Hudson River PCBs Site

Engineering Performance Standards For Dredging

Presentation to Peer Review Panel

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Synergistic Characteristics - Performance Standard Interactions Promote Protection and Productivity

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Performance Standards

Purpose: ***establish boundaries for project implementation***

- Consistent with project objectives
- Protect resource & human health
- Require sufficient data collection to evaluate Phase 1

Development Philosophy

- Provide design flexibility
- Allow field decisions where possible
- Avoid over-specification to allow innovative project design & implementation as appropriate

Alternative Philosophy

Prescriptive Standards

- Reduce flexibility
- Discourage innovation
- Force premature decisions

Development Approach

- Establish solid technical basis for each standard
- Subject to a test case to ensure project objectives met Practicable application for each standard

Technical Team

- Large, highly-qualified development team assembled
  - Diverse backgrounds & perspectives
  - Extensive knowledge of upper Hudson River System

Quality Review Team

- Leading experts in field
- Functioned independently from development team
- Fully integrated into process
- Role was to “challenge” the standards

Current Focus - Phase 1

- Data collection is important component of Phase 1
  - Recognize limitations of available data
  - Obtain site-specific data required for refining project design
  - Address concerns of local citizens
- Satisfactory performance during Phase 1 will likely lead to streamlined standards for Phase 2

