U.S. Environmental Protection Agency
National Drinking Water Advisory Council (NDWAC)
Virtual Public Meeting

November 28, 29 and 30, 2023

Meeting Summary

Day 1: November 28, 2023

Chair's Welcome and Introductions

The National Drinking Water Advisory Council's (NDWAC) Designated Federal Officer (DFO) **Elizabeth Corr** opened the meeting, reviewed logistics, and introduced the NDWAC's Chair, **Lisa Daniels**, Director of the Bureau of Safe Drinking Water at the Pennsylvania Department of Environmental Protection.

Ms. Daniels welcomed everyone and thanked the NDWAC members, members of the NDWAC's Microbial and Disinfection Byproducts (MDBP) Rule Revisions Working Group (WG), and public attendees for joining. Ms. Daniels then asked NDWAC members and the NDWAC's Centers for Disease Control (CDC) liaisons to introduce themselves.[1]

Office of Ground Water and Drinking Water's Welcome

Ms. Corr introduced the EPA's Office of Ground Water and Drinking Water Deputy Director, **Yu-Ting Guilaran.** Ms. Guilaran expressed gratitude to all NDWAC members for their service and for responding to EPA's charge through the 13 recommendations in the WG's report to the Council.[2] She stressed that the MDBP drinking water regulations are essential to the provision of safe drinking water and emphasized the importance of this meeting. She thanked WG co-chairs Lisa Daniels and Andy Kricun and all of the WG members for their work and efforts, emphasizing appreciation for members in both the WG and the NDWAC.[3]

[1] The roster of all NDWAC members and the NDWAC's CDC liaisons is in Appendix A. NDWAC members Yolanda Barney and Macaroy Underwood did not attend the November 2023 meeting.

[2] The WG provided a report including 13 recommendations for the Council's consideration in responding to EPA's November 2021 charge to the NDWAC on potential revisions to MDBP rules. The charge is in Appendix D. The WG's report to the Council, "Report of the Microbial and Disinfection Byproducts Rule Revisions Working Group to the National Drinking Water Advisory Council: November 2023," is posted along with the NDWAC's December 14, 2023, letter to the EPA Administrator on EPA's NDWAC website at: https://www.epa.gov/ndwac.

[3] Five NDWAC members served on the WG: Elin Betanzo, Scott Borman, Lisa Daniels, Nancy Quirk, and Alex Rodriguez.

Ms. Guilaran introduced the purpose of the meeting, stating that the MDBP regulations are in place to provide public health protection from microbial pathogens while balancing risk from the potential formation of disinfection byproducts. The Safe Drinking Water Act (SDWA) requires EPA to review the National Primary Drinking Water Regulations once every six years and revise them as needed. Any revisions must maintain or strengthen public health protection. In the Six-Year Review 3 EPA identified MDBPs as candidates for the rule review process.

Ms. Guilaran explained that the WG members developed a report, including the 13 recommendations, which the NDWAC would review before presenting the Council's recommendations for MDBP rule revisions to EPA. Ms. Guilaran discussed how over 12 meetings the WG members reached common ground and developed their report to the NDWAC. She noted that this is the first of three days of discussion by the NDWAC.

Public Comment to the National Drinking Water Advisory Council

Ms. Corr invited commenters to speak in the following order. Commenters' remarks are summarized below. Written comments from Mr. Via and Mr. Roberson are in Appendix C.

Steve Via, with the American Water Works Association (AWWA), began by thanking everyone for their work on this. He noted that it is important for the NDWAC to recognize and inform EPA that the report is constrained because of the lack of data. Mr. Via explained that the information is described in a more qualitative way from different experiences rather than quantitative with data backing it up. Mr. Via stressed that Recommendation 12 is critical, and EPA should craft strategic research and an information collection program for MDBP data gaps with adequate funding. Mr. Via stated that EPA will need to overcome the gaps in knowledge the WG members faced and determine which recommendations can be supported with scientific evidence. Mr. Via added that it is important to recognize any administrative burdens and determine ways to address them. Mr. Via noted EPA and other federal agencies must ensure that building operators and owners value water quality maintenance. Mr. Via stated that the WG recommendations are a reflection of discussions throughout the water sector and that many topics are present within AWWA's best practice manuals. Mr. Via thanked everyone for their time and the opportunity to provide a public comment.

Brian Redder, Manager of Regulatory and Scientific Affairs at the Association of Metropolitan Water Agencies (AMWA) thanked everyone for their efforts throughout this process. He explained that AMWA is most concerned that the final recommendations lack scientific support and were formulated based on individuals not finding fatal flaws in the recommendations, rather than reaching consensus. Mr. Redder suggested that additional, extensive technical work and data collection should be completed to help support each recommendation. He acknowledged that Recommendations 3 and 12 highlight the data gaps in the analysis and commented that these should be a focus for further work. AMWA asked the NDWAC to focus the final recommendations to EPA on those that have existing supporting data, and to complete further analysis on recommendations with data gaps. In addition, Mr. Redder expressed that some of the recommendations are outside of the scope of the MDBP rules and SDWA, and that the NDWAC clearly expresses that issues like premise plumbing and source control are not the sole responsibility of drinking water utilities. Mr. Redder added that building water owners and other entities need to be properly regulated through other authorities to reduce the burden on water utilities.

Alan Roberson, Executive Director of the Association of State Drinking Water Administrators (ASDWA), thanked everyone for their efforts throughout this process and the opportunity to provide comments. He emphasized the lack of EPA resources and limited funding to pass all the recommendations. ASDWA recommends that a follow up stakeholder group prioritize recommendations to meet EPA's regulatory deadlines. In addition, Mr. Roberson noted the state burden aspect and how Recommendations 11 and 13 constrain funding and increase the burden on states as many are already limited in staffing and other resources. Mr. Roberson added that some states have already implemented some of the recommendations and ASDWA recommends that EPA work closely with these states to learn from their experiences and to determine if the recommendations are effective and can be implemented. In addition, Mr. Roberson stressed that ASDWA expressed that EPA should use this rulemaking to eliminate differences in how ground water systems and surface water systems are regulated under similar circumstances. For Recommendation 9, Mr. Roberson articulated the challenges of data management and the ability to capture snapshots of data on a national basis. Lastly, Mr. Roberson agreed with previous comments regarding the data gaps and noted that, with 22 data gaps identified and limited funding to address all of them, it will be very challenging to complete additional technical work.

Erik Olson, with the Natural Resources Defense Council (NRDC), began by thanking everyone for their work. Mr. Olson acknowledged that there is a lot of material to read through but suggested that the NDWAC review the attributed comments from WG members [*in the WG's report to the Council*] to gain more context and insight on the report. He also pointed out the close relationship between Recommendation 3 and Recommendation 4 and expressed concerns about short-term health effects of brominated and iodinated chemicals. Mr. Olson explained that by addressing multi-benefit precursor controls, this can help reduce both microbial risk and the risks from DBPs.

Ms. Corr thanked all for their comments and turned over the remainder of the meeting to Ms. Daniels.

Review of the Report of the Microbial and Disinfection Byproducts Rule Revisions Working Group to the National Drinking Water Advisory Council

Ms. Daniels began her presentation[4] by noting the MDBP Rule Revisions WG members:[5]

- **Lisa D. Daniels**, Director of the Bureau of Safe Drinking Water at the Pennsylvania Department of Environmental Protection.
- **Andy Kricun,** PE, WG Co-chair Senior Fellow, U.S. Water Alliance Managing Director, Moonshot Missions.
- **Elin W. Betanzo**, Founder and Principal for Safe Water Engineering, LLC.
- **D. Scott Borman,** General Manager of Benton/Washington Regional Public Water Authority.
- **John Choate,** General Manager for the Tri County Regional Water Distribution District.
- **Kay Coffey,** PhD, PE**,** Engineering Manager and Public Water Supply Group Project Adviser for the Water Quality Division of the Oklahoma Department of Environmental Quality (Not Present).
- **Jeffrey K. Griffiths**, MD, MPH & TM, Professor of Public Health and Community Medicine, and of Medicine at Tufts University School of Medicine.

[4] Ms. Daniels' slides are in Appendix B.

[5] The WG's roster is also in Appendix A of the WG's report to the NDWAC.

- **Michael Hotaling**, MBA, PE, Facilities Manager (Retired) at Newport News Waterworks Department.
- **Jolyn Leslie**, PE, Regional Engineer for the Office of Drinking Water, Northwest Regional Office, Washington State Department of Health.
- **Rosemary Menard**, Water Director for the City of Santa Cruz.
- **William F. Moody,** PE, BCEE, Director for the Bureau of Public Water Supply, Mississippi State Department of Health.
- **Erik D. Olson**, Senior Strategic Director of Health & Food for the Healthy People & Thriving Communities Program, Natural Resources Defense Council (NRDC).
- **Benjamin J. Pauli**, PhD, Associate Professor of Social Science at Kettering University.
- **Nancy A. Quirk**, General Manager for the Green Bay Water Utility.
- **Lisa J. Ragain**, Principal Water Resources Planner for the Metropolitan Washington Council of Governments.
- **Alex Rodriguez**, President and Chief Executive Officer for Diversity Consulting Group, LLC.
- **Lynn W. Thorp**, National Campaigns Director for the Clean Water Action and Clean Water Fund.
- **Gary Williams**, Executive Director of the Florida Rural Water Association.

Ms. Daniels noted that the WG met 12 times from May 2022 to November 2023 and delivered the recommendations report to the NDWAC on November 15. She anticipated mid-December delivery of the NDWAC's report to EPA.

Ms. Daniels provided some background information on what the MDBP WG has done to date, as well as explaining cross-cutting themes reflected in the WG's final report and the level of support among WG members for the recommendations. Each recommendation includes an abbreviated statement of the recommended action as well as background information and an outcomes sought section. Nine of the recommendations received "Full" support, indicating that all 18 WG members said "Yes" to the recommendation; three recommendations received "Substantial" support, indicating that 15 to 17 WG members said "Yes;" and one recommendation received "Full" support for Parts 1 and 2 and "Substantial" support for Part 3.

Ms. Daniels said there is an emphasis on delivering equitable outcomes for all communities, with the need to address affordability and provide support to environmental justice and overburdened communities to ensure no one is left behind. She expressed that there is an understanding that new requirements can place additional pressure on the affordability of drinking water services, so the recommendations can provide enhanced support. All of the recommendations reflect a problem-based emphasis and seek to establish positive incentives for identifying and addressing problems. Ms. Daniels stated that the recommendations are assembled to intertwine and work together to advance equitable public health improvements and public water system (PWS) performance. Lastly, Ms. Daniels explained that the recommendations span from source water to tap, invoke SDWA changes and other federal authorities, and provide a mix of regulatory and non-regulatory interventions.

Overview of the WG's Recommendations 1-13

Ms. Daniels shared an overview and provided details on each of the WG's 13 recommendations. A summary of her remarks follows.

Recommendation 1: Disinfectant Residual

This recommendation helps address the potential for no or low disinfectant residual in surface water PWS distribution systems (DS). The WG discussed and acknowledged that there is potential to exacerbate disinfection byproduct (DBP) challenges, so this recommendation should link to a clear requirement for EPA to provide assistance to overcome these challenges. Ms. Daniels explained the three-part approach to tackling disinfectant residuals:

1. Adopt a national numeric minimum disinfectant residual requirement.
2. Establish and require adoption of disinfectant residual sampling and monitoring approach to provide an enhanced understanding of areas within the DS that have low or no disinfectant residual.
3. Establish a revised disinfectant residual compliance basis that reduces the potential for areas of DS to experience low or no disinfectant residual on a repeat basis.

Recommendation 2: Premise Plumbing

This recommendation helps EPA advance a national building water quality improvement initiative based on enhanced partnerships and collaborations among federal agencies and state SDWA oversight agencies. This includes leveraging existing partnerships to establish a program framework that incentivizes improved premise plumbing safety, as well as expanding partnerships to other stakeholders. This recommendation emphasizes conducting an analysis to understand any current incentives; establish a framework to identify high risk buildings; identify further incentives for Water Management Program uptake; and characterize current building, energy, and plumbing code influences.

In addition, this recommendation would build out a risk-based building water management promotional program and help develop and implement *Legionella* public awareness campaigns for smaller scale building owners and/or occupiers.

Recommendation 3: DBP Maximum Contaminant Level (MCL) Data and Analysis Gaps

This recommendation addresses any data and analysis gaps associated with DBPs of emerging concern. Key areas for EPA data gathering and analysis include haloacetic acids (HAAs) exposure, chloramination, DBP mixtures, and occurrence, health risks, and control strategies for haloacetonitriles (HANs) and iodinated DBPs. Ms. Daniels emphasized that this recommendation includes generating nationally representative occurrence, health effects, and treatment data for regulated and non-regulated DBP groups. Along with this, EPA-approved analytical methods for DBPs of emerging concern can be developed.

