Agreement Log #: KIF-10-052

Time-Critical Concurrence

Area: East of Dike 2

Agreement:

This concurrence form adds dredge grids, dredge-to surfaces, and a dredging approach to the dredge plan addendum for the area East of Dike 2 in the Swan Pond Embayment.

The area called "East of Dike 2" is the area between Dike 2 and the old north-south ash berm constructed by TVA to control ash migration into the river (includes this north-south ash berm). This area is included in the time critical action. Two small berms were built to construct a clean water ditch in the northern portion of the area. An intermediate dike was built to shelter efforts along Dike C. The area above a pumped down water level (around elevation 730-734 depending on the time of the year) was cleared of ash mechanically. The first attachment is a photo from October showing the area pumped down and the excavation efforts. The area between the intermediate dike, Dike 2, and Dike C was completely cleaned of ash mechanically as supported by 5 vibecore samples taken in June. The area above the lowered water level was also cleared completely of ash as shown in attached aerial photos. Figure 1 shows the progression of work south of the intermediate berm and the land mass north of the intermediate berm cleared of ash to the pumped down water level. Figure 2 shows the extent of mechanical excavation south of the intermediate berm at its maximum extent. Figure 2 also shows the return of the water level north of the intermediate berm to the winter Watts Bar pool elevation of 737' above sea level after the removal of a portion the north-south berm.

To characterize remaining ash outside of the berms but below the pumped down water level and to define a river bottom, three vibecore sampling rounds were conducted, one on March 16th, one on May12, and an ongoing round that started on June 8, 2010. The attached figure shows the sampling locations and the discovered ash depths recorded to date. The results from the first two rounds of sampling along with LIDAR survey results were used to develop a dredge-to surface for the four berms as well as to identify additional areas requiring dredging. The areas requiring dredging were refined with the last round of sampling. Figure 4 presents the resultant dredge grids as well as the dredge-to surface. Grids where the Kylee will work will be cut to a flat elevation based on the vibecore results and the output from the dredge pipeline (when clay is encountered, the cutterhead is pulled up). Grids where the Addison will work will be cut to the dredge-to surface, pulling the cutterhead up if clay is encountered prior to reaching that depth. Where the cutterhead is moved off the dredge-to surface because of clay or where the Kylee cuts, confirmation vibecore samples will be taken to demonstrate completion.

Attachments:
Figure 1; Extent of Mechanical Excavation, aerial photo dated October 8, 2009
Figure 2; Extent of Mechanical Excavation, aerial photo dated March 19, 2010
Figure 3, ETRAC/Pre-Spill Surface, with control grids and dredge paths, dated June 1~~5~~7, 2010
Figure 4, Vibecore Sampling Results, dated June 1~~5~~7, 2010
Vibecore Sediment Sampling Logs and Photos

Agreement Log #: KIF-10-052

Time-Critical Concurrence

Concurrence Comments:

Julie L Pfluff
Jacobs Project Manager

6/17/10
Date

Kathryn Nash
Tennessee Valley Authority

6/21/10
Date

Lee Franklin
U. S. Environmental Protection Agency

6/22/10
Date

Consulted w/ TDEC

Form 036

Z:\0105 TIME-CRITICAL REMOVAL ACTIONS\D - Approved Concurrences\Drafts\Active\KIF_10-052 East of Dike 2\KIF-10-052 East of Dike 2.docx

Note:

Topo information from the April 2010 survey. Contours at 1 foot interval.

0 2000 4000

JACOBS™

Figure 1: Extent of Mechanical Excavation October 8, 2009

06/15/2010

Note:

