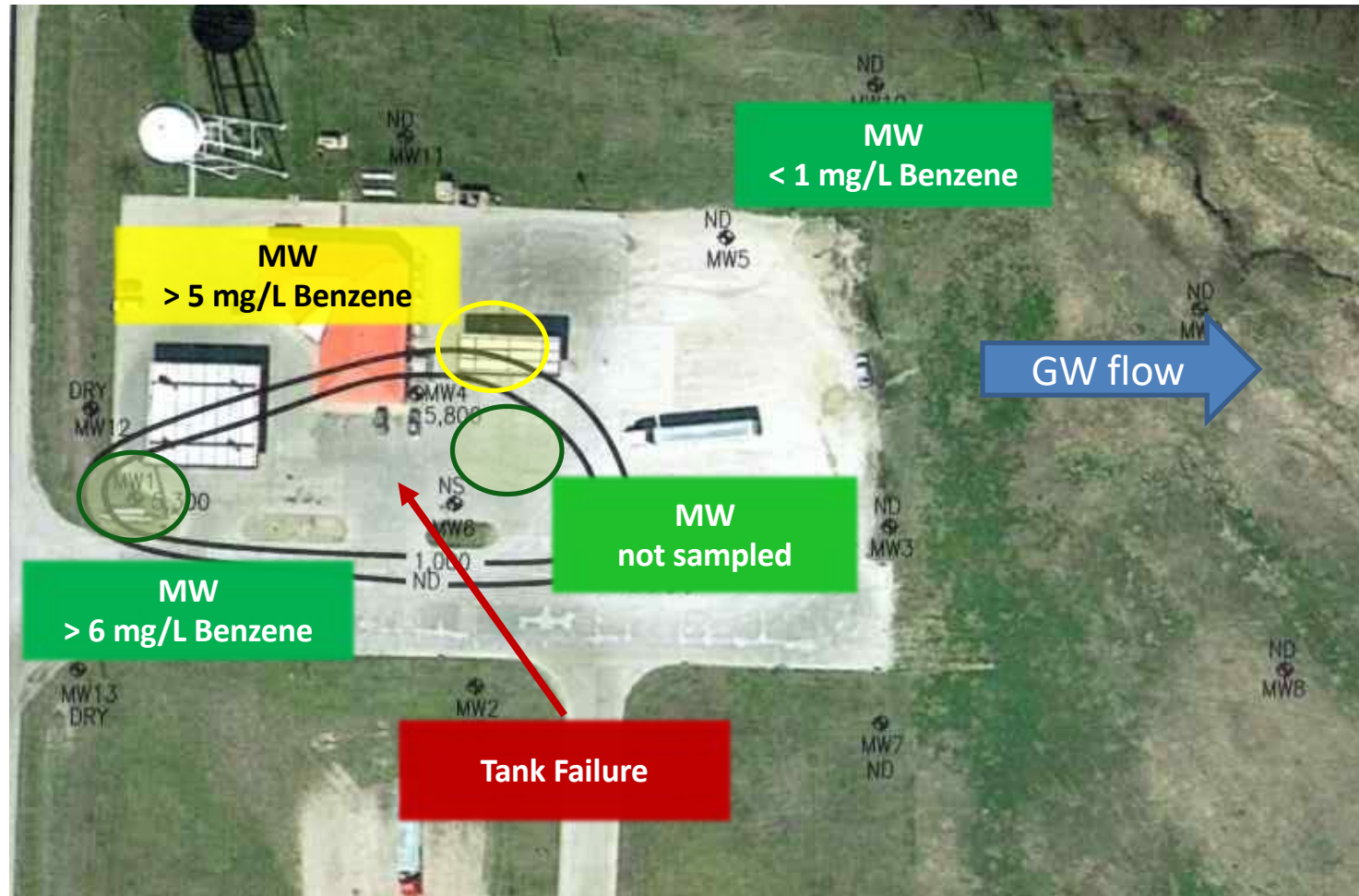


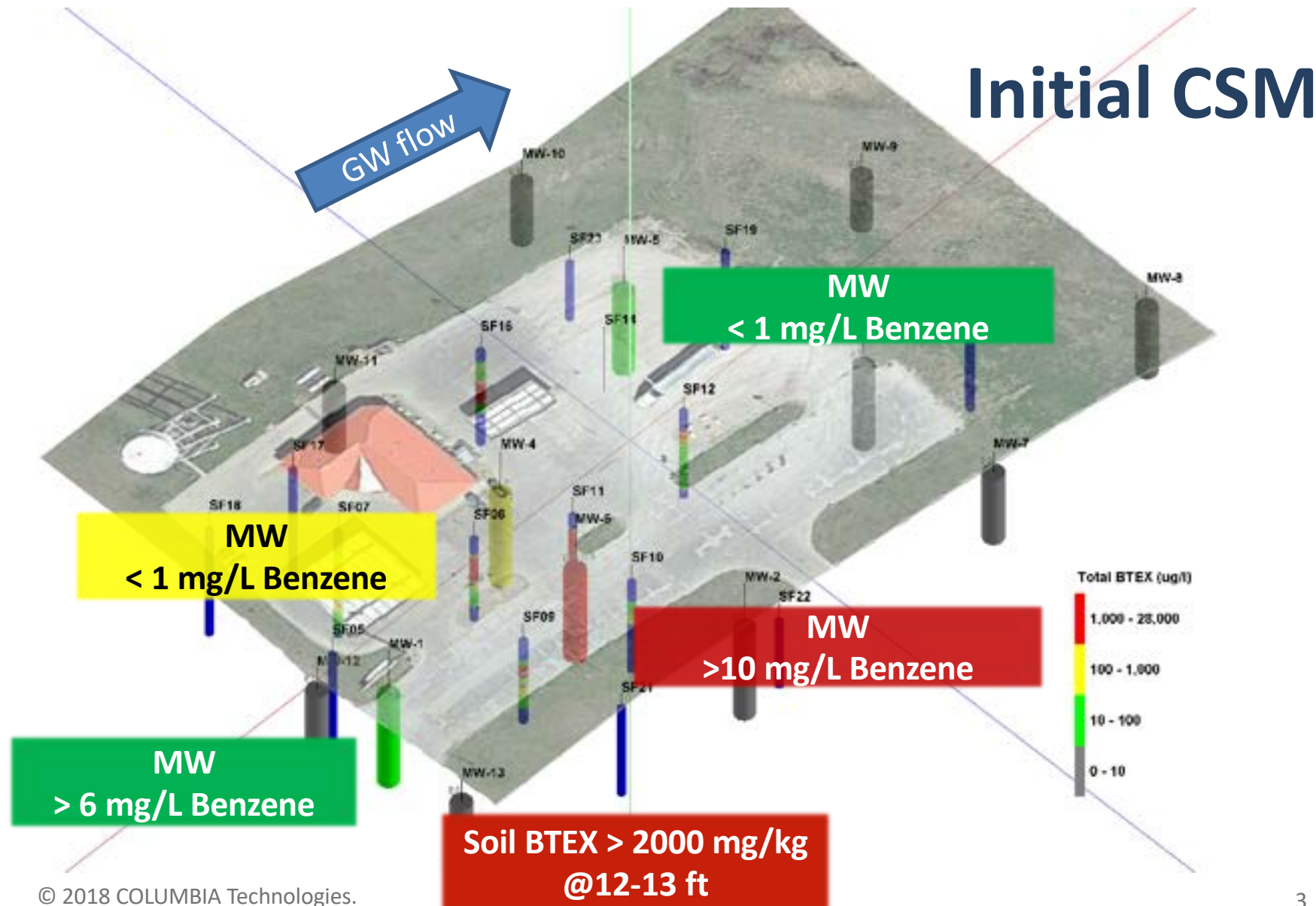


CASE STUDY – COMPARISON OF MULTIPLE LINES OF EVIDENCE



Initial CSM





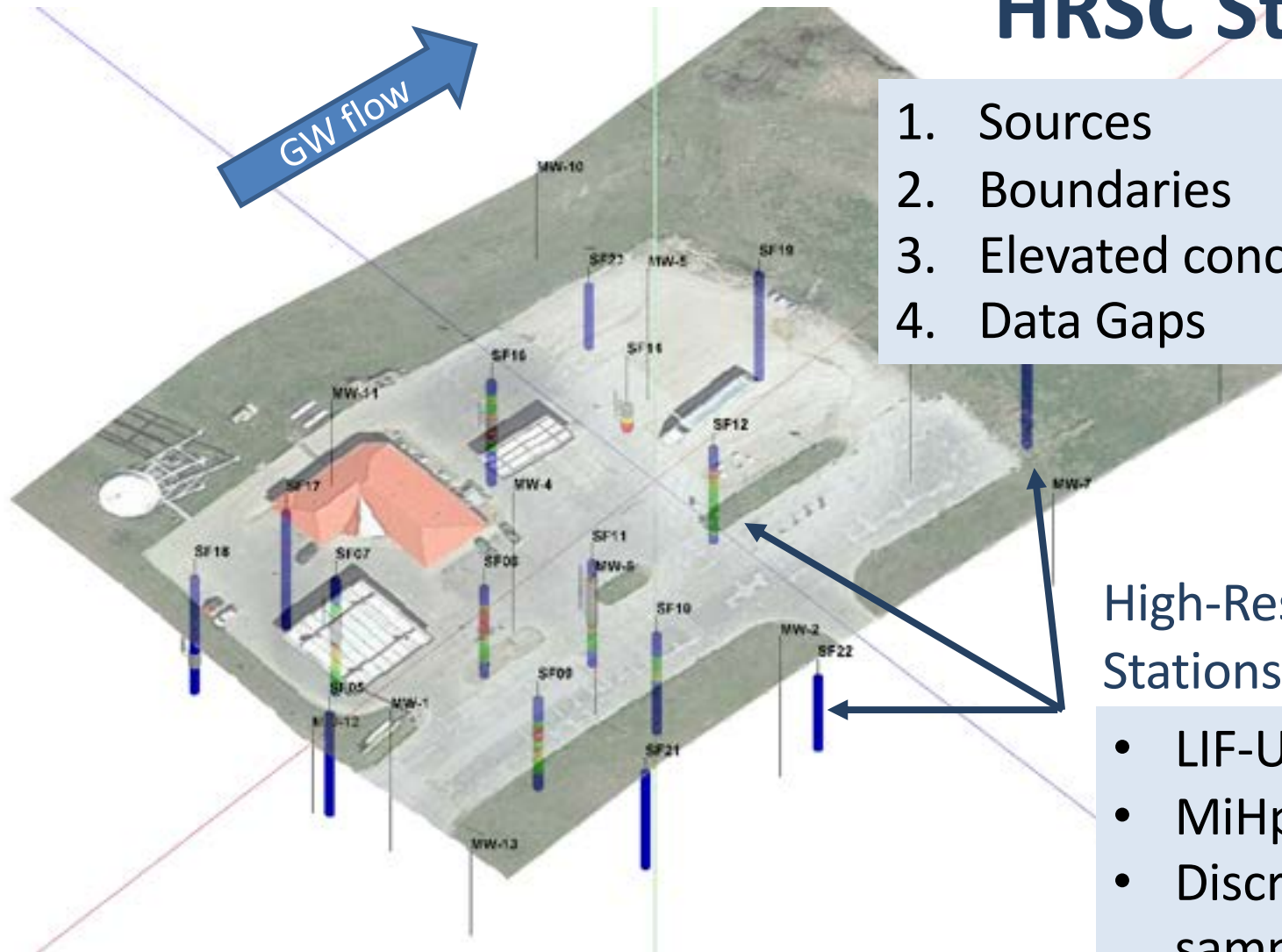


HRSC Stations

1. Sources
2. Boundaries
3. Elevated concentrations
4. Data Gaps

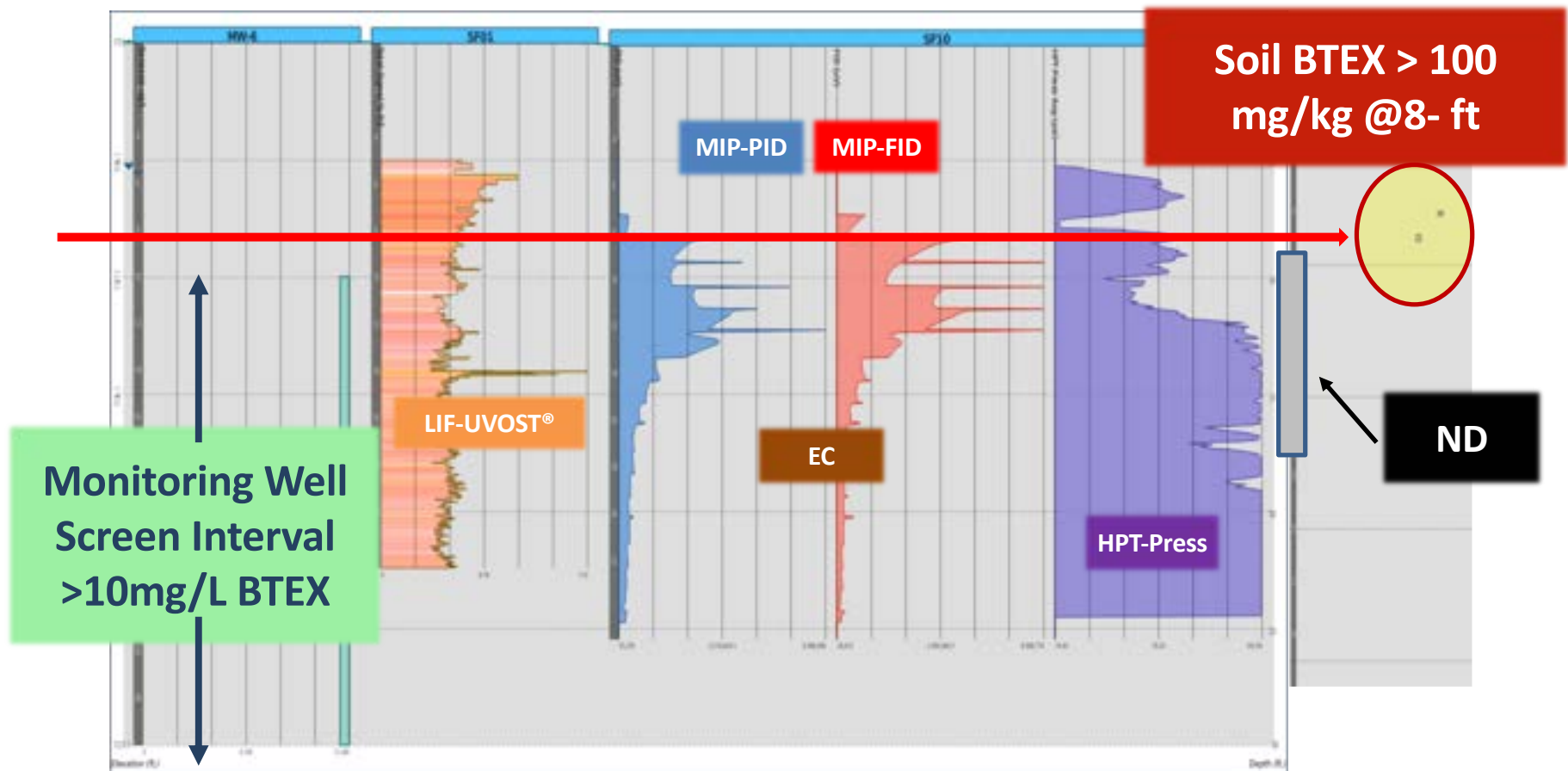
High-Resolution Stations

- LIF-UVOST®
- MiHpt
