



Unique Aspects of Capping and Long-Term Monitoring at River Raisin, Michigan

Paul Doody

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Andrew Corbin
Dan Opdyke

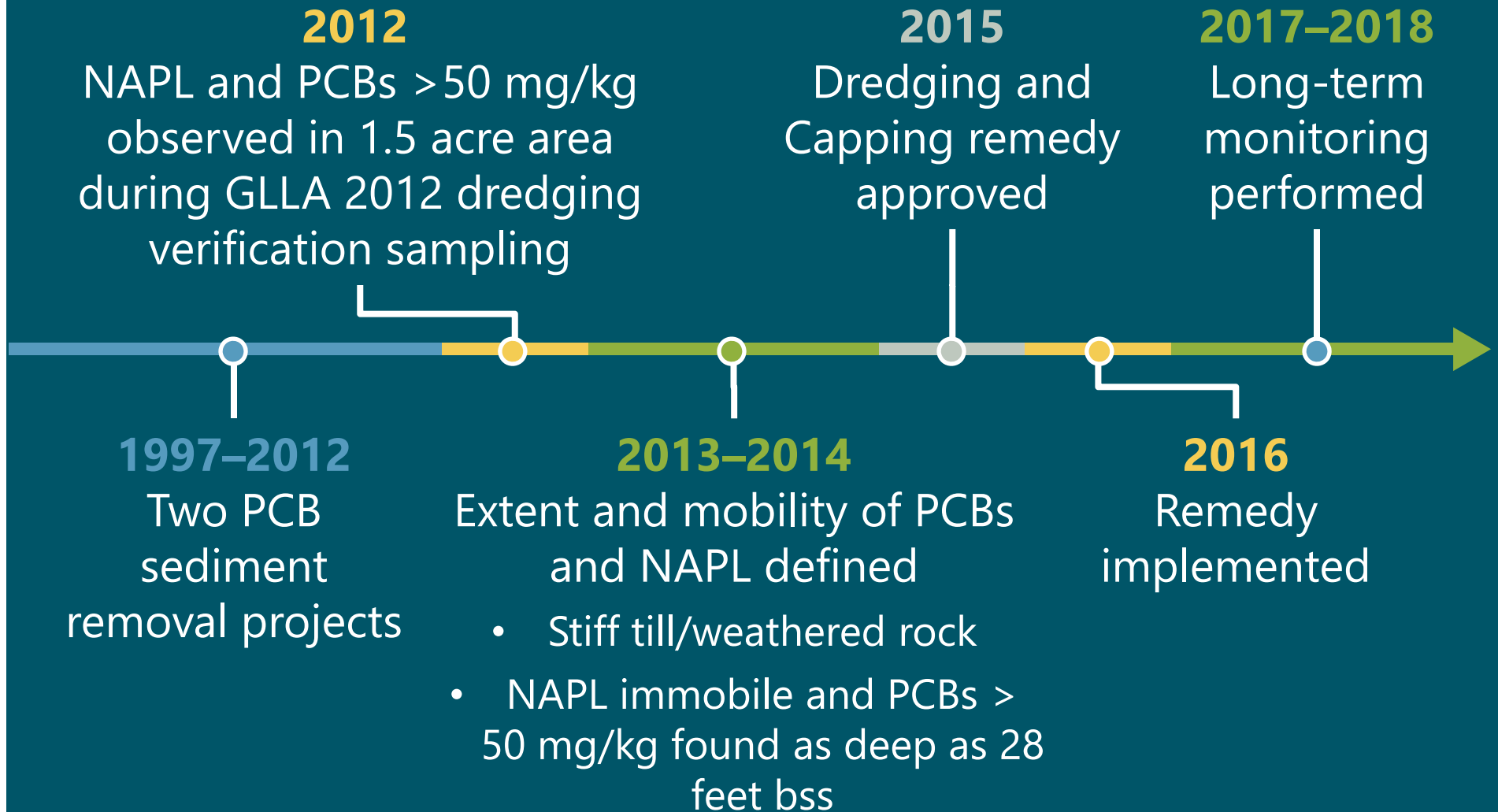


Chuck Pinter



William Murray

Background

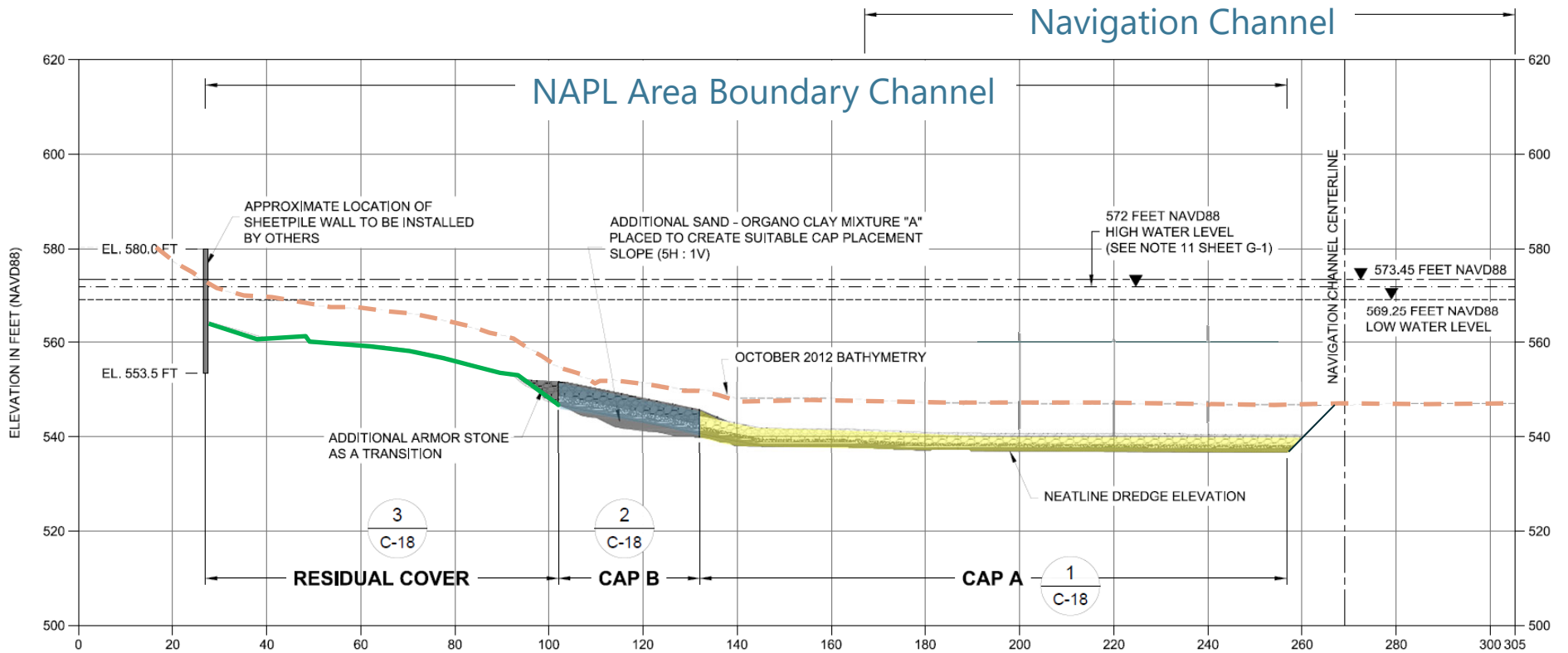


Project Participants

- Ford Motor Company
 - Mannik & Smith Group, Inc.
 - Anchor QEA, LLC
 - Severson Environmental Services, Inc.
- EPA
 - Great Lakes National Program Office (GLNPO)
 - Environmental Restoration, LLC and J.F. Brennan Co., Inc.
 - U.S. Army Corps of Engineers
- MDEQ
 - Surface Water Quality Division

The remedy was a joint effort between Ford Motor Company, EPA, and MDEQ.

Remedial Design