Recommendation 4: Multi-Benefit Precursor Control

This recommendation would establish a PWS source water evaluation screening requirement and under certain conditions would provide additional mandatory treatment to reduce DBP formation and disinfection demand. A three-part framework helps guide systems, beginning with source water screening to determine and identify any vulnerable precursor conditions. If these conditions are identified, the next two steps can be followed: potential for targeted new monitoring and targeted application of treatment technique for enhanced precursor control. This approach helps identify systems that need help with precursor control and treatment technique-flexible response options.

Recommendation 5: Finished Water Storage Tanks
This recommendation focuses on addressing finished water storage tanks by establishing national inspection and cleaning requirements to fill the gaps left by limited state-level regulatory efforts. This process would be supported by reviews and updates, as needed, to the current storage tank operations and maintenance guidance.

Recommendation 6: Chloramination
This recommendation helps improve chloramination practices to control microbial contamination and DBP formation potential, which will improve overall consistency of water quality. Ms. Daniels anticipated that the NDWAC would continue to have discussions regarding regulatory and non-regulatory approaches for this recommendation throughout this meeting. Some areas of interest for this recommendation include chlorine conversion periods, the role of nitrification control plans, and effective practices for managing key operational parameters.

Recommendation 7: Consecutive Systems
This recommendation would improve water quality and regulatory compliance for consecutive systems. Similar to Recommendation 6, the WG actively discussed the regulatory and non-regulatory approaches. The areas of interest for this recommendation include improving partnerships between wholesalers and consecutive systems and establishing a problem-based trigger for coordinated action between partners.

Recommendation 8: Source Control
This recommendation focuses on leveraging non-SDWA authorities to prevent the introduction of potential drinking water contaminants in the water cycle. In addition, it would restrict discharge into source waters that contribute to the formation of DBPs or growth potential for opportunistic pathogens and the introduction of frank pathogens.

Recommendation 9: Environmental Justice (EJ)
This recommendation is to conduct analyses to characterize gaps in MDBP rule implementation by PWSs serving communities with EJ concerns. It would provide new strategies to close the gap and work toward equitable implementation of the MDBP rules. New requirements should be implemented consistently with additional resources provided to equitably receive the benefits. The following three primary action areas are included in this recommendation: an EPA analysis to account for existing and potential disparate impacts to communities with EJ concerns; MDBP rule structure revisions to enable and incentivize problem-solving and proactive improvement; and improvement of community access to timely information.

It was emphasized that this recommendation helps provide resources and address affordability in combination with Recommendation 10.

Recommendation 10: Public Water System Technical, Managerial, and Financial (TMF) Capacity
This recommendation helps provide and align additional technical, managerial, and financial (TMF) capacity for small, rural, and underserved communities consistent with new demands placed on PWSs by potential MDBP rule revisions. It is recognized that many small, rural, and underserved communities operate in a capacity-constrained context as changes to rule requirements may apply additional pressure on maintaining compliance, financial, and resiliency objectives. This recommendation targets identifying current resources and creating new ones to help close the gap and provide these resources to the communities that need them the most. The WG discussed that these additional resources will help

tackle current costs associated with addressing water quality and supply reliability issues contributing to cumulative disadvantages experienced in EJ communities. The WG identified four action areas for this recommendation:

1. Prepare an action plan to target additional technical and financial assistance to small, rural, and underserved communities, including systems with non-compliance issues.
2. Evaluate and improve operator certification, particularly with distribution system management.
3. Address affordability by making a permanent low-income household water assistance program.
4. Establish strong incentives for PWSs to train their board members.

Ms. Daniels emphasized that tackling and addressing the managerial component of TMF will help significantly as board members of a PWS will learn about the status of the water quality and how it can be improved to benefit the system.

Recommendation 11: Primacy Agency Capacity

This recommendation addresses SDWA primacy agency capacity needs associated with the new demands expected from the MDBP rule revisions. It was recognized that changes to the MDBP rules may impose additional pressure on a primacy agency's ability to provide support effectively with the new demands required. Furthermore, the gap may increase under these demands unless means are undertaken to lessen this gap. The WG established the following two action areas:

1. Adjust sanitary survey implementation to reflect MDBP rule revisions.
2. Identify and direct capacity resources for primacy agencies to implement new MDBP rule requirements (training, funding, guidance, peer support, public notice, PWS TMF capacity, etc.).

Recommendation 12: Data and Analysis Gaps

This recommendation would establish efforts to address key MDBP-related data and analysis gaps. Topics under consideration include:

1. Source Water Data and Analysis Gaps
2. Treatment Data and Analysis Gaps
3. Distribution System Data and Analysis Gaps
4. Premise Plumbing Data and Analysis Gaps
5. Enabling Environment Data and Analysis Gaps

These topics require additional research to have a complete understanding of how to address them. There are new treatment technologies that can be researched to encompass every available option to help all communities. Some recommendations require a broader viewpoint and shared responsibility, so collaborating with other agencies and stakeholders will be beneficial.

Recommendation 13: Ground Water under the Direct Influence of Surface Water (GWUDI)

This recommendation suggests that EPA should revisit the definition, determination methods, and guidance for GWUDI to establish what changes to make to improve the protection of public health.

Furthermore, this recommendation would include revising the definition of GWUDI to add total aerobic spores or other indicators to the definition. A goal for this recommendation is to make the determinations more accurate and simpler. Lastly, this recommendation would require systems to periodically update GWUDI determinations.

Discussions and Preliminary Voting

Ms. Daniels explained that she would begin discussions at Recommendation 1 and continue through to Recommendation 13, as ordered in the report. She encouraged the group to provide any questions, comments, or concerns to initiate discussions about the recommendations. She explained that, following the discussions, voting on the recommendations would occur as Ms. Daniels asks each NDWAC member, in alphabetical order, if they support the recommendation. Ms. Daniels stressed that this round of voting will be preliminary voting with final voting happening on Day 3 of the meeting.

To begin, Ms. Daniels asked if the NDWAC members had any initial thoughts about any of the recommendations. **Shellie Chard** noted Recommendations 4, 8, and 10 as a focus for discussions. **Jana Littlewood** and **Jeffrey Szabo** expressed the need to further discuss the recommendations that did not receive "Full" support from the MDBP WG members. **Steven Elmore** was interested in discussing Recommendations 1, 5, 7, 9, 10, and 12.

Eagle Jones and **Mr. Szabo** asked Ms. Daniels if she could explain the process regarding public comments and review. **Ms. Corr** and **Ryan Albert**, Supervisor of the Standards and Risk Reduction Branch in EPA's Office of Ground Water and Drinking Water, responded. Ms. Corr explained that November 21st was the date by which public comments were requested in the *Federal Register* meeting notice; however, both Ms. Corr and Dr. Albert emphasized that comments submitted up until and following the meeting would be provided to NDWAC members.

Following this discussion, the recommendations discussion began.[6]

Recommendation 1: Disinfectant Residual

Ms. Littlewood began by expressing concerns about part 1 of this recommendation. She noted that operational flexibility is required to balance adequate disinfection and the reduction of DBPs and that establishing a minimum numeric value can greatly constrain operational flexibility. The suggested values of up to 0.5 mg/L for free chlorine and up to 0.7 mg/L for total chlorine can greatly increase DBPs particularly in small systems or systems with low demand.

Ms. Daniels thanked Ms. Littlewood for her feedback and provided some additional context. Ms. Daniels explained that under this recommendation EPA should consider a range up to 0.5 mg/L and 0.7 mg/L, allowing for more flexibility than solely including one numeric value. She also shared that there are some limitations with the existing methodology for detecting chlorine residuals using test kits, as some instrumentation may only achieve a reporting limit of 0.1 mg/L.

Scott Borman expressed that he agrees with having a range of numeric values rather than one definitive value, but he does not support the current values included in the recommendation. Mr. Borman added that this range will provide EPA an opportunity to determine what is actually detectable and what a minimum residual would be within this range. In addition, Mr. Borman stated that many states already have minimum residuals at varying values, whereas other states are following the SDWA detectable criteria.

[6] Recommendations from the WG's report, including modifications that were made to language during discussions, were shared on screen.

Elin Betanzo expressed that the WG linked Recommendation 1 with Recommendation 4, which looks at opportunities for precursor removal. The intention is not to raise the disinfection dose, but to use other techniques to maintain the disinfectant residual and keep the detectable level reasonable.

Ms. Littlewood expressed that 0.5 mg/L and 0.7 mg/L are too high for maximum numeric values and this can greatly impact small systems as they have limited capacity and resources. She noted concern that EPA may review this recommendation and only view and use the highest value of 0.5 mg/L and 0.7 mg/L rather than consider a range of values up to those respective maximums. Ms. Littlewood suggested lowering these values to 0.1 mg/L or 0.2 mg/L instead, which small systems would be able to manage more easily.

Ms. Daniels noted that during this process the WG did not want to specify one numeric value and rather suggested a range, allowing EPA to determine the best value to use based on further data and scientific support. In addition, Ms. Daniels stated the experts who assisted the WG provided a range with 0.5 mg/L and 0.7 mg/L being the uppermost values.

Ms. Betanzo expressed that the maximum numeric values currently in the recommendation are also representative of upper bounds for the numeric minimum residuals that states are currently using as noted earlier by Mr. Borman.

Ms. Chard asked who the technical experts were.

Ms. Daniels explained that the WG members wanted to include technical expertise and requested a wide range of subject matter expertise to assist with answering questions while the WG developed the recommendations. Furthermore, Ms. Daniels noted the range of numeric values in Recommendation 1 are reflective of the discussions held by the technical support staff. She noted that page 9 of the report includes additional information on the technical support staff who assisted the MDBP WG.

Jennifer Peters asked why the technical support staff were not named in the report and suggested identifying the experts and acknowledging their efforts with the MDBP WG. Ms. Littlewood also wanted to know who the technical experts were.

Ms. Corr explained that the technical analysts were responding to questions from WG members and were not directly included as WG members themselves. **Dr. Albert** added that the technical analysts covered a wide range of drinking water expertise and the names of each should be included in the docket. Ms. Corr and Dr. Albert subsequently informed the group of analysts who provided technical support to the MDBP WG:

- **Mark LeChevallier**, Dr. Water Consulting. Formerly with American Water
- **Nancy Love**, University of Michigan
- **Shawn McElmurry**, Wayne State University
- **Andy Jacque**, Water Quality Investigations – Wisconsin
- **Vanessa Speight**, University of Sheffield
- **Scott Summers**, Formerly University of Colorado
- **Chad Seidel**, Corona Environmental Consulting
- **Delvin DeBoer**, AE2S (Advanced Engineering and Environmental Services, LLC)
- **Steve Duranceau**, University of Central Florida

- **Zaid Choudhury**, Garver
- **Susan Teefy**, East Bay Municipal Utility District
- **Christine Owen**, Hazen and Sawyer. Formerly Tampa Water
- **Stuart Krasner**, formerly with the Metropolitan Water District of Southern California

Mr. Szabo asked if the WG took into consideration the additional staff, operators, and training needed for implementation of sampling and monitoring programs. In addition, he asked if training would need to be completed differently and who would be responsible for the expense.

Ms. Daniels expressed that Recommendation 10 includes more detailed information on TMF capacity and resources needed for all the recommendations. She stated that the WG recognized that with each new additional requirement, there was a need for additional resources and TMF capacity to make the new changes feasible. Ms. Daniels noted that more discussions on Mr. Szabo's question could be held once the group reaches Recommendation 10.

Mr. Elmore supported including a numeric value in Recommendation 1, rather than keeping the current "detectable" disinfectant residual requirement. In addition, Mr. Elmore supported bringing together distribution system requirements within one comprehensive framework containing monitoring and sampling plans and assessments. Lastly, Mr. Elmore asked why Recommendation 1 only focuses on surface water systems and not ground water systems as well.

Ms. Daniels explained that the charge from EPA focused on reviewing and evaluating Surface Water Treatment Rules and did not include the Ground Water Rule. Ms. Daniels noted that ground water is mentioned in the discussion and context of Stage 1 and 2 DBPs in later recommendations, which apply to both surface water and ground water.

Nancy Quirk added that not all ground water systems chlorinate, so the WG acknowledged this and that including ground water systems with this recommendation would be adding requirements and forcing them to chlorinate.

