Delaware River Basin Commission
25 Cosey Road
P.O. Box 7360
West Trenton, NJ 08628-0360
Phone: 609-883-9500
Fax: 609-883-9522
www.drbc.gov

Kristen Bowman Kavanagh, P.E.
Executive Director

Minutes
Water Quality Advisory Committee
July 23, 2026

WQAC Members & Alternates who attended:

Chairs:
Sarah Rickard, reserved Member from NYSDEC (outgoing)
Michael (Josh) Lookenbill, reserved Member from PADEP (incoming)

Other Reserved

DNREC
Alternate: Bhanu Paudel

NJDEP
Member: Frank Klapinski

EPA
Member: Taylor Krolik (R3)

National Park Service
Alternate: Caleb Tzilkowski

Non-Reserved

Academia/Science
Member: John Jackson (Stroud Water Research Center)

Environmental Professional
Alternate: Kacy Manahan (Delaware Riverkeeper Network)

Local Watershed Organizations
Alternate: Stefanie Kroll (Riverways)

Regulated Community Industrial
Member: Scott T. Northey

Regulated Community Municipal
Member: Jason Cruz (PWD)

Other Attendees:

Laura Morales (AKRF)
Sean Quinn (American Water)
Emma Abell (Amherst College)
Leah Gaffney (ANDRIS Consulting LLC)
Jean Malafronte (ANDRIS Consulting LLC)
Maggie Reilly (Aqua Water Co.)
Eric Jonebring (Bartram's Garden)
Jason Fry (Camden County MUA)
Gregory Cavallo (Cavallo Environmental)
Eileen Althouse (CDM Smith)
Emily Condon (CDM Smith)
Zach Eichenwald (CDM Smith)
Paula Kulis (CDM Smith)
Melanie Knezich (City of Philadelphia)
Kate Schmidt (DRBC)
Namsoo Suk (DRBC)
Michael Thompson (DRBC)
John Zang (Duane Morris Gov. Strategies)
Dana Craft (GCUA)
John Yagecic (Gilmore & Associates)
Andrew Anderson (Hazen and Sawyer)
Eloise Gibby (Hazen and Sawyer)
Joseph Buckley (Hazen and Sawyer)
Andrew Thuman (HDR, Inc.)
Brandon Bach (HDR, Inc.)
Adam Burger (Jacobs)
Gayle Mateyak (Lehigh County)
Scott Hinz (LimnoTech)
Louise Usechak (LWVNJ)

Maria Castro (Coalition for the DRW)
Sakinat Ahmad (DE DNREC)
George Mwangi (DE DNREC)
Bhanu Paudel (DE DNREC)
Julia Palmer (Delaware Riverkeeper Ntwk)
Sara Labrum (DELCORA)
Vincenzo DiSantis (DELCORA)
Catherine Sengstock (DELCORA)
Jaden Spears (DELCORA)
Amanda Khalil (DRBC)
Amber Munchback (DRBC)
Anthony Pontarelli (DRBC)
Ava Williams (DRBC)
Avery Lentini (DRBC)
Bailey Adams (DRBC)
Matt Amato (DRBC)
Carl Bargery (DRBC)
Sarah Beganskas (DRBC)
Pam Bush (DRBC)
Fanghui Chen (DRBC)
Jeremy Conkle (DRBC)
Elba Deck (DRBC)
Samuel Erwine (DRBC)
Joey Fogarty (DRBC)
Brittany Gigliotti (DRBC)
Mike Heller (DRBC)
Kristen Kavanagh (DRBC)
Naomi Mendelsohn (DRBC)
Sonia Nicholson (DRBC)
Elaine Panuccio (DRBC)
Sonya Patel (DRBC)
Chad Pindar (DRBC)
Patrick Rago (DRBC)
Brenda Gotanda (MGKF, LLP)
Michelle Stevens (National Park Svc.)
Katherine Dollman (NJDEP)
Brent Gotsch (NYC DEP)
Duke Adams (PA DEP)
Harmonie Hawley (PA DEP)
Benjamin Lorson (PA Fish & Boat Comm.)
Zachary Salada (PA Fish & Boat Comm.)
Michael Hayes (Paulsboro Refining Co.)
Emma Bast (PennFuture)
Melissa Kampf (PennFuture)
Alex Ridyard (Philadelphia Water Dept.)
August Ebert (Philadelphia Water Dept.)
Julie Midgette (Philadelphia Water Dept.)
Kelly Anderson (Philadelphia Water Dept.)
Kinman Leung (Philadelphia Water Dept.)
Melanie Murphy (Philadelphia Water Dept.)
Ramona McCullough (Sci-Tek Consultants)
Kip Cherry (Sierra Club)
Erik Silldorff (Straw Hat Aquatics)
Sen Bai (Tetra Tech)
Melissa Polk (Trinity Consultants)
Luke Krier (University of Pennsylvania)
Rita Isabel Matos (US EPA Region 2)
Denise Hakowski (US EPA Region 3)
Greg Voigt (US EPA Region 3)
Nicole Lick (US EPA Region 3)
Sheila Eyler (US Fish & Wildlife Svc.)
Rachel Davis (Waterspirit)
Katie Lavallee (Woods Hole Group)

