

Sand Branch Benthic Total Maximum Daily Load (TMDL) Study

Second Technical Advisory Committee Meeting

January 25, 2021

Meeting Summary

Location: Virtual (GoToMeeting platform)

Start: 1:00 p.m.

End: 3:00 p.m.

Meeting Attendance:

Project Team

Sarah Sivers – Virginia Department of Environmental Quality (DEQ)

Bryant Thomas – DEQ

Cathy Nicely – DEQ

Courtney Hayler – DEQ

Jeff Talbot – DEQ

Justin Loyd – DEQ

Mark Evans – DEQ

Mark Richards – DEQ

Rob Breeding – DEQ

Roland Owens – DEQ

Ed Stuart - DEQ

Katie Shoemaker – Wetland Studies and Solutions, Inc. (WSSI), DEQ contractor

Leah Potts - WSSI, DEQ contractor

Robert Brent – James Madison University (JMU), DEQ contractor

TAC Members

Ashley Hall – Stantec, representing Virginia Department of Transportation (VDOT)

Tracey Harmon, VDOT

Chris Ruck – Fairfax County

Chris Van Vlack – Loudon Soil and Water Conservation District (LSWCD)

Dennis Cumbie – Loudon County

Mike Smith – Virginia Department of Mines, Minerals, and Energy (DMME)

Heather Ambrose – Fairfax County MS4 coordinator

Joseph Fitterer – Chantilly Crushed Stone

Niffy Saji – Fairfax Water

Normand Goulet – Northern Virginia Regional Commission

Sean Minavio – Environmental Systems Service, Ltd (ESS), representing Loudon Composting

Shannon Curtis – Fairfax County

Thomas Foley – Virginia Concrete

Meeting Materials:

The meeting agenda is provided as an attachment to the PDF.

The meeting was conducted with the assistance of a MS PowerPoint presentation, which is provided in the embedded file below. Detailed information in the presentation (provided as an attachment to the PDF) is not repeated in these summary notes; instead, highlights from each general topic section of the meeting are summarized along with the questions and discussion held during the meeting.

Meeting Summary:

Sarah Sivers, DEQ provided an overview of the GoToMeeting platform to help attendees become familiar with it. She then discussed requirements for holding a solely virtual meeting and read opening remarks (provided as an attachment to the PDF).

All persons participating in the meeting introduced themselves to acquaint everyone with each other. Ms. Sivers then provided an overview of the meeting agenda (provided below) and discussed the goals of meeting were discussed:

1. To share information on the development of the stressor analysis for Sand Branch.
2. This is Part 1 of 2 in presenting the information that goes into the benthic stressor analysis effort. This meeting is to present water quality chemical data and analyses; a third Technical Advisory Committee (TAC) meeting will be scheduled for late February or March to share the second portion of the analysis, including biological and physical habitat data.

Ms. Sivers shared the following updates that occurred since the last TAC meeting, which was held concurrently with the first public meeting on October 29, 2020.

- A watershed tour was held on December 10th to familiarize DEQ/contractor team with watershed, verify portions of watershed boundary, and visited four permitted sites.
- Reviewed the updated watershed boundary map.
- Noted future land use planned for the area.
- Presented the Virginia Stream Condition Index (VSCI) scores presented, including most recent data (September 2020).
- DEQ Water Quality Monitoring is continuing in the field – various continuous monitoring probes currently deployed in Sand Branch and Licking Run.

Ms. Sivers then provided an overview of the components that comprise a benthic stressor analysis. As part of this overview, she provided a refresher of the purpose of a stressor analysis, which is to categorize various pollutants as Non-Stressor/Possible Stressor/Probable Stressor to guide a path to a healthier stream. She also provided an overview of the data incorporated into the study. The components of the stressor analysis being considered in this study are:

- Stream monitoring data compared to water quality standards and/or thresholds from probabilistic monitoring. The analysis considers hydrology (flow and precipitation), land cover, daily/seasonal variations and the influence of Triassic Basin geology on baseline/background concentrations.

