Reduce, Reuse, Recycle: A Story of Contaminated Materials
The LSP's Perspective

GEI Consultants

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AGENDA

1 Background/MCP Compliance

2 Material Management Methodology

3 Summary of Materials Reuse

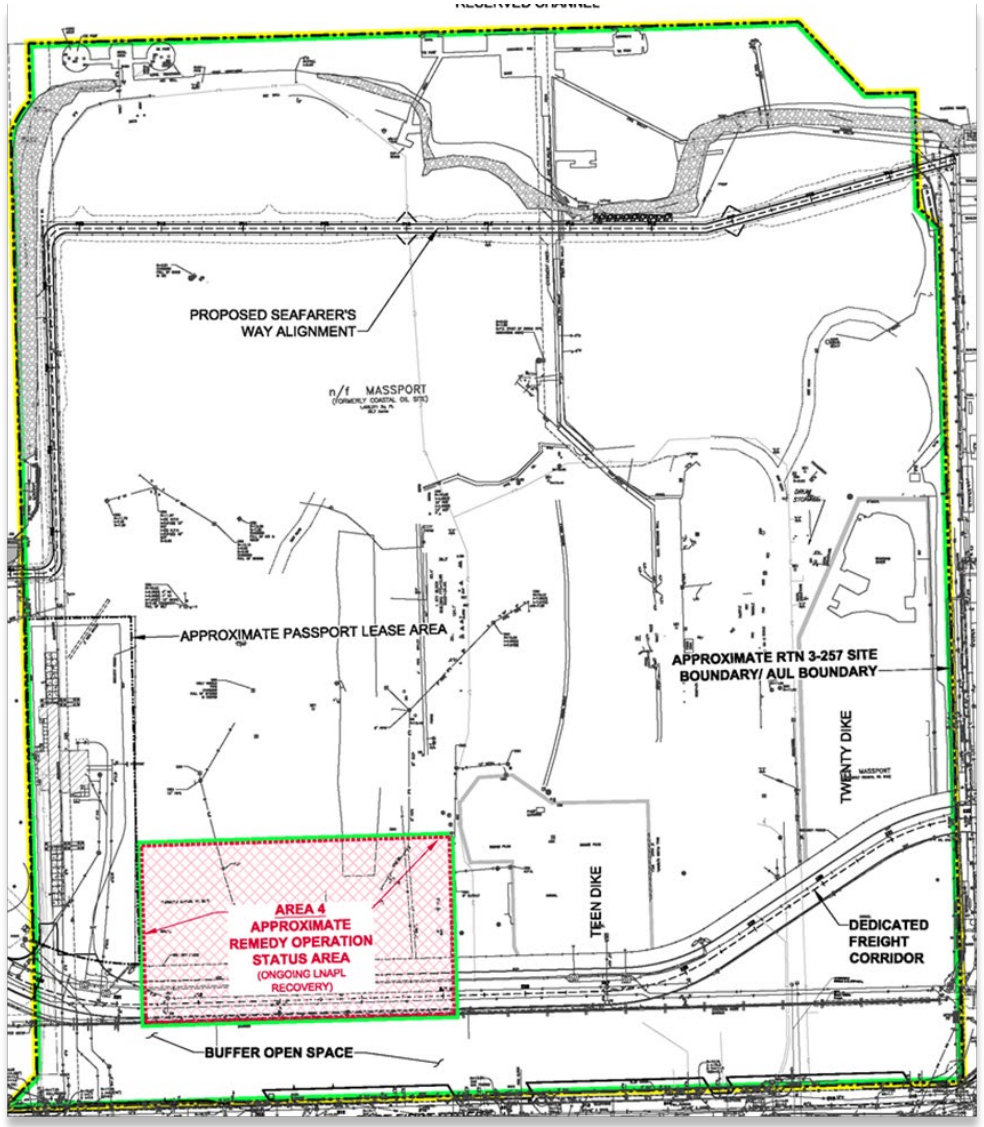
Background

Former Coastal Oil of New England Site

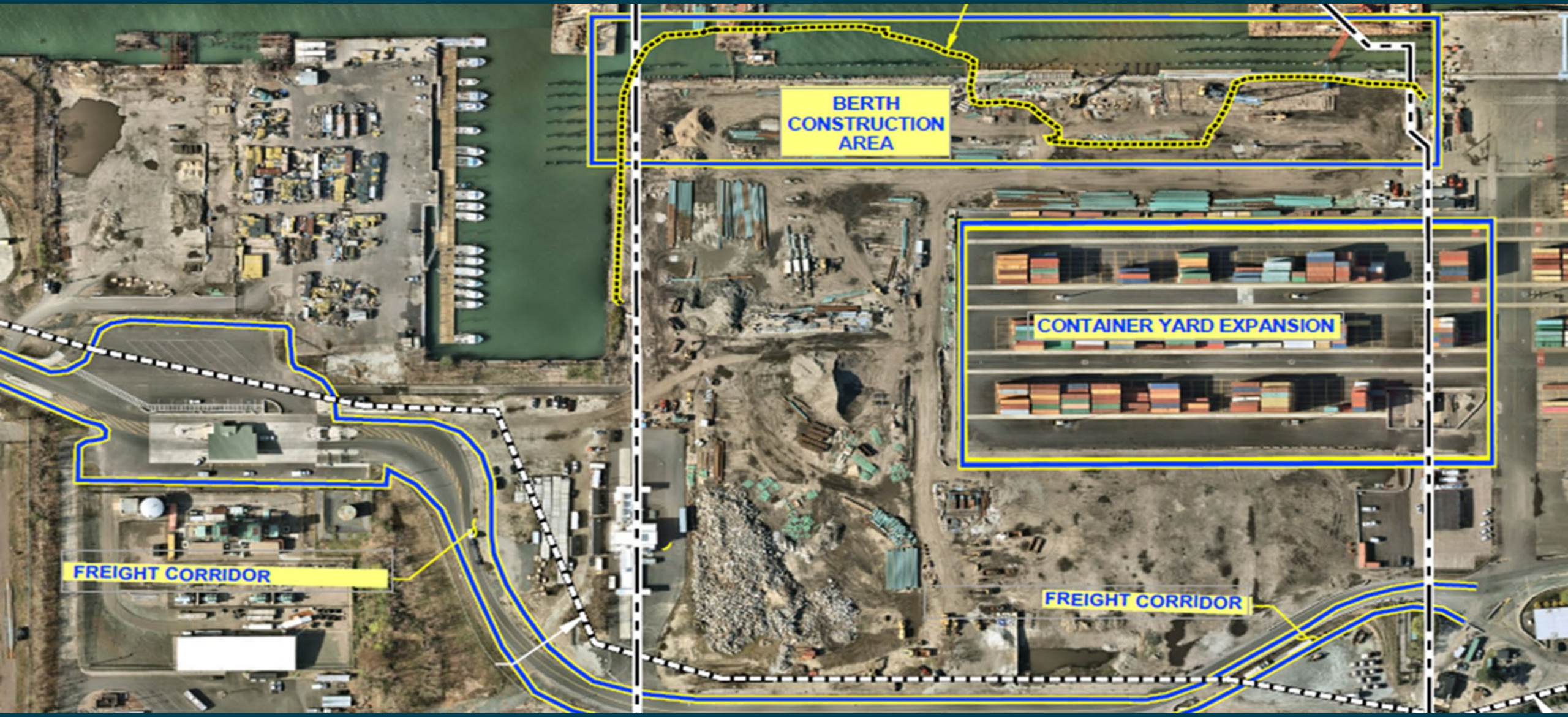
- Massport acquired in 2008
- On-Terminal Property
- 1987: Originally reported to MassDEP (RTN 3-257)
- 2000: Ceased operations
- 2009: All tanks removed

Previous Response Actions

- 2003-2008: Multi-phase extraction (MPE) system removed 32,000 gallons LNAPL.
- Biopiles to treat soil not remediated by the MPE system.
- 2009-2014: MPE converted to bioventing system remediated 34,000 gallons of LNAPL.
- 2009-2018: Manual and automatic recover in Area 4 removed 11,000 LNAPL.
- 2014: In-situ Solidification (ISS) of 15,000 yd3 LNAPL impacted soil during Dedicated Freight Corridor construction.
- 2015: Capping portions of the Site with three feet of soil suitable for park use or roadway pavement.
- 2015: Placing an AUL on the Site.



