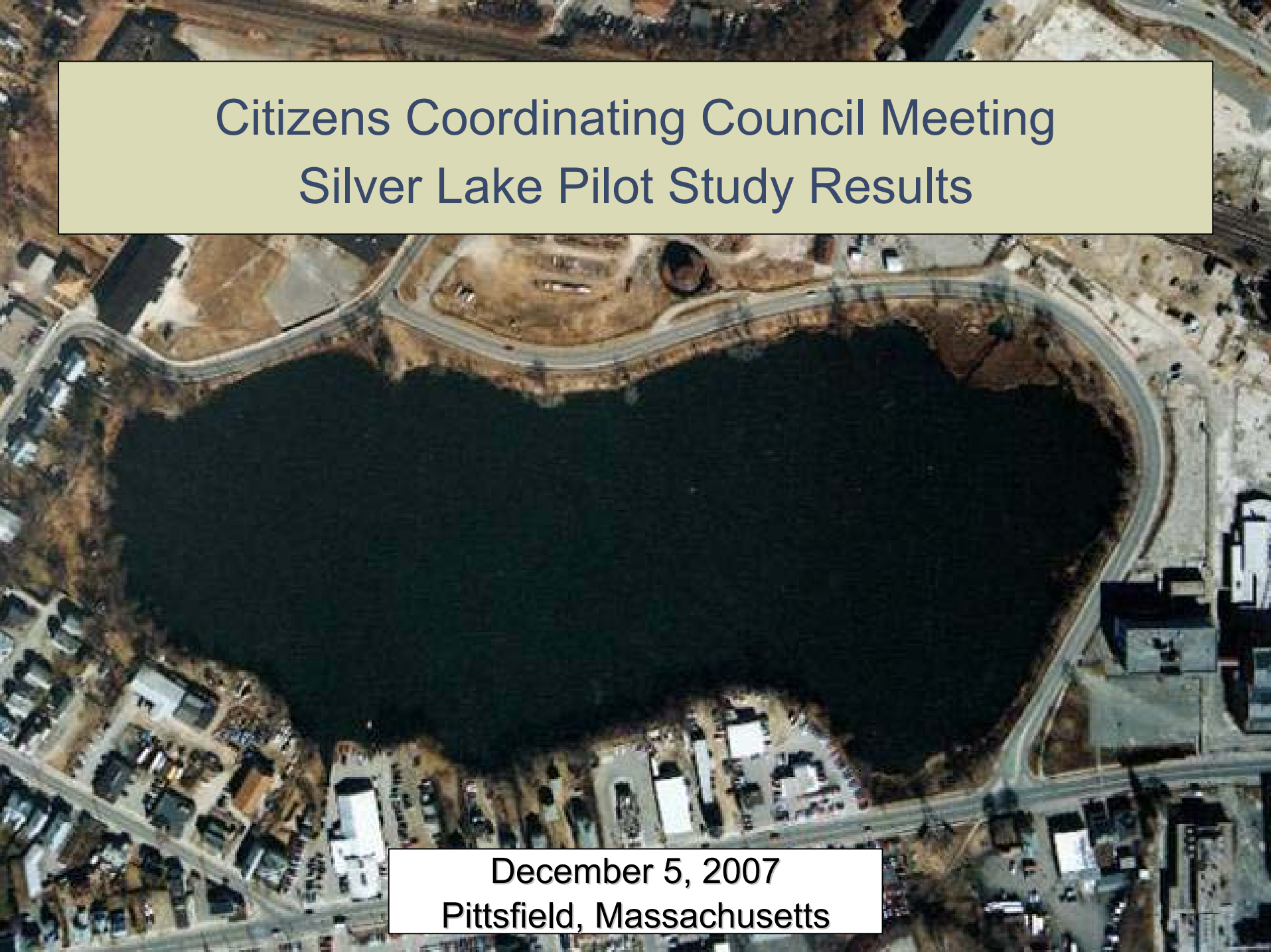


Citizens Coordinating Council Meeting
Silver Lake Pilot Study Results

December 5, 2007
Pittsfield, Massachusetts

Silver Lake CCC Meeting Summary

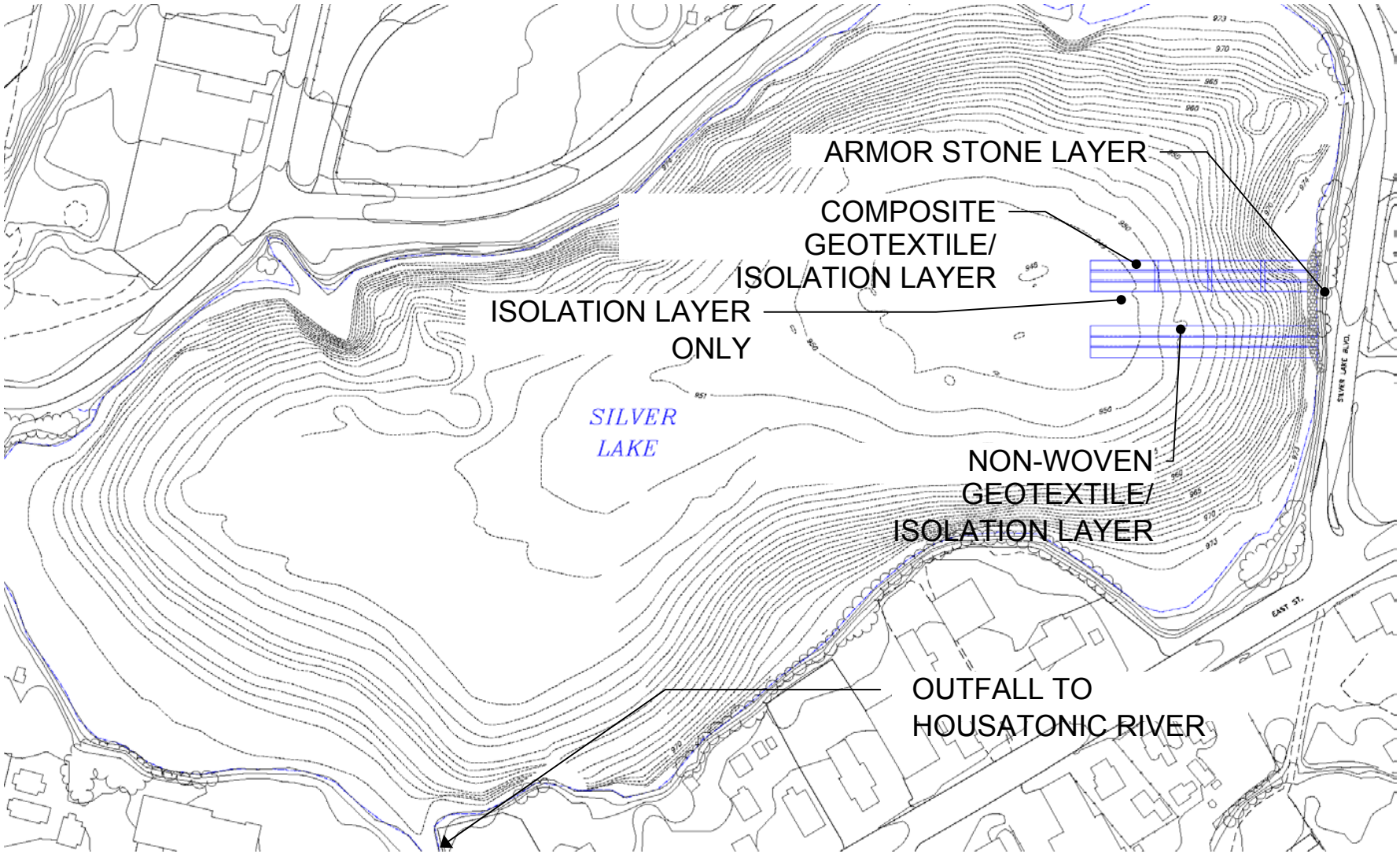
December 1, 2004:	Pre-Design Investigation Results
March 30, 2006:	Capping Bench-Scale Study Results
September 13, 2006:	Capping Pilot Study Work Plan
Tonight:	Capping Pilot Study Results

