Responses to Public Comments on Preliminary Regulatory Determinations for Contaminants on the Fifth Drinking Water Contaminant Candidate List

Office of Water (4607M)
EPA 815-R-26-003
March 2026

Table of Contents

List of Exhibits

Abbreviations

1,2,3-TCP	1,2,3-Trichloropropane
AMWA	Association of Metropolitan Water Agencies
ASDWA	Association of State Drinking Water Administrators
ATSDR	Agency for Toxic Substances and Disease Registry
AWWA	American Water Works Association
CCL	Contaminant Candidate List
CCL 3	Third Contaminant Candidate List
CCL 5	Fifth Contaminant Candidate List
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
HAA5	Five Haloacetic Acids
HRL	Health Reference Level
IMOA	International Molybdenum Association
MCLG	Maximum Contaminant Level Goal
MIG	Manganese Interest Group
NPDWR	National Primary Drinking Water Regulation
NRDC	Natural Resources Defense Council
RD 5	Regulatory Determination 5
RfD	Reference Dose
RSC	Relative Source Contribution
SDWA	Safe Drinking Water Act
TSCA	Toxic Substances Control Act
TTHMs	Total Trihalomethanes
UCMR	Unregulated Contaminant Monitoring Rule
UCMR 3	Third Unregulated Contaminant Monitoring Rule
UCMR 4	Fourth Unregulated Contaminant Monitoring Rule
UF	Uncertainty Factor

Introduction and Overview

Background

The Safe Drinking Water Act (SDWA) section 1412(b)(1)(B)(i) requires the U.S. Environmental Protection Agency (EPA) to publish a list of unregulated contaminants that are candidates for drinking water regulations, referred to as the Contaminant Candidate List (CCL). The statute requires the EPA to publish the CCL every five years, after public notice and an opportunity to comment. The CCL is a list of contaminants that are not subject to any proposed or promulgated National Primary Drinking Water Regulations (NPDWRs), are known or anticipated to occur in public water systems (PWSs), and may require regulation under SDWA. SDWA section 1412(b)(1)(B)(ii) directs the Agency to determine whether to regulate at least five contaminants from the CCL every five years. Under section 1412(b)(1)(A) of SDWA, the EPA may regulate a contaminant in drinking water if the Administrator determines that:

> (i) the contaminant may have an adverse effect on the health of persons;
>
> (ii) the contaminant is known to occur or there is substantial likelihood that the contaminant will occur in PWSs with a frequency and at levels of public health concern; and
>
> (iii) in the sole judgment of the Administrator, regulation of such contaminant presents a meaningful opportunity for health risk reduction for persons served by PWSs.

If, after considering public comment on a preliminary determination, the Agency determines that these three statutory criteria are met and makes a final determination to regulate a contaminant (*i.e.,* a positive determination), section 1412(b)(1)(E) of SDWA requires the EPA to propose and promulgate a NPDWR and publish a Maximum Contaminant Level Goal (MCLG) for that contaminant. The Agency must publish a proposed MCLG and NPDWR within 24 months and promulgate a final MCLG and NPDWR within 18 months of proposal. SDWA provides that a determination not to regulate is subject to judicial review. The Agency can choose to publish a Health Advisory (a non-regulatory action) or other documents for any contaminant on the CCL, independent of the regulatory determination.

On January 15, 2025, the EPA published preliminary findings from the fifth round of Regulatory Determinations (RD 5) and requested public comment (90 FR 3830, USEPA, 2025). In RD 5, the EPA issued preliminary negative determinations (a determination that regulation is not warranted) for nine contaminants from the fifth CCL (CCL 5): 2-aminotoluene, cylindrospermopsin, ethoprop, microcystins, molybdenum, permethrin, profenofos, tebuconazole, and tribufos. The Agency provided information about the status of five additional prioritized CCL 5 contaminants for which the Agency did not make a preliminary determination: 1,2,3-trichloropropane (1,2,3-TCP), 1,4 dioxane, manganese, quinoline, and strontium. (As explained further in the preamble, the Agency made a preliminary determination to regulate

strontium when it was listed on the third CCL (CCL 3) but has not yet made a final determination whether to regulate under SDWA.)

The RD 5 comment period lasted from January 15, 2025, to March 15, 2025. In response to the call for public comments, the EPA received eight submissions. All original public submissions can be found at www.regulations.gov, under Docket ID EPA-HQ-OW-2024-0456. The EPA has reviewed the submitted comments. The Agency's responses to the points raised in the comments are presented in this document.

Explanation of Comment Processing and Document Organization

The EPA received public comment on several topics. A list of topics was developed and organized into a hierarchy, and numerical topic codes were assigned for easy reference. Each public comment was divided into topic-specific sections or "snippets," and each snippet was assigned the appropriate topic code. If multiple topics were so intertwined in a comment that they could not be separated, the snippet containing them was assigned whichever topic code comes first in the topic code list. As needed, the EPA adapted and expanded the initial topic code list to accommodate the range of topics raised in the comments.

In the "Comments and EPA Responses by Comment Code" section below, all snippets are presented in topic code order, along with the EPA's responses. The snippets are grouped into six general topic code areas, following the topic code hierarchy:

1. General comments
2. Comments on the approach employed for RD 5
3. Overall comments on the RD 5 preliminary determination outcomes
4. Comments on specific contaminants receiving a preliminary determination
5. Comments on contaminants not receiving a preliminary determination at this time
6. Comments on CCL

Not all topic codes were needed, and therefore not all topic codes appear in the "Comments and EPA Responses by Comment Code" section below. Exhibit 1 provides the complete list of comment topics and the corresponding codes and indicates whether they were used.

Exhibit 1: Topic Code List

Topic Code	Topic	Code Used?
Topic Code Area 1, General		
1.1	Statutory requirements and program history	Yes
1.2	RD5 communications	No
1.3	Timeline and next steps	No
Topic Code Area 2, Approach Employed for RD 5		
2.1	The RD 5 Protocol	Yes
2.2	Evaluation of adverse health effects (first criterion)	Yes

Topic Code	Topic	Code Used?
2.3	Evaluation of occurrence data (second criterion)	No
2.4	Evaluation of meaningful opportunity for health risk reduction (third criterion)	Yes
Topic Code Area 3, RD 5 Preliminary Determinations, Overall		
3.1	EPA's nine preliminary negative determinations	Yes
Topic Code Area 4, Contaminants Receiving a Preliminary Determination Under RD 5		
4.1	2-Aminotoluene	Yes
4.2	Cylindrospermopsin	Yes
4.3	Ethoprop	Yes
4.4	Microcystins	Yes
4.5	Molybdenum	Yes
4.5.1	Molybdenum Health Reference Level (HRL)	Yes
4.5.2	Molybdenum Uncertainty Factor (UF)	Yes
4.5.3	Molybdenum Relative Source Contribution (RSC)	Yes
4.6	Permethrin	Yes
4.7	Profenofos	Yes
4.8	Tebuconazole	Yes
4.9	Tribufos	Yes
Topic Code Area 5, Contaminants Not Receiving a Preliminary Determination Under RD 5		
5.1	EPA's decision to defer preliminary determinations for five contaminants	Yes
5.2	1,2,3-Trichloropropane	Yes
5.3	1,4-Dioxane	Yes
5.4	Manganese	Yes
5.5	Quinoline	Yes
5.6	Strontium	Yes
5.7	Other CCL 5 contaminants	Yes
5.8	Non-CCL 5 contaminants	No
Topic Code Area 6, Comments on CCL		
6.1	CCL comments	Yes

In the "Comments and EPA Responses by Comment Code" section below, each snippet is preceded by identifying information. This includes:

- **Commenter**. This is the person or organization that submitted the comment.
- **Comment Number**. This is a unique identifier assigned to each comment, based on the federal Docket ID.
- **Snippet Number**. Each snippet within a comment was assigned a snippet number, based on line numbering during comment processing.
- **Topic Code**: This is the code assigned based on topic content (see Exhibit 1, above, for the complete list of topic codes).

Who Submitted Comments?

The EPA grouped commenters into categories to provide a broad characterization of interested stakeholders. Exhibit 2, below, lists commenter categories and the number of comments received from each category.

Exhibit 2: Public Comments by Commenter Type

Commenter Type	Number of Submissions
Drinking Water Organization	3
Public Water System	1
Industry Organization	2
Non-Governmental Organization	1
Private Citizen	1

Exhibit 3, below, identifies each comment received by Docket ID and organization name. The Docket IDs are hyperlinked to the comments themselves as received and posted by the federal government.

Exhibit 3: Links to Commenter's Full Comment

Docket ID	Organization Name
EPA-HQ-OW-2024-0456-0099	Association of State Drinking Water Administrators (ASDWA)
EPA-HQ-OW-2024-0456-0100	American Water
EPA-HQ-OW-2024-0456-0101	International Molybdenum Association (IMOA)
EPA-HQ-OW-2024-0456-0102	Association of Metropolitan Water Agencies (AMWA)
EPA-HQ-OW-2024-0456-0103	Manganese Interest Group (MIG)
EPA-HQ-OW-2024-0456-0104	Private Citizen
EPA-HQ-OW-2024-0456-0105	Beyond Pesticides
EPA-HQ-OW-2024-0456-0106	American Water Works Association (AWWA)

Comments and EPA Responses by Comment Code

TOPIC CODE AREA 1, General

1.1: Statutory requirements and program history

Commenter: Association of Metropolitan Water Agencies (AMWA)
Comment Number: EPA-HQ-OW-2024-0456-0102
Snippet Number: 18
Topic Code: 1.1, Statutory requirements and program history

Comment:

The Association of Metropolitan Water Agencies (AMWA) appreciates the opportunity to comment on the Environmental Protection Agency's (EPA) request for public comment, Announcement of Preliminary Regulatory Determinations for Contaminants on the Fifth Drinking Water Contaminant Candidate List (CCL). AMWA is an organization composed of the largest publicly-owned drinking water systems in the United States, providing drinking water to more than 160 million people.

AMWA supports the regulatory approach of the Safe Drinking Water Act Amendments of 1996 (SDWA). The statute takes into account lessons learned from past drinking water laws and focuses on contaminants that actually occur in drinking water at levels of public health concern as understood by the best available science. The law provides a sound scientific basis for regulations and appropriately considers the benefits the public may receive from regulatory efforts against the costs they will be asked to bear to achieve those benefits. EPA must faithfully follow the new contaminant regulatory process as established by the 1996 amendments for the establishment of National Primary Drinking Water Regulations (NPDWR).

AMWA believes following the process outlined in the SDWA remains the best way to prioritize the agency's limited resources by focusing on those contaminants most likely to present human health risks through drinking water while also being conscious of the finite resources available to public water systems across the country.

EPA Response:

The EPA thanks AMWA for their support of the SDWA regulatory process. SDWA mandates the EPA to determine whether regulation of a contaminant would present a meaningful opportunity for health risk reduction, therefore, the regulatory determination approach is designed to allow the EPA to prioritize drinking water contaminants that may pose risks to human health.

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 184
Topic Code: 1.1, Statutory requirements and program history

Comment:

Taken as a whole, the processes included in the SDWA regulatory process have successfully served to identify and then obtain the necessary occurrence data to make informed regulatory determinations.

EPA Response:

The EPA thanks AWWA for their feedback. The EPA agrees that in following the regulatory determination process, the Agency aims to identify and analyze each contaminant's most representative drinking water occurrence data and relevant health effects information to inform the regulatory determinations.

TOPIC CODE AREA 2, Approach Employed for RD 5

2.1: The RD 5 Protocol

Commenter: Association of State Drinking Water Administrators (ASDWA)
Comment Number: EPA-HQ-OW-2024-0456-0099
Snippet Number: 94
Topic Code: 2.1, The RD 5 Protocol

Comment:

ASDWA recommends EPA reevaluate the contaminant selection process for regulatory determination to focus on contaminants with existing occurrence data. While it is important to exercise caution when making public health decisions, it is equally important to ensure the different pieces of the regulatory process are working together toward the goal of making contaminant regulatory determinations.

Several contaminants have available occurrence data gathered through the various cycles of the Unregulated Contaminant Monitoring Rule (UCMR). Appendix A includes the contaminants currently listed in CCL 5 that have gone through monitoring and have occurrence data. There are 19 contaminants with existing UCMR data that should be prioritized for regulatory determination. ASDWA recommends EPA reevaluate their contaminant selection and prioritization process to ensure contaminants are being moved off the CCL.

As always, ASDWA appreciates EPA's investment in protecting drinking water and the opportunity to provide comments. If there are any questions, please do not hesitate to reach out to Kevin Letterly (kletterly@asdwa.org) or Carsen Lennon (clennon@asdwa.org).

[Signature Block]

APPENDIX A

This table is a representation of all contaminants (chemical and microbial) on the Contaminant Candidate List 5 (CCL5) that have been included on a previous contaminant candidate lists or were previously included on an Unregulated Contaminant Monitoring Rule (UCMR). Contaminants highlighted in red are currently on CCL5 and have previously been on a UCMR.

[Table 1: See EPA Docket ID EPA-HQ-OW-2024-0456-0099]

EPA Response:

The EPA appreciates the commenters' recommendation for improving the contaminant selection process to focus on contaminants with existing occurrence data. The EPA's current process does, in fact, account for and focus on contaminants with existing occurrence data, while also focusing on health effects and analytical methods. The three phases of the Regulatory Determination protocol are: (1) the *Data Availability Phase*, (2) the *Data Evaluation Phase* and (3) the *Regulatory Determination Assessment Phase* (information about each phase of the Regulatory Determination protocol can be found in Appendix B of the *Final Regulatory Determination 5 Support Document* (USEPA, 2026)). In Phase 1 of the Regulatory Determination Protocol, the *Data Availability Phase*, the EPA prioritizes the CCL contaminants according to the availability of three categories of information: health effects, occurrence, and analytical methods. Contaminants with an approved analytical method, a qualifying health effects assessment, and nationally representative finished water data (most often acquired under the Unregulated Contaminant Monitoring Rule (UCMR) program) are considered among the best candidates to inform a regulatory determination.