Berth 10 and Conley Yard Expansion

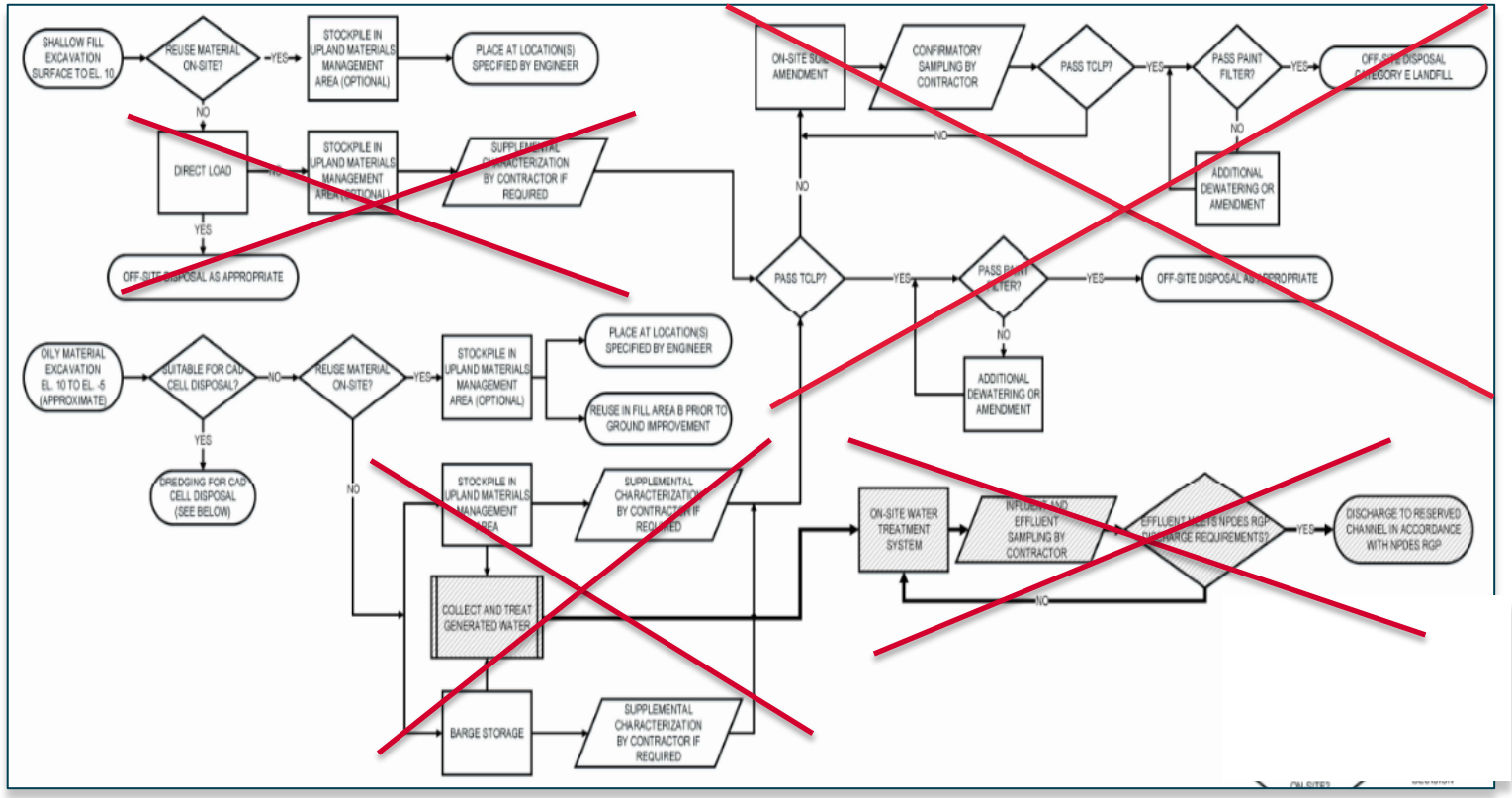


Material Management Methodology

Material Management Methodology: Updated during Construction

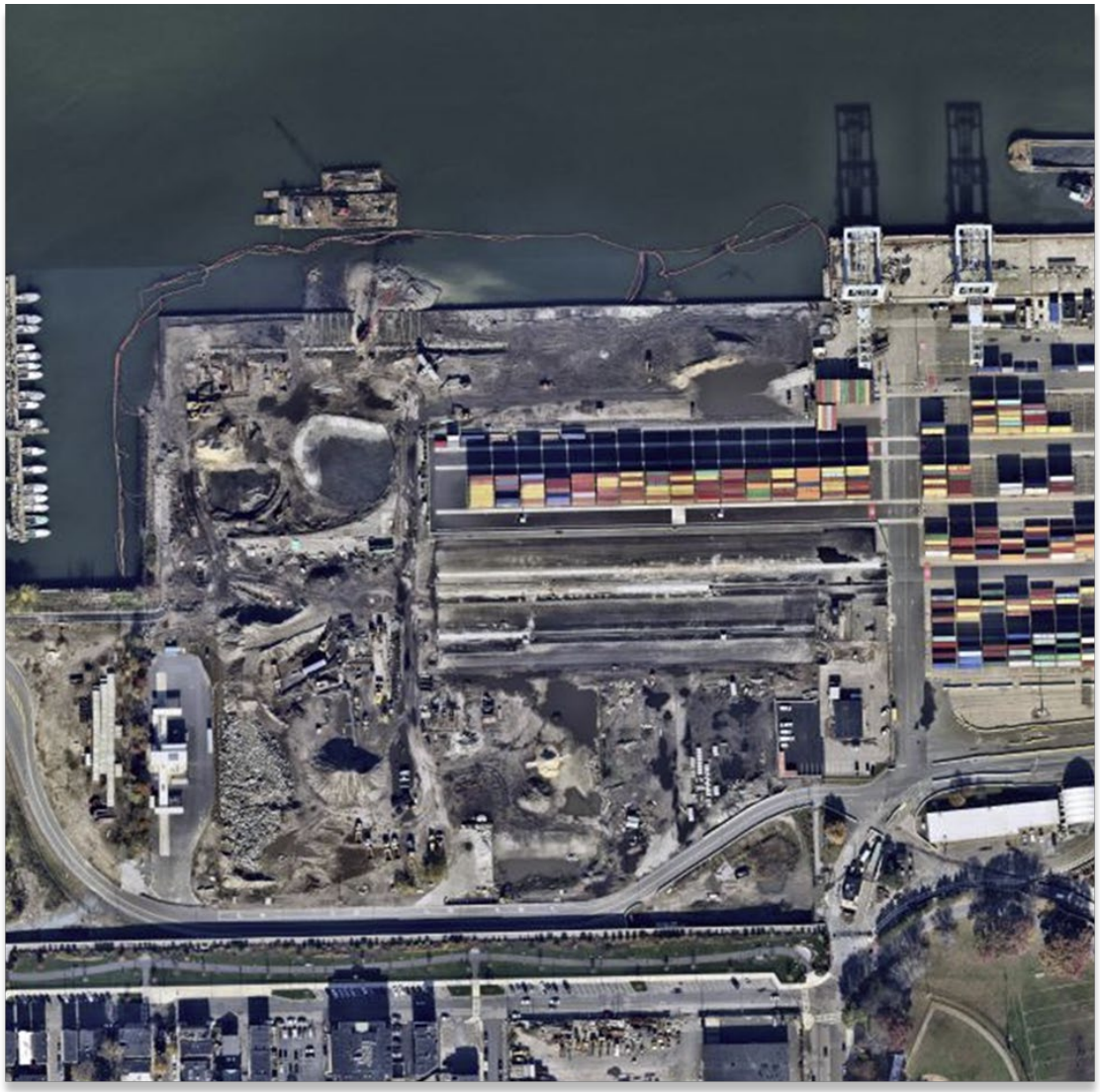
- **Characterization:** Environmental and geotechnical characterization performed prior to excavation, so the material could be segregated precisely onsite.
- **In-situ Concrete Stabilization (ISS):** ISS mixes soil with concrete while it is still in the ground (i.e. in-situ) and simultaneously improves the geotechnical properties of soil/sediment and binds contaminants into a matrix, so that they are no longer a risk to human health or the environment.
- **Identification of Suitable Material:** Suitable on-site geotechnical material was identified and mined for onsite reuse. The voids were backfilled with unsuitable contaminated materials and stabilized by ISS.