Pilot Study Objectives

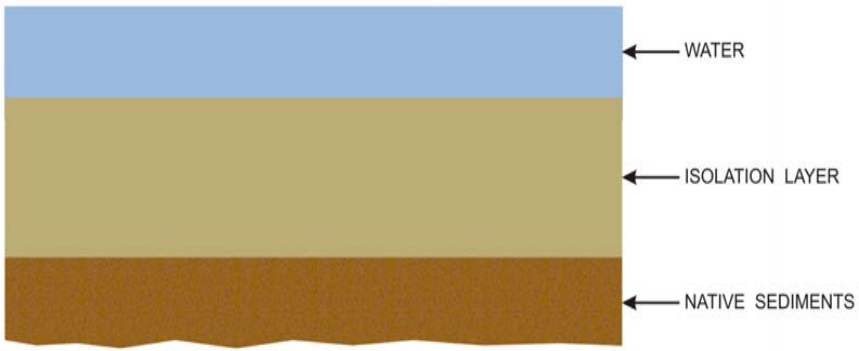
- Assess potential for physical mixing of sediments and isolation layer materials as a result of cap placement
- Evaluate constructability issues related to placement of isolation layer materials in thin lifts
- Evaluate effectiveness of employing geotextile in cap configuration
- Assess potential for water quality impacts during cap placement
- Evaluate physical response of soft sediments to cap and armor stone placement

Pilot Study Location and Components

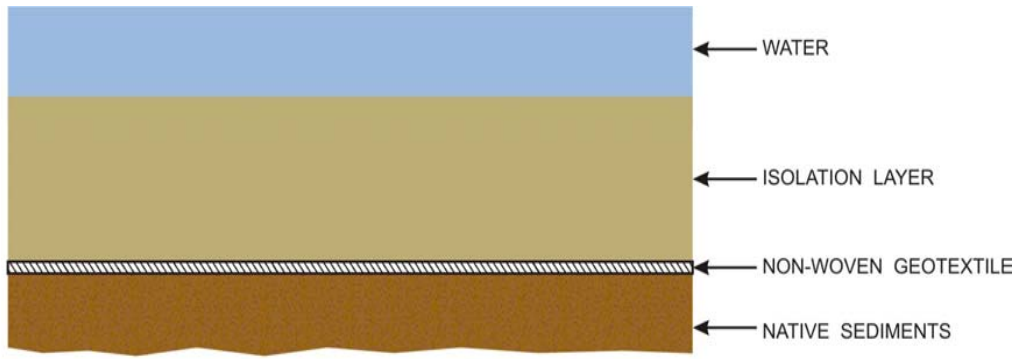
One acre study area split into contiguous cells with three cap configurations



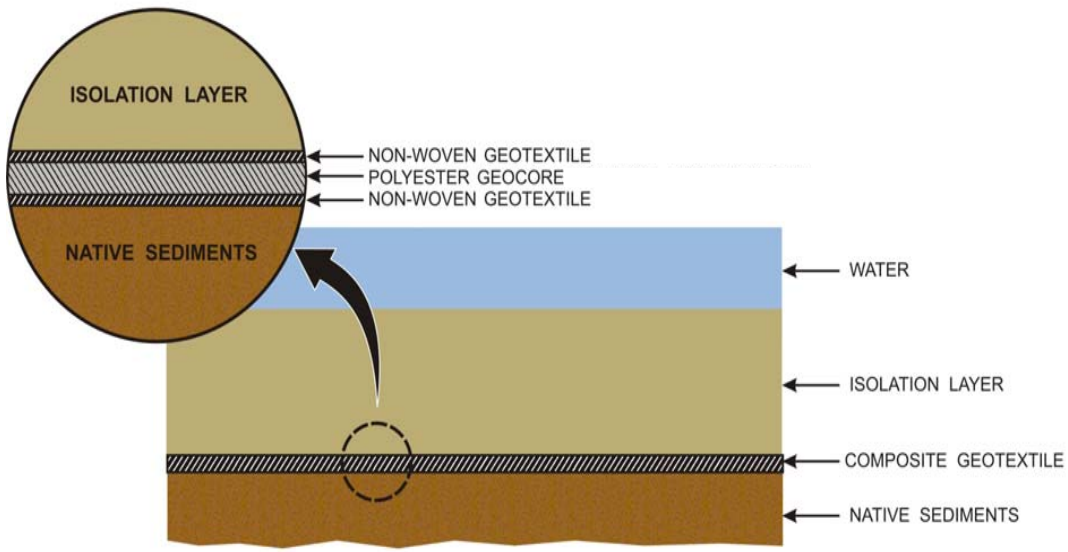
Pilot Study Cap Configurations



SAND CAP ONLY



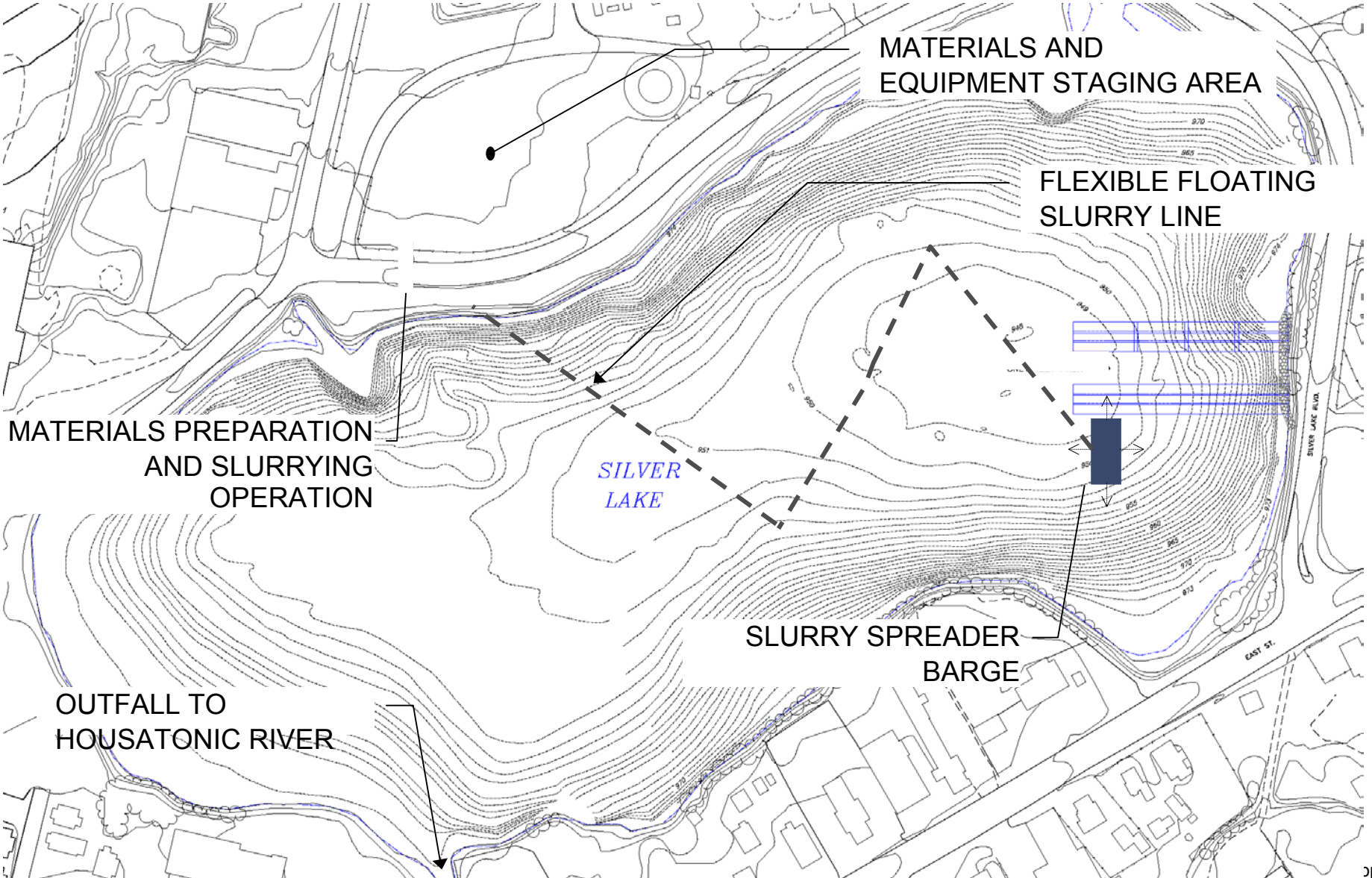
GEOTEXTILE AND SAND CAP



GEOCOMPOSITE AND SAND CAP

Pilot Study Operations

Isolation layer materials slurried on shore w/ lake water, and pumped via floating slurry line to spreader barge



Geofabric Placement

- Non-woven geotextile and geocomposite fabrics installed from barge
  - adjacent full length rolls sewn together and loaded onto barge mounted rollers
  - anchored to shore and barge moved away from shore
  - sand bags and rebar used to weight fabric and secure to lake bottom

Isolation Layer Material Placement

- Spreader-box distributes slurried isolation layer material over 20-ft span
- Barge speed and slurry delivery rate monitored/adjusted to achieve approximate 1-inch lifts
- Placement rate later increased for 2- to 3-inch/day trials
- Side discharge used in near shore areas (approx. 2- to 4-ft water depths)