Ms. Daniels noted that Pennsylvania had set their own numeric value of 0.02 mg/L for detectable residual based on the definition from a major manufacturer. However, upon further research it was determined that the manufacturer was advertising the method detection limit (MDL), which differs from the reporting limit. Ms. Daniels stated that the 0.02 mg/L was determined through the MDL, which is a calculated value. Ms. Daniels added this resulted in an understanding that different instrumentation achieved different detectable residual levels, with 0.1 mg/L being the actual reporting limit for the instrument.

At the end of the discussion Ms. Daniels called for a vote to determine the level of support for Recommendation 1, reminding members this is a preliminary voting period and that final votes would be determined on Day 3 of the meeting. Of members present for this vote, there were 10 in support and three not in support.[7]

Following the voting, Ms. Daniels explained that NDWAC members who did not support the recommendation can provide potential modifications to part 1 of Recommendation 1. All three members

[7] NDWAC members Ms. Barney and Mr. Underwood are counted throughout as not present.

who did not support the recommendation were concerned with the numeric values provided (0.5 mg/L and 0.7 mg/L).

Ms. Chard began by suggesting removing the specific values altogether and simply only stating that EPA should look at a minimum numeric disinfectant residual requirement. **Mr. Jones** agreed that he would support the recommendation if this part was simplified, based on Ms. Chard's suggestion.

Ms. Littlewood disagreed with this suggested modification and said that she would like to include numeric values, particularly 0.1 mg/L and 0.2 mg/L. Ms. Littlewood further suggested that the minimum numeric value should be stated, but at these lower values compared to what is currently included in the recommendation.

Mr. Borman suggested removing the numeric values and replacing that part of the recommendation stating instead that the "The NDWAC recommends EPA base the minimum numeric standard on the minimum inactivation ratios for the specific disinfectant type." Mr. Borman also noted that there was disagreement among the technical experts on what numeric values to include, so EPA would need to determine what the actual minimum numeric disinfectant residual should be based on data and scientific support.

Ms. Daniels explained that the WG kept the higher numbers from the technical experts. Some states have higher values of 1 mg/L or 2 mg/L.

Ms. Peters asked if the WG considered developing numeric value ranges for small systems versus larger systems and why a range of values was considered. **Ms. Daniels** explained that the WG expects EPA will set one number, not a range, but EPA should consider a range of values when determining the final numeric value. Ms. Daniels added that a range allows EPA to complete a comprehensive assessment to compare different values and a cost benefit analysis for each value. The technical experts agreed on 0.5 mg/L and 0.7 mg/L as the upper limits for free chlorine and total chlorine, respectively; however, the technical experts did not agree on lower limits, resulting in the language stating a "'range up to 0.5 mg/L" and "range up to 0.7 mg/L."

Ms. Daniels observed that through these discussions and suggestions the NDWAC was close to consensus and suggested double checking the range of values that the experts provided. Ms. Daniels tabled discussion of the recommendation and another vote to determine the level of support until Day 2 pending confirmation of the information being discussed.

Recommendation 2: Premise Plumbing

Ms. Littlewood supported the focus on water quality and premise plumbing, noting this has been a prevalent issue. She expressed concern with this issue being addressed in a regulatory context. Ms. Littlewood stated that this could increase the state burden as well.

Ms. Daniels explained that part 1 of the recommendation focuses on collaborations and partnerships to develop a framework for addressing this issue. She clarified that this could be in a regulatory or non-regulatory context. There would only be a regulatory requirement if the sister agencies agree to take it on and make it a regulatory requirement.

Mr. Szabo expressed his support for the recommendation but added his concern about the lack of specificity of the initiatives and programs; however, he acknowledged that EPA and state agencies would

likely take the lead on developing the details, hence why this additional information was not present in the recommendation.

Ms. Daniels called for a vote to determine the level of support for Recommendation 2. All 12 members present for this vote were in support.

Recommendation 3: DBP MCL Data and Analysis Gaps

Ms. Daniels began by noting how Recommendation 3 and Recommendation 4 are closely related as they both address DBPs. The WG was not at a point where they could support the addition of more MCLs for DBPs, as they did not think there was sufficient detail and information. Ms. Daniels added that there are many DBPs, and there were concerns on how effective it would be to view MCLs one by one. The WG decided to consider data and analysis gaps associated with DBPs of emerging concern to gather more information.

Mr. Szabo expressed his support for this recommendation but noted that it lacks specificity.

Ms. Daniels explained that in the full report there is additional information and details with each recommendation having a background section and an outcomes sought section. She offered that if the NDWAC would like, the full report may be sent to EPA in addition to the executive summary of the recommendations to provide those additional details and specifics.

Mr. Szabo added that he is concerned about the timeframe for EPA to complete additional data analysis and scientific research, and whether this is feasible.

Ms. Daniels explained that EPA is on a schedule for the MDBP rule revisions, and it could be that some of the data already exists and only needs to be pulled together. She also suggested that, if there is not data already available, the additional analysis and studies could help inform the future rulemaking process, as she thought that EPA will likely not be able to address all the data gaps between now and the anticipated rulemaking date.

Ms. Daniels noted that the recommendations in the executive summary have been condensed and asked the NDWAC if they would like to include the full report when delivering to EPA. The NDWAC members confirmed that they would like to attach the full report in addition to the executive summary to provide the additional context and information for EPA to review.

Ms. Daniels called for a vote to determine the level of support for Recommendation 3. All 13 members present for this vote were in support.

Recommendation 4: Multi-Benefit Precursor Control

Ms. Chard expressed that this is a complex regulatory issue and compliance data and violations can vary from state to state depending on the sources of water. She added that this recommendation may impact small surface water systems negatively, as these systems in particular have limited sources of water and may not be able to adjust and respond effectively.

Mr. Borman explained that the WG wanted to provide as much flexibility with this recommendation in terms of the approaches systems can take to reduce DBP formation. He added that there will not be a one size fits all approach for systems, but rather different approaches to reduce precursor materials. The full report provides multiple options and a hierarchy progression to determine what the best approach could be.

Ms. Littlewood expressed her support for the idea of the source water vulnerability screening to assist the systems who are challenged by higher DBP formation and believes this to be a helpful step; however, she expressed concerns with this recommendation being a one size fits all approach, and how it will significantly impact smaller systems. She also noted that if a system has a single source of water, then there is a very narrow approach to what can be changed, making it challenging for those systems.

Mr. Borman provided some additional information after hearing Ms. Littlewood's concerns and feedback on this recommendation. He expressed that the WG understood and acknowledged that no two systems are alike and that multiple approaches would be needed to address this issue at small and large systems. In addition, there would be an evaluation of operations for enhanced precursor control with the idea that adding additional treatment would be the last option in the hierarchy of approaches. This allows multiple approaches and flexibility for systems to determine what works best for them once the initial source water vulnerability screening process is completed.

Ms. Betanzo emphasized that this recommendation is condensed and simplified in the executive summary and that the full report contains much more detail with the progression and hierarchy of approaches that a system could take. She further noted that additional mandatory treatment would only be needed for systems that meet the high-risk criteria, with this likely only occurring for 10% or less systems.

Ms. Daniels also explained that in part 1 of the recommendation, the WG determined that EPA needs to evaluate options to determine the criteria for what a source water vulnerability screening would look like. The full report includes all the potential options to take into consideration and also notes different reasons that systems could opt out of this entire process, such as having high source water quality or advanced treatment in place.

Ms. Chard asked what the process will be if the NDWAC does not reach consensus on a recommendation. **Ms. Daniels** responded that if consensus is not reached then the first step would be to have those not in support provide some modifications and suggestions to the recommendation. Polling would follow these discussions surrounding any modifications to determine if the modifications would result in full consensus. Ms. Daniels added that if this does not occur, then the NDWAC will acknowledge that there is not consensus and then provide alternative perspectives from those not in support of the recommendation.

Nearing the end of Day 1, **Ms. Daniels** explained that the group would pick back up on Day 2 with Recommendation 1 to further discuss, modify (if needed), and confirm by polling, and then continue discussions picking up at Recommendation 4.

Ms. Corr thanked all and adjourned for the day.

Day 2 - November 29, 2023

Ms. Corr opened Day 2 and turned over the meeting to the NDWAC's Chair, **Ms. Daniels.**

Discussions and Preliminary Voting, continued

Ms. Daniels stated that the NDWAC would continue discussing the recommendations from the MDBP WG and reminded the members that final voting would take place on Day 3. She also reminded the NDWAC members that they had previously finished discussion and deliberation on Recommendations 2 and 3 on Day 1. Ms. Daniels added that during Day 2 the NDWAC would continue discussion about Recommendation 1 and hold initial voting for the recommendation before continuing with their deliberation and initial voting for Recommendation 4.

Recommendation 1: Disinfectant Residual

Ms. Daniels summarized the Day 1 discussion, stating that the NDWAC was working on an edit to the MDBP WG's version of Recommendation 1 because some NDWAC members wanted to include information about the lower end of the range in reference to the expert input provided to the WG, which only mentioned the upper end of the range. She added that there had been discussion about whether the lower range should be 0.1 mg/L or 0.2 mg/L and summarized the evidence that had been collected and presented to the MDBP WG to support both levels. Ms. Daniels also provided an example from her work in Pennsylvania where the Department of Environmental Protection concluded that 0.1 mg/L was the true detectable level but decided to go with 0.2 mg/L due to the issue of rounding. She then suggested to the NDWAC that if they could not agree on inserting a minimum value of 0.1 mg/L or 0.2 mg/L that they could instead insert a narrative statement. Ms. Daniels suggested that the NDWAC include the following narrative statement in the report; "In order to balance the risk-risk tradeoff and limit the formation of DBPs, EPA should consider the lowest disinfectant residual level that can achieve inactivation of *Legionella* and other pathogens of concern while also ensuring a true detectable residual (taking analytical method and instrumentation limitations into consideration)." She then opened the floor for discussion.

Mr. Borman stated that he liked Ms. Daniels' suggestion because it keeps the NDWAC from recommending specific values and he felt like recommending values was not the NDWAC's place. He suggested that the NDWAC insert the sentence instead of the numeric values.

Ms. Littlewood thanked Ms. Daniels for encouraging the input of the technical experts and added that she would like to still see a number in the final report, which would be important because she felt a higher limit would be challenging for small water systems. Ms. Littlewood proposed that the minimum specific level would be up to 0.2 mg/L for free chlorine and the maximum up to 0.5 mg/L.

Alexandra Campbell-Ferrari asked to clarify how the MDBP WG came up with the ranges in the recommendation. She also asked if a NDWAC member would be able to confirm the logic behind a previous comment from Ms. Littlewood about how the values of disinfectant in the water decrease from the point of entry.

Ms. Daniels responded that 0.2 mg/L was the minimum value of residual at the entry point that EPA had set to ensure sufficient inactivation in the plant for source water contaminants and confirmed that the disinfectant residual value typically drops when water leaves the entry point due to water age and chlorine demand.

Ms. Daniels invited Ken Rotert, Physical Scientist with EPA's Standards and Risk Reduction Branch, Office of Ground Water and Drinking Water, to provide additional clarification. **Mr. Rotert** added that the range

in the recommendation was reflective of the MDBP WG Meeting 2 presentation from August 2022. The range was compiled from all the occurrence data that the EPA collected from the Six Year Review 3 information collection request. He also stated that the data had residual and total coliform levels paired together and those levels displayed distinctive demarcation at 0.2 mg/L for free chlorine and 0.5 mg/L for total chlorine.

Ms. Campbell-Ferrari expressed concern about making changes to the maximum range due to differences between PWSs.

Ms. Littlewood proposed modifying the expert sentence, in addition to modifying the sentence from the NDWAC, to remove the upper range numbers of 0.5 mg/L and 0.7 mg/L.

Mr. Jones stated that he liked Ms. Daniel's language suggestion from earlier in the conversation about adding a narrative sentence to the recommendation and asked Ms. Daniels to repeat it. He also added that, as a water system operator/manager, most of the time it was not up to the operator/manager to interpret the regulations.

Ms. Littlewood asked to insert Ms. Daniels' narrative sentence into the document and to discuss the potential removal of the expert opinion, as well as potentially edit the NDWAC sentence.

Ms. Daniels called for votes to gage interest in two approaches:

1. The new sentence with narrative language would replace the expert input sentence, therefore removing the upper limit; and
2. The new sentence would be added after the expert input sentence.

Of members present for these votes, there were 6 in support and 5 not in support of the first approach; and 10 in support and 1 not in support of the second approach.

Ms. Littlewood stated that she would like to have an upper limit listed in the report but was uncomfortable with the current value in the expert sentence. She asked where the testimony for the values listed in the report is located and specifically brought attention to the 0.7 mg/L value.

Mr. Borman suggested changing the static maximum values in the report to ranges.

Ms. Daniels was hesitant to change the language of the experts in the report.