Construction – Sheetpile Installation



2016 Sheetpile Installation

Construction – Dredging



2016 Sediment Remediation at River Raisin¹

Construction – Sediment Processing



Construction – Capping



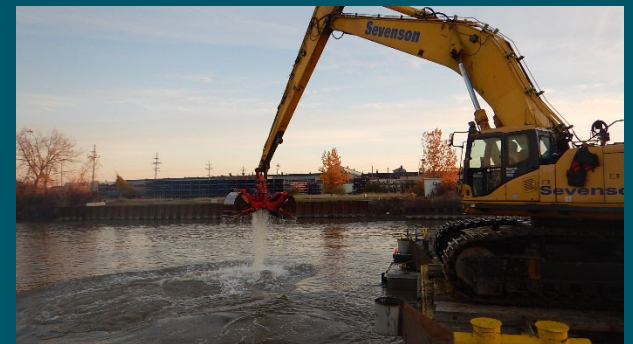
Remediation Statistics

- Removed 29,465 cy (ave 330 cy/day)
- Calciment® and Type II Portland cement (6% ave) for stabilization
- 62,293 tons (1,353 truckloads) stabilized sediment hauled off site as TSCA waste
- Capping completed in 2-week Port shutdown window
 - Sand and organoclay blended onshore (hoppers with augers, conveyors)
 - Sand leveling and sand/organoclay placed inside moonpool
 - Filter gravel and armor stone placed without moonpool