- Discrete soil sampling



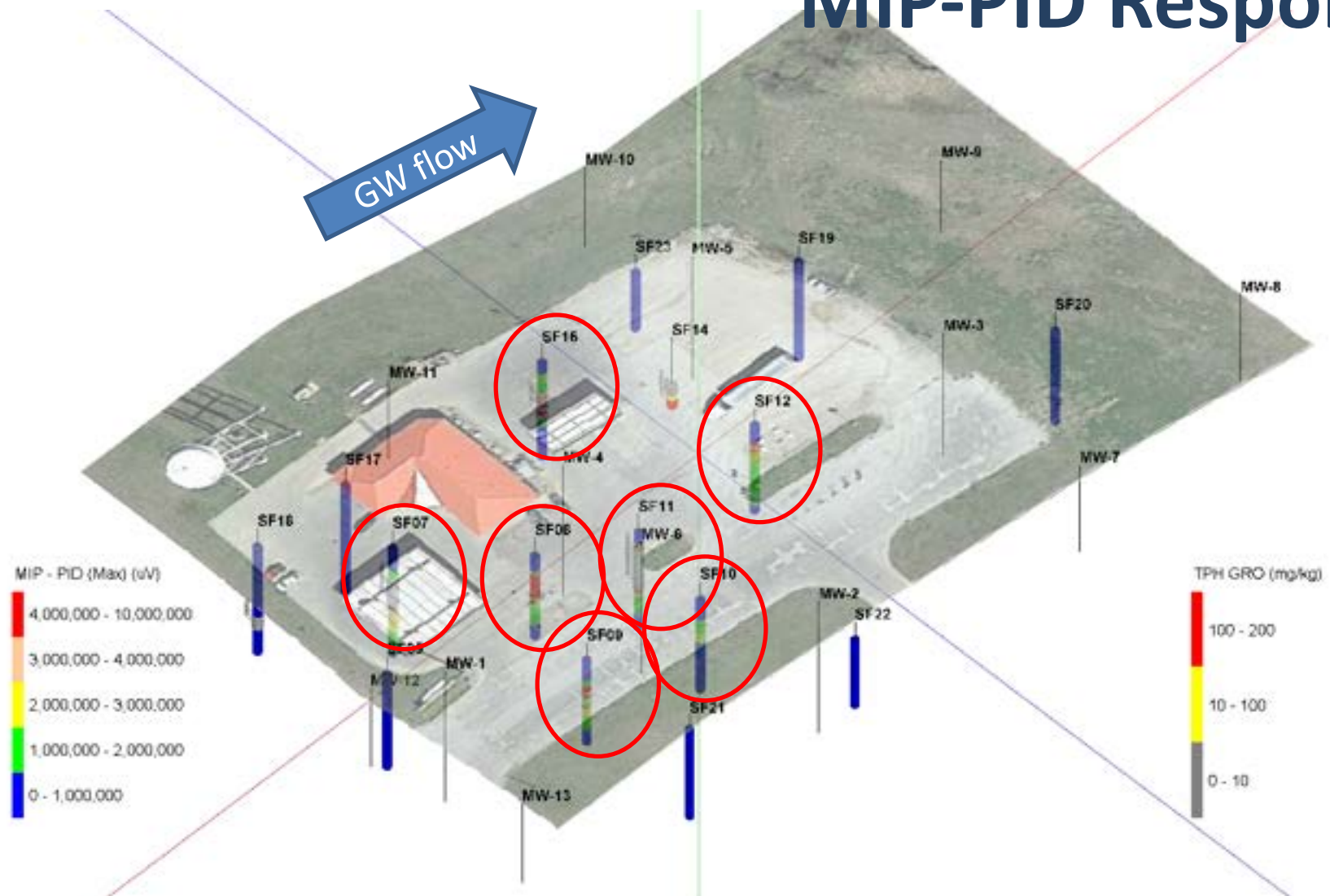


Comparing Lines of Data – Weathered Gasoline Exceeding NAPL Concentrations



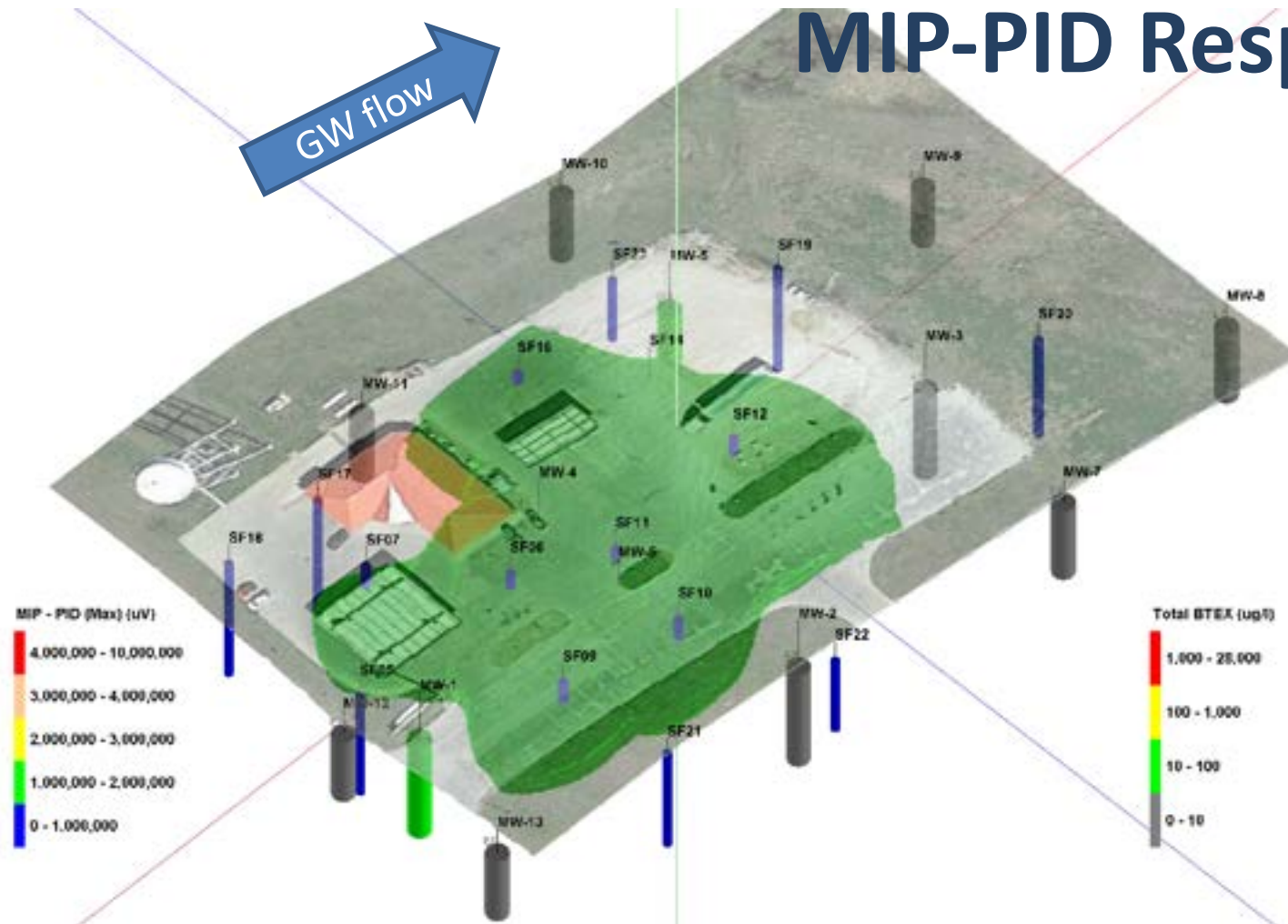


MIP-PID Response



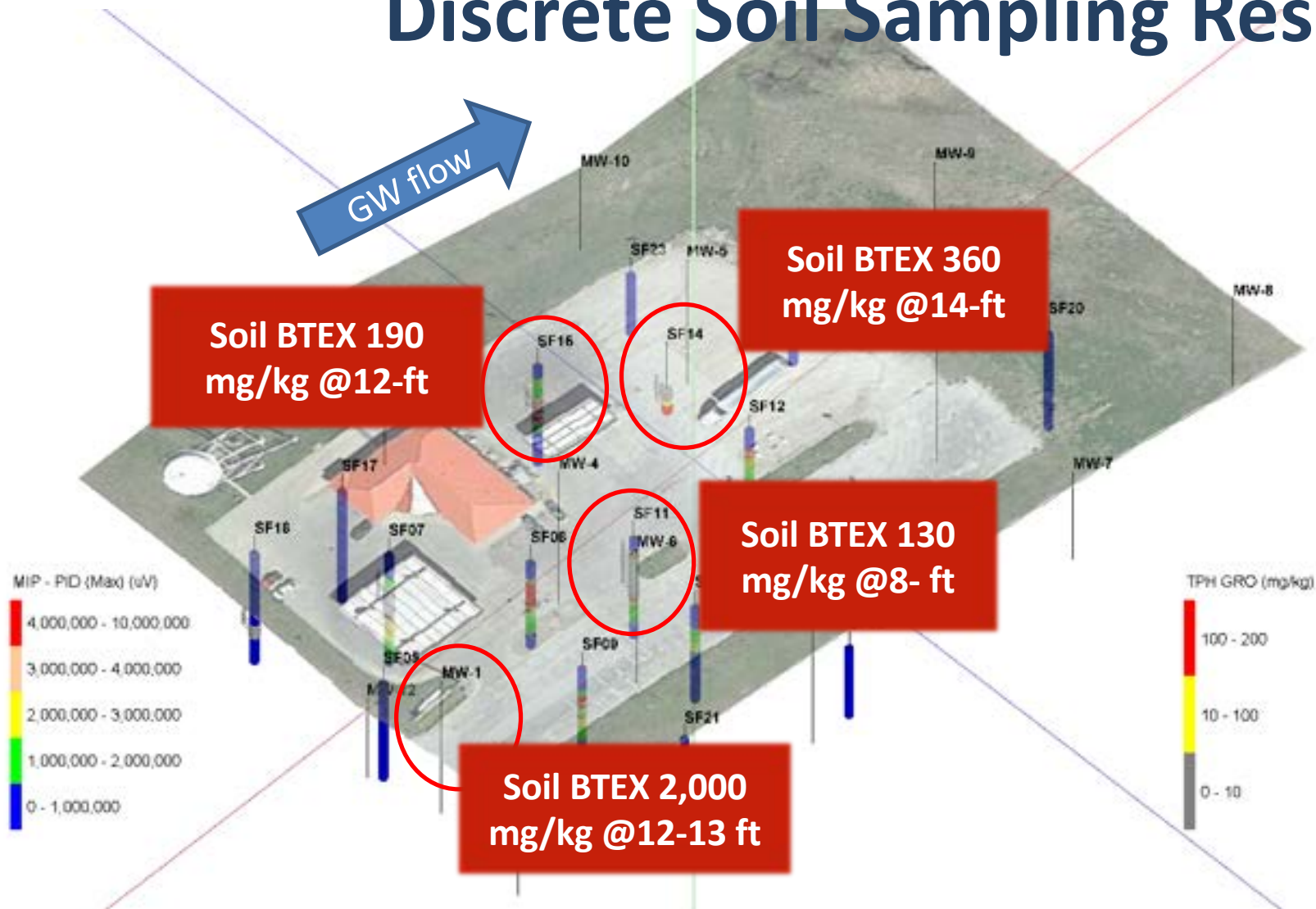


Dissolved Phase (or greater) based on MIP-PID Response





Discrete Soil Sampling Results





Systematic Screening