- Analysis of biological and physical habitat data. This information will be addressed in the next TAC meeting. DEQ will review VSCI scores, analyses of observed taxonomy and what it reveals regarding stressors, physical habitat metrics and will discuss results from bioassays to evaluate toxicity. USEPA's Causal Analysis/Diagnosis Decision Information System (CADDIS) analysis also to be presented at the next TAC meeting.

Ms. Silvers then provided an overview of the water quality chemistry data analysis, covering the parameters reviewed by showing a series of charts and graphs. The following parameters were covered: temperature, pH, dissolved oxygen (DO), DO saturation, total phosphorous, total nitrogen, ammonia, total suspended solids, turbidity, specific conductivity, total dissolved solids, dissolved sulfate, dissolved chloride, dissolved potassium, dissolved sodium and dissolved metals.

Summarized below is the content of the discussion and comments shared during the meeting.

- Question received if habitat scores for benthic monitoring stations have been evaluated.
 - DEQ responded that they have reviewing habitat data and results from the Log Relative Bed Stability (LRBS) index. These data will be presented with the biological data at the next TAC meeting.
- Comment from a TAC member that it seems this stream has a different impairment in contrast to a lot of the rural, suburban stream impairment the commenter's was familiar with from experience working in Loudoun over the last 15 years or so. Commenter noted it was likely due to it having a much more industrial watershed rather than a residential, agricultural watershed.
 - DEQ responded that the commenter's observation was correct, that this watershed has a variety of land uses. It is an urban, industrialized watershed. There can be many contributors to the stream impairment. There are permitted discharges as well as other activities not necessarily addressed in VPDES permits. This watershed does not have residential subdivisions like many other watersheds in this area.
- There was a question of what is the geology and environmental setting of the reference stream, Licking Run.
 - DEQ responded that the project team mapped all of the DEQ monitoring stations within the Trapp Rock Conglomerate and Triassic Lowlands ecoregions, and identified biological monitoring stations that were not impaired. It is relatively in the same geologic setting as Sand Branch. But, it is a much more rural setting than Sand Branch. The project team is considering this site as a potential reference location.
- A TAC member asked the following question. Does the team has a comparison of natural stream baseline flow compared to volume from permitted dischargers? What percentage of stream flow is typically from permitted effluents?
 - DEQ responded that the project team has not looked at the percentages of discharge volumes as a component of stream flow. It is fair to say that, at times, Sand Branch has significant augmentation of flow. DEQ has discharge information for VPDES authorized discharges, and flow is a component of this information. However, the data is variable; the type and frequency of monitoring depends on the type of activity and nature of the discharge. The monitoring data is submitted to DEQ through Discharge Monitoring Reports (DMR). DMRs may be submitted monthly, quarterly, semi-annually or annually, depending on the frequency of the monitoring required by the permit. DEQ will use the