The CCL 5 contaminants that did not proceed to Phase 3 in the regulatory determination process did not move forward in the process for one or more of the following reasons (as stated in section III of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025)):

a. "An updated health assessment completed by January 31, 2023 was not identified;
b. Critical health effects gap (e.g., lack of data to support quantification for the oral route of exposure);
c. Lack of nationally representative finished drinking water occurrence data and lack of sufficient other data to demonstrate occurrence at levels and frequencies of public health concern;
d. Critical occurrence data limitation or gap (e.g., inconsistent results or trends in occurrence data requiring further research; significant uncertainty in occurrence analyses or data); or
e. The contaminant is being evaluated in other actions by the Agency."

See Exhibit 1.3 in the *Final Regulatory Determination 5 Support Document* (USEPA, 2026) as well as Section III of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025) for additional information on why some contaminants from CCL 5 were not given a regulatory determination. The EPA will continue to recommend/consider these contaminants for UCMR data collection or development of qualifying health assessments, as appropriate, based on their

data needs. The EPA will also continue to improve the CCL and Regulatory Determination processes each cycle.

For the five contaminants identified as proceeding to Phase 3 but for which no determination was made in RD 5, the EPA is considering conducting preliminary benefits or treatment feasibility analyses that would inform the meaningful opportunity statutory requirement. Any other actions that the EPA takes with respect to these contaminants as part of the regulatory processes will be communicated with the public and the water sector.

As required by SDWA, the EPA will continue evaluating contaminants on the CCL for potential future regulatory determinations. The Agency's existing process for evaluating contaminants ensures that if new information about specific contaminants becomes available (*e.g.,* new studies on adverse health effects or new occurrence data), the EPA will consider such information in determining whether to include those contaminants in a future CCL.

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 63
Topic Code: 2.1, The RD 5 Protocol

Comment:

Of further concern is that mixtures, synergisms, and breakdown products are not considered or being studied for water contaminants. Exposure to chemicals does not occur solitarily; exposure to a myriad of substances occurs simultaneously, with the potential for synergistic effects that increase toxicity and potential harm.[FN13]

[FN13: Beyond Pesticides (March 2019). Take Action: What's In the Bottle, Bag, or Box Is Not Tested Fully for Adverse Effects. Available at: https://beyondpesticides.org/dailynewsblog/2019/03/take-action-whats-in-the-bottle-bag-orbox-is-not-tested-fully-for-adverse-effects/.]

EPA Response:

The EPA thanks Beyond Pesticides for their comment. When the potential for additive or synergistic effects is known or anticipated, based on the best available scientific information, the Agency has the ability to regulate groups or mixtures of contaminants. For example, the EPA has regulated as groups five haloacetic acids (HAA5) and total trihalomethanes (TTHM) (40 CFR Part 141 Subpart L), which may be formed in public water systems as disinfection byproducts and may have additive health effects.

2.2: Evaluation of adverse health effects (first criterion)

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106

Snippet Number: 153
Topic Code: 2.2, Evaluation of adverse health effects (first criterion)

Comment:

This notice partially reveals the substantial conservatism in the determination of HRLs. There are multiple instances when "10 x" safety factors enter calculations that already target very low risk levels. These safety factors are layered onto the initial conservatism present in determinations of reference doses and cancer slope factors. This notice illustrates both opportunities and a need to revisit the agency's approach to determining concentrations of contaminants in drinking water that pose a demonstrable risk to public health with an adequate margin of safety.

EPA Response:

The EPA thanks AWWA for their comment. As part of the EPA human health risk assessment process, uncertainty factors (UFs) are considered during toxicity value derivation, such as for the derivation of health reference levels (HRLs) for regulatory determination under SDWA. For non-cancer endpoints, EPA human health risk assessments consider UFs to account for the variability and uncertainty introduced by potential differences between test animals and humans (generally a 10-fold or 10x UF) and variability within the human population (generally another 10x UF).

Safety factors are considered during toxicity value derivation for pesticides only. The Food Quality Protection Act requires the EPA to apply an additional 10-fold safety factor for pesticides during toxicity value derivation, if necessary, to protect infants and children from effects of the pesticide. For more information on how the EPA evaluates pesticides in human health risk assessment, please see: https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/overview-risk-assessment-pesticide-program.

For RD 5, the EPA has transparently described the process for selection of toxicity information for HRLs from final human health risk assessments for currently registered pesticide chemicals (see Appendix B, Section B.5.1.2, of the *Final Regulatory Determination 5 Support Document* (USEPA, 2026). For each pesticide considered during RD 5, the EPA selected the most recent human health risk assessment that is the basis of the current pesticide registration because this is considered the best available science.

2.4: Evaluation of meaningful opportunity for health risk reduction (third criterion)

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 142
Topic Code: 2.4, Evaluation of meaningful opportunity for health risk reduction (third criterion)

Comment:

½ HRL values lead to very clear negative determinations but are confusing if transferred to an expanded analysis to support positive determinations.

AWWA pointed out in its comments on EPA's Preliminary RD3 that the HRL and ½ HRL values used in the regulatory determination algorithm imply tentative health-based values and impacts. At this stage, the HRL has not been finalized but could be construed to be the likely maximum contaminant level goal (MCLG) or the premise for health risk reduction analysis. If observed concentrations are reliably below ½ the conservatively developed HRL, then there is little reason to believe a positive determination could be warranted. Conversely, use of the ½ HRL becomes difficult to understand if EPA were to make a positive regulatory determination.

EPA Response:

The EPA thanks AWWA for their comment. The Agency agrees that the ½ HRL value may be useful to support a negative determination in cases in which nationally representative finished water data are available showing few, if any, occurrences above ½ the HRL. Nationally representative data showing an abundance of concentrations in finished water between ½ the HRL and the HRL could also inform the second statutory criterion under SDWA Section 1412(b)(1)(A)(ii), that "the contaminant is known to occur or there is a substantial likelihood that the contaminant will occur in drinking water with a frequency and at levels of public health concern." Examining the occurrence between ½ the HRL and the HRL may provide a qualitative indication of the likelihood of occurrence at levels of public health concern.

HRLs are derived based on precedent in prior regulatory determination cycles that is consistent with Agency guidance (USEPA, 2002; USEPA, 2019, USEPA 2021a; USEPA2021b; USEPA 2021c) and the use of the best available science as required under SDWA. However, as described in the EPA's *Final Regulatory Determination 5 Support Document* (page B-37), an HRL is not a final determination on establishing a protective level of a contaminant in drinking water for a particular population; it is derived prior to development of a complete health and exposure assessment and can be considered a screening value (USEPA, 2026).

TOPIC CODE AREA 3, RD 5 Preliminary Determinations, Overall

3.1: EPA's nine preliminary negative determinations

Commenter: Association of State Drinking Water Administrators (ASDWA)
Comment Number: EPA-HQ-OW-2024-0456-0099
Snippet Number: 9
Topic Code: 3.1, EPA's nine preliminary negative determinations

Comment:

The Association of State Drinking Water Administrators (ASDWA) thanks the Environmental Protection Agency (EPA) for the opportunity to comment on the preliminary fifth regulatory determination. ASDWA appreciates EPA for taking action on contaminants from the contaminant candidate list (CCL) and making regulatory determinations on the CCL contaminants.

ASDWA represents the drinking water primacy agencies, who work collaboratively with EPA and their utilities to implement the Safe Drinking Water Act (SDWA) and ensure the delivery of safe drinking water for all Americans. ASDWA is the non-partisan professional association for the 57 state, territorial, and tribal drinking water programs serving as the primacy agencies (hereafter referred to as "states") to implement the Safe Drinking Water Act (SDWA). However, these comments do not necessarily represent the specific views and concerns of individual states or consensus from all states.

ASDWA appreciates the continued research and decisions on the CCL contaminants and supports EPA's negative regulatory determinations for the proposed nine contaminants: 2-aminotoluene, cylindrospermopsin, ethoprop, microcystins, molybdenum, permethrin, profenofos, tebuconazole, and tribufos. These contaminants do not occur at a level or frequency that would justify a national regulation and would not provide a meaningful health risk reduction.

EPA Response:

The EPA thanks ASDWA for their support for the nine preliminary determinations for RD 5. The EPA agrees that the nine contaminants 2-aminotoluene, cylindrospermopsin, ethoprop, microcystins, molybdenum, permethrin, profenofos, tebuconazole, and tribufos do not occur at levels or with a frequency that provide a meaningful health risk reduction and would not justify a national regulation.

Commenter: American Water Works Company, Inc.
Comment Number: EPA-HQ-OW-2024-0456-0100
Snippet Number: 14
Topic Code: 3.1, EPA's nine preliminary negative determinations

Comment:

American Water Works Company, Inc. (American Water) appreciates the opportunity to provide comment to the U.S. Environmental Protection Agency (U.S. EPA) regarding its preliminary regulatory determinations for contaminants on the fifth Drinking Water Contaminant Candidate List (CCL) as described in the January 15, 2025, Federal Register (90 FR 3830). American Water provides drinking water and wastewater service to an estimated 14 million people with regulated operations in 14 states, including more than 300 public drinking water systems. In addition to our regulated operations, the company also provides water and wastewater services to 18 military installations across the country through its Military Services Group and currently operates under 50-year contracts with these installations as part of the U.S. Government's Utilities Privatization Program. The company's comments are based on its extensive experience in designing, installing

and operating treatment for groundwater and surface water that allows it to meet state standards and implement drinking water regulations across its national footprint.

American Water supports U.S. EPA's preliminary determinations to not regulate nine contaminants from CCL 5: 2-aminotoluene, cylindrospermopsin, ethoprop, microcystins, molybdenum, permethrin, profenofos, tebuconazole and tribufos. U.S. EPA provides rationale in the proposal for how each of these contaminants do not meet one or more of the criteria for making a positive regulatory determination as described in the Safe Drinking Water Act (SDWA). American Water recommends that U.S. EPA finalize the regulatory determinations as proposed.

EPA Response:

The EPA thanks American Water for their support for the nine preliminary negative determinations for RD 5.

Commenter: Association of Metropolitan Water Agencies (AMWA)
Comment Number: EPA-HQ-OW-2024-0456-0102
Snippet Number: 37
Topic Code: 3.1, EPA's nine preliminary negative determinations

Comment:

With this consideration, AMWA supports EPA's negative determinations for the proposed nine contaminants from CCL 5: 2-aminotoluene, cylindrospermopsin, ethoprop, microcystins, molybdenum, permethrin, profenofos, tebuconazole and tribufos.

EPA Response:

The EPA appreciates AMWA's support for the nine preliminary negative determinations for RD 5.

Commenter: Kayla Dalton
Comment Number: EPA-HQ-OW-2024-0456-0104
Snippet Number: 1
Topic Code: 3.1, EPA's nine preliminary negative determinations

Comment:

According to the EPA, there were nine containments found in drinking water that would result in health concerns for a healthy human. Water is essential to the human body, and in biology class, I learned that 80% of our body is made out of water. Humans need water to survive in this growing world, and if we do not have suitable drinking water then our life expectancy will be shorter. The chemicals the EPA found in our drinking water has a high risk of developing certain cancers. Chemicals that the policy tends not to regulate have a high percentage of creating carcinogens. Carcinogens is what causes cancer in the human body, and if the chemicals increase

that risk then it should be regulated by the EPA. However, there are many food and drugs that increased cancer, but it should not be found in our drinking water. Water is essential to the human body, and the human body can just survive off of water. All chemicals need to be regulated so that there is not a chance to develop cancer due to the carcinogen mutating our genes.

[Attachment 1: See EPA Docket ID EPA-HQ-OW-2024-0456-0104]

EPA Response:

The EPA thanks the commenter for the input provided and agrees that it is important to identify and take action to reduce risks to the public from exposure to contaminants in drinking water. The Safe Drinking Water Act, as amended in 1996, provides a procedure that the EPA must follow when deciding whether or not to regulate a contaminant. In order to regulate a contaminant under Section 1412(b)(1)(A) of the Safe Drinking Water Act, the Agency must determine that:

i. The contaminant may have an adverse effect on the health of persons;
ii. The contaminant is known to occur or there is substantial likelihood the contaminant will occur in public water systems with a frequency and at levels of public health concern; and
iii. In the sole judgment of the Administrator, regulation of such contaminant presents a meaningful opportunity for health risk reduction for persons served by public water systems.

All three of these criteria must be met to support a positive regulatory determination. Based on these criteria, knowing that there may be harmful health effects from exposure to a contaminant is not by itself enough reason to regulate that contaminant in drinking water. The contaminant must also be present in public water systems sufficiently frequently and at levels that may be harmful to those who drink the contaminated water. The EPA also needs to be reasonably sure that regulating the contaminant in drinking water would reduce the health risks. The EPA presents its findings for the nine contaminants mentioned in Section IV of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025). Based on the monitoring data that the EPA evaluated, the Agency determined that these nine contaminants do not occur frequently in public water systems at levels of public health concern and therefore do not warrant a National Primary Drinking Water Regulation under SDWA.

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 14
Topic Code: 3.1, EPA's nine preliminary negative determinations

Comment:

These comments are submitted on behalf of Beyond Pesticides. Founded in 1981 as a national, grassroots membership organization that represents community-based organizations and a range

of people seeking to bridge the interests of consumers, farmers, and farmworkers. Beyond Pesticides advances improved protections from pesticides and alternative pest management strategies that eliminate a reliance on pesticides. Our membership and network span the 50 states and the world.

We are writing in response to the preliminary determinations of the U.S. Environmental Protection Agency (EPA), under the Safe Drinking Water Act (SDWA), not to regulate nine contaminants including 2-aminotoluene, cylindrospermopsin, ethoprop, microcystins, molybdenum, permethrin, profenofos, tebuconazole and tribufos. Clean water is essential for human health and yet water is being polluted at unprecedented rates with chemicals, nutrients, metals, pesticides, and other contaminants that pose severe health threats.[FN1]

Individually, scientific literature finds the contaminants in question linked to various adverse health effects ranging from gastrointestinal issues and organ damage to neurotoxicity and cancer.

