure that additional data, representative of the water quality produced by the source, was considered. The Department does not agree with the commentator's suggestion to limit the data set to the most recent three-year period and the commentator was unclear regarding what was meant by highest three-year period. Water systems with detections during the two-year period may not have continued to monitor for hexavalent chromium; limiting the data set as suggested by the commentator would result in excluding some of the hexavalent chromium detections from the two-year period, thereby underestimating the cost of compliance. In the case of re-evaluating the arsenic MCL, the most recent three-year period was used because, unlike hexavalent chromium, applicable water systems were regularly monitoring their sources for arsenic under existing state regulations at prescribed frequencies and the most recent three-year period was sufficient to capture source monitoring data for arsenic. The commentator states that using a nine-year duration for hexavalent chromium may have influenced the number of systems requiring treatment and, therefore, decreased potential costs of compliance. The Department does not agree with the commentator for the reasons previously discussed.

The Department believes that a water usage rate of 150 gpcd is appropriate, and is consistent with industry estimates and the water usage rate used in most recent regulatory actions including those that adopted MCLs for arsenic and perchlorate. The Department recognizes that water usage can vary throughout the state as the commentators' study points out. It should also be noted that the commentators' proposed use of 225 gpcd was reportedly based on the California Department of Water Resources (DWR) report, "2010 Urban Water Management Plan"; however, the report is limited to only those suppliers providing over 3,000 acre-feet annually (977 million gallons annually) or serving 3,000 or more customers and may include agricultural and process water usage. Additionally, the Department does not agree it is appropriate to include potential costs based on prospective events when considering economic feasibility.

CF-3: Some commentators noted that since hexavalent chromium is naturally occurring there are no polluting responsible parties to help pay for treatment and, therefore, such treatment must be essentially funded by rate-payers. Commentators expressed the

opinion that they should not have to pay for an MCL established based on anthropogenic influences, while sometimes referring to concerns of plants/lawns dying (because water will be too expensive to use). In short, commentators assert that they should not have to pay and be responsible for treatment in circumstances when they do not contribute to contamination, and that the proposed rule does not account for natural background (naturally occurring) levels and the MCL could be more stringent than the natural background levels.

Response: *The Department is statutorily mandated to establish drinking water standards for the protection of public health, including a standard (MCL) for hexavalent chromium. There is no provision in applicable law to establish a standard only for the non-naturally occurring (anthropogenic) contaminants.*

CF-4: Commentators made the following additional suggestions, comments, or observations related to cost feasibility:

- While referencing WaterRF Project #4450, states that one specific treatment cannot be used for all sources, yet Department estimates are derived from consideration of one type of treatment only.
- Suggests the use of POUs to offset costs, be allowed to purchase drinking water, or suggests treatment is not necessary since most customers have filters or drink bottled water. In doing so, commentators assert that state regulations prohibit the use of POUs and ask for an interim action to allow use, suggest that non-treated water could be used for non-potable uses (irrigation, bathing, toilet-flushing, etc.), and that they would like to just purchase water for drinking like Imperial Irrigation District, and not have to treat all the water used.
- For the treatment costs for SWS, customers could buy drinking water as they see fit for less.
- Suggests collecting a mitigation fee from PWS to cover the costs of the cancer cases avoided.
- The proposed MCL will disproportionately economically impact a few regions in the state.
- Suggests that the ISOR should include discussion of cost impact, if any, that the proposed MCL will have on chemicals used in treatment processes and states that it is unclear if cost for the public notification portion of the proposed action (section 64465) were included.

Response: *As discussed in the ISOR, the Department agrees that treatment options for hexavalent chromium is not limited to one specific treatment. However, for the purposes of determining economic feasibility, the Department is mandated to utilize best available treatment. In addition, H&S Code section 116370 mandates that the Department take into consideration BAT that has been proven effective under full-scale applications. The Department is not obligated to develop cost estimates utilizing several or all types of treatment.*

Bottled water and POUs may not be used as a permanent means of compliance with an MCL, but may be used on a temporary basis (see Code of Federal Regulations, section

141.101, for which the Department must be no less stringent). The suggestion that non-treated water be used for non-potable uses and/or that some commentators would like to purchase water for drinking as Imperial Irrigation District has done, and not have to treat all the water used, is beyond the scope of the proposed regulatory action. Similarly, the suggestion to collect a mitigation fee from PWS and the need for inclusion of a discussion regarding the effects the proposed MCL will have on chemical costs is beyond the scope of the regulatory action.

Since hexavalent chromium contamination is not found homogeneously throughout the state at the same concentration, the Department agrees that the economic impact of the proposed MCL will be geographically disproportionate.

The Department did not include costs associated with the proposed public notification section since there were no associated costs. The proposed regulation merely revises existing requirements to be consistent with statutory requirements that have been in place since Assembly Bill (AB) 938 was chaptered in 2011. The proposed regulatory action does not impose costs additional to those required otherwise.

Cost/Benefit (CB):

CB-1: A number of commentators expressed the opinion that the benefits from the proposed MCL (generally, referring to the theoretical cancer cases avoided) are insignificant to the costs, or that the Department failed to balance the costs with the benefits, with some suggesting that the Department forego establishing an MCL for hexavalent chromium. Commentators generally noted two concerns in this regard: a) Financial - the costs for compliance (i.e., treatment costs) would have greater realized health benefits if spent in other ways and/or asserted the costs may result in adverse health effects, or b) Benefits - the health-related benefits are overestimated.

Regarding the financial concerns, commentators noted the following:

- Notes that the statewide compliance cost is roughly equal to ten percent of the National Cancer Institute's annual research funding for the ten most common cancers or simply notes the dollars spent for compliance would be better spent on cancer research.
- Suggests California provide bottled water for lower income populations.
- States that fewer dollars will be available for health care due to increases in water bills, particularly for economically disadvantaged communities.
- Asserts the financial burden will be so great that it may possibly result in more cancer and/or illnesses than the projected benefits of the new MCL.
- Fewer dollars will be available to PWS for other health-related problems identified in capital improvement plans, such as maintaining distribution systems, etc.

Regarding health-related benefits being overestimated, commentators noted the following:

- Individuals served by NTNCWS are unlikely to receive any health benefits.

- The benefits were cited as current, but would take 70 years to be realized and/or would not be realized due to inability to immediately comply.
- Asserts the Department only considered or assumed wells were serving populations, and did not account for the imported water a PWS uses.
- One commentator requested the Department to evaluate the potential negative health consequences due to implementing treatment (e.g., lack of calcium/magnesium in drinking water causing problems ranging from pre-eclampsia to cardiovascular problems).
- Claims that due to increased water bills, the public will consume less drinking water, which will result in damage to health.

Response: *Pursuant to H&S Code section 116365(a), the Department is mandated to adopt an MCL "at a level that is as close as feasible to the corresponding public health goal placing primary emphasis on the protection of public health, and that, to the extent technologically and economically feasible." There is no mandate to "balance" the costs with the benefits. In fact, the statute indicates otherwise by requiring the primary emphasis to be placed on the protection of public health.*

Regarding financial concerns related to the benefits, how funds may be dispersed otherwise or in comparison to other health programs is beyond the scope of this regulatory action and the Department's authority. The Department is mandated to adopt an MCL for hexavalent chromium, as noted above and as stated in H&S Code section 116365.5.

Regarding health-related claims that the benefits are overestimated, for risk assessment purposes annual theoretical risk and lifetime theoretical risk are related arithmetically, with annual risk being 1/70th of lifetime risk, and lifetime risk being 70 times the annual risk. The benefit in theoretical cancer risk reduction begins with the initial regulation of carcinogens -- it is not accrued only after 70 years.

Since populations served by NTNCWS are, by definition, non-transient, the Department does not agree that such populations would not benefit from reducing their risk to a chronic contaminant. In addition, when estimating the population exposed, the Department did take into consideration the fact that some PWS with wells that may exceed the MCL also import compliant water. In other words, in such cases, the entire population served by the PWS was not considered to be at risk. The suggestion that the Department evaluate potential negative health consequences of implementing treatment by way of potentially removing beneficial nutrients is beyond the scope of this regulatory action.