Project Challenges

- Very stiff glacial till
- Depth of NAPL/PCBs
- Vessel traffic scheduling and coordination
- Landfill material acceptance
- Procurement and contracting
- Two-week cap schedule



Implementation Costs

Activity	Entity	Cost (M)
Sheetpile Installation	EPA	\$0.4
Dredging and Processing	Ford	\$5.4
Sediment T&D	EPA	\$5.4
Fill Material Purchase & Delivery	EPA	\$2.5
Capping	Ford	\$1.3
Total		\$15.0

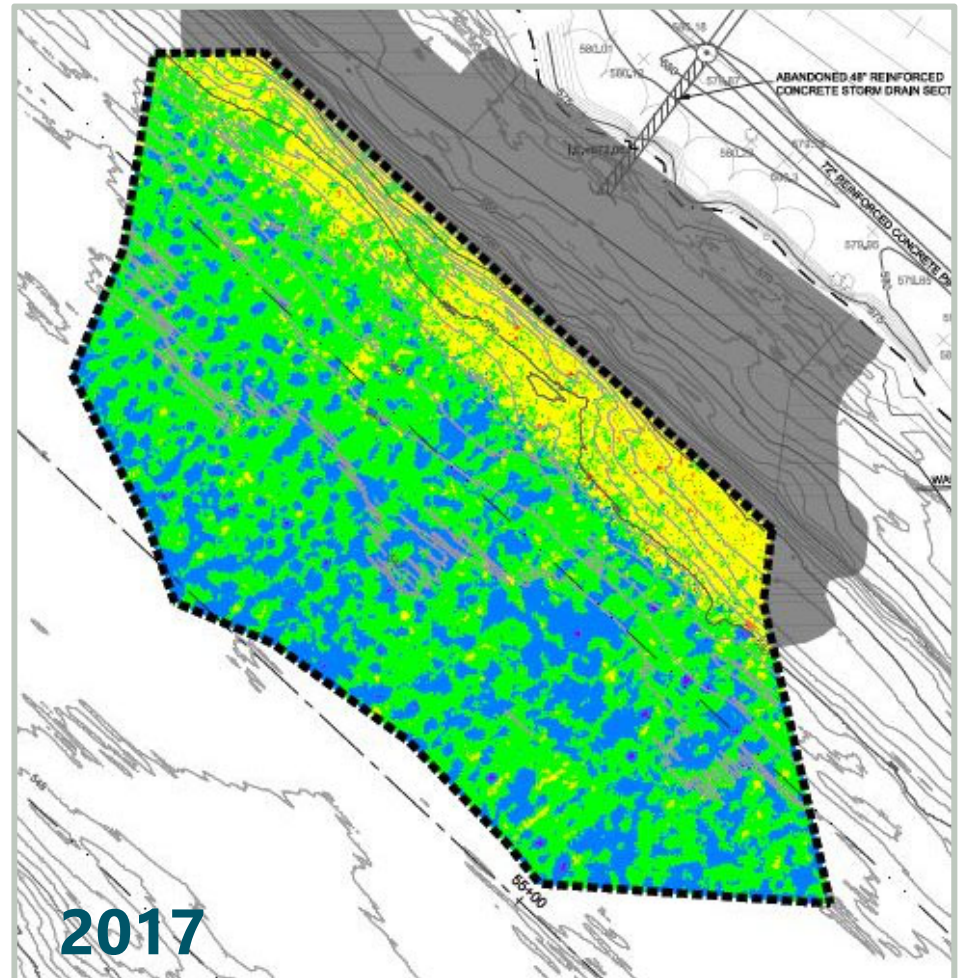
Monitoring Activities Completed to Date

Activity	Baseline (2016)	Year 1 (2017)	Year 2 (2018)
Bathymetry		✓	✓
Sediment Probing		✓	✓
Sediment Sampling (Within Cap Area)		✓	✓
Sediment Sampling (Outside Cap Area)		✓	✓
SPMD	✓	✓	✓
SPME		✓	✓