Welcome and Call to Order

The meeting was called to order by Sarah Rickard at approximately 09:30 AM. Voting members (or alternates) introduced themselves.

Administrative items

Having chaired the WQAC since April 2024, Sarah Rickard made a motion to nominate Josh Lookenbill from PADEP as Chair. Frank Klapinski seconded the motion, which passed unanimously with no abstentions. Sarah relinquished the Chair at approximately 9:45 AM and Josh led the remainder of the meeting as the newly elected Chair.

DRBC Liaison Thomas Amidon informed the meeting participants that the WQAC, originally formed in 1965, is currently authorized by a resolution from March 2019 that expires in December of this year, but that DRBC will post a draft resolution in the afternoon that would re-authorize WQAC beginning January 2027. Mr. Amidon provided the link where the draft resolution will be posted, and also the dates for the DRBC's next public hearing (August 5, 2026) and business meeting (September 2, 2026). He then summarized the changes reflected in the draft resolution:

- The resolution would authorize the WQAC for ten years from January 2027 to January 2037.
- Membership would be unchanged, although the description for the non-reserved stakeholder representatives for environmental groups would be consolidated into "watershed or environmental organization (2)."
- Vice Chair will preside in the absence in the Chair.
- Vice Chair will rotate annually among the Members in a prescribed order and get elevated to Chair the following year.
- Purpose of WQAC and roles of Chair, Vice-Chair, and Liaison would be articulated more clearly.

Discussion: Attendee Kip Cherry representing the Sierra Club of NJ asked whether proposed WQMP Amendments come through this Committee, and was answered by Mr. Amidon that they do not. Mr. Amidon also stated that the WQAC resolution, like all Commission resolutions, are approved by DRBC Commissioners after a public process, but that he was providing a description of the updates as a courtesy. Namsoo Suk clarified that there is an opportunity for public input during the draft stage.

Both appointments to non-reserved membership positions in 2026 (Stefanie Kroll and Lia Mastropolo) were made by the Executive Director of the DRBC from among the multiple applications received.

Minutes from the meeting held on April 23, 2026, were provided to the Members on April 9, 2026, for review, with no comments having been received. Frank Klapinski motioned to approve the Minutes, which were seconded by John Jackson and approved with no abstentions or opposition.

Water quality dashboard for EPA's new dissolved oxygen criteria

Sarah Beganskas presented Announcing the newest addition to DRBC's water quality dashboard: EPA Criteria Assessment. DRBC's water quality dashboard compares recent water quality observations against water quality criteria. Spearheaded by Jake Bransky, the latest plot added to the dashboard assesses dissolved oxygen (DO) observations against the new EPA criteria applicable to Zones 3, 4 and Upper 5 of the Delaware River estuary. Sarah walked through how to interpret the dashboard , provided an evaluation of historical DO observations from 2000 to 2025 against EPA's new criteria, and invited feedback.

Discussion ensued after the presentation.

- Frank Klapinski asked whether there is a way to see how many days of non-missing data there are, and Sarah responded that it can be calculated but the actual number is not currently shown on the WQ dashboard.
- Jason Cruz asked how many individual observations would have to be missing for a day to be considered missing data. Sarah indicated that this threshold is conservative and any interpolation is under discussion. In response to follow up question, Sarah confirmed that data

are pulled new each morning, reflecting any USGS updates. Namsoo Suk reiterated the point that the dashboard reflects provisional USGS data not a "final product."