- **Processing and Reuse:** Approximately 30,000 cubic yards of asphalt, brick, and concrete (ABC) and gravel was processed with previously geotechnically unsuitable soils to produce Granular Aggregate Base Course (GABC), a suitable pavement sub-base.
- **Contaminant Isolation:** Residual contamination and material stabilized by ISS were isolated and its exposure eliminated with a pavement cap.
- **CAD Cell Disposal:** Dredged materials were disposed in the Boston Harbor Confined Aquatic Disposal (CAD) Cell instead of being brought upland for landfill disposal.

Original Soil Management Strategy

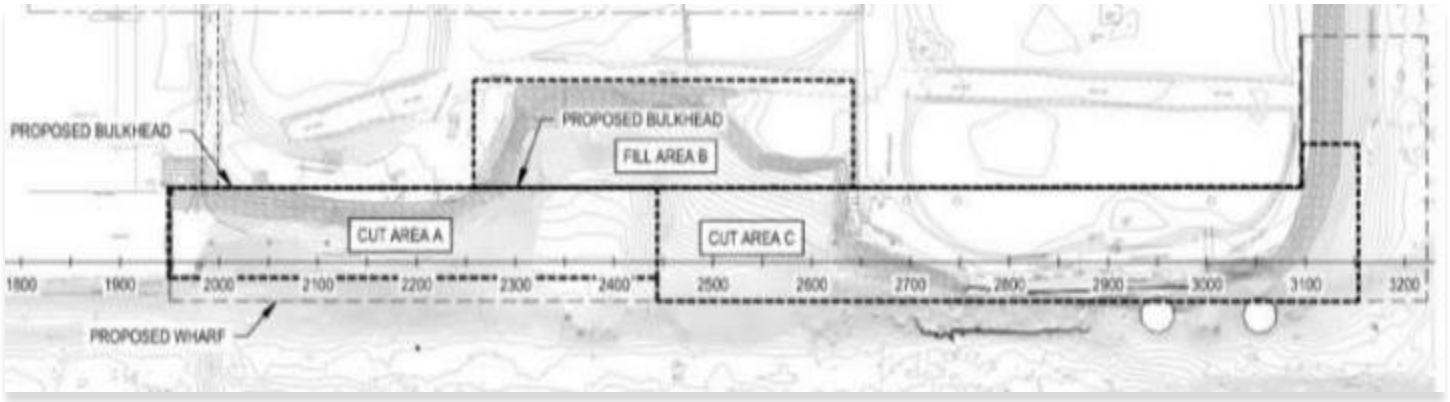


Shoreline Excavation

- Existing shoreline cut back exposing a “fresh face” of oily soil/sediments and residual LNAPL
- Potential for LNAPL to seep into the adjacent surface waters of Boston Harbor
- Cut back shoreline, fill embayment to match existing wharf at Berth 11.
- Initial design estimate for over 50,000 cubic yards of oily soil, urban fill, and sediment to be generated during construction