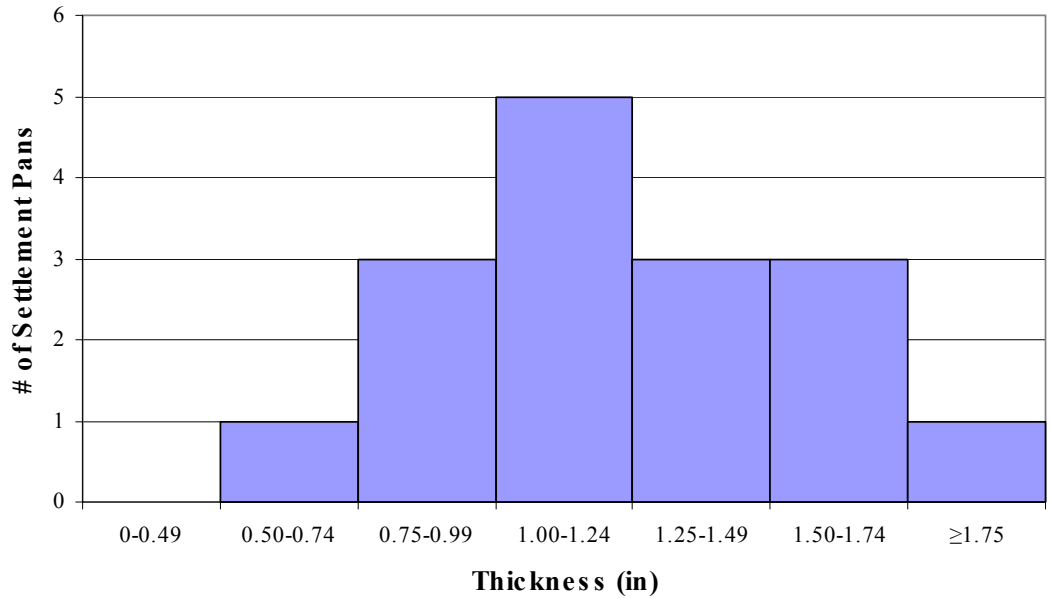
Cap Construction Along Bank

- Bank soils excavated in anticipation of finished cap elevations
- Isolation layer and armor layer placed
- Armor stone layer extends to elevations approximately 2.5 ft above and below the apparent mean water line
- Gravel habitat layer placed on top of armor below water surface
- Remaining bank areas graded and seeded/mulched

Monitoring Program

Monitoring Event	Time Relative to Pilot Study Construction Activities			
	Before	During	Immediately After	6-Months After
Lake Bottom Imagery				
Bathymetric Survey	X	--	X	X
Sub-Bottom Profiling	--	--	X	X
Sediment Profile Imaging	X	X	--	--
Geophysical/Consolidation Monitoring				
Vibrating Wire Settlement Cells	--	X	X	X
Physical Settling Plates	--	X	X	X
Surface Water Quality Monitoring				
Weekly Water Sampling	X	X	X	X
Continuous Turbidity	--	X	X	--
Sediment/Cap Material Collection				
Chemical/Physical Coring	--		X	X

Collection Pan Data



- Collection pans placed in path of barge travel to represent thickness of one 1-inch/day “pass”
- Data suggests success in placement of approximate 1-inch lifts

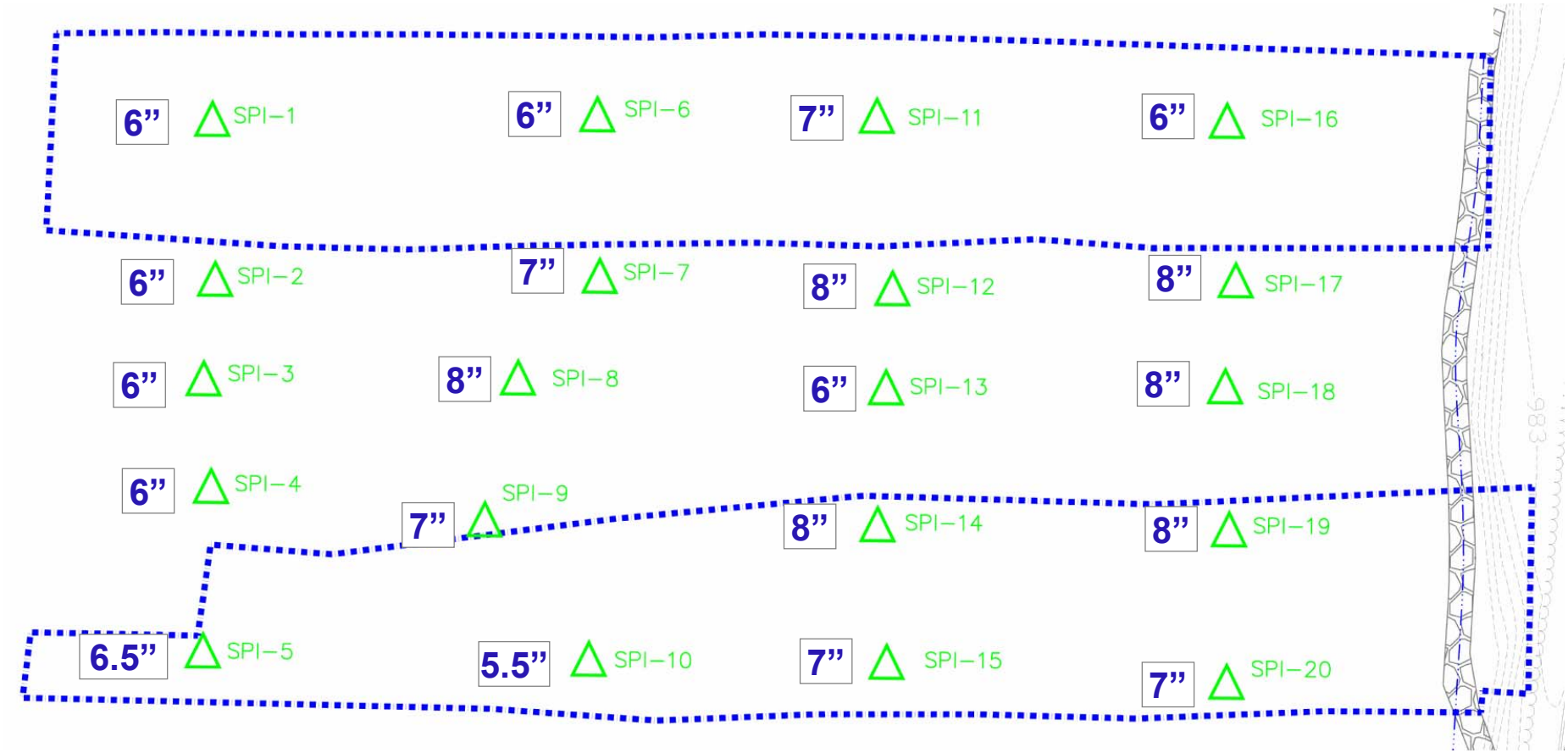
Sediment Profile Imaging

- Collected prior to and at approximate midway point of cap placement (after 7 lifts)