CB-2: Commentators provided the following general comments or questions related to cost/benefit:

- Asserts that costs are spread out over 70 years, but benefits are not spread out over the same 70-year timeframe for consistency, and claims this artificially inflates the benefits.

- Notes that the ISOR does not include theoretical cancer cases avoided for the other candidate MCLs and, therefore, provides no information regarding the benefits at 10 ppb being distinctly significant compared to other levels.
- Claims that all seven candidate MCLs must have been protective to have been considered and, therefore, the commentator concludes that the chosen MCL was "arbitrary," based only on the cost-benefit analysis.
- Suggests an MCL of 25 ppb since the cost/benefit ratio is about three-times higher at 10 ppb and 25 ppb would still be four-times more protective than U.S. EPA's standard, or simply to minimize financial impact. Similarly, another commentator states that, "Even without correcting the cost estimates, the Department's cost-benefit analysis shows the benefit-cost ratio is three times higher at the standard of 25 ppb."
- While noting similarities between arsenic and hexavalent chromium (naturally occurring, ubiquitous, occurrence, health effects), a commentator questions why the Department proposed a hexavalent chromium MCL with a different benefit/cost ratio than that used by the Department in its decision to maintain the federal arsenic standard. The commentator requests the Department clarify its rationale in using different benefit/cost ratios for arsenic and hexavalent chromium.
- With much hexavalent chromium naturally occurring, a commentator states that the Department should be absolutely comfortable that the MCL is justified and appropriately conservative without placing unwarranted burdens on the public.

Response: *Treatment costs, as well as theoretical excess cancer cases avoided (see page 25 of the ISOR), were annualized, making the basis of the commentator's assertion of perceived inflated benefits unclear. The Department is required by law to set an MCL as close as possible to the applicable PHG considering only technical and economic feasibility necessitating a higher number. The Department is not obligated to provide theoretical excess cancer cases avoided for each of the candidate MCLs, nor is the Department obligated to determine that the proposed MCL's estimate of theoretical excess cancer cases avoided be significantly different from the other candidate MCLs. Additionally, there is no mandated criterion related to a cost/benefit ratio having to be no more than an existing MCL, or be within some fraction of a federal standard. The Department agrees that, to some extent, each of the seven candidate MCLs are protective. However, the overriding mandate placed on the Department is to adopt an MCL that is as close to the PHG as technologically and economically feasible, while placing primary emphasis on protection of public health.*

Although the U.S. EPA has an existing total chromium MCL that ultimately limits hexavalent chromium, the U.S. EPA has no MCL specific to hexavalent chromium. However, it is the Department's understanding that the U.S. EPA is evaluating the establishment of an MCL specific to hexavalent chromium. Since the Department is required to be no less stringent than the U.S. EPA, should a federal standard be set for hexavalent chromium that is lower than California's, the Department will have to adopt the federal standard (or one more stringent).

An MCL is not dependent on comparative cost-benefit ratios with prior MCLs. The most significant difference between the cost/benefit ratio for hexavalent chromium when compared to arsenic lies with the costs to small water systems. The Department recognizes that for small water systems compliance with the proposed MCL for hexavalent chromium may not be affordable if these systems were to use the best available technology identified in the proposed regulation (which PWS are not required to use). However, unlike with the arsenic MCL, small water systems can seek a variance (H&S Code section 116430) from the hexavalent chromium MCL. While a variance does not excuse the PWS from having to comply, a variance may allow them to use less costly mitigation measures such as POUs or bottled water, provided that these measures do not result in a significant risk to health. The Department is confident that such measures will meet that criterion, while greatly reducing compliance costs.

Technical Feasibility (TF):

TF: One commentator claimed that treatment down to the proposed MCL of 10 ppb is not technically feasible, while another alluded to reverse osmosis (RO) being the necessary treatment.

Another commentator questioned the feasibility of method 218.6 and asserted that the number of labs certified for testing (while stating there are 41) under method 218.6 may not be sufficient and should be evaluated. The commentator also asserted that the Department should determine monitoring costs by using method 218.7, which the U.S. EPA has found to be BAT. A commentator claimed that the proposed rule does not provide a sound reason for the Department's exclusion of Method 218.7, noting that the method has been approved by U.S. EPA and the cost difference is insignificant.

Response: *The Department utilized costs realized by successful and consistent treatment of hexavalent chromium down to 10 ppb. The Department also recognized RO as a BAT for hexavalent chromium.*

As noted in the ISOR (pages 12 – 13), Method 218.6 is approved for hexavalent chromium analysis by the Department's Environmental Laboratory Accreditation Program (ELAP) and has been used to analyze for hexavalent chromium in drinking water since 2001. As of June 19, 2012, there are 43 certified laboratories (41 in California and two out-of-state) for hexavalent chromium in drinking water. The Department demonstrated the feasibility of the method for analyzing hexavalent chromium in drinking water. Based on the Department's experience with prior MCL adoptions and hexavalent chromium monitoring under the state UCMR, laboratory capacity is not expected to be an issue. For example, for purposes of comparison, the number of ELAP-certified laboratories for radiochemicals are fewer (36 total) than the number of ELAP-certified laboratories for hexavalent chromium (43 total).

It appears the commentator misunderstood the meaning of the phrase "best available technology" (BAT). A BAT is a treatment technology used for reducing the level of a contaminant in drinking water to comply with the proposed MCL (see ISOR, page 27); it

is not an analytical method. As discussed in the ISOR (pages 12, 13, and 26), U.S. EPA Method 218.6 is approved for hexavalent chromium analysis by the Department's ELAP. Although the Department is evaluating U.S. EPA Method 218.7, the method was not approved at the time the monitoring costs were developed and the method review is on-going. Therefore, it is not appropriate to base monitoring costs on analyses using U.S. EPA Method 218.7. The proposed regulatory action does not specifically require or exclude the use of any method for analysis of hexavalent chromium, including Method 218.7 or Method 218.6.

Economic and Fiscal Impact Statement (EFIS)

EFIS: Several commentators questioned the Department's statements that public water systems (PWS) are not considered businesses for the purpose of the proposed regulatory action. In support of their contention that PWS are (or may be) businesses, the commentators assert that mutual water systems are private corporations, rather than public entities, pursuant to Corporation Code section 14300(a). In addition, a commentator noted that mutual water companies, per Corporations Code section 1501, requires them, as corporations, to distribute annual financial reports to each shareholder/customer, unlike other PWS and they also do not receive benefits that PWS do, such as property tax exemptions, immunity from liabilities, and ability to participate in public employee retirement systems.

Others suggested (while providing the definition of a nontransient noncommunity water system in the Health and Safety Code), that many nontransient noncommunity water systems (NTNCWS) are businesses while pointing out the NTNCWS may have their own water supplies, provide water to their employees and guests, does not provide water for drinking, and may include entities such as schools, hospitals, manufacturing facilities, wineries, commercial nurseries, agricultural operations, and food processors. One commentator further claims that the Department's costs for compliance for such systems exceeds the $10 million dollar criteria for a regulation to be considered a "major regulation," as noted in the Department of Finance's Economic and Fiscal Impact Statement (sometimes referred to as a "399"). Further, others note that even if PWS are not considered businesses, the costs are subsequently passed on to customers via increased water rates resulting from the need to pay for treatment.