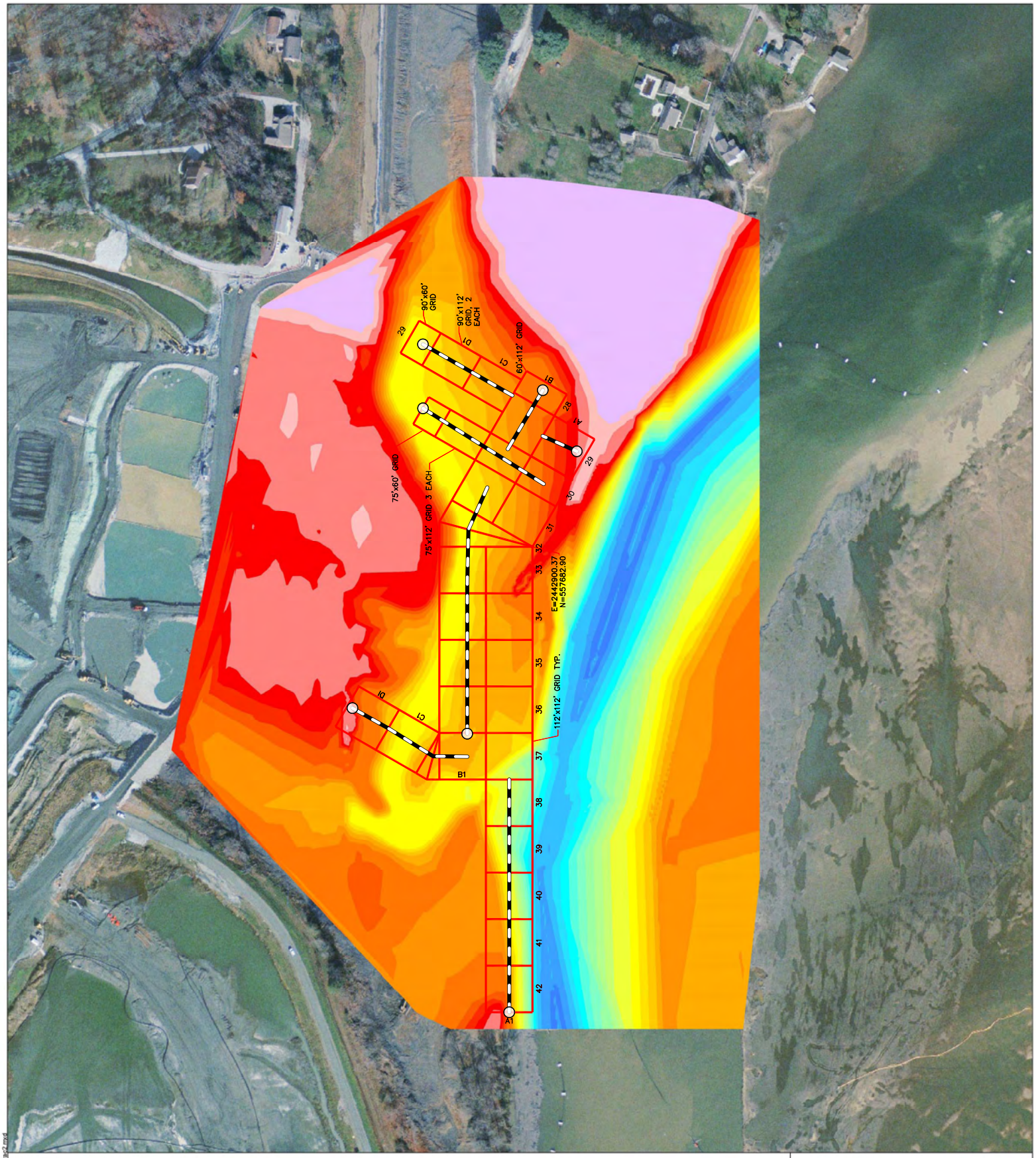
Topo information from the April 2010 survey. Contours at 1 foot interval.

0 2000 4000

JACOBS™

Figure 2: Extent of Mechanical Excavation March 19, 2010

06/15/2010



Legend

Pre-Spill Elevation
Feet (ft)

- 746 - 755
- 744 - 746
- 742 - 744
- 740 - 742
- 738 - 740
- 736 - 738
- 734 - 736
- 732 - 734
- 730 - 732
- 728 - 730
- 726 - 728
- 724 - 726
- 722 - 724
- 720 - 722
- 718 - 720
- 716 - 718
- 714 - 716
- 712 - 714
- 710 - 712
- 708 - 710
- 706 - 708
- 704 - 706
- 702 - 704
- 700 - 702

