



NOTIFICATION AND RESPONSE LEVEL ISSUANCE

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| Contaminant: | Manganese |
| Notification Level: | 0.05 milligrams per liter (mg/L) [Based on a running annual average (RAA)]* |
| Response Level: | 0.20 milligrams per liter (mg/L) [Based on a single confirmed detection]** |
| Analytical Method: | EPA Methods 200.7 or 200.8 or Standard Methods 3113 B or 3120 B |
| Toxicological Endpoint: | Neurotoxicity in rats |
| <p>*Average concentration of four (4) consecutive quarterly samples. **Following an initial detection a repeat sample is collected and analyzed, and the two values are averaged to confirm the initial detection pursuant to Finding 24.</p> | |

FINDINGS:

General Background on Notification and Response Levels and Specific Requirements

1. Health and Safety Code sections [116455](#) and [116456](#) authorize the State Water Resources Control Board (State Water Board) to issue or revise notification and response levels for contaminants in drinking water delivered for human consumption before primary maximum contaminant levels (MCLs) are adopted. Pursuant to subdivision (k)(2) of section [116271](#) of the Health and Safety Code, the Deputy Director of the Division of Drinking Water (DDW) is delegated through the State Water Board's authority to issue notification and response levels.
2. Health and Safety Code section [116455](#), subdivision (c)(3), defines notification levels as the concentration level of a contaminant in drinking water delivered for human consumption that has been determined, based on available scientific information, to not pose a significant health risk but which warrants notification to the governing bodies. Notification levels are nonregulatory, health-based advisory levels for contaminants that are established as precautionary measures.
3. Response levels are established in conjunction with notification levels. Health and Safety Code section [116455](#), subdivision (c)(4), defines response levels as the concentration of a drinking water contaminant above which additional steps, beyond notification to the governing bodies, are recommended to reduce public exposure. As with notification levels, response levels are not drinking water standards.
4. The adoption or revision of notification levels and response levels does not trigger new monitoring requirements for public water system for the contaminant. However, within



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- 30 days after a public water system learns of a confirmed detection exceeding an MCL, notification and/or response level, the public water system must notify its governing body of the exceedance(s) and any relevant governing bodies of the areas it serves (Health and Safety Code section [116455](#)).
5. Public water systems regulated by the California Public Utilities Commission shall also notify the commission when exceeding an MCL, a notification level and/or a response level. The commission may order further action to ensure a potable water supply.
 6. Health and Safety Code section [116450](#), subdivision (e) authorizes the State Water Board to require a public water system to notify its customers to avoid internal consumption of the water supply and use bottled water due to a chemical contamination problem that may pose a health risk. Health and Safety Code section [116450](#), subdivision (g), further requires certain customers (such as schools, rental properties, and businesses) to provide the same notice to those consuming the water.
 7. Public water systems or water agencies subject to recycled water regulations (Cal. Code Regs., tit. 22, div. 4, [ch. 3](#)) or direct potable reuse project monitoring requirements (Cal. Code Regs., tit. 22, section [64669.65](#)) have additional requirements related to MCLs and notification levels.

Information on the Contaminant and the Issuance

8. Manganese is an essential nutrient and enzyme cofactor that is naturally present in many foods and available as a dietary supplement. Despite its nutritional benefits, adverse health effects can be caused by over-exposure. Formula-fed infants may be particularly susceptible to adverse neurotoxicological effects from manganese exposure because they absorb and retain more manganese than adults. Public health notification and related mitigation can protect formula-fed infants by notifying parents and caregivers that short periods of manganese exposure above the response level in formula-fed infants may lead to developmental impacts.

For additional information see the following website:

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Manganese.html

9. In accordance with Health and Safety Code, [116275](#) subdivision (d), secondary MCLs control contaminants that primarily affect aesthetic qualities and consumer acceptance such as discolored water, staining of fixtures or clothing, and taste and odor. These standards apply to community water systems only. Non-community systems, including non-transient non-community systems such as schools and workplaces, are not subject to secondary standards.
10. California established a manganese secondary MCL of 0.05 mg/L. Exceedance of the secondary MCL is determined with a running annual average of four (4) consecutive quarters and carries monitoring and public notification requirements in accordance with

[Article 16](#) and [Article 18](#) of title 22, division 4, chapter 15 of the California Code of Regulations.

11. The revised notification level for manganese cancels applicability of manganese secondary MCL waivers in accordance with California Code of Regulations, title 22, division 4, chapter 15, section 64449.2, which disallows waivers for source water quality above the notification level. These systems will be required to comply with the secondary MCL monitoring, public notice, and treatment requirements.
12. In 2003, manganese notification and response levels were set at 0.5 mg/L and 5 mg/L, respectively, based on neurotoxicity.
13. In April 2022, DDW staff conducted a literature search for human and animal research that studied adverse health effects from manganese exposures specifically by route of ingestion. This literature review indicated that the then-current notification level of 0.5 mg/L and response level of 5 mg/L should be revised downward based on the potential risk for manganese-induced neurological impacts in formula-fed infants.

DDW staff derived a health protective concentration (HPC) equivalent to 0.02 mg/L, to serve as the basis for future recommended revisions to the current manganese notification and response levels. For contaminants like manganese with non-cancer health risks, a response level concentration up to 10 times the HPC is consistent with an acceptable margin of safety.