Response: *The process for a regulatory action is governed by Government Code, Division 3, Part 1, Chapter 3.5, and its implementing regulations. Part of the regulatory review process includes the development of an Economic and Fiscal Impact Statement ("399"), as provided to the Department of Finance. The Economic and Fiscal Impact Statement for the subject regulatory action was reviewed and approved by the Department of Finance and is consistent with previous regulatory actions pertaining to public water systems by the Department.*

Although the Government Code provides no definition of "business," Government Code section 11342.610(b)(8) explicitly excludes a "utility" or "water company" from the definition of a small business. Further, public water systems generally operate as

monopolies within their respective defined service areas and, therefore, do not compete, in the ordinary sense of the word. In common usage, "business" generally implies some money-making objective, which is consistent with section 23101 of the Revenue and Taxation Code, which states: "'Doing business' means actively engaging in any transaction for the purpose of financial or pecuniary gain or profit." The purpose of a public water system is to provide drinking water for human consumption, as defined in H&S Code section 116275(c). This is also true of a mutual water company in that the purpose of the mutual water company is to provide water for human consumption for the mutual benefit of its members and/or shareholders, and although the mutual water company may be formed by a private corporation, if properly formed it is a nonprofit mutual benefit company (as opposed to a for-profit business) and regulated as a public water system if it meets the definition of a "public water system" in H&S Code section 116275. In addition, any NTNCWS is, by definition, a public water system. Thus, public water systems – including mutual water companies meeting the definition of a public water system and NTNCWS, and are operating as a utility for the delivery of water for human consumption. In addition, the proposed regulation is not a major regulation. As noted in section E ("Major Regulations") of the 399, section E pertains specifically to California Environmental Protection Agency boards, offices, and departments. The California Department of Public Health is not a board, office, or department within the California Environmental Protection Agency. In addition, the proposed regulatory action was published in the California Regulatory Notice Register on August 23, 2013; prior to the November 1, 2013, and December 1, 2013, effective dates of the Department of Finance's regulations pertaining to major regulations.

Additionally, section 11342.535 of the Government Code refers to "cost impacts" as the amount of reasonable range of direct costs. Thus, for the purpose of meeting the applicable statutory requirements under the Government Code, indirect costs to customers associated with potential water rate increases need not be considered. Also, section 11346.3 of the Government Code refers to requirements to assess the potential adverse economic impact on California business enterprises "to the extent that these requirements do not conflict with other state or federal laws." The Department is mandated by statute to adopt drinking water standards for public water systems, including a drinking water standard specifically for hexavalent chromium (see H&S Code section 116365.5).

Legal Issues (LGL):

LGL: While referencing the new studies/science previously discussed, commentators asserted that the Department is required, via H&S Code section 116365(g), to consider new evidence indicating a materially different risk to public health.

One commentator also asserted that the Department did not consider financial impacts on local communities, as required by statute. Similarly, another commentator claimed that the Department is not authorized to enact a standard that imposed significant and severe cost (for SWS) and must be economically feasible. One commentator noted that under California Prop 218, their PWS is mandated to consider public sentiment and the

ability to pay before increasing water rates, and fears the majority of their disadvantaged community will oppose the rate increase and the PWS will not be able to fund the treatment. Another commentator asserted that recent legislation (AB 240, Chaptered in 2013) by Anthony Rendon requires liens on shareholders/customers who do not pay on time, and expresses concern regarding the potentially large number of resulting evictions due to high water bills.

One commentator, after asserting the law does not allow or support a grace period, suggested that the Department revise the existing law to allow for an implementation schedule. Another commentator requested that the Department allow 45 days for comment if the proposed MCL is revised.

Response: *Regarding H&S Code section 116365(g), while the Department agrees that the section requires the Department to consider new scientific evidence that indicates that the substance may present a materially different risk to public health, the Department does not agree that the section is relevant to the proposed action. Section 116365(g) applies to five-year (or sooner) reviews "after the adoption of a primary standard" when new scientific evidence that indicates that the substance may present a materially different risk to public health "than was previously determined." Commentators on this subject are encouraged to read the response to PHG-1 [OTL].*

Regarding fiscal impact, the Department presented fiscal impact estimates developed pursuant to H&S Code sections 116365(a) and (b) in the ISOR. With respect to treatment costs for SWS, please note that the costs provided were developed using the best available technology (BAT), consistent with the requirements of the H&S Code, and that PWS are not limited to utilizing the treatment process described in the ISOR. The criterion under California Prop 218 or AB 240 is beyond the scope of this regulatory action.

The H&S Code does not preclude the Department from allowing a grace period when adopting drinking water standards. In fact, the proposed regulation includes a six-month grace period. For further discussion regarding the appropriateness of a grace period, the commentator is encouraged to review the response to EPA-1 [OTL].

The Department does not have the authority to amend existing statutes.

General Comments (GC):

GC-1: Some commentators incorrectly cited the proposed MCL, the PHG, and/or their relationship. For example, the Department received opposition to a proposed MCL of 2 ppb, and suggested an MCL of 5 ppb or 10 ppb. Some incorrectly referred to the PHG being proposed as being excessively arbitrary, or that the proposed standard is "10 times higher than the current U.S. EPA and 5 times higher than the current CDPH chromium standard." One commentator noted that the proposed regulation does not include a compliance date, while others cited assumed expected effective dates.

Response: *For further clarification and as noted in the proposed regulatory action, the Department is proposing an MCL for hexavalent chromium of 10 ppb. The PHG is 0.02 ppb. OEHHA established the PHG in 2011 and comments concerning the PHG are beyond the scope of this regulation and should be presented to OEHHA. The proposed MCL is five times* ***lower*** *than the current California total chromium MCL and ten times* ***lower*** *than the current federal total chromium MCL (which are not specific to hexavalent chromium, but do limit its concentration in drinking water).*

For the proposed regulatory action, the effective date of the regulation is dependent on the completion of the regulatory process, as described in section 11343.4 of the Government Code. As noted in the regulatory text (section 64432(b)), unless a PWS choses to grandfather their data, CWS and NTNCWS PWS will be required to initiate monitoring for hexavalent chromium within six months of the effective date.

GC-2: Commentators asserted that the Department does not have a basis for revising the MCL (or even a basis for the current California or federal MCL for total chromium) and/or suggests that California already has a standard (e.g., the total chromium MCL). In support, commentators noted that the existing total chromium MCL is required by law to be protective and, therefore, there is no need to lower the MCL, suggesting that the Department leave the current standard as-is. Some asserted that there are no documented cases of cancer via hexavalent chromium and, therefore, question how the Department can adopt the standard.

Response: *The Department has the authority and is mandated, via H&S Code sections 116365 and 116365.5, to adopt an MCL for hexavalent chromium. The health-based standard utilized in the process is the PHG, which is based on studies of the health effects of hexavalent chromium.*

GC-3: Commentators sought to be exempted from the proposed MCL, in particular during droughts and emergencies so that they may utilize their groundwater sources (exceeding the proposed MCL) to supplement their surface water, noting that it is too expensive to treat just for short-term use. Some commentators also suggested that SWS be required to only notify customers if their drinking water exceeds the MCL, but be exempt from complying with the MCL. Another commentator noted that the proposed regulation does not address groundwater wells that are used intermittently, for only a few days of the year. A commentator also asserted that the proposed regulation is arbitrary and should not apply to all water systems since the costs are disproportionate, and that SWS should be allowed an exemption.

Response: *The proposed regulatory action does not preclude a PWS from applying for an exemption pursuant to H&S Code section 116425. Utilization of a well as a stand-by source for emergencies is outside the scope of this regulatory action. Regarding whether the regulation should apply to all water systems due to disproportionate cost between SWS and larger PWS, the commentator may wish to review the response to CF-1 [OTL]. Additionally, a failure to apply the same level of public health protection to*

persons served by an SWS as that provided to persons served by a large water system would apply a disproportionate protection of public health based on solely on the size of the water system.

GC-4: One commentator requested that the Department extend the comment period for another 60 days to allow additional comments from politicians, community leaders, and customers. Another commentator claimed that the Department failed to provide timely transparency by not including and releasing a 'full-file' with the CBA (cost benefit analysis) procedure, Cost Estimating Methodology, and Economic and Fiscal Impact Statements until two weeks after the start of the 45-day comment period, and that this was done only following a special request.

Response: *The Administrative Procedure Act (Government Code section 11340 et seq.) establishes criteria for the public comment periods with respect to proposed regulatory actions. The Department met the requirements. The documents cited by the commentator were included in the rulemaking file and available to the public for review, upon request, for the entirety of the comment period.*

GC-5: A commentator expressed concern that water rates will increase, which in turn will discourage growth, with developers avoiding the area, while another was concerned that debt from compliance costs would affect their credit rating. A commentator also requested training for operation of the treatment processes. It was also suggested that funds from parties responsible from contaminating sites should be used to finance the treatment, monitoring, reporting, etc., of such chemicals.

