



# Remediation Proposal: Phase 1 Remedy – Bank Stabilization

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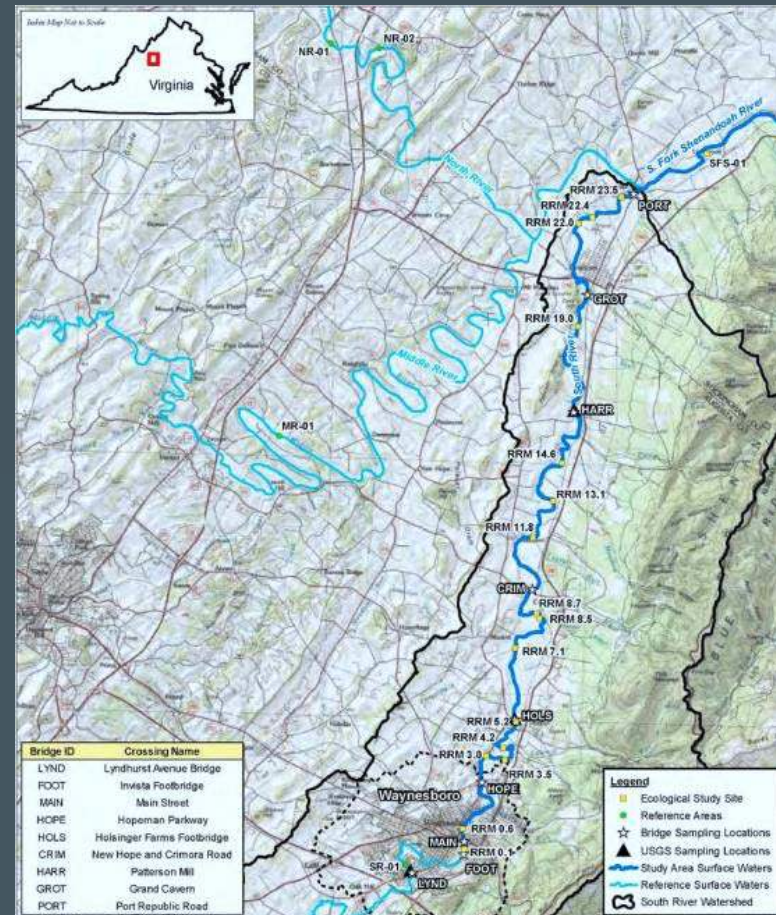
South River Science Team

October 9, 2013



# Discussion Outline

- Remediation Proposal overview
- Further Phase 1 bank evaluations
  - Mercury concentrations
  - Bank stability
- Next steps



