South River Science Team
February 1, 2017 Web Meeting Minutes

Overview of Constitution Park Remediation: *Mike Liberati, DuPont*

- See presentation for pictures of construction work.
- An area of soil that was obviously higher than other areas was excavated. Soil tested as non-hazardous and was hauled to Waste Management landfill near Richmond. About 30 trucks worth.
- Rest of bank being covered with geocell material, filled with soil and planted.
- Construction will be finished 1st half of February.

Monitoring and Database Update: *Bill Reese, AECOM*

- Long-term Monitoring
    - Baseline data collection activities completed (2014-2016) and generally agree with historic data (2006-2012).
    - Graphs shown for THg, MeHg, sediment and periphyton
        - Surface Water THg: generally agree with historic data.
        - Surface Water MeHg: VDEQ doesn't collect MeHg and there are few <12c data, but >12 c data generally consistent with historical data.
        - Interstitial Sediment: generally agrees with historic, more variation with MeHg.
        - Epilithic Periphyton: generally agrees with historic, more variation with MeHg. Consider reducing sampling frequency.
        - Where media is related showing significant correlation, consider reducing what media is sampled.
    - Beginning integration of multiple lines of evidence and changing focus from event-based analysis to more holistic view.
        - Synergistic lines of evidence establish pre-remedy conditions on a large spatial scale.
        - Post-remedy monitoring intends to evaluate progress toward attainment of remedial action objectives.
        - Utilize adaptive management post-remedy to optimize monitoring program.
- Short-term Monitoring
    - 2016 monitoring stations include Constitution Park (STM-01), North Park (STM-05) and WWTP (STM-07)
    - Constitution Park construction almost completed
    - Graphs shown for bulk sediment and pore water
        - For pore water, box plots includes all transects. May need to separate out transects.
    - Additional stations pending anticipated remedial schedule
    - 2017 – post-remediation monitoring at STM-01
    - Continued monitoring of ancillary habitat metrics
- Monitoring Field Schedule
    - Short-term Monitoring
        - Spring event- early June
        - Post-remediation sampling at Constitution Park

        - Pre-remediation (transitional) sampling at North Park, WWTP and across from WWTP (STM-08)
    - Long-term Monitoring
        - March 2017 mallard sampling
        - Spring/summer: aquatic exposure media, bass, turtles and terrestrial exposure media
        - 2017 bass sampling with VDEQ in May
- Reporting Schedule
    - Short-term Monitoring
        - 2016 Data Summary Memorandum
        - 2016 Annual Report
    - Long-term Monitoring
        - Baseline Report (2014-1016)
- Database Update
    - Over 108,000 results in EIM
    - On-going integration of researcher data and biological data (~5,000 records added, ~20,000 more to go)
    - Locus Mobile data collection platform tests successful and anticipate rolling out program-wide in 2017

2016 Angler Survey: *Brad Fink, VADGIF*

- See presentation for graphs of angling data.
- Report should be finished by March 1st.
- Recreational data was used to estimate economic impact to area.
    - 20 miles of South River = $141,000/year
    - South Fork Shenandoah = $2.2 million/year

Biochar Studies at Waterloo: *Erin Mack, DuPont*

- Focusing on new chars and support of field pilots
- Deep dive into char data to help evaluate chars for different applications (bank remediation and floodplain)
- New Chars
    - Alt En (digestate and distillers grain)
    - BioChar Now
- Results
    - Leaching Profiles
        - Chars exhibited different profiles in leaching tests, but pre-washing of chars may control leaching of nutrients and sulfur oxyanions.
    - Hg removal characteristics
        - Biochar Now less effective at removing <0.45 um Hg compared to activated carbon and cowboy charcoal.
        - Alt En Digestate biochar removed >98% of mercury, similar to activated carbon and Cowboy Charcoal.
        - Alt En Distillers char (both 100% and 50/50 blend) was less effective in removing Hg
    - Column Studies
        - Biochar Now