Ms. Daniels paused the discussion on Recommendation 1 until after the break to see if any of the NDWAC members could determine where the 0.7 mg/L value was referenced.

Recommendation 4: Multi-Benefit Precursor Control

Ms. Daniels stated that during yesterday's meeting, some NDWAC members had concerns about precursor control and that during the meeting members had been going through the language of the MDBP report to get more detail and aid in the discussion about the recommendation. Ms. Daniels asked if the NDWAC had questions, comments, or concerns about part 1, the vulnerability screening criteria.

Ms. Littlewood stated that she was okay with the screening requirements.

Ms. Daniels reviewed part 2 of Recommendation 4 and asked the NDWAC members if they had questions, comments, or concerns about the monitoring component of the treatment technique.

Ms. Littlewood asked if the monitoring only happens if the water system is out of compliance.

Ms. Daniels responded that if a water system has violations it factors into a system's determination as vulnerable.

Ms. Littlewood asked if bromide monitoring was expensive and about the frequency of the source water monitoring.

Ms. Daniels responded that bromide monitoring was relatively inexpensive but noted that there would be an increased cost to doing source water monitoring, though it would be limited to systems identified as having high levels of bromide during the initial screening. She added that there may be an increased cost from expanding the five haloacetic acids (HAA5) to the nine haloacetic acids (HAA9).

Ms. Littlewood expressed her concern about the potential incurred cost of this recommendation on small water systems and asked Ms. Daniels if the MDBP WG had discussed it.

Ms. Daniels responded that the MDBP WG wrote the recommendation to allow for off-ramps for small systems so that they would not all need to monitor with the exception of water systems with precursors in the initial screening. Ms. Daniels emphasized that she would like to find another way to address the financial limitations of small water systems other than allowing them to perform less monitoring because Ms. Daniels does not want to decrease the level of public health protection.

Ms. Littlewood responded that she was concerned about small water systems being conscripted to a narrow, expensive solution if they are out of compliance.

Ms. Daniels added that there are no waivers for DBPs and the MDBP WG decided on the recommendation because they did not want to set MCLs, which can be costly for all water systems.

Ms. Betanzo added that the MDBP WG recognized Ms. Littlewood's concerns and that the concept of achieving public health protection in every community regardless of economic status is built into multiple MDBP WG recommendations. She mentioned that in later recommendations, the WG suggested providing a financial incentive, rather than a fine, to water systems who find precursors in their source water to allow them to fund the treatment with the technology that works best for them. Ms. Betanzo also mentioned that the WG discussed making it a requirement so that small and disadvantaged water systems could qualify for State Revolving Fund (SRF) funding.

Ms. Daniels continued the discussion on part 2 of Recommendation 4 and asked the NDWAC members if they had comments or concerns about numbers 2 and 3.

Ms. Littlewood stated that she was concerned about some of the phrasing of part 2 number 3 and expressed that she would like to see this part of the recommendation phrased as a recommendation created to assist small water systems that need additional support rather than a regulatory change that requires water systems to follow a narrow pathway back to compliance.

Ms. Daniels responded that the MDBP WG was ultimately suggesting a requirement, not a recommendation, even though the wording indicates that there is flexibility within the treatment technique. Ms. Daniels also stated that it needs to be a requirement rather than a recommendation in order for systems to receive funding. She mentioned that a renewed effort under the Infrastructure Investment and Jobs Act (IIJA) is already underway to help systems apply for funding.

Ms. Littlewood stated that any system that is out of compliance with the Stage 1 and Stage 2 Disinfectants and Disinfection Byproducts Rules (DBPRs) would already score high on the IIJA list if they sent in an application for funding, meaning there would be an additional financial burden if they also had to meet the new requirement set by this recommendation.

Ms. Betanzo added that the recommendation aims to cover DBPs that are not currently regulated by EPA, and that the implementation of appropriate precursor control could potentially help water systems already struggling to meet Stage 2 MCLs.

Recommendation 1: Disinfectant Residual

Following the break**, Ms. Daniels** returned the conversation to Recommendation 1. Ms. Daniels determined that the 0.5 mg/L value in the report was from Six Year Review 3 analysis and had been a part of many presentations to the MDBP WG. She also stated that the 0.7 mg/L value was from an in-person meeting at the EPA headquarters in Washington, D.C. that took place in June of 2023 and communicated to the MDBP WG verbally. *[The MDBP WG held its Meeting 9 over two-and-a-half days in June 2023 at the EPA's headquarters conference center in Washington, D.C.]* Ms. Daniels asked the group about altering the sentence to end with "up to 0.5 mg/L" and removing the 0.7 mg/L value because there is stronger data to support the 0.5 mg/L value.

Ms. Littlewood said that she felt removing the 0.7 mg/L value was necessary and provided an example from one of her water systems to highlight her concern with including a maximum value in the recommendation.

Ms. Daniels asked if any NDWAC member would be opposed to leaving the expert suggestion as is.

Ms. Daniels called for a vote on whether to add the new narrative sentence before the expert statement. Of members present for this vote, there were 11 in support and one not in support of this approach.

Ms. Littlewood provided an alternative perspective, stating that "moving the requirement from a detectable in the field to a numeric is problematic for small water systems and including the 0.5 mg/L as an upper range is concerning."

Recommendation 4: Multi-Benefit Precursor Control

Ms. Daniels noted that NDWAC members had agreed to attach the MDBP WG report to the letter with the recommendations that will be sent to EPA. She added that previously NDWAC members had concerns about the cost of this recommendation for small systems and asked James Proctor if he had any concerns or input to add, as he was absent from the earlier part of the meeting.

Mr. Proctor stated that he has the same concern about small water systems and asked if it would be useful to remove the word "requirement" and instead encourage the evaluation of options.

Ms. Daniels responded that even though the recommendation is written in a way that is asking EPA to review options, ultimately it would be a treatment technique implemented, which is a requirement. She expressed that what the NDWAC puts forward needs to be a balance between recognizing that additional disinfection to address opportunistic pathogens and other pathogens that are not currently well controlled and what the additional disinfection would do to DBPs. Ms. Daniels added that she was unsure that the NDWAC recommending EPA make a recommendation would be sufficiently protective of

what the increase in disinfectant residuals could do to DBPs, and that the MDBP WG had recognized how Recommendation 4 could lead to increased cost.

Mr. Proctor stated that if the NDWAC proposes a recommendation rather than a requirement, that does not necessarily mean that EPA would not make it a requirement in the future.

Ms. Daniels stated that she felt it would be incomplete rulemaking if EPA only addressed microbial protection and was unsure if EPA could make a rule raising the disinfectant residual and do nothing to address the concerns about DBPs. She once again emphasized that the MDBP WG decided on this recommendation as an alternative to proposing MCLs.

Ms. Betanzo emphasized that the intention of adding a requirement is to protect public health, and if EPA did a cost-benefit analysis of incorporating this recommendation, they would expect the benefit to outweigh the costs.

Ms. Daniels stated that later recommendations discuss the TMF capacity of smaller systems and that the MDBP WG understood that there would be a cost to this recommendation but also wanted resources allocated towards systems that might incur those costs.

Ms. Campbell-Ferrari seconded Ms. Betanzo's previous statement and added that the cost impact does not negate the fact that protecting public health is the NDWAC's primary priority. Ms. Campbell-Ferrari suggested that, if not already stated somewhere in the recommendation letter, the NDWAC supports EPA to encourage states to put more money into the systems who will need financial support if the recommendations are adopted.

Ms. Chard asked who the language in the recommendation would apply to and stated that many states already prioritize small systems and small systems with DBP violations.

Ms. Daniels responded that the recommendation was for EPA to evaluate options for a vulnerability screening requirement and EPA would determine how it would work. She added that the MDBP WG thought that all systems could potentially go through the screening process and what would trigger a system to be determined as vulnerable would have to do with what was included in the screening, such as DBP compliance history and source water quality. Ms. Daniels added that EPA could also consider an off-ramp where systems that have met certain requirements may not have to even undergo the screening.

Ms. Chard stated that she feels differently about the information included in the NDWAC recommendations compared to the MDBP WG report and asked Ms. Daniels if the NDWAC would consider bringing any of the language from the MDBP WG report into the letter.

Ms. Daniels stated that she did not feel inclined to include additional information in the recommendation because the WG report would be attached but stated that if the NDWAC members wanted to bring through more information from the WG report, there was potential to add it.

Ms. Chard explained that she would like to add more detail to the NDWAC recommendation to retain some of the information from the MDBP report, specifically in relation to Recommendation 4 part 1.

Ms. Daniels suggested adding in the original language of the MDBP report for Recommendation 4 part 1.

Ms. Daniels called for a vote on parts 1 and 2 of Recommendation 4 with modification to part 1. Of members present for this vote, there were 11 in support and 2 not in support.

Mr. Proctor stated that he was concerned about the recommendation leading to a regulation before there was sufficient data to support the need for a regulation. He suggested adding conditional language to the recommendation so that if science does not support a regulation, one does not need to be put in place.

Ms. Daniels responded that the MDBP WG added a reference to this section stating that EPA, through the regulatory process, has the responsibility to conduct the science and collect the data to support the implementation of this recommendation.

Rob Greenwood of Ross Strategic, who served as professional facilitator for the MDBP WG, added that the MDBP WG had discussed the questions and concerns Mr. Proctor had raised and highlighted the use of the word "evaluate" in the recommendation.

Ms. Littlewood stated that she is okay with part 1 or Recommendation 4 but not part 2 because she is concerned about mandating a treatment technique.

Ms. Daniels called for a vote on the modified part 1 of Recommendation 4. All 13 members present for this vote were in support.

Ms. Daniels called for a vote on part 2 of Recommendation 4. Of members present for this vote, there were 12 in support and one not in support.

Ms. Littlewood added an alternative perspective, stating that a DBPR already exists where water systems must come into compliance with it, and that she is okay with EPA providing assistance with screening to out of compliance systems, but she cannot agree with the treatment technique aspect if the NDWAC is recommending a regulatory element.

Recommendation 5: Finished Water Storage Tanks

Ms. Daniels overviewed Recommendation 5, parts 1 and 2, and gave the floor to Mr. Elmore.

Mr. Elmore stated that Wisconsin has experience with storage tank requirements and noted that proper training (specifically the use of dry suits instead of wet suits) and disinfection need to be emphasized if diver inspections are included in the recommendation. He also added that it is important to have adequate training and oversight of storage tank requirements. Mr. Elmore mentioned that he does not see anything in the recommendations about cleaning up the distribution system and would support a recommendation or emphasis on the consideration of requirements for distribution system cleaning that may include unidirectional flushing in a pre-existing recommendation.

Ms. Daniels stated that the NDWAC is allowed to add additional recommendations on top of those proposed by the MDBP WG and added that the MDBP WG report goes into more detail about inspections and existing industry standards related to what Mr. Elmore was speaking about.

Ms. Quirk stated that the MDBP WG discussed unidirectional flushing as a treatment technique for reducing DBPs and added that her water systems see a lower chlorine residual need at the end of their systems when unidirectional flushing is being used. Ms. Quirk also stated that unidirectional flushing is not an option for all groups.

Ms. Chard asked if the utilities themselves or the state would be able to contract with an outside source to perform the inspections.

Ms. Quirk stated that the Green Bay Water Utility always contracts an outside firm to perform their inspections.

Ms. Daniels added that the tank inspection requirement would be for water systems to complete and then provide the information to the state as needed. She also mentioned that there is another section in the recommendations that discusses state capacity to implement programs where sanitary surveys are mentioned. Ms. Daniels stated that the item discusses that states will need increased sanitary survey guidance and training if the MDBP rules add additional components that need to be incorporated into the state's sanitary surveys, and that she does not expect state staff to perform interior tank inspections.

Ms. Littlewood stated that she supports this recommendation but does not want to remove the possibility that the operator or tank owner perform the inspection themselves. She also asked what situations the phrase "as needed" would be referring to as it was written in part 1 of the recommendation?

Ms. Daniels responded that the MDBP report lists the factors that would lead to the "as needed" but that there could be more.

Ms. Daniels called for a vote on Recommendation 5 parts 1 and 2. All 13 members present for this vote were in support.

Recommendation 6: Chloramination

Ms. Daniels overviewed Recommendation 6, parts 1, 2, 3, and 4 and opened the floor to questions, comments, and concerns.

Mr. Proctor asked if rather than assuming that there is no existing national guidance and having the NDWAC recommend that EPA start from scratch, to instead recommend that EPA review existing guidance and create new guidance to fill in the gaps.

Ms. Daniels responded that the MDBP WG report references preexisting guidance.

Mr. Borman added that part 1 mentions "relevant existing documents and literature".