Response: *No response is necessary since the comments are beyond the scope of the proposed regulatory action.*

GC-6: A commentator noted that, per CEQA guidelines section 15051(b)(1), the local agency would be the lead agency for CEQA and the Department would be the responsible party for the PWS permit amendment. Therefore, to expedite CEQA review of projects and expedite compliance, the commentator requested that the Department prepare a Master Environmental Impact Report or other program-level CEQA document in conjunction with the rulemaking. The commentator included reasons why the suggestion would be effective including the expediency of the MCL to better achieve compliance with the intent of the legislative H&S Code mandate for the MCL and because the Department has a duty to comply with CEQA in the issuance of the regulation anyway.

Response: *The comments are beyond the scope of the regulatory action and no response is necessary. However, the commentator may wish to review the Department's CEQA determination included in this document.*

GC-7: One commentator questioned if the proposal was consistent or compatible with existing state regulations since the ISOR did not include discussion of direct/indirect (NSF 60/61) requirements, specifically: asking what studies were used to determine there was consistency with NSF 60/61; while acknowledging the likelihood of exceeding is small and confirmed via NSF data, will treatment processes need to be altered to comply with the MCL?; if chromium occurs in primary chemicals (disinfectants/coagulants) what adjustments must be required to meet the MCL requirements?

Response: *The comments are beyond the scope of the regulatory action in that the NSF 60/61 requirements pertain to another regulatory action and, under the version NSF 60/61 versions specified, hexavalent chromium is not addressed.*

GC-8: One commentator suggested that the ISOR should include explanations for issues that may not be readily understood. For example, the commentator questioned or noted the following:

- While referring to a table in the ISOR, noted that the number of affected sources decreases as the MCL gets lower, which is counterintuitive (the commentator further states, "This means that those affected sources are now being required to increase their monitoring frequency because their source water has exceeded the MCL.")
- How were the annualized routine source water monitoring costs adjusted to reflect the differences in the monitoring schedules between the GW and SW sources?
- Do cost estimates include standby sources?
- Why do some of the columns not add up?
- Noted that the 1999 DWSAP (Drinking Water Source Assessment and Protection Program) stated there are about 16,000 drinking water sources, but adding up the affected sources in Table 2 the total is about 12,000. Why the discrepancy?
- Asserted that past proposed MCLs included costs for all identified BATs and questioned why the ISOR did not include costs for coagulation/filtration and RO.
- Asserted that the ISOR needs to identify full-scale field applications for BAT, yet the commenter is unaware of full-scale treatment using RO (also see 64447.2, BAT).
- Noted that page 12 of the ISOR refers to establishing an MCL at the DLR. The commentator notes that this would be impractical for ion exchange since the treatment costs assume resin would be changed out or regenerated at 80 percent of MCL (i.e., the 80 percent value would be below the DLR). Similarly, the commentator questioned why page 9 of the ISOR refers to "not detected" if lower than 0.0005 ppm, but the DLR is 0.001 ppm; in other words, the commentator wonders whether 0.001 ppm has been used?
- Where the ISOR discusses pH adjustment additional costs for corrosion control, are the treatment costs doubled? If not, how were the additional costs established?
- Does variability or accuracy of the analytical method justify using the extra significant figure for the MCL? Another commentator, while asserting the MCL is

established to one significant figure, asserted that the MCL could just as well be 20 ppb.

Response: *The Department reviewed the ISOR (pages 12 – 25) and found there is sufficient explanation on how the numbers in the tables were derived. In addition, the Department does not believe reiterating information that is readily accessible and listed in the ISOR references (pages 34 – 36) is necessary. With regard to comments directed at the tables, the Department has determined that no change is needed in the ISOR.*

As noted in the ISOR (page 16 – Table 2, footnote (a)), routine source monitoring costs for groundwater sources were annualized over three years. The cost estimates do not include standby source monitoring. As noted in the ISOR (page 13), only active sources were considered.

It is not clear to which columns the commentator is alluding. A review of Tables 1 through 8 indicates that only Tables 1, 4, and 5 contain data that should "add up." The Department double-checked the numbers in Table 1 and the "Subtotal" and "Total" values add up and are correct as shown. For Tables 4 and 5, the Department refers the commentator to footnote (a) in each table, which reads, "Totals may not add up due to rounding."

While the commentator did not provide a full citation for the 1999 DWSAP report referenced, the Department deduces that the commentator is referring to the 1999 Drinking Water Source Assessment and Protection (DWSAP) Program document available on the Department's website, which contains a reference to "nearly 16,000 active drinking water sources." The difference in the number of sources cited in Table 2 and the 1999 DWSAP document is not a discrepancy; rather the difference is due to the applicability of the hexavalent chromium regulation and the DWSAP. As noted in the ISOR (pages 6 and 7), the hexavalent chromium regulation applies to community water systems and nontransient noncommunity water systems and their sources. The DWSAP applies to all public water systems (i.e., community water systems, nontransient noncommunity water systems, and transient noncommunity water systems) and their sources.

H&S Code section 116370 mandates that the Department "take into consideration the costs and benefits of best available treatment technology that has been proven effective under full-scale field applications" when adopting a primary drinking water standard. The Department took into consideration the BATs that have been proven effective under full-scale field applications. Additionally, as noted in the ISOR (page 27), coagulation/filtration and reverse osmosis are ***existing*** *BATs for chromium, which consists of trivalent chromium and hexavalent chromium. Because the two technologies are existing BATs, it is not necessary for the Department to repeat the cost analyses performed by U.S. EPA or the Department in their adoption of the chromium drinking water standard. The Department refers the commentator to the earlier federal and state chromium regulatory actions for further information on the cost analysis of the two technologies. As noted in the ISOR (page 27), "Studies evaluating the performance*

of the current best available technologies with respect to chromium or hexavalent chromium show that coagulation/filtration (preceded by reduction step), ion exchange, and reverse osmosis are capable of reducing hexavalent chromium levels to below the proposed hexavalent chromium MCL of 0.010 mg/L. Based on the Department's review, the following technologies are proposed as the best available technologies for hexavalent chromium: reduction/coagulation/filtration, ion exchange, and reverse osmosis."

For reverse osmosis, a study demonstrated that this existing BAT was capable of removing chromium to below the proposed hexavalent chromium MCL. This study was listed in the ISOR references (page 36; see NSF International and U.S. EPA, 2004).

A review of the ISOR (page 9) shows that the term "not detected" is associated with a ***reporting level*** *of 0.0005 mg/L; a reporting level is not the same as a DLR, which is formally adopted in regulation. As noted in the ISOR (page 9), the hexavalent chromium analyses were performed by the Department, which had the capability to perform low-level analysis of hexavalent chromium with its in-house laboratory (i.e., Drinking Water and Radiation Laboratory Branch). The analytical results are available on the Department's website (see ISOR references, page 35, CPDH, 2012) and were included in the ISOR for historical purposes; note that pages 9 – 12 of the ISOR merely serve to describe the timeline for development of the proposed hexavalent chromium drinking water regulation. The Department does not agree that the hexavalent chromium analytical results for surface water sources should be reported as nondetect based on the proposed DLR of 0.001 mg/L. As noted in the ISOR (page 9), the reporting level associated with the analyses was 0.0005 mg/L.*

The cost of pH adjustment before and after the ion exchange treatment process was included in developing the treatment cost (capital and O&M costs). The Department refers the commentator to the report referenced in the ISOR. Additionally, as noted in the ISOR (page 18), "These additional costs, as well as the cost of residual disposal, are included in the [Department's] capital and O&M costs."

One commentator asserts the proposed MCL is to just one significant figure, while the other questions whether the analytical method justifies the MCL having two (i.e., inferred to be the "extra" referenced by the commentator). The proposed MCL consists of two significant figures; had it been one significant figure, it would have been proposed and shown as "0.01" mg/L, which would still significantly differ from 20 ppb (0.02 mg/L). With the DLR being one-tenth the proposed MCL and being adjusted to account for variability and accuracy of the analytical method, the Department believes the number of significant figures is justified.

GC-9: Commentators expressed concern or asserted that they would have to abandon their groundwater sources to use more expensive surface water sources and that the impact, such as a resulting depletion of drinking water sources that are already scarce, needs to be taken into consideration.