[FN1: Beyond Pesticides Factsheet. Pesticides in My Drinking Water? Individual precautionary measures and community action. Available at: https://www.beyondpesticides.org/assets/media/documents/infoservices/pesticidesandyou/documents/watertesting.pdf.]

EPA Response:

Please see the response under snippet number 1 of comment EPA-HQ-OW-2024-0456-0104 under topic code 3.1, EPA's nine preliminary negative determinations. The EPA acknowledges the potential for adverse health effects from exposure to each of the nine contaminants that received a negative determination in RD 5. However, as shown in SDWA 1412(b)(1)(A), the potential for adverse health effects is not by itself sufficient to warrant regulating a contaminant under the Safe Drinking Water Act. The EPA's evaluations of the potential adverse health effects of each of the nine contaminants receiving preliminary negative determinations were presented in Section IV of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025).

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 60
Topic Code: 3.1, EPA's nine preliminary negative determinations

Comment:

All of these health risks to the individual contaminants warrant regulation within drinking water to protect human health.

EPA Response:

Please see the response under snippet number 1 of comment EPA-HQ-OW-2024-0456-0104 under topic code 3.1, EPA's nine preliminary negative determinations. The EPA acknowledges the potential for adverse health effects from exposure to each of the nine contaminants that

received a negative determination in RD 5. However, as shown in SDWA 1412(b)(1)(A), the potential for adverse health effects is not by itself sufficient to warrant regulating a contaminant under the Safe Drinking Water Act. The EPA's evaluations of the potential adverse health effects of each of the nine contaminants receiving preliminary negative determinations are presented in Section IV of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025).

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 68
Topic Code: 3.1, EPA's nine preliminary negative determinations

Comment:

Chemicals, including pesticides, contaminate surface water, groundwater, and drinking water throughout the U. S. Rain or snow melt carries pesticides from agricultural fields, golf courses, parks, and residential properties through storm drains and into local water reservoirs, endangering wildlife and adding stress to water treatment facilities.[FN13],[FN14],[FN15] Improperly disposed pesticide products in unlined landfills can also contaminate groundwater and end up in the water supply.

The pervasiveness of hazardous chemicals throughout the environment threatens the health of all organisms. These substances, such as the nine contaminants listed above, need to be properly regulated in drinking water to protect human health while we transition to safer land management practices that eliminate the sources of this pollution. In ordering to make drinking water safe under the SWDA, Beyond Pesticides urges that these nine contaminants be considered for regulation.

Thank you for your consideration of our comments.

[FN13: Beyond Pesticides (March 2019). Take Action: What's In the Bottle, Bag, or Box Is Not Tested Fully for Adverse Effects. Available at: https://beyondpesticides.org/dailynewsblog/2019/03/take-action-whats-in-the-bottle-bag-orbox-is-not-tested-fully-for-adverse-effects/.]

[FN14: Beyond Pesticides (October 2023). EPA Rejects Petition Seeking Review of Complete Ingredients in Pesticide Products. Available at: https://beyondpesticides.org/dailynewsblog/2023/10/epa-rejects-petition-seeking-review-ofcomplete-ingredients-in-pesticide-products/.]

[FN15: Beyond Pesticides. Regulatory Issues Maintaining Important Protections. Available at: https://www.beyondpesticides.org/resources/threatened-waters/regulatory-issues.]

EPA Response:

The EPA thanks Beyond Pesticides for their comment and acknowledges the request that "these nine contaminants be considered for regulation." While all nine contaminants do have the

potential to cause adverse health effects through exposure to drinking water, the available occurrence data show that these nine contaminants do not occur frequently in finished drinking water at levels of public health concern. These nine contaminants, therefore, do not meet all three of the criteria required by the SDWA to warrant regulation. Please see the response under snippet number 1 of comment EPA-HQ-OW-2024-0456-0104 under topic code 3.1 for a list of the SDWA-required statutory criteria for regulating a contaminant in drinking water with a National Primary Drinking Water Regulation. Should new data become available in the future about either the health effects or occurrence of these contaminants, the EPA has the ability to re-evaluate these contaminants for potential regulation under the SDWA.

TOPIC CODE AREA 4, Contaminants Receiving a Preliminary Determination under RD 5

4.1: 2-Aminotoluene

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 30
Topic Code: 4.1, 2-Aminotoluene

Comment:

2-aminotoluene can cause cancer, particularly bladder cancer, and is also harmful to the eyes and skin.[FN2]

[FN2: Vermont Department of Health (2018). 2-Aminotoluene Factsheet. Available at: https://www.healthvermont.gov/sites/default/files/documents/pdf/ENV_CDP_95_53_4_2Aminotoluene.pdf.]

EPA Response:

The EPA thanks Beyond Pesticides for their comment and acknowledges the potential for adverse health effects from exposure to 2-aminotoluene, as identified in Section IV(B) of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025). However, as noted in 1412(b) of the SDWA, the potential for adverse health effects by itself is not sufficient to warrant regulating 2-aminotoluene under SDWA. Based on the drinking water monitoring data described in the 2-aminotoluene occurrence sub-section within the preliminary RD 5 *Federal Register* Notice in Section IV(B), the EPA determined that 2-aminotoluene is not occurring frequently in public water systems at levels of public health concern. Therefore, 2-aminotoluene does not meet all of the criteria required by SDWA to warrant regulation.

4.2: Cylindrospermopsin

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 31
Topic Code: 4.2, Cylindrospermopsin

Comment:

Cylindrospermopsin has been shown to be "cytotoxic, dermatotoxic, genotoxic, hepatotoxic in vivo, developmentally toxic, and may be carcinogenic," according to a study in Environmental Science: Processes & Impacts.[FN3]

[FN3: de la Cruz, A. et al. (2013) A review on cylindrospermopsin: the global occurrence, detection, toxicity and degradation of a potent cyanotoxin, Environmental Science: Processes & Impacts. Available at: https://pubmed.ncbi.nlm.nih.gov/24056894/.]

EPA Response:

The EPA thanks Beyond Pesticides for their comment and acknowledges the potential for adverse health effects from exposure to cylindrospermopsin, as identified in Section IV(B) of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025). However, as noted in 1412(b) of the SDWA, the potential for adverse health effects by itself is not sufficient to warrant regulating cylindrospermopsin under SDWA. Based on the drinking water monitoring data described in the cylindrospermopsin occurrence sub-section within the preliminary RD 5 *Federal Register* Notice in Section IV(B), the EPA determined that cylindrospermopsin is not occurring frequently in public water systems at levels of public health concern. Therefore, cylindrospermopsin does not meet all of the criteria required by SDWA to warrant regulation.

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 165
Topic Code: 4.2, Cylindrospermopsin

Comment:

Negative Determinations

EPA proposes to make negative determinations for o-toluidine, cylindrospermopsin, ethoprop, microcystins, molybdenum, permethrin, profenofos, tebuconazole, and tribufos.

1. AWWA supported inclusion of cylindrospermopsin and microcystins in Contaminant Candidate List 4 (CCL4) to facilitate collection of occurrence data. Now that data is available through UCMR4 with few detections, EPA has the information necessary to discern that

additional risk reduction through a primary drinking water standard is not needed. Furthermore, professional practice to reduce potential local risks from cylindrospermopsin and microcystins has advanced considerably in recent years, further reducing the potential for meaningful risk reduction through a standard.

EPA Response:

The Agency thanks AWWA for their comment and agrees that the nationally representative occurrence data collected under the fourth UCMR cycle (UCMR 4) informed the EPA's decision not to regulate cylindrospermopsin and microcystin under RD 5, as stated in Section IV(B) of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025).

4.3: Ethoprop

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 33
Topic Code: 4.3, Ethoprop

Comment:

Ethoprop is acutely toxic, showing cholinesterase inhibition and carcinogenic effects.[FN4]

[FN4: Pesticide Action Network. Pesticide Info. Database: Ethoprop. Available at: https://www.pesticideinfo.org/chemical/PRI3070.]

EPA Response:

The EPA thanks Beyond Pesticides for their comment and acknowledges the potential for adverse health effects from exposure to ethoprop, as identified in Section IV(B) of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025). However, as noted in 1412(b) of the SDWA, the potential for adverse health effects by itself is not sufficient to warrant regulating ethoprop under SDWA. Based on the drinking water monitoring data described in the ethoprop occurrence sub-section within the preliminary RD 5 *Federal Register* Notice in section IV(B), the EPA determined that ethoprop is not occurring frequently in public water systems at levels of public health concern. Therefore, ethoprop does not meet all of the criteria required by SDWA to warrant regulation.

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 181
Topic Code: 4.3, Ethoprop

Comment:

3. UCMR4 included ethoprop, permethrin, profenofos, tebuconazole, and tribufos providing missing occurrence data.

EPA Response:

The EPA agrees with the commenter that the occurrence data provided by UCMR 4 were used to inform the preliminary regulatory determinations for these contaminants.

4.4: Microcystins

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 36
Topic Code: 4.4, Microcystins

Comment:

Microcystins, which are toxins produced by certain cyanobacteria, can be highly toxic, primarily affecting the liver and leading to liver damage, gastrointestinal issues, and death.[FN5]

[FN5: California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (2009). Microcystins: A Brief Overview of their Toxicity and Effects, with Special Reference to Fish, Wildlife, and Livestock. Available at: https://oehha.ca.gov/media/downloads/ecotoxicology/document/microcystin031209.pdf.]

EPA Response:

The EPA thanks Beyond Pesticides for their comment and acknowledges the potential for adverse health effects from exposure to microcystins, as identified in Section IV(B) of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025). However, as noted in 1412(b) of the SDWA, the potential for adverse health effects by itself is not sufficient to warrant regulating microcystins under SDWA. Based on the drinking water monitoring data described in the microcystins occurrence sub-section within the preliminary RD 5 *Federal Register* Notice in section IV(B), the EPA determined that microcystins are not occurring frequently in public water systems at levels of public health concern. Therefore, microcystins do not meet all of the criteria required by SDWA to warrant regulation.

4.5: Molybdenum

Commenter: International Molybdenum Association (IMOA)
Comment Number: EPA-HQ-OW-2024-0456-0101

Snippet Number: 10
Topic Code: 4.5, Molybdenum

Comment:

IMOA thanks the EPA for this opportunity to comment on their CCL5 preliminary determination not to regulate nine substances including molybdenum, as published in the Federal Register Notice Volume 90, No. 9, dated 15 January 2025. In this respect we share the following molybdenum-specific remarks and insights for your consideration:

IMOA is supportive of EPA's preliminary determination not to regulate molybdenum, and likewise that EPA's selected data reference basis for their assessment is the 2020 US ATSDR Toxicological Profile for Molybdenum. IMOA agrees with EPA's preliminary determination that molybdenum does not satisfy all three criteria for regulation and thereby does not warrant regulation.

It is clear from the data presented by EPA in its Regulatory Determination 5 Support Document dated December 2024 that molybdenum is not "known to occur or there is substantial likelihood that the contaminant will occur in public water systems (PWSs) with a frequency and at levels of public health concern." Exposures to molybdenum in drinking water do not begin to approach EPA's proposed HRL for molybdenum.

EPA Response:

The EPA appreciates the IMOA's supportive comment that agrees with the EPA's preliminary negative determination for molybdenum. The EPA acknowledges the additional information provided by the IMOA but notes some differences between the EPA and Agency for Toxic Substances and Disease Registry (ATSDR) toxicity assessment methods and guidance which can result in differences between an EPA reference dose (RfD) and an ATSDR minimum risk level for a given chemical (see Chapter 2, Section 2.4.2, of the *Final Regulatory Determination 5 Support Document* (USEPA, 2026)).

Commenter: International Molybdenum Association (IMOA)
Comment Number: EPA-HQ-OW-2024-0456-0101
Snippet Number: 45
Topic Code: 4.5, Molybdenum

Comment:

In conclusion, IMOA thanks EPA for consideration of the insights contained in this document, whilst fully supporting EPA's existing preliminary determination not to regulate molybdenum.

[…]

All in all, the information in the attached three Annexes A - C serve to further underpin the correctness of EPA's preliminary determination not to regulate molybdenum as a contaminant under the Safe Drinking Water Act.

EPA Response:

The EPA appreciates the IMOA's comment that agrees with the EPA's preliminary negative determination for molybdenum, as well as for the material presented in their comment's appendices.

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 38
Topic Code: 4.5, Molybdenum

Comment:

Molybdenum can cause neurotoxicity, with documented cases of human poisoning, seizures, and hallucinations.[FN6]

[FN6: Momcilović, B. (1999) A case report of acute human molybdenum toxicity from a dietary molybdenum supplement--a new member of the 'Lucor metallicum' family, Archives of Industrial Hygiene and Toxicology. Available at: https://pubmed.ncbi.nlm.nih.gov/10649845/.]

EPA Response:

The EPA thanks Beyond Pesticides for their comment and acknowledges the potential for adverse health effects from exposure to molybdenum, as identified in Section IV(B) of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025). However, as noted in 1412(b) of SDWA, the potential for adverse health effects by itself is not sufficient to warrant regulating molybdenum under SDWA. Based on the drinking water monitoring data described in the molybdenum occurrence sub-section within the preliminary RD 5 *Federal Register* Notice in section IV(B), the EPA determined that molybdenum is not occurring frequently in public water systems at levels of public health concern. Therefore, molybdenum does not meet all of the criteria required by SDWA to warrant regulation.

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 178
Topic Code: 4.5, Molybdenum

Comment:

2. AWWA supported inclusion of molybdenum in CCL4; UCMR3 provided necessary occurrence data for molybdenum to support making a negative regulatory determination.

EPA Response:

The EPA thanks AWWA for their support of SDWA's contaminant evaluation processes. The Agency agrees that the third Unregulated Contaminant Monitoring Rule (UCMR 3) provided the occurrence data that were used to inform the preliminary negative determination for molybdenum.