Dredge Grid for Embayment Area

Projected Dredge Path

DRAFT

0 150 300 Feet

N

1:900

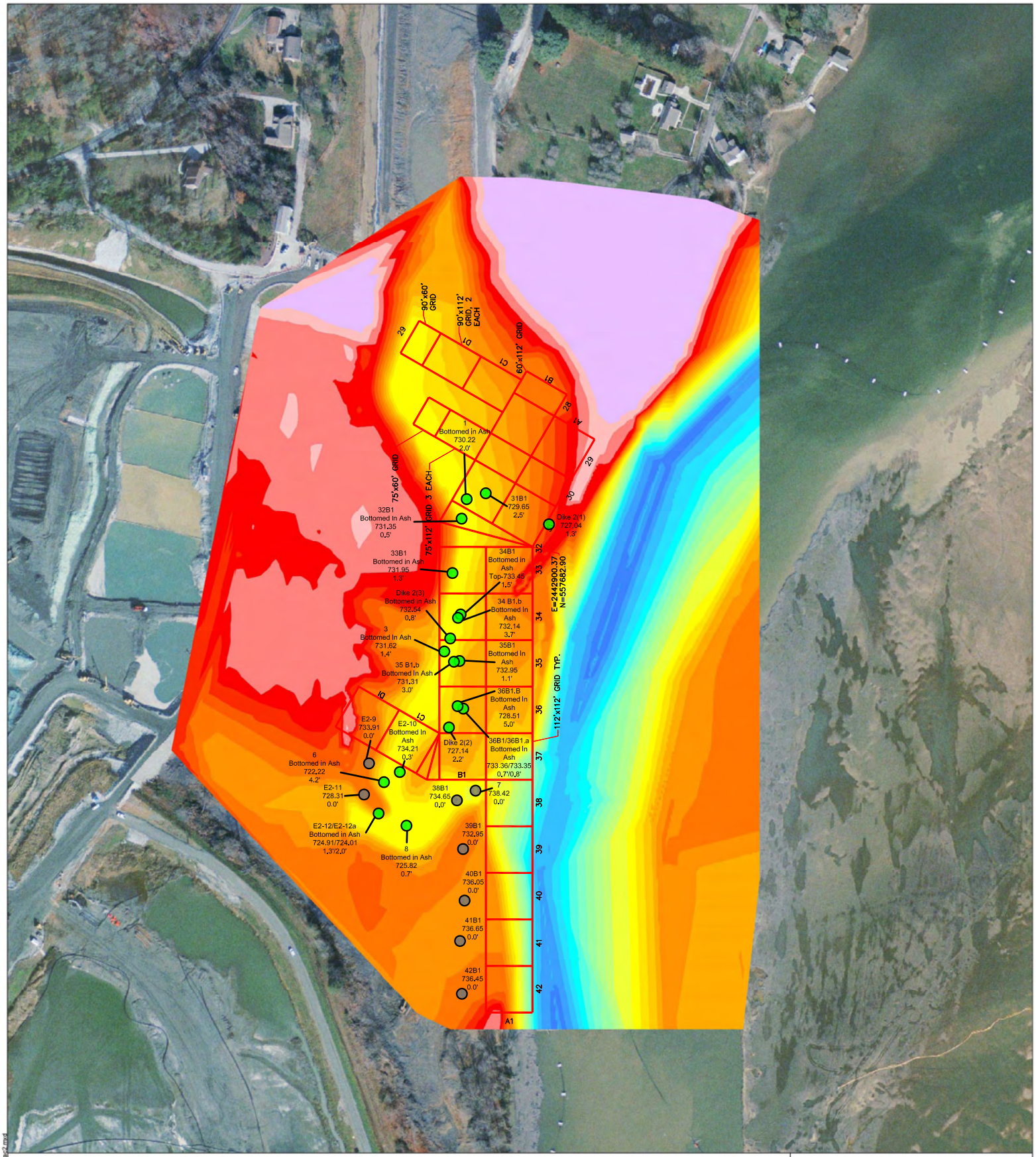
JACOBS

ETRAC/Pre-Spill Surface

NAME: clong DATE: 06/17/10

Figure 3

Y:\TVA\Projects\05DJ5400\20100060\ArcGIS\embayment_etrac2.mxd



Legend

Pre-Spill Elevation Feet (ft)

- 746 - 755
- 744 - 746
- 742 - 744
- 740 - 742
- 738 - 740
- 736 - 738
- 734 - 736
- 732 - 734
- 730 - 732
- 728 - 730
- 726 - 728
- 724 - 726
- 722 - 724
- 720 - 722
- 718 - 720
- 716 - 718
- 714 - 716
- 712 - 714
- 710 - 712
- 708 - 710
- 706 - 708
- 704 - 706
- 702 - 704
- 700 - 702

Dredge Grid for Embayment Area

VibeCore Format: Ash Recovered

Core Name
Bottom of Ash Elevation
Ash Thickness

No Ash Recovered

DRAFT

0 150 300 Feet

N

1:900

JACOBS

VibeCore Sampling Results

NAME: clong DATE: 06/17/10

Figure 4

Y:\TVA\Projects\05DJ5400\2010060\ArcGIS\embayment_etrac2.mxd

TVA JACOBS

Vibecore Documentation

Date: 03/16/2010 Weather: Mostly cloudy. Highs in the lower 50's. North winds 10 mph or less. Location: Inside Dike 2

River Flow: 1840 cfs River Elevation: 736.84'

Crew: David, Mathis, Chad Fairless, Travis Walls, James Mullins

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
Dike 2(1)	R0010371	6' Acrylic	N: 557737.29'	E: 2442940.01'	8.5'	10:18	Mixture of medium and coarse brown sand, orange clay, and ash. >50% ash.	0-1.3
Deviations encountered:							Clay mixed with fine brown sand. Cherty material >50%. Refusal met at clay.	1.3-1.7
							Total Depth	1.7'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
Dike 2(2)	R0010372	6' Acrylic	N: 557248.66'	E 2442699.34'	7.5'	10:41	Ash. >50%	0-2.2
Deviations encountered:							Orange fine sandy clay. Refusal met at clay.	2.2-3.2
							Total Depth	3.2'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
Dike 2(3)	R0010373	6' Acrylic	N: 557462.7'	E: 2442702.39'	3.5'	11:02	Very hard packed ash >50% mixed with fine and coarse grained sand. Refusal met at compacted ash.	0-0.8
Deviations encountered:							Total Depth	.8'

Date: 05/12/2010 Weather: Cloudy, 85 deg F Location: Dike C and Above Segment 5 of Emory River

River Flow: 571 cfs River Elevation: 740.42'

Crew: Greg Schwartz, Tommy Davis

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
1	N/A