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NJ Water Monitoring Council

Measuring What Counts for Clean & Plentiful Water

January 24, 2018
MEETING MINUTES

Member Attendees

NJDEP – *DWM&S*: Leslie McGeorge, Alena Baldwin-Brown, Bruce Friedman, Brian Henning, Helen Pang, Vic Poretti, Bob Schuster *DWS&G*: Jeff Hoffmann, Ray Bousenberry *DSREH:* Nick Procopio, Sandra Goodrow *DWQ:* Marzooq Alebus
NJDOH – Doug Haltmeier
USGS – Bob Reiser, Heather Heckathorn, Tom Imbrigotta
USGS (retired) –
DRBC – John Yagecic
EPA R2 – John Kushwara, Emily Nering
IEC – Jessica Bonamusa
NJ Pinelands Commission – Marilyn Sobel
NJ Water Supply Authority – Heather Desko
Rutgers (Coop Extension Service) –
Rutgers (IMCS) –
Rutgers (Env. Bioengineering) – Eric Vowinkel
Montclair University – Meiyin Wu
Monmouth University/Urban Coast Institute –
Stockton University – Christine Thompson
NJ Sea Grant Consortium – Pete Rowe
Meadowlands Environmental Research Institute –
NOAA –
Monmouth County Health Dept. – Dave Sorensen
Barnegat Bay Partnership –
Stony Brook-Millstone Watershed Association – Erin Stretz, Nik Hansen
Musconetcong Watershed Association – Nancy Lawler
Raritan Headwaters Association – Angela Gorczyca
Great Swamp Watershed Association –
NJ Harbor Dischargers – Greg Alber
Brick Township MUA – William Ruocco

Guest Speakers/Discussion Leaders*

Jeff Fischer - USGS NJWSC
Patricia Gardner – NJDEP/DWS&G
Jenny Goodman - NJDEP/DES&S
James Henitz – NJDOH
James McCullough – NJDEP/DES&S
Rob Newby – DEP/DSREH
Elaine Panuccio - DRBC
Zoltan Szabo – USGS NJWSC
Karen Tuccillo – NJDEP/DES&S

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Other Attendees*
Yaritza Acosta Caraballo– Montclair State University
Compton Alleyne – NJDEP/ DES&S
Shar Azmat – NJDEP/ DES&S
Linda Bonnette – NJDEP/DWS&G
Lisa Carper – USGS NJWSC
Isabella Castiglioni – AmeriCorps NJ Watershed Ambassador
Kim Cenno – NJDEP/DWM&S
Lisa Congiu – NJDEP/DSREH
Lauren Cromie – AmeriCorps NJ Watershed Ambassador
Richard Dalton – NJDEP/DSW&G
Julia Galayda – AmeriCorps NJ Watershed Ambassador
Roop Guha – NJDEP/DWM&S
Teresa Guloy – NJDEP/DWQ
Toni Heater – NJDEP/DWM&S
Fairfax Hutter – AmeriCorps NJ Watershed Ambassador
Adam Iaccheo - AmeriCorps NJ Watershed Ambassador
Scott Jedrusiak - DRBC
Sarah Johnson – American Littoral Society
Debbie Kratzer - NJDEP/DWM&S
Justin Linten - AmeriCorps NJ Watershed Ambassador
Kelly Meccia – NJDEP/DWS&G
Joe Power – NJDEP/ DES&S
Erica Rossetti - AmeriCorps NJ Watershed Ambassador
Paul Schwartz – NJDEP/ DES&S
Steve Spayd – NJDEP/DWS&G
Yelena Stroiteleva – NJDEP/DWS&G
Kirsten Stokes – NJDEP/ DES&S
Mara Tippett – Raritan Headwaters Association
Jay Vouglitois – NJDEP/ DES&S

- **Council Business (**Copies of the agenda, minutes and many of the information updates and presentations are available on the Council's webpage, under "Meeting Information" - **http://www.state.nj.us/dep/wms/wmccmeetinginfo.html)**

- Minutes from the 09/20/17 Council meeting were approved
- The next meeting will be May 23 at USGS. The final 2018 meeting will be September 26 at DRBC. Several suggestions were offered for May and September meeting topics – pathogens/source trackdown, road salt/conductivity, Contaminants of Emerging Concern - microplastics & endocrine disruptors, intersex fish studies, and lakes monitoring related to management. The Council Steering Committee will review the suggestions and select a topic for the May meeting.

