

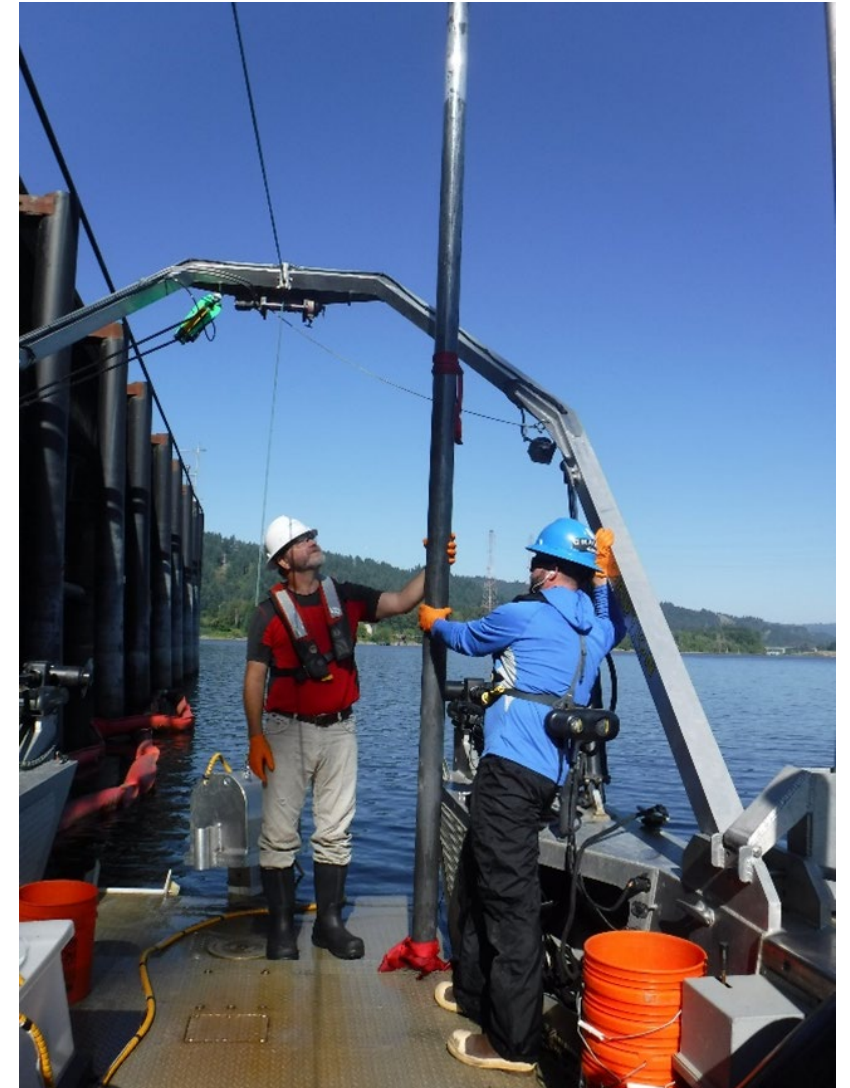
Bayou Chico Remediation – Conceptual Approach

