RA Case Study EPA Region 5, Velsicol Chemical Corporation Superfund Site RES CLIN 2 – OU1 Downgradient Vertical Barrier Wall (DGVBW) Construction, St. Louis, Michigan

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Why is Velsicol a Superfund Site?

- Chemical Plant from 1850 -1977
  - Oil refinery & lumber mill (DNAPL)
  - Brine & salt plant
  - Chemical manufacturing
  - Pesticides (DDx, DBCP)
  - Pharmaceuticals
  - Fire retardants (PBB, HBB, TRIS)
- 1973 PBB Disaster
  - 500 affected Michigan farms
  - 30,000 cattle euthanized
  - 1,500,000 chickens euthanized
  - Millions of Michigan residents ate contaminated meat and dairy
  - Generational human health effects from the PBB disaster
  - Led to passage of 1976 TSCA

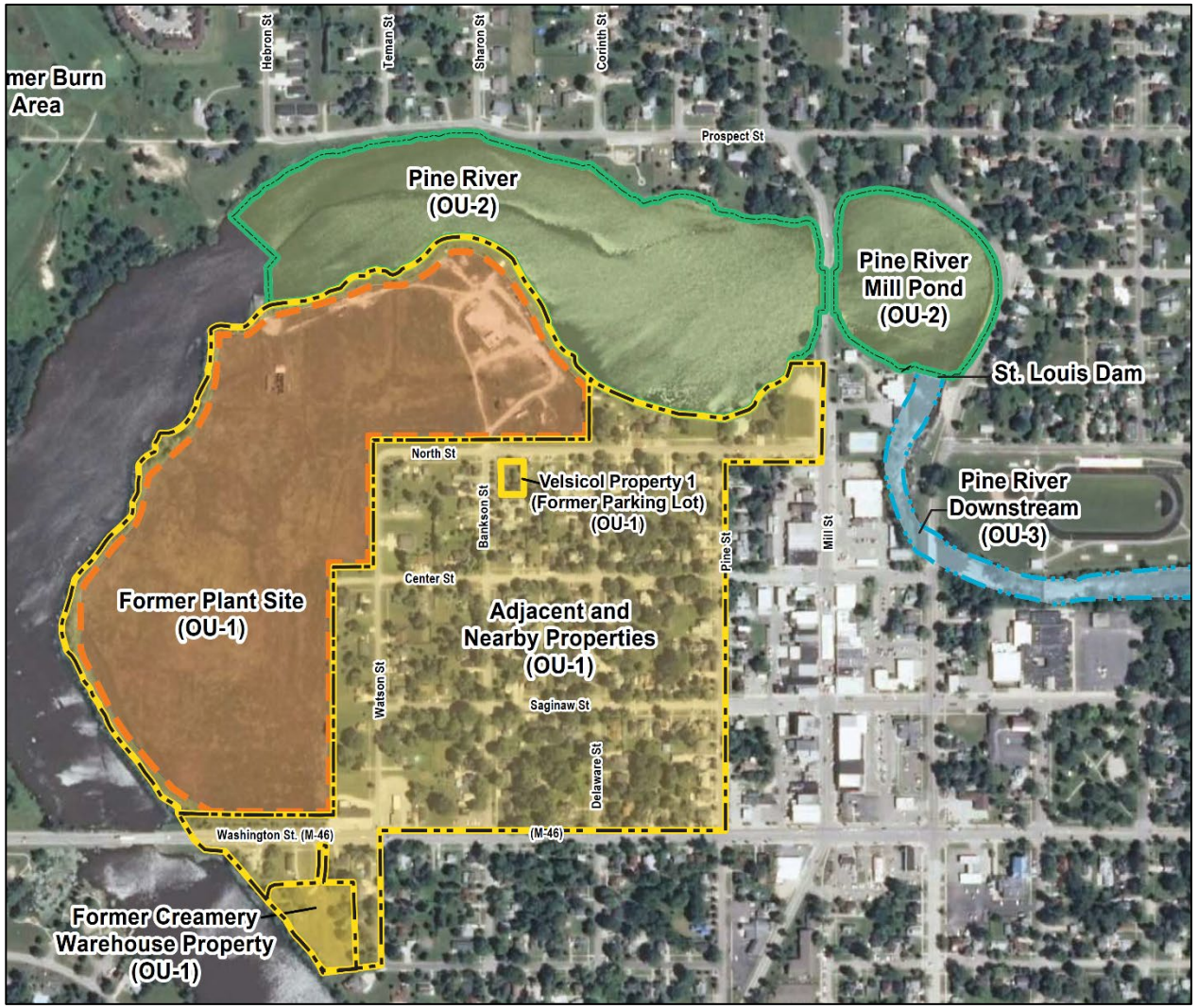
Velsicol Cleanup History

Years	Major Activities & Achievements
1978–1986	Demolition and initial response measures
1984	Slurry wall, clay cap, containment system, and fencing completed
1994–1999	EGLE & EPA investigations; DDT levels in fish doubled since 1989; sediment removal at OU2
1998–2006	750,000 tons of contaminated sediment removed; 4,300 gallons of liquid chemicals recovered
2000–2011	OU1 Remedial Investigation and Feasibility Study
Ongoing Since 2002	DNAPL identified and removed (~4,300 gallons); 20,000 gallons/week groundwater collection ongoing
2012–2014	OU1 ROD issued. Residential cleanup — 111 properties remediated (DDT-impacted soil removed)
2017–2022	ISTT implementation at Main Plant; 382,000 pounds of contaminants removed
2020–2023	City of St. Louis drinking water system replaced
2022–2024	PSA-1 & PSA-2 Source Area Removal (110,000-ton excavation, sheet pile install)
2023–2025	ISTT implementation at off-site Burn Pit; 296,000 pounds of contaminants removed
2024–2026	DGVBW Construction (4,383-foot-long combined sheet & king pile wall for groundwater contamination cut-off) and UGSW Repair (350-feet existing slurry wall repair)