During-Construction SPI

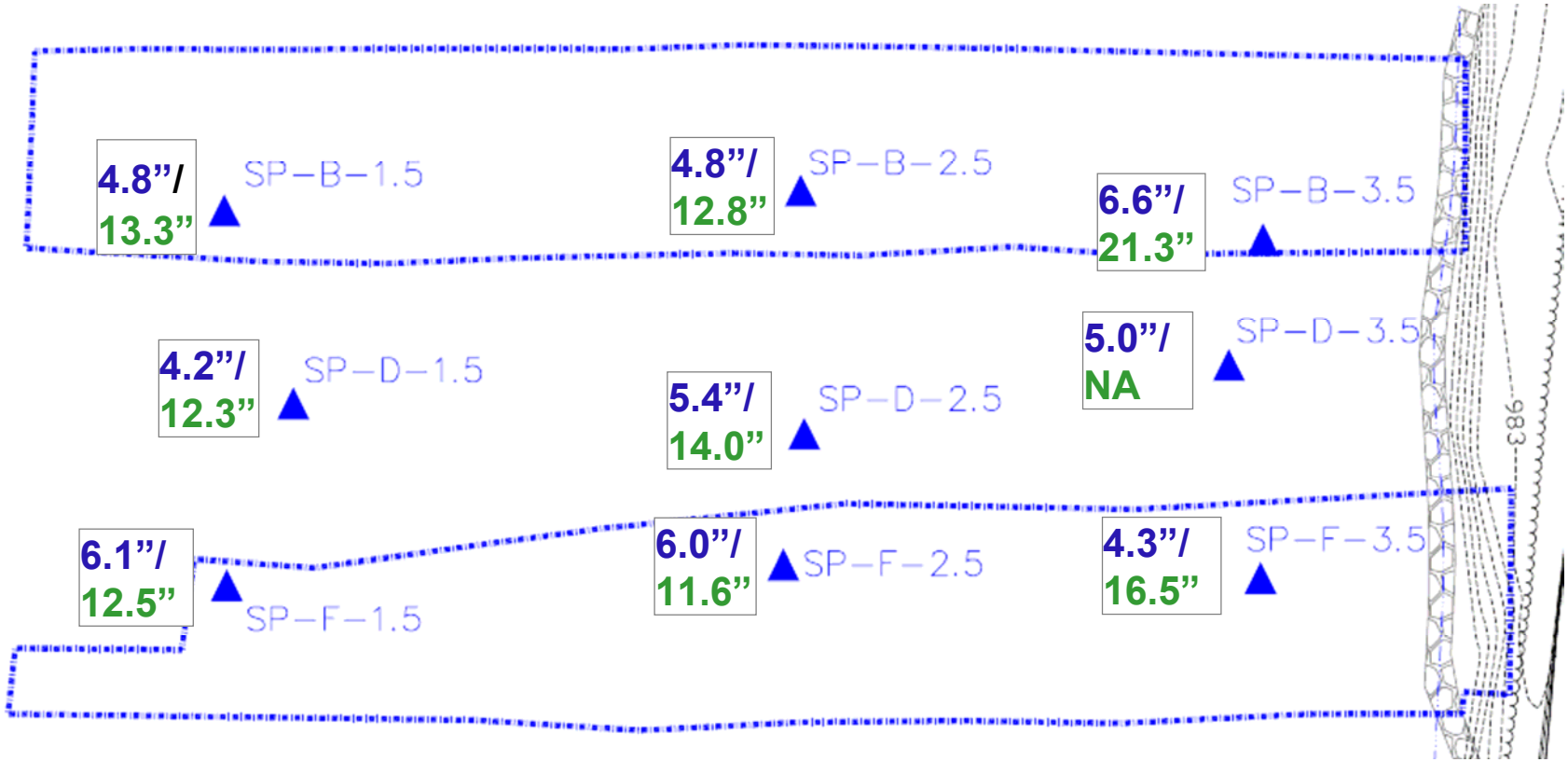
- Isolation layer materials appear fairly homogenous
- Mixing appears limited to the first inch of isolation layer materials in non-geofabric areas

SPI Based Cap Thickness Estimate



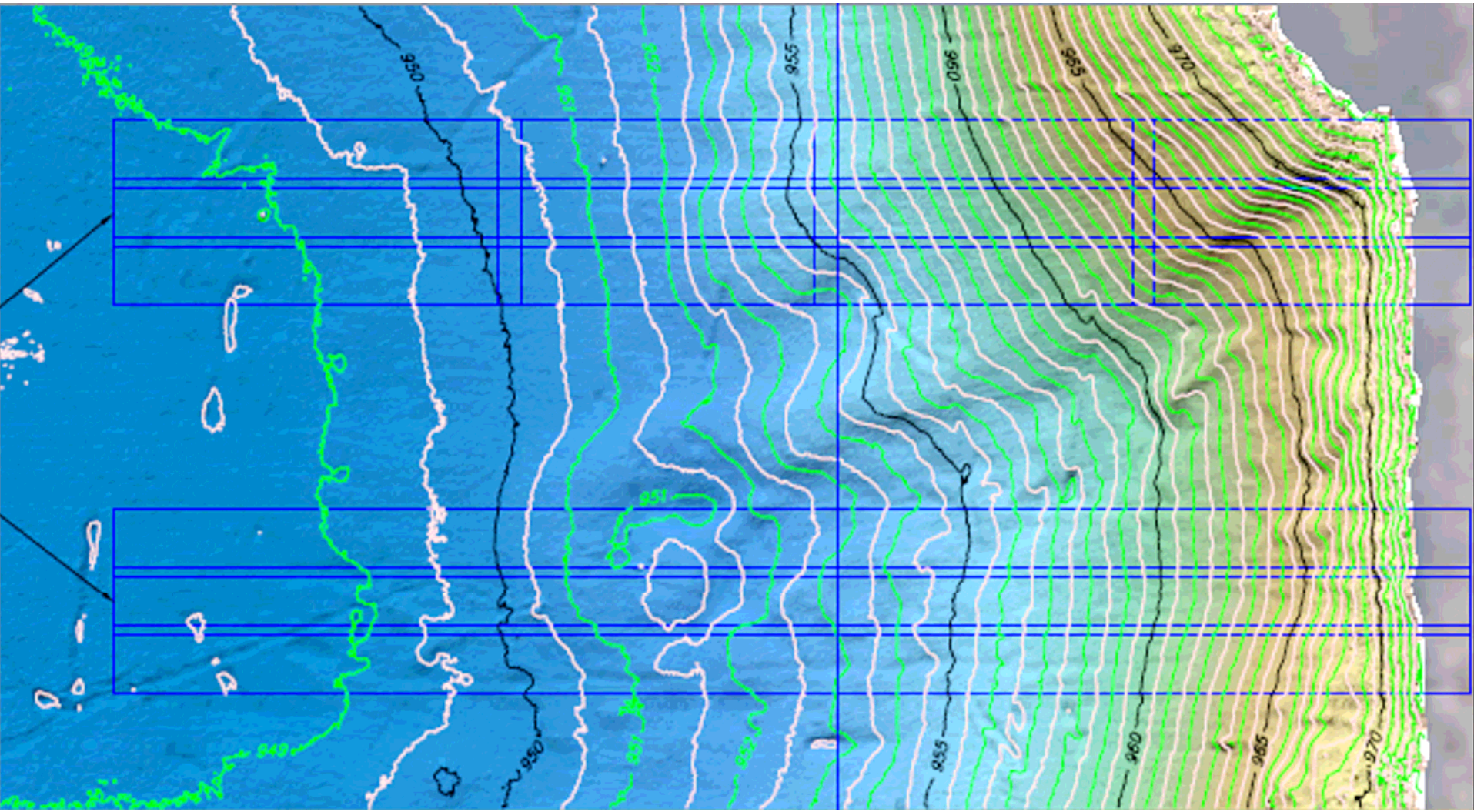
- SPI images collected at 20 locations
  - suggests achievement of cap thickness goals at mid-point of construction (after 7 lifts)

Cap Thickness Probing Results at Settlement Plates



- 9 physical settlement plate locations probed by divers to confirm cap thickness and placement rates at **interim**/**immediately after** events
- Cap material well distributed using thin lift placement technique

