

South River Remediation Proposal: Preliminary Monitoring and Community Outreach Plan

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Outline

- Goals and objectives
- Monitoring features
- Short-term monitoring
- Long-term monitoring
- Discussion



Goals and Objectives of Monitoring

- Overall goal:
 - Assess efficacy of remedy to reduce transport and exposure pathways
 - Secondarily to improve WQ and bank habitat
- Specific objectives are to monitor:
 - Human and ecological exposure to mercury
 - System responses to remediation
 - Integrity of corrective action; and
 - Provide input to adaptive management framework and relative risk model



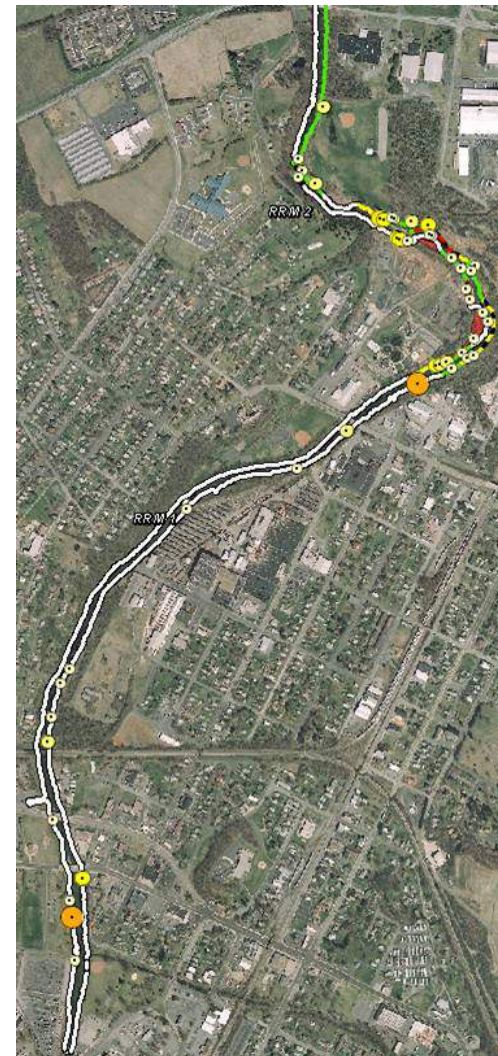
Monitoring Features

Monitoring is:

- Front-loaded
- Iterative, and may be scaled back or modified pending results, and
- Contains short-term and long-term elements
 - Differ in terms of spatial and temporal scope
 - Similar overall goals

Short-Term Monitoring

- Short time frame (e.g., 2-10 years)
- Small spatial scales (e.g., Phase 1: specific banks on RRM 0-2)
 - Phase 2: Remediation of downstream reaches informed by remedy success on RRM 0-2



Short-Term Monitoring Objectives

- Improve water quality and bank habitat functions between RRM 0-2 of the South River
 - Reduce bank erosion
 - Reduce mercury loading
 - Reduce in-channel mercury exposure
 - Downstream periphyton and clam deployments



Other Examples of Short-Term Monitoring Plans

- Waynesboro sewage treatment plan (2011)
 - Understand effects of nutrients on MeHg in periphyton
- Plant site interim remedial measures (IRM) (2013):
 - Understand effects of outfall Hg on invertebrates, periphyton



<http://aquaticinsectsofcentralvirginia.blogspot.com/>

Long-Term Monitoring

- Timeframe is >10 years
- Focus is South River and SFS River
- Objectives:
 - Monitor human exposure to MeHg in food
 - Monitor ecological exposure to MeHg in aquatic and terrestrial food web
 - Monitor potential improvements to water quality and benthic habitat



Power Analysis

- Probability of at least 75% of finding a significant downward trend in mercury concentrations considering three different trend tests:
 - Williams test
 - Jonckheere-Terpstra
 - Simple linear regression

Long-Term Monitoring for Potential Human Exposure

- Three food items of interest:
 - Adult largemouth and smallmouth bass
 - Other wildlife
- Community outreach
 - Signage
 - Physician and clinic outreach
 - Angler surveys
 - Outreach to non-English speaking communities



Promotores de Salud

Long-Term Monitoring: Monitor Potential Ecological Exposure (Aquatic)

- Young-of-year fish and benthic invertebrates:
 - Commonly used to monitor changes in mercury loading
 - Important food item
- Periphyton
- Asiatic clam tissue
- Sediment
 - Track interannual variability in MeHg production
 - Monitor potential natural attenuation



Long-Term Monitoring: Monitor Potential Ecological Exposure (Terrestrial)

- Preliminary focus on three receptors:
 - Adult Carolina wrens
 - Wolf spiders
 - Earthworms



Long-Term Monitoring: Water Quality and Benthic Habitat Quality

- Benthic habitat impaired RRM 0 to 14:
 - Phosphorous and sedimentation
 - May improve slowly as BMPs adopted
- Surface water:
 - Interannual variability
 - Long-term data set



Schedule

- Sampling for long-term monitoring elements begins in May 2014
- LTM plan draft available for review
- Short-term monitoring will be included with interim measures work plan in May 2014



www.dgif.virginia.gov/fishing/waterbodies/photos/South%20River.JPG

south river
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