



Evaluating Dredging at the Portland Harbor Contaminated Sediment Site



Presented by

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WODCON XXI - June 14, 2016

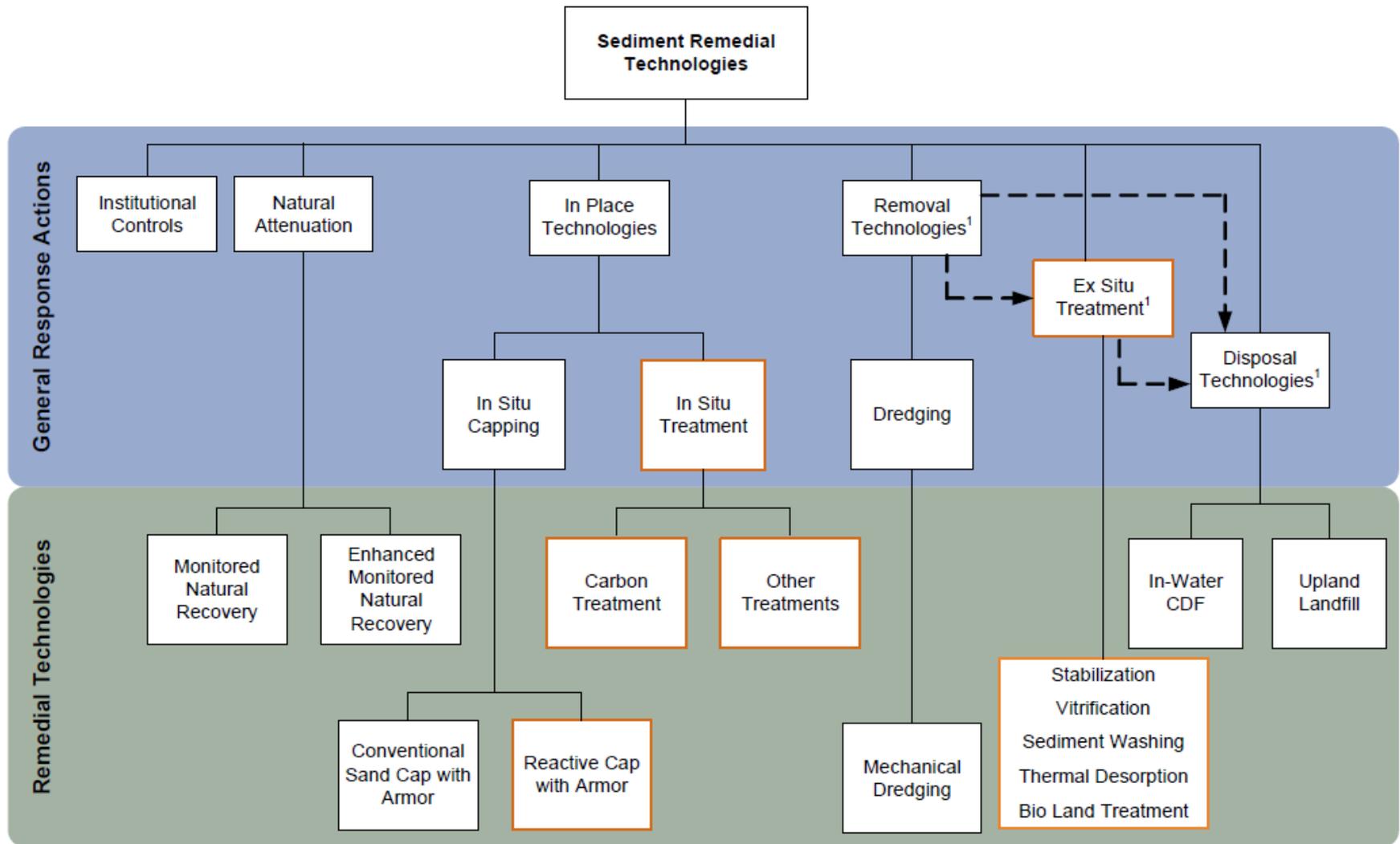
Today's Discussion

- Remedy overview
- River setting
- Dredging site-specific considerations
- Challenges to properly evaluating dredging in the FS remedial alternatives
- Conclusions