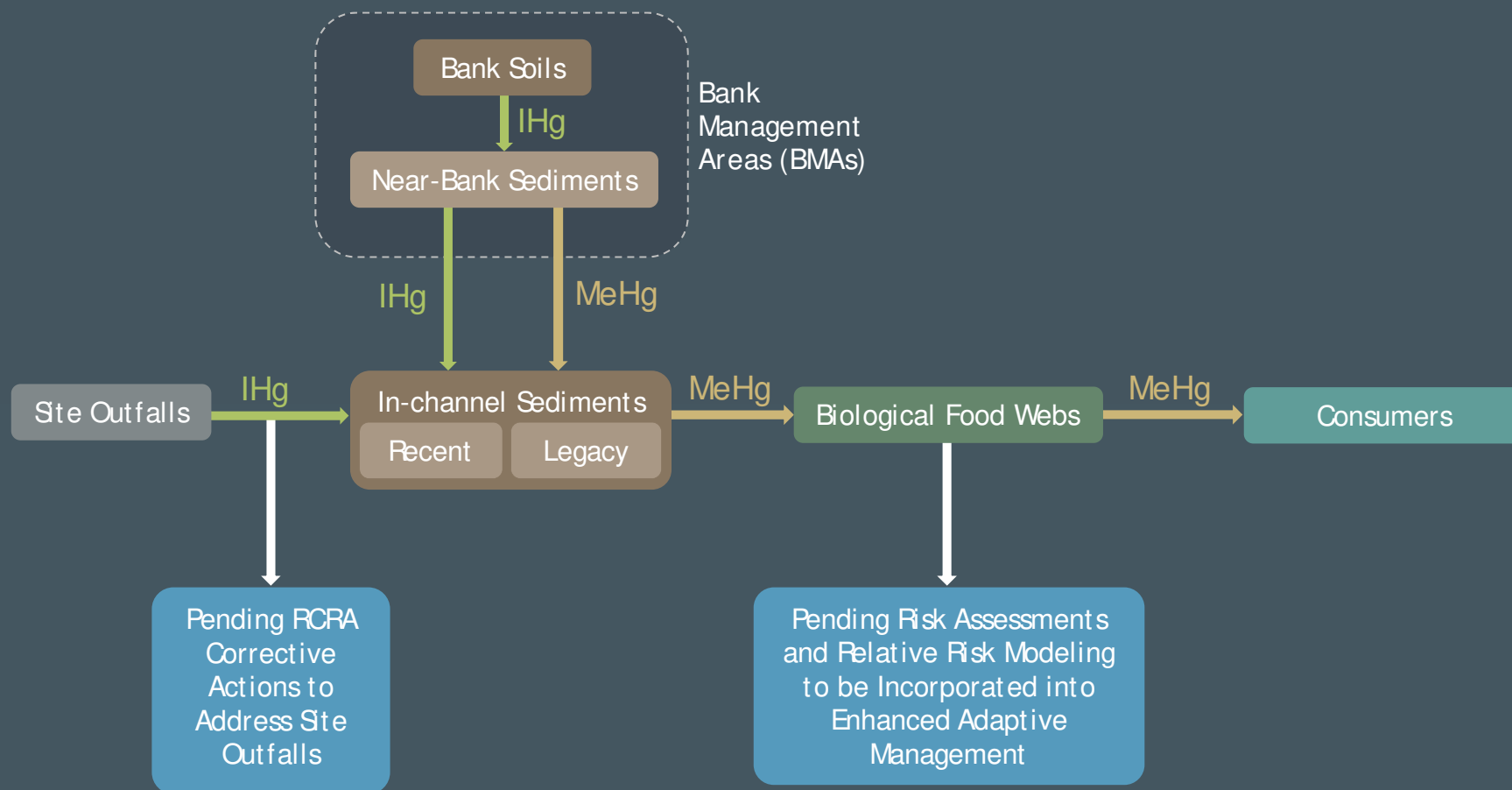
# Features of the Remediation Proposal

- Provided a mechanism for stakeholder input, including NRDC, agencies, and SRST
- Focuses on ongoing sources
- Forms the basis for future corrective action plans and adaptive management with VADEQ
- Utilizes risk management principles
- Incorporates sequential adaptive management over a 5- to 10-year period starting with Phase 1 actions

# Features of the Remediation Proposal, cont'd

- Develops recommendations for conceptual Phase 1 bank management actions
  - Use proven bank remediation technologies
  - Test hypothesis that reducing bank loading to the channel will accelerate recovery processes
  - Phased implementation, monitoring, and adaptive management
- Future phases will include downstream corrective actions and terrestrial/ floodplain evaluations