4.5.1: Molybdenum Health Reference Level (HRL)

Commenter: International Molybdenum Association (IMOA)
Comment Number: EPA-HQ-OW-2024-0456-0101
Snippet Number: 26
Topic Code: 4.5.1, Molybdenum Health Reference Level (HRL)

Comment:

Further, IMOA assesses that the proposed HRL used for screening is overly conservative and could be at least 3-fold higher. We have provided detailed commentary in Appendices A - C to explain why a higher screening value would be scientifically justified. This only serves to provide even stronger support for EPA's preliminary decision not to regulate molybdenum. In other words, we believe the decision not to regulate molybdenum is even more compelling than indicated by the overly conservative HRL.

IMOA is not requesting that EPA revise the HRL for molybdenum in response to our comments below since it is clear that exposures to molybdenum in drinking water are well below even the overly conservative HRL. We understand that HRLs calculated in the CCL5 preliminary support document are non-regulatory values. HRLs are designed to be screening values, not drinking water standards. As stated in Appendix B, Section B 6.1.1. of the EPA document: "Unlike an MCLG, an HRL is derived prior to development of a complete health and exposure assessment for a drinking water contaminant and can be considered a screening value." We acknowledge and understand that whether EPA agrees with IMOA that the HRL could be higher than proposed, it would not change EPA's determination not to regulate molybdenum and it certainly does not change IMOA's support for EPA's decision. Our goal is simply to provide the Agency with current information that further supports and confirms EPA's preliminary determination.

EPA Response:

The EPA disagrees that the HRL used for screening is overly conservative, for the reasons explained in *Final Regulatory Determination 5 Support Document* (USEPA, 2026), and acknowledges that the commenter is not requesting that EPA revise the HRL for molybdenum. The EPA agrees with the commenter that HRLs are non-regulatory screening values. The EPA appreciates the commenters' support for the preliminary negative regulatory determination for molybdenum.

4.5.2: Molybdenum Uncertainty Factor (UF)

Commenter: International Molybdenum Association (IMOA)
Comment Number: EPA-HQ-OW-2024-0456-0101
Snippet Number: 48
Topic Code: 4.5.2, Molybdenum Uncertainty Factor (UF)

Comment:

We do assess that the evidence-based technical content provided by IMOA in this submission demonstrates that the calculation of the HRL including the UF of 3, which EPA added beyond the abundance of caution that is already embedded in the HRL calculations in the form of the ATSDR MF of 3, is unwarranted.

EPA Response:

Please see the response to snippet number 26 of comment EPA-HQ-OW-2024-0456-0101 under topic code 4.5.1, addressing EPA's HRL calculations for molybdenum.

4.5.3: Molybdenum Relative Source Contribution (RSC)

Commenter: International Molybdenum Association (IMOA)
Comment Number: EPA-HQ-OW-2024-0456-0101
Snippet Number: 51
Topic Code: 4.5.3, Molybdenum Relative Source Contribution (RSC)

Comment:

Likewise, IMOA finds that an upwards adjustment of the RSC upwards well beyond its current 20% would be warranted, as detailed in Appendix C attached.

EPA Response:

The EPA disagrees that an adjustment of the relative source contribution (RSC) used for molybdenum would be warranted, for the reasons described in the *Final Regulatory Determination 5 Support Document* (USEPA, 2026).

4.6: Permethrin

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 39
Topic Code: 4.6, Permethrin

Comment:

Permethrin, especially with long-term exposure, is suggested to increase the risk of cancer and endocrine disruption in addition to irritation in the skin, eyes, and respiratory tract. Ingestion and inhalation also can lead to nausea, vomiting, diarrhea, abdominal pain, headaches, dizziness, and seizures. Studies find permethrin exposure to cause liver and kidney damage, as well as oxidative stress.[FN7],[FN8]

[FN7: Sun, Y.-J. et al. (2022) Long-term low-dose exposure of permethrin induces liver and kidney damage in rats, BMC Pharmacology and Toxicology. Available at: https://bmcpharmacoltoxicol.biomedcentral.com/articles/10.1186/s40360-022-00586-2.]

[FN8: Wang, X. et al. (2016) Permethrin-induced oxidative stress and toxicity and metabolism: A review, Environmental Research. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0013935116301621.]

EPA Response:

The EPA thanks Beyond Pesticides for their comment and acknowledges the potential for adverse health effects from exposure to permethrin, as identified in Section IV(B) of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025). However, as noted in 1412(b) of SDWA, the potential for adverse health effects by itself is not sufficient to warrant regulating permethrin under SDWA. Based on the drinking water monitoring data described in the permethrin occurrence sub-section within the preliminary RD 5 *Federal Register* Notice in section IV(B), the EPA determined that permethrin is not occurring frequently in public water systems at levels of public health concern. Therefore, permethrin does not meet all of the criteria required by SDWA to warrant regulation.

4.7: Profenofos

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 45
Topic Code: 4.7, Profenofos

Comment:

Profenofos can enable overstimulation of the nervous system from cholinesterase inhibition, which could lead to respiratory failure and death. Exposure to profenofos also shows chromosomal aberrations, apoptosis, and necrosis of blood cells, according to a study in the Journal of Environmental Quality.[FN9]

[FN9: Kushwaha, M., Verma, S. and Chatterjee, S. (2016) Profenofos, an Acetylcholinesterase-Inhibiting Organophosphorus Pesticide: A Short Review of Its Usage, Toxicity, and Biodegradation, Journal of Environmental Quality. Available at: https:// https://acsess.onlinelibrary.wiley.com/doi/abs/10.2134/jeq2016.03.0100.]

EPA Response:

The EPA thanks Beyond Pesticides for their comment and acknowledges the potential for adverse health effects from exposure to profenofos, as identified in Section IV(B) of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025). However, as noted in 1412(b) of SDWA, the potential for adverse health effects by itself is not sufficient to warrant regulating profenofos under SDWA. Based on the drinking water monitoring data described in the profenofos occurrence sub-section within the preliminary RD 5 *Federal Register* Notice in section IV(B), the EPA determined that profenofos is not occurring frequently in public water systems at levels of public health concern. Therefore, profenofos does not meet all of the criteria required by SDWA to warrant regulation.

4.8: Tebuconazole

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 48
Topic Code: 4.8, Tebuconazole

Comment:

Studies show tebuconazole can negatively affect the liver, adrenals, hematopoetic system, and nervous system. A Science of The Total Environment study finds tebuconazole has "potential developmental toxicity, genotoxicity, reproductive toxicity, mutagenicity, hepatotoxicity, neurotoxicity, cardiotoxicity, and nephrotoxicity, which were induced via reactive oxygen species-mediated apoptosis, metabolism and hormone perturbation, DNA damage, and transcriptional abnormalities."[FN10] These effects are in addition to endocrine-disrupting effects through the modulation of hormone levels and gene transcription.

[FN10: Dong, B. (2024) A comprehensive review on toxicological mechanisms and transformation products of tebuconazole: Insights on pesticide management, Science of The Total Environment. Available at: https://pubmed.ncbi.nlm.nih.gov/37918741/.]

EPA Response:

The EPA thanks Beyond Pesticides for their comment and acknowledges the potential for adverse health effects from exposure to tebuconazole, as identified in Section IV(B) of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025). However, as noted in 1412(b) of SDWA, the potential for adverse health effects by itself is not sufficient to warrant regulating tebuconazole under SDWA. Based on the drinking water monitoring data described in the tebuconazole occurrence sub-section within the preliminary RD 5 *Federal Register* Notice in section IV(B), the EPA determined that tebuconazole is not occurring frequently in public water systems at levels of public health concern. Therefore, tebuconazole does not meet all of the criteria required by SDWA to warrant regulation.

4.9: Tribufos

Commenter: Beyond Pesticides
Comment Number: EPA-HQ-OW-2024-0456-0105
Snippet Number: 57
Topic Code: 4.9, Tribufos

Comment:

Lastly, tribufos causes cholinesterase inhibition, leading to neurological effects and potentially cancer. Long-term or repeated exposure can lead to neurological problems, as well as hematological changes, including decreased blood cell counts, and gastrointestinal issues.[FN11],[FN12]

[FN11: U.S. National Library of Medicine National Center for Biotechnology Information. PubChem Compound Database: Tribufos. Available at: https://pubchem.ncbi.nlm.nih.gov/compound/Tribufos.]

[FN12: Centers for Disease Control and Prevention, Toxic Substances Portal (2020). ToxFAQsTM for S,S,S-Tributyl Phosphorotrithioate (Tribufos). Available at: https://wwwn.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=1485&toxid=292.]

EPA Response:

The EPA thanks Beyond Pesticides for their comment and acknowledges the potential for adverse health effects from exposure to tribufos, as identified in Section IV(B) of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025). However, as noted in 1412(b) of SDWA, the potential for adverse health effects by itself is not sufficient to warrant regulating tribufos under SDWA. Based on the drinking water monitoring data described in the tribufos occurrence sub-section within the preliminary RD 5 *Federal Register* Notice in section IV(B),

the EPA determined that tribufos is not occurring frequently in public water systems at levels of public health concern. Therefore, tribufos does not meet all of the criteria required by SDWA to warrant regulation.

TOPIC CODE AREA 5, Contaminants Not Receiving a Preliminary Determination Under RD 5

5.1: EPA's decision to defer preliminary determinations for five contaminants

---

Commenter: Association of State Drinking Water Administrators (ASDWA)
Comment Number: EPA-HQ-OW-2024-0456-0099
Snippet Number: 27
Topic Code: 5.1, EPA's decision to defer preliminary determinations for five contaminants

Comment:

Contaminants for Which No Determination is Proposed

ASDWA would appreciate additional clarity on the data collection and method development status for the five contaminants that were proposed as "no determination."

ASDWA recommends EPA provide regular updates on the status of the five contaminants left in Phase 3:

- 1,2,3-trichloropropane;
- 1,4 dioxane;
- Manganese;
- Quinoline; and
- Strontium.

If these contaminants are not addressed through a regulatory determination to avoid unintended consequences, states should be informed on any planned or ongoing data collection that will change the determination of these contaminants. States are partners with EPA in the implementation of SDWA, so it is in their best interest to remain fully informed on potential regulatory changes.

EPA Response:

The EPA thanks ASDWA for their comment. 1,2,3-TCP, 1,4-dioxane, and strontium were monitored under UCMR 3 (2013-2015). Manganese and quinoline were monitored under UCMR 4 (2018-2020). When the collection of new UCMR data is planned, it is reported during the publication of the UCMR proposal as well as during the final rule announcement. When new occurrence data becomes available for a contaminant, the EPA considers all current best available information while evaluating the contaminant for potential regulatory determination, inclusive of any new information.

Commenter: American Water Works Company, Inc.
Comment Number: EPA-HQ-OW-2024-0456-0100
Snippet Number: 34
Topic Code: 5.1, EPA's decision to defer preliminary determinations for five contaminants

Comment:

American Water further supports U.S. EPA's decision to not make preliminary regulatory determinations for five contaminants: 1,2,3-trichloropropane, 1,4-dioxane, manganese, quinoline and strontium. The company agrees that U.S. EPA should continue to analyze health effects and occurrence data to evaluate and determine whether these contaminants occur at levels of public health concern in finished drinking water, and to characterize the potential meaningful opportunity for health risk reduction if they were to be regulated under the SDWA. American Water agrees that U.S. EPA must complete a more thorough analysis and evaluation before making a positive regulatory determination, especially given the inability to withdraw a positive regulatory determination even if evidence identified during the rulemaking would change the Administrator's conclusion of the potential for meaningful opportunity for health risk reduction by regulating a contaminant as described in the proposal.

"As noted in section III.A.3 of this document, the 2023 panel ruling from the D.C. Circuit Court of Appeals in NRDC v. EPA (D.C. Cir., 2023) established that the agency cannot withdraw a positive determination even if evidence identified during the rulemaking would change the EPA's conclusion of the potential for meaningful opportunity for health risk reduction by regulating a contaminant. Prior to this ruling, formal evaluation of the potential health benefits and analysis of the availability and feasibility of treatment options were conducted during the rule development process as part of the HRRCA. Because of the 2023 ruling, however, the EPA now has concluded that while the SDWA does not require a full HRRCA as part of regulatory determination prior to rule development, the agency will need to conduct preliminary benefits analyses, treatment feasibility analyses or both prior to making determinations for contaminants that may warrant regulation under the SDWA."

In conclusion, providing safe, clean, reliable, and affordable water service is American Water's charge, and the company looks forward to working cooperatively and collaboratively with the U.S. EPA, regulators, and policymakers in the determination and development of drinking water regulations that will provide meaningful opportunity to protect customers, communities, and the general public.

Please direct any questions regarding these comments to my attention at 856-676-5799 or Lynda.DiMenna@amwater.com.

EPA Response:

The EPA thanks American Water for their support for EPA's continued evaluation of health and occurrence data for 1,2,3-trichloropropane, 1,4-dioxane, manganese, quinoline and strontium,

and support for the Agency's evaluation of the potential for meaningful opportunity for health risk reduction for persons served by public water systems.

Commenter: Association of Metropolitan Water Agencies (AMWA)
Comment Number: EPA-HQ-OW-2024-0456-0102
Snippet Number: 42
Topic Code: 5.1, EPA's decision to defer preliminary determinations for five contaminants

Comment:

AMWA encourages EPA to continue to ensure that the best available science is leveraged in making its regulatory determinations, and to offer transparency as appropriate as to what steps are being taken to evaluate and mitigate risk for contaminants for which determinations are not yet appropriate. AMWA comments the lack of a regulatory determination for the Phase 3 contaminants still in evaluation, with consideration of the specific population impacted by each contaminant of concern.

EPA Response:

The EPA uses the best available science to inform regulatory determinations and NPDWRs. The updates provided in Section V of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025) for contaminants that are still being evaluated are intended to inform the public of the evaluation status.