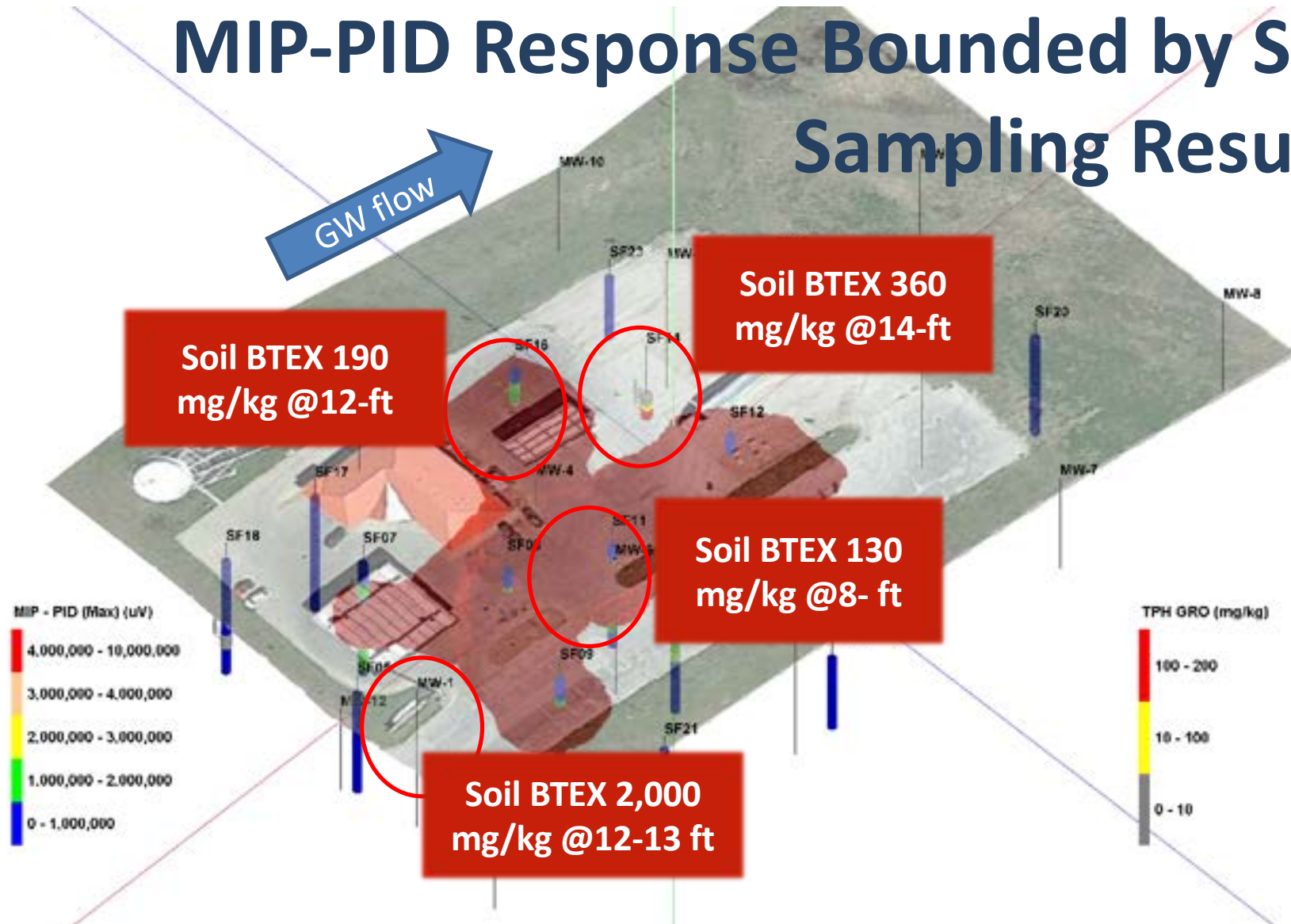
Systematic Sampling



Sealed & Preserved For Lab

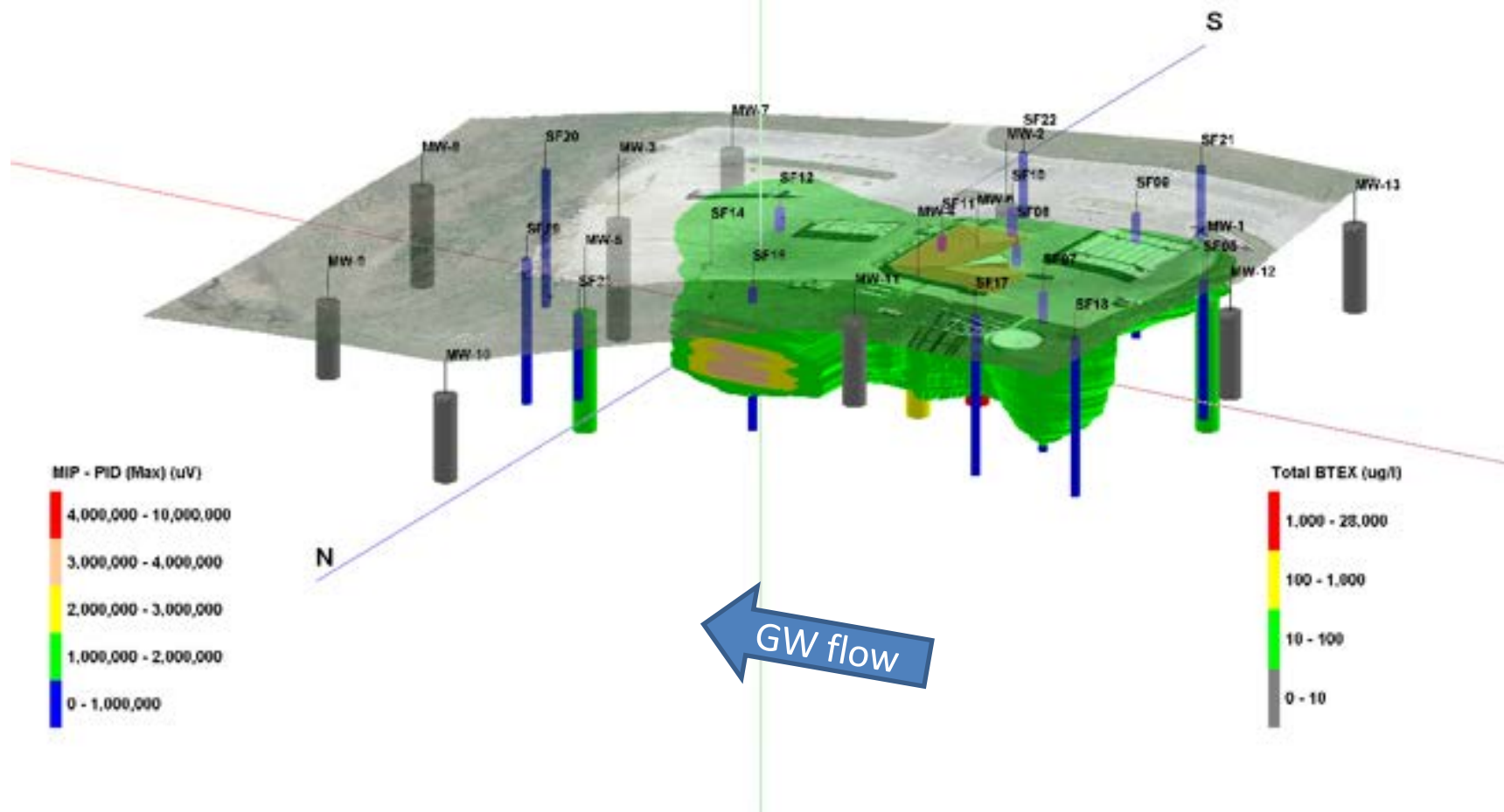


MIP-PID Response Bounded by Soil Sampling Results



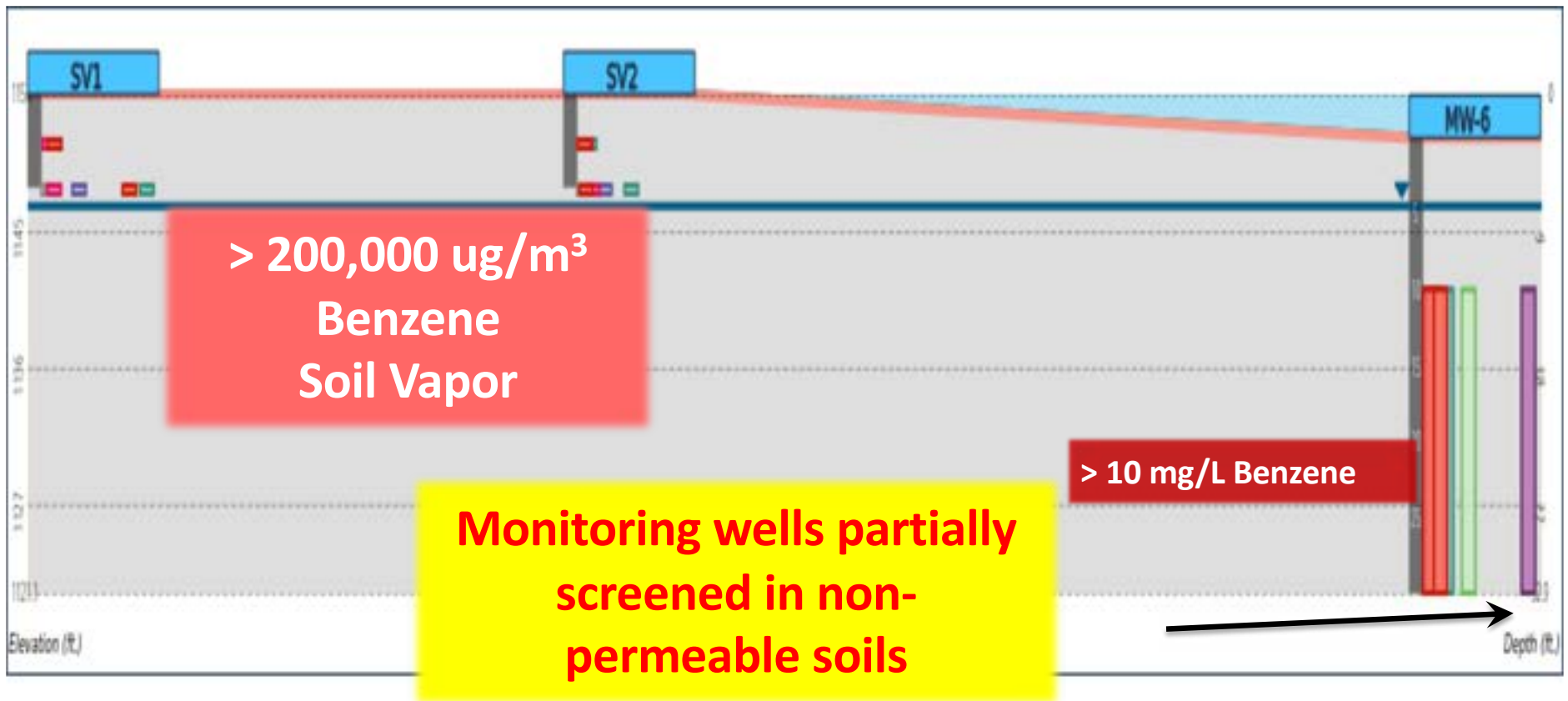


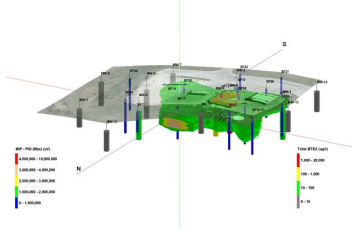
Updated LCSM





Petroleum Vapor Impact





Lessons Learned

- Monitoring well results will not adequately delineate a residual LNAPL impact or mass
- Cleanup goals for groundwater are not going to be achieved if LNAPL mass remains onsite – *“if you have a water problem, you have a soil problem”*
- Petroleum vapor intrusion may pose a risk if the residual LNAPL mass is not fully characterized
- Adequate characterization of weathered gasoline LNAPL requires multiple lines of evidence