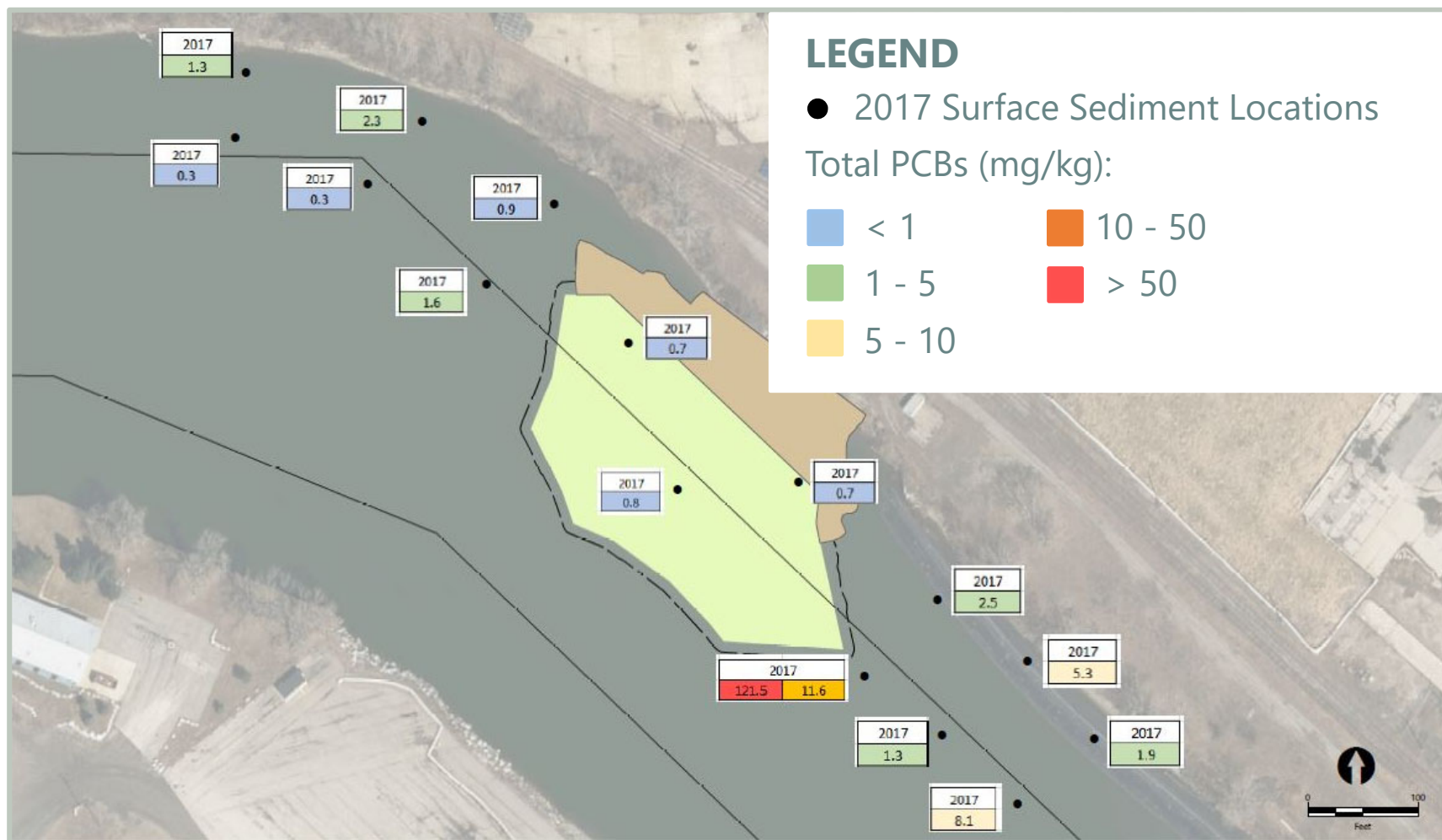
Post-Construction Bathymetry Results

ELEVATION DIFFERENCE (FT)	COLOR	AREA (SF)	AREA (%)
-1.0 to -0.5	Red	12	0.024%
-0.5 to 0.0	Orange	218	0.44%
0.0 to 0.5	Yellow	8051	16%
0.5 to 1.0	Green	27910	57%
1.0 to 2.0	Blue	12957	26%
2.0 to 5.0	Purple	80	0.16%