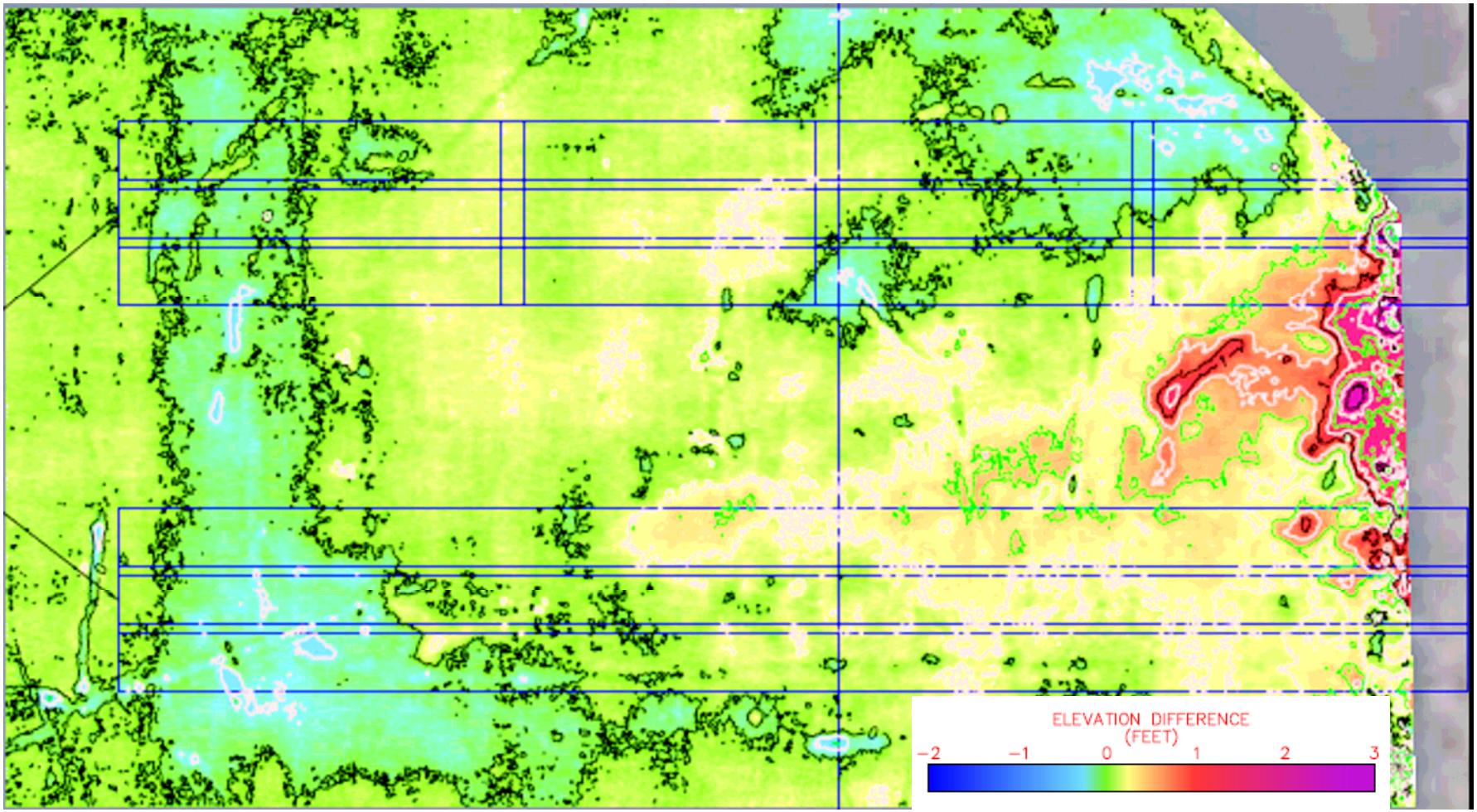
Bathymetric Surveying



- Performed prior to; immediately after; and 6-months after construction for comparative purposes

Pre- & 6-Mo Post-Construction Bathymetry –

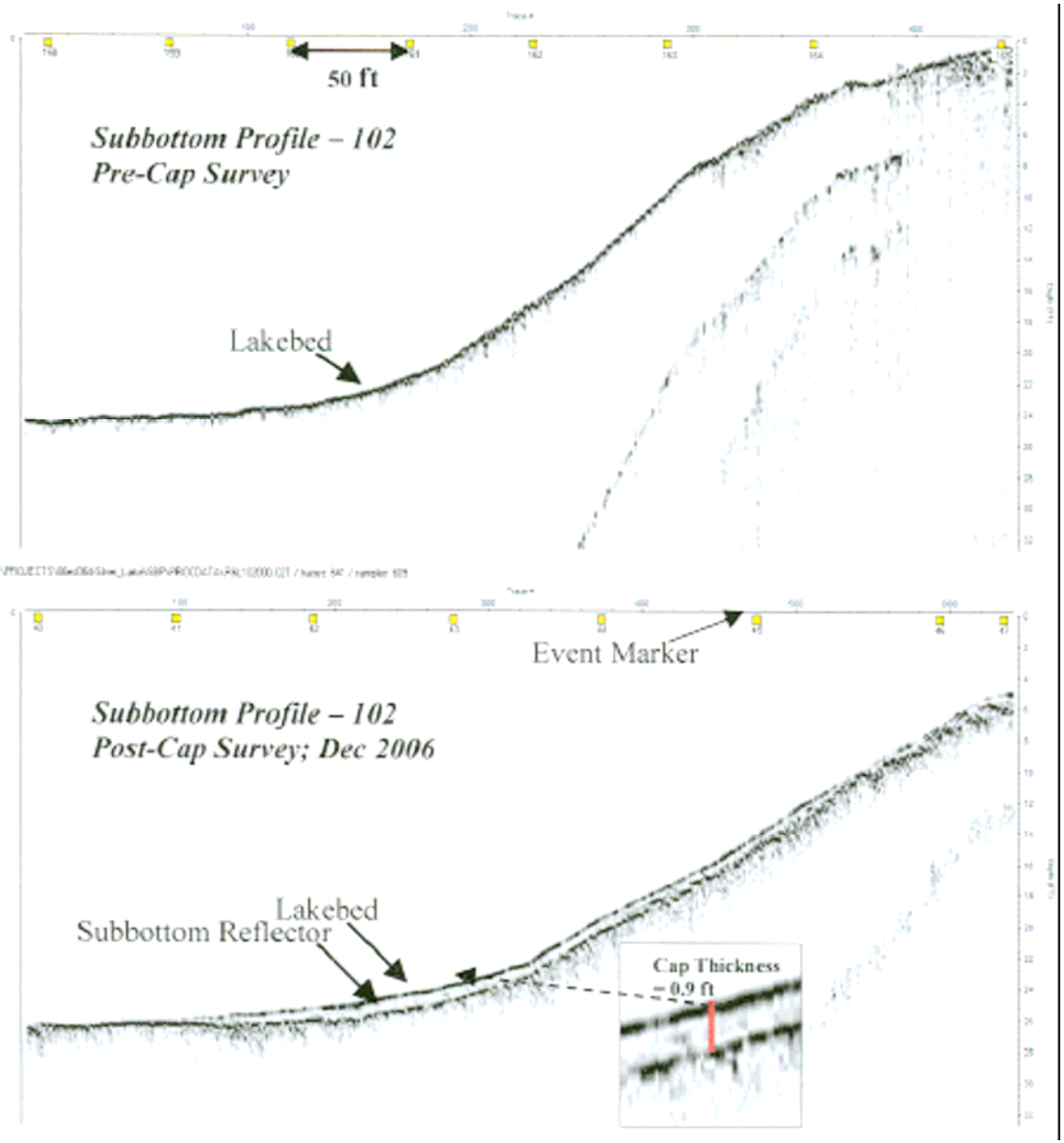
Net Comparison of Surface Elevations



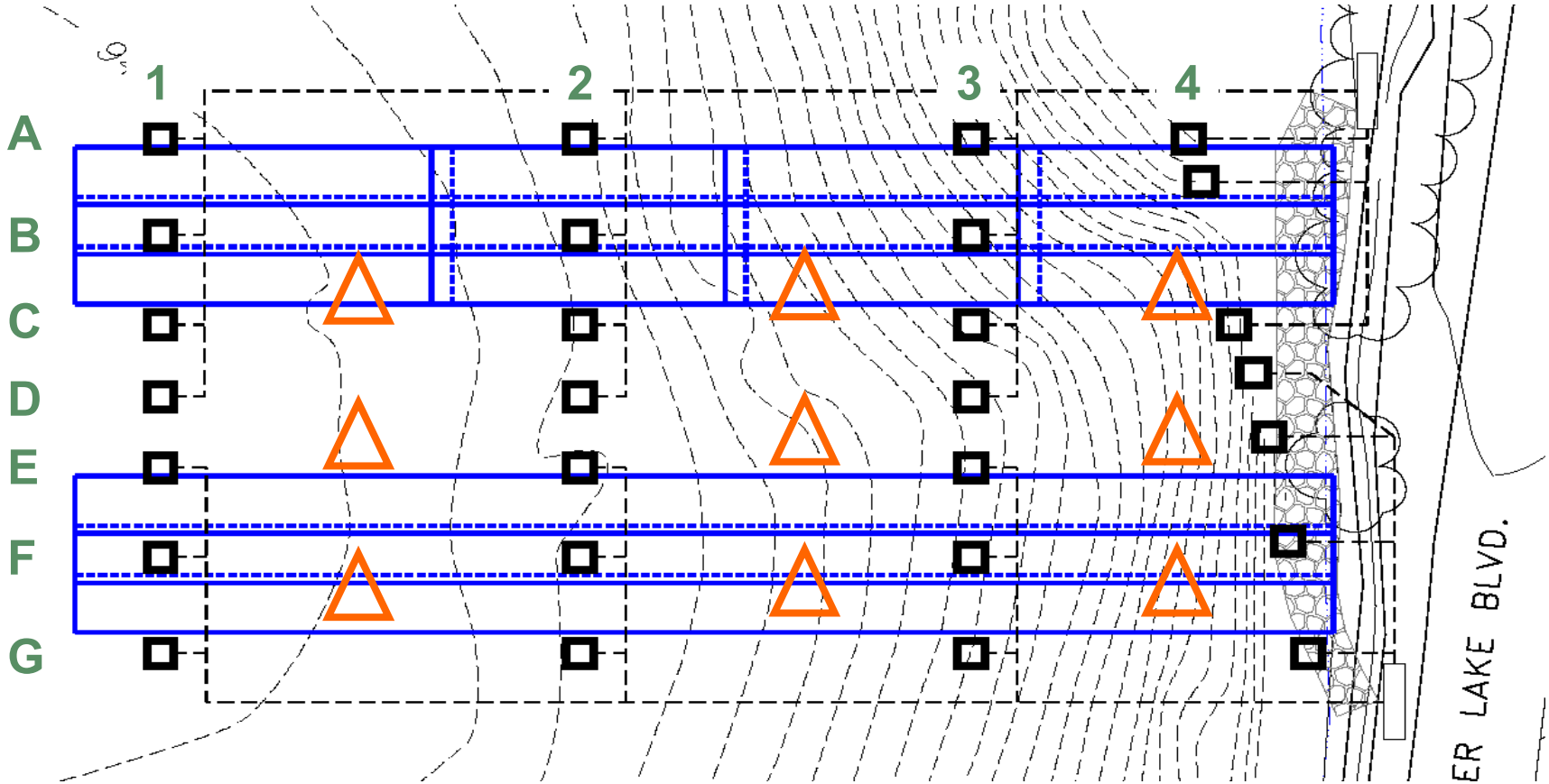
- In general, data suggests final surface is near pre-construction elevations
- No indications of significant movement of underlying materials
- No apparent difference related to presence/absence of geofabric