Response: *No response required because the comments are beyond the scope of this regulatory action.*

GC-10: While stating that the ISOR development was similar to previous MCL regulatory packages, a commentator noted that the ISOR contained cost analysis, but no clear benefit analysis. In doing so, the commentator asked the following questions:

- The ISOR mentions 0.3 theoretical excess cancer cases (avoided) in the SWS and 12 overall. Are those annual theoretical excess cancer cases or lifetime?
- How were those theoretical excess cancer cases avoided used in the cost-benefit analysis?

Response: *The section of the ISOR in which the theoretical excess cancer cases avoided is addressed informs readers that they are referring to annual theoretical excess cancer cases avoided. Note that the title of the section is "Estimated Annual Cost per Theoretical Excess Cancer Cases Reduced" and refers to "theoretical cancer cases avoided per year statewide" [emphasis added]. For in-depth discussion regarding cost/benefit analysis, the commentator may wish to review the responses to comments found in CB-1 and CB-2 [OTL].*

Not Relevant (NR):

The Department received a number of comments it considered to be irrelevant, which did not warrant a response. These included a) personal opinions or theories regarding the role of politics or activist groups on the proposed regulatory action, b) references to other laws or actions beyond the scope of the proposed regulation.

The Department did not consider such comments as objections or recommendations directed at the proposed regulatory action or procedures.

Oppose – the MCL is too high [OTH]

Health Effects (HE)

HE-1: Commentators generally asserted that the proposed MCL is not safe or protective of public health, often citing the fact that the proposed MCL is 500 times the PHG and suggesting that the Department should "listen to the scientists." As a result, commentators requested or demanded that the MCL be set closer to the PHG, or should not be higher than the PHG, sometimes claiming that setting an MCL at a level 500 times the PHG is unprecedented and the Department is required to publish scientific justification for any level above the PHG.

The health-related concerns and/or claims included: claims of significant risk of cancer and liver toxicity at the proposed MCL; concerns that the proposed MCL is above the "non-cancer PHG" of 2 ppb; claims that even at levels below the proposed MCL, hexavalent chromium is a potent carcinogen and is linked to other serious health complications, such as liver or kidney damage; assertions that state standards are made for 176-lb adult males, without consideration of children, women, or sensitive populations; assertions that the Department ignored adverse reproductive and developmental effects in laboratory animals and, while referring to Prop 65, noting that OEHHA established a Maximum Allowable Dose Level (MADL) of 8.2 µg/day by the oral route, which would yield a 3.6 µg/L exposure level; and noted that California already has enough people dying from cancer (or some other health ailment), while sometimes referring to Hinkley.

Response: *No changes to the regulation are required to accommodate these comments. OEHHA, the entity that establishes PHGs, has specifically addressed whether drinking water greater than the PHG is unsafe, stating that a PHG is not a boundary line between a safe and dangerous level of a contaminant. The assumptions that are utilized in risk assessments are intended to* ***not underestimate*** *the risks to people. In other words, the actual risk will likely be lower than the risks indicated with the PHG, which is addressed in OEHHA's PHG report. The PHG report (page 106) states: "Protection of public health requires that health-based criteria be developed in a manner to ensure that risk is not markedly underestimated."*

Drinking water can still be acceptable for public consumption if it contains contaminants at levels higher than the PHG, and having drinking water MCLs that exceed their respective PHG is not unprecedented. One example is for arsenic, where the federal and California MCL of 10 ppb exceeds California's PHG. The degree of hexavalent chromium toxicity depends on the level of exposure. Toxicologists often quote Paracelsus from the early 1500s, considered the father of toxicology: "The dose makes the poison." This means that high levels of substances may be dangerous and low doses of the same material may not be as risky. Also, the science supporting the PHG does not demonstrate a direct connection between health effects and exposure through drinking water. The connection, rather, is through the extrapolation of the results of very

high doses of hexavalent chromium, administered to laboratory animals in a controlled setting, downward to lower environmental levels comparable to those that would be encountered in drinking water, with assumptions made to enable application of the laboratory results to human exposures. In the case of the few human exposures to hexavalent chromium, the lack of adequate exposure data does not enable a truly direct connection, as supported by the PHG report (page 105), which states: "The available human studies provided limited information on the dose-response relationship for Cr VI by the oral route. Cancer potency values based on a dose response relationship could not be reliably calculated from the findings of Zhang and Li (1987)."

Regarding non-cancer effects, some commentators (e.g., Natural Resources Defense Council/Environmental Working Group/Clean Water Action/et al.) stated that liver effects in female rats were observed at drinking water concentrations of 14.3 mg/L, which according to OEHHA's PHG report corresponds to 200 µg/kg-day. This is considerably greater than the 0.29 µg/kg-day (10 µg/L x 2 L per day/70 kg) being proposed by the Department. The 2-µg/L (2 ppb) non-cancer value reflects the application of a 1,000-fold uncertainty factor from the animal studies, as well as an assumed 0.8 relative source contribution (assumes 80 percent of hexavalent chromium is from drinking water). Since the 2 ppb concentration is an estimate of the no observable adverse effect level (NOAEL) in people, as derived from rodent studies, the Department does not consider the mild inflammation of the liver that is the basis for the estimated NOAEL to pose a significant risk to chronic health at a level five times higher. Some commentators may not have understood that the non-cancer endpoint is not the non-cancer PHG. There is only one PHG for a contaminant, and for hexavalent chromium it is the cancer-based value.

At five times the NOAEL, it is extremely unlikely that other adverse effects mentioned by the commentators will occur. Again, the estimates are based on extrapolations from laboratory animal exposures that were orders of magnitude higher than those expected to occur in drinking water. In the case of reproductive effects, OEHHA's Maximum Allowable Dose Level (MADL) for purposes of Proposition 65 is a level that at 1,000 times the level in question would be expected to have no adverse reproductive effect. Hence, at the proposed MCL of 10 ppb, which is approximately three times the drinking water concentration based on the MADL cited by the commenters, there would still be a 300-fold safety factor.

The assertion that state standards are made for adult males, without consideration of children, women, and sensitive populations, is not correct. With a contaminant's PHG being the primary basis for the establishment of a contaminant's MCL, the resulting drinking water standard, by implication, also takes into consideration the protection of sensitive members of the population. OEHHA, in establishing its PHG, is required by law to consider sensitive members of the population in developing its PHGs (see H&S Code section 116365(c)). For hexavalent chromium, OEHHA used the child and the adult in its derivation of the non-carcinogenic effects of hexavalent chromium (see page 101 of the PHG report). For the determination of cancer risk, OEHHA used age-sensitivity factors in determining exposure (see page 103 of the PHG report). Thus, the cancer risk includes consideration of exposures during the third trimester of pregnancy,

infancy, childhood, and adulthood. OEHHA states on page 1, "The PHG was adjusted to account for increased sensitivity associated with early-in-life exposures," which is discussed in detail on page 96, in the section entitled, "Correction for Early-in-Life Exposures."

In summary, the Department believes the assessment OEHHA performed for the PHG indicates that the proposed MCL provides protection to those exposed to drinking water with hexavalent chromium concentrations at or below the proposed MCL. Statements regarding the PHG itself are beyond the scope of the proposed regulation.

HE-2: Commentators noted that the proposed MCL leaves more than 85 percent of Californians (or some similarly large percent, or a particular population, or "vast majority") to continue to be exposed to a known carcinogen. Some commentators included estimates of populations receiving untreated water (i.e., below the proposed MCL of 10 ppb), along with corresponding estimates of cancer cases avoided at 5 ppb and 1 ppb. For example, it was cited that ten counties would bear a disproportionate burden of untreated water that would result from the proposed standard, which commentators find unacceptable. They also noted that those populations will also be exposed to the non-cancer risks. Others expressed concern regarding exposure via showering, washing clothes, washing dishes, washing fruits and vegetables, etc., while sometimes noting that they can buy bottled water or install filters, but cannot do anything about other such exposures.

