

The Potomac Aquifer Recharge Oversight Committee
Meeting Minutes
June 16, 2023

In attendance: Whitney Katchmark (Committee Chair), Ken Bannister (remote), Erin Bereyso (remote), Jay Bernas, Charles Bott, Ryder Bunce (remote), Bryan Campbell, Weedon Cloe, Curtis Consolvo (remote), Jason Early (remote), Lance Gregory (remote), Julie Henderson (remote), Dan Holloway, Hadi Khatami, Mark Kram (remote), Eduardo Mendez (remote), William Mann, Jamie Mitchell, Scott Morris (remote), Bryant Mountjoy (remote), Mark Nelson (remote), Ivy Ozmon, Harry Post, Doug Powell, Mike Rolband, Gary Schafran, Mark Widdowson, Nat Wilson (remote), Lauren Zuravnsky.

Ms. Katchmark (HRPDC) called the meeting to order at 11:30 am.

The minutes of the previous meeting were approved as distributed.

Dr. Widdowson (PARML) updated the committee on recent PARML activities and accomplishments. Several research presentations were made, and one graduate student completed their M.S. degree in Civil Engineering. Dr. Widdowson and others recently visited Orange County, California, to tour their groundwater replenishment system. PARML is working to develop a relationship with Orange County to discuss experiences and share best practices. Dr. Widdowson also provided an update on PARML's strategic plan. PARML is currently reviewing consultant proposals to assist with developing the plan. Ms. Katchmark and Mr. Powell expressed interest in participating in the plan's development, and Dr. Widdowson asked other interested members to contact him to get involved. Dr. Widdowson also shared the PARML's EPA Star Grant research proposal status. PARML received an award number in April but awaits the award letter from EPA. A start date of July 1 is anticipated but uncertain.

The committee asked if PARML or HRSD have engaged with other groundwater injection programs on the East Coast, and members shared that they have contacts with different programs in Maryland and Florida. DEQ shared that elected officials support implementing projects like SWIFT in Northern Virginia but have yet to commit funding.

Mr. Consolvo requested to submit a public comment after discussing other aquifer recharge programs. He shared that the Potomac Aquifer potentiometric surface should be mapped throughout the Eastern Virginia Groundwater Management Area (EVGMA) to evaluate the actual impacts of groundwater recharge across the region. Mr. Consolvo noted that modeling differs from monitoring. He suggested that groundwater data collected through the EVGMA should be used to understand what is happening in the aquifer instead of relying on model predictions. The committee discussed the groundwater data available for such an evaluation and noted that the existing USGS and DEQ monitoring wells were not installed to evaluate the impact of SWIFT. Cross-agency collaboration would be needed to develop a representative network of monitoring wells to map water levels. Mr. Consolvo noted that North Carolina provides informative snapshots of their managed aquifers through time, and they see great differences in groundwater levels in distinct zones in the Potomac Aquifer. Dr. Widdowson noted that Virginia Tech is developing a web-based public viewer that shows the real-time status of the Potomac Aquifer based on USGS well data inputs. The committee agreed that better alignment between agency

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Meeting Minutes
June 16, 2023

efforts to monitor EVGMA water levels would benefit understanding SWIFT impacts. Mr. Consolvo recommended that the committee make a recommendation to USGS to study this.

Ms. Zurvansky (HRSD) provided an update on construction projects at the HRSD James River Plant. She walked the committee through the progress made since then and acknowledged that the project has three years of work remaining before completion. Ongoing work on the plant's advanced wastewater treatment side includes installing two new upsized clarifiers and constructing a new pump station delivering returned activated sludge to the new clarifiers. Progress was also made on the SWIFT side of the plant. Earthwork, building foundation work, and installation of stormwater features were completed in late 2022. Foundation retaining walls are under construction, and concrete is currently being installed in one process building. Ms. Zurvansky compared site plans to marked-up aerial images to show the footprint of buildings once construction is completed. Construction updates for the James River Plant are posted on the HRSD website, <https://www.hrsd.com/james-river-tp-swift-improvements>.

Mr. Holloway (HRSD) presented progress updates on well construction for the James River SWIFT plant. He reviewed the typical structure of managed aquifer recharge (MAR) wells in cross-section and the geophysical data used for well design. The well installation process was described and illustrated in presentation photos. Mr. Holloway shared that MAR wells undergo pressure testing, well development, and performance testing after construction. If MAR wells do not achieve a minimum of 80% injection efficiency, they are treated with surfactants and dispersants to achieve the required efficiency. The first MAR well at James River (JR_MAR_01) achieved 82% efficiency following such treatment. Construction is ongoing for MAR wells JR_MAR_03 and JR_MAR_04, and construction of the seven off-site MAR wells is on hold. Mr. Holloway also shared that two wells in the cluster of four monitoring wells are complete, one is under construction, and the other still needs to be started. Cross sections of the MAR wells and monitoring wells were presented for comparison.