May 10, 2023

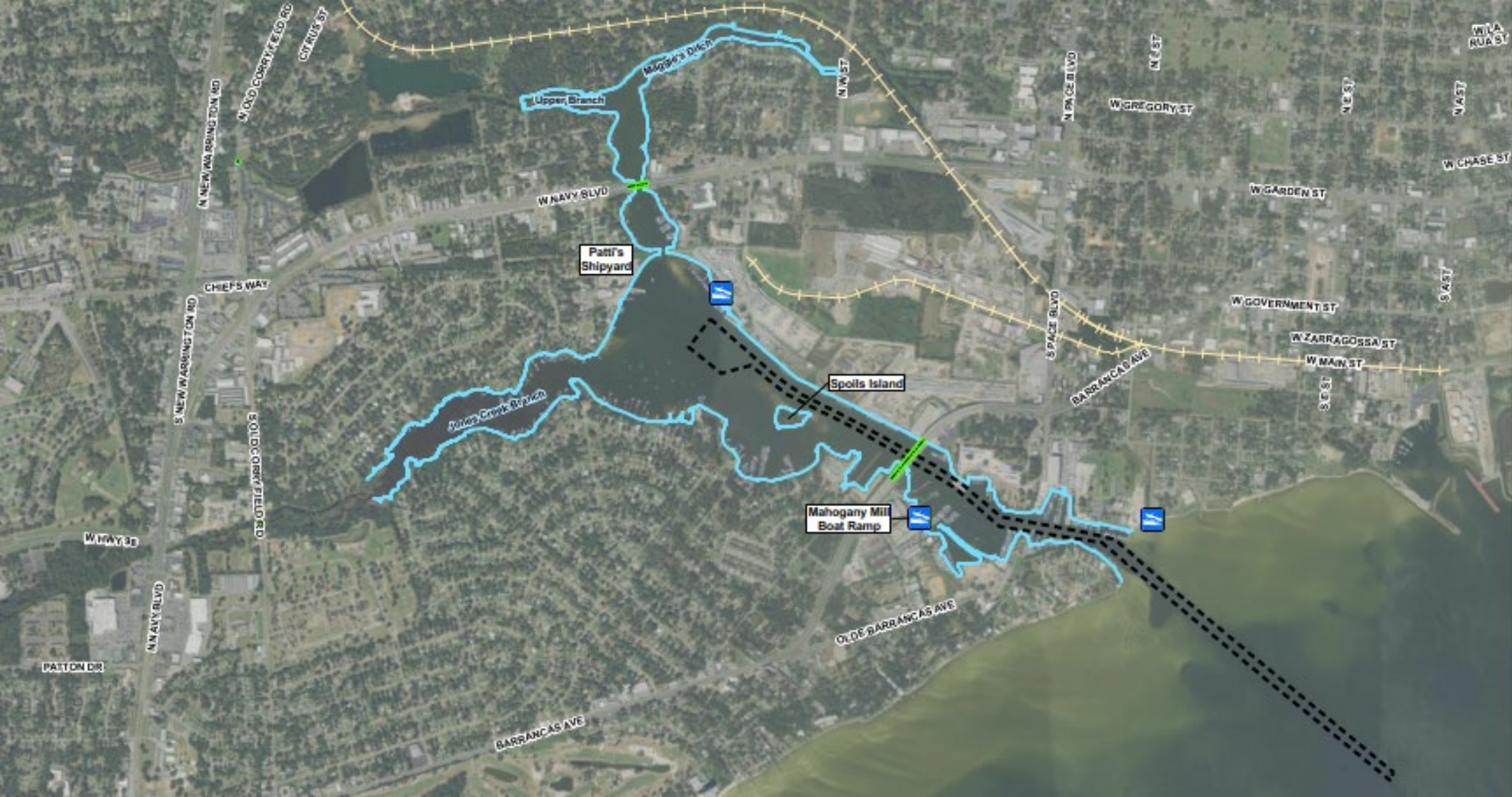
Bayou Chico Remediation – Sediment Management Area

Evaluate sediment dewatering/material handling processes for transportation and disposal

1. Evaluate Sediment Management Area (SMA) including size, orientation, duration of use, quality of life impacts, etc. (See Selection Matrix)
2. Use process flow and mass balance to define remediation effort and identify pinch-points.
3. Provide examples of different methods/processes being evaluated as part of the alternatives analysis process.



Bayou Chico Remediation – Project Area



Bayou Chico Remediation – Sediment Management Area (SMA) Locations



Criteria:

- Acreage
- Shoreline access
- Distance from dredge prism
- Surrounding residential, commercial, and/or recreational areas
- Community/Ecological Impacts
- Engineering/Operational Considerations

Overall Process Flow

Bayou Chico Remediation – Example Process Flow



Hydraulic Dredging

- 50,000 (12,500 CY @ 25% solids; 25,000 CY @ 50% solids)
- 2,500 gpm discharge; 7.5% dry wt solids
- 20 MG over 11 days (12 h/d, 5 d/wk)



Chemical Conditioning Make-Down & Delivery

- Dual polymer program (coagulant/flocculant)
- 250-ppm dose
- 4,040 pounds of polymer



Geotextile Tubes

- 60-ft circumference x 4,098-ft long
- 2 acres; .5-ft aggregate sump (1.1 MG capacity)
- 21 tubes, stacked two high
- 1.8 MG dredge slurry/day



Water Treatment

- 1.44 MG treated/day (24 h/d, 6 d/wk)
- Clarification, filtration, sorption and ultrafiltration
- Modular units in parallel
- Discharge criteria to Bayou Chico



Transportation & Disposal

- Pass a paint filter test (transportation)
- Meet criteria for onsite landfill disposal (waste characterization, strength, volume)
- ~50,000 CY (50% dry wt solids) Transported to landfill
- Beneficial reuse - segregate impacted and unimpacted material (if applicable)
- Stabilization required?

Hydraulic Dredging

Bayou Chico Remediation – Hydraulic Dredging

Cutterhead Dredge



Jet Suction Dredge



Crane with Hydraulic High-solids



Hydraulic Dredge Barge



Bayou Chico Remediation – Conveyance from Dredge to SMA



Floating Dredge Discharge Pipe



Booster Pump



HDPE Conveyance Pipe

Chemical Conditioning

Bayou Chico Remediation – Chemical Conditioning Make-Down & Delivery



- Perform Treatability Tests
- Dual-polymer program (coagulant/flocculant)
- ~200-ppm dose (emulsion or dry)
- Dosage will change depending on treatability tests
- Polymer activated/aged prior to delivery with specialized equipment or batch tanks
- Polymer can be delivered to the dredge discharge line prior to the dewatering equipment
- Used with passive and mechanical dewatering alternatives

Sediment Dewatering Alternatives

Bayou Chico Remediation – Passive Dewatering (Time, Space, & Community Impact)