Mr. Jones asked if the recommendation was intended only for water systems that chloraminate and if the recommendation also applied to water systems that chloraminated seasonally.

Ms. Daniels responded that the recommendation was intended for any system that chloraminates, even if they only do it seasonally.

Ms. Daniels called for a vote on Recommendation 6. All 13 members present for this vote were in support.

Recommendation 7: Consecutive Systems

Ms. Daniels moved to Recommendation 7 and gave the floor to Mr. Elmore.

Mr. Elmore stated that he wanted to bring up situations where water systems are not necessarily consecutive but are extensions of the distribution system (e.g., systems that wholesale to another entity

but not individual customers). He was unsure of what additional language in the recommendation would help to address his concern but wanted to bring the situation up for consideration.

Ms. Daniels responded that she is not sure if Mr. Elmore's concern could be addressed in the NDWAC recommendations because the issue relates directly to the SDWA. Ms. Daniels suggested that the issue could be brought to EPA through the Association of State Drinking Water Administrators (ASDWA) because she was not sure it could be fixed under the MDBP rules.

Mr. Elmore responded that he is okay with that approach because he felt that regardless of what language would be inserted into the recommendation, the problem would not be solved. Mr. Elmore stated that he wanted to bring the issue up to see if the WG had discussed it.

Ms. Daniels added that the MDBP WG did not get into detail.

Mr. Borman stated that he is okay with part 1 of the recommendation but he has an issue with part 2 because he does not want EPA to get involved in the contract business between consecutive systems and wholesalers. He stated that he would support this recommendation as long as the language of the recommendation retained the idea of EPA providing "guidance."

Ms. Daniels called for a vote on Recommendation 7. All 13 members present for this vote were in support.

Recommendation 8: Source Control

Ms. Daniels emphasized that the NDWAC recommendations work together to support one another and overviewed Recommendation 8 parts 1 and 2. She opened the floor to questions, comments, and concerns.

Ms. Chard stated that she was concerned with the language of part 2 because she does not want the recommendation to instruct EPA to go beyond the scope of the Clean Water Act. Ms. Chard emphasized that she would be okay with modifications to part 2 but does not like it as it is currently written.

Mr. Borman responded that many of Ms. Chard's concerns were brought up by the MDBP WG and that he thought the recommendation was meant to be nonregulatory as outlined in the MDBP WG report.

Ms. Daniels stated that the MDBP WG uses the word "restrict" in the report, which is strong language, and emphasized that reducing discharge to zero is not practical which is why the recommendation is suggesting for EPA to examine opportunities to address what is coming downstream where practical. She added that some of the MDBP WG supported the determination of the proper entity to pay for treatment rather than it always being the downstream user.

Ms. Chard responded that another issue is whether the same or different entities treat drinking water and wastewater, and she emphasized that she would like the language in the recommendation to undoubtedly be a recommendation and not a regulatory requirement.

Mr. Elmore and **Ms. Chard** suggested alternative phrasing instead of the word "restrict."

Ms. Quirk mentioned that during the MDBP WG in-person meeting with EPA, she had been told that EPA recently implemented regulations to limit coal plant discharges into source waters. She recommended that the NDWAC encourage EPA to continue that type of work.

Ms. Littlewood suggested changing the language of line 168 and 169 of the document on display in this meeting to address Ms. Chard's previous concern, and Ms. Chard suggested the addition of "as appropriate" to the phrase.

Ms. Quirk asked if the NDWAC needed to qualify what "appropriate" means in the recommendation.

Ms. Daniels responded that she is okay with the inclusion of "as appropriate" because state clean water programs generally have a benchmark for moving forward with a standard. She understands that under the Clean Water program, EPA similarly limits discharge.

Ms. Chard added that the EPA Clean Water Act staff who would be tasked with implementing the recommendation would have to go through the process to determine what qualifies as "appropriate," which is why she is okay with adding the phrase to the recommendation.

Ms. Daniels called for a vote on Recommendation 8 with modification. All 13 members present for this vote were in support.

Recommendation 9: Environmental Justice

Ms. Daniels overviewed Recommendation 9 parts 1, 2, and 3 gave the floor to Steve Elmore.

Mr. Elmore asked if the NDWAC would consider adding specific verbiage (e.g., "SRF" or "grant resources") to the recommendation. He stated that he thinks a new program might be needed to assist small and disadvantaged systems, especially if regulations are modified and that leads to increased requirements for systems to meet. Mr. Elmore added that training and financial assistance would also be needed.

Ms. Daniels asked NDWAC members who served on the MDBP WG if the WG report specifically mentioned any funding opportunities.

Ms. Betanzo responded that Recommendations 9, 10, and 11 discuss the need for resources but there is nothing as specific as Mr. Elmore had suggested.

Ms. Daniels added that Recommendation 10 covers TMF assistance for small, rural, EJ, and disadvantaged communities and the reason SRFs were not mentioned in the recommendation was because EPA does not have full authority over the allocation of SRF funds. She also mentioned that the MDBP WG discussed that there should be a priority need with an action plan to identify how to fund a program at the necessary level by using a congressional budget request.

Ms. Campbell-Ferrari asked a member of the MDBP WG to clarify part 2 of the recommendation and explain the thinking behind how it is worded.

Ms. Betanzo provided an example to clarify the recommendation about providing financial rewards and necessary resources, rather than a financial penalty, to water systems that discover problems when sampling for disinfectant residuals in a distribution system. **Ms. Campbell-Ferrari** stated that she liked Ms. Betanzo's statement but did not feel that came through in the wording of the recommendation. **Ms. Betanzo** responded that there is more content to convey her message in the formal MDBP WG report.

Ms. Daniels stated that language from the MDBP report could be brought into this recommendation.

Ms. Betanzo mentioned that in the introduction to the MDBP WG report there is a set of themes that Ms. Daniels overviewed yesterday which mentions the idea of providing positive incentives to solve water quality issues. Ms. Betanzo suggested incorporating the relevant language from the introduction of the MDBP report into the NDWAC recommendation letter.

Ms. Campbell-Ferrari stated that she agreed that there is an overarching theme and felt that it should be stated at some point in the recommendation letter.

Ms. Daniels asked Ms. Campbell-Ferrari if inserting some of the language from part 2 of Recommendation 9 in the MDBP WG report into the recommendation letter would be helpful. **Ms. Campbell-Ferrari** responded that she felt it would provide important context to the recommendation but noted that it was not a dealbreaker for her if the language was added or not.

Ms. Daniels called for a vote on Recommendation 9 including the addition of language from the MDBP WG's report. All 13 members present for this vote were in support.

Recommendation 10: Public Water System Technical, Managerial, and Financial Capacity
Ms. Daniels overviewed Recommendation 10 parts 1, 2, 3, and 4 and gave the floor to Ms. Chard.

Ms. Chard noted that the phrase "make permanent" in part 3 of the recommendation is a congressional act and asked if it was appropriate to insert the phrase because the letter is going to EPA.

Ms. Daniels responded that Ms. Chard made a good point and the NDWAC would need to think about the phrasing because the MDBP WG would like to have that part of the recommendation included.

Ms. Elmore added that he had the same concerns as Ms. Chard but felt comfortable with the recommendation. He suggested that the NDWAC inserts language to part 3 that highlights the importance of low-income household assistance and emphasized that even if EPA does not have a direct role it should still be a part of the recommendation.

Ms. Daniels asked if a representative of EPA on the call could comment on what language might be acceptable to incorporate into the letter.

Ms. Corr responded that EPA would not comment on the NDWAC's considerations of the MDBP WG content while the NDWAC is in the process of developing the recommendation material.

Ms. Daniels suggested changing the language from "make permanent" to "support or advocate for" in the recommendation.

Ms. Campbell-Ferrari mentioned that she has seen instances where individuals within EPA have actively supported or advocated for programs. She added that she would prefer to use the term "advocate" in the recommendation.

Mr. Proctor stated that federal agencies are allowed to provide technical assistance but not affirmatively advocate for funding or legislation. He suggested changing the language to "support efforts to make permanent."

Ms. Daniels responded that she felt more comfortable with the use of the word "support" and asked the NDWAC members if they would be okay with the language change to "support".

Ms. Betanzo asked for more time to deliberate the change and Ms. Daniels paused the discussion and vote on Recommendation 10 until tomorrow's meeting.

Recommendation 11: Primacy Agency Capacity
Ms. Daniels overviewed Recommendation 11 parts 1 and 2 and opened the floor to questions, comments, and concerns.

Ms. Daniels called for a vote on Recommendation 11. All 12 members present for this vote were in support.

Recommendation 12: Data and Analysis Gaps
Ms. Daniels overviewed Recommendation 12 and opened the floor to comments, questions, and concerns.

Mr. Elmore stated that he likes the recommendation but does not think the current language adequately addresses the need for primacy agencies to have platforms to provide regulatory oversight on the areas mentioned in the recommendation.

Ms. Daniels asked if he felt his concern should be addressed under Recommendation 11 instead of Recommendation 12. Mr. Elmore responded that he felt his concern should be addressed in Recommendation 12 because it is specific to data management analysis. He added that past data gaps could have been caused by a lack of support of primacy agencies.

Ms. Betanzo stated that some of Mr. Elmore's concerns are addressed in the full MDBP WG report but not necessarily in the context of primacy. She added that Recommendation 9 intervention 3 in the WG report could be applicable. **Ms. Daniels** stated that she felt intervention 3 was intended towards making information available to communities but added that the NDWAC could adjust the wording to recommend that primacy agencies adequately track compliance initially. **Ms. Daniels** agreed with Mr. Elmore that in the future, MDBP rules language about appropriate data systems for primacy agencies needed to be included.

Ms. Betanzo mentioned that she did not think that solving the data gaps would be the first step in revising the MDBP rules and viewed the recommendation as a collection of information that was unknown to the MDBP WG. Ms. Betanzo added that she felt as though the language under Recommendation 12 in the full report did not clearly and succinctly communicate that solving the data gaps could be completed in parallel with rulemaking.

Next Steps and Closing Remarks

Ms. Daniels reviewed the action items to discuss or revisit on Day 3 of the NDWAC meeting. **Ms. Corr** adjourned for the day.

Day 3 - November 30, 2023

Ms. Daniels started Day 3 with the following key objectives:

1. Revisit Recommendation 10, develop alternative language for Part 3, and revote.
2. Revisit Recommendation 12 and revote.
3. Deliberate Recommendation 13 and do preliminary vote.
4. Revisit Recommendation 1 and Recommendation 4.
5. Final voting for all Recommendations.
6. Revise the draft letter and insert all final Recommendations.

Revisiting Recommendation 10: Public Water System Technical, Managerial, and Financial Capacity
Ms. Daniels discussed modifying the language to indicate what EPA could do in part 3.

Ms. Campbell-Ferrari discussed the difference between using the language "support" vs. "advocate for". She would like to see EPA use more active language to show that they are advocating and vocally supporting. She suggested referencing the EPA Needs Assistance to support the Low-Income Household Water Assistance Program.

Ms. Betanzo agreed. She suggested including the word "prioritize" to make the language more active.

Ms. Daniels said she is not sure how far EPA support can go for a program that is not funded.

Ms. Quirk said she talked to legislators who said it would be unlikely that this program would get funded.

Ms. Campbell-Ferrari said EPA should be more vocal about getting funding for this program.

Mr. Proctor wanted to switch the order of the words "prioritize" and "advocate." The phrase "where possible" was moved to apply to "advocate."

Ms. Campbell-Ferrari said that the phrase "where possible" is unnecessary because these are recommendations, and EPA will only be able to do what they can. The phrase was removed.

Ms. Betanzo asked if the group would want to include that we are advocating for a longer-term solution.

No hands were raised for further comments.

Ms. Daniels called for a vote on Recommendation 10 with modification. Of members present for this vote, there were 12 in support and one member abstained.

Revisiting Recommendation 12: Data and Analysis Gaps
Mr. Elmore raised the potential to expand on part 5, referencing page 44 of the MDBP report to see what the initial WG included.

Mr. Elmore said his concern fits more with Recommendation 9, and referenced Intervention 3, bullet 4. He suggested that more tools are needed in order to implement the requirements. Those tools are provided by EPA through the modernization of SDWIS. He said this was not captured in the letter in any way. He suggested adding something that is more general, such as "develop tools to implement data."

Ms. Daniels thought people would wonder why this is under Recommendation 9 rather than Recommendation 12. She added that the group could make this modification to Recommendation 9 and not 12. No comments or concerns were raised.

Revisiting Recommendation 9: Environmental Justice

Ms. Betanzo said that the language "develop requirements" is a bit out of place here. She states that depending on how you set up a requirement, it may be trackable, but some things are unique to an individual water system. Thus, it should be made sure that things are set up in a way to allow for automated reporting.