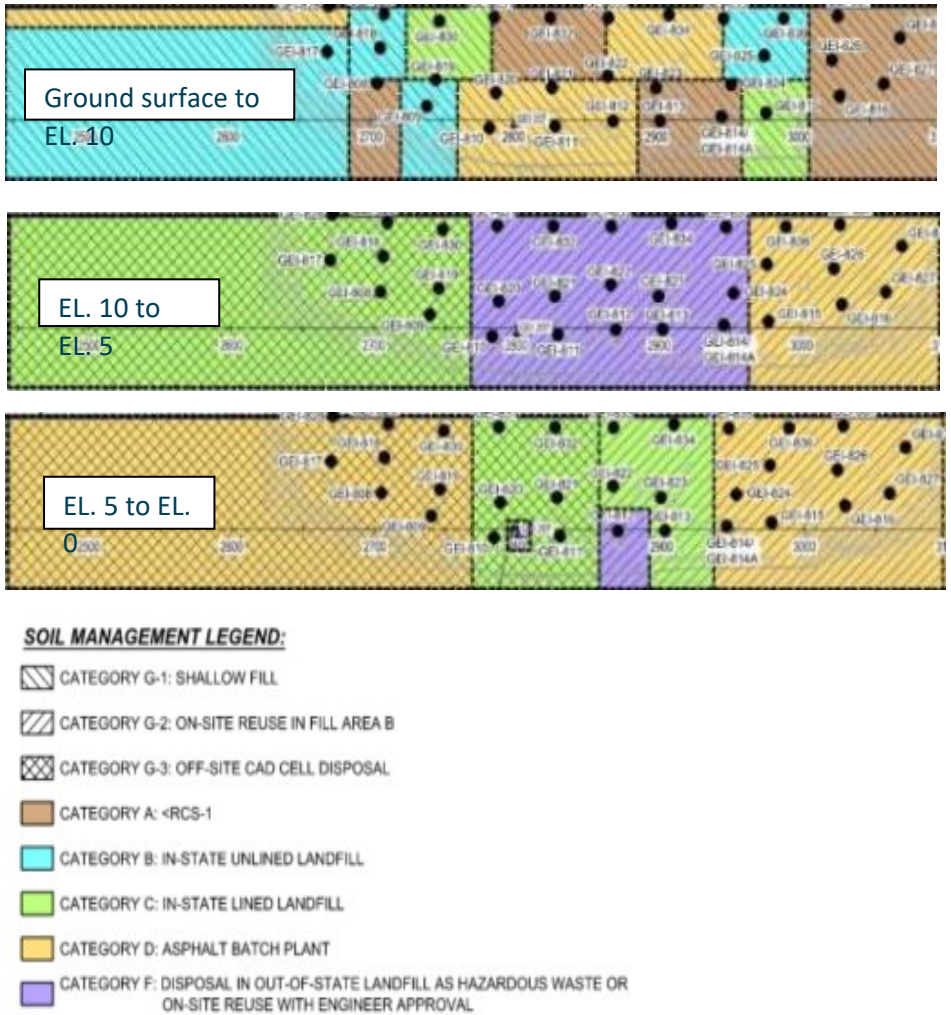


Material Management Methodology

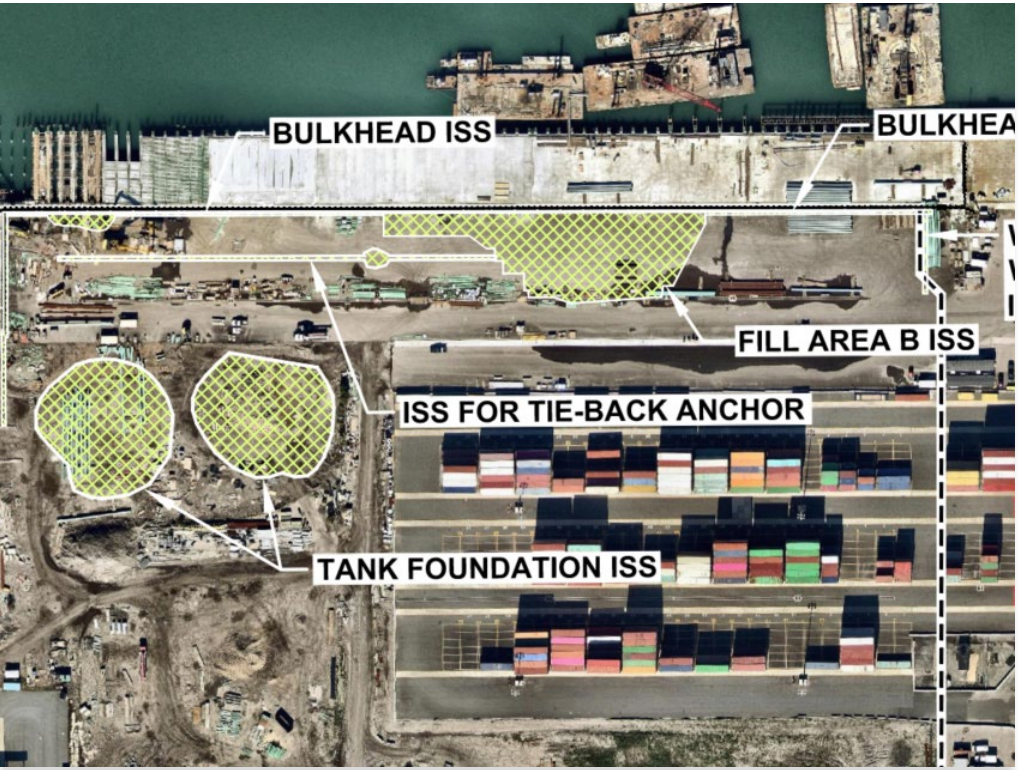


- Multi-disciplined engineering design team working collaboratively to optimize reuse.
- Onsite reuse of characteristic hazardous waste.
- Onsite reuse of oily material
- Reuse for ground improvement.

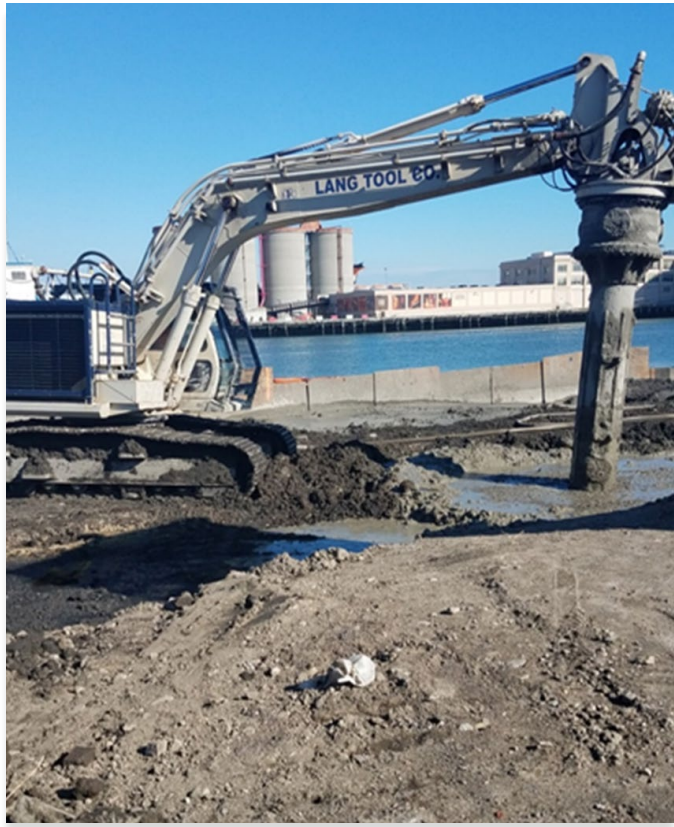
