Integration of Dredging and Disposal

(Tab F)

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Training Objectives

- Show that environmental dredging is only a component of a remediation alternative.
- Develop understanding of the interdependency of system components.
- Provide guidance on requirements to integrate the dredging, transport, rehandling, dewatering, treatment and disposal systems.

Integration Issues

- System Approach for Compatibility
  - Multi-component
- On Site vs. Off Site Considerations
  - Staging
- Rehandling, Dewatering and Treatment
  - Equalization, separation
- CDF and Landfill Disposal Requirements
  - Moisture control
  - Transport
- Throughput vs. Footprint Requirements
  - System dependent

Need for Integration

- Lack of flexibility, redundancy and equalization are major causes for problems associated with use of dredging as a remedial alternative
- Contributes to
  - Delays and low production rates
  - High dredging costs
  - High rehandling costs
  - Inefficient dewatering and treatment
  - Failure to meet performance standards
- Critical for equipment selection and alternative design

System

- Composed of Dredging, Transport/Rehandling, Separation, Dewatering, Treatment and Disposal
- Simplicity, integration and isolation of components by equalization promotes production and lowers costs
- Equalization needs dependent on operation
- Design remedial systems with clear objectives, contingencies, and expectations
- Incorporate adaptive management

Hydraulic Dredging

- Produces variable waste stream, requiring dewatering
- Performs best with equalization to provide a uniform solids feed rate to separation or mechanical dewatering systems
- Facilitates separation
- Dewatering, if undersized or without flexibility, may limit production rate
  - Is most compatible with CDFs or
  - flexible dewatering systems such as “geobags”
- Produces very large quantities of water for treatment
  - strongly dependent on operation
  - average solids content often less than expected, generating larger wastewater flows than projected
  - treatment may limit production rate if inadequately sized

Mechanical Dredging

- Produces more consistent waste stream, requiring transport and rehandling
- Minimizes dewatering and treatment needs
- Most compatible with solidification
- Transport and disposal may limit production
- Incompatible with separation
- May be hydraulically rehandled, but then presents problems associated with hydraulic dredges

Transport for Treatment/Disposal

- Transport distance
- Optimal water content for process train
- Transport must be compatible with treatment/disposal
- Hydraulic - pipeline transport is inherent with removal (batch transport not efficient)
- Mechanical - batch transport is another step in the process train, but reslurry/pipeline is possible.

Disposal

- CDFs
  - Must be sized for bulked storage and sedimentation
  - Typically, about 150% to 200% of sediment volume
  - May be dewatered or solidified in place
- Landfill
  - Must pass paint filter test
  - Generally requires dewatering/solidification
  - Fees based on weight, about one ton/cubic yard fine-grained sediment

Lessons Learned

- Unique nature of contaminated sediment must be considered
- Material variability is important
- CDF for initial placement can attenuate variability
- A large number of treatment processes can be applied
- Conventional waste water treatment trains difficult to apply to sediment
- Complex train are workable but expensive
- Containment options are available

QUESTIONS?