Ms. Daniels asked whether the reporting in Recommendation 9 should be one bullet or two bullets.

Ms. Elmore concurred with using two bullets, and stated that SDWIS should include implementation, enforceability, and public availability of the data. There should be a push for more electronic reporting.

Ms. Daniels wanted to add to what the WG already produced.

Changes were made to Recommendation 9, part 3 to reference the six items listed under Intervention 3. An additional statement was made that EPA should provide the necessary funding and resources to complete upgrades to SDWIS as soon as possible to improve the availability and transparency of data to consumers and allow primacy agencies to fully implement rules to include tracking operation and compliance data and enforcing new requirements.

Ms. Daniels called for a vote on Recommendation 9 with modification. All 13 members present for this vote were in support.

Revisiting Recommendation 12: Data and Analysis Gaps

Ms. Daniels overviewed Recommendation 12 and opened the floor to comments, questions, and concerns.

No additional concerns were raised on Recommendation 12.

Ms. Daniels called for a vote on Recommendation 12. All 13 members who were present for this vote were in support.

Recommendation 13: Ground Water under the Direct Influence of Surface Water (GWUDI)

Ms. Daniels noted that the focus was that EPA should revisit the definition, determination methods, and guidelines for GWUDI.

Ms. Littlewood was concerned that requiring all systems to periodically update their GWUDI determination does not make sense for the state of Alaska. In Alaska, there are no systems to her knowledge that have gone from GWUDI to ground water or ground water to GWUDI. She would be more comfortable if this was not a mandated requirement and rather a recommendation handled at the state level. This is because individual states have better knowledge of their geological systems and water.

Ms. Daniels pointed out that the language indicates that it is not required that systems do a re-evaluation, but rather that it is a recommendation.

Mr. Borman said there should be a mechanism to go back and re-determine the GWUDI designation and it should not be more stringent on certain states.

Mr. Jones mentioned that tribes are regulated by the EPA and not by the state. States do not have jurisdiction over tribes and sovereign nations.

Ms. Littlewood suggested changing the language to state that "primacy agencies would periodically re-evaluate the determinations".

Mr. Jones agreed that this change would help the group reach consensus on it because there is greater generalizability for whether the primacy agency is the state or EPA.

Mr. Borman said that many states are looking at aerobic spores and water quality chemistry changes as good indicators. Primacy agencies need to receive federal authorization to re-evaluate determinations.

Ms. Littlewood stated that she is in favor of parts 1 and 2.

Ms. Daniels shared an example of how bottled water is regulated in Pennsylvania. A bottler drilled additional boreholes and impacted the protected nature of a portion of the original aquifer. Awareness of this issue would have only been possible if it were indicated in routine monitoring. The impact was only detected because the boreholes had coliform bacteria as well.

Part 3 of Recommendation 13 was revisited to edit the language.

Ms. Littlewood suggested that "monitoring" should be included in addition to "events".

Ms. Daniels called for a vote on Recommendation 13 with modification. All 13 members present for this vote were in support.

This concluded the deliberations and preliminary votes on all 13 recommendations. Ms. Daniels noted that Recommendations 1 and 4 would need to be revisited after the break to make sure that all alternative perspectives were adequately captured.

Revisiting Recommendation 1: Disinfectant Residual

Ms. Littlewood believed that leaving it at 0.2 mg/L or as the current detectable level would be best. She discussed the challenge of meeting the 0.2 mg/L level and the further non-compliance issues and costs associated with it.

Ms. Daniels shared the costs associated with Pennsylvania: systems were able to change their practices within the distribution system to achieve a more stable and consistent residual through changed operation practices, which then helped control disinfection byproducts. For most systems, raising the residual level to 0.2 mg/L did not result in a major change in the DBP compliance rates.

Ms. Daniels said that the likely case, which Scott Borman also mentioned, is that systems will need to look at precursor removals.

Mr. Borman said that there should be a statement that Recommendations 1 and 4 need to work together.

Ms. Daniels said it is not true in all cases that if you raise the minimum detectable level, then some systems will be automatically put out of compliance, especially if you pair Recommendation 1 with what is stated in Recommendation 4.

The additional discussion was included as members' responses to the alternative perspective and states that Recommendation 1 is intended to work in concert with Recommendation 4 to avoid increasing DBP formation.

Revisiting Recommendation 4: Multi-Benefit Precursor Control

Ms. Littlewood revisited the alternative perspective that she raised on Day 2. She said that on line 113 of the document being displayed in this meeting, there should be a change from "there are more affordable avenues" to "there could be more affordable avenues."

Ms. Borman emphasized that Recommendation 4 is a multi-layered approach to solving DBP issues. It allows for flexibility and variability of different treatment techniques before mandating any treatment processes.

Ms. Betanzo reiterated that the point of this recommendation is for public health protection and suggested that this should be included in the statement.

There were no further comments on the alternative perspective and additional discussion.

Final Voting on All Recommendations

Ms. Daniels explained that the final voting would only be on the underlying recommendation. There would not be voting on alternative perspectives because those become part of the recommendations going to EPA. Ms. Daniels added that if there was previously concurrence in voting but disagreement now, then the goal is to capture any remaining alternative perspectives.

Mr. Greenwood stated the only place where sub-part voting is necessary is Recommendation 4 because part 1 had received consensus, but part 2 did not receive full support.

Sarah Faust of Ross Strategic, who assisted with meeting support, asked clarifying questions about not voting on alternative perspectives and additional discussion.

Ms. Daniels called for final votes.[8] Final tallies on the recommendations including modifications made during the meeting were:

Recommendation 1: 11 members voted yes, with Ms. Littlewood voting no.

Recommendations 2: All 12 members present voted yes.

Recommendation 3: All 12 members present voted yes.

Recommendation 4 Part 1: All 12 members present voted yes.

Recommendation 4 Part 2: 11 members voted yes, with Ms. Littlewood voting no.

Recommendation 5: All 12 members present voted yes.

Recommendation 6: All 12 members present voted yes.

Recommendation 7: All 12 members present voted yes.

Recommendation 8: All 12 members present voted yes.

Recommendation 9: All 12 members present voted yes.

[8] NDWAC members Ms. Barney, Mr. Proctor, and Mr. Underwood were not present for the final votes.

Recommendation 10: 11 members voted yes and one abstained.

Recommendation 11: All 12 members present voted yes.

Recommendation 12: All 12 members present voted yes.

Recommendation 13: All 12 members present voted yes.

Additional Issues
Ms. Daniels opened the floor to any additional issues that were not adequately addressed in the 13 Recommendations.

Mr. Elmore suggested highlighting information on flushing, specifically unidirectional flushing techniques because it has shown great success in maintaining DBP formation and disinfectant residuals in some systems. He references Page 12 of the MDBP report, Recommendation 1 part 1, where flushing is mentioned.

In response to this, **Ms. Daniels** showed a link in the reference to an EPA toolbox which contains drinking water distribution system tools and resources. **Mr. Elmore** thought this was sufficient to address his concern. **Ms. Daniels** said that the WG did not feel a need to pursue new regulations surrounding operations and maintenance and that they can make sure that water suppliers are educated about the different options available to them using the toolbox of guidance from the EPA.

Mr. Elmore supported pulling the existing text from the MDBP report into the body of the letter for further emphasis.

Ms. Daniels called a new vote for making this modification to Recommendation 1 and placing it before the alternative perspective. The additional modification was confirmed, with Ms. Littlewood continuing to vote no on Recommendation 1.

No further comments were made on the recommendations.

Draft Letter from the Council to EPA

Discussion of the letter's draft introductory text, which was shared on-screen, resulted in the WG's report being described as foundational information; and inclusion of the WG's six key themes (from Page 10 of the WG's report), attributed to WG members. There was additional discussion about whether to reference the expert inputs for transparency. **Ms. Corr** said that information will be made available on the EPA website.

Ms. Corr said that the next steps would be to produce the final clean version of the letter and post the signed letter to the EPA website.

Closing Remarks

Ms. Daniels thanked everyone for their fantastic work and input on the MDBP WG over the course of a year and a half.

Dr. Albert thanked Ms. Daniels for chairing the NDWAC, leading the NDWAC meeting, and co-chairing the WG. He also thanked the WG's facilitator Mr. Greenwood for his role.

Ms. Corr recognized and thanked five council members—Ms. Campbell Ferrari, Ms. Peters, Mr. Proctor, Ms. Quirk, and Mr. Underwood—who will be departing the NDWAC in December and closed out the meeting.

APPENDIX A
NDWAC Roster: November 2023

National Drinking Water Advisory Council Members	
Lisa D. Daniels, NDWAC Chair Director, Bureau of Safe Drinking Water Pennsylvania Department of Environmental Protection Harrisburg, PA	Yolanda Barney Environmental Program Manager Navajo Public Water System Supervision Program Navajo Nation Environmental Protection Agency Window Rock, AZ
Elin Warn Betanzo Founder and Principal Safe Water Engineering, LLC Detroit, MI	D. Scott Borman General Manager Benton/Washington Regional Public Water Authority Rogers, AR
Alexandra Campbell-Ferrari Co-Founder and Executive Director The Center for Water Security and Cooperation Washington, DC	Shellie R. Chard Director, Water Quality Division Oklahoma Department of Environmental Quality Oklahoma City, OK
Steven B. Elmore Program Director Bureau of Drinking Water and Groundwater Wisconsin Department of Natural Resources Madison, WI	Eagle Jones Director of Water Operations Pechanga Tribal Government Temecula, CA
Jana Littlewood National Rural Water Association Board of Directors -- Alaska Representative Wasilla, AK	Jennifer L. Peters National Water Programs Director Clean Water Action/Clean Water Fund Littleton, CO
James M. Proctor, II Senior Vice President and General Counsel McWane, Inc. Birmingham, AL	Nancy A. Quirk General Manager Green Bay Water Utility Green Bay, WI
Alex Rodriguez President and Chief Executive Officer DCG Public Affairs Diversity Consulting Group, LLC Santa Barbara, CA	Jeffrey W. Szabo Chief Executive Officer Suffolk County Water Authority Oakdale, NY
Macaroy "Mac" Underwood Principal Consultant Raftelis Financial Consultants, Inc. Vestavia, AL	
Centers for Disease Control Liaisons	
Dr. Arthur S. Chang Chief Medical Officer Division of Environmental Health Science and Practice National Center for Environmental Health Centers for Disease Control and Prevention Atlanta, GA	Dr. Vincent Hill Chief, Waterborne Disease Prevention Branch Division of Foodborne, Waterborne and Environmental Diseases National Center for Emerging and Zoonotic Infectious Diseases Centers for Disease Control and Prevention Atlanta, GA

National Drinking Water Advisory Council: Microbial and Disinfection Byproducts (MDBP) Rule Revisions Working Group
Lisa D. Daniels* – Working Group Co-chair Director, Bureau of Safe Drinking Water Pennsylvania Department of Environmental Protection Harrisburg, Pennsylvania
Andy Kricun, PE** **– Working Group Co-chair** Senior Fellow, US Water Alliance Managing Director, Moonshot Missions Camden, New Jersey
Elin W. Betanzo, PE** Founder and Principal, Safe Water Engineering LLC Detroit, Michigan
D. Scott Borman* General Manager, Benton/Washington Regional Public Water Authority Rogers, Arkansas
John Choate General Manager, Tri County Regional Water Distribution District Russellville, Arkansas
Kay Coffey, PhD, PE Engineering Manager and Public Water Supply Group Project Adviser, Water Quality Division Oklahoma Department of Environmental Quality Oklahoma City, Oklahoma
Jeffrey K. Griffiths, MD, MPH&TM Professor of Public Health and Community Medicine, and of Medicine Tufts University School of Medicine Boston, Massachusetts
Michael Hotaling, MBA, PE Facilities Manager (Retired), Newport News Waterworks Department Yorktown, Virginia
Jolyn Leslie, PE Regional Engineer, Office of Drinking Water, Northwest Regional Office Washington State Department of Health Kent, Washington
Rosemary Menard Water Director, City of Santa Cruz Santa Cruz, California
William F. Moody, PE, BCEE Director, Bureau of Public Water Supply Mississippi State Department of Health Jackson, Mississippi
Erik D. Olson Senior Strategic Director, Health & Food, Healthy People & Thriving Communities Program Natural Resources Defense Council Washington, D.C.