Velsicol Constituents of Concern

- DNAPL
- Numerous VOCs
  - (with Benzene &
  - Chlorobenzene most prevalent)
- Numerous SVOCs
  - (with TRIS very prevalent)
- PBBs, PCBs
- Pesticides & Herbicides
  - (with DDT & DBCP most prevalent)
- Metals

Velsicol Superfund Site Maps



Velsicol DGVBW Overview

Client:

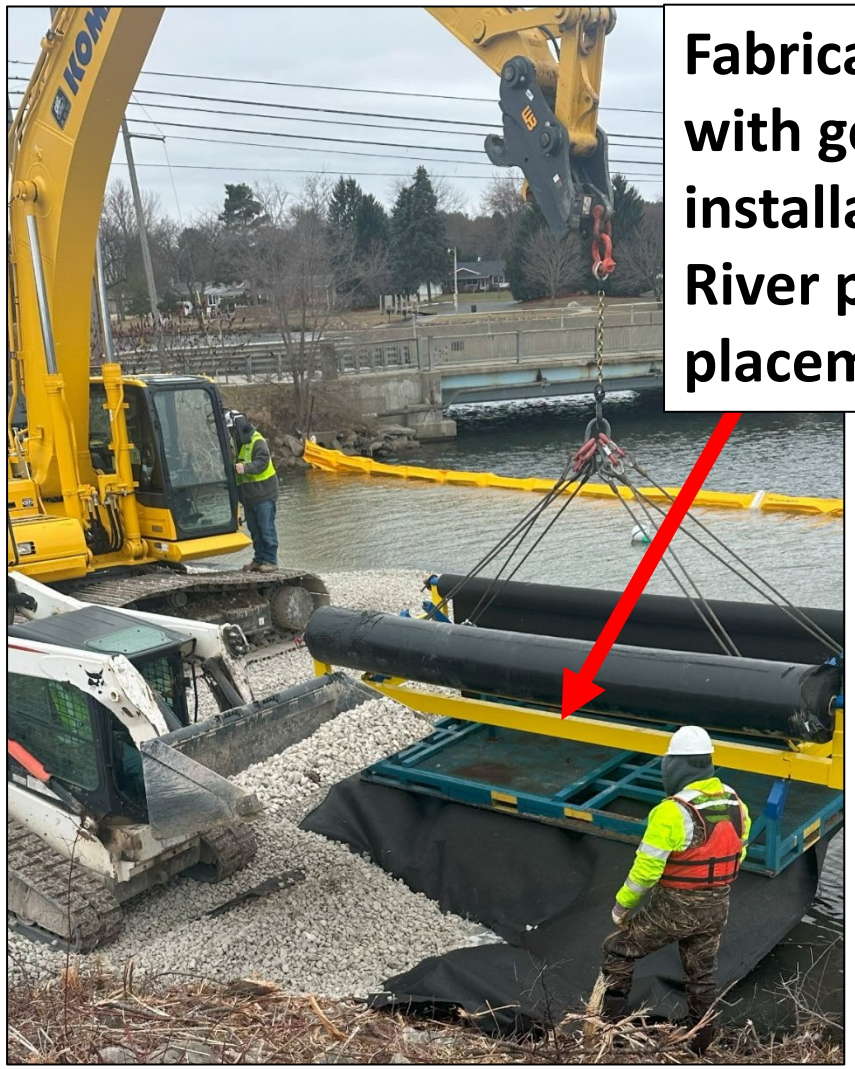
- **EPA Region 5 Superfund**
- **USACE Detroit District** (On-site Government Representatives)

Scope of Work:

- **4,383 ft**-long steel sheet & king pile wall embedded into glacial till of the Pine River to cut-off contamination flow from groundwater
- **505** cylindrical king piles (KPs)
- **535** sealed sheet pile pairs (SPs)
- KPs & SPs installed **25 to 40** feet below final grade into glacial till

How to Build DGVBW?