        - Maximum mass of Hg on char was not approached
        - Effective removal of Hg at 3.3% wt. biochar
        - MeHg concentrations were relatively low
        - Hg removal comparable to Cowboy Charcoal in parallel tests
    - Alt En Chars
        - Increases in sulfate and pH were transient
        - Digestate char showed best Hg removal (better than Cowboy Charcoal), Distiller char comparable to Cowboy Charcoal
        - MeHg analysis pending
- Predicting char performance?
    - Batch Studies
        - Best chars in general appear to be high temperature, low PO4-P, lactate, acetate, propionate, formate, DOC, Fe
        - Worst biochars appear to be low temperature, surface area, sulfate
    - Columns
        - The percent Hg removal in the batch test corresponded to performance in a column setting for Alt En 100% Digestate, however parameters from batch test could not predict the small difference between Cowboy Charcoal and 100% Distiller's Grain observed in the flow-through columns.
- Conclusions
    - Both Biochar Now and Alt En products appear suitable for application to bank remediation scenarios (pending final MeHg measurements on Alt En layered columns)
    - Batch studies appear to underestimate performance in flow through columns but overestimate performance in co-blending conditions.
- Next Steps
    - Further review and data mining of screening studies and previous co-blending experiments
    - Potential additional co-blending char studies to support Floodplain pilot (effect of char particle size, application rate and added fertilizer for crops)

2017 ROPs activities and EFPC Highlights: *Nancy Grosso, DuPont*

- 2017 activities will include:
    - Continued characterization/treatment of sediment/soil with biochars (Carol Ptacek, U. Waterloo)
    - Stable Mercury Isotope Analysis (Joe Blum, U. Michigan)
    - Dynamic Mercury Cycling Model (Reed Harris)
    - Post Remedy Pore water Monitoring at Constitution Park (Danny Reible, TTU)
    - Floodplain Soil Amendment Pilot (Bill Reese, AECOM)
    - Field Verification of Aquanty HydroGeoSphere Model (Steve Berg, Aquanty/AECOM)
- Highlights from webinar held 1/19/2017 detailing activities at ORNL – Upper East Fork Popular Creek
    - Parallels with SR, but some differences
    - UEFPC loading: 50% from Y-12 facility, 50% from creek and floodplain
    - Average flow ~50 cfs
    - MeHg increases downstream, DHg and THg decrease downstream
    - Apparent seasonal change in KD
    - Much remediation focus has been on Y-12 Plant (30 years)

    - Both systems will likely need significant reductions in water concentrations before a fish tissue response seen
- 3 Major Remediation Focus Areas
    - Soil and GW sources control
        - Creek bank soils have a visually identifiable layer in the banks (fly ash)
        - Studies include desorption and dissolution/kinetics and equilibrium (due to storm, rainfall and groundwater)
        - HRD contains many fines, high moisture content and could result in local MeHg production.
        - Erosion appears to be a significant source of loading to the creek
    - Water and sediment chemistry manipulation
        - Investigating the role of NOM on Hg sorption (inhibiter for amendment effectiveness)
        - Amendments: Thiol-SAMMS, GAC, Sedimite, Biochar, Lignin-based carbon, Organoclay, apatite
        - Evaluating the effects of Cl- (at plant site) on solubility of Hg in storm drains
    - Ecological manipulation
        - Biodynamic model (considers uptake, loss, growth rates)
        - Exploring restoring native freshwater mussel species for trophic modification.

Outreach: *Mike Liberati, DuPont and Carmen Moreno, JMU*

- Mike Liberati and Calvin Jordan gave tour of remediation site to local blogger of Waynesboro.com
- Remedial Advisory Panel given tour of site in December
- Lots of media coverage of the NRDAR settlement.
- Promotores
    - Working with 8 Harrisonburg High School students.
    - Will be giving them a tour of SRST office and South River along with their Spanish teacher and Andy Jackson.
    - Participating in STEM Day Event at Harrisonburg Mall on 2/18
    - Officer Hernandez (DGIF Conservation Officer) met with students and shared experiences becoming Conservation Officer.
    - Still trying to recruit more people from Waynesboro area for Promotores program.
    - Will be attending 3 health fairs this spring at East Rock, Harrisonburg and Broadway High Schools.

Update on NRDAR Settlement: *Anne Condon, USFWS*

A public information meeting was held January 10. About 150 people attended. The public comment period for the draft Restoration Plan closed January 30. Over 50 emails and letters were received and staff are now beginning to review them, address comments and work on finalizing the Restoration Plan. The presentation, fact sheet, restoration evaluation criteria, draft restoration plan and visuals from the public meeting can be found at the following website: https://www.fws.gov/northeast/virginiafield/environmentalcontaminants/dupont_waynesboro.html

Please keep checking this website for updates.

Spring and Summer Meeting Plans

April 19th – room reserved at VRO, but may meet in Waynesboro. Possibly include tour of Constitution Park remediation bank.

Fly Fishing Expo: April 22-23

Riverfest: April 29