- available data to develop hydrologic modelling in support of TMDL development, and will look at the discharge data in more detail at that time. It is possible that DEQ will ask for additional information from some discharges, if it is available, to better understand discharge volumes.
- Another TAC member asked if the team saw the Triassic Basin as stressor and if so how? They noted that during the presentation, Ms. Siverson noted the impact of the Triassic Basin.
 - DEQ responded that Triassic Basin geology influences the soils found in the area and as such may influence the baseline of water quality parameters. DEQ is considering a reference watershed that also contains Triassic Basin geology so that we will have comparable baselines. Fairfax County has done a lot of research into the impacts of Triassic Basin geology on water quality.
 - Fairfax County commented that they have observed higher baseline specific conductivity and phosphorus levels in their probabilistic monitoring stations located in the Triassic Basin vs Piedmont non-Triassic Basin. The County has been collecting data since 2015 and is preparing a manuscript on this topic. They also see a difference in the benthic community in reference watersheds correlated with the underlying geology. The County has identified a maximum 2-5% impervious surface as a threshold range for correlating benthic impairments. Fairfax County also noted that phosphorus levels at the USGS station in the Cub Run watershed were roughly 4-5 times higher and that conductivity levels are roughly 150-250 micro Siemens higher in the Triassic Basin than other Piedmont/Northern Piedmont watersheds.
 - A TAC member noted their interest in the super saturation of the DO in the monitoring data with the elevated total phosphorous, which is often the limiting nutrient; they question if the super saturation could be related to elevated total phosphorous and resulting algal production?
 - DEQ responded that it cannot be said for certain at this point. A TAC member remarked that the team could look at total phosphorous levels in the winter outside the growing season to see how it relates to production.
 - It was commented that it did not appear that DEQ has a monitoring station on Cub Run upstream of its confluence with Sand Branch, but does have one downstream?
 - DEQ clarified that they do have monitoring data both upstream and downstream of the confluence with Sand Branch and Cub Run. There is limited information at the upstream monitoring location.
 - Fairfax County commented that the Occoquan Watershed Monitoring Lab (OWML) has a stream gauge downstream on Cub Run, at its confluence with Bull Run. They have also conducted two synoptic monitoring events, 2017 and 2019, in which they walked Cub Run and measured specific conductance along the channel. The County commented that the data shows that conductivity readings drastically decrease on Cub Run above its confluence with Sand Branch.
 - Mr. Brent noted that while elevated conductivity readings have been observed at the upstream station on Cub Run, and the ion analysis is ongoing, a distinct 'fingerprint' is apparent for Sand Branch compared to ions found upstream on Cub Run. DEQ will request additional data/information from OWML and/or Fairfax County to help better understand the circumstances.
 - DMME commented that where TDS concentrations in coalfields are in the similar range of those observed on Sand Branch, roughly 500-600 mg/L, they see impairments. However, the VSCI

scores are in the range of 40-50 and not as significantly impaired as what is seen in Sand Branch, which are as low as 10. Commenter recognized we are likely to find different organisms in the different places/ecoregions. The ions in the coalfields tend to be: bicarbonate, sulfate, magnesium, calcium and potassium, but not much sodium. Commenter suggested that there may be additional stressors besides simply the TDS.

- DEQ replied that there are many potential contributing sources leading to stress on the benthic community in Sand Branch. It could be the discharges discussed, underlying geology and also a developed watershed with relatively high impervious surfaces in the watershed that will change over time. So, there are many potential contributing factors to the impairment in Sand Branch.
- A TAC member requested if the team has considered sampling for polynuclear aromatic hydrocarbons (PAHs) or other contaminants that may be coming off of parking lots and road surfaces.
 - DEQ responded that in general, run-off from roads surfaces and parking lots can contain a number of different pollutants. Among those, can be petroleum related contaminants, oils and grease, solids. DEQ also often see metals in stormwater runoff, especially in higher risk areas that are more commercial/industrial. DEQ sees zinc and copper from tire wear and brake linings. DEQ does not see elevated levels of these metals in Sand Branch. These are good comments and questions, and DEQ wants to receive this type of input and feedback.

Following the discussion, Ms. Siverson reviewed with the TAC a revised project timeline. This was updated to include a third TAC meeting in late February or early March to cover additional data related to the benthic stressor analysis. Also, the second public meeting was shifted to April to give time to draft the report and share with the TAC prior to that meeting.

She then provided information on how the TAC could provide feedback on the virtual meeting format itself. Comments on the virtual meeting format, comment form provided as an attachment to the PDF, are to be submitted to FOIA Council.

Ms. Siverson asked that any questions or comments pertaining to the Sand Branch TMDL study be directed to her. She also noted that she would be following up with TAC in the following week regarding:

- Sharing a recording of the meeting and Virtual Meeting Comment Form with all meeting attendees the day after the meeting.
- Providing a draft of the meeting summary for the TAC to review.
- Scheduling for the third TAC meeting.

She then concluded the meeting with thanking those present for attending.