Response: *No changes to the regulation are required to accommodate these comments. Commentators would prefer a more restrictive standard, which may further reduce health risks to more people and may additionally provide more protection from other uses of drinking water. However, although a drinking water standard is designed to minimize exposures to a known contaminant, an MCL's concentration is not dependent on the geographic distribution of the contaminant. The Department is required to adopt an MCL as close to the PHG as technologically and economically feasible, with emphasis on the protection of public health. The Department has met that obligation.*

Regarding other routes of exposure, OEHHA's hexavalent chromium PHG report addresses other routes of exposure other than through consuming drinking water. For example:

- *Page 97: "Calculations of concentrations of chemical contaminants in drinking water associated with negligible risks for carcinogenic or noncancer endpoints must take into account the toxicity of the chemical and the potential exposure of individuals using the water. Tap water is used directly for drinking, and for preparing foods and beverages. It is also used for bathing or showering, and in washing, flushing toilets, and other household uses resulting in potential dermal and inhalation exposures. Therefore, three routes of exposure, ingestion, inhalation, and dermal contact with domestic water are addressed in developing the PHG."*

- *Page 101: "Drinking water intake refers to tap water consumed as a beverage or tap water used in the home or local establishments to prepare food or drink…."*

The primary risk associated with hexavalent chromium in drinking water is from the ingestion of hexavalent chromium in drinking water. As discussed and noted in the OEHHA Report, ingestion of water via washing fruits and vegetables is taken into consideration in the assumptions used in the exposure assessment. Additionally, OEHHA uses an assumption of 0.8 for the relative source contribution (RSC). This value of the RSC means that 80 percent of the exposure to hexavalent chromium is assumed to come from drinking water. Exposures via other routes are considered to be minor compared to the ingestion route. As OEHHA states on page 101 of the OEHHA Report, "Little or no Cr VI exposure is expected from air, food, incidental inhalation, dermal and oral exposure to soil and dust."

In short, with a contaminant's PHG being the primary basis for the establishment of a contaminant's MCL and with the PHG having taken into consideration other routes of exposure, the resulting drinking water standard, in turn, also addresses routes of exposure.

HE-3: Two commentators, via their oral testimony presented at the October 2013 Sacramento public hearing, described the death of their son, which occurred on August 22, 1997. They asserted that ingested creek water containing hexavalent chromium was responsible for his death.

Regarding the death of their son, commentator Hernandez stated his opinion that it was because of hexavalent chromium reportedly at a concentration of 49 ppb in the creek and stated his concerns about hexavalent chromium, and particularly about Remco. He was also critical about government agencies and their failure to take appropriate actions.

Commenter Scales mentioned the laboratory results from the creek's water, the creek's foam, and in the son's vomit, which were included in documents submitted for the record. Commenter Scales criticized the current 50 ppb standard as being unsafe (the concentration in their son's vomit was lower than that); and stated that standards are based on adults working in chromium plating facilities, not children. She also stated that she got a red penetrating ulcer from just taking [creek and foam] samples, because she didn't know enough to wear gloves. She noted that scientist Max Costa said that any exposure to hexavalent chromium should be avoided. She stated her belief that 10 ppb is too high, and that 1 or 2 ppb would be acceptable. She concluded her testimony by noting that documents submitted for the record point out the dangers of hexavalent chromium to adults and children. Submitted documents included copies of the aforementioned laboratory results, the death certificate and related correspondence, a letter to U.S. EPA Region 9 about the Remco facility, and extracted pages from Dr. Costa's 1997 article and from the Agency for Toxic Substances Disease Registry, and a newspaper article.

Response: *The Department does not wish in any way to minimize the death of the commentator's son, nor to dispute the statements they provided.*

Regarding comments and documents related to the health effects of hexavalent chromium, OEHHA's 2011 PHG report provides the basis for the PHG, drawing upon available scientific studies about its toxicity. The Department is required to adopt an MCL as close to the PHG as technologically and economically feasible, with emphasis on the protection of public health. The Department has met that obligation.

Cost/Benefit (CB):

CB-1: Commentators claimed that the Department's costs presented in the ISOR are inflated due to the assumption that all PWS in violation with the proposed hexavalent chromium would need to provide treatment, where some PWS will use other less-costly means of complying such as blending, facilitating connections with larger PWS that do not exceed the standard, and that smaller and financially-challenged PWS can be offered financial assistance. Similarly, commentators suggested that since some large PWS will be able to blend, the aggregate cost will be lower than shown and will allow the Department to focus on and provide more funding to small water systems (SWS). Commentators also stated that the Department should focus on ensuring PWS have adequate funding for treatment, sometimes including a reference to available federal funds.

Commentators seeking a lower standard also suggested that "the answer to high costs for some water systems is not to allow people to be exposed to hexavalent chromium or other potent toxins at unsafe levels in their drinking water and to pretend that the water is safe" and that the proposed MCL "puts a disproportionate focus on treatment costs over health impacts, perpetuating a cycle of injustice which uses the excuse of costs for low-income communities and those relying on small water systems to allow them to be exposed to chemicals at levels that will harm their health."

Response: *As noted in the ISOR, the Department's analysis assumed that best available technology (BAT) would be used by those PWS for whom the Department's analysis indicated may be noncompliant with the proposed MCL. H&S Code section 116365(b)(3) mandates the Department to determine economic feasibility of compliance using BAT. The statute does not require the Department to consider the economic feasibility of using other compliance approaches to address sources that may be in violation of the proposed MCL. Concerns regarding Department-administered funding programs and other potential sources of funding are outside the scope of this regulation package.*

CB-2: Commentators assert that the Department failed to include the avoidance of non-cancer health risks of a more stringent MCL. In doing so, commentators referenced a number of claims regarding adverse health effects such as: liver damage and OEHHA's PHG report reflecting a 2 ppb non-cancer endpoint; potential non-cancer

effects on rats; concerns regarding sensitive populations; concerns regarding adverse reproductive and developmental effects in laboratory animals; while referring to Prop 65, notes that OEHHA established a MADL of 8.2 µg/day by the oral route, which would yield a 3.6 µg/L exposure level; and that "OEHHA's calculations indicate that an MCL above 2 ppb will not be sufficiently protective against liver toxicity and damage." Commentators also claimed that the Department failed to include co-benefits of having hexavalent chromium treatment and stated that weak base anion exchange would also remove other contaminants such as uranium, nitrate, arsenate, and selenite, therefore reducing the costs for treatment of those contaminants.

Similarly, commentators suggested that the Department ignored the costs borne by communities including: health expenditures, replacement water, lower property values, and other social effects. Others suggested that clean-up costs should be ignored and/or increases in water bills are acceptable to ensure safe water.

Response: H&S Code *section 116365(b)(3) mandates the Department to consider the PHG, a standard established by U.S. EPA, and the technological and economic feasibility of compliance with the proposed MCL using BAT. In doing so, the Department must ensure that the proposed MCL be established as close to the PHG as technologically and economically feasible, with primary emphasis on public health such that the MCL:*

- *With respect to acutely toxic substances, avoids any known or anticipated adverse effects on public health with an adequate margin of safety, and*
- *With respect to carcinogens, or any substances that may cause chronic disease, avoids any significant risk to public health.*

The Department has met the requirement for establishing an MCL that is as close as feasible to the PHG, with primary emphasis on the protection of public health, to the extent that it is technologically and economically feasible.

Consideration of co-benefits from having hexavalent chromium treatment is beyond the scope of this regulation package, as is consideration of theoretical costs based on assumptions that may or may not result from establishment of the MCL. Concerns regarding the non-cancer health risks are discussed in detail in response HE-1 [OTH].

CB-3: While claiming or implying that hexavalent chromium is solely the result of industry or companies, commentators noted that clean-up costs would be avoided if such entities were more careful about not contaminating the water. Commentators also asserted that the Department has made costs/polluters/budgets/corporate profits/campaign contributions a priority over the benefits to public health. One commentator noted that "840 cancers will be avoided" at 10 ppb and questioned why the Department, in the ISOR, discussed cancer cases per year.

Response: *As noted in the ISOR, the presence of hexavalent chromium found in drinking water sources may be attributed to both its natural occurrence and industrial use. Hexavalent chromium in groundwater and drinking water sources is often naturally*

occurring due to its presence in geological formations throughout the state. Therefore, presence of hexavalent chromium and its associated treatment costs for drinking water would not be avoided if industrial polluters did not contaminate waters with hexavalent chromium. As noted in the ISOR, the Department does not regulate industrial polluters and the proposed regulatory action does not apply to such entities. The Department is mandated by law to establish an MCL as close to the PHG as economically and technically feasible. As a result, the potential costs of treatment to PWS must be considered.