Post-Construction Sub-Bottom Profile

- Acoustic survey capable of identifying unique layers and material interfaces
- Images provide visual information related to cap surface consistency/relief
- Suggests no apparent difference in performance related to presence/ absence of geofabric

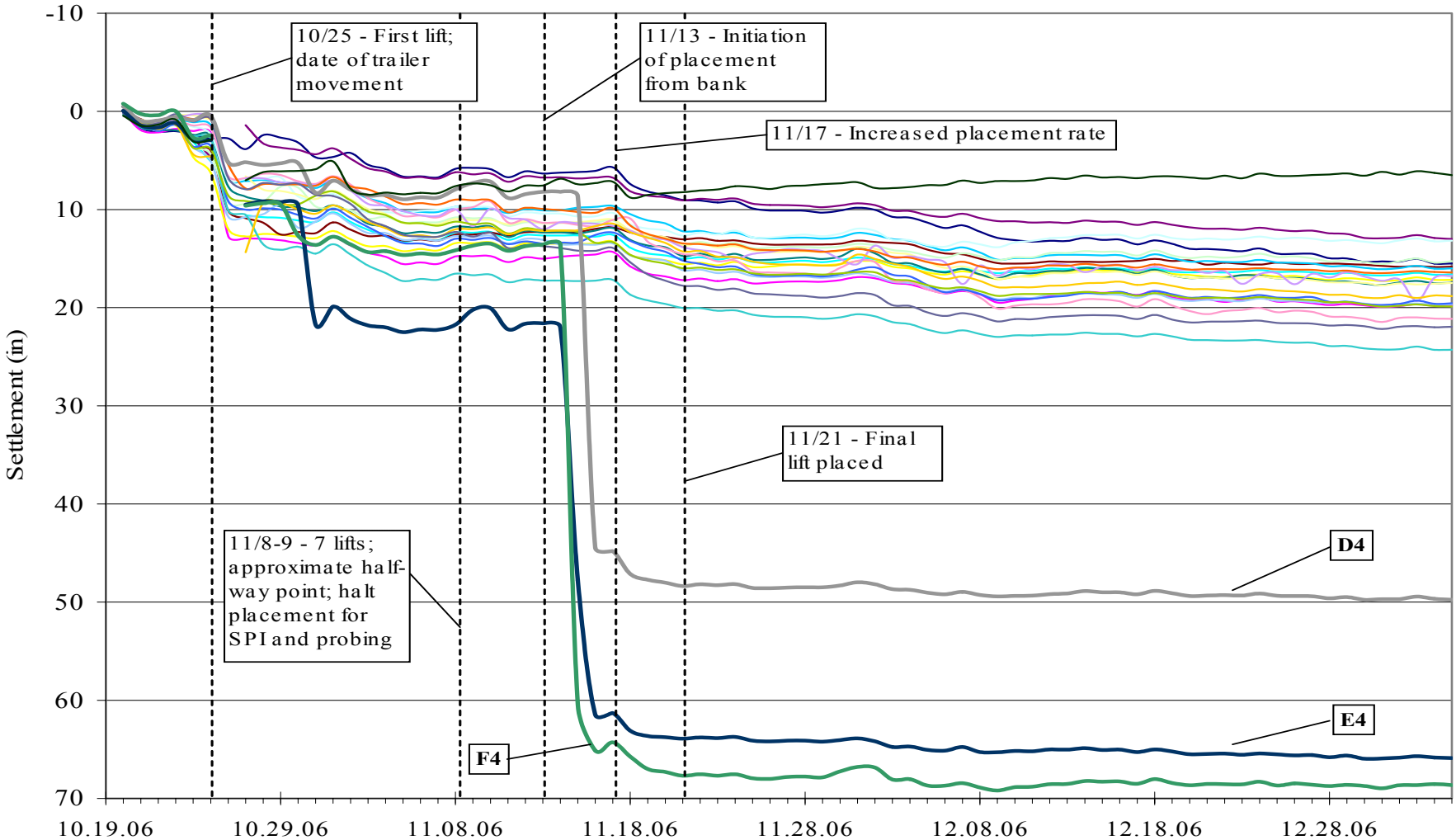


Geophysical/Consolidation Monitoring



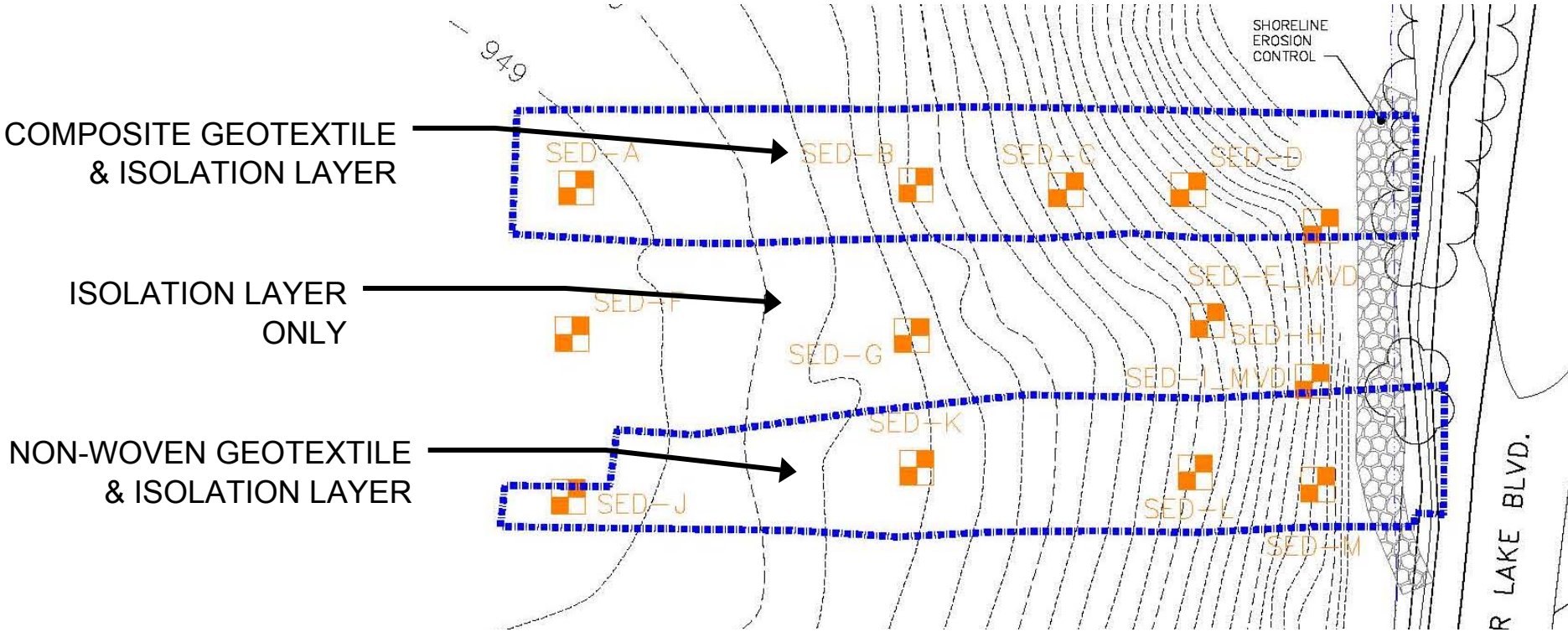
- 28 individual vibrating wire settlement cells and 9 physical settlement plates installed on top of sediment (above geofabric)
- Monitored during and after construction to assess sediment response (i.e., consolidation) to cap placement