- Erik Silldorff asked whether results from June, which appear to be on the upper end of allowable exceedances, are typical. Sarah confirmed that results do not appear to be unusual, and that a possible archive for previous years' assessment results is under discussion.
- Kacy Manahan asks when the provisional USGS data become final, and when these final data be reported I terms of compliance. Sarah indicated that it takes about a year for data to be finalized, and in reports this distinction is noted. Namsoo confirmed that USGS finalizes data every water year (Oct1 – Sep30), but they can be adjusted sooner than that even while still characterized as provisional. Namsoo further clarified that this dashboard is for public information, not official assessment. Thomas added that this feedback is helpful and encouraged members to send additional suggestions via email. He also echoed that the dashboard is for public knowledge, not regulatory assessment (which is published every other year). Sarah further confirmed that the dashboard only shows recent, current snapshots for informational purposes, but that DRBC is in the process of updating the WQ dashboard and considering an archive page to post finalized plots of past years' results.

Wasteload Allocation Study: outline and schedule

Thomas Amidon presented the outline and schedule for the Wasteload Allocation (WLA) Study, showing Phase 1 (Baseline Scenarios) in the context of the entire study and previewing the remaining phases. The purpose of the WLA Study is to determine what effluent requirements would support the new DO criteria. The study is conceptualized in 5 phases, each culminating in a WQAC meeting; this meeting culminates Phase 1, and future phases are expected to occur in October 2026, January 2027, and April 2027. The Final WLA Study Report is due June 2027.

Discussion ensued after the presentation.

- Kacy Manahan asked about public involvement and feedback on the study (i.e., an opportunity for public comment on a draft study). Tom responded this is a regulatory exercise as regulators do their work within the scope of their authorities. WQAC is considered public outreach, showing our work throughout the process. A formal public process is not anticipated for the WLA Study itself, but there is a public process with a formal comment/response period when the study is implemented within discharge permits. The WQAC is valuable because we can preview and season ideas with the members, and benefit from their expertise.
- Alex Ridyard (Sage Services LLC - consultant to PWD) in chat asked: "Are there any meeting minutes or summary from the WLA co-regulatory study workgroup?" Tom responded that the WQAC is documented but the WLA study workgroup is not a public meeting; it is merely agencies working together on a common project. Today's presentations reflect what was shared amongst the three different states, but minutes from these meetings are not generated.

Wasteload Allocation Study: facilities, flows, concentrations, & ranked loads

Matt Amato presented Wasteload Allocation Study: Facilities, flows, concentrations, & ranked loads, in which he reviewed the facilities included in the study, their effluent quality based on the most recent data, and their cumulative rankings by flow, load, and concentration. Matt shared state-by-state facility and permitted flow updates. He then walked through the characterization of baseline effluent quality based on analysis of last 5 years of eDMR data. Values from the 2018–2019 intensive monitoring period were retained for model constituents without recent data. Matt showed example plots of facilities with total oxygen demand both higher and lower than the 2018–2019 baseline. Additionally, plots of point dischargers ranked by flow, load, and concentration were presented, showing that 27 dischargers account for the top 99% of oxygen demand.

Discussion ensued after the presentation.

- Jason Cruz asked, regarding the example discharger concentration graphs, to clarify whether "future boundary" in the legend means "it is planned to be used in the WLA model" and that x-axis is month of the year. Tom confirmed that the x-axis numbers are months of the year, but that the discharger concentration graphs represent a characterization of current effluent quality; they would be used in the WLA Study only inasmuch as a particular simulation is intended to capture current effluent quality for a particular parameter.
- Jason expressed concern that permitted flow is being used for "baseline" and therefore represents a "nonrealistic" condition that is not actually going on in the river. Tom responded that, consistent with standard permit procedures, the "permitted flow" is used to characterize what discharges are "allowed" to do. Tom also clarified that the rankings were based on permitted flows.
- Paula Kulis asked: "I'd like to confirm that plant discharge concentrations will be entered into the model as monthly average values for the baseline scenario. I'm also wondering if those plots can be shared with the dischargers." Matt responded that large dischargers were entered in as monthly concentrations while smaller dischargers without as much information were characterized as an annual average. The plots are not finalized yet, but when flows and concentration boundaries are finalized, they will be shared. Namsoo confirms. Tom cautions that the graphs represent a characterization of current effluent quality, not necessarily a WLA Study scenario.
- Erik Sildorff asked for an explanation as to the significant changes in effluent quality between the 2018-2019 intensive monitoring period and the last 5 years for some discharges. For instance, the near doubling of ammonia from CCMUA and PWD-SW's substantial decrease. It is important to explain such "updates" for these major loads. Tom agreed that these are fair questions and part of the reason these data are being provided to the regulators. These graphs are a draft, so Tom suggested we make sure the data are right first and then explore any anomalies.
- Julia Palmer asked: "What defines a large vs small discharger?" Matt responded that generally, Tiers 1 and 2 were characterized as monthly averages while Tier 3 was based on annual