Dr. Bott (HRSD) updated the committee on the SWIFT Research Center (SRC) progress. He reviewed the study to confirm the design of bromate control in ozone contactors, research to validate pathogen removal through treatment, and results from PFAS removal studies. Hydrogen peroxide dosing was tested and optimized for ozone contactors to achieve enhanced removal of 1,4-dioxane and other organic compounds while significantly reducing bromate formation. Pathogen disinfection credits achieved through various treatment processes were also presented. The manuscript detailing this work was recently accepted for publication in the Environmental Science and Technology journal. Additionally, HRSD collaborated on a Water Research Foundation project (5129) to study pathogen removal in carbon-based advanced treatment (CBAT). The research determined that pathogen removal via ozone treatment is likely underestimated. Pathogen viability was also studied since molecular methods detect all DNA present, including the DNA of non-viable pathogens. When DNA was assessed for viability, data indicated an even greater removal of pathogens throughout the treatment processes compared to the molecular method that does not discriminate between viable and non-viable pathogen DNA. Dr. Bott also provided an update on PFAS removal through granular activated carbon (GAC) treatment. PFOA has not been detected in either of the two GAC treatment vessels since carbon was replaced in GAC1 in February. HRSD expects to meet all PFAS MCLs, but the quantity of GAC

The Potomac Aquifer Recharge Oversight Committee

Meeting Minutes

June 16, 2023

required to achieve that remains to be determined. Evaluations to project carbon replacement timelines are underway. Ongoing research will also help determine if routine GAC vessel backwashing disrupts the mass transfer zone (MTZ). MTZ disruptions lead to earlier breakthrough of PFAS compounds. HRSD is also working to understand the impact of upstream water treatment on GAC treatment capacity. In closing, Dr. Bott shared that HRSD plans to test ion exchange treatment and other novel adsorbents downstream of GAC treatment for the complete removal of PFAS and to extend GAC life. That research is expected to begin in August.

Dr. Schafran shared updates on PARML progress. The perfluorochemical (PFC) method in development was shortened and can detect the GenX PFC at 10 ng/L. Dr. Schafran shared results from the rapid small-scale column test (RSSCT) used to determine GAC capacity for PFAS removal at the laboratory bench scale, which simulated operating conditions at the SRC. This method allows for rapid assessment compared to full-scale testing, except that the RSSCT runs do not include a biological removal component compared to the full-scale GAC operations. A portion of the carbon used to replace spent carbon in GAC1 at the SRC was used in the RSSCT study. RSSCT-treated water samples were analyzed for total organic carbon (TOC) and PFCs to generate carbon breakthrough curves for the compounds of interest. Those data were used to predict days and bed volumes treated until 50% breakthrough at full-scale GAC operation. Dr. Schafran also detailed the analytical capabilities of PARML after commissioning the recently purchased ion chromatography system. PARML staff also expanded after recently hiring a new laboratory analyst.

There were no additional public comments.

Dr. Schafran and Dr. Khatami (PARML) concluded the meeting with a lab tour. Dr. Schafran shared information about the building and the spaces in use by PARML. Dr. Khatami demonstrated the preliminary processing of water samples for PFC analysis and provided an overview of the method used to identify and measure PFC compounds of interest.

The meeting adjourned at 1:45 p.m.

Approved:

Date:



8/21/23

Committee Chair

Committee Members:

- Mike Rolband, Director of Virginia DEQ
- Dr. Karen Shelton, Virginia State Health Commissioner
- Dr. William Mann, Governor Appointee
- Doug Powell, Governor Appointee
- Whitney Katchmark, HRPDC
- Dr. Stanley Grant, Director of Occoquan Watershed Monitoring Laboratory
- Dr. Mark Widdowson, Co-Director of the Potomac Aquifer Recharge Monitoring Lab

The Potomac Aquifer Recharge Oversight Committee
Meeting Minutes
June 16, 2023

- Dr. Gary Schafran, Co-Director of the Potomac Aquifer Recharge Monitoring Lab

Non-voting members:

- Mark Bennett, Director of Virginia and West Virginia Water Science Center, USGS
- Leslie Gillespie-Marthaler, Deputy Director Water Division, US EPA Region 3