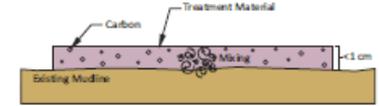
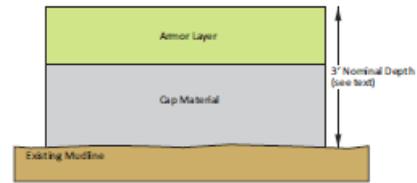
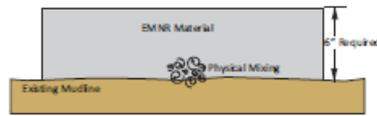
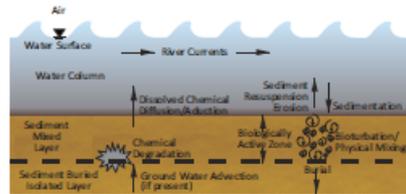
Anchor QEA consulted with the Lower Willamette Group ("LWG") on the preparation of a draft Feasibility Study submitted to EPA in 2012. On behalf of the LWG, it will review EPA's Final Feasibility Study and Proposed Plan. Views or positions expressed by Anchor QEA in today's presentation do not necessarily reflect those of the LWG or EPA.

Remedy Overview

Remedy Overview: Considered Technologies



Remedy Overview: Considered Technologies



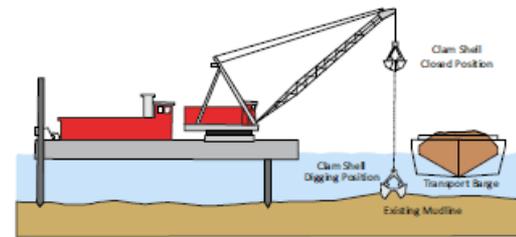
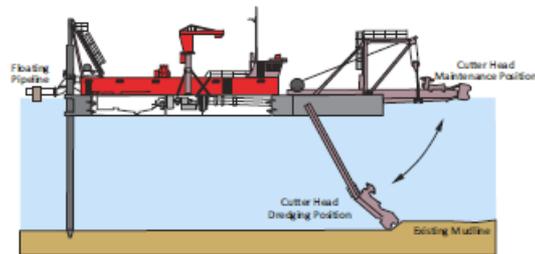
In-Place Technologies

Monitored Natural Recovery

Enhanced Monitored Natural Recovery

Typical Cap Section

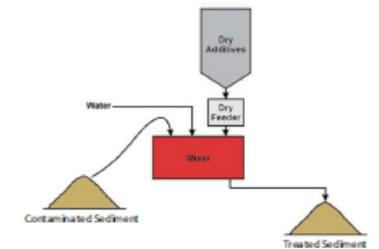
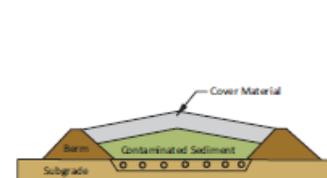
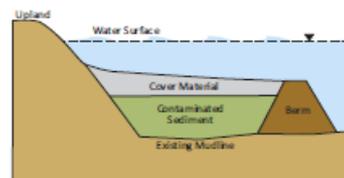
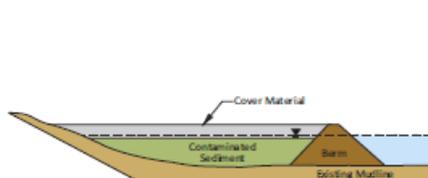
In-Situ Treatment