averages. Tom added that if there was enough data to construct a monthly discharge, DRBC did so.

- Kelly Anderson asked: "Is it appropriate for the discharges/ public to review the presentations in the absence of a report to send comments in response to the info being shared today?" Tom replied: "Absolutely. While it would be easier for the DRBC to wait until the study is completed before requesting feedback, the agency benefits from feedback from interested experts earlier in the process, which the WQAC is specifically designed to facilitate."

Two questions were deferred to open discussion due to schedule constraints.

Wasteload Allocation Study: methodology and next steps

Thomas Amidon presented WLA Study methodology and introduced the next phase of the study. He defined the baseline scenarios (Actual Condition and Permitted Condition) and introduced a stepwise conceptual approach to identifying potentially impactful discharges, assessing their degree of impactfulness, and using that information to determine what effluent loads from impactful discharges would satisfy the new DO criteria. He then walked through the next phase of the study, namely the Impact Potential Evaluation. Joseph Fogarty showed an example plot of spatial differences in DO between one scenario and another. Tom concluded the presentation with a preview of future phases of the WLA Study.

During the presentation, Jay Cruz asked about the Vertical Change Factor (VCF) definition, since the presentation stated that the Actual Condition would be used as the baseline for VCF. Tom stated that VCF computes the difference in the DO condition between what actually occurred in a given year vs any simulated alternative condition (e.g., using baseline permitted flow). This method was described in previous WQAC meetings and serves as an empirical approach leveraging historical DO data with model simulation outputs to isolate expected DO changes without propagating uncertainty.

Tom indicated that CSO loads are not a major driver of oxygen demand in the mainstem estuary. Loads were reduced to align with LTCP implementation, meaning these reductions are already required and effectively factored out of the WLA study.

Discussion ensued after the presentation.

- Jason Cruz asks whether the "hopscotch" plots (spatial plots presented by Joey) were used to only demonstrate the tool. Tom responds that while both scenarios (Actual Condition and Baseline Permitted Condition) were drafts, the true answer may be close to what was presented, and then explains the DO between the calibrated model and a draft version of baseline permitted, followed by an explanation of baseline permitted. Jason reiterates that the Baseline Permitted is not a real condition, just what could happen at permitted flow. Tom confirms that the figures were provided to show the tool, not the specific results.
    - Regarding actual flows versus permitted flows, it is envisioned that WLAs will be mass loads and not necessarily concentration limits.
    - The permitted baseline serves as a benchmark so that comparisons are not confounded by flow differences.

- Andrew Anderson asked: “Just confirming that the DO graphs being discussed are negative, because "Actual Condition" minus "Baseline Permitted Condition" is negative (that's the order of operations, correct?)” Tom confirms that Actual Condition – Baseline Permitted Condition = delta DO, yielding negative values because predicted DO demand is higher under full permitted flows.

Discussion

Discussion was opened up to Members first and then the other attendees.