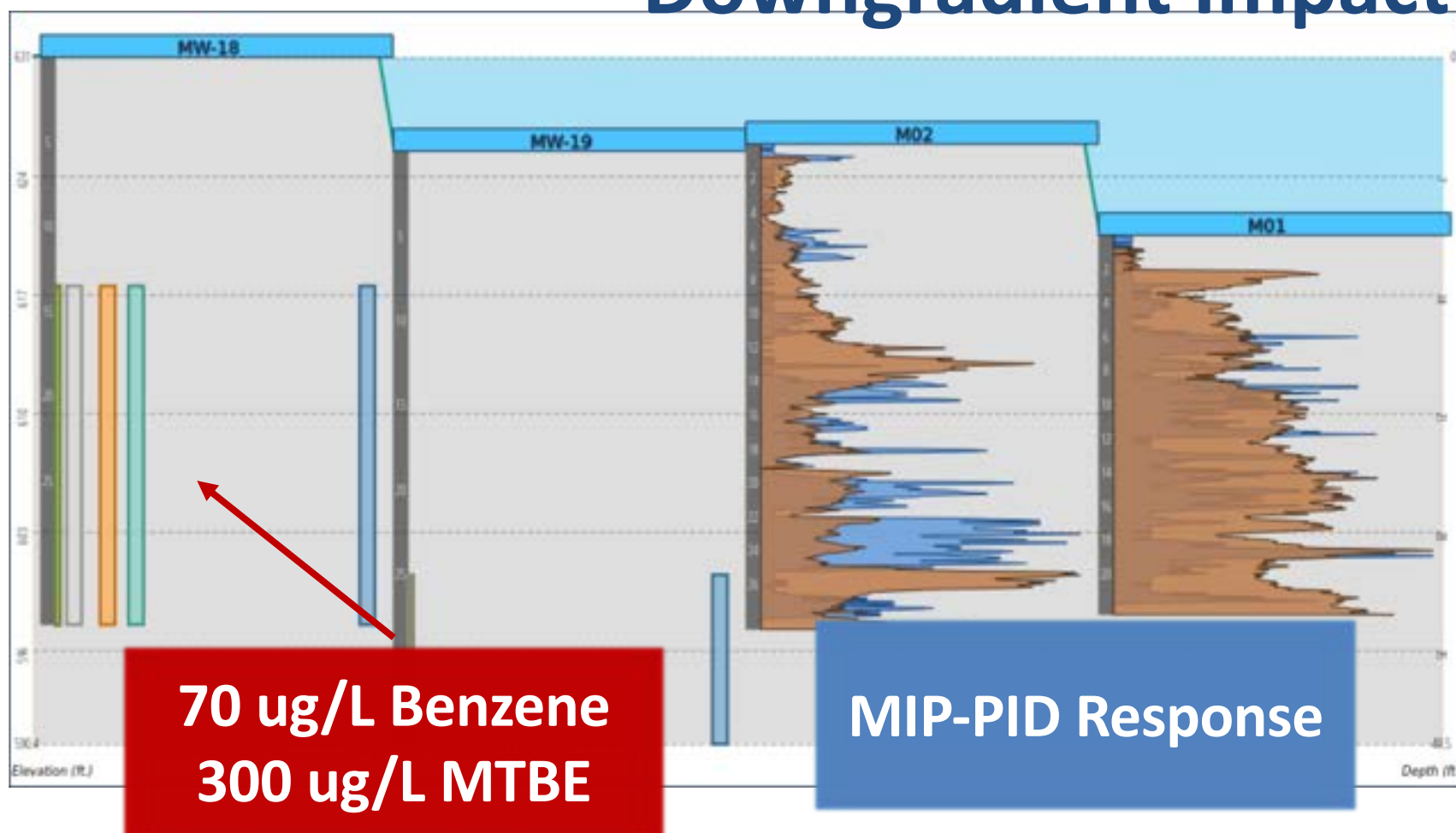


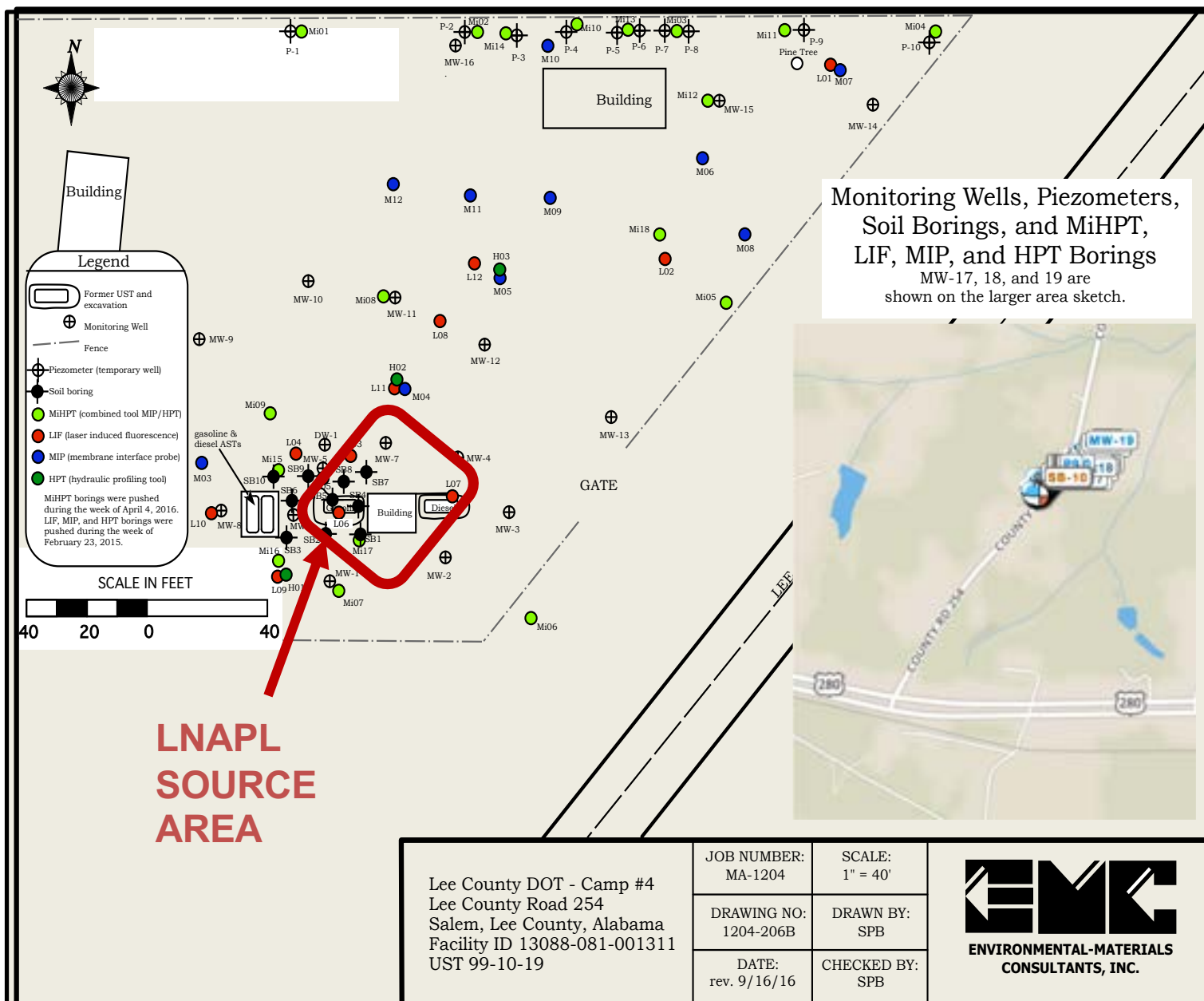
CASE STUDY – DISSOLVED PHASE PLUME





Downgradient Impact





Survey Locations

Lee County DOT #4
Salem, AL

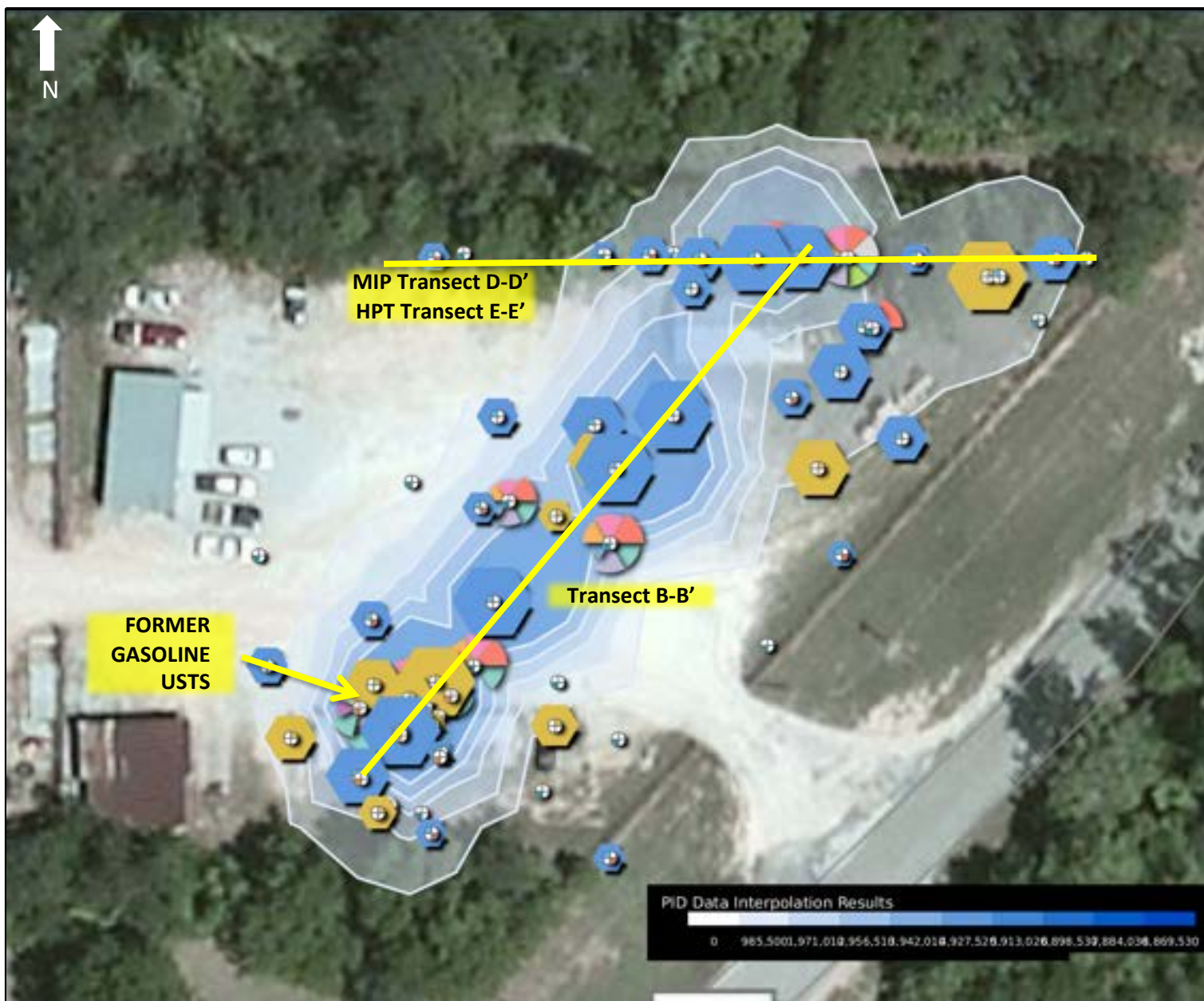
High-Resolution
Assessment

Figure 1





Lee County DOT #4 Salem, AL	Site Photo	
	High-Resolution Assessment	Figure 3
		

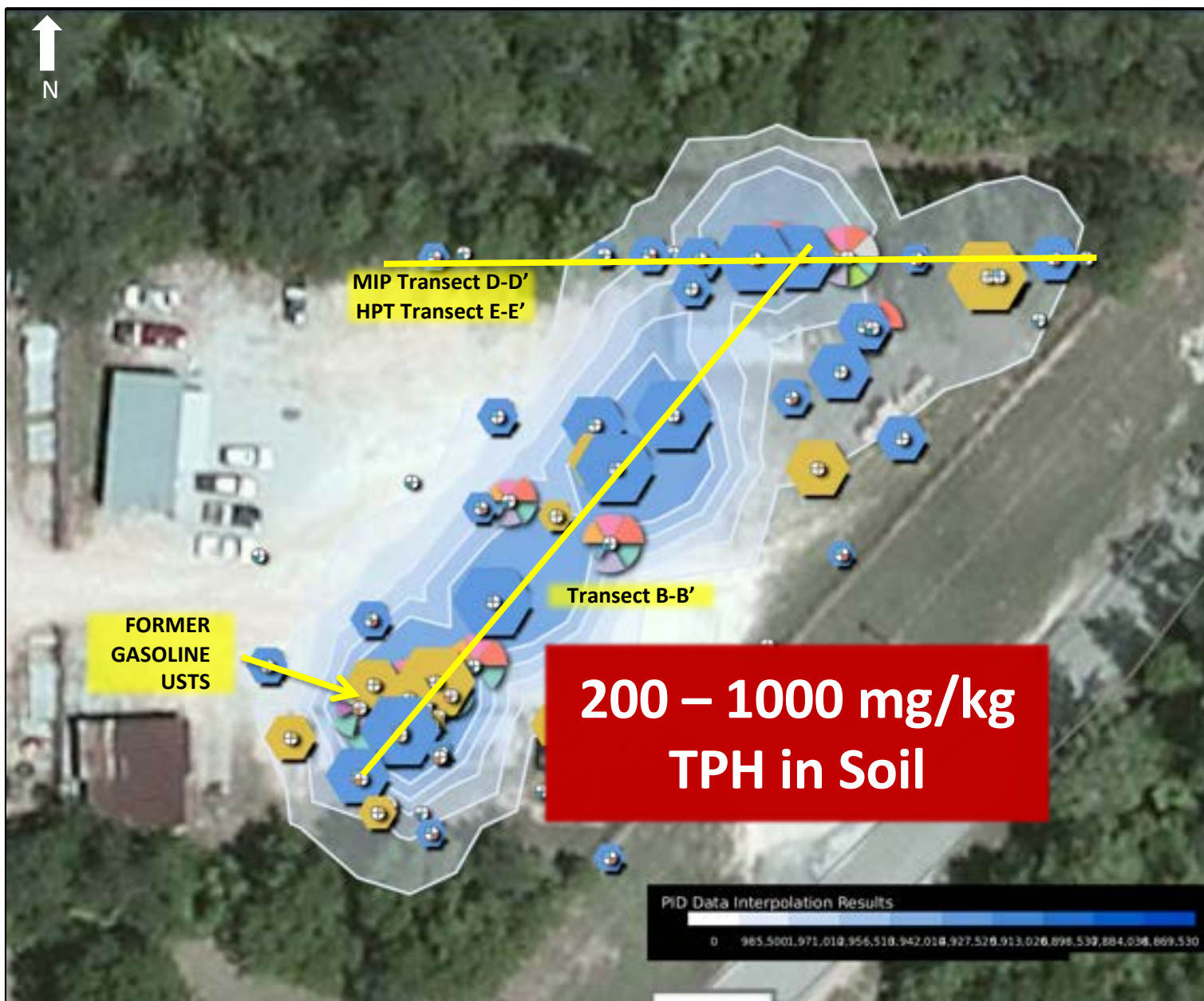




	Lee County DOT #4 Salem, AL		Example EnCore Sampler
	High-Resolution Assessment	March 2017	Figure 5



		Lee County DOT #4 Salem, AL	Discrete Soil Sample Plug
High-Resolution Assessment	March 2017	Figure 6	