Benjamin J. Pauli, PhD** Associate Professor of Social Science, Kettering University Flint, Michigan
Nancy A. Quirk, PE* General Manager, Green Bay Water Utility Green Bay, Wisconsin
Lisa J. Ragain Principal Water Resources Planner, Metropolitan Washington Council of Governments Washington, D.C.
Alex Rodriguez* President & CEO, Diversity Consulting Group Santa Barbara, California
Lynn W. Thorp National Campaigns Director, Clean Water Action Clean Water Action/Clean Water Fund Washington, DC
Gary Williams Executive Director, Florida Rural Water Association Tallahassee, Florida

*Member of U.S. EPA's National Drinking Water Advisory Council.

**Member of U.S. EPA's National Environmental Justice Advisory Council.

APPENDIX B

NDWAC Chair Presentation
November 2023

NATIONAL DRINKING WATER ADVISORY COUNCIL

MICROBIAL AND DISINFECTION BYPRODUCT WORKING GROUP RECOMMENDATIONS

MDBP NDWAC Working Group Membership

- **Lisa Daniels, WG Co-Chair, Director,** Pennsylvania Department of Environmental Protection, Bureau of Safe Drinking Water
- **Andy Kricun, WG Co-Chair,** Managing Director**,** Moonshot Missions
- **Elin Betanzo** - Founder of Safe Water Engineering LLC.
- **Scott Borman** - General Manager, Benton/Washington Regional Public Water Authority
- **John Choate** - General Manager, Tri County Regional Water Distribution District
- **Dr. Kay Coffey** - Public Water Supply Engineering Manager and Group Project Adviser, Oklahoma Department of Environmental Quality Water Quality Division
- **Dr. Jeffrey Griffiths** - Professor of Public Health and Community Medicine, Tufts University School of Medicine
- **Michael Hotaling** -Facilities Manager (Retired), Newport News Waterworks Department
- **Jolyn Leslie** - Regional Engineer, Washington State Department of Health
- **Rosemary Menard** - Water Director, City of Santa Cruz
- **Bill Moody** - Director of the Bureau of Public Water Supply, Mississippi State Department of Health
- **Erik Olson** - Senior Strategic Director, Health & Food, Natural Resources Defense Council
- **Dr. Benjamin Pauli** - Assistant Professor of Social Science, Department of Liberal Studies, Kettering University
- **Nancy A. Quirk** - General Manager, Green Bay Water Utility
- **Lisa Ragain** - Principal Water Resources Planner, Metropolitan Washington Council of Governments
- **Alex Rodriguez** - President & CEO, Diversity Consulting Group
- **Lynn Thorp** - National Campaigns Director, Clean Water Action/Clean Water Fund
- **Gary Williams** - Executive Director, Florida Rural Water Association

MDBP Schedule

- EPA's schedule for the NDWAC's MDBP Rule Revisions WG meetings started in the Spring 2022
- WG met 12 times from May 2022-November 2023
- WG report delivered to NDWAC November 15, 2023
- NDWAC report delivery to EPA December 15, 2023

- EPA is targeting the following deadlines:
  - Rule proposal or a formal decision not to propose amended rules: NLT July 31, 2024*
  - Final Agency Action: Final rule or withdraw proposal by September 30, 2027*

*Source: Waterkeepers Alliance, Inc. et al v. U.S. et al, EPA Settlement Agreement, filed June 1, 2020 (19 Civ. 899 (LJL)).

WG Report

1. All working group members reviewed the final report text and understood it would move forward to the NDWAC.
2. Report contains 13 Recommendations.
3. Each Recommendation includes an abbreviated statement of the recommended action, then "Background" and "Outcomes Sought"
4. Nine Recommendations received "Full" support of the Working Group. (Full = Yes from 18 WG members)
5. Three Recommendations received "Substantial" support. (Substantial = Yes from 15-17 WG members)
6. One Recommendation received "Full" support for Parts 1 and 2 and "Substantial" support for Part 3.

WG Recommendations and NDWAC Charge Topics

WG Recommendations

- R1: Disinfectant Residual
- R2: Premise Plumbing
- R3: DBP MCL Data and Analysis Gaps
- R4: Precursor Control
- R5: Finished Water Storage Tanks
- R6: Chloramination Practice
- R7: Consecutive Systems
- R8: Contaminant Source Control
- R9: Environmental Justice
- R10: PWS TMF Capacity
- R11: Primacy Agency Capacity
- R12: Overall MDBP Data and Analysis Gaps
- R13: GWUDI

NDWAC Consensus Recommendation Topics

- Disinfectant residuals and opportunistic pathogens
- Regulated and unregulated DBPs
- Finished water storage facilities
- Distribution system water quality management
- Source water approach, including DBP precursor removal
- Mischaracterized ground water under the direct influence of surface water (GWUDI) systems
- Sanitary Surveys
- Water Safety Plans
- Consecutive and small systems

MDBP Working Group Report Cross-Cutting Themes (Summarized from Report Section 3 "Key Themes Across Recommendations")

- EPA will undertake substantial additional analysis as part of EPA rules revision evaluation and will be more in-depth than that available to WG members during their deliberations.
- Emphasis on delivering equitable outcomes across all communities irrespective of community and PWS capacity and underlying vulnerabilities – need to address affordability and develop a specific plan of action for small, rural, disadvantaged and historically underserved communities to ensure that no community or household gets left behind.
- There is an understanding that new requirements can place pressure on the affordability of drinking water services (especially small, rural, and EJ communities), and the recommendations seek to reflect a strong emphasis – consistent with the commitment to delivering equitable outcomes – on enhanced support to low-income customers; along with recognition that DWSRF funding is reliant on upgrades needed to comply with SDWA – it is difficult to get funding to implement guidance or best practices.
- Recommendations related to new requirements utilize a problem-based approach and seek to establish positive incentives for identifying and addressing problems proactively.
- Recommendations are assembled to work together to advance equitable public health improvement, even as individual recommendations, in and of themselves, can act to advance public health and improved PWS performance.
- Recommendations span from source water to tap and invoke SDWA changes, other federal authorities (e.g., TSCA, CWA, CAA), and a mix of regulatory and non-regulatory interventions.

Recommendations Overview

Appendix C

November 2023 Public Meeting: Written Public Comments to the NDWAC

American Water Works Association
Dedicated to the World's Most Important Resource™

Government Affairs Office
1300 Eye Street NW
Suite 701W
Washington, DC 20005-3314
T 202.628.8303
F 202.628.2846

November 21, 2023

Lisa D. Daniels
Chair
National Drinking Water Advisory Council
Office of Ground Water and Drinking Water (Mail Code 4601)
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

Transmitted electronically via NDWAC@epa.gov

RE: Report of the Microbial and Disinfection Byproducts Rule Revisions Working Group

Dear Ms. Daniels and NDWAC members,

On Thursday, November 16 the U.S. Environmental Protection Agency (EPA) released the National Drinking Water Advisory Council (NDWAC) Working Group report with recommendations for revision of the suite of existing microbial and disinfection byproducts (DBPs) rules (M/DBP rules). These comments were due by noon November 21, three business days later, so as a matter of necessity the following comments are brief.[1]

First, the American Water Works Association (AWWA) would like to express its appreciation to the members of the NDWAC working group and water sector members who volunteered countless hours to participate in web-enabled meetings and associated preparatory work. We are especially appreciative of the efforts by the working group members with a strong grasp of the current Safe Drinking Water Act (SDWA) regulations and the practical aspects of reliably providing safe drinking water to the communities they serve. Disinfection is a linchpin of drinking water treatment and, as a consequence, existing practice and associated regulatory controls are interwoven and not easily conveyed to those who are not immersed in implementation on a day-to-day basis.

The M/DBP regulations are central to water system design and operation. The risk-risk trade-offs are both discrete (e.g., disinfection to inactivate pathogens vs formation of DBPs) and more global (e.g., will a new regulatory requirement for more total organic carbon removal improve system operation or harm consumers by further delaying more critical investments in environmental justice communities). Because of the importance of these rules to protecting public health and centrality of these rules to water system

[1] 88 Federal Register 75281

operation, AWWA has asked repeatedly for EPA to support relevant research and information collection as well as engage knowledgeable stakeholders in developing technically sound solutions. EPA is now faced with an imminent deadline for publishing a proposed rule(s) but still lacks the underlying data to craft implementable regulatory requirements that effectively protect public health.[2] Currently, there are four EPA research projects that have just been initiated to inform the questions before the working group. EPA did not engage in *a priori* planning with the sector. The research objectives were not coordinated in a deliberate manner and most importantly, the research results will not be available until EPA is past the point-of-no-return in the substance of the upcoming rulemakings. AWWA urges the NDWAC to bolster Recommendation 12 to strongly encourage Administrator Regan to direct the relevant offices in EPA to engage drinking water associations and research organizations in crafting a strategic research and information collection program for M/DBP data gaps. Ideally this would be a more holistic research agenda, but the working group report provides a clear demonstration of knowledge gaps facing EPA with respect to disinfection and DBPs.

The working group recommendations are, in part, a reflection of expert dialogue within the water sector. That dialogue includes concepts readily found in AWWA's manuals of practice, conference proceedings, and committee of practice discussions. AWWA's recommendations for best practice include basic concepts such as:

1. Ensuring disinfectant residual reaches throughout the distribution system
2. Managing chloramination so as to not have unwanted biofilm growth and DBP formation
3. Appropriately engaging in asset management including inspection and maintenance of finished water storage facilities
4. Effectively managing water quality deterioration associated with increasing water age including such deterioration as water is conveyed through multiple water systems

Good practice is what water systems do daily to provide an adequate supply of water that is safe to use 365 days a year, 24 hours a day on a sustainable basis; it is not the substance of regulation. Regulations provide a check on ongoing system operations to make sure that drinking water is indeed safe. Water quality challenges are site-specific; extrapolating from anecdotes and broad generalizations over-simplifies the diverse range of water systems across the U.S. Such generalizations may help us identify how to triage technical assistance to systems that are encountering difficulties, but the matrix of challenges facing any one system is unique and requires solutions that are place-based.

EPA's task is to identify specific public health challenges that need to be addressed and can be addressed through regulation, and then determine which specific regulatory criteria will address the challenge being targeted (without doing more harm than good). Historically finding that balancing point has been difficult for the M/DBP rules, hence the prior use of negotiated rulemakings and the associated detailed analyses to make data-driven recommendations.[3] As just one example of the scientific research gaps that will need

[2] Waterkeeper Alliance v EPA
[3] 2021 AMWA, AWWA, NRDC, and CWA correspondence to Radhika Fox.

to be overcome in any rule revision, quantitative data are lacking to link a specific numeric secondary disinfectant residual level to a reduced incidence of waterborne disease while balancing increased exposure to DBPs and associated health risks.

In determining if the NDWAC should accept the working group report and forward it on to the EPA Administrator, it is important that the Council recognize and convey the following points to the Administrator:

1. The NDWAC working group was working under resource constrained conditions and as a consequence their recommendations are qualitative, largely resting on personal experiences rather than substantive quantitative analysis.
2. For EPA to effectively translate the NDWAC working group report into action, the EPA drinking water program will need adequate resources to overcome the gaps in knowledge that the working group faced. EPA will need to:
    a. Distinguish which of the working group recommendations can be supported with sound science as required by SDWA.
    b. Discern what the practical effects of specific regulatory changes are likely to be (e.g., would requirements intended to enhance water quality through consecutive system – wholesale system collaboration create a barrier to water transfers to less sophisticated consecutive systems? What increase in DBPs can be expected from increasing disinfectant residuals, and what are the health implications of this increase?).
    c. Understand what steps are entailed in regulatory compliance reporting and oversight (e.g., are administrative burdens appropriate to the objective of the requirement).
3. The NDWAC working group recommendations will require substantial additional technical discussion with the drinking water community to realize viable and defensible regulatory revisions. EPA's past SDWA rulemakings have demonstrated that engaging with informed stakeholders is essential to crafting sound, detailed regulatory requirements.
4. The NDWAC working group's recommendation that building owners / operators need to appreciate that water quality must be managed within buildings and building owners / operators are responsible for acting to assure adequate water quality within their premises is very important.
5. EPA needs to engage drinking water associations and research organizations in preparing a strategic research and information collection program for M/DBP data gaps and adequately fund that research agenda.

AWWA hopes that these comments will assist NDWAC as it supports EPA formulate the agency's review and revision of the drinking water M/DBP regulations. If you have any questions regarding this correspondence, please contact me at 202.326.6130 or svia@awwa.org.

Best regards,
ON BEHALF OF THE AMERICAN WATER WORKS ASSOCIATION

Signed 11/21/2023

Steve Via
Director – Federal Relations
American Water Works Association

cc: Elizabeth Corr
Docket ID: EPA-HQ-OW-2020-0486
M/DBP Revisions (MDBPRevisions@epa.gov)
Kenneth Rotert
Ryan Albert

Who is AWWA
The American Water Works Association (AWWA) is an international, nonprofit, scientific and educational society dedicated to providing total water solutions assuring the effective management of water. Founded in 1881, the Association is the largest organization of water supply professionals in the world. Our membership includes more than 4,000 utilities that supply roughly 80 percent of the nation's drinking water and treat almost half of the nation's wastewater. Our 50,000-plus total membership represents the full spectrum of the water community: public water and wastewater systems, environmental advocates, scientists, academicians, and others who hold a genuine interest in water, our most important resource. AWWA unites the diverse water community to advance public health, safety, the economy, and the environment.

