Managing Key Cost Drivers During Construction at Contaminated Sediment Sites

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AGENDA

Sediment remediation overview
Dredging
Contractor Procurement
Material Handling
Monitoring
Closing thoughts
Contaminated sediment – significant environmental problem

Contributing factor to fish advisories

Over 3,200 fish consumption advisories issued nationwide (EPA, 2016)

Cleanups under CERCLA, RCRA, WRDA and various State programs

Cleanups selected at more than 150 CERCLA / Superfund sediment sites as of 2016
Recent Remediation Cost Projections for Select Sediment Sites

Sediment remediation costs can be substantial.

Relatively minor changes can result in significant savings and/or improve cost predictability.

Review cost drivers at each project stage.

Optimize approach at each of the stages including construction.

- Grasse River: 0.24
- Gowanus Canal: 0.51
- Lower Duwamish Waterway: 0.34
- Cornell-Dubilier: 0.18
- Housatonic River: 0.61
- Passaic River: 1.38
- Portland Harbor: 1.05

COST ($B)
Typical Sediment Remedial Approaches

- No Action / Natural Recovery
- Monitored Natural Recovery (MNR)
- Capping
- In situ Treatment
- Removal
Removal Program Components

- Procurement
- Sediment dredging
- Turbidity control
- Sediment dewatering / processing
- Water treatment
- Transport of dredged sediment
- Potential sediment disposition
- Air quality monitoring
Procurement Contracting Strategies

Design-Build

- Reduces bidding cost
- Level of design and documentation

Single entity responsible for entire project

- Avoids finger pointing and stand-by costs for delays

Direct purchase - owner avoids mark-ups on materials

Shared risk and rewards based on performance
Dredging

- Component of almost all remedies
- Typically most costly
- Minimize down time
- Limit subsequent passes

- Dredge to prescribed elevations
- Minimize resuspension/re-deposition
- Cover residuals to avoid confirmation sampling

2017 Design and Construction Issues at Hazardous Waste Sites
Minimize downtime related to turbidity exceedances
Opportunities for Savings During Sediment Processing / Dewatering

**Passive Dewatering (space intensive)**
- Ponds
- Geobags

**Mechanical Dewatering**
- Belt Filter Press (continuous)
- Plate and Frame (batch process)

**Additives**
- Solidification
- Polymers

**In-line monitoring and redundancy**
Water Treatment During Lake Dredging

- Hydraulic dredging of 2 million cubic yard sediment
- Need capacity for flows up to 5,600 gpm

- Metals, organics, and conventional parameters needed treatment
- TMDL Limits for – NH3, P

- Primary discharge to local POTW
- Secondary direct discharge during wet weather

- Limited excess polymer from Thickening Operations to avoid delays due to impacts to system components (IPCs, MMFs, GACs)
Costs Vary for Different Modes of Available Transportation

For Processing and local disposal
- Pipeline
- Conveyor

For off-site disposal
- Trucking
- Rail
- Barge
Disposal is often the biggest cost driver

- Reuse
- Open water disposal
- Confined Aquatic Disposal
- On-site disposal
- Off-site disposal
- Treatment may render it suitable for lower cost landfill
Cost-effective Dredged Materials Management

Harbor Point Former MGP, NY
- Record of decision (ROD)
  - Removal and off-site management of contaminated soils followed by backfilling
  - Dredging 80,000 cy sediment from harbor and contain in off-site cell
- Alternate approach
  - Remove larger volume of soils on-site to accommodate dredged sediment volume
- Estimated cost savings of $4M
  - Sediment transportation, off-site disposal and backfill costs

Delaware and Raritan Canal, NJ
- Low contamination sediment led to low water depths
- Assessed sediment quality and designed dredging program
- Identified local opportunity for beneficial reuse
- Estimated cost savings of $2M+ (270K cy)
Addressing Community Air Quality Concerns

Lake Project AQM System

Cost impact is stoppage due to:
- Any Community complaints of odor
- Exceedance of 1-hour average

- Two integrated weather stations with action level notifications and alarms
- Provided 1-hour and 1-minute averages
- Ability to make corrective changes based on 1-minute data before 1-hour compliance reading
- Publicly accessible project website with real time data
- Pilot air emissions control evaluation performed
Air Emission Controls Evaluation
Spray Cover

FOAM
FIBER
LIQUID
Air Emission Controls Evaluation

Other

WIND BLOCK

POINT SOURCE AIR MIST
Closing thoughts

- Proactively manage cost drivers during project life-cycle including during construction
- Select project components and structure schedule to control costs
- Minimize downtime during implementation
Thank you!
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