Vibrating Wire Settlement Cells



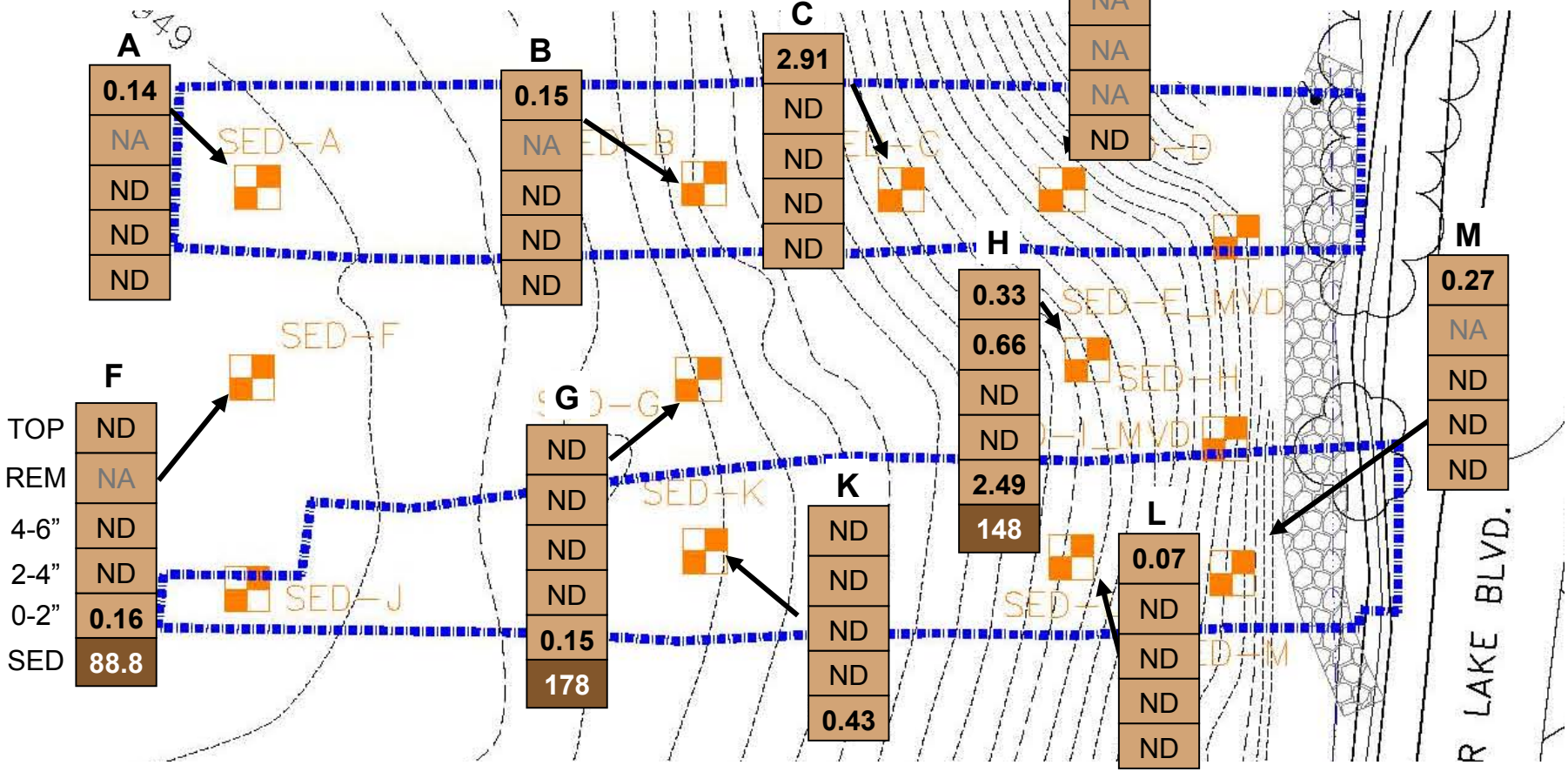
- Confirms general patterns of settlement as indicated by bathymetric mapping and conventional survey at physical settlement plates
- Provided insight into sediment response to initial shoreline capping approach
- No apparent difference related to presence/absence of geofabric

Cap Coring and Sample Collection Program



- Performed immediately after, and 6 months after construction
- Cores visually observed to evaluate cap thickness and extent of mixing
- Cap materials analyzed for PCBs and TOC

Cap Coring PCB Results –
6-Months After



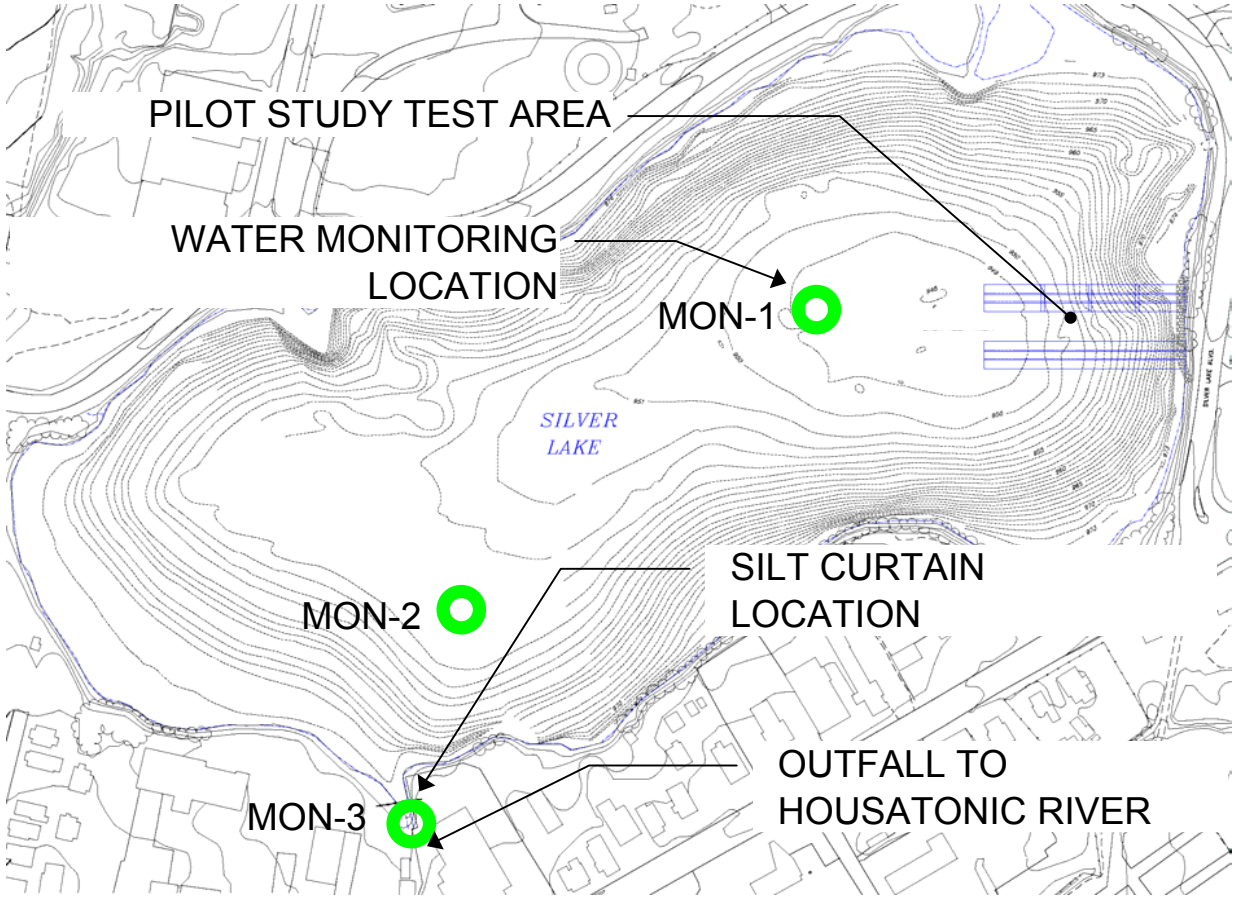
- 43 of 55 total samples contained no detectable PCBs
- 9 of 13 cores have no detectable PCBs below the surface increment
- Excluding TOP and 0-2" sample intervals, only one core has a detection in the remaining interior intervals

Cap Coring TOC Results

Average TOC	
0.58%	TOP
0.51%	REMAINDER
0.47%	4- to 6-inch
0.44%	2- to 4-inch
0.44%	0- to 2-inch