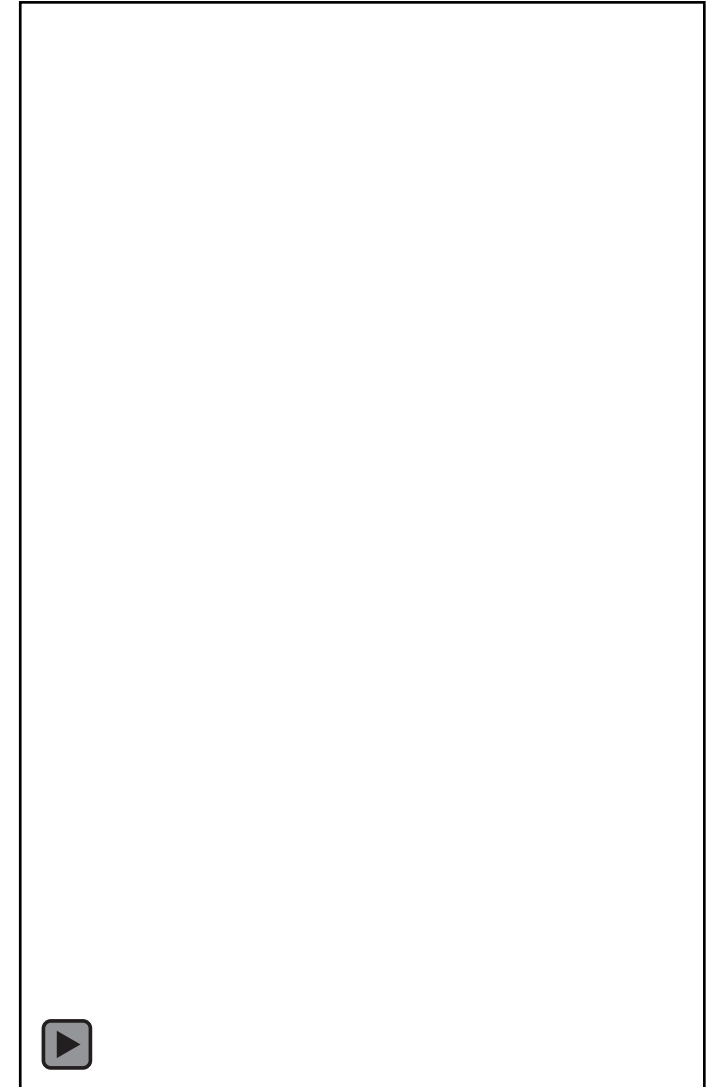
Geotextile Tubes

- 60' circumference geotextile tubes
- 0.5 – 1.0 ft. aggregate sump
- Capable of stacking tubes 3+ high



Confined Disposal Facility

- With or without polymer
- Hydraulic retention time (HRT) is several days depending on particle size distribution (PSD)
- Sediment can be left in place or excavated for disposal or reuse



Bayou Chico Remediation – Mechanical Dewatering



Clarification or Dissolved Air Floatation (DAF) Plant



Total Clean Sediment Screening System



Centrifuge



Plate & Frame Press

Bayou Chico Remediation – Barge Dewatering



- Hopper barges range in size but typically are 35' x 195' x 12' (L x W x H)
- Self-propelled or tug-assisted
- 1.8 MG/day; 404,000 gallons/barge; approx. 4.5 barges/day
- Assuming 7 days to dewater in the barges, will need about 35 barges
- Alternatively: The same volume of dredge materials requires a minimum of ~6 acres for barge transloading and sediment dewatering/staging

Transportation and Disposal

Bayou Chico Remediation – Transportation & Disposal

- Regulatory/permit approval
- Pass a paint filter test (transportation)
- Meet criteria for disposal (waste characterization, strength, % moisture)
- Beneficial reuse – segregate impacted and unimpacted material (if applicable)
- Stabilization (if required for disposal or beneficial reuse) can be mixed while sediment is in barges or during loadout, or in trucks/rail cars prior to transport

Bayou Chico Remediation – Transportation & Disposal (Images)



Barge Unloading



Geotextile Tube Excavation



Solidification/Stabilization Reagent Mixing



Truck Loadout

Water Treatment

Bayou Chico Remediation – Water Treatment



- Clarification, filtration, sorption and/or ultrafiltration
- Modular units in parallel (Backwash and O&M)
- Water quality discharge criteria to Bayou Chico or Wastewater Treatment Plant
- Temporary discharge permit required
- Dredge discharge rate effects volume of water and treatment system size

Restoration

Bayou Chico Remediation – Restoration

- Recolonization is expected to occur quickly
- Can be expedited by replanting
- Unimpacted sediment can be used to benefit restoration in other areas where needed
- Potentially backfill dredge prism to encourage recolonization and improve habitat quality
- Add structures, etc., to improve habitat quality for sensitive and preferential species



Next Steps

Bayou Chico Remediation – Next Steps

- Phase 2 Sampling (May 2023)
- Data Analysis, Risk Assessment, Treatability Testing (Summer 2023)
- Basis of Design / Conceptual Design (Fall 2023)
- Completion of Design and Permit Submittal (Spring 2024)



Thank You