The Department referenced 12 theoretical cancer cases avoided per year, as opposed to 840 theoretical cancer cases avoided over 70 years, because the costs were annualized.

Treatment and Cost Feasibility

TCF-1: Commentators asserted less costly forms of treatment for hexavalent chromium are available. Specifically, commentators referred to John Todd's Ecological Design and the treatment systems provided by PG&E for utilization by the residents of Hinkley. It was also asserted that there are proven treatment technologies that are commercially available that will treat hexavalent chromium to levels commensurate with the PHG. One commentator claimed a treatment system "doesn't just take out part of it [Cr6]. It takes it all out."

Response: *Commentators did not provide information regarding costs, the precise form of treatment, nor the applicability to PWS. John Todd's Ecological Design is currently used for wastewater applications, rather than drinking water. The Department acknowledges that ongoing research may result in less costly forms of treatment for hexavalent chromium. However, the Department is unaware of such treatment being practical and available for the large-scale needs of most PWS. For some small water systems, small-scale treatment devices may be a useful treatment application. The Department awaits commentators providing relevant information so that such treatment may be approved for use by PWS. The Department is also unaware of a treatment process that removes hexavalent chromium down to the PHG or all hexavalent chromium from water.*

Legal Issues (LGL):

LGL-1: Commentators asserted that the Department failed to establish a standard that meets the statutory mandate of placing primary emphasis on protection of public health. In support of the claim, they point to the legislative intent to establish a program "that is more protective of public health than the minimum federal requirements" [H&S Code section 116270(f)]; that California's law, unlike the federal Safe Drinking Water Act (SDWA), "tips the balance in favor of public health, designating cost a secondary consideration;" that, in their opinion, the Initial Statement of Reasons fails to explain how the proposed MCL places primary emphasis on public health and why lower MCLs

considered are economically and technically infeasible; and, they point to the fact that the proposed MCL is 500 times the PHG. Furthermore, they assert that U.S. EPA's safe or acceptable risk range is 1-in-10,000 (or 100-in-1 million) to 1-in-1,000,000 and that the proposed MCL does not meet that standard and, therefore, in their opinion fails to meet the legislative intent.

Response: *California's existing standard for total chromium is more restrictive than U.S. EPA's. By addressing the carcinogenic risk of hexavalent chromium in drinking water with the proposed regulatory action, the Department is proposing to lower the standard further, making California's standard for hexavalent chromium one-tenth that of U.S. EPA's. U.S. EPA has no standard that is specific for hexavalent chromium in drinking water. Thus, the proposed standard meets the legislative intent stated in section 116270(f) that the Department's primary drinking water standards are* ***at least*** *as stringent as those established by U.S. EPA and to establish a* ***program*** *that is more protective of public health than the minimum federal requirements.*

Regarding the commentators' contention that the Department has failed to establish a standard that meets the statutory mandate of placing primary emphasis on protection of public health and that the ISOR fails to explain how the proposed MCL places primary emphasis on public health, the Department disagrees. Section 116365 of the H&S Code mandates the Department to adopt the standard "as close as feasible to the corresponding public health goal placing primary emphasis on the protection of public health…and that, to the extent technologically and economically feasible … with respect to carcinogens, or any substances that may cause chronic disease, avoid any significant risk to health." The Department has balanced the requirement for setting the proposed MCL of 10 ppb as close to the PHG as is feasible while emphasizing the protection of public health, with the requirement for consideration of technological and economic feasibility while avoiding acute adverse health effects and any significant cancer risk or any significant risk of chronic disease. The ISOR analyzes the MCL's economic feasibility, and clearly demonstrates substantial increases in treatment costs as candidate MCLs decrease. The proposed MCL of 10 ppb is significantly reduced from the current California MCL of 50 ppb for total chromium and the federal MCL of 100 ppb for total chromium (which limits hexavalent chromium concentrations), and provides considerable public health protection. The health-related concerns regarding the proposed MCL being 500 times the PHG is addressed in the Department's response to HE-1 [OTH].

LGL-2: Commentators asserted that the Department has a mandate to establish a drinking water standard that ensures all known water sources contaminated with hexavalent chromium are treated and that the Department is obligated by statute to use the PHG, "not the science that's thrown at you by the hired guns of the polluters." Commentators also noted that legislators mandated an MCL to be established by 2004 and that the regulatory action is overdue. Another commentator claimed the proposed MCL does not meet the Department's "moral obligations, health obligations, or legal obligations."

Response: *No changes to the regulation are required to accommodate these comments. The Department is mandated to adopt primary drinking water standards for contaminants* ***in drinking water*** *(see H&S Code section 116465). Therefore, the proposed regulatory action applies only to applicable public water systems providing drinking water, not to "all known water sources contaminated with hexavalent chromium."*

A review of the ISOR makes it clear that the PHG was the health-based goal utilized when setting the proposed MCL. A standard for hexavalent chromium could not be adopted without the establishment of a PHG. This step was completed in 2011 by OEHHA, an office that is separate from the Department.

The Department's obligation is to establish an MCL as close to the PHG as is technologically and economically feasible, with emphasis on the protection of public health. The Department has met that obligation.

General Comments (GC)

GC-1. A number of commentators made errors when citing the existing MCL, the proposed MCL, or the public health goal (PHG). Commentators also expressed concern that the Department never set any limit for hexavalent chromium or asserted that the concentration of hexavalent chromium is not limited in drinking water, or stated that it is irresponsible of the Department to not have an MCL for hexavalent chromium. Furthermore, a number of commentators asserted or implied that the Department is *increasing* the allowable concentration of hexavalent chromium in drinking water, including statements that the Department made a "disastrous decision to weaken the protection we are currently blessed to have," asking that the MCL remain at its safe level, or that the Department should "not be weakening the standard." The Department also received comments stating that the U.S. EPA is well-informed and has always protected the public from cancer-causing chemicals, while implying that the Department should also protect the public.

Response: *No change to the regulations is required to accommodate these comments as the Department believes the ISOR clearly identified the existing MCL, PHG and proposed MCL, and does not misstate the Department's role as compared to the role of the U.S. EPA. The concentration of hexavalent chromium in drinking water is currently limited by way of the existing MCL for total chromium, which is 0.050 mg/L (0.050 ppm or 50 ppb). Because some of the total chromium may consist of both hexavalent chromium and trivalent chromium, the resulting effect is that hexavalent chromium is currently limited in drinking water to maximum concentrations of 50 ppb or less. The existing MCL has been in effect since 1977 and is half the existing federal limit (for total chromium) of 100 ppb. The proposed hexavalent chromium MCL is 0.010 mg/L (0.010 ppm or 10 ppb) and the PHG is 0.02 ppb. The Department is* ***not*** *increasing or weakening the MCL. In fact, the Department has proposed to establish a* ***more stringent*** *standard, which is one-fifth California's existing standard and one-tenth that of the existing federal standard established by the U.S. EPA.*

GC-2. While asserting or implying that hexavalent chromium is not a naturally-occurring contaminant and is only the result of industrial activities, commentators often suggested that polluters should be held accountable and pay for treatment, not the public or public water systems, with it also being suggested that the "Toxic Police" be "enforced" to ensure they do their jobs of finding and fining polluters and that the Department should improve its "decision making between the MCL and natural background chromium 6." Such requests often included references to Pacific Gas and Electric Company (PG&E).

Similarly, comments were received suggesting that the Department should protect the public and California's water bodies (i.e., groundwater, streams, rivers, estuaries, etc.), not industry or polluters; and that it is the Department's job to establish a more protective MCL "so that less clean-up is done at contamination sites, because the MCL is not just used for drinking water systems." Some commentators suggested the Department was conspiring with (or catering to) polluters and big business and, for example, that the Department's decision "stinks of obvious corporate cronyism." The Department also received comments asserting or referring to corporate influence over the Office of Environmental Health Hazard Assessment (OEHHA) in OEHHA's establishment of the PHG.