Cut Area C Characterization



Insitu Solidification (ISS) in Berth 10 Construction

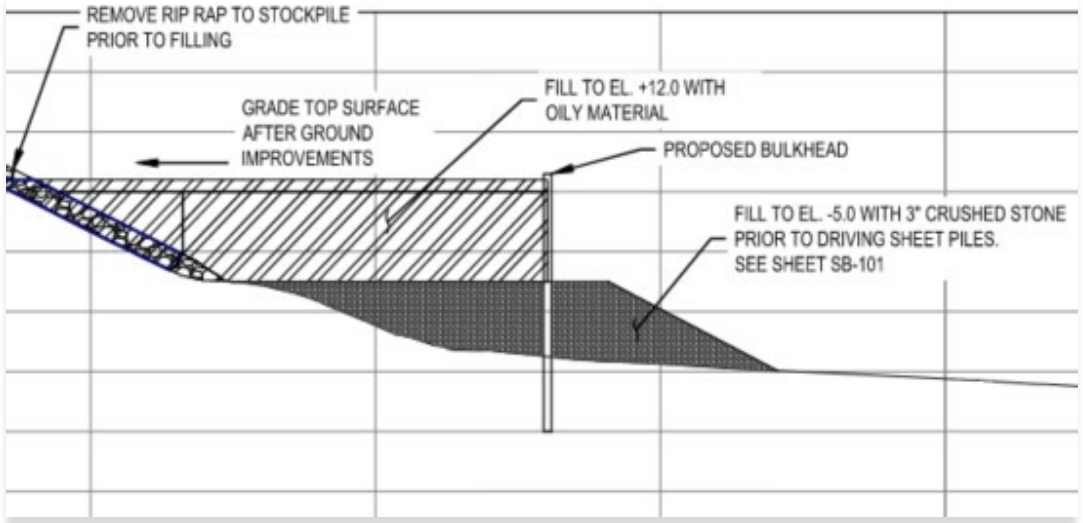


- 1,450 ft. of 3 feet wide and 20 feet deep ISS inboard of bulkhead and wing walls.
- ISS used to create a cut off wall behind new king pile bulkhead
- Reduce mobility of residual, micro-scale LNAPL mobile LNAPL