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 16
Topic Code: 5.1, EPA's decision to defer preliminary determinations for five contaminants

Comment:

The American Water Works Association (AWWA) appreciates the opportunity to comment to the U.S. Environmental Protection Agency (EPA) on the Announcement of Preliminary Regulatory Determinations for Contaminants on the Fifth Drinking Water Contaminant Candidate List (RD5). The regulatory determination cycle is a statutory element of the Safe Drinking Water Act (SDWA) and is important to effective risk reduction under the Act.

No Determination

The fifth regulatory determination cycle is particularly important as it is the first cycle following National Resources Defense Council v. U.S. Environmental Protection Agency (NRDC v. EPA) (D.C. Cir. 2023, Case No. 20-1335). The court's decision in NRDC v. EPA has the effect of placing even greater emphasis on the care taken in making positive regulatory determinations. AWWA appreciates this clearly constructed Federal Register notice, given the District of Columbia Court of Appeals ruling. It is clear from the notice that EPA understands the additional burden the court ruling has placed on the agency.

AWWA has previously commented that adequate technical grounding should be in place prior to a positive regulatory determination. AWWA strongly agrees with EPA that given the court's ruling in NRDC v. EPA, that preliminary benefits and treatment feasibility analyses should be undertaken prior to a positive regulatory determination. Such analyses will be critical to effective and efficient implementation of the Act.

EPA identified five chemicals for further evaluation, 1,2,3 – trichloropropane (1,2,3 – TCP), 1,4-dioxane, manganese, quinoline, and strontium.

EPA Response:

The EPA thanks AWWA for their support of the Agency's intention to conduct preliminary benefits and treatment feasibility analyses.

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 160
Topic Code: 5.1, EPA's decision to defer preliminary determinations for five contaminants

Comment:

As EPA undertakes deeper analysis of these five "no determination" chemicals, if the agency approaches making a positive determination, it must be clear as to the role of the HRL and ½ HRL values and the anticipated steps in the regulatory process to establish an actual MCLG and an actual health risk reduction premise in the proposed rule health risk reduction and cost analysis (HRRCA).

EPA Response:

The EPA agrees with AWWA that it is important to share the evidence and decision process used to make regulatory determinations. In the context of future determinations, the EPA intends to consider whether the available information about a contaminant is sufficiently robust to develop an MCLG and to support the development and finalization of an NPDWR prior to making a final positive determination. As noted in the 2023 *Natural Resources Defense Council (NRDC) v. Regan*, 67 F.4th 397 (D.C. Cir. 2023) decision, the EPA does not have the ability to rescind a final positive determination once it has been made.

5.2: 1,2,3-Trichloropropane

Commenter: Association of State Drinking Water Administrators (ASDWA)
Comment Number: EPA-HQ-OW-2024-0456-0099
Snippet Number: 43
Topic Code: 5.2, 1,2,3-Trichloropropane

Comment:

1,2,3 Trichloropropane

For transparency, ASDWA requests EPA share any new information on the development of the improved analytical method for 1,2,3 trichloropropane with the states.

EPA Response:

The EPA is developing a document that includes recommended parameters to optimize the sensitivity of method 524.3, which is used for the analysis of 1,2,3-trichloropropane and other contaminants in drinking water. The Agency plans to release the optimized method documentation to the public once it has been finalized.

Commenter: Association of Metropolitan Water Agencies (AMWA)
Comment Number: EPA-HQ-OW-2024-0456-0102
Snippet Number: 47
Topic Code: 5.2, 1,2,3-Trichloropropane

Comment:

Given the lack of determinations for these additional contaminants, AMWA asks for the following:

- 1,2,3-Trichloropropane: Updates on the status of analytical method updates to address the discrepancies between the Health Reference Level and the higher Minimum Reporting Level.

EPA Response:

Please see the response to snippet number 43 of comment EPA-HQ-OW-2024-0456-0099 under topic code 5.2, 1,2,3-Trichloropropane.

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 40
Topic Code: 5.2, 1,2,3-Trichloropropane

Comment:

EPA should collect additional occurrence data for 1,2,3-trichloropropane using analytical methods and laboratories that can report data at MRLs adequate to support decision-making.

AWWA recommended in our comments on the agency's Fourth Preliminary Regulatory Determination (RD4) that EPA improve the analytical methods for quantifying 1,2,3-TCP and collect additional occurrence data through the Unregulated Contaminant Monitoring Rule (UCMR). In this notice and the UCMR analytical methods Federal Register notice (2024) EPA

has indicated that it is pursuing improved methods and better occurrence data. AWWA continues to support the agency's efforts in this regard.

EPA Response:

The EPA thanks AWWA for its support for analytical method development efforts for improving the ability to quantify 1,2,3-TCP.

5.3: 1,4-Dioxane

Commenter: Association of State Drinking Water Administrators (ASDWA)
Comment Number: EPA-HQ-OW-2024-0456-0099
Snippet Number: 47
Topic Code: 5.3, 1,4-Dioxane

Comment:

1,4 Dioxane

ASDWA supports the leveraging of SDWA and the Toxic Substances Control Act (TSCA) in regulating contaminants like 1,4 dioxane. In response to EPA's commitment to developing risk management actions that are transparent and involve stakeholders, ASDWA recommends EPA develop a webinar or some form of information dissemination method in coordination with ASDWA on its process of using TSCA to address 1,4 dioxane. ASDWA also recommends that EPA consider the development of a state and EPA workgroup to discuss the prevalence of 1,4 dioxane and if states believe it can be addressed with a non-regulatory approach.

EPA Response:

The EPA thanks ASDWA for their support of the EPA's approach of leveraging the Agency's authorities under the Toxic Substances Control Act (TSCA) and SDWA to address public health risks associated with exposure to 1,4-dioxane. The EPA acknowledges ASDWA's recommendation that the EPA establish a state and EPA workgroup to discuss the prevalence of 1,4-dioxane and the potential for non-regulatory approaches.

Commenter: Association of Metropolitan Water Agencies (AMWA)
Comment Number: EPA-HQ-OW-2024-0456-0102
Snippet Number: 53
Topic Code: 5.3, 1,4-Dioxane

Comment:

[Given the lack of determinations for these additional contaminants, AMWA asks for the following:]

• 1,4-Dioxane: In a memo dated November 5, 2024, the agency indicated a joint approach would follow to address the "unreasonable risk" posed by 1,4-dioxane, and indicated regulation under SDWA may be necessary. AMWA asks for continued updates on the status of risk management efforts of 1,4-dioxane from polluters before managing any remaining risk through SDWA.

EPA Response:

The EPA appreciates AMWA's interest in risk management efforts related to 1,4-dioxane. In the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025), the EPA stated that the Agency was working collaboratively across programs to address the unreasonable risk from 1,4-dioxane identified under TSCA. Since that time, the EPA is administratively reconsidering the 2024 supplemental risk evaluation and revised risk determination, as well as the underlying 2020 risk evaluation, focusing on the cancer risk analysis in the hazard assessment and its consistency with the best available science and EPA's 2005 Cancer Guidelines (https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/final-risk-evaluation-14-dioxane). Results of the reconsideration of the cancer risk analysis may be taken into consideration for future Agency actions, as appropriate, to protect public health based on the best available science.

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 49
Topic Code: 5.3, 1,4-Dioxane

Comment:

The SDWA program should be applauded for its work with the agency's Toxic Substances Control Act (TSCA) program for prioritizing risk reduction through TSCA and the Clean Water Act (CWA) prior to considering regulating 1,4-dioxane under SDWA. The Agency's decision to not make a positive regulatory determination for 1,4-dioxane is sound.

While TSCA used much different assumptions and decision criteria than would be used under the SDWA to find that exposure to 1,4-dioxane via water represented a risk reduction opportunity, the associated November 5, 2024, memorandum from assistant administrators Freedhoff and Pigott, "Coordinated Risk Management Action on 1,4-Dioxane under Section 9(b) of the Toxic Substances Control Act" was a welcome development. AWWA strongly advocates for source water protection and the utilization of existing statutory authority under TSCA, CWA, and other environmental statutes to protect the nation's water supply. That memo sets forth an appropriate path incorporating (1) action under TSCA and CWA to reduce release of 1,4-dioxane and (2) re-evaluating 1,4-dioxane occurrence in a future cycle of UCMR to ensure appropriate occurrence information supports future SDWA risk management actions. The timelines anticipated in the memorandum will likely require refinement given the pace not just of TSCA and CWA rulemakings but also the speed with which those regulatory actions will impact occurrence levels.

As described in EPA's Preliminary RD4 notice, the occurrence of 1,4-dioxane in UCMR3 at levels relevant to the health reference levels (HRLs) (0.35 and 35 µg/L) is limited. As observed in the current Federal Register notice, Health Canada finalized its guideline in March 2021. The Health Canada Guideline value is 50 µg/L, somewhat higher than the HRLs employed with UCMR3 and the RD4 and RD5 analyses. At this higher concentration the occurrence of 1,4-dioxane is even more limited, reducing the potential for meaningful health risk reduction as described with respect to negative determinations in the current notice.

EPA Response:

The EPA appreciates AWWA's support for the Agency's coordination of statutory authorities under TSCA and the Clean Water Act (CWA) as well as SDWA with respect to managing risks from exposure to 1,4-dioxane. As stated in the response to snippet number 53 of comment EPA-HQ-OW-2024-0456-0102 under topic code 5.3, 1,4-Dioxane, the EPA is administratively reconsidering the 2024 supplemental risk evaluation and revised risk determination, as well as the underlying 2020 risk evaluation, focusing on the cancer risk analysis in the hazard assessment and its consistency with the best available science and EPA's 2005 Cancer Guidelines (https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/final-risk-evaluation-14-dioxane). Results of the reconsideration of the cancer risk analysis may be taken into consideration for future Agency actions, as appropriate, to protect public health based on the best available science.

5.4: Manganese

Commenter: Association of State Drinking Water Administrators (ASDWA)
Comment Number: EPA-HQ-OW-2024-0456-0099
Snippet Number: 56
Topic Code: 5.4, Manganese

Comment:

Manganese

Manganese has proven to be a challenging contaminant for the states to address. As EPA is aware, several drinking water programs are utilizing the Bipartisan Infrastructure Law (BIL) Emerging Contaminant funds to resolve manganese issues in their state. In this Federal Register notice, EPA acknowledges that it is evaluating health effects and occurrence data and will conduct preliminary benefits analysis and treatment feasibility analysis. ASDWA requests that EPA offer more transparency into this process, highlighting the research being done and the timeline for completing benefit and treatment analyses. ASDWA also recommends EPA provide insight into what additional data beyond UCMR 4 is needed, as well as how, and why it will inform the decision to move manganese through Phase 3. Having some clarity of potential EPA actions would assist states in their ongoing decisions to address manganese.

EPA Response:

The EPA thanks ASDWA for their comment. The EPA recognizes that manganese is a challenging contaminant for states to address and understands that several states are utilizing funding from the Infrastructure Investment and Jobs Act's Emerging Contaminant funds, as well as the Drinking Water State Revolving Fund, to resolve manganese issues in their states. To inform the regulatory determinations in future cycles, the EPA is considering performing benefits and treatment feasibility analyses to inform the "meaningful opportunity" statutory criterion for contaminants being considered for regulation. As required by SDWA, the preliminary determination will be provided for public comment in a future regulatory determination cycle.

Commenter: Association of Metropolitan Water Agencies (AMWA)
Comment Number: EPA-HQ-OW-2024-0456-0102
Snippet Number: 60
Topic Code: 5.4, Manganese

Comment:

[Given the lack of determinations for these additional contaminants, AMWA asks for the following:]
• Manganese: Transparency regarding what research is being completed to address health effects and occurrence gaps and a timeline for these analyses.

EPA Response:

The EPA thanks AMWA for their comment.

Commenter: Manganese Interest Group (MIG)
Comment Number: EPA-HQ-OW-2024-0456-0103
Snippet Number: 29
Topic Code: 5.4, Manganese

Comment:

I. Introduction

On behalf of the Manganese Interest Group ("MIG"), we are pleased to submit the following comments concerning the U.S. Environmental Protection Agency's ("EPA" or "Agency") Preliminary Regulatory Determinations for Contaminants on the Fifth Drinking Water Contaminant Candidate List ("CCL-5") (the "Notice"). See 90 Fed. Reg. 3,830 (Jan. 15, 2025) (referring to docket EPA–HQ–OW–2024–0456). MIG is an ad hoc coalition of trade associations and companies interested in the scientifically sound evaluation and regulation of manganese compounds. MIG's members include steel producers, metalworkers, ferroalloy producers, and other like-minded stakeholders, most of which operate in the United States.[FN1]

In the Notice, EPA indicates that it has made "no determination" as yet regarding regulation of manganese under the Safe Drinking Water Act ("SDWA"). 90 Fed. Reg. at 3,841. Before issuing such a determination, the Agency must first evaluate whether manganese occurs "at levels of public health concern in finished drinking water and to characterize the potential meaningful opportunity for health risk reduction" if manganese was to be regulated under the SDWA. 90 Fed. Reg. at 3,854. For the reasons detailed below, SDWA regulation of manganese is unnecessary and is unlikely to reduce health risks to the public in a meaningful fashion.

The Agency has readily acknowledged in other regulatory settings that manganese is an essential nutrient that is subject to strict homeostatic control in the human body,[FN2] as plainly demonstrated in the peer-reviewed scientific literature.[FN3] Large amounts of manganese are naturally present in many foods consumed as a part of a normal diet. For that reason, manganese in drinking water at the levels typically measured is unlikely to add materially to the normal daily ingestion of manganese from diet. Against this backdrop, the best available peer-reviewed science does not support regulating manganese through issuance of a health-based SDWA drinking water standard. Accordingly, EPA should issue a "negative determination" regarding further SDWA regulation of manganese.

In addition to the practical reality that drinking water contributes minimally to manganese intake compared to the normal human diet, the best available science demonstrates that the levels of manganese encountered in public drinking water systems does not lead to meaningful accumulation of manganese in the brain or other target tissues at levels of potential concern.