# Basis for Phase 1 Remediation Conceptual Site Model

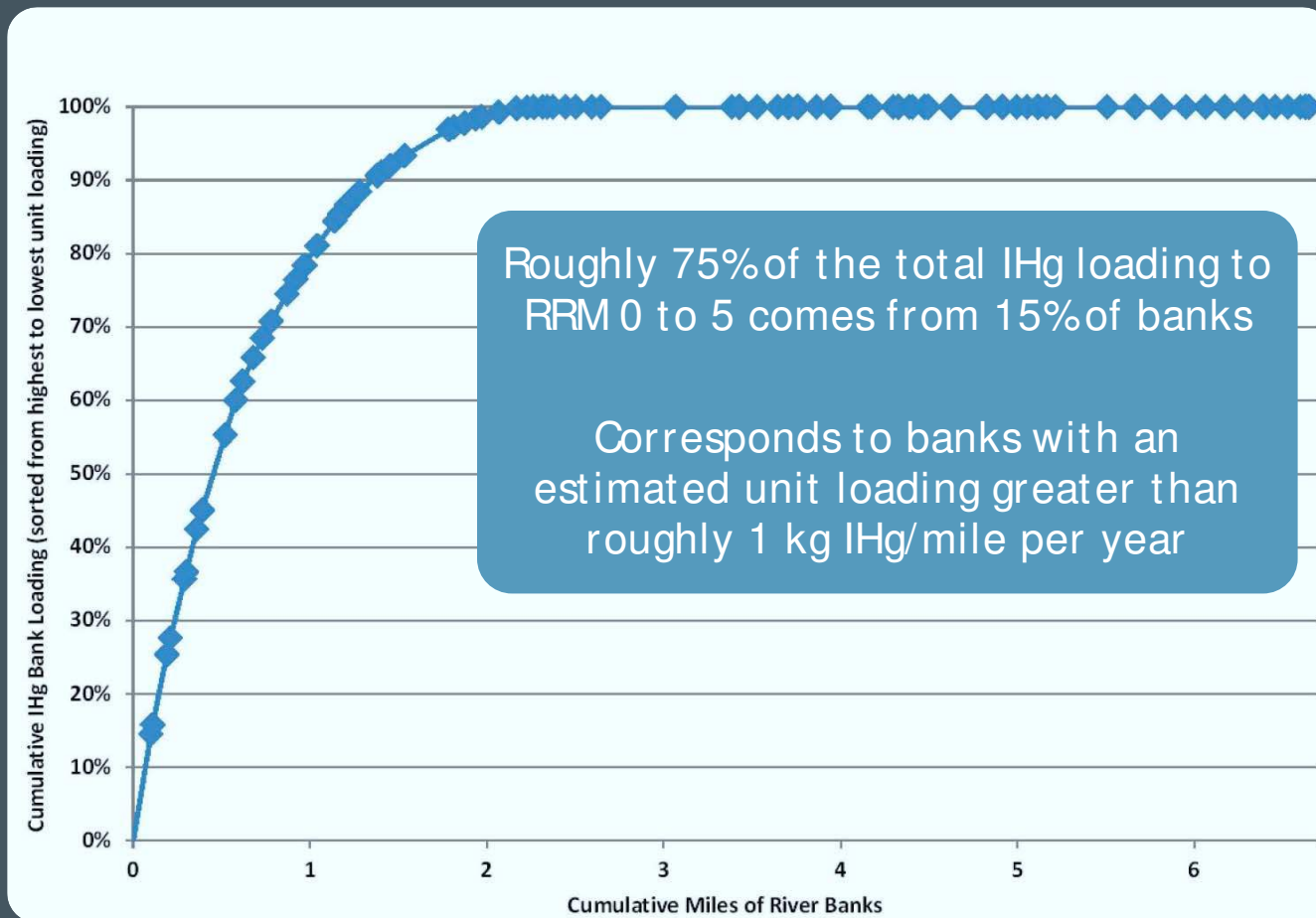


# Mercury Loading to the South River Aquatic System Based on Multiple Lines of Evidence – RRM 0 to 10

## Mass Loading of Mercury (Hg) to Fish Tissue

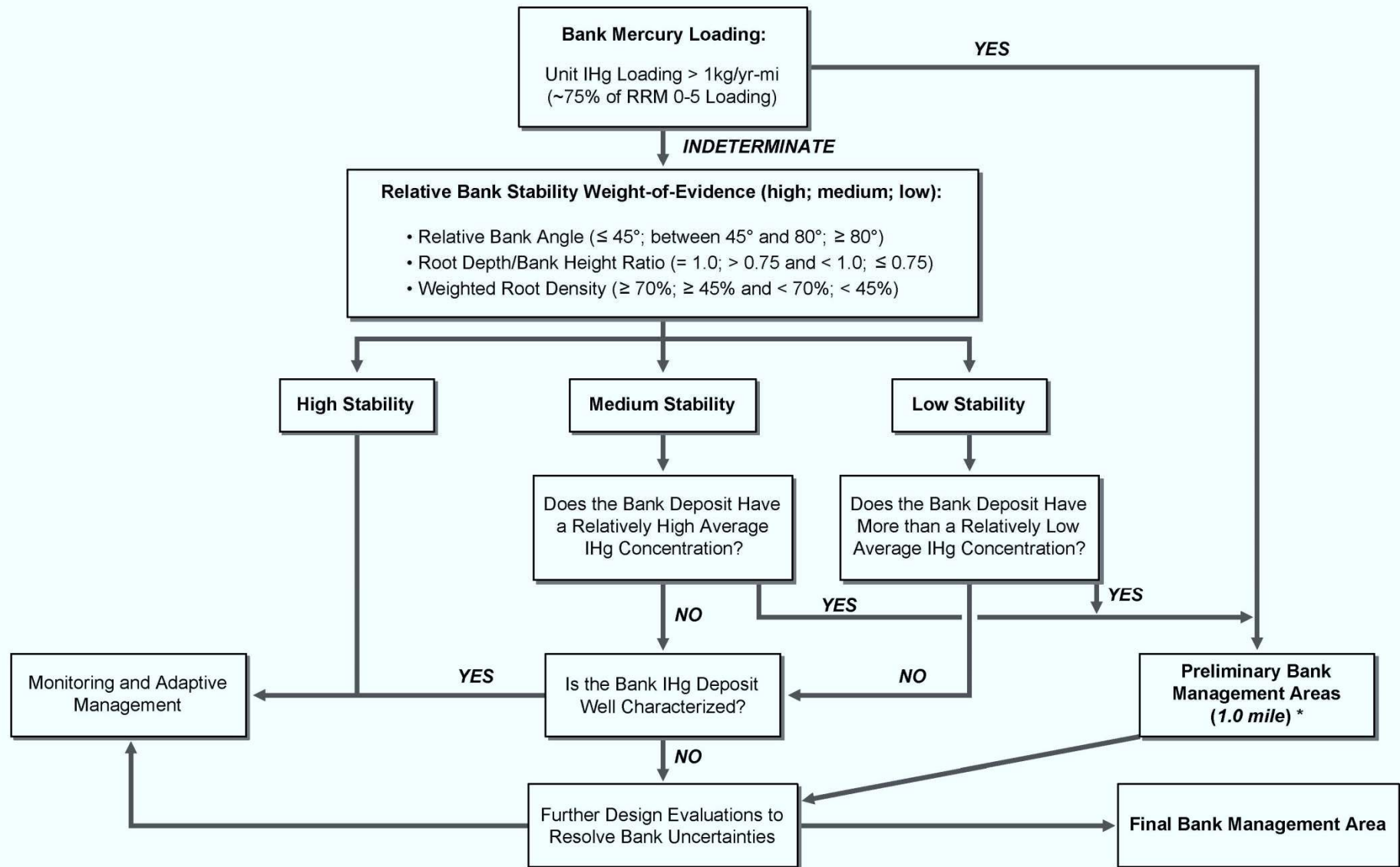
|            |                                   |
|------------|-----------------------------------|
| 3% to 5%   | Plant site outfalls               |
| 40% to 60% | Eroding banks (historic deposits) |
| 15% to 35% | In-stream beds                    |
| 5% to 20%  | Other                             |