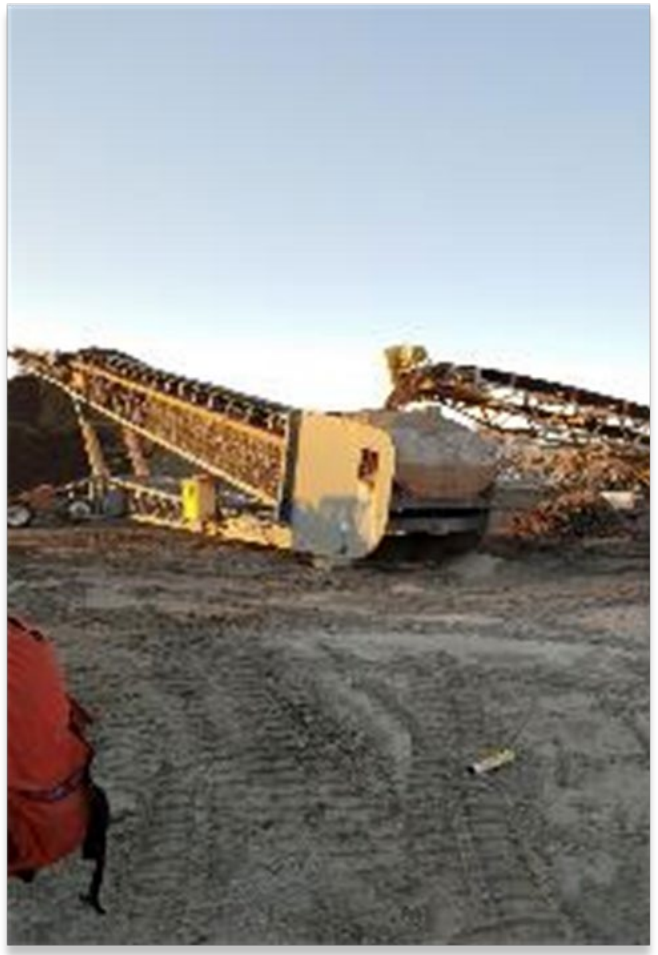
ISS in Cove & Use for Tiebacks

- Approximately 15,000 cubic yards of contaminated sediment/soil
- Oily and Characteristic Hazardous Waste
- ISS solidified waste material up to 20 feet deep
- ISS used as ground improvement creating material to support high surcharge facility loads
- ISS used to create 520 feet of anchor tie-backs to remediate bulkhead deflection



Sediment Reuse and ISS in Former Tank Foundations

- On-site geotechnical material mined for reuse
- Processed with urban fill to create subgrade material
- Eliminated the need to import 30,000 cubic yards of clean fill.
- Voids filled with oil impacted dredge material
- Approximately 7,500 cubic yards oily soil/sediment stabilized by ISS



MCP Compliance

2008: Remedy Operations Status (ROS)

2014: Modified Phase III RAP and Phase IV RIP for DFC construction

2015: Partial Permanent Solution Statement (PSS) with Conditions (AUL) and Area 4 remained in ROS

November 2017: Conley Terminal Expansion RAM Plan (Berth 11)

February 2018: RAM Plan Modification 1; Container Yard Phase I

July 2018: RAM Plan Mod 2A; Berth 10 Phase I, Soil and GW management

July 2018: Area 4 ROS Termination, Tier II Reclassification and Extension, Supplemental Phase III RAP, & Phase IV RIP Modification