Critically, a validated human physiologically-based pharmacokinetic ("PBPK") model that EPA is primarily responsible for developing has been applied specifically to address EPA's main concern about manganese in drinking water – namely, whether manganese in drinking water might lead to developmental impacts in children. The relevant citation is Yoon, M., et al., "Assessing children's exposure to manganese in drinking water using a PBPK model," Toxicology and Applied Pharmacology 380 (2019) 114695 (hereafter "Yoon 2019"). The Yoon 2019 paper states, "[t]hese simulations indicate that drinking-water Mn at levels commonly encountered is expected to have minimal effect on globus pallidus Mn concentrations in very young children through age 18" (referring to Figure 6). The stated conclusion is based on an "expanded Mn PBPK model" that describes age-dependent Mn homeostasis at dietary steady state, introduces environmentally relevant inhalation and drinking water exposure conditions, and accounts for differences in oral bioavailability of Mn for infants ingesting breast milk, formula milk, or drinking water. This biologically-based model provides internal dose information for children exposed by both inhalation and drinking-water and allows a better understanding of the question whether there is age-related sensitivity to Mn exposure via drinking water. Based on the results of the model, infants and children are not expected to be at greater exposure than adults to Mn in drinking water.

The most current and fully-validated version of the published human PBPK models for manganese is now available at:

Campbell, J. L., et al., Incorporation of rapid association/dissociation processes in tissues into the monkey and human physiologically based pharmacokinetic models for manganese. Toxicological Sciences, 191(2), 212–226 (2023) (https://doi.org/10.1093/toxsci/kfac123) ("Campbell 2023").

As detailed in Campbell 2023, the current human PBPK models for manganese are well-suited to risk assessment ("The increased biological relevance of the Mn model structure and parameters provides greater confidence in applying the Mn PBPK models to risk assessment.").[FN4]

The manganese PBPK models, developed at EPA's direction,[FN5] remain critical to a proper interpretation of the epidemiological studies purporting to show a link between manganese in drinking water and adverse health impacts in the very young. The manganese PBPK model papers, including those noted in these comments, show very little or no change in brain manganese concentrations for any childhood life stage exposed to manganese concentrations in drinking water at or below 100 µg/liter. EPA's "occurrence data" show that the 90th percentile measurement for manganese in U.S. drinking water is more than 3-fold lower than this level.

In sum, adverse health effects, from neonates to adults, at manganese levels encountered in U.S. drinking water are not biologically plausible. This has been demonstrated by the validated human PBPK models developed at the direct behest of EPA. Accordingly, EPA cannot make a scientifically plausible determination that regulation of manganese under the SDWA will provide a meaningful opportunity for health risk reduction.

II. EPA Has Long Recognized the Importance of PBPK Models for Risk Assessment, Particularly for Essential Metals Such as Manganese

EPA has long recognized the potential importance of PBPK models to risk assessment.[FN6] PBPK models consist of a series of mathematical representations of biological tissues and physiological processes in the body that simulate the absorption, distribution, metabolism, and excretion of chemicals that enter the body. PBPK models are designed to estimate how much of a chemical reaches target tissues (i.e., the internal dose) from a particular level of exposure to that chemical (i.e., an administered dose). The choice of an internal dose metric (sometimes called the biologically effective dose) replaces the administered dose in the derivation of the quantitative dose-response relationship, with the intent of reducing the uncertainty inherent in risk assessments based on an applied dose (i.e., exposure level). This reduction in uncertainty and the improved scientific basis for the dose-response value are the main advantages of PBPK models. PBPK models reduce uncertainty and improve the scientific basis for determining the relationship among: (a) exposure to the substance of interest; (b) dose to target tissues; and (c) biological response, i.e., toxicity. PBPK models are typically used for interspecies extrapolation, estimating intraspecies variability, route-to-route extrapolation, and duration of exposure adjustment in the risk assessment by means of chemical-specific adjustment factors rather than traditional uncertainty factors.[FN7]

In the case of manganese, EPA had the foresight to mandate the generation of the data necessary to develop human PBPK models as part of the registration testing program for the manganese-based octane-enhancing fuel additive known as mmt®.[FN8] As explained by several EPA

scientists in a paper published in 2018, the test rule for mmt addressed a wide range of issues regarding uncertainty for the risk assessment of manganese:

Among the uncertainties identified were: the chemical forms of Mn emitted in automotive exhaust; the relative toxicity of different Mn species; the potential for exposure among sensitive subpopulations including females, the young and the elderly; differences in sensitivity between test species and humans; differences between inhalation and oral exposures; and the influence of dose rate and exposure duration on tissue manganese accumulation.[FN9]

As these same authors explained in their paper, "It was anticipated that development of specific sets of pharmacokinetic (PK) information and models regarding Mn could help resolve many of the identified uncertainties and serve as the best foundation for available data integration."[FN10]

All of the data on which the PBPK models are based were derived from research programs developed and closely managed by EPA, Health Canada, and Environment Canada. In addition, most of the animal data on which the PBPK models are based have been independently reproduced and corroborated by academic researchers.

As reflected in the following schematic, all elements of the research program were subjected to multiple layers of independent peer-review intended to ensure, so far as possible, generation of valid and appropriate scientific information.

[Figure 1: See EPA Docket ID EPA-HQ-OW-2024-0456-0103]

Additional information about the Alternative Tier 2 test fuel for mmt can be found at www.regulations.gov in docket EPA-HQ-OAR-2004-0074 and in the following two scientific publications:

- Dorman, D., et al., Update on a Pharmacokinetic-Centric Alternative Tier II Program for MMT - Part I: Program Implementation and Lessons Learned, Journal of Toxicology, Volume 2012, Article ID 946742 (hereafter "Dorman 2012").

- Smith, D, et al., Manganese Testing Under a Clean Air Act Test Rule and the Application of Resultant Data in Risk Assessments, Neurotoxicology. 2018 January; 64: 177-184 (hereafter "Smith 2018").

The Dorman 2012 paper clearly states: "All required study protocols, protocol amendments, and draft final reports underwent independent scientific review by project specific 'technical advisory panels' (TAPs) composed of individuals with expertise in inhalation toxicology, pharmacokinetics, and neurotoxicity (Figure 1). Members of the TAPs, which changed for different facets of the test program, were chosen by the study sponsor with input from the testing laboratory and approved by the USEPA. All study results underwent additional independent peer review during subsequent publication of the work in scientific journals." (emphasis added)

At about the same time EPA developed its Alternative Tier 2 test rule for mmt, Health Canada and Environment Canada initiated a parallel research program to investigate the emission by-products of mmt when used in gasoline as part of the Canadian Toxic Substances Research Initiative ("TSRI"). The research program was headed by Dr. Joseph Zayed of the University of Montreal. The TSRI manganese research program resulted in the following scientific publications:

- St. Pierre, A., et al., Bioaccumulation and Locomotor Effect of Manganese Dust in Rats. Inhalation Toxicology, 13:623-632, 2001.

- Normandin, L., et al., Assessment of Bioaccumulation, Neuropathology, and Neurobehavior Following Subchronic (90 Days) Inhalation in Sprague-Dawley Rats Exposed to Manganese Phosphate. Toxicology and Applied Pharmacology 183, 135-145 (2002).

- Salehi, F., et al., Bioaccumulation and locomotor effects of manganese phosphate/sulfate mixture in Sprague-Dawley rats following subchronic (90 days) inhalation exposure. Toxicology and Applied Pharmacology 191 (2003) 264-271.

- Normandin, L., et al., Manganese Distribution in the Brain and Neurobehavioral Changes Following Inhalation Exposure of Rats to Three Chemical Forms of Manganese. NeuroToxicology 25 (2004) 433-441.

- Beaupre, L. A., et al., Physical and Chemical Characterization of Mn Phosphate/Sulfate Mixture Used in an Inhalation Toxicology Study. Inhalation Toxicology, 16:231-244, 2004.

- Tapin, D., et al., Bioaccumulation and locomotor effects of manganese sulfate in Sprague-Dawley rats following subchronic (90 days) inhalation exposure. Toxicol Appl Pharmacol. 2006 Mar 1; 211(2): 166-174.

- Salehi, F., et al. Neuropathology, tremor and electromyogram in rats exposed to manganese phosphate/sulfate mixture. J Appl Toxicol. 2006 Sep-Oct; 26(5): 41926.

The PBPK models for manganese are based on data generated from the Alternative Tier 2 test rule for mmt, as well as the data generated in the Canadian TSRI manganese research program led by Dr. Zayed from the University of Montreal.

The PBPK models for manganese were developed in a stepwise fashion consistent with the nature of the animal research program on which the models are ultimately based. A rat PBPK model was developed first and validated against the comprehensive manganese tissue concentration data obtained in the Alternative Tier 2 test program for mmt and the TSRI manganese research program conducted in Canada by the University of Montreal. The model was shown to adequately match the hundreds of measured tissue concentrations obtained from the rodent inhalation research programs.

The second step was development of the primate PBPK model and its validation using tissue concentration data derived from testing in primates as part of the Alternative Tier 2 test rule for

mmt, as well as other available primate research studies. As with the rodent PBPK model, the primate model was shown to match the available measured manganese tissue concentration data.

The third step was development of a human PBPK model. Unlike the rodent and primate models, however, there is no repository of measured manganese tissue concentrations against which to validate the models directly (as testing in humans similar to that which occurred in rodents and primates is not an option). Therefore, a somewhat different approach was applied for development of the human PBPK model, first, by scaling various physiological parameters across species (e.g., breathing rates, food intake, weight, blood flow, etc.) and then by comparing modeled results against available human data wherever possible (i.e., tissue concentration data obtained via autopsies, manganese blood concentrations measured in occupational studies involving inhaled manganese, and radioactive manganese studies conducted in volunteers). The genesis of the human PBPK models is described in more detail in the following two scientific publications:

- Gentry, P.R., et al. A tissue dose-based comparative exposure assessment of manganese using physiologically based pharmacokinetic modeling - the importance of homeostatic control for an essential metal. Toxicology and Applied Pharmacology 322 (2017)27-40.

- Ramoju, S.P., et al. The application of PBPK models in estimating human brain tissue manganese concentrations. NeuroToxicology 38 (2017) 226-237.

- Campbell 2023 (see above)

Smith 2018, noted above, also addresses the human PBPK models and their development.

The validated human PBPK model for manganese affords EPA a clear opportunity to integrate the available scientific data in the best possible way, just as EPA hoped would ultimately occur when it developed and imposed the mmt registration test rule more than two decades ago. As a result, EPA's work has resulted in not less than 45 publications in the peer-reviewed scientific literature, the culmination of which is a validated human PBPK model for manganese.[FN11]

[FN1: Group members include: the American Iron and Steel Institute, the Steel Manufacturers Association, the Specialty Steel Industry of North America, the International Manganese Institute, the National Slag Association, Cleveland-Cliffs, Inc., Eramet Marietta, Inc., New Castle Stainless Plate LLC, North American Stainless, Nucor Steel, S.H. Bell Company, and U.S. Steel.]

[FN2: See, e.g., Science Advisory Board, "Review of the EPA's Draft Fifth Contaminant Candidate List (CCL 5)" at 11 (Aug. 19, 2022) ("SAB Report").]

[FN3: See, e.g., Aschner, J. L., & Aschner, M. (2005). Nutritional aspects of manganese homeostasis. Molecular Aspects of Medicine, 26(4–5), 353–362 (https://doi.org/10.1016/j.mam.2005.07.003).]

[FN4: The abstract to Campbell 2023 summarizes (emphasis added):

In earlier physiologically based pharmacokinetic (PBPK) models for manganese (Mn), the kinetics of transport of Mn into and out of tissues were primarily driven by slow rates of association and dissociation of Mn with tissue binding sites. However, Mn is known to show rapidly reversible binding in tissues. An updated Mn model for primates, following similar work with rats, was developed that included rapid association/dissociation processes with tissue Mn-binding sites, accumulation of free Mn in tissues after saturation of these Mn-binding sites and rapid rates of entry into tissues. This alternative structure successfully described Mn kinetics in tissues in monkeys exposed to Mn via various routes including oral, inhalation, and intraperitoneal, subcutaneous, or intravenous injection and whole-body kinetics and tissue levels in humans. An important contribution of this effort is showing that the extension of the rate constants for binding and cellular uptake established in the monkey were also able to describe kinetic data from humans. With a consistent model structure for monkeys and humans, there is less need to rely on cadaver data and whole-body tracer studies alone to calibrate a human model. The increased biological relevance of the Mn model structure and parameters provides greater confidence in applying the Mn PBPK models to risk assessment. This model is also well-suited to explicitly incorporate emerging information on the role of transporters in tissue disposition, intestinal uptake, and hepatobiliary excretion of Mn.]

[FN5: EPA's role in the development of the PBPK models is detailed in Smith, D., et al., "Manganese Testing Under a Clean Air Act Test Rule and Application of Resultant Data in Risk Assessments," Neurotoxicology. 2018 January; 64: 177-184.]

[FN6: See "Approaches for the Application of Physiologically Based Pharmacokinetic (PBPK) Models and Supporting Data in Risk Assessment," (EPA/600/R-05/043F) (2006) available at http://epa.gov/ncea.]

[FN7: Id.]

[FN8: mmt® is a registered trademark owned by Afton Chemical Corporation. As the manufacturer of mmt, Afton is subject to the registration testing requirements developed by EPA to implement the requirements of section 211(b) of the Clean Air Act ("Act") (42 U.S.C. § 7545(b)). Section 211(b) of the Act directs that EPA "require the manufacturer of any fuel or fuel additive . . . to conduct tests to determine potential public health and environmental effects of the fuel or fuel additive (including carcinogenic, teratogenic, or mutagenic effects) . . . ." Implementing that responsibility for mmt, EPA issued an "Alternative Tier 2 test rule" for mmt in 2000 that effectively mandated development of the PBPK models for manganese.]