14. In a technical memorandum dated April 7, 2022, DDW requested that the Office of Environmental Health Hazard Assessment (OEHHA) review staff's HPC assumptions and derivations and provide comments.
15. On May 3, 2022, OEHHA provided its review, supporting the intermediate approach used to derive the HPC and agreed with the parameters used in the calculation of the HPC, including use of the Kern et al. (2010) study, the composite uncertainty factor of 1,000, the relative source contribution of 0.2, and the drinking water intake of 0.237 liters per kilogram per day (L/kg-day) based on infants aged 0 to 6 months.
16. In accordance with Health and Safety Code section 116456, on February 16, 2023, DDW provided email notice and posted on its website: (1) proposed revised manganese notification and response levels of 0.02 mg/L and 0.2 mg/L, respectively, (2) the technical memorandum, and (3) OEHHA's comments on the technical memorandum.
17. On March 21, 2023, DDW presented an informational item on the proposed revised manganese notification level of 0.02 mg/L and response level of 0.2 mg/L during the regularly noticed meeting of the State Water Board.
18. As a result of comments received on the February 16, 2023 proposal and the March 21, 2023 State Water Board informational item, the revision to the manganese notification level was modified to:



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- Align with the public health benefit provided by existing water quality regulations for bottled water. Replacement water, such as bottled water and water from vending stations, is regulated by the California Department of Public Health, Food and Drug Branch, which enforces a manganese concentration limit of 0.05 mg/L.
 - Align with manganese secondary MCL public notice requirements for community water systems. Although the consumer acceptance-based secondary MCL and health-based notification level serve different functions, establishing the secondary MCL and notification level at the same value provides the State Water Board authority to require community water systems to notify both the governing body and public of an exceedance in accordance with section [116455](#) of the Health and Safety Code and Article 18 of title 22, division 4, chapter 15 of the California Code of Regulations, respectively. Transient non-community and non-transient non-community water systems must also notify its governing body when the notification level is exceeded (Health & Safety Code, section [116455](#).)
https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Notices.html
 - Account for the fluctuation of manganese levels over time. Exceedance of the notification level for manganese is based on a running annual average to support communication of manganese trends. A sudden increase in manganese concentration above the response level warrants further action to reduce public exposure.
19. In accordance with Health and Safety Code section 116456, on September 4, 2025, DDW provided email notice and posted the proposed revisions to the notification level of 0.05 mg/L (RAA) and response level of 0.20 mg/L for manganese on its website.
 20. In accordance with Health and Safety Code section 116456, on October 7, 2025, DDW presented an informational item on the proposed revised manganese notification level of 0.05 mg/L and response level of 0.20 mg/L during the regularly noticed meeting of the State Water Board.
 21. Documents related to the development of the notification and response levels described herein are available at
https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/NotificationLevels.html.

Recommendations and Requirements for Public Water Systems

22. Due to the health concerns associated with manganese, DDW recommends that samples be analyzed and results reported electronically to the public water system and DDW as soon as practicable, but no later than 30 days following the date of sample collection.

23. Within 30 days after a public water system learns of a confirmed detection exceeding an MCL, notification and/or response level, the public water system must notify its governing body of the exceedance(s) and any relevant governing bodies of the areas it serves (Health and Safety Code section [116455](#)).
24. When a public water system becomes aware of a manganese result greater than the response level, DDW recommends the public water system (a) notify DDW within seven (7) days of the exceedance, and (b) as soon as practicable, but no later than thirty (30) days from becoming aware of the initial exceedance, complete the following process to confirm the response level exceedance:
 - Collect and analyze a confirmation sample and receive the results.
 - If the average of the initial and confirmation manganese sample results exceeds the response level, the initial detection is confirmed. Report the result to DDW within two (2) days of receiving the confirmation result.
 - If the average of the initial and confirmation manganese sample results does not exceed the response level, report the result to DDW within seven (7) days of receiving the confirmation result.
 - If a confirmation sample is not completed as described above, DDW shall treat the initial detection as confirmed.
25. DDW considers the exceedance of the manganese response level to pose a potential health risk to formula-fed infants and recommends notifying customers to use an alternative water supply (bottled water) when preparing formula for infants. Accordingly, pursuant to Health and Safety Code section [116450](#), to reduce public exposure following a confirmed response level exceedance, as determined pursuant to Finding 24, a community water system must do either of the following within 30 days of the initial exceedance:
 - Notify customers to use an alternative water supply (bottled water) when preparing formula for infants. Customers receiving the same notice shall provide public notice to those consuming the water as prescribed by Health and Safety Code section [116450](#), subdivisions (e) through (g). If consumers have other health issues concerning the consumption of manganese in their drinking water, they may wish to consult their doctor, or
 - Mitigate exposure until exceedances cease (take source offline, provide treatment or provision of alternative water)
26. DDW may require the same notice as described in Finding 25 for non-community water systems which exceed the manganese response level pursuant to Finding 24 and serve a vulnerable population, as determined on a case-by-case basis.



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- 27. Community water systems must include secondary MCL violations in their annual consumer confidence reports pursuant to Health & Safety Code section [116470](#) and California Code of Regulations title 22, division 4, chapter 15 sections [64449.4](#), subdivision (c) and [64480](#).
- 28. In addition to the above requirements, DDW recommends public water systems inform customers and consumers about the presence of manganese above the notification or response level and associated health concerns in the annual consumer confidence report.

Therefore, the Deputy Director of DDW establishes a notification level of 0.05 mg/L (RAA) and a response level of 0.20 mg/L (based on a single confirmed detection) for manganese.

Approved:

Signature:

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06/02/2026

Darrin Polhemus, P.E.
Deputy Director, Division of Drinking Water
State Water Resources Control Board

Date