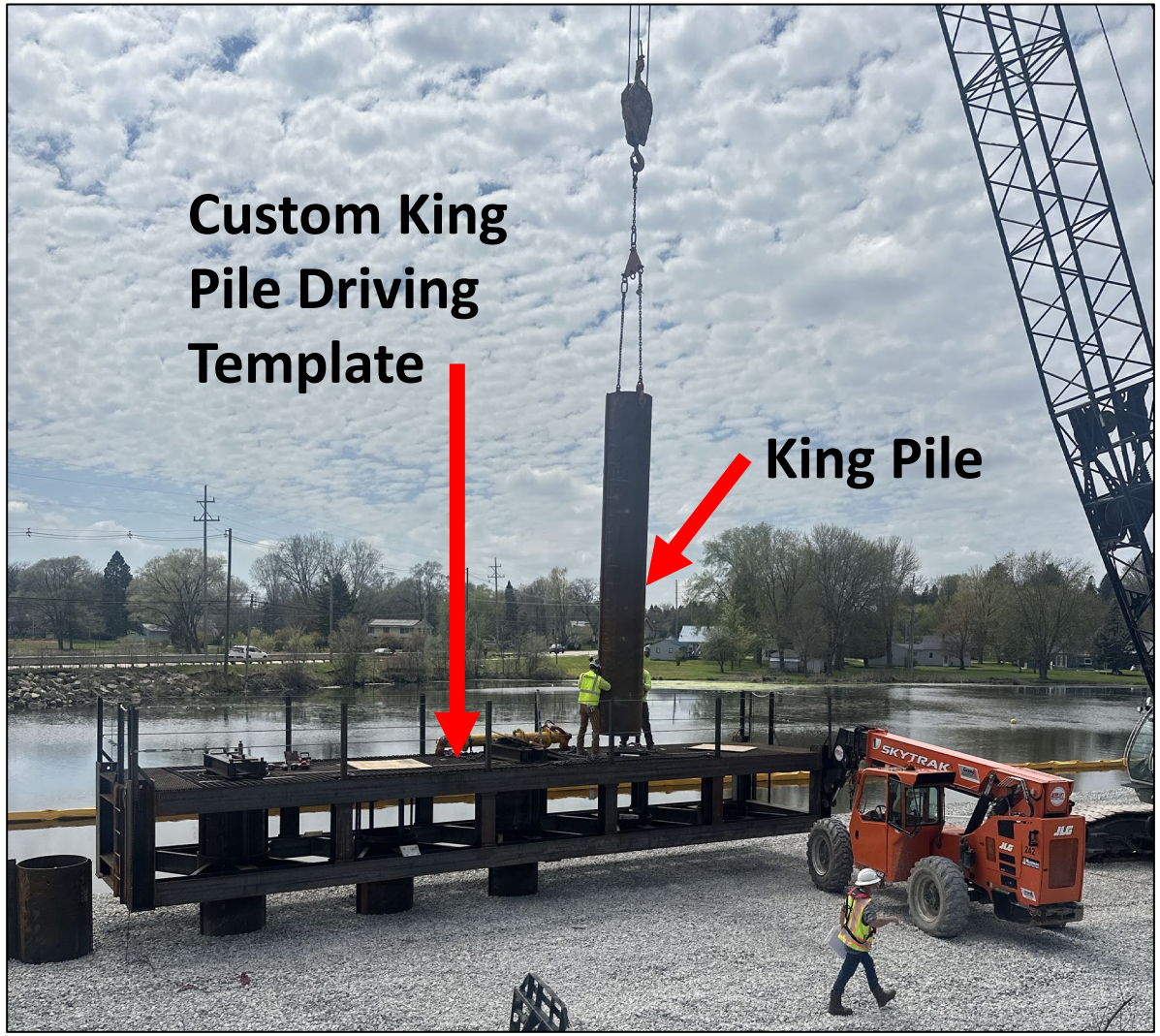
Stone Platform Installation

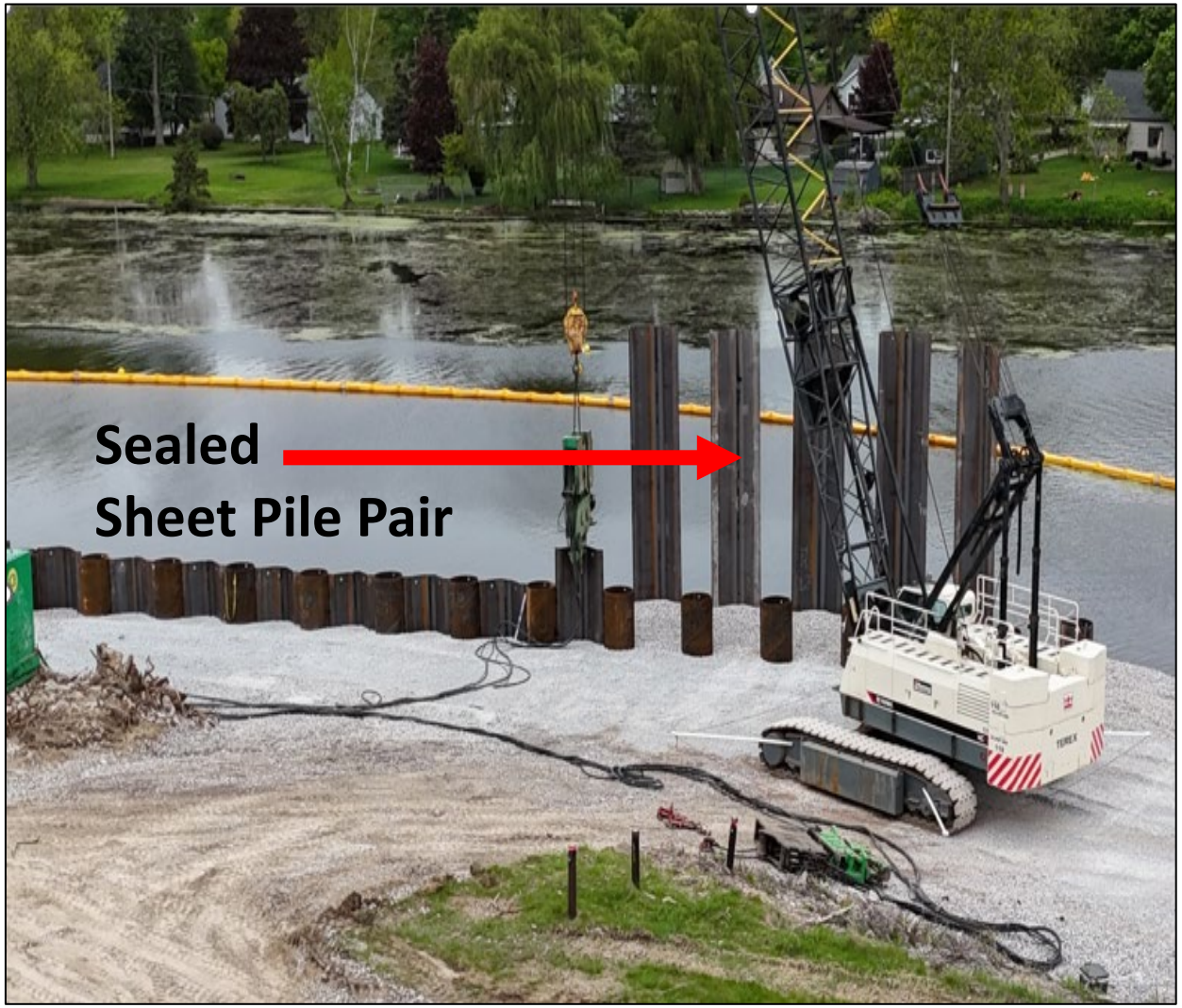


Fabricated tool assists with geotextile installation in the Pine River prior to placement of stone

Stone platform during construction

King Pile & Sealed Sheet Pile Pair Driving

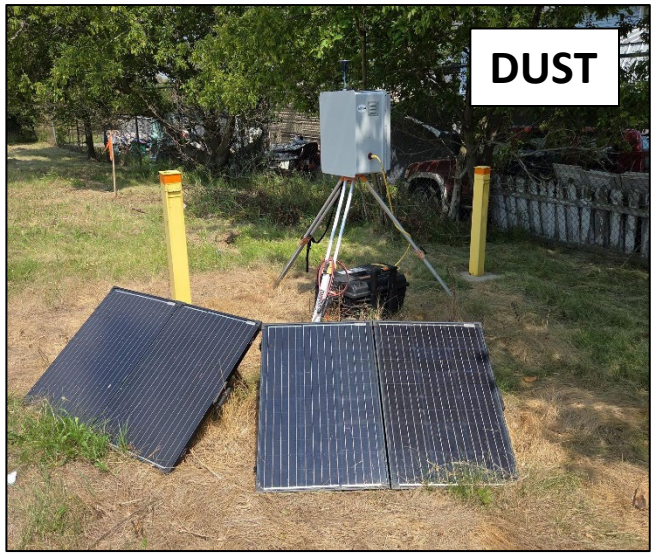




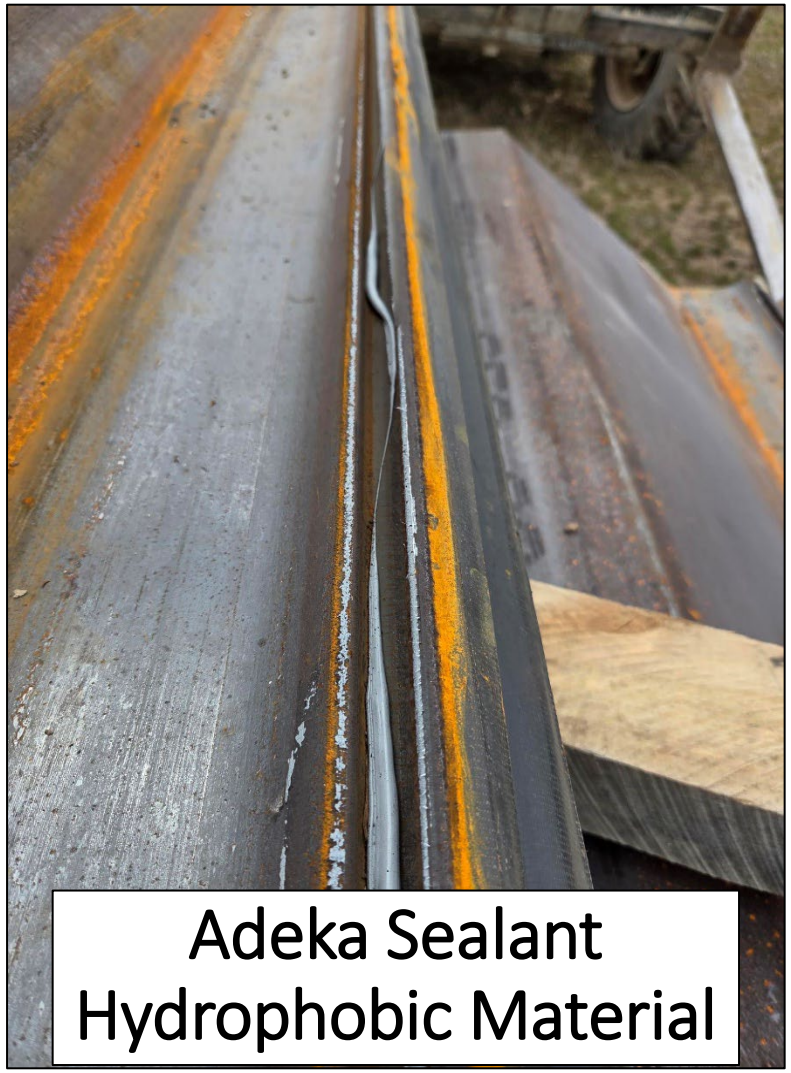
King Pile Embedment Drilling

Platform Stone Retrieval

Monitoring and Testing Activities

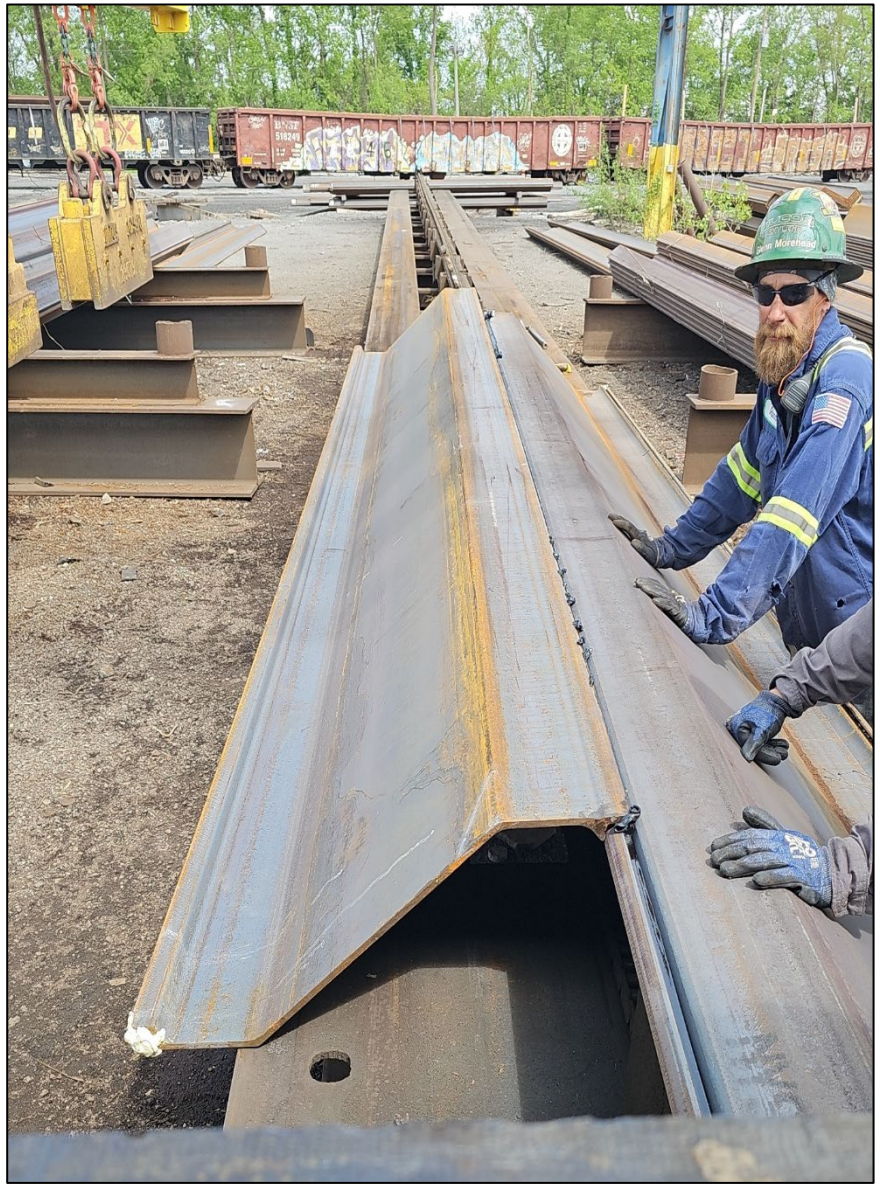


Sealed Sheet Pile QA/QC

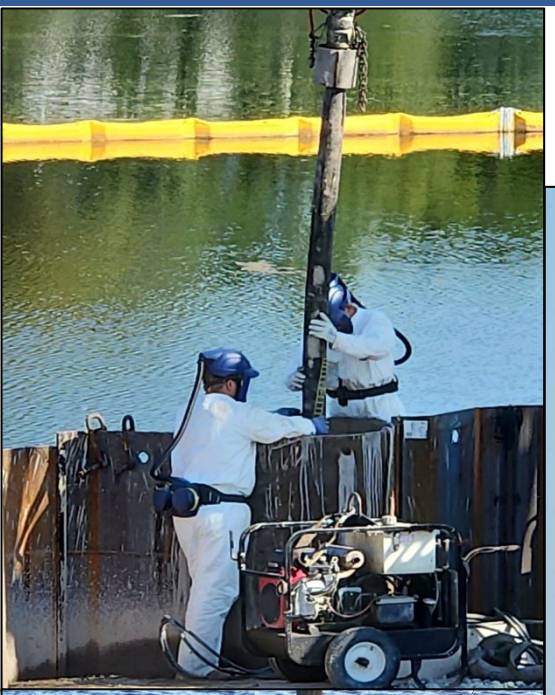


Adeka Sealant
Hydrophobic Material

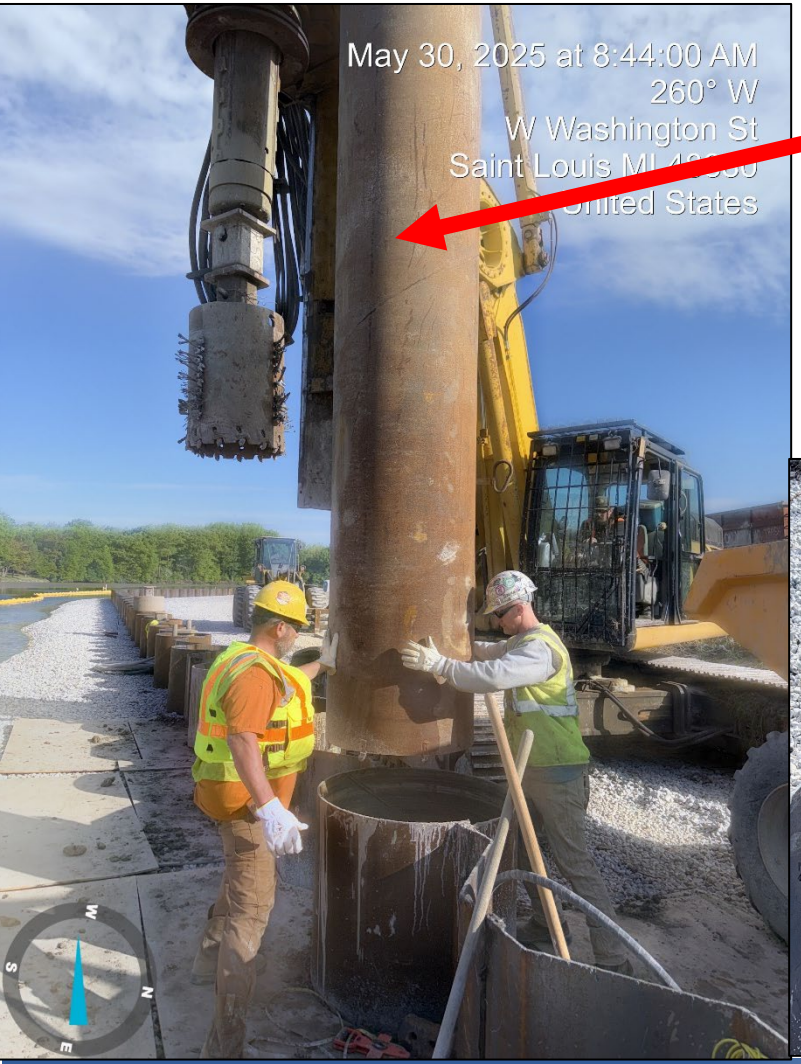
Steelant B Sealant
Hydrophilic Material



Till Embedment Challenges



Till Embedment Solutions

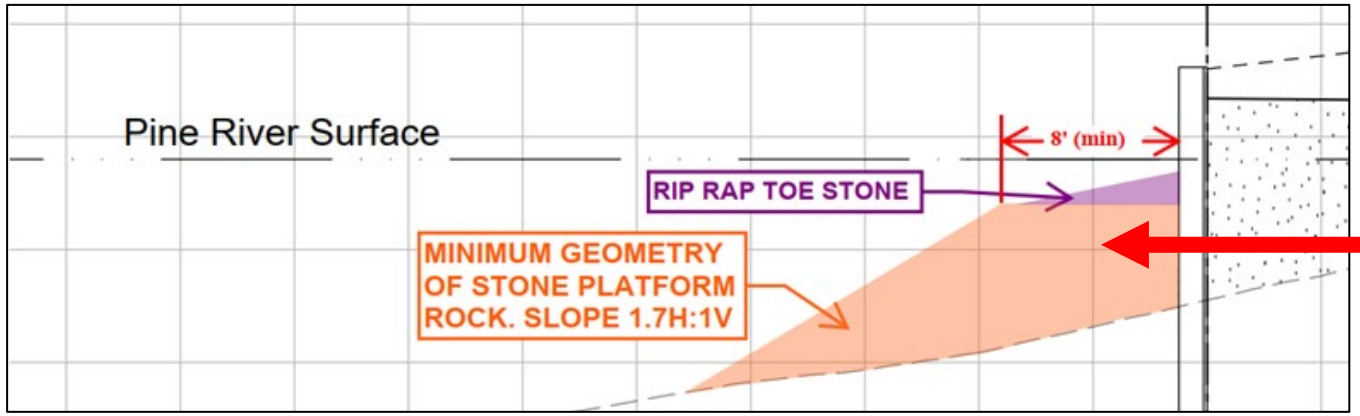


Caisson sleeve liners provided temporary/permanent support to prevent collapse in soft soils

Extending cages to provide embedment in deeper glacial till encountered

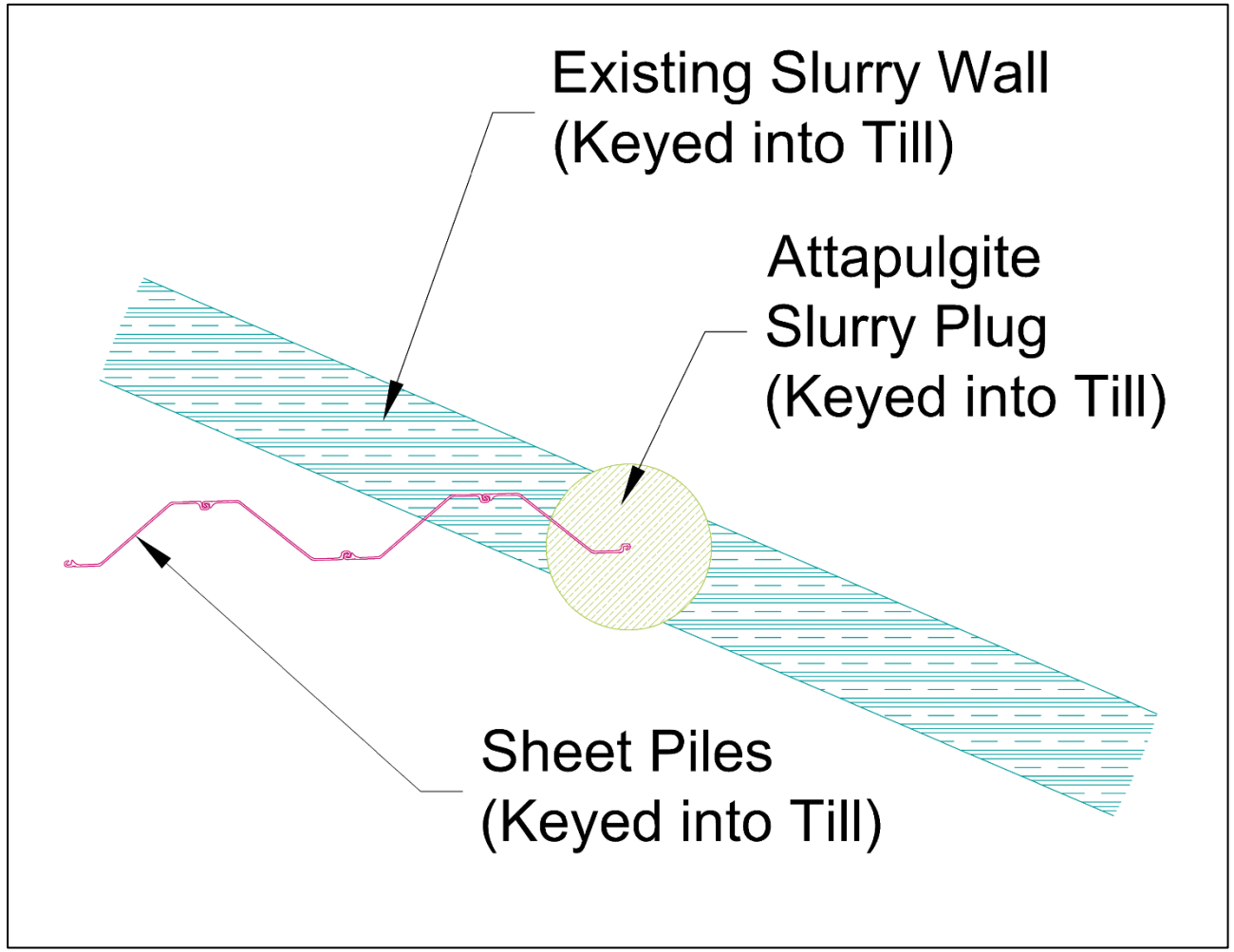
Till Embedment Solutions

Water-side stone fill left in place to provide structural support where till embedment requirement were modified

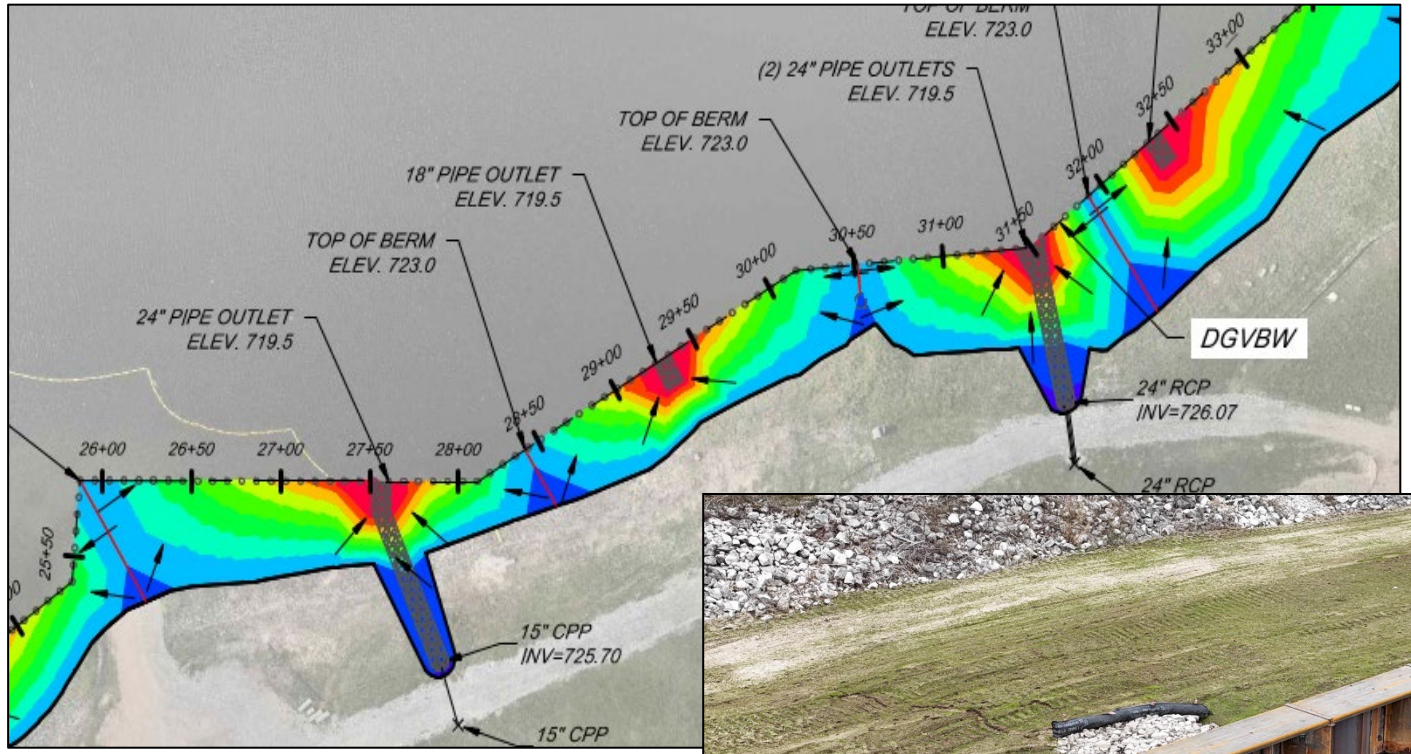


Stone fill finished grade requirements

DGVBW Tie-In to Existing Slurry Wall



DGVBW Storm Water Outlet Modification



DGVBW Drone Video

DIGITAL SITREP 14AUG2025 Reverse Flyover

Finished Cover Plates for DGVBW

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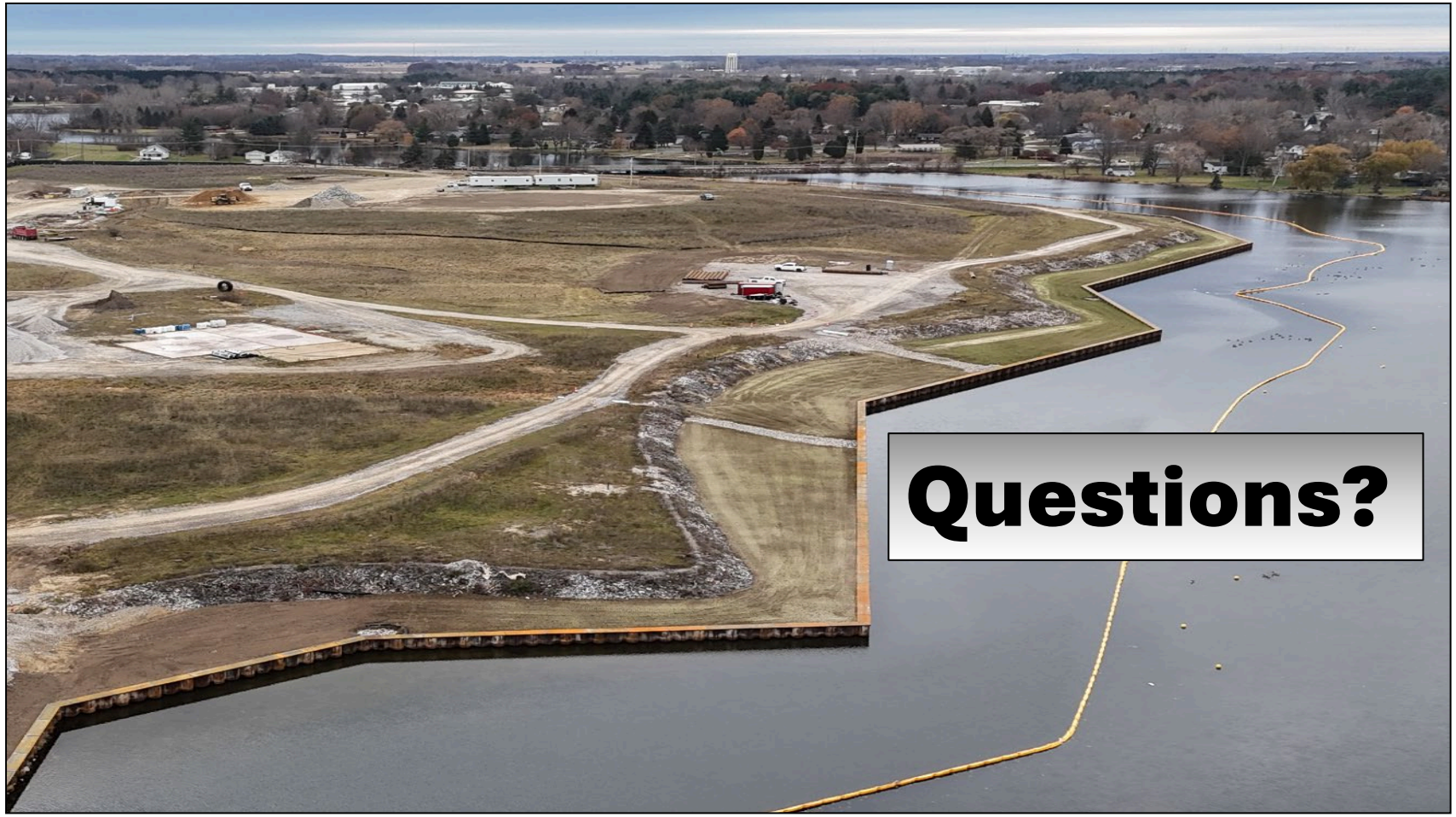
Questions?