Removal Technologies

Hydraulic Dredge

Mechanical Dredge



Post-Removal Technologies

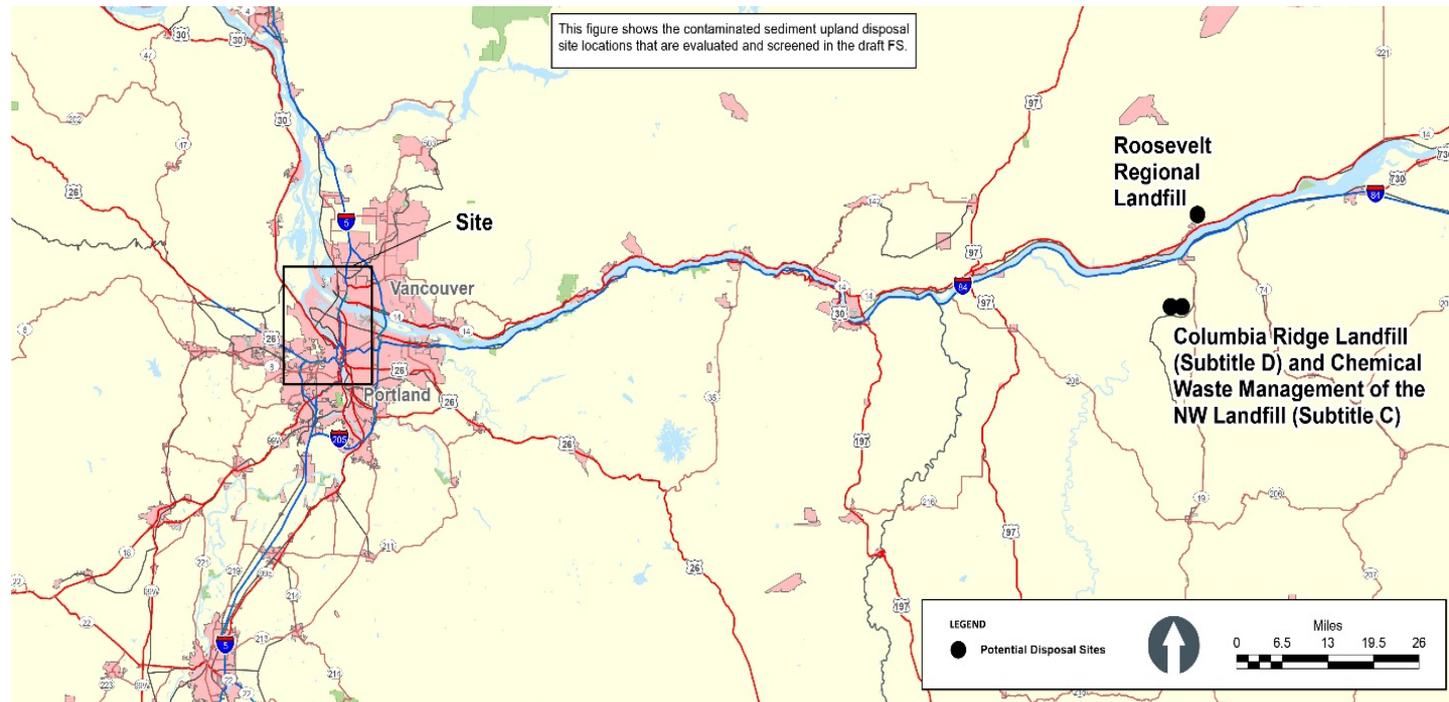
Nearshore Confined Disposal

Confined Aquatic Disposal

Upland Confined Disposal

Ex-Situ Treatment

Remedy Overview: Upland Landfill Locations



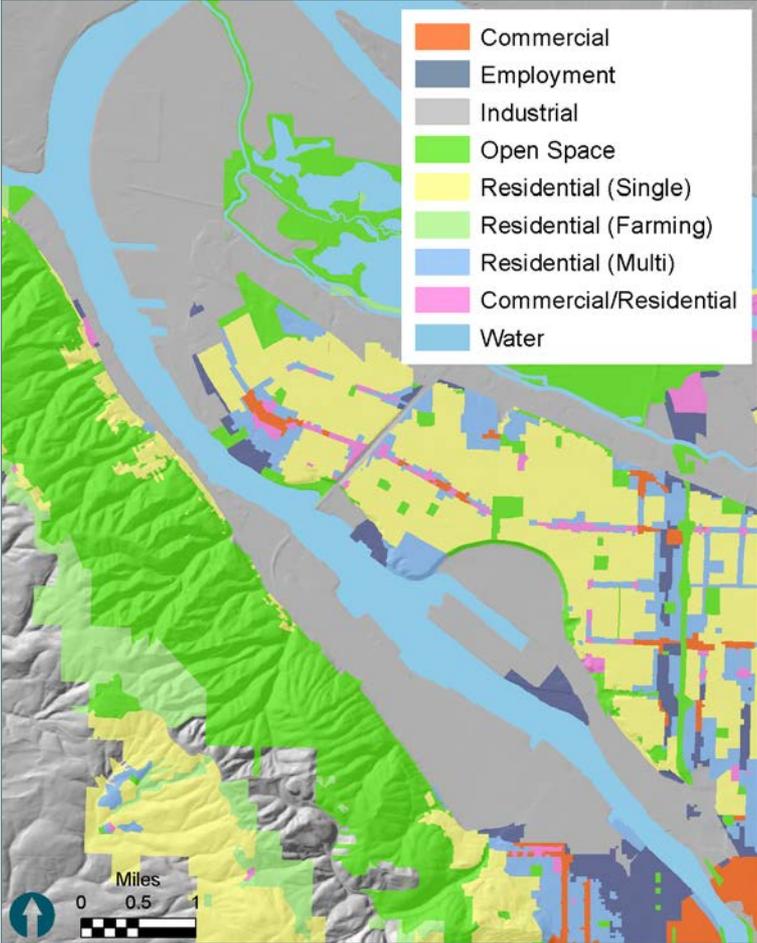
River Setting

River Setting: Characteristics and Use

- Federally authorized channel
- Drains the Willamette Basin