Lee County DOT #4
Salem, AL

High-Resolution
Assessment

Figure 2

LNAPL Footprint

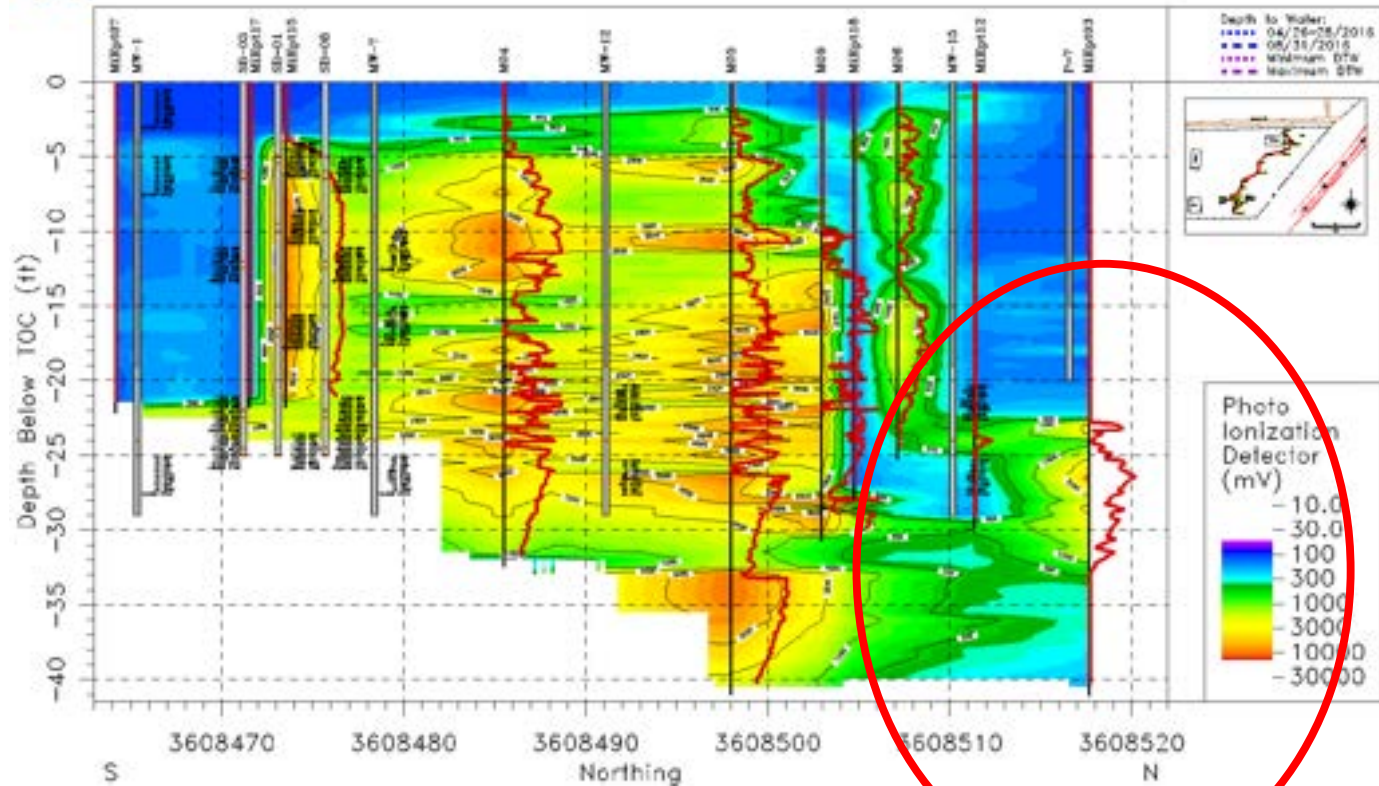
3/12/2017

MIP Cross-Section B-B': PID



MIP Cross-Section B-B': PID

Lee County DOT Camp #4, 517 Lee County Road 254, Salem, Alabama



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[Hydraulic Conductivity](#)
[Water Quality Concentrations](#)
[Soils Concentrations](#)
[HPT/MiHot Evaluations \(Electrical Conductivity, Injection Pressure, Flow\)](#)
http://www.primmath.com/leecamp4/review/html/mip_xsecBB_PID.html

MIP-PID Cross-Section B-B'

