

Remedial Options Program Update

South River Science Team

1-11-11



Feedback from Expert Panel Members as it Relates to Remedial Decisions

- General Categories of Comments
 - Conceptual Model and Mass Balance
 - Management of Mercury in the System
 - Watershed Management
- Current Proposed Approach



Conceptual Model and Mass Balance - Comments

- Aquatic Conceptual Model Documentation and Exploration
 - Document assumptions and equations used in mass balance
 - Consider expressing fluxes on a per unit basis to distinguish high flux versus large area
 - Hyporheic zone dynamics over different flow conditions
 - Explicitly define mercury sources to the base of the food web
 - Further explore the importance of periphyton in the food web
 - Use in situ and streamside (JMU) Mesocosms to test CM
- Aquatic Conceptual Model Mapping -
 - Characterize / Map System on a reach by reach basis
 - River substrates and SAV coverage
 - Loadings / sources inorganic Hg
 - MHg production compartments
 - Links with aquatic and terrestrial food webs
 - Etc.
- Build on toolkit to characterize bioavailable Hg fraction in the system
- Terrestrial Food Web
 - Identify key areas / compartments of methylation
 - Understand links between terrestrial and aquatic food web



Managing Mercury - Comments

- Define clear objectives and targets
- Employ in-situ and ex-situ mesocosms to test treatment options
- Advance understanding of innovative options including MHg control and reducing Hg bioavailability
 - Begin culling / developing concepts
- Terrestrial vs. Aquatic - can the differences in the MHg biomagnification factors (2 to 5 X) be exploited?
- Articulate specific features of the trophic modification options
- Track other Hg remediation sites
- Engage the broader public



Watershed Management - comments

- Define clear and achievable goals for the watershed by defining desired future conditions
- Examine how bank stabilization effort interplays with benefits to ecosystem (e.g. improved habitat quality)
- Coldwater fishery unlikely - promote SR as trophy warm water fishery – continue Catch and Release
- Engage the broader public



Mercury Management

- Remedial Action Objectives (2008)
 - Reduce fish tissue Hg levels to concentrations that would allow consumption
 - Ensure protection of aquatic and terrestrial ecology with respect to Hg exposure

Mercury Management – Proposed Short-term and Long-term Actions

- Aquatic Environment Approach – Short term
 - Control significant ongoing sources from banks
 - Refine Hg Loading model estimates and validate with field program (RRM 0 to 10)
 - Prioritize Actions for bank stabilization
 - Conceptually design stabilization options on reach by reach basis (range of technologies)
 - Establish Stakeholder Group and refine designs
 - Test proposed actions using Relative Risk Model for potential unintended consequences
 - Implement on selected reach and monitor



Mercury Management – Proposed Short-term and Long-term Actions

- Aquatic Environment Approach – Long term
 - Continue to explore innovative approaches to control / reduce methyl mercury
 - Employ adaptive management to test
 - Test the transport zone bed turnover model (90% of the bed in 20 years; 50% of the bed in 5 years)



Mercury Management – Proposed Short-term and Long-term Actions

- Floodplain
 - Test sorbent amendment in floodplain pond (2011)
 - Track terrestrial / avian food web studies and identify potential options for reducing Hg in biota.
 - Lab and Field testing as appropriate
 - Stakeholder review and refinement
 - Model potential outcomes (Relative Risk Model)
 - Implement feasible management options



Questions / Discussion



Proposed Next Steps

- Task Teams to process Expert Panel comments along with today's discussion
- Address comments
- Update approaches / activities of the Task Teams