



New Jersey Drinking Water Quality Institute (DWQI)

December 8, 2022, 1 PM via Microsoft Teams

Meeting Minutes

Members Present (10):

Gloria Post, Keith Cooper, Patricia (Trish) Ingelido, Norm Nelson, Michele Potter, Judith Klotz, Tina Fan, Rich Calbi, Mike Furrey, Anthony Matarazzo

Members Absent (2):

Jessie Gleason, Leslie Brunell

Public Attendees

Chelsea Brook, Gary Buchanan, Brandon Carreno, Mingzhu Fang, Sabrina Hill, Lee Lippincott, Tom Miller, JC Miranda, Rob Newby, Brian Pachkowski, Laura Scatena, Kristin Tedesco, Linda Walsh (New Jersey Department of Environmental Protection)

John Kuehne (New Jersey Office of the Attorney General)

Taylor McFarland, Megan Steele (Sierra Club New Jersey)

Scott H Brezinski, Matthew Csik, Oleg Kostin (NJ American Water)

Jon Hurdle (NJ Spotlight)

Dave Brogle, Bob Fullagar (Middlesex Water Company)

Raquel Gonoretzky (Hughes, Hubbard & Reed)

Erik Person (Langan Engineering)

Alissa Vanim (Aqua America)

Samantha Jones (Chemistry Council of New Jersey)

Laura Cummings (Southeast Morris County Municipal Utilities Authority)

Ali Raza (American Chemistry Council)

Ryan Manning (ExxonMobil)

Nidal Azzaam, Avanti Shirk (USEPA)

Sandy Krietzman (Retired)

Trevor Mulhall (MBI)

Heather Desko, Angela Mostwill (New Jersey Water Supply Authority)

Mark LaFranconi (ERM)

Josh Engleking, Andrea McElroy (Suez)

Jeff Tittel (Retired)

Kaitlyn Fare (Evesham MUA)

Mark Hubal (Remington & Vernick Engineering)

Sharonda Allan (Operation Grow Inc)

Mark Jasko (Thermo Fisher Scientific)

Ryan Berger (Drinking Water Coalition of New Jersey)

Eileen Murphy (New Jersey Audubon)

Brian Chalfant (Pennsylvania Department of Environmental Protection)

James D Walker (Unaffiliated)
Deborah Derwid (Unaffiliated)

1. Chairman's Remarks

Introductions: At the request of the Chair, Keith Cooper, members of the Drinking Water Quality Institute (DWQI or Institute) introduced themselves to attendees.

Meeting Focus: Chairman Cooper introduced the agenda for this meeting. Historically, there were multiple pathways through which the DWQI has been asked to evaluate new and emerging contaminants. Contaminants to be evaluated by the DWQI have come forward from requests from the Commissioner of the NJ Department of Environmental protection (NJDEP), the Legislature, DWQI members, or the public. DWQI has previously discussed several compounds that are on its list for potential consideration. DWQI will begin to evaluate cyanotoxins, including microcystins and several others, as their next work objective. It is recognized that cyanotoxins have unique characteristics, and NJDEP has done a great deal of work on cyanotoxins in the past. DWQI hopes to use that body of NJDEP research as a starting point to build from.

DWQI members conducted roll call.

2. Review of December 8, 2021 Meeting Minutes

The Institute members reviewed the minutes and offered no substantive changes. Mike Furrey moved to accept the minutes; Judith Klotz seconded the motion. There were no objections from any members.

3. Presentation of Initial Department Research on Cyanotoxins

Trish Ingelido provided an introduction to the evaluations of cyanotoxins that have been conducted by NJDEP. Ms. Ingelido said that, in the next three presentations, NJDEP staff will share their understanding of the current state of research. The NJDEP Division of Science and Research has developed toxicity factors and drinking water guidance for several cyanotoxins. The NJDEP Office of Quality Assurance has done some preliminary research regarding testing methods. NJDEP's Division of Water Supply & Geoscience has also held ongoing meetings with public water systems (PWSs) that use surface water to evaluate public notification, source water management, reporting processes, and treatment options related to cyanotoxins. Overall, protecting the public from cyanotoxins in drinking water is a multibarrier process which the DWQI is requested to weigh in on. After today's meeting, it is hoped that the DWQI will review the NJDEP research and evaluation and conduct its own independent evaluation as to how to address cyanotoxins in drinking water.

Chelsea Brook and Kristin Tedesco from NJDEP presented background information on harmful algal blooms (HABs)/cyanotoxins and possible treatment approaches.