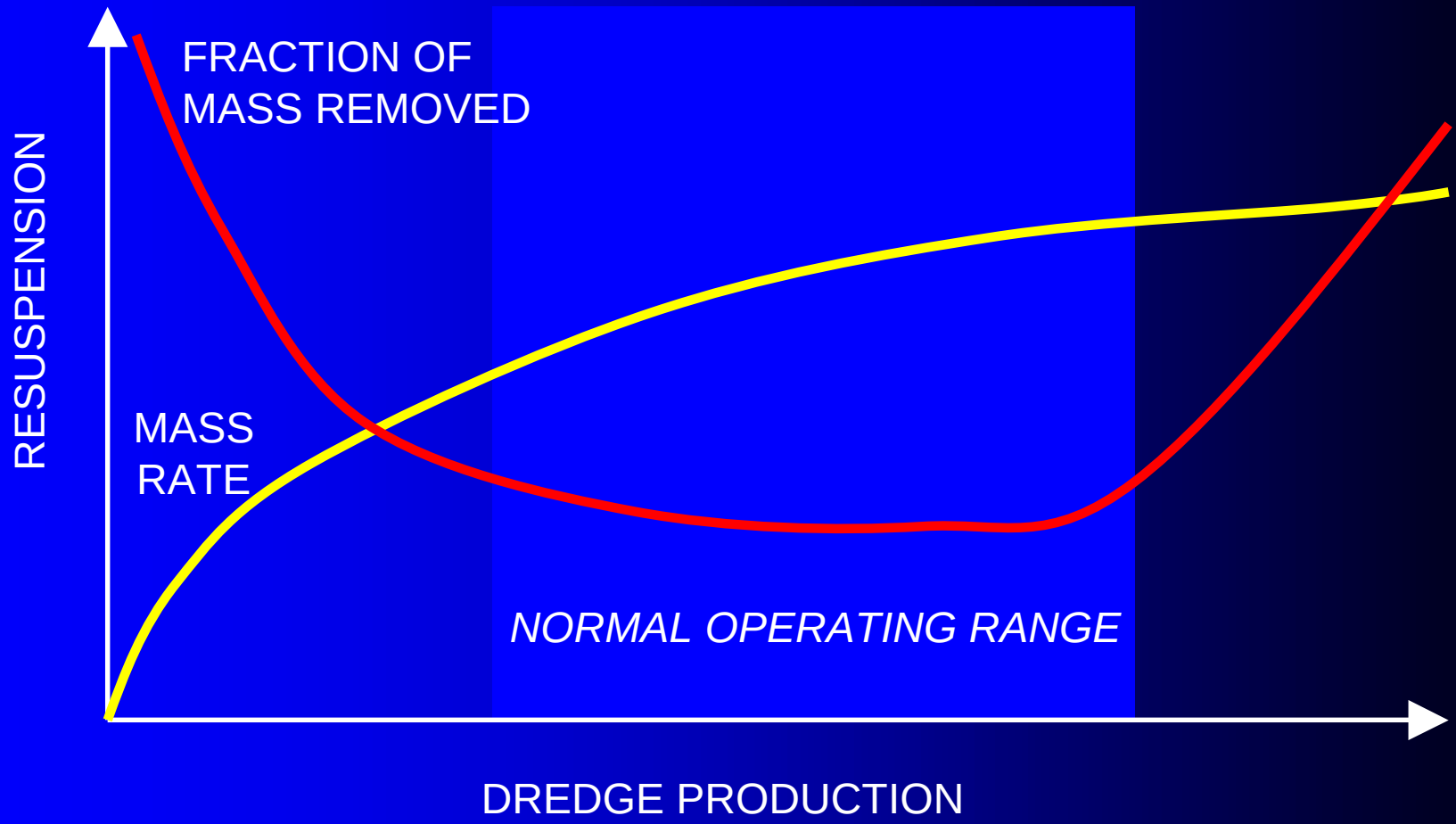
Natural Tension

- Expeditious project completion leads to more rapid resource recovery (Productivity Standard)
- Remedial project design must not further damage the resource, thereby jeopardizing project benefits (Resuspension Standard)
- Post-project conditions must meet or exceed project objectives (Residuals Standard)

False Notions

- Increased production yields increased residual and resuspension losses
- Corrollary
  - Restricting a dredging operation minimizes residuals and decreases resuspension losses

Resuspension Trends



Residuals

- Processes regarding how and why residuals occur are poorly understood
- Normal dredging operations should result in least residual sediment
- Excessively aggressive dredging may increase residuals
- Sediment conditions and equipment type are important

Performance Standard Interactions

Productivity Standard

- Establishes a progress schedule to meet project objectives
- Productivity schedule based upon
  - Conventional equipment
  - Conservative production estimates
- Proper design & equipment selection should lead to higher production rates

Residuals Standard

- Recognizes
  - Inability of dredges to precisely remove contaminated sediment shown during previous projects
  - Limited effectiveness of repeated dredging attempt with same equipment

Residuals Standard (cont'd)

- Repeated dredging attempts detrimental to productivity
  - 2 additional attempts maximum during Phase 1 (after inventory removed)
  - Definitive process allows field decisions

Resuspension Standard

- Routine monitoring
  - Baseline data collection
- Evaluation Level
  - Properly designed operation should remain at or below this level
- Concern Level
  - Increases monitoring to identify source of resuspension

Resuspension Standard (cont'd)

- Control Level
  - Implements actions to avoid temporary cessation of operations
- Threshold exceeded
  - Temporary cessation of operations

Data Collection

- Essential component of Phase 1, particularly at Evaluation & Concern Levels
  - Comparison to action levels
  - Identify mechanism of release
  - Identify TSS – turbidity relationship
- Automated monitoring and data evaluation encouraged

Intricacies Within The Standards

Drinking Water Protection

- 500 ng/l standard maintained in river
- Additional treatment will further reduce concentration
- Lag time allows adequate notification - details will be in CHASP
- Early notification by using TSS as a surrogate

Redredging requirements streamlined

- **When a CU is non-compliant because of one or a few nodes, the CU can be brought into compliance by:**
  - Redredging areas of concern
    - Guidance for area definition provided
  - Capping areas of concern
    - Remaining area must be compliant

Aggregating Small Dredging Areas

- Proximate non-contiguous dredging areas < 5 ac can be tested as a single contiguous area (i.e. only 40 samples required)
- If non-targeted areas are contained within a barrier, a plan to either protect or sample non-targeted areas must be submitted.

Resuspension Monitoring

- **Balanced between sampling requirements and data needs**
- **Automated sampling methods encouraged whenever they can meet the DQOs**
- **Split-phase sampling**
  - Required to address concern over dissolved releases at the point of dredging
  - Since sampling is more difficult and expensive, not required in routine monitoring

Flexibility

- **Redredge, Backfill, or Cap decisions for individual areas left to design and field operation based upon technical feasibility**
- **Capping within navigation channel**
  - Discouraged, but allowed if
  - Overdredged to accommodate cap thickness
  - Indicator layer installed to protect the cap
- **Non-contiguous areas can be backfilled/closed as long as they are compliant within themselves**

Recharacterization

- **Post-dredging samples (0-6”) for a CU are the basis to determine if an investigation of additional inventory is needed**
- **Mean > 6 ppm AND Median > 6 ppm**
  - Must recharacterize entire CU (deeper samples), then redredge to remove additional inventory located
- **Mean > 6 ppm AND Median < 6 ppm**
  - Must recharacterize only areas that seem to have inventory, then redredge to remove additional inventory located

Conclusions

- Standards have been developed through a thorough & reasoned process
  - Considered input from QRT, trustees, GE, and public
- Aim is for a constructible project that accomplishes stated objectives
- Standards provide a framework that allows for innovation and a unique approach to the problem
- We look forward to your independent review

Important Questions for the Peer Review Team to Consider

Are The Standards

- Technically sound?
- Reasonable and appropriate?
- Balanced?
- Implementable?

Are The Standards

- Technically adequate?
- Properly documented?
- Developed so as to satisfy established quality requirements?
- Developed so as to yield scientifically valid and credible conclusions?