- Kelly Anderson from PWD asked about sturgeon population data and who can access it. She opined that the WLA Study seems exclusively focused on water quality while the ultimate goal is fish. How are fish being tracked and are those data publicly available? How much fish work is happening to observe the changes as we, utilities, work to make improvement? Do we have a good sense of the baseline from which we can measure improvements? Kelly requested to include this consideration as the WLA Study project moves forward. Kelly highlighted that PA Fish and Boat conduct juvenile sturgeon sampling and population analysis around the Marcus Hook area and asked if these data will be shared. “My main takeaway is that we're focusing on water quality, but the endpoint is the fish and sturgeon.” Kelly suggested that more fish information should be included at upcoming WQAC meetings.
    - Sheila Eyler of USFWS indicated that DNREC conducts annual sturgeon sampling in estuary, and that data may be available by request.
    - Namsoo affirmed that fish propagation is the ultimate goal, but that the direct linkage is with DO, which is the criteria set to support the propagation. The WLA study will identify how to support the updated designated use by upgrading water quality to meet criteria.
    - Tom noted that PWD requested that the WQAC be “more fishy.”
- Kip Cherry asked: “Is there a max toleration level for ammonia and how close are we to it?” Tom answered that in high concentrations, ammonia is toxic to aquatic life. However, in the mainstem Delaware River, the more relevant impact is due to ammonia’s oxygen demand.
- Kip Cherry asked: “When you speak about impactfulness - is this an ecological term - in terms of what the river ecology can tolerate?” Tom answered that there are different levels, but the first threshold is determining if a facility has any measurable impact at all at the scale of analysis. Impactfulness in this context refers to the impact on dissolved oxygen.
- Paula Kulis asked whether metrics for impactfulness and actual allocations had been identified yet. Tom responded that metrics are not identified yet but will be shared with WQAC.
- Kip asked earlier in Q&A: “Under the Clean Water Act, the Congress required that each State create Designated Planning Agencies (DPA)--Governor Whitman set these up. Each DPA is supposed to adopt a Water Quality Management Plan, and projects involving 20,000 gal/day have to be considered as amendment to the plan. We are trying to figure out the process for reviewing projects such as the Amazon Data Center proposed for Falls Twp.” Namsoo says we will contact them separately on that question.

- Jason Cruz asked which phase will have corresponding reports distributed for review. While a modeling report will not be expected for every scenario, what deliverables will be expected? Tom answered that a draft report will be shared with the coregulators before the final report is made public. Updates throughout the study will be provided to the WQAC but multiple reports are not anticipated. The formal public process starts when the states incorporate WLAs into discharge permits. This is a technical study during which we will keep the public informed through the WQAC. A supplemental model calibration report from DRBC and a model suitability report from the expert panel are forthcoming.
    - Kelly expressed concern that the public and WWTPs are expected to comment based on slides and meetings for a study that may impose billions of dollars of cost just on PWD. Tom answers that this is a technical regulatory study performed by DRBC with its co-regulating states, and that DRBC is informing and soliciting input throughout the study from the WQAC. The formal public process will be kicked off with any discharge permit changes.
- Kacy Manahan says that in response to the process going to be through the permit changes, she posits the case where a state revises permits in line with the WLA, the public process happens, the state changes the permits, does the WLA get changed from that point on? Tom answered that the process of translating a WLA to a permit limit allows for some discretion, and that DRBC expects to work directly with States during that process.
- Kelly Anderson suggests that, considering the endpoint for this being sturgeon and fish science, it would make sense to have a marine biologist or someone from Fish & Boat in this group. PWD wants to know more about the sturgeon science. Tom responds that this study will not drill down to fish population; it will define the load reductions needed to satisfy the new DO criteria. Namsoo supports sharing baseline sturgeon population and information to track fish improvement but affirmed that this is a very specific task in front of us (WLA to meet EPA new criteria). Related discussion is good and supported, but we should focus on the study.
    - Sheila Eyler offered in the chat: “I will bring this discussion back to the fishery agencies. If there is a specific request for information or a presentation, please let me know to make sure the agencies would be prepared to share that information with this group.”
    - Erik Silldorff suggested we focus on implementing the new DO criteria. If PWD thinks the Sturgeon propagation data are more relevant as an end point than the water quality, we should revisit whether EPA’s new DO criteria are stringent enough to support young sturgeon.
    - Kelly Anderson recommended that the fish data be made available and indicated that PWD might take a more proactive role in fish science and preservation. It would be in the best interest of all for them to work with members of the WQAC.

Adjournment

John Jackson motioned to adjourn the meeting, which was seconded by Jay Cruz. With no abstentions and none opposed, Josh Lookenbill adjourned the meeting at 12:07 PM.

These Minutes were approved by the Water Quality Advisory Committee on October 14, 2026.