[FN9: Smith, D., et al., Manganese Testing Under a Clean Air Act Test Rule and the Application of Resultant Data in Risk Assessment, Neurotoxicology. 2018 January; 64: 177-184.]

[FN10: Id. (emphasis added).]

[FN11: Attachment 1 is a list of articles pertaining to the PBPK model development that was previously submitted in our 2021 comments on the proposed CCL-5 listings. Since that submission, the Campbell 2023 paper referenced above is a noteworthy addition to that list.]

EPA Response:

The EPA thanks MIG for their comment. The EPA made a negative regulatory determination for manganese in the first round of regulatory determinations (68 FR 42898, USEPA, 2003a). The EPA, at the time of the negative regulatory determination, stated that "a meaningful opportunity for health risk reduction [did] not exist for persons served by public water systems because the average dietary intake of manganese exceeded the contribution normally found in public drinking water systems" (USEPA, 2003b). Since then, the EPA has identified new health effects information published suggesting that exposure to elevated levels of manganese in drinking water contributes to increased risk for adverse neurological effects (WHO, 2021). Also, the EPA has collected additional nationally representative occurrence data in finished drinking water under UCMR 4.

In addition to their comment, the EPA also appreciates the recommendations and the resources that MIG provided. Along with the other available health and occurrence data, the data and recommendations provided by MIG will be taken into consideration as the EPA continues to evaluate the health effects and occurrence data for manganese.

Commenter: Manganese Interest Group (MIG)
Comment Number: EPA-HQ-OW-2024-0456-0103
Snippet Number: 275
Topic Code: 5.4, Manganese

Comment:

III. EPA Must Rely on the Best Available Science for All Aspects of the Safe Drinking Water Act Program

EPA is obligated to rely upon the best available science for any of its decisions relating to regulation under the SDWA.[FN12] EPA's CCL-5 listing proposal indicates that the 2019 Health Canada drinking water assessment for manganese was a primary basis for the Agency's CCL-5 manganese listing proposal.[FN13],[FN14] Subsequently, EPA's Science Advisory Board noted that "[t]he Health Canada (2019) report would be a good starting point."[FN15]

Reliance upon the Canadian Manganese Assessment is unwarranted, however, because it does not meet the "best available science" standard.

First, the literature review completed by Health Canada does not include a number of key references which were not yet available when Health Canada completed its assessment of the scientific literature. As explained in more detail in the following section, the omitted references directly address EPA's concerns about manganese in drinking water and the likelihood of any adverse developmental impacts. As noted, these studies specifically incorporate drinking water as a component of the validated PBPK models for manganese.

Second, although Health Canada acknowledged the existence of the manganese PBPK models in its assessment, Health Canada opted not to apply them in any respect, apparently based on the misguided understanding that the manganese PBPK models have not been validated.[FN16] In fact, as detailed above, the manganese PBPK models have been validated a number of times, including the human manganese PBPK models.[FN17]

[FN12: 42 U.S.C. § 300g-1(b)(3)(A).]

[FN13: See Technical Support Document for the Fifth Contaminant Candidate List (CCL 5) – Contaminant Information Sheets, p. A-522, EPA 815-R-21-006 (July 2021).]

[FN14: Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Manganese, Health Canada (May 2019) (hereafter "Canadian Manganese Assessment").]

[FN15: SAB Report at 11.]

[FN16: Canadian Manganese Assessment at 47 ("Although the model can be used to estimate manganese concentrations in brain tissue, such simulations have not been validated in humans.").]

[FN17: See Campbell 2023; Ramoju, S.P., et al., "The application of PBPK models in estimating human brain tissue manganese concentrations," Neurotoxicology 58 (2017) 226-237 (Figure 2); Gentry, P.R., et al., "A tissue dose-based comparative exposure assessment of manganese using physiologically based pharmacokinetic modeling - The importance of homeostatic control for an essential metal," Toxicology and Applied Pharmacology 322 (2017) 27-40 (Figures 1-5); Schroeter, J.D., et al., "Analysis of tracer kinetics and target tissue dosimetry in monkeys and humans with multi-route physiologically-based pharmacokinetic models," Toxicological Sciences 120(2) (2011) 481-498. The Yoon 2019 paper also includes validation as follows: "[A]ll the simulated brain concentrations in the globus pallidus region were within the range observed in human cadavers" and "[t]he age-profiles of whole-blood Mn concentrations are consistent with the reported human data."]

EPA Response:

The EPA thanks MIG for their comment. The EPA continues to evaluate the health effects information for manganese. For the RD 5 evaluation of manganese, the 2021 WHO *Guidelines for Drinking Water Quality* (WHO, 2021) was selected as the primary health effects assessment, not the Health Canada 2019 (Health Canada, 2019) assessment, because it is the most recent health effects assessment identified for manganese that derives an oral toxicity value and uses the best available science in its evaluation of noncancer risks. During the future evaluation of manganese for potential regulatory determination under SDWA, the EPA will rely on the best available science to derive an HRL and to develop the regulatory determination.

Commenter: Manganese Interest Group (MIG)
Comment Number: EPA-HQ-OW-2024-0456-0103

Snippet Number: 301
Topic Code: 5.4, Manganese

Comment:

IV. An Updated Human PBPK Model for Manganese Confirms that Children Are Not Susceptible to Brain Manganese Tissue Increases When Exposed to Concentrations of Manganese Measured in Drinking Water

The Canadian Manganese Assessment does not address three important papers that have updated the validated human PBPK model for manganese to include a drinking water component that now covers children ranging in age from infants to 18 years. The three papers are:

1. Song, G., "Physiologically-based pharmacokinetic modeling suggests similar bioavailability of Mn from diet and drinking water," Toxicology and Applied Pharmacology 359 (2018) 70-81;

2. Yoon 2019; and

3. Campbell 2023.

4.

Of particular importance to EPA's drinking water evaluation, the Yoon 2019 paper applies the human PBPK model for manganese to cover the following exposure scenarios:

1. A male infant exclusively breast-fed for 6 months after birth;

2. A male infant exclusively formula-fed for 6 months after birth, assuming the average daily intake from formula powder of 1.145 mg Mn/day;

3. A male infant exclusively formula-fed for 6 months after birth, assuming the average daily intake from formula powder of 0.05 mg Mn/day;

4. A 3-year-old male toddler;

5. A 10-year-old male child;

6. An 18-year-old male teenager;

7. A male adult;

8. A female adult; and

9. A pregnant female and a male fetus.

According to the authors, the simulations run with the updated human PBPK model indicate "that drinking-water Mn at levels commonly encountered is expected to have minimal effect on globus pallidus Mn concentrations in very young children through age 18." Figure 6 from Yoon 2019, which is replicated below, clearly shows very little or no change in brain manganese concentrations for any childhood life stage exposed to manganese concentrations in drinking water at or below 100 µg/liter. According to EPA's own "occurrence data" for manganese, very few samples of drinking water in the United States reach such a high level of manganese given that the 90th percentile measurement is more than three-fold lower.[FN18]

[Figure 6: See EPA Docket ID EPA-HQ-OW-2024-0456-0103]

For very young children, moreover, the authors observe, "The PBPK modeling analysis strongly indicated that the apparent difference in uptake in neonates is not due to immature homeostatic mechanisms as previously inferred from earlier studies (Ballatori et al., 1987; Keen et al., 1986) but rather the need to sequester Mn to build up tissue levels." (Emphasis added.)

The authors of Yoon 2019 ultimately conclude: "Simulations with this expanded multidose route, multi-age model structure indicate that the effect of adding drinking-water exposure along with dietary intake and ambient air inhalation on tissue Mn concentrations in children is not expected to be any greater than the effects in adults, even at drinking-water concentrations approximately twice the Lifetime Health Advisory value set by the USEPA."

The Campbell 2023 paper supports the scientific validity of all of these conclusions when the PBPK models incorporate what is now known about how manganese is handled at the cellular level in the human body.

MIG strongly encourages EPA to consider this important scientific information to support a "negative determination" regarding further regulation of manganese under the SDWA.

V. Existing Scientific Literature Does Not Support the SDWA Regulation of Manganese

A comprehensive systematic review of the scientific literature pertaining to low-level environmental exposure to manganese and neurodevelopmental toxicity has been completed and published in the peer-reviewed literature.[FN19] The findings of that review reinforce the fact that existing studies do not support a causal association between adverse health effects (specifically developmental toxicity) and exposure to Mn in water, for the following reasons:

1. The studies do not indicate any consistent dose-response relationship, and there is no clear pattern of association between adverse effects and within study populations or in comparison to the general population.

2. The studies do not use consistent biomarkers for Mn and apply different sets of tests to evaluate intellectual development. Unfortunately, there is not yet a validated biomarker for Mn exposure (similar to blood as a biomarker for lead exposure).

3. All of the studies openly acknowledge confounding variables that limit the strength of any causal inferences that might be made concerning the effects of Mn exposure. Accordingly, it is impossible for these studies to establish a causal link between Mn exposure and developmental effects.

4. The cross-sectional design of most of these studies is problematic in attempting to establish a causal relationship.

5. The results showing adverse impacts are not biologically plausible based on the best available current science, including validated human PBPK models for manganese inhalation and ingestion.

These conclusions are reinforced by the fact that the levels of Mn in drinking water are unlikely to add meaningfully to the normal daily ingestion of Mn from diet.

VI. Conclusion

As explained in these comments, the best available science does not support regulation of manganese under the SDWA and EPA should issue a "negative determination." In particular, drinking water is a minor source of manganese intake compared to food in the normal human diet and SDWA regulation of manganese presents no meaningful opportunity to reduce any risk to public health. Moreover, the best available science – notably the PBPK models for manganese developed under the auspices of EPA and now fully validated – shows no meaningful change in target issue (including brain) concentrations of manganese even after exposure at relatively high levels (100 µg /L) seen in very few samples in the United States. This makes sense as manganese, as an essential nutrient, is well-known to be subject to homeostatic control mechanisms.

In short, adverse health effects, from neonates to adults, at manganese levels encountered in U.S. drinking water are not biologically plausible. This has been demonstrated by the best available science: the validated human PBPK models developed at the direction of EPA. Accordingly, EPA should decline to regulate manganese under the SDWA as such an action would not provide meaningfully benefits to human health.

MIG appreciates the opportunity to provide these comments. If you have any questions or would like additional information, please contact Joseph Green, counsel to MIG, at 202.342.8849 or JGreen@KelleyDrye.com.

[Attachment 1: See EPA Docket ID EPA-HQ-OW-2024-0456-0103]

[MIG Drinking Water CCL5 Comments (September 2021): See EPA Docket ID EPA-HQ-OW-2024-0456-0103]

[FN18: Technical Support Document for the Draft Fifth Contaminant Candidate List (CCL 5) - Contaminant Information Sheets at A-521-524.]

[FN19: Leonhard, M.; Chang, E.; Loccisano, A.; Garry, M., 2019. "A Systematic Literature Review of Epidemiologic Studies of Developmental Manganese Exposure and Neurodevelopmental Outcomes." Toxicology 420 (2019) 46-65 (doi: 10.1016/j.tox.2019.03.004). In summary, the paper concludes:

Taken together, the available epidemiologic literature indicates that the association of early-life exposure to Mn, as indicated by specific biomarkers, with child intelligence is not strong or consistent, is temporally ambiguous, and lacks a clear biological gradient. Therefore, a causal relationship has not been established by the existing data. The cross-sectional design of most studies raises concerns about reverse causation, and other factors such as confounding, information or selection bias, effect modification, and chance could affect the reported results and partly explain some of the inconsistencies observed among studies.]

EPA Response:

The EPA thanks MIG for providing comments and information for our review. We are continuing our evaluation of manganese and will take the information provided by MIG into consideration during that evaluation, along with the other available health and occurrence data.

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 75
Topic Code: 5.4, Manganese

Comment:

A careful study as proposed by EPA is warranted prior to deciding to establish a primary drinking water standard for manganese.

As shown in UCMR4, naturally occurring manganese occurrence is significant. A primary standard would potentially impact a broad cross-section of public water systems (PWSs) ranging from small, ground water systems to large surface water systems.

EPA references the World Health Organization (WHO) provisional guideline of 80 µg/L based on health considerations for bottle-fed infants, noting that the agency had not updated its health assessment. In the United States, infant formula manufacturers are required to supplement manganese levels in formula, setting the stage for an inter-agency risk management effort. The latest available Integrated Risk Information System (IRIS) Program Outlook (Oct. 2024) includes the initial steps of a manganese health assessment, illustrating that such an effort by the agency will take some time to develop. AWWA sponsored preparation of a summary of existing health assessments for manganese. A copy of that report is attached (Attachment 1). The report identifies limitations in health assessments published to-date and identifies opportunities for preparing a state-of-the-art toxicological assessment.

[Attachment 1: See EPA Docket ID EPA-HQ-OW-2024-0456-0106]

There are recognized aesthetic benefits to reducing manganese to levels well below the health-protective concentrations developed by Health Canada (120 µg/L) and WHO. Experts generally target manganese concentrations below 20 µg/L when installing treatment to manage aesthetic impacts, but the UCMR4 data show that there are a substantial number of systems with observed manganese at higher concentrations.

The UCMR 4 manganese occurrence data may warrant revisiting post-Lead and Copper Rule Revisions (LCRR) / Lead and Copper Rule Improvements (LCRI) implementation. Changes in corrosion control practice are anticipated at 20% or more of water systems that have lead service lines. These changes will have implications for the form and amount of manganese found in finished water.

AWWA has an active program of activity to assist water systems understand how to improve management of manganese. As EPA begins its analysis of treatment feasibility, AWWA looks forward to robust opportunities for technical discussion of treatment alternatives and their implications. AWWA's comments on RD4 sought engagement with EPA in this ongoing effort to build water system capacity to recognize and manage manganese occurrence. That engagement has been limited and the primary staff that did engage with AWWA are no longer with the agency. Given the agency's continued interest in manganese, greater engagement with AWWA would be a beneficial collaboration.