<https://www.state.nj.us/dep/watersupply/pdf/cyanotoxins-treatment.pdf>

Mike Furrey asked about different potential regulatory approaches. If NJDEP proceeds with a Treatment Technique approach, rather than a Maximum Contaminant Level (MCL), is the thinking that standards

would be set for specific cyanotoxins or that they would be regulated as a whole? He also asked how that decision would be made.

Chelsea Brook responded that Brian Pachkowski will discuss the specific cyanotoxins that are being evaluated in this effort during his health effects presentation. While the DWQI and NJDEP will be considering the health impacts of cyanotoxins, the feasible levels to which these compounds can be analyzed and removed also need to be identified and considered when developing regulations for cyanotoxins.

Kristin Tedesco added that that the question of the regulatory approach to be used for cyanotoxins is one reason why the DWQI is being asked to evaluate these compounds. Part of the challenge with regulation of cyanotoxins is that a single analytical method does not capture all cyanotoxins. Therefore, there may be challenges in determining the approach needed to address the issue.

Mike Furrey responded that he agrees with this approach, and, from a regulatory perspective, he prefers a Treatment Technique to an MCL.

Chairman Cooper asked whether evaluation of a HAB that occurs in a PWS is done in-house or sent to external laboratories.

Chelsea Brook responded that some PWSs do have in-house analytical capabilities while others don't, and that it depends on the system. Some PWS may have consultants that they call to assist when a HAB occurs. All surface water PWSs have submitted Cyanotoxin Management Plans to the Department which outline how they would respond during a HAB event. These steps include ensuring surface water monitoring and checking for indicators that a HAB may be present, among others. NJDEP is working on improving education on the best ways to identify when HABs are occurring, but there have been varied approaches so far.

Brian Pachkowski from NJDEP Division of Science and Research presented on health effects of cyanotoxins. <https://www.state.nj.us/dep/watersupply/pdf/cyanotoxins-health-effects.pdf>

Chairman Cooper noted that he appreciated the presentation and learned a lot about the work the Department has done on evaluation of toxicity of cyanotoxins.

Rob Newby from NJDEP Division of Science and Research presented on testing (analytical) capabilities for cyanotoxins. <https://www.state.nj.us/dep/watersupply/pdf/cyanotoxins-testing.pdf>

Chairman Cooper opened up the floor for questions from DWQI members. One question he had was on testing. In the ELISA method, there is interference at low levels from other compounds that causes. He assumed more evaluation is needed for this analysis.

Rob Newby responded that this issue is being evaluated. As part of the NJDEP Round Robin validation that has been completed, certified microcystin in deionized water at low levels was used to determine detection limits and performance for both of the commercially available ELISA kits, ADDA-OH (higher reporting limit 0.1 micrograms/L), and SAES (lower reporting limit, 0.05 micrograms/L).

This testing was conducted to identify best case recovery and detection. If the recovery achieved in the best-case scenario cannot be achieved, a higher reporting limit should be considered due to testing limitations. The second portion of the NJDEP Round Robin study will be a method comparison between

EPA 546 (ELISA) and EPA 544 with the lower detection limit kit (SAES). This will be done solely with finished drinking water samples to account for any matrix effects and obtain data from “real-world” scenarios.

Mike Furrey asked for a concise simple explanation of EPA Methods 546 and 544.

Rob Newby responded that Method 546 measures all the congeners of microcystin, while Method 544 method only tests for select congeners of microcystins. It is possible to have a detection of a high level of microcystins from Method 546 while not detecting microcystins at a comparable level from Method 544.

Mike Furrey asked if ELISA measures microcystins and how it compares to Method 544.

Michele Potter replied that the ELISA test kits measure total microcystins, and Method 544 analyzes for 6 congeners of microcystin and a nodularin with a homologous structure.

Judith Klotz asked about the health effects of cyanotoxins. It is important to realize that the relevant risks are associated with short term exposure, rather than lifetime exposure. She stated that it is fascinating that there are acute impacts at such low levels. She is familiar with how some cyanotoxins are similar to ricin or other biological/chemical warfare agents. She noted that it will be key to note that short term exposure to low doses of cyanotoxins cause toxicity in communications about their health effects. Dr. Klotz also asked about the rounding of some of the Reference Dose values in the health effects presentation. Some of the numbers were rounded to one significant figure, while others weren't. What's the rationale for that, given that uncertainty factors include one significant figure?