# Cumulative IHg Bank Loading: RRM 0 to 5

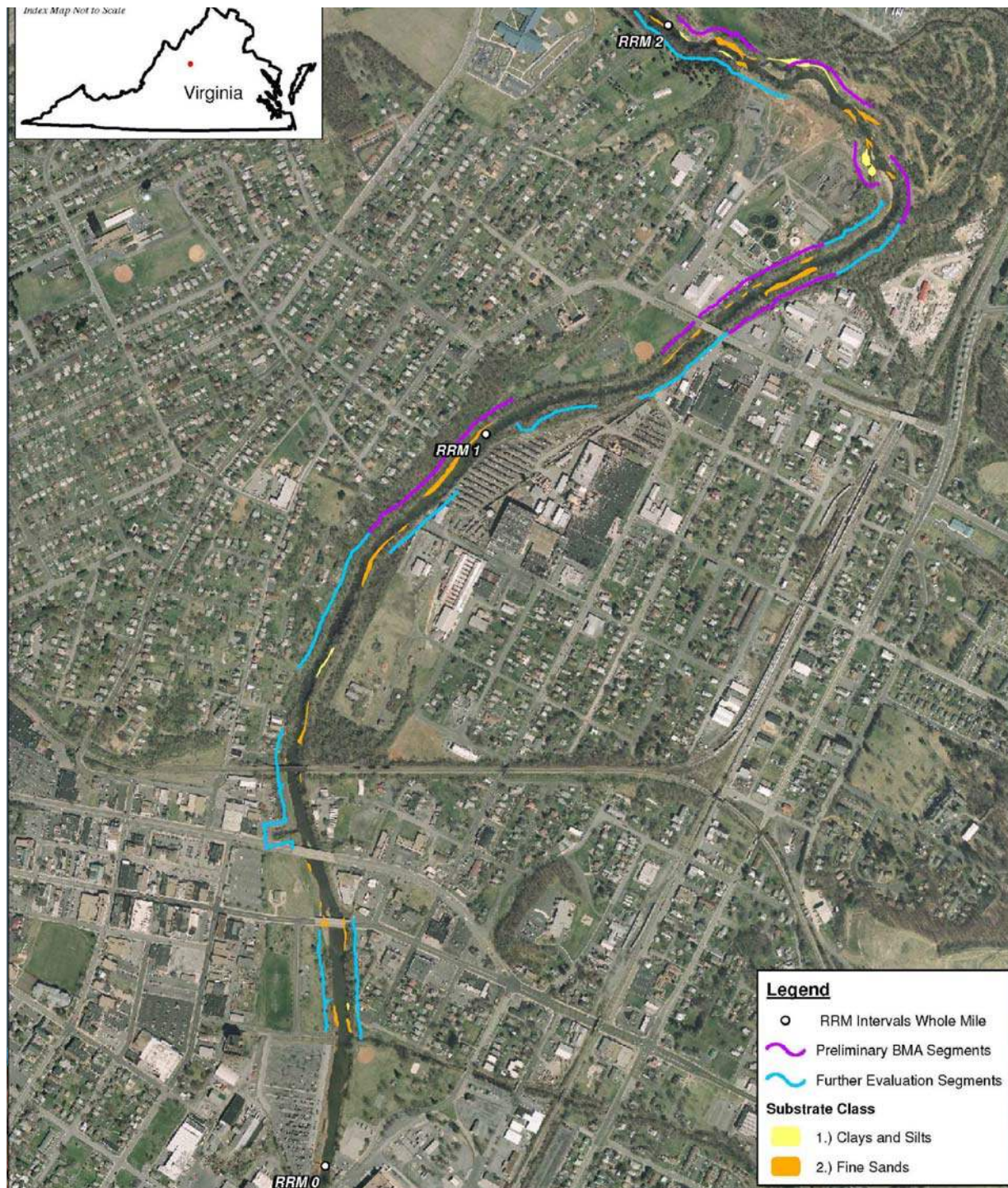
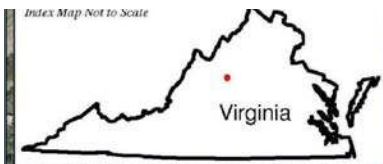


Source: From Pizzuto et al. (2011), excluding anthropogenically altered banks

# Preliminary Evaluations of Phase 1 BMAs



\* In addition to the 0.1-mile Bank Stabilization Pilot



#### Legend

- RRM Intervals Whole Mile
- Preliminary BMA Segments
- Further Evaluation Segments