EPA Response:

The Agency thanks AWWA for their comment and agrees with AWWA that a careful study of manganese is warranted prior to making a regulatory determination. The EPA will be conducting additional analyses and appreciates the recommendations and resources that AWWA provided for consideration in these analyses. The EPA will evaluate the occurrence, exposure, and treatment information for manganese, as appropriate, as part of the preliminary benefits and treatment feasibility analyses that EPA is considering for future regulatory determination cycles.

5.5: Quinoline

Commenter: Association of State Drinking Water Administrators (ASDWA)
Comment Number: EPA-HQ-OW-2024-0456-0099
Snippet Number: 68
Topic Code: 5.5, Quinoline

Comment:

Quinoline

ASDWA once again requests EPA provide clarity on the data that is needed beyond UCMR 4 to move quinoline through Phase 3 and additionally requests transparency in any ongoing or planned actions by EPA.

EPA Response:

The EPA will continue to evaluate the occurrence, exposure, and treatment information for quinoline during the Agency's future regulatory determination evaluation of the potential meaningful opportunity for health risk reduction for persons served by public water systems.

Commenter: Association of Metropolitan Water Agencies (AMWA)
Comment Number: EPA-HQ-OW-2024-0456-0102
Snippet Number: 64
Topic Code: 5.5, Quinoline

Comment:

[Given the lack of determinations for these additional contaminants, AMWA asks for the following:]

- Quinoline: Updates on any ongoing actions to improve the analytical method and what additional analyses are being performed.

EPA Response:

The EPA is not aware of any efforts related to improving the drinking water analytical method for quinoline.

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 113
Topic Code: 5.5, Quinoline

Comment:

It is not clear from the record why EPA placed quinoline in the list of chemicals worthy of focused investigation.

Quinoline occurrence is quite limited in UCMR4 and very limited (1 system) at the 10-4 risk level. There is a renewed focus on quinoline with respect to workplace exposure at the Occupational Health and Safety Administration (OSHA) but there is not an obvious linkage to drinking water exposure.

EPA Response:

The EPA will continue to evaluate occurrence, exposure, and treatment information for quinoline.

5.6: Strontium

Commenter: Association of State Drinking Water Administrators (ASDWA)
Comment Number: EPA-HQ-OW-2024-0456-0099
Snippet Number: 73
Topic Code: 5.6, Strontium

Comment:

Strontium

Similarly, ASDWA requests clarity on data needed beyond UCMR 3 to determine a positive or negative regulatory determination for strontium. ASDWA again requests transparency in any ongoing or planned actions by EPA.

EPA Response:

The EPA thanks ASDWA for their comment and continues to evaluate the health effects and occurrence data for strontium. The EPA is considering conducting additional analyses, potentially including preliminary benefits or treatment feasibility analyses, to inform whether regulating strontium under SDWA would present a meaningful opportunity for health risk reduction for persons served by PWSs.

Commenter: Association of Metropolitan Water Agencies (AMWA)
Comment Number: EPA-HQ-OW-2024-0456-0102
Snippet Number: 68
Topic Code: 5.6, Strontium

Comment:

[Given the lack of determinations for these additional contaminants, AMWA asks for the following:]

- Strontium: Transparency in the evaluation of treatment methods and health benefits.

EPA should continue with its thorough approach of ensuring that strong health and occurrence data support the decision of whether a meaningful opportunity exists for health risk reduction. If there is any additional information needed on these comments, please contact AMWA's Manager of Regulatory and Scientific Affairs, Kaline Gabriel, at gabriel@amwa.net.

EPA Response:

The EPA thanks AMWA for their comment and continues to evaluate the health effects and occurrence data for strontium. In addition, the EPA continues to evaluate the effectiveness and feasibility of treatment methods to lower concentrations of this contaminant in drinking water

systems. The EPA plans to describe the procedures used for these analyses when the future preliminary regulatory determination is published for strontium (subsequent to RD 5).

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 120
Topic Code: 5.6, Strontium

Comment:

The Agency's decision to not make a positive regulatory determination for strontium is sound. There is sufficient basis for making a negative determination. Removing strontium from drinking water also removes calcium. As the health effect of concern is based on strontium replacing calcium in developing bones, this co-removal complicates addressing any public health risks from strontium occurrence. The available treatment technologies also require consideration of corrosion control adjustments as well. Consequently, there are potential negative quantitative and qualitative impacts from a strontium drinking water standard, which would have to be considered if EPA were to set a primary drinking water standard.

Under UCMR3, strontium was detected in approximately 5.8% of the finished drinking water supplies at a level above the health reference level used in UCMR3 (1.5 mg/L). The 2019 Health Canada Guideline level referenced in the current Federal Register notice is 7.0 mg/L. This concentration is markedly higher than the HRL and ½ HRL EPA used in its decision to prioritize strontium. At the Health Canada guideline level, observed occurrence in UCMR3 is limited to a very small number of systems, suggesting that, like the negative determinations in this notice, there is not sufficient occurrence to warrant a positive regulatory determination.

While EPA made a preliminary positive determination to regulate strontium in 2014, research and occurrence data over the intervening decade have not supported finalizing a positive determination. Lacking a final positive determination, the decision in NRDC v. EPA does not prevent EPA from making a negative determination.

EPA Response:

The EPA thanks AWWA for their comment and continues to evaluate the health effects and occurrence data for strontium. The EPA is considering conducting preliminary health benefits analyses to inform whether there would be a potential meaningful opportunity for health risk reduction through regulation of this contaminant with an NPDWR. In addition, the EPA continues to evaluate the effectiveness and feasibility of treatment methods to lower concentrations of this contaminant in drinking water systems. While the EPA used information from the 2019 Health Canada Guideline Technical Document for strontium (Health Canada, 2019) for its RD 5 analysis, the Agency did not adopt Health Canada's guideline level (7,000 µg/L) for its analyses. Instead, the EPA derived its own HRL for strontium using standard Agency practices. The EPA plans to describe the procedures used for these analyses when the future preliminary regulatory determination is published for strontium (subsequent to RD 5).

5.7: Other CCL 5 contaminants

Commenter: Association of State Drinking Water Administrators (ASDWA)
Comment Number: EPA-HQ-OW-2024-0456-0099
Snippet Number: 86
Topic Code: 5.7, Other CCL 5 contaminants

Comment:

In addition, many of the contaminants on the CCL have been on various CCLs for years. Of the 90 contaminants on CCL 5, 32 of them have been included on a previous CCL (as seen in Appendix A). ASDWA understands and supports the process of gathering substantial data before making a decision, but contaminants should not remain on the CCL in regulatory limbo. ASDWA requests updates from EPA on the data gathering status of the "no determination" contaminants. This update should include what additional data is needed, why, and how it will move the "no determination" contaminants through the regulatory determination process.

EPA Response:

The CCL compiles occurrence and health effects data for contaminants with the objective of identifying contaminants that are known or anticipated to occur in PWSs, that have adverse health effects, and that may require future regulation.

During the regulatory determination process, the EPA aims to identify (and analyze) the best available data to make an informed determination for a contaminant. The CCL 5 contaminants that did not proceed to Phase 3 in the regulatory determination process did not move forward in the process for one or more of the following reasons (as stated in section III of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025)):

a. "An updated health assessment completed by January 31, 2023 was not identified;
b. Critical health effects gap (e.g., lack of data to support quantification for the oral route of exposure);
c. Lack of nationally representative finished drinking water occurrence data and lack of sufficient other data to demonstrate occurrence at levels and frequencies of public health concern;
d. Critical occurrence data limitation or gap (e.g., inconsistent results or trends in occurrence data requiring further research; significant uncertainty in occurrence analyses or data); or
e. The contaminant is being evaluated in other actions by the agency."

See Exhibit 1.3 in the *Final Regulatory Determination 5 Support Document* (USEPA, 2026) as well as Section III of the preliminary RD 5 *Federal Register* Notice (90 FR 3830, USEPA, 2025) for additional information on why some contaminants from CCL 5 were not given a regulatory determination. The EPA will continue to recommend/consider these contaminants for UCMR data collection or development of qualifying health assessments, as appropriate, based on their

data needs. The EPA will also continue to improve the CCL and Regulatory Determination processes each cycle.

For the five contaminants identified as proceeding to Phase 3 but for which no determination was made in RD 5, the EPA is considering conducting preliminary benefits or treatment feasibility analyses that would inform the meaningful opportunity statutory requirement. Any other actions that the EPA takes with respect to these contaminants as part of the regulatory processes will be communicated with the public and the water sector.

TOPIC CODE AREA 6, Comments on CCL

6.1: CCL comments

Commenter: Association of State Drinking Water Administrators (ASDWA)
Comment Number: EPA-HQ-OW-2024-0456-0099
Snippet Number: 78
Topic Code: 6.1, CCL comments

Comment:

Suggestions for Improving the Regulatory Determination Process

ASDWA would like to thank EPA for bringing the number of contaminants in the Contaminant Candidate List 5 (CCL 5) to a more manageable number, when compared to the Contaminant Candidate List 4 (CCL 4). ASDWA and its members appreciate the trimming of the CCL from previous years, as the CCL should not be used to house contaminants in perpetuity and keeping the number manageable is important to ensuring the process is efficient. However, clarity is needed on the missing 19 contaminants that were neither regulated nor designated to be regulated from CCL 4 to CCL 5.

EPA Response:

For CCL, SDWA directs the EPA to identify those contaminants that present the greatest public health concern related to exposure from drinking water. The EPA compiled the best available scientific information at the time when identifying and evaluating the universe of unregulated contaminants for the CCL 5. For the development of CCL 5, the EPA used screening and classification processes described in the CCL 5 technical support document (USEPA, 2022) to evaluate the universe of chemicals and identify the contaminants of greatest potential public health concern for the final CCL 5 based on the SDWA criteria. Contaminants were included on CCL 5 based on the evaluation of the health and occurrence data available at the time and not based on their presence on previous CCLs.

Commenter: American Water Works Association (AWWA)
Comment Number: EPA-HQ-OW-2024-0456-0106
Snippet Number: 187

Topic Code: 6.1, CCL comments

Comment:

Contaminant Candidate List

This Federal Register notice demonstrates that with the NRDC v. EPA decision, AWWA's recurring recommendation to better focus the CCL to allow timely, adequate data collection warrants serious consideration by the agency.

While this notice addresses regulatory determinations as required by SDWA, the analysis presented and contemplated in the notice is resource intensive for EPA, states, and PWSs. AWWA has recommended and continues to recommend that the agency reduce the number of contaminants on the CCL so that resources can be effectively targeted toward contaminants that represent opportunities for meaningful health risk reduction. EPA's current CCL process is based on recommendations from the National Drinking Water Advisory Council. The NDWAC report acknowledges the value of expert review at the end of the CCL development process to use expert analysis to winnow and focus each final CCL. With the burden imposed by the court in NRDC v EPA the value of such expert winnowing and the subsequent targeting of EPA research and data collection will be even more essential.

Thank you for the opportunity to inform the agency's deliberations in preparing the fifth regulatory determination cycle. If you have any questions regarding this correspondence or if AWWA can be of assistance in some other way, please contact Steve Via at (202) 326-6130 or svia@awwa.org.

EPA Response:

The Agency aims to improve on the CCL process every cycle to produce a CCL that contains the contaminants that present the greatest public health concern, as directed by SDWA.

References

Health Canada. 2019. *Guideline Technical Document—Strontium. Guidelines for Canadian Drinking Water Quality.* Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch. H144-13/14-2019E-PDF. https://publications.gc.ca/collections/collection_2019/sc-hc/H144-13-14-2019-eng.pdf.

United States Environmental Protection Agency (USEPA). 2002. *A Review of the Reference Dose and Reference Concentration Processes*. EPA 630-P-02-002F. https://www.epa.gov/sites/default/files/2014-12/documents/rfd-final.pdf.

USEPA. 2003a. Announcement of Regulatory Determinations for Priority Contaminants on the Drinking Water Contaminant Candidate List. *Federal Register,* 68(138): 42898, July 18, 2003. https://federalregister.gov/a/03-18151.

USEPA. 2003b. Health Effects Support Document for Manganese. EPA 822-R-03-003. https://www.epa.gov/sites/default/files/2014-09/documents/support_cc1_magnese_healtheffects_0.pdf.

USEPA. 2019. Exposure Factors Handbook Chapter 3 (Update): Ingestion of Water and Other Select Liquids. Office of Research and Development. EPA 600-R-18-259F. https://cfpub.epa.gov/ncea/efp/recordisplay.cfm?deid=343661.

USEPA. 2021a. Policy on Children's Health. Office of Children's Health Protection. https://www.epa.gov/system/files/documents/2021-10/2021-policy-on-childrens-health.pdf.

USEPA. 2021b. Announcement of Final Regulatory Determinations for Contaminants on the Fourth Drinking Water Contaminant Candidate List. *Federal Register,* 86(40): 12272, March 3, 2021. https://www.govinfo.gov/content/pkg/FR-2021-03-03/pdf/2021-04184.pdf.

USEPA. 2021c. *Final Regulatory Determination 4 Support Document*. EPA 815-R-21-001.

USEPA. 2022. *Technical Support Document for the Final Fifth Contaminant Candidate List (CCL 5)—Chemical Contaminants*. EPA 815-R-22-002, September 2022.

USEPA. 2025. Announcement of Preliminary Regulatory Determinations for Contaminants on the Fifth Drinking Water Contaminant Candidate List. *Federal Register,* 90(9): 3830, January 15, 2025. https://www.govinfo.gov/content/pkg/FR-2025-01-15/pdf/2025-00133.pdf.

USEPA. 2026. *Final Regulatory Determination 5 Support Document.* EPA 815-R-26-002.

WHO. 2021. *Manganese in Drinking-Water. Background Document for Development of WHO Guidelines for Drinking-Water Quality.* WHO/HEP/ECH/WSH/2021.5. https://iris.who.int/bitstream/handle/10665/350933/WHO-HEP-ECH-WSH-2021.5-eng.pdf.