Information Updates, Presentations and Announcements:

1. *Announcements* –

- Meiyin Wu announced a study, along the Musconetcong River, looking at potential fecal coliform reductions from 2007-2018 in an effort to assess the effectiveness of various BMPs that have been put in place to address the fecal coliform impairment that resulted in a TMDL for the river. The study is being conducted in conjunction with the Musconetcong Watershed Association.

- Nancy Lawler announced that the Musconetcong Watershed Association has received a grant from the US Fish & Wildlife Service to monitor the impact of dam removals on fish passage and water quality. The grant is for $300,000 over 5 years and involves monitoring for temperature, DO, total suspended solids and benthic macroinvertebrates.

- Brick Township MUA was recognized for its receipt of the 2017 Governor's Environmental Excellence Award in the Water Resources category. The award was for its Metedeconk Watershed Protection & Restoration Plan.

- Bob Reiser announced several new USGS publications summarized in a handout. There are several new USGS fact sheets related to ground water quality in principle aquifer systems, a new publication related to in-situ benthic nutrient flux and sediment oxygen demand in Barnegat Bay, as well as a publication regarding leaching and sorption of certain insecticides and fungicides from seed coatings. These publications can be found online at the USGS publications warehouse https://pubs.er.usgs.gov/.

- Zoltan Szabo announced a new USGS study regarding Polonium-210 which is being undertaken because naturally occurring contaminants frequently exceed drinking water maximum contaminated levels (MCLs). Previous NAWQA studies had received comments that the aquifers supplying groundwater for public supply for the largest populations should be studied as a priority. Data on Po-210 and Pb-210 is being studied in the aquifers serving public water supply to the most people in the country. There is very little known about Po chemistry and occurrence. The data are being sorted and categorized now, but there was no "advance" or "pre-conceived" prioritization of various aquifers or regions. States will be notified when detections are above the 0.7 pCi/L concentration value that equals 1:10000 70-yr lifetime cancer fatality risk for the ingestion of 2-L drinking water per day. These notifications are expected to be initiated shortly.

- Because arsenic and radionuclides (including Polonium-210) are the chief contaminants exceeding the MCLs, the study will focus on public water supplies that are drawn from aquifers.

- Kim Cenno announced that NJDEP has awarded a $240,000 grant to the Stony Brook- Millstone Watershed Association (SBMWA) for an enhanced Community Water Monitoring program. The goals of the program will be to increase the quality of volunteer-collected data, increase the geographic focus on volunteer/community water monitoring around the state, develop and maintain consistency in collection/assessment methods and improve the sustainability of volunteer/community monitoring programs within NJ. Erin Stretz will lead this program for SBMWA.

- Paul Morton announced that the Department is pursuing the Council-requested trainings for both WQDE as well as WQX-Web. DRBC, Brick Township MUA, the American Littoral Society, Raritan Headwaters Association, the NJ Water Supply Authority and others responded they would be interested in these trainings. Eric Vowinkel offered Rutgers Environmental Science as a potential host. Paul indicated he would follow-up. [Note: WQX-Web training by Dwane Young, from EPA HQ, with input from NJDEP was held on February 15 at DRBC. Fourteen attendees were present representing NJDEP, DRBC, MERI, NJ Pinelands Commission, EPA Region 2, Stony Brook Millstone Watershed Association and Raritan Headwaters. WQDE training will be held April 24 at NJDEP HQ.]

2. Presentations:

- ***Decontamination Protocols Workgroup*** – Heather Desko (NJWSA) shared proposed objectives and scope for forming the Decontamination Protocols Workgroup that was discussed at the May 2017 NJWMC meeting which focused on Aquatic Invasive Plant Monitoring & Control. Heather offered to lead the workgroup and is seeking both volunteers to participate as well as any decontamination protocols NJWMC member organizations may have. DEP (BFBM), Raritan Headwaters Association, Montclair University, NJ SeaGrant Consortium, DRBC, USGS, Stony Brook Millstone Watershed Association, Brick Township MUA and Musconetcong Watershed Association indicated they would be interested in participating. Heather will schedule an initial meeting of the group. If others are interested in joining the workgroup, please let Alena know. [*see www.state.nj.us/dep/wms/wmccmeetinginfo.html for presentation*]
- ***National Water Quality Monitoring Council (NWQMC - http://acwi.gov/monitoring/)*** – Leslie McGeorge provided a summary of the National Water Quality Monitoring Council's December web meeting. Key topics included the National Conference, recent & upcoming Council-sponsored webinars, the Council newsletter and an update on the Water Quality Portal. The National Water Monitoring Conference is now expected to occur in Spring 2019. Location is still TBD but Denver is a possible location. A call for abstracts is expected in March, with a due date of September. Leslie highlighted 3 recently held webinars