Association of State
Drinking Water Administrators

November 21, 2023

National Drinking Water Advisory Council
U.S. Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460

Sent via email to NDWAC@epa.gov

Re: ASDWA's Comments on the November 13, 2023, Report of the Microbial and Disinfection Byproducts Rule Revisions Working Group

Dear Members of the National Drinking Water Advisory Council,

The Association of State Drinking Water Administrators (ASDWA) is appreciative of the opportunity to provide comments to the National Drinking Water Advisory Council (NDWAC) on the November 13, 2023, Report of the Microbial and Disinfection Byproducts (MDBP) Rule Revisions Working Group. ASDWA is the professional association that serves the leaders (and their staff) of the 57 state and territorial drinking water programs. As co-regulators with EPA, ASDWA's members play a critical role in ensuring that drinking water is of the highest quality possible, and that public health and the environment are protected through implementation of the Safe Drinking Water Act (SDWA) regulations.

ASDWA is also appreciative of the Agency's efforts, as well as the efforts of the 18 members of MDBP Rule Revisions Working Group, to grapple with many challenging issues through several long meetings in 2022 and 2023 to develop this report. We recognize and appreciate the collective knowledge of the Working Group Members of the intricacies of the Safe Drinking Water Act's (SDWA's) regulatory development process, and that the collective knowledge recognized the inherent risk-risk balancing challenges of maintaining and/or increasing protection from the acute microbial risk and while working to decrease the chronic risk of Disinfection Byproducts (DBPs). The process to develop this Report was not simple, and ASDWA recognizes and appreciates the significant effort made by all involved.

ASDWA's comments that follow are organized into two sections – general comments and comments on specific recommendations of the Report. Recognizing that the Agency has discretion in how to incorporate NDWAC's final recommendations into a proposed regulation, ASDWA intends to provide substantial comments on the proposed MDBP Rule Revisions when that proposal is published in 2025. Obviously, the proposed MDBP Rule Revisions will have to

ASDWA • 1300 Wilson Boulevard • Suite 875 • Arlington, VA 22209
703-812-9505 • info@asdwa.org • www.asdwa.org

meet the statutory requirements of the SDWA's regulatory development process, including developing a Health Risk Reduction and Cost Analysis (HRRCA).

General Comments

Developing these comments was challenging as the Report was made publicly available on the EPA website at approximately noon EST, on Thursday, November 16th. Three business days were available to develop these comments, as the deadline to submit comments to EPA was by noon EST on Tuesday, November 21st, in order that the comments would be included in the mailing to the NWDAC members for the November 28-30 meeting. ASDWA is aware of the scheduling challenges to complete this Report in time for the November NDWAC meeting, yet, at the same time, three business days is inadequate to thoroughly review an 87-page report and develop cogent comments. Again, ASDWA intends to provide substantial comments on the proposed MDBP Rule Revisions when that proposal is published in 2025 so we recognize that there will be another chance to provide the perspective of the primacy agencies.

ASDWA recommends that, in developing the proposed MDBP Rule Revisions, EPA maintain the Agency's focus on the dual goals of protecting public health while developing an implementable regulatory framework. A revised MDBP Rule that cannot be implemented will do little to improve public health protection. How EPA decides to incorporate the recommendations into the proposed regulations is critical, as many of the recommendations do not have the necessary robust data required for the multiple analyses for the HRRCA.

The 13 recommendations in the Report contain multiple parts and options to potentially revise the MDBP Cluster of regulations that balances the acute microbial risk with the chronic DBP risk. Most of the Report's recommendations, with the various parts and options, each create an additional implementation burden for primacy agencies. While Recommendation 11 recognizes Primacy Agency Capacity, this recommendation lists six concepts under Part 1 that are good ideas that aren't a likely reality in the future, given the Agency's funding constraints and other priorities. In the meantime, primacy agencies are swamped with the increased infrastructure funding from the Infrastructures Investment and Jobs Act (IIJA) that has led to a significant increase in reviews of grant applications, as well as the Lead and Copper Rule Revisions (LCRR0, and in 2024, the final regulation for perfluoroalkyl substances (PFAS), the final regulation for Consumer Confidence Report (CCR) revisions, and the final Lead and Copper Rule Improvements (LCRI).

ASDWA fully expects the proposed recommendations will substantially increase the state burden. For example, the recommendation of a distribution system monitoring plan and nitrification control plans would require state review and approval. Referencing ASDWA's Cost of State Transactions Study (CoSTS) for the Lead and Copper Rule Revisions (LCRR) tap sampling plans, a similar review and approval process for the required distributions system monitoring plans would add over 1,200,000 hours of additional state staff time. Assuming a three-year staggered timeframe for these reviews and approvals, that would require an additional 192

state staff. Review and approval of nitrification control plans would add an additional 400,000 hours to state staff time. Those estimates are for only two specific recommendations, as there are many other recommendations and parts and options that would substantially increase the state burden. This increased state burden would be in addition to the estimated increased burden of over 4,000,000 hours of state staff time for LCRR implementation and over 1,000,000 hours of state staff time for implementation of a final regulation for Perfluoroalkyl Substances (PFAS).

To develop a better understanding of the additional increased burden, ASDWA intends to develop a MDBP Rule Revisions Cost of State Transactions Study (MCoSTS) to estimate the numbers of hours for each primacy agency transaction to develop the total state burden associated with the NDWAC's recommendations. In the current regulatory environment with states being given more responsibilities without additional resources, ASDWA requests the NDWAC MDBP Working Group continue to consider state burden in its recommendations, and for the NDWAC to recognize increased state burden in the transmittal letter for the Report to the Agency.

ASDWA recommends that EPA work closely with states that already address certain aspects of the NDWAC recommendation to better understands "dos and don'ts" of implementation so that federal rules attempting to address these areas can be developed with the benefit of state implementation experiences. Two examples of the recommendations are disinfectant residual and storage tanks.

Additionally, the Agency should use this rulemaking to eliminate differences in how groundwater systems and surface water systems are regulated under similar circumstances. ASDWA recommends that the Agency use the MDBP Rule Revisions to eliminate differences in addressing significant deficiencies, e.g., timeframe to address, treatment technique violation, and public notice requirements. These requirements should be consistent for all systems, and consistency will enhance transparency to the public and simplify implementation.

Specific Comments

- Recommendation 1 – Several primacy agencies have rules in place to address low disinfection residual in distribution systems. The Agency should partner with ASDWA to review the approaches taken in these states, including issuing violation, public notice and enforcement, and any experiences with impacts to DBPs levels, especially violation of the existing MCLs.
- Recommendation 4 – The source water vulnerability screening (#4) will likely be a burden for states to review, as well as each component (additional monitoring, increased performance determinations, and compliance determinations for increased performance requirements) of Part 2. While the logic of determining systems with a high risk of DBP formation is solid, this recommendation has a likely potential for ongoing increases in state burden as conditions in the watershed change over time.

- Recommendation 5 – A few primacy agencies have existing storage tank regulations, and the Agency should partner with ASDWA to broker conversations with the states that have these existing storage tank regulations. ASDWA supports a storage tanks rule that applies to all systems. Additionally, strategies that states have used in the past to address significant deficiencies with storage tanks should be used to further inform these conversations.
- Recommendation 7 – ASDWA has some concerns with how the "problem-based consultative requirement" would translate into potential guidance and/or regulations and would be successfully implemented. Improving compliance for consecutive systems needs a holistic approach. Such a holistic approach would be a challenging regulation to develop, and we (the collective "we") would be missing the mark if future actions don't look at the systems holistically. Supplying systems and receiving systems typically have complicated relationships, and achieving compliance may not be possible with only a joint, root-cause analysis consultation. Additionally, these consultations would be another increased burden for primacy agencies to broker and facilitate.
- Recommendation 8 – ASDWA has continually recommended strengthening TSCA bans, use restrictions and other regulatory actions to keep contaminants out of source water. While natural constituents such as Total Organic Carbon (TOC) can be significant DBP precursors, other manmade chemicals can also be DBP precursors. The Agency needs to get "ahead of the curve" with TSCA to prevent contamination of the environment from existing and new chemicals.
- Recommendation 9 – Many of these recommendations are appropriate policy goals that would require significant resources for EPA, primacy agencies, and water systems to implement. The recommendations have potential but only with a significant increase in funding. Given the current resource constraints, ASDWA recommends that these recommendations be prioritized by a follow-up stakeholder group so that tactics on how to implement these policy goals can evolve in regulatory and non-regulatory actions over a longer timeframe that is allowed under EPA's current regulatory deadline for the MDBP Rule Revisions.

  For Intervention 3 of Recommendation 9, the process of developing the Drinking Water State-Federal-Tribal Information Exchange System (DW-SFTIES) has been challenging for all parties involved. While ASDWA supports improving the availability and transparency of data to consumers, many states already provide that information through Drinking Water Watch and other platforms. From a national perspective, future modifications of DW-SFTIES to develop national snapshots of drinking water quality data will be challenging.
- Recommendation 11, Part 2 – Primacy agencies use a variety of approaches for sanitary surveys and the addressing of significant deficiencies, and the Agency should partner with ASDWA to broker conversations with states on potential sanitary survey adjustments.

- Recommendation 12 – This recommendation identifies 22 significant data gaps for source water, treatment, distribution system, premise plumbing and enabling environmental data. The Agency does not appear to have the resources to develop a better understanding of the technical issue through the necessary data collection and analysis. Doing this work would require an unprecedented investment in EPA research, data collection and analysis that's not likely going to occur given funding constraints and Agency priorities. EPA's latest effort to conduct similar research, the Research and Information Collection Partnership (RICP), that was an outgrowth of the Total Coliform Rule/Distribution System Advisory Committee, never really got off the ground. Very little, if any, of the recommended research, was completed. The lack of this research resulted in the current conundrum of 13 regulatory recommendations that were made using informed judgement as opposed to robust data.

  ASDWA recommends that EPA partner with a cross-section of drinking water stakeholders to prioritize these 22 significant data gaps and develop a focused research agenda for the 5-6 highest priority data gaps. The Water Research Foundation (WRF) could serve as a vehicle for this prioritization and research agenda development. WRF has a track record of developing and implementing comprehensive research agendas.

Thank you for the opportunity to comment on this significant step in the regulatory development process for the MDBP Rule Revisions. If you have any questions about these comments, please contact me (aroberson@asdwa.org) or Kevin Letterly (kletterly@asdwa.org).

Sincerely Yours,

J. Alan Roberson, P.E.
ASDWA Executive Director

Cc: Radhika Fox – EPA OW
Jennifer McLain – EPA OGWDW
Eric Burneson – EPA OGWDW
Elizabeth Corr – EPA OGWDW
Ryan Albert – EPA OGWDW
Ken Rotert – EPA OGWDW
Peter Grevatt - WRF

NDWAC Meeting Participants

November 28. 29 and 30, 2024

National Drinking Water Advisory Council Members

Lisa D. Daniels, NDWAC Chair
Elin Warn Betanzo
D. Scott Borman
Alexandra Campbell-Ferrari
Shellie R. Chard
Steven B. Elmore
Eagle Jones
Jana Littlewood
Jennifer L. Peters
James M. Proctor
Nancy A. Quirk
Alex Rodriguez
Jeffrey W. Szabo

Centers for Disease Control Liaison

Dr. Arthur Chang, Chief Medical Officer for the Division of Environmental Health Science and Practice, National Center for Environmental Health
Dr. Vincent Hill, Chief, Waterborne Disease Prevention Branch, Division of Foodborne, Waterborne and Environmental Diseases, National Center for Emerging and Zoonotic Infectious Diseases

U.S. Environmental Protection Agency Meeting Participants

Elizabeth Corr, Designated Federal Officer, National Drinking Water Advisory Council, Office of Ground Water and Drinking Water
Yu-Ting Guilaran, Deputy Director, Office of Ground Water and Drinking Water
Dr. Ryan Albert, Supervisor, Standards and Risk Reduction Branch, Standards and Risk Management Division, Office of Ground Water and Drinking Water
Ken Rotert, Physical Scientist, Standards and Risk Reduction Branch, Standards and Risk Management Division, Office of Ground Water and Drinking Water

Other Participants

Rob Greenwood, Ross Strategic