Brian Pachkowski responded that the number of significant figures comes from the underlying data. The Reference Dose for saxitoxin has two significant figures, since water ingestion rate and other parameters used to develop it have two significant figures. For the other three cyanotoxins, some of the parameters used to develop the Reference Dose had only one significant figure, so the Reference Dose is presented in one significant figure.

Judy Klotz observed that the decision of how many significant figures to use might be more philosophical than technical. With many orders of magnitude of adjustment with uncertainty factors, a degree of specificity disappears.

Gloria Post added that NJDEP has decided that all health-based criteria and standards in general will be developed with two significant figures. Brian Pachkowski is the lead on that initiative and can discuss how uncertainty factors are considered in regard to significant figures.

Brian Pachkowski responded that uncertainty factors are judgements, not absolute measurements. NJDEP approach for significant figures is generally consistent with the approach used by USEPA.

Mingzhu Fang asked about how water systems measure water quality, specifically whether toxicity assays of raw and finished water have been considered for supporting new treatment technologies.

Chelsea Brook responded that as part of a treatment technique approach, there are several parameters, such as pH and temperature, for which monitoring can be required. Toxicity monitoring has not been considered so far.

Chairman Cooper said that consideration of toxicity testing of complex mixtures in drinking water is beyond the scope of the current request to the DWQI. For the current request, analytical and treatment issues will be the driving factors, and the Testing and Treatment Subcommittees will have the most challenging work.

Mike Furrey stated that he would like to invite Rob Newby to the next Testing Subcommittee meeting. He believes that an in-depth discussion of the analytical issues that Dr Newby presented would be worthwhile.

Chairman Cooper agreed and stated that the analytical methods have many challenges for matrices other than pure water. He then opened up the Public Comment portion of the meeting.

Jeff Tittel commented that an old mentor of his once said that the cleaner the water going into a treatment plant, the cheaper and easier it is to address. In summary, he said that important factors for water quality include nutrients, climate change, runoff, and stormwater management. For example, at Lake Hopatcong, use of fertilizer to maintain beautiful lawns, as well as septic systems, contribute to nutrient loading. Actions in watersheds, buffers, wetland restoration, and stormwater basins all can assist in addressing this issue. Actions can also be taken inside the treatment plant. Mr. Tittel further stated that it was mentioned that the drinking water guidance for cyanotoxins applies to 30 days of exposure, but Lake Hopatcong has had HABs that last for months, much longer than 30 days. He continued on to ask whether the DWQI will evaluate impacts from secondary chemicals formed during HABs, such as from reaction of chlorine with algae in a manner similar to formation of disinfection by-products. He also stated that other components associated with HABs are fairly serious and asked why MCLs are not being considered for some of these.

Chairman Cooper responded that factors related to water quality that may impact the occurrence of HABs are important and are being evaluated at DEP. However, the DWQI evaluation that is being discussed at this meeting is primarily about how to address cyanotoxins in drinking water once a HAB occurs.

Matt Csik asked a question of Rob Newby. He stated that variations in the molecular structure of cyanotoxins can impact chemical behavior and asked if there are any congener-specific data on occurrence toxicity.

Rob Newby responded we don't yet have complete information on which of the 240+ congeners of microcystin are most common in New Jersey. Microcystin-LR is the most commonly detected so far, but most data that we have now are only a snapshot and the congener distribution can shift over the course of a bloom. Most of the data available to the scientific community are from the Lake Erie bloom near Toledo a few years ago, and the microcystin congeners shifted throughout that season. From this information, it's hard to say one way or another if the congener distribution will stay constant throughout the event. This is part of the reason why EPA Method 544 is so important, although it has a downside which is that some compounds detected by the ELISA method are missed by Method 544. There is little information on congener-specific toxicity, but it's an interesting question.

4. Call for Information on Cyanotoxins

Chairman Cooper observed that there were no further questions from the public. He recognized the valuable NJDEP presentations to DWQI members and said that he learned a lot from them. He asked

that anyone in the audience or the public at large provide any research on cyanotoxins for the DWQI to consider. He specifically asked for any pilot projects or other studies on treatment or testing of cyanotoxins. Any such research would assist the DWQI in their evaluation.

5. New Business

Chairman Cooper asked if there was any new business for DWQI, and none was mentioned. He stated his hope that the next meeting would be scheduled in 3-4 months. In the interim, Subcommittees will meet to discuss the information presented today and identify work needs. He then thanked all for their attendance and adjourned the meeting.