July 2018: RAM Plan Mod 2B; Berth 10 ISS

September 2018: RAM Plan Mod 3; Container Yard Phase II

March 2019: RAM Plan Mod 4; Berth 10 Phase II, Soil and GW management

October 2019: RAM Plan Mod 5; Utility Installation and substation

March 2021: Partial PSS with Conditions including Area 4

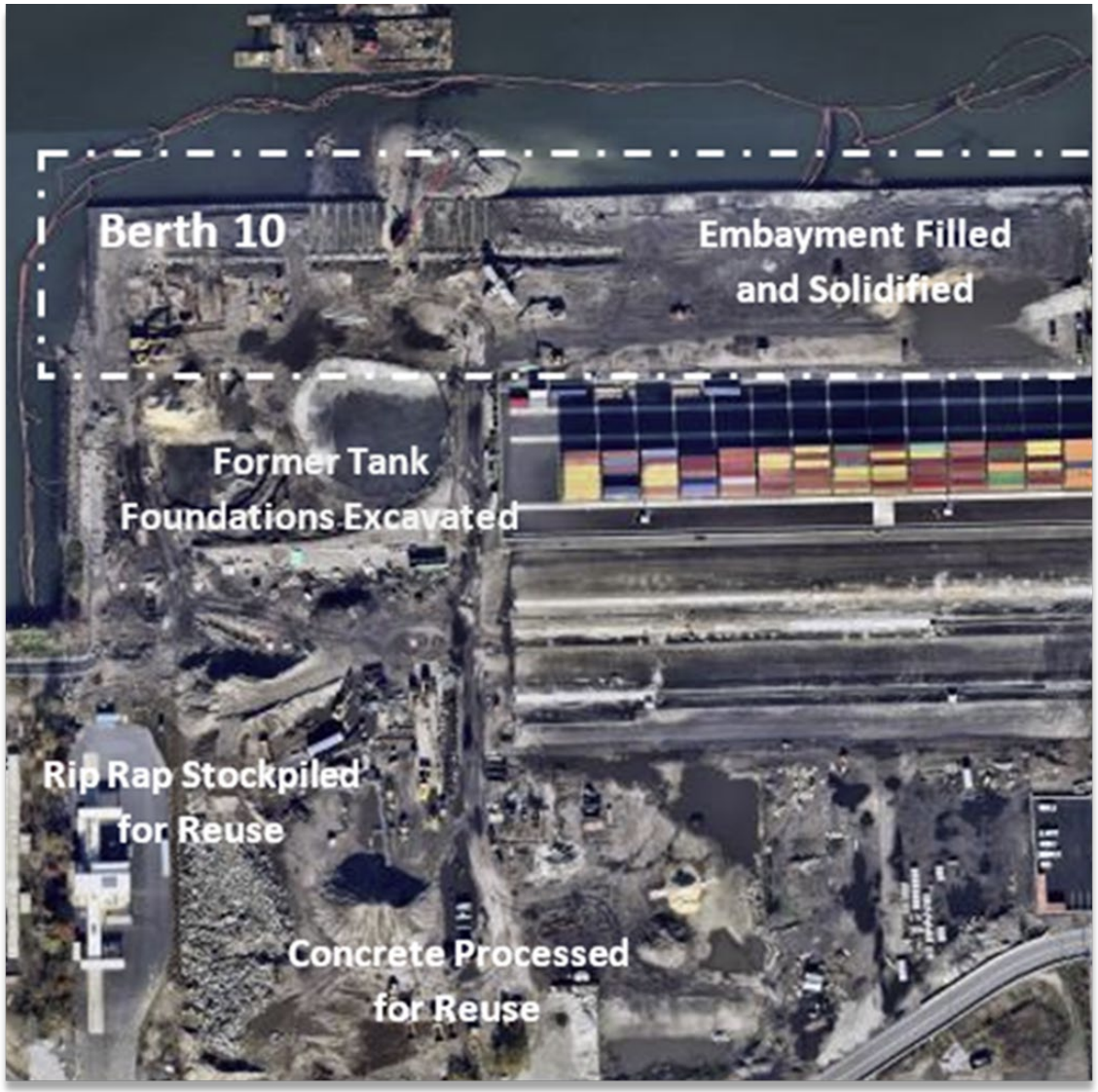
July 2021; RAM Plan Mod 6; New Gate Project

December 2021: RAM Plan Mod 7 incorporates RTN 3-4424, Berth12 Backlands paving

Summary of Materials Reuse

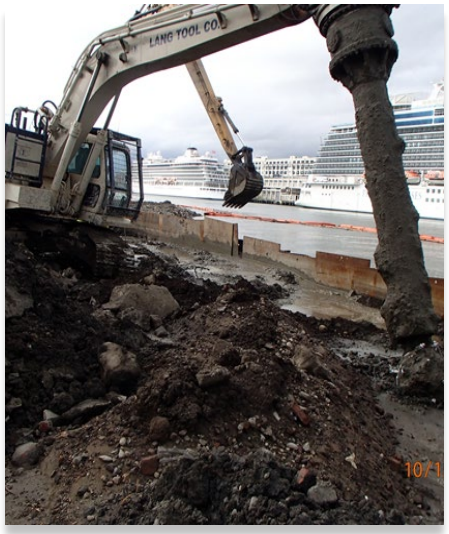
Material Management Results

- 61,000 cy of oily soil, urban fill and sediment reused or solidified
- 12,800 cy of concrete and granite obstructions processed
- 15,000 cy of gravel mined and reused
- 13,000 cy of sediment reclassified for CAD cell disposal
- Minimized imported fill
- Nearly 100,000 cy of materials reused
- 0 yds of soil transported to landfills
- 8,700 truck trips eliminated
  - From local residential roads
  - 34,750 gallons of fuel
  - 2.64 short tons on NOx
  - 391 short tons of CO^2
  - $5 million in economic benefits



Lessons Learned

- Begin planning for soil management early in the project.
- Importance of a collaborative team and cooperation between owner, engineer, and contractor.
- Adaptability during construction to maximize reuse.
- Consider soil management across multiple planned projects.



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