In addition, the Department received comments from residents of Hinkley, California, along with comments referring to the movie titled "Erin Brockovich." Commentators provided data and statistics pertaining to their well water, a history of PG&E actions, Hinkley area contamination, notes of failures of PG&E regarding clean-up efforts or PG&E's handling of the situation, suggestions that PG&E should pay for the clean-up and/or treatment costs, and assertions that the proposed standard essentially loosens the requirements on PG&E.

Response: *No change in the regulations is required to accommodate these comments. As noted in the Initial Statement of Reasons (ISOR), the presence of hexavalent chromium found in drinking water sources may be attributed to both natural occurrence and through industrial use. Hexavalent chromium in groundwater and drinking water sources is often naturally occurring due to its presence in geological formations throughout the state, and, thus, not always the result of pollution. Even where the presence of hexavalent chromium is a result of anthropogenic activities, the proposed MCL applies* ***only*** *to applicable public water systems providing drinking water,* ***not*** *businesses or industries and their discharges to the state's lakes, streams, estuaries, etc., which may be regulated by other state and federal statutes or regulations. There are currently no public water systems serving the community of Hinkley affected by the Hinkley area contamination plume. As noted in the ISOR, the Department does not have the independent authority to regulate contamination of such waters, including hexavalent chromium contamination that occurred as a result of business or industrial practices.*

The Department is independent of OEHHA and any comments regarding OEHHA or its establishment of the PHG are beyond the scope of the proposed regulatory action.

Not Relevant (NR)

The Department received a number of comments it considered to be irrelevant. The APA provides that an agency adopting a regulation may summarily dismiss irrelevant comments as a group. (Government Code section 11346.9.) The comments that the Department determined are irrelevant include: a) personal accounts of strife caused by government agencies; b) rumors and stories regarding the effects of hexavalent chromium; c) the inability to sell personal property as a result of PG&E's action or inaction; d) background information, including personal life histories; e) requesting the Department to remove fluoride or other contaminants unrelated to the regulatory action; f) illegible comments; g) comments with unclear meanings; h) insults or veiled threats, and;i) rhetorical questions, comments, and suggestions.

The Department did not consider such comments as objections or recommendations directed at the proposed regulatory action or procedures.

Section 64432, CCR.

The Department received no comments regarding the proposed changes in subsections (a), (b)(2), (c), (h), (m), (n), and (o). The Department also received comments on subsections (f)(2), (g)(2), (h)(1), (h)(2)(B)(i), and (i), which were not proposed to be added or revised as part of the regulatory action. Therefore, no response is necessary.

Comments were received on paragraph (b)(1), and subsections (d) and (p), as summarized below.

Subsection (b)(1): A commentator asked how the grandfathering in subsection (b)(1) will "inform MCL compliance determinations" under section 64432(i).

Response: *If a PWS has a sampling result that meets the criteria in subsection (b)(1) and the PWS chooses to use that result in lieu of a collecting a sample during the first six months following the effective date of the regulation, as allowed by subsection (b)(1), the sampling result will be used as the six-month initial sampling result. The subsequent required actions would be dependent on the result of the sample (i.e., whether it exceeds the MCL or not).*

Subsection (d): Commentators recommended a DLR of 0.03 ppb, consistent with U.S. EPA's UCMR3 requirements, to eliminate potential public notification confusion in the Consumer Confidence Reports and PHG exceedance reports.

Response: *The UCMR3 hexavalent chromium detection limit and Consumer Confidence Reports reporting requirements for UCMR3 (40 CFR 141.153(d)(7)) are federal requirements, with which applicable water systems must comply. The comment is beyond the scope of the proposed regulatory action. Therefore, no response is needed. PHG reporting is a tri-annual activity conducted by applicable water systems under H&S Code section 116470(b), which mandates that a PWS include detected contaminants in drinking water that exceed the applicable PHG. Because the hexavalent chromium PHG is 0.02 ppb, any detectable level greater than or equal to 0.02 ppb would be included in the PHG exceedance report.*

Subsection (p): Commentators provided the following comments and recommendations:

- Noted that the expected compliance (or consequence, such as having to install treatment) is not defined or is confusing.
- Compliance should be from source monitoring results.
- Lawmakers did not direct the Department to revise its regulations for total chromium.
- Purpose of the distribution system monitoring study is unclear.
- Unclear if costs of monitoring were included.
- Details of requirement should have been provided, along with how the information will be used.
- The proposed requirement is not consistent with how other inorganic compounds are regulated.

- The need for a study should be based on entry point monitoring results, not source, to be more representative of public exposure.
- The requirement is duplicative of U.S. EPA's.

Response: *The Department has decided to withdraw proposed subsection (p), with no regulatory effect.*

Section 64447.2, CCR.

The Department did not receive a comment specific to section 64447.2, but did receive a comment generally related to the subject (i.e., BAT). The comment and response is provided under the comments and summary for section 64431, GC-8 [OTL].

Section 64463, CCR.

The Department received no comments.

Section 64465, CCR.

The Department did not receive comments on proposed revisions to paragraph (c)(3) or subsection (d). For subsections (c)(1) and (c)(2), the Department received a comment generally related to the subject (i.e., public notification), but not specific to the requirements. That comment and response is provided under the comments and summary for section 64431, CF-4 [OTL]. The remaining comment is as follows:

Subsection (c): A commentator noted that it would be more appropriate for the text should refer to "multilingual," rather than "bilingual."

Response: *The Department agrees that "multilingual" is more appropriate and has revised the text accordingly. The revision to the proposed text is grammatical in nature and is nonsubstantive in that the revision has no effect on the proposed requirements.*

Section 64481, CCR.

The Department received no comments, except as follows:

Subsection (m): A commentator suggested using "chromium (hexavalent)" or "chromium (VI)" rather than "hexavalent chromium" to result in a pattern more closely paralleling nitrate, nitrite, and their sum.

Response: *The Department reviewed Table 64481-A and did not find a listing for nitrate, nitrite, and their sum; only nitrate and nitrite are listed. The Department disagrees that a renaming of "hexavalent chromium" to "chromium (hexavalent)" is necessary. Such a listing would be inconsistent with the use of the term in other sections and could be argued that such a revision could cause more confusion.*

Section 64530, CCR.
The Department received no comments.

Section 64534, CCR.
The Department received no comments.

Section 64534.2, CCR.
The Department received no comments.

Section 64534.8, CCR.
The Department received no comments.

Section 64535.2, CCR.
The Department received no comments.

Section 64535.4, CCR.
The Department received no comments.

Section 64671.80, CCR
The Department received no comments.

STATEMENTS OF DETERMINATION

Local Mandate Determination
The proposed regulations do not impose a mandate on local agencies or school districts.

Alternatives Considered
No alternatives considered by the Department would be more effective in carrying out the purpose for which the regulation is proposed, would be as effective as and less burdensome to affected private persons than the adopted regulation, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

Impact on Business
The Department has made a determination that the regulations would not have a significant statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states.

ADDITIONAL PROGRAM STATEMENTS

45-Day Public Notice Mailing
The Department has complied with the provision of Government Code sections 11346.4(a)(1) through (4) regarding the mailing of notice of proposed action at least 45 days prior to public hearing or close of the public comment period. The date upon which the notice was mailed was on or before August 23, 2013, and the date the notice was emailed was on or before August 23, 2013.

California Conference of Local Health Officers Review
Pursuant to Health and Safety Code section 13205, the Department provided a copy of the public notice document, including the text of the proposed regulation text and the Initial Statement of Reasons, to the California Conference of Local Health Officers for review and comment.

California Environmental Quality Act
The Department finds that adoption of the subject regulations is a ministerial project proposed to be carried out or approved by a public agency, and therefore exempt from Public Resources Code, Division 13, commencing with section 21000 (CEQA) pursuant to section 21080(b)(1) of said division.

State Water Policy
In adopting this regulation, the Department considered the statewide policy expressed in section 106.3 of the Water Code.

Public Hearing Statement

In anticipation of a request for a public hearing, the Department held two public hearings - one in Sacramento, one in Los Angeles - both on October 11, 2013. The location, time, and date of the hearings were provided in the public notice for DPH-11-005.