- Stage and currents influenced by Willamette and Columbia River hydrologic conditions
- Varied commercial vessel use

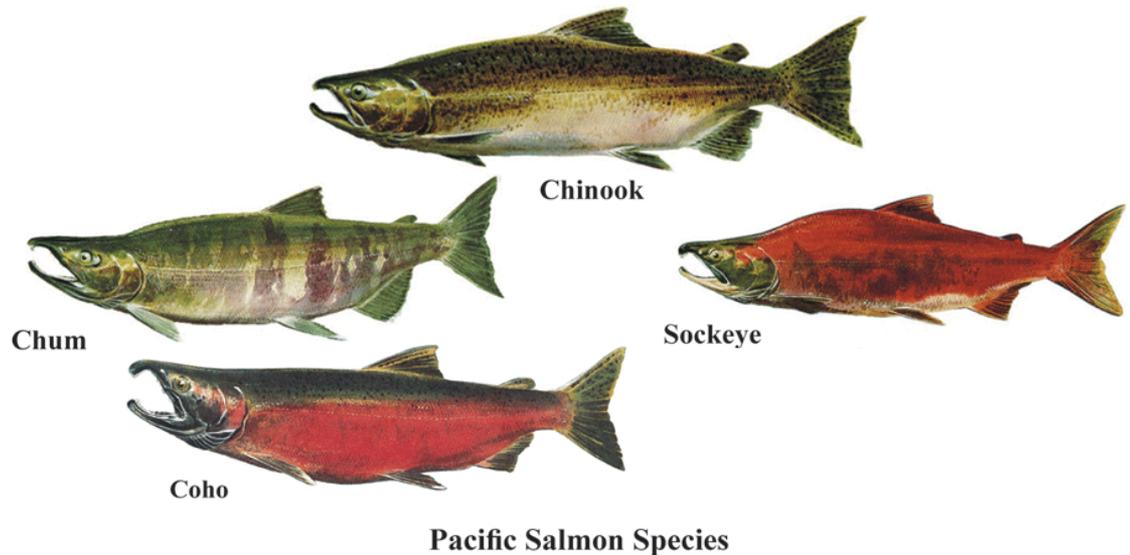


River Setting: Portland Harbor Site Superfund Land Use Types



River Setting: Endangered Species

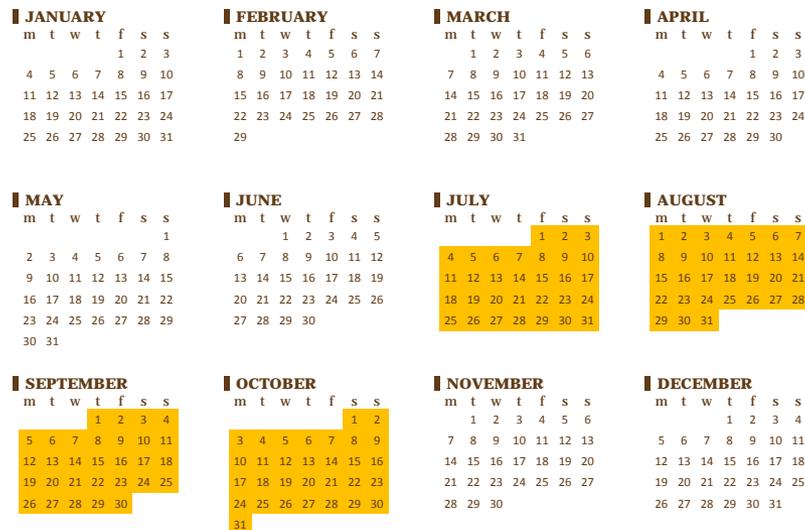
- ESA-listed salmonids are known to use River
- All in-water work limited to within work window of July 1 to October 31