(multivariate statistical analysis in water quality, continuous monitor deployment, and volunteer monitoring capacity building) as well as 2 upcoming webinars (observing the microscopic ocean from space, and autonomous detection of biotoxins associated with fresh & marine water HABs) as well as shared that the Council is looking for articles for its upcoming Newsletter (due date for submission is March 2). In addition, Leslie provided a brief update on the National Water Quality Portal including the current focus on adding additional query functions, applications that use the Portal, and publications referring to or using the Portal. [*see www.state.nj.us/dep/wms/wmccmeetinginfo.html for presentation*]

- ***HABs: Strategy/EPA R2 Meeting/2017 HABs/Partnerships/Research Committee/Remote Sensing/Montclair University Work*** – Leslie McGeorge, Vic Poretti, Bob Schuster (NJDEP/DWM&S), Rob Newby (NJDEP/DSREH) and Meiyin Wu (Montclair University) updated the Council on HABs-related work and activities. Leslie summarized the HABs-related capacity building that has taken place in NJ from 2007-2018 including additional remaining collaboration needs, provided information from the November 30, 2017 HABs meeting at EPA Region 2, as well as requested Council feedback on needed modifications to the Response Strategy/website for 2018 (modifications should be provided to Leslie, Vic or Alena Baldwin-Brown). Vic summarized the Strategy, reviewed the 2017 HAB events and associated responses. In addition, he shared the types of partnering activities that NJDEP is seeking for 2018 and asked that interested members/member organizations contact him for further information. Rob presented information on the newly formed CyanoHAB Research Committee including its objective, current members, potential research topics as well as ongoing projects in which the Committee may be able have some input. Rob asked that potential research ideas and/or interested new members be sent to himself (robert.newby@dep.nj.gov) or BFBM's Tom Miller (thomas.miller@dep.nj.gov) who is the other committee Co-Chair. Bob shared work that's been done regarding the use of remote sensing for HAB detection in coastal waters. He also described some pilot work to develop an algorithm for phycocyanin (the pigment that's in cyanobacteria) using remote sensing. If successful, this would allow remote sensing to be used for freshwater HAB detection. Meiyin summarized the freshwater phytoplankton monitoring related to CyanoHABs work that has been taking place at Montclair University. The objectives are to build a database of NJ phytoplankton species, understand the distribution and abundance of phytoplankton in NJ, and identify potential toxin-producing cyano taxa. Using the information from this study, the intent is to continue to build the freshwater phytoplankton database, develop qPCR detection methods for various toxin-producing taxa, research environmental variables triggering HABs, and expand to study cyanotoxins in fish/shellfish. [*see www.state.nj.us/dep/wms/wmccmeetinginfo.html for presentations*]

Session – Monitoring for Radionuclides

A. ***Overview of Radiation & Analytical Water Testing for Radiological Contaminants*** – James Henitz (DOH) provided a general overview of radiation/radiounuclides, as well as types of water testing for radiological contaminants. This included a definition of radiation, the various types of radiation that exist (alpha, beta, gamma), the radionuclide decay series, demonstrations of testing for each, an explanation of how radiological contaminants get into water, why it's important to monitor for them, as well as what radiological-related testing capabilities exist at the DOH laboratory. [see *www.state.nj.us/dep/wms/wmccmeetinginfo.html for presentation*]

B. ***Radon in Drinking Water*** - Pat Gardner (NJDEP/DWS&G) provided a history of radon, first in air and then in water, as the context as to why it's important to monitor radon in drinking water. Pat described the development of and testing performed under NJ's Radon Program, including routes of entry into structures, radon decay products, and routes of human exposure. She also reviewed the requirements for radon in air testing, as well as the efforts that have taken place to date to provide a basis for the potential management/regulation of radon in drinking water, including work done by the NJ Drinking Water Quality Institute. [see *www.state.nj.us/dep/wms/wmccmeetinginfo.html for presentation*]