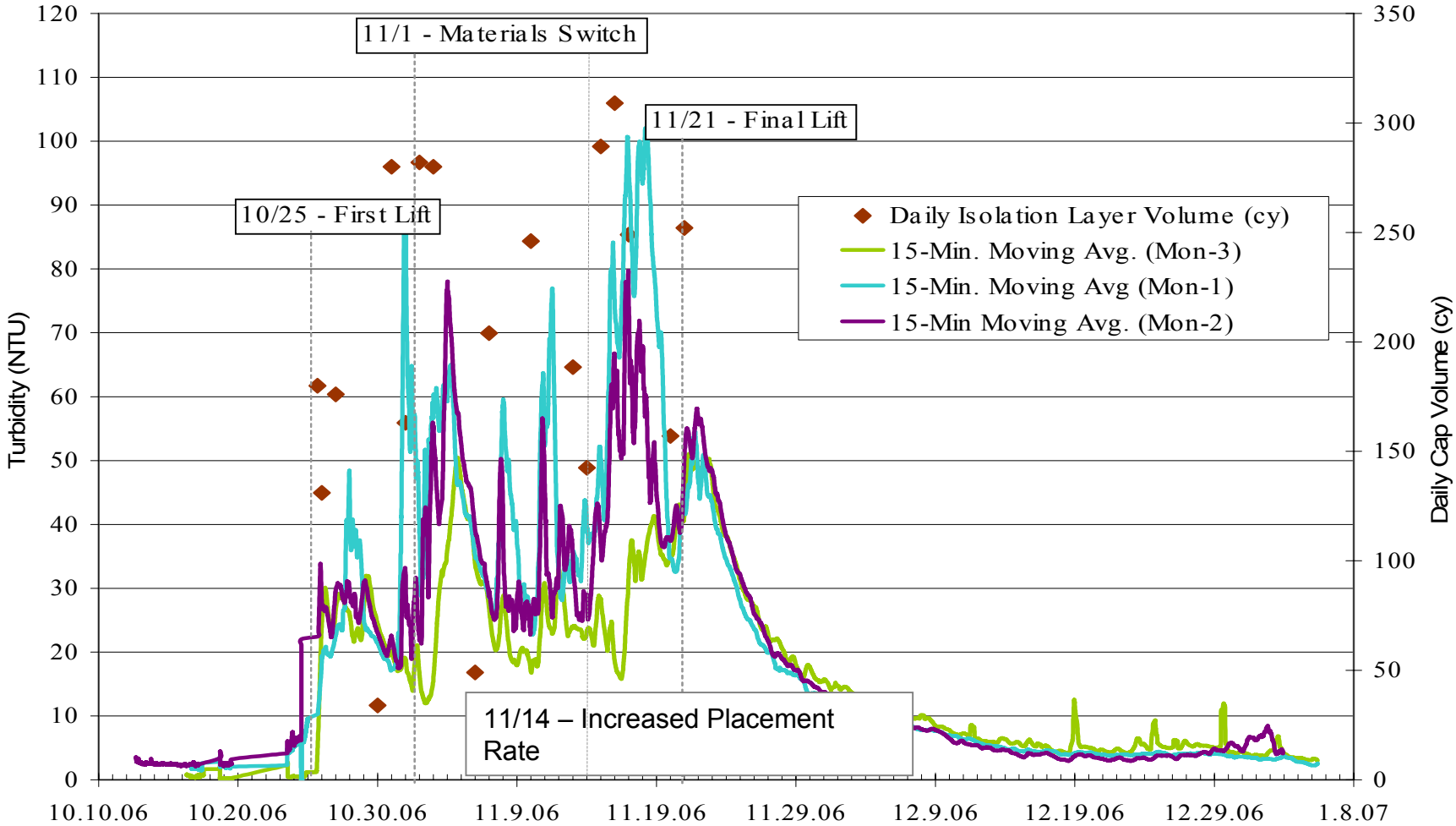
- Dry isolation layer material samples pre-characterized for TOC:
  - Average: 1.1%
- Sedimentation pans collected outside study area:
  - Average TOC ~ 4.0%
- Depth weighted average TOC ~ 0.5 %

Water Quality Monitoring Program



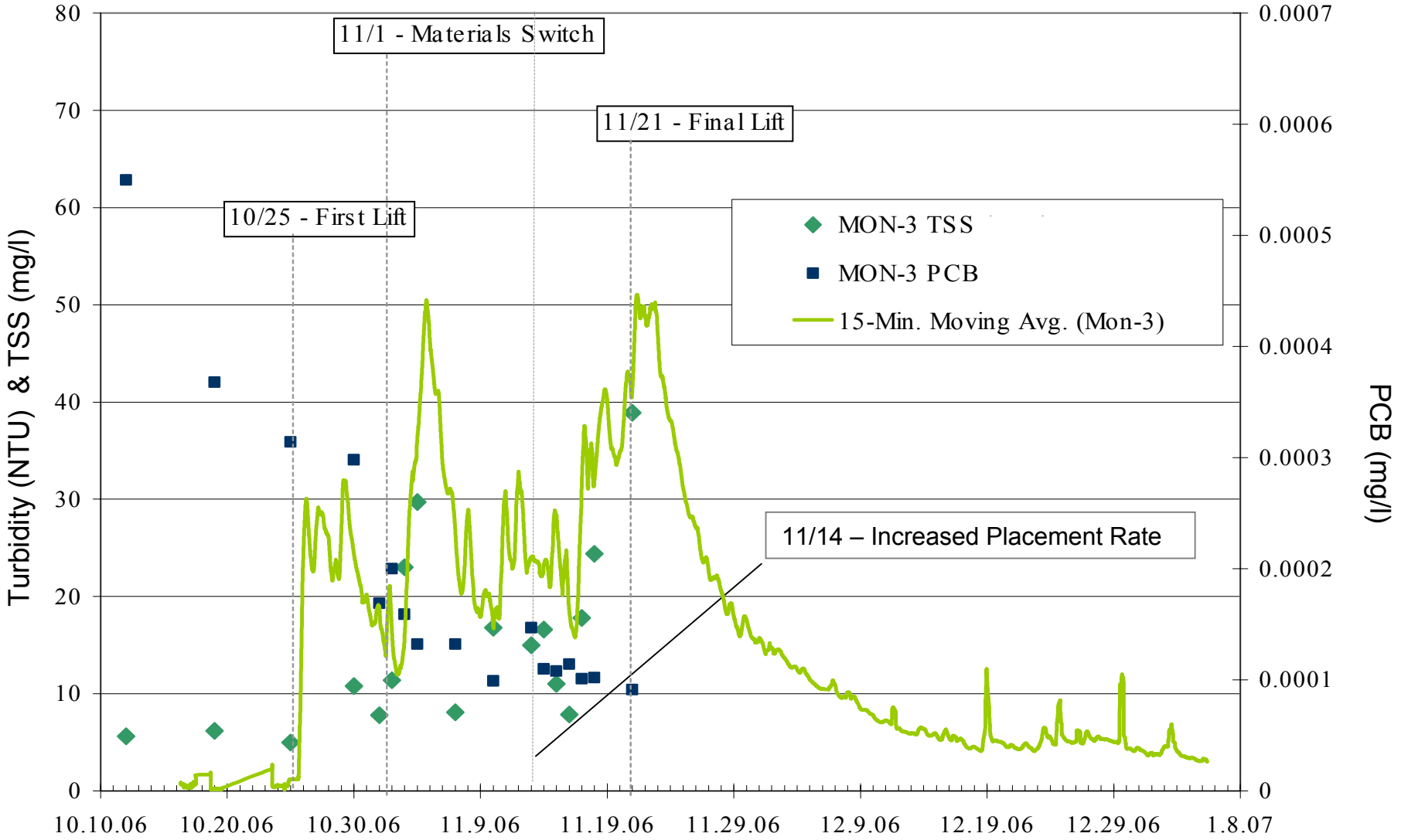
- Weekly collection at all three locations (PCBs, TSS)
- Continuous turbidity monitoring performed
- Turbidity >50 NTU at MON-2 or MON-3 triggered sample collection at all three locations (PCB, TSS)

Turbidity Results



- Few exceedances of 50 NTUs observed at outfall location
- Turbidity appears to approach pre-construction levels within 1 month of completion of placement activities

Surface Water PCB, TSS Results



- PCBs concentrations in surface water were lower during the pilot study than PCB concentrations found before the study.

Pilot Study Objectives & Conclusions

- *Assess potential for physical mixing of sediments and isolation layer materials as a result of cap placement*
  - Minimal mixing observed at the sediment/cap interface only
    - appears limited to the first 1- to 2-inches of isolation layer material
    - where detected, PCB concentrations 1 to 3 orders of magnitude below that of underlying sediment
- *Evaluate effectiveness of employing geotextile in cap configuration*
  - No significant differences noted between geofabric and non-geofabric areas based on physical or analytical data

Pilot Study Objectives & Conclusions (cont'd)

- *Evaluate constructability issues related to placement of isolation layer materials in thin lifts*
  - Generally successful from barge with fabricated spreader-box
  - Important to use appropriate near-shore placement methods
- *Evaluate physical response of soft sediments to cap and armor stone placement*
  - With exception of near-shore areas, settling observed to be fairly uniform in time and space
  - Majority of locations exhibited settlement within 1- to 2-ft range

Pilot Study Objectives & Conclusions (cont'd)

- *Assess potential for water quality impacts during cap placement*
  - Short-term increased turbidity observations related to isolation layer placement
  - No increase in surface water PCB concentrations observed

Questions ?