South River Science Team

Summer Web Meeting

July 26, 2016

Minutes*

Remedial Design/Permitting: ***Clay Patmont, Anchor QEA***

- The construction plan has changed slightly in that the goal is to begin construction at Constitution Park this fall and at the WWTP Spring 2017. However, permits, construction plans, etc. are still being submitted jointly for both sites. Construction at both sites still calls for removal of high mercury concentrated soils and then capping the rest of the bank. Great care will be taken to preserve as many mature trees in the capping area as possible. It is estimated that in the Constitution Park site there will be a 90% reduction in THg loading. VMRC and USACE are still reviewing permit, but are close to finishing review.

Monitoring: ***Josh Collins, AECOM***

- Mallard ducks were collected from 13 locations in March and breast tissue was analyzed for THg and MeHg. Results were similar to 2008 DEQ results.
- Benthic community sampled using Surber sampler in June and October. Results shown for Spring and Fall 2014 and 2015.
- AECOM has archived benthic voucher collections dating back to 2010 that need a new home. If interested contact Josh Collins.
- Short-term monitoring spring collections are complete. This includes periphyton, clams, sediment, pore water and habitat metrics. Data are pending.
- 2015 Annual Report for Short-term monitoring is undergoing revision. Final document to be posted July/August. STM will be reported annually.
- First summary report for Long-term monitoring to be compiled following 2016 data collections. Next will be compiled either post-remedy or every three years.
- Fall 2016 Field Summary includes STM listed above plus adult and YOY (young of year) bass, periphyton, clams, interstitial sediment, mayflies, benthic community and habitat metrics.

Database: ***Jen Badner, AECOM***

- The objective is to create a data repository for all project data including analytical and field data as well as spatial data and documents which is accessible to multiple stakeholders.
- Currently most data lies in Excel data master files. In process of prepping Locus Mobile field forms.
- Locus Mobile Work Flow allows data entry in the field from hand-held device.
- Schedule
    - Upload data from existing biota file – 8/24/2016
    - Test formatted report templates for biological data – 9/29/2016
    - Test mobile app (Spring LTM Data) – 8/30/2016
    - Field test mobile app – Fall 2016

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- Add spatial layers – when EIM functionality becomes available.
- Determine functionality of SRST website for common user - TBD

Relative Risk Model: *Sagar Thakali, AECOM*

- Overview of the model was given.
- Future Tasks and Schedule:
  - Start with smallmouth bass model
    - Review RRM and revise/update input files – July
    - Incorporate monitoring data – August
    - Review output/integrate with EAM – September
    - Test scenarios (e.g. bank stabilization, etc.) – October
  - Complete Carolina wren and abiotic models next following similar strategy.

In-situ Hg measurements: *Todd Martin, Integral*

- Instrument was deployed at the Augusta Forestry Center for 6 weeks and was able to capture two storm events. AECOM collected 11 discrete sampling events. Still waiting for results of last 3 sampling events.
- Summary of findings:
  - Successful development of robust optical models with model error within range of analytical error except for dissolved Hg.
  - Large instruments not necessary for robust PLS models for particulates and potentially for dissolved (a smaller, less costly, more versatile instrument suite can be deployed).
  - Particulates and particulate phase Hg and MeHg concentrations closely tied to flow. Suggest engagement of bank and bar areas during higher water/flow events is important.
  - Majority of MeHg is dissolved under baseflow; concentrations possibly related to temperature.
  - During peak storm flows, particulate MeHg is more prominent and dissolved MeHg concentrations decrease.

Mercury Cycling Model Update: *Reed Harris, RHE*

- Model reasonably simulating several, but not all, key trends.
- Particle dynamics very important (gross and net fluxes).
- What will bank stabilization do to particle dynamics in river bed? Current model results probably need adjustment.
- Need to resolve issue of “hump” too far downstream in model.
- Need to further examine model results for downstream erosion after bank stabilization and make adjustments.
- Need to test sensitivity to strongly bound vs freely exchangeable Hg on solids.
- Test scenarios with elimination of different sources:
  - Bank erosion RRM 0 – 2
  - Bank erosion RRM 0 – 5
  - Bank leaching
  - Invista site loads

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Phase 1B BMA Bank Soil Sampling: ***Josh Collins, AECOM***

- Additional soil samples have been collected to provide additional data to refine loading estimates and to inform Phase 1B BMA remedial designs, to close data gaps at secondary BMAs and to provide horizontal and vertical delineation within potential removal areas.
- A combination of surface samples on the bank face and core samples were collected.
- JMU co-sampled while field testing XRF technology.
- Max THg sample collected = 2,470 mg/kg. For results, see presentation.
- Path Forward:
    - Update bank loading model.
    - Refine Phase 1B BMA boundaries.
    - Begin Phase 1B remedial design (Q4 2016/Q1 2017).

JMU XRF Field Study Update: ***Robert Brent, JMU***

- Robert Brent and students worked alongside AECOM during bank soil sampling to conduct field and lab validation of XRF. The XRF is a hand held instrument that uses x-rays to determine elemental composition of a material such as lead in house paint or to help determine type of metal alloy brought to a scrap yard. XRF is capable of providing almost instantaneous readings.
- For this study, AECOM collected the soil samples. JMU then analyzed the samples in the field, then the samples were shipped to the lab for analysis (EPA 7471A). Samples were then shipped back to JMU for analysis in lab using XRF.
- A total of 236 samples were collected. 37% were < MDL of 7.4 ppm and ranged to 2470 ppm.
- Data quality analysis was performed as well as precision and accuracy analysis comparing lab results with XRF field and lab use. Tables and graphs of these results are in the presentation.
- Summary of Results:
    - Accuracy of detection at the 7.4 ppm level is very good – general agreement at the detection level between methods.
    - Accuracy throughout the range of 7.4 to 1000 ppm is very good – based on comparison with Method 7471A and comparison to known spiked amounts.
    - Precision is comparable to Method 7471A and is constrained by sample heterogeneity.
    - XRF method produces quick, real-time Hg results with equivalent analytical methods.
- Demonstrated and potential uses include:
    - More efficient bank characterization: ability to increase density of transects in response to Hg levels and provides quicker bank characterization results and avoid field re-deployments.
    - Confirmation and delineation of high Hg bank soils.
    - Quick investigation of interesting features such as highly eroding banks, tree falls, etc.
    - Confirmation of removal extents during construction.

Training: ***Nancy Grosso, DuPont***

- Still on schedule for fall training.
- Still undecided about in person or web training.
- Mechanistic Mercury Cycling Model will probably not be ready for a fall training event.

Fall Meeting: October 25-26

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