C. ***NJ Private Well Testing Act Data*** – Nick Procopio (NJDEP/DSREH) detailed the importance of testing in private wells as they can be contaminated from a variety of sources including naturally occurring substances (including radionuclides), from man-made sources, such as agriculture or industrial run-off, or from contamination in regional ground water, lakes or rivers. There are ~400,000 private wells in NJ and, while there are no federal regulations governing private wells, NJ has the NJ Private Well Testing Act. The Act requires testing during real estate transactions (radiologicals are included). Testing information is

shared with the homeowner and stored by NJDEP. The Department has interactive maps available online (http://arcg.is/1CPkHyC) which show where testing has been done (by county, municipality and 2x2 grids), and presents the number and percent of wells tested that exceed a standard. The maps are current through 2014. A goal for future analyses and enhancements to maps is to include well depth and aquifer unit. Nick shared that a point of emphasis is to increase communication about the geographic extent of certain private well-related contaminant problems throughout the state to further encourage homeowners to test their wells even if they are not engaged in a real estate transfer. [see *www.state.nj.us/dep/wms/wmccmeetinginfo.html for presentation*]

D. ***Radionuclides in NJ Aquifers Compared to National Aquifers*** – Zoltan Szabo (USGS NJWSC) detailed a USGS study comparing radionuclide occurrence in principal drinking water aquifers nationally vs NJ. Results revealed that differences in geology and geochemistry are primarily responsible for the type of radionuclides seen (radium, uranium or radon) and the distribution. Nationally, radionuclide occurrences are similar to what was found in NJ - radon occurs in both anoxic or acidic conditions and gross alpha in bedrock may be controlled by either uranium or radium isotopes or a mixture of the two. In NJ radionuclide occurrence is a local issue as the state's geochemistry varies widely between the northern and southern parts of the state. In northern NJ, bedrock is uranium rich; therefore, waters have high radon and high uranium in alkaline oxic conditions. In the acidic conditions of the Coastal Plain in the southern part of the state, radium controls gross alpha. Information related to the study is available online at: http://water.usgs.gov/nawqa/trace/radium. [see *www.state.nj.us/dep/wms/wmccmeetinginfo.html for presentation*]

E. ***Dichotomy Between Radionuclides in Groundwater in North & South Jersey*** – As a complement to Zoltan's presentation, Jeff Fischer (USGS NJWSC) presented additional information regarding the dichotomy between radionuclides in groundwater between North and South Jersey. Specifically, in the northern part of the state where there is complex bedrock geology, both the uranium and thorium decay series are important - uranium, radium, radon & gross alpha are all of concern. Uranium can exceed MCLs everywhere, radon often exceeds the proposed 4000pCi/L MCL in the Piedmont & Highlands regions, and gross alpha concentrations are related to all radionuclides. In the southern part of the state where there are unconsolidated sediments, the thorium decay series dominates – radium and gross alpha are the main concerns. Uranium is rarely present, radon is present but rarely exceeds the 4000pCi/L MCL, and gross alpha MCL exceedances correlate with radium concentrations. Additional information is available online at: http://pubs.usgs.gov/ or http://www.nj.gov/dep/rpp/rms/agreedown/urwater.pdf/ http://www.nj.gov/dep/rpp/rms/agreedown/radwater.pdf. [see *www.state.nj.us/dep/wms/wmccmeetinginfo.html for presentation*]

F. ***The Radium Cycle: Tracking of Natural Radium in S. Jersey from Groundwater, to Community and NTNC Treatment Systems, WWTPs, through to Sludge Disposal*** – James McCullough & Jenny Goodman (NJDEP/DES&S) provided an overview regarding tracking natural radium in South Jersey water. They explained how radium is tracked for compliance purposes through groundwater that is used for drinking water as well as through drinking water treatment systems and the different treatment systems employed for radium exceedances. In addition, they detailed how water treatment waste is handled and shared the results of their study of wastewater treatment plants (WWTP). The radium from WWTPs accumulates in the sludge, which has various disposal options (land application, incineration, surface disposal). The results of the study showed that both workers and the public do not receive doses in excess of the allowable public dose limit. Several pathways were analyzed and modeled, including WWTP workers, sludge land application workers, a nearby neighbor to a sludge incinerator, and a member of the public that builds a house on a former land application site. [see *www.state.nj.us/dep/wms/wmccmeetinginfo.html for presentations*]