#### Substrate Class

- 1.) Clays and Silts
- 2.) Fine Sands

# Preliminary Phase 1 BMAs and Near-Bank Deposits:

## Further Evaluation Segments in RRM 0 to 2

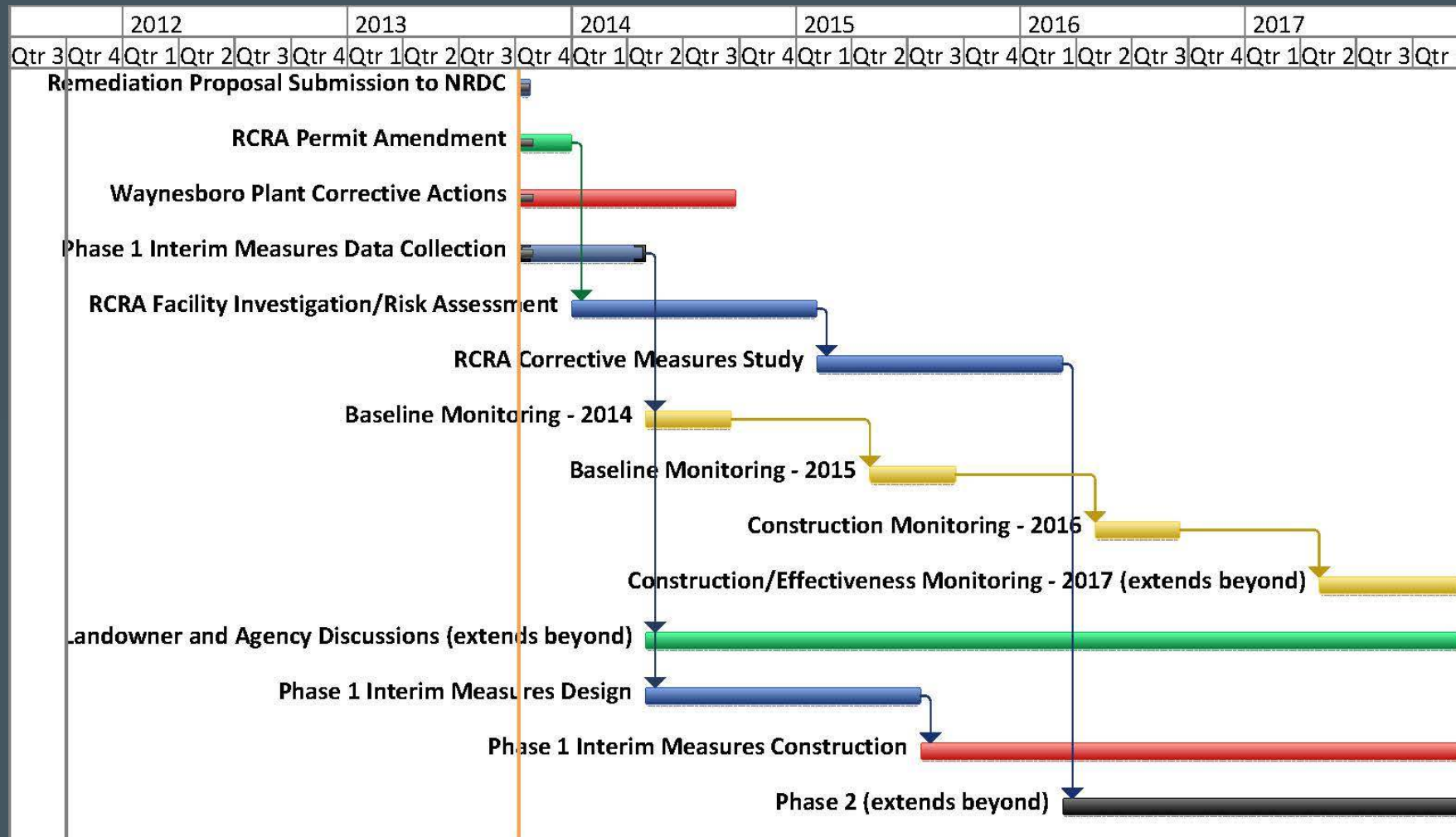
# Further Evaluations of Phase 1 BMAs

- Provide additional data to:
  - Support Phase 1 BMA designs
  - Determine if additional banks should be categorized as BMAs
  - Further characterize bank erosion rates
  - Compare bank evaluation tools and techniques
- IHg concentrations in bank soils
  - Composite samples from middle and top of bank
  - Used in BMA weight of evidence evaluation
  - Refine IHg loading estimates

# Further Evaluations of Phase 1 BMAs, cont'd

- Correlations between erosion rates and key bank stability metrics
  - Ongoing Univ. of Delaware LiDAR resurveys of 12 banks in RRM 0 to 10 evaluated in 2006/ 2007
  - Broader application of laser survey methods
- Key bank stability metrics at finer scales
  - Bank angles measured with laser range finder
  - Root depth to bank height ratios
  - Weighted root densities
  - Evidence of erosion (e.g., undercutting)
  - Soil physical characteristics

# Next Steps



# Key Next Steps

- Refinement of Phase 1 BMAs
- Location-specific corrective action designs
  - Designs tailored to bank characteristics
- Agency reviews
- Landowner preferences
- Access agreements
- Permitting