Dredging Site-Specific Considerations

Dredging Site-Specific Considerations: Production Constraints

- 123 total calendar days (104 excluding Sundays and holidays)
- Commonly 6 days work and 1 day maintenance or makeup
- 12- or 24-hour work days?



Dredging Site-Specific Considerations: Disposal and Offload Facility Constraints

- Distant upland disposal sites
- Need to secure large upland property near the River for transload facility



Dredging Site-Specific Considerations: Anticipated Dredging Approach

- Multiple smaller dredge areas



Dredge areas from EPA's Preferred Alternative presented to the National Remedy Review Board on 11-18-2015. Capping and MNR, which are part of EPA's alternative, are not shown on this figure

Dredging Site-Specific Considerations: Anticipated Dredging Approach

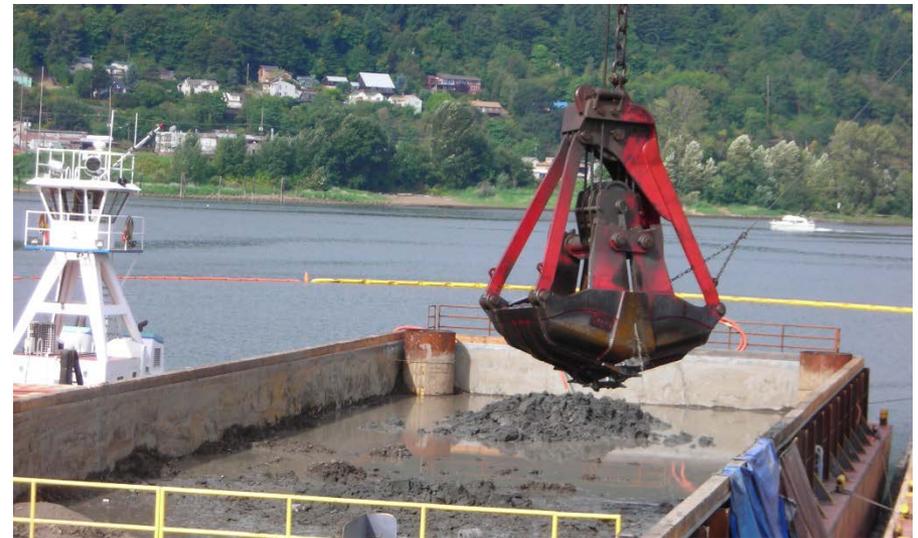
- Mechanical dredging anticipated



Challenges to Proper FS Alternatives Evaluation

Challenges to Proper FS Alternatives Evaluation: Estimating Representative Dredge Volumes

- Detailed dredge prisms not feasible
- Different methods to estimate dredge volume at FS stage
- Need to capture uncertainty



Challenges to Proper FS Alternatives Evaluation: Management/Implementability of the Remedial Action

- Extensive coordination required
- Multiple sites, multiple responsible parties
- Work site bottlenecks

Challenges to Proper FS Alternatives Evaluation: Estimating Dredging Production Rates

- Urban setting, residential area impact on working hours
- Sediment handling bottlenecks
- Varying site conditions



Conclusions

Conclusions: Dealing with Uncertainties

- Uncertainties present issues
- Address uncertainties
 - Use site-specific information
 - Use information from other local projects
 - Use realistic assumptions
- Assess uncertainties
 - Use of ranges
 - Sensitivity analyses of key parameters
- Propagate sensitivity analysis to all aspects of alternatives evaluation

Questions/Discussion