G. ***NJ Nuclear Power Plants: Tritium in Groundwater*** – Karen Tuccillo (NJDEP/DES&S) shared information on monitoring for tritium in groundwater at NJ's nuclear power plants. The NJ Bureau of Nuclear Engineering has an ongoing program to monitor the concentrations of tritium in the groundwater associated with leaks from nuclear power plants. Numerous monitoring wells are sampled on a routine basis to monitor the progress of remediation activities and to ensure that off-site groundwater is not impacted by the leaks. The results of this program have demonstrated that off-site groundwater, including drinking water sources, have not been impacted by these leaks, and that the ongoing remedial activities

have successfully reduced the level of tritium contamination in on-site groundwater. Monitoring data are available on the DEP Nuclear Engineering website - http://www.nj.gov/dep/rpp/bne/index.htm [see *www.state.nj.us/dep/wms/wmccmeetinginfo.html for presentation*]

H. ***Baseline Radiochemistry in the Non-tidal Delaware and Tritium Response Monitoring in the Delaware Estuary*** – John Yagecic and Elaine Panuccio (DRBC) provided an overview of 2 DRBC conducted case studies related to radiochemistry monitoring in the Delaware River Basin. John shared details regarding a study in the upper Delaware Basin in advance of potential natural gas development. The study, which was funded by the William Penn Foundation, involved sampling at 32 sites from Hancock, NY to the Delaware Water Gap for gross alpha and beta as well as radium-226 and radium-228 to establish pre-natural gas radiochemistry activities. All results for gross alpha and beta were below the DRBC standards at all locations. The report and data are available online at: http://www.nj.gov/drbc/library/documents/BaselineRadiochemReport_October2015.pdf. Elaine summarized work that was done using Delaware Estuary boat runs for monitoring after high tritium concentrations were detected in snow and ice outside of the Hope Creek Nuclear Generating Station in March 2015. As a result, tritium was added to monitoring at 5 boat run locations near the Hope Creek and Salem generating stations. Results indicated that no tritium exceedances occurred in surface water samples surrounding the nuclear plant and results were well below EPA's Maximum Contaminant Level across all stations. In addition, gross beta and gross alpha emitters were collected for across all stations, as the Delaware River Basin Commission has criteria for these radiochemistry parameters. Across all 22 stations, results indicate no exceedances of water quality criteria of gross beta emitters. Exceedances of gross alpha emitters criteria were reported at the higher-salinity (DRBC's Zone 6) sites closer to the ocean due to the phase transformation of certain gross alpha emitters to the dissolved phase, such as radium. However, alpha particles are harmful through ingestion and within DRBC's Water Quality Zone 6, drinking water is not a use to be protected. [see *www.state.nj.us/dep/wms/wmccmeetinginfo.html for presentation*]

- **Action Items**
  - Work with Heather Desko (NJWSA) to set up initial meeting of NJ Aquatic Invasive Species Decontamination Protocols Workgroup
  - Work with Paul Morton to coordinate WQDE training on April 24

- **Technical Topic for Next Meeting**
  Microbial Indicator Monitoring

- **Next Meeting**
  May 23, 2018 at USGS NJWSC

*Speaker/Attendee Organization Acronyms (other than NJWMC member organizations):
NJDEP/DES&S – NJDEP/Division of Energy Security & Sustainability (includes both Bureau of Environmental Radiation and the Bureau of Nuclear Engineering)

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Gaps/Needs Related to Radionuclide Monitoring

- Analysis of Ra-224, Ra-228, and to a lesser extent Ra-226 in the PRM aquifer is needed. Some data has been collected but never assessed. PRM and AC800 sand are probably the only remaining un-assessed major aquifers in the State.
- A study of the relation of Rn-222 in water and air, similar to the Pennsylvania USGS study (Eliza Gross), is needed. The study was proposed several years ago.
- After the National Po-210 and Pb-210 assessments are complete, follow up assessment in NJ is needed to find out if any aquifers have similarities to those where Po-210 and Pb-210 were detected nationally
- Monitoring for beta-emitting medical waste associated with hospital wastewater would be beneficial
- Monitoring for radionuclides at abandoned Uranium mines in North Jersey would be useful (there are > 100; however all, but perhaps one, are small)
- A follow up study of the very high U234:U238 isotope ratios discovered in North New Jersey groundwater (typical values are 1.2-1.7, values in North NJ were as high as 8.8) would be beneficial