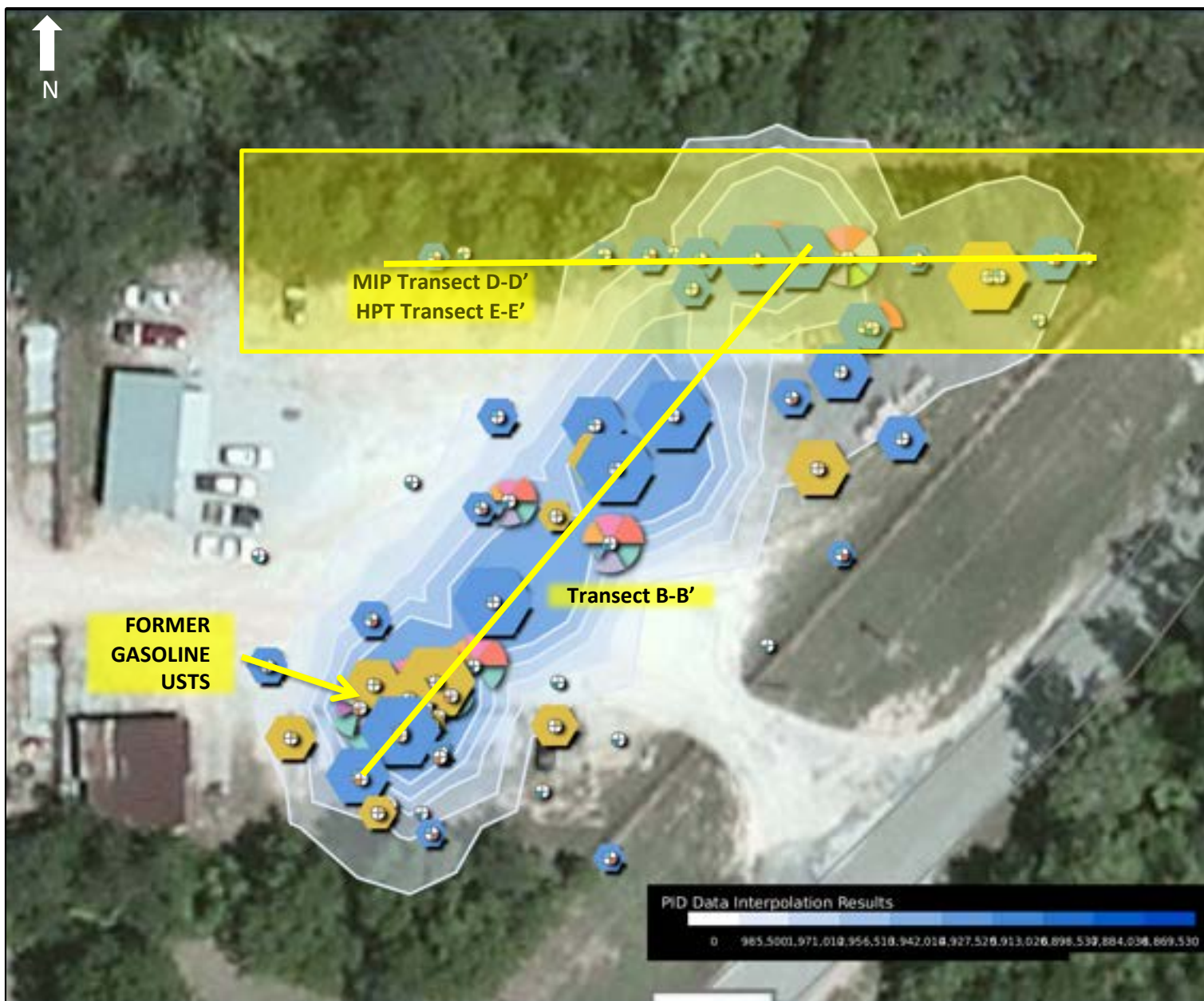
Lee County DOT #4
Salem, AL

March 2017

High-Resolution
Assessment

Figure 8





LNAPL Footprint

Lee County DOT #4
Salem, AL

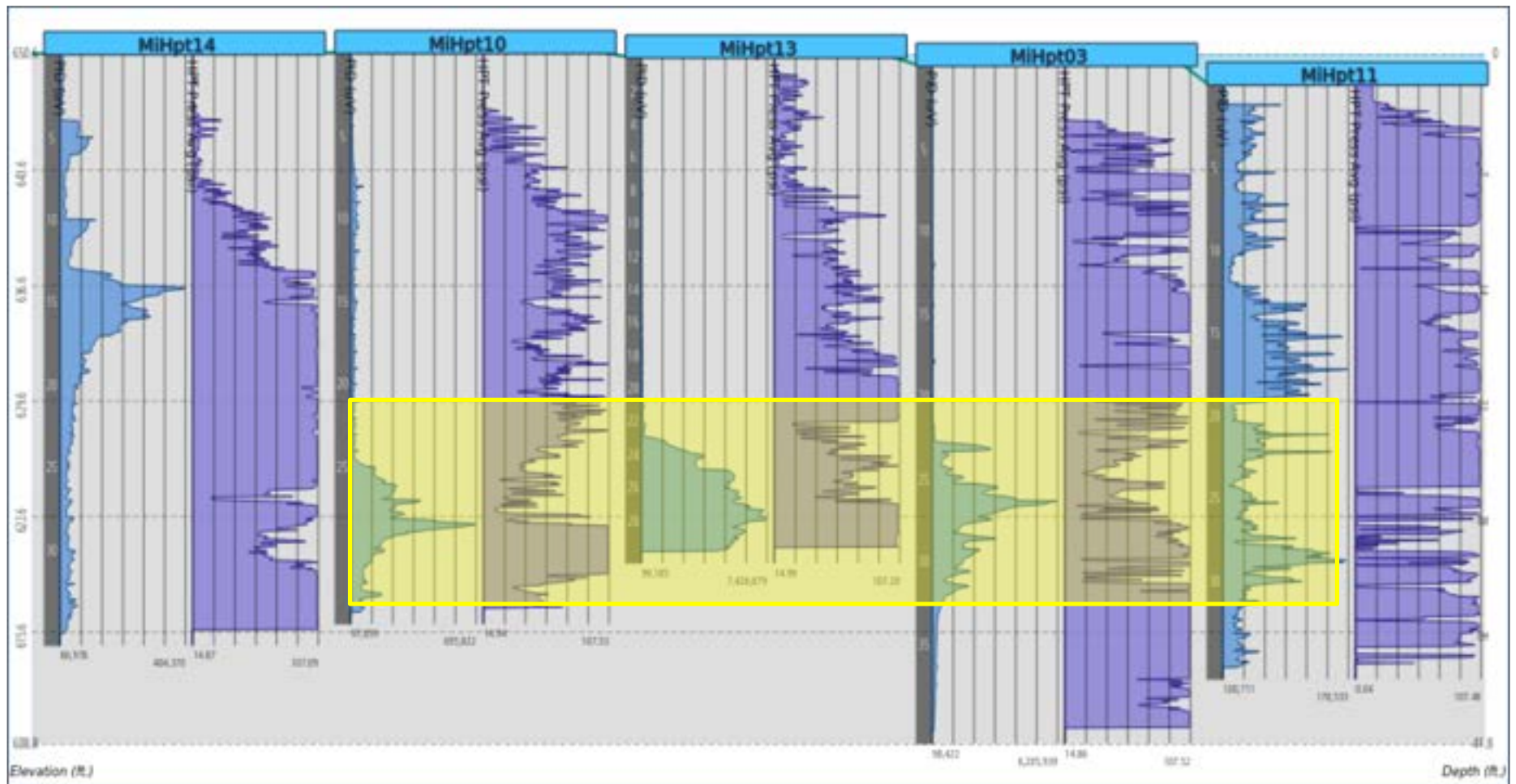
High-Resolution
Assessment

Figure 2



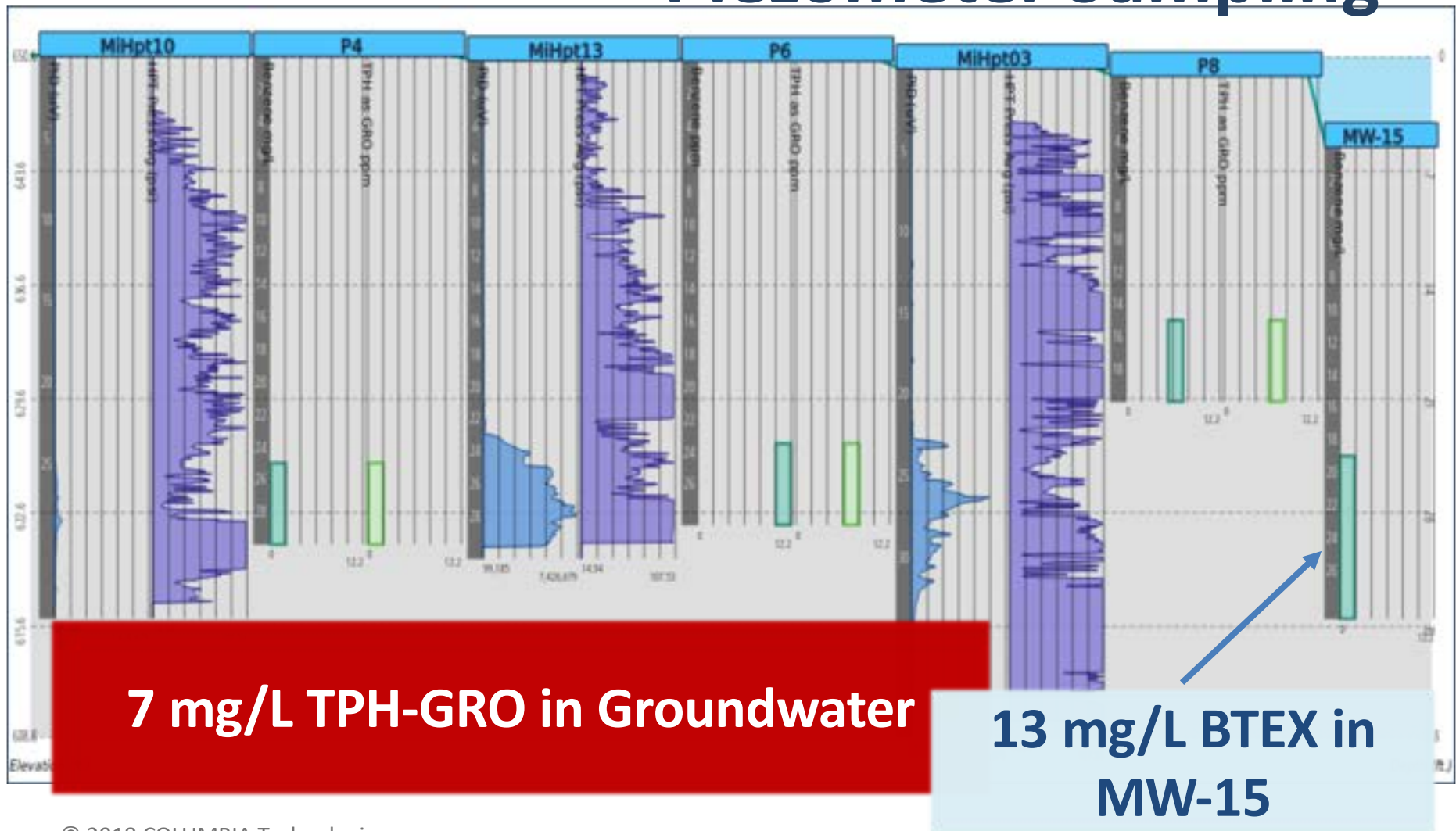


MiHpt Transect



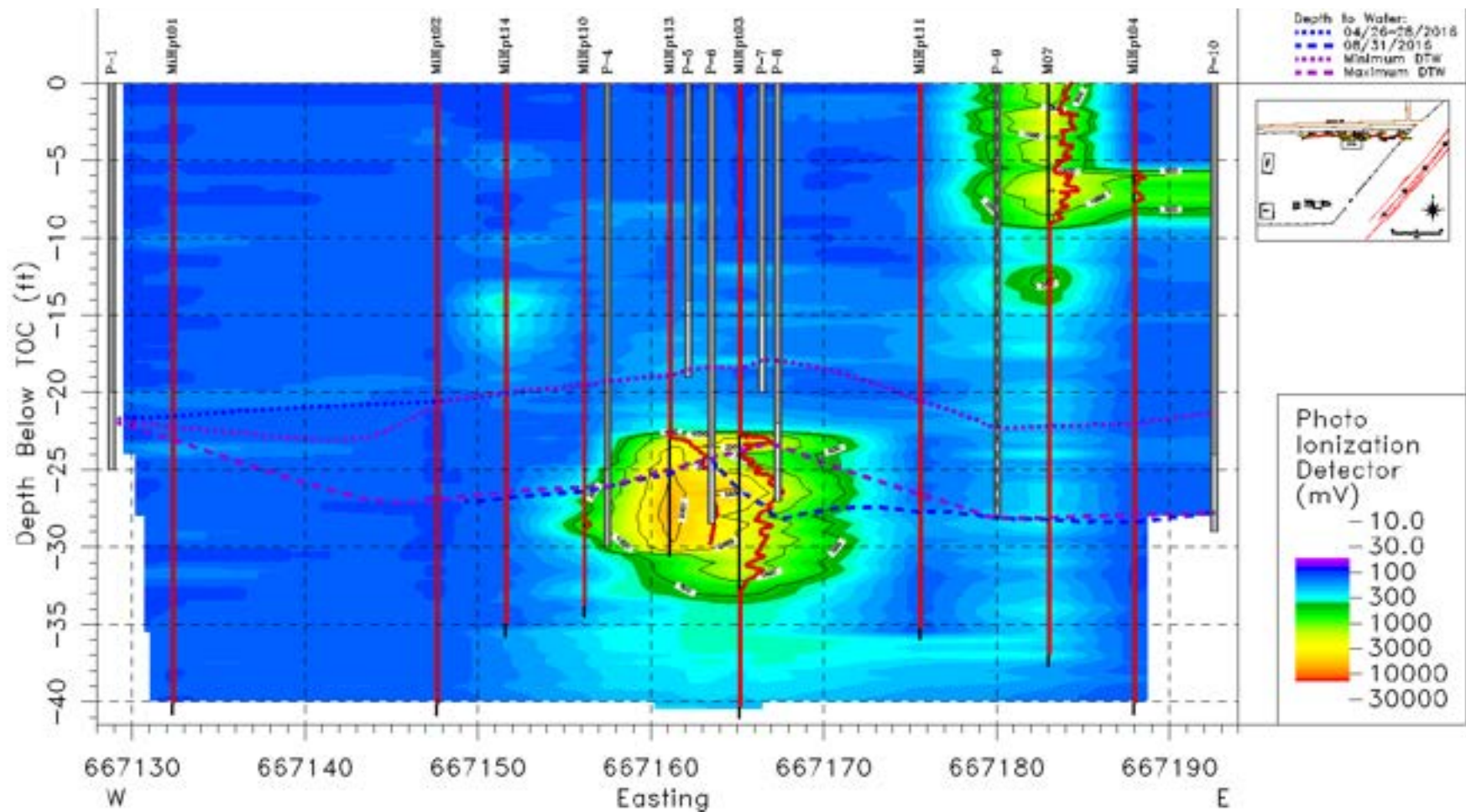


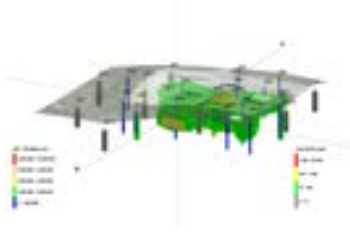
Piezometer Sampling





Mass Transport Diagram





Lessons Learned

- Dissolved phase contamination will result from residual LNAPL mass in saturated zone
- Cleanup goals for groundwater are not going to be achieved if LNAPL mass remains onsite – *“if you have a water problem, you have a soil problem”*
- Transport pathways will likely result in 80-90% of the dissolved phase mass moving through 10-20% of the vertical plane
- Scale appropriate measurements are needed to identify the mass transport pathway