Compared to
2016
As-Built Survey

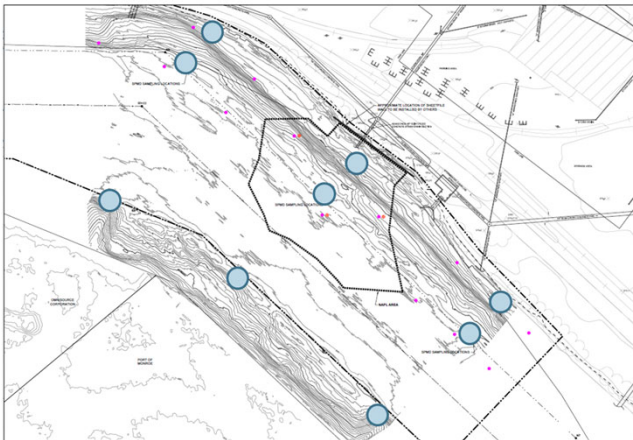


Surface Sediment Results



SPMD Sampling

- LDPE sleeve filled with triolein (oil)
- Deployed several weeks, to obtain time-integrated sample – represent surface water
- Nine locations – some disturbed

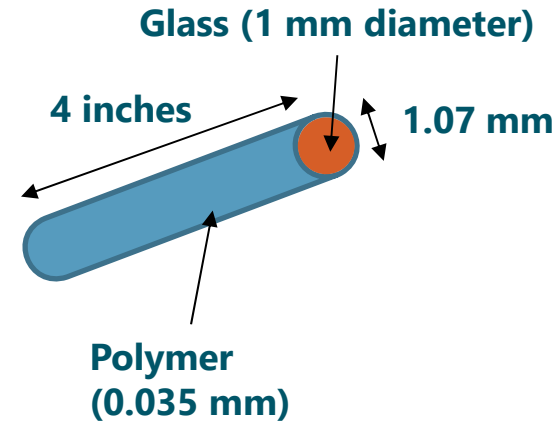


- Redeployment over time allows for relative comparison of PCB levels
- PCBs detected in SPMDs, higher downstream of NAPL Area

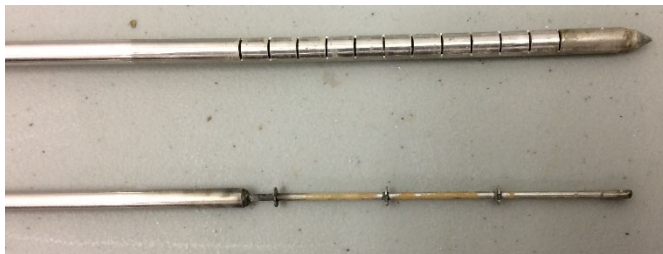


SPME Sampling

- Polymer coating absorbs PCBs
- Extended deployment
- Three monitoring ports
 - Sample porewater above organoclay
- PCBs detected in SPME
 - Similar concentrations to SPMD-calculated surface water



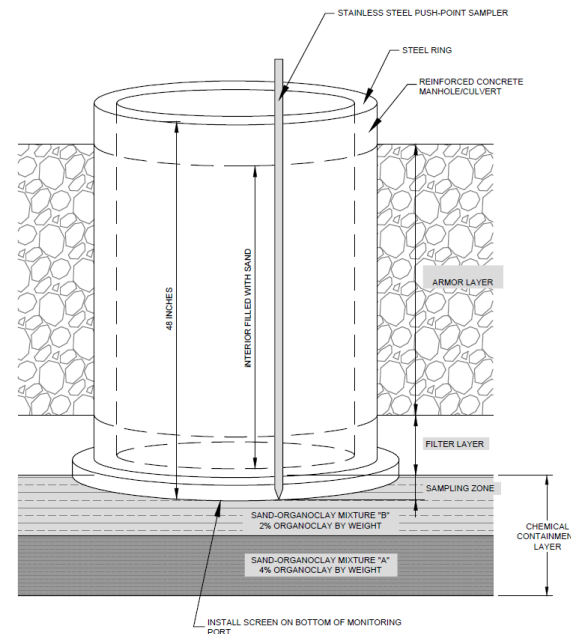
Entire push-point sampler



Sampler tip



Sampler tip with one fiber



Lessons Learned

- Expect change and adaptation
- Multi-contractor/owner implementation can work
- No substitute for extensive communications
- Landfill workability criteria presents challenges
- Expect PCBs in chemical containment layer after placement (entrained surface water)

Questions/Discussion



References

- Illinois-Indiana Sea Grant, 2016. "2016 Sediment Remediation at River Raisin (No sound)". October 3, 2016. Available at: <https://www.youtube.com/watch?v=N28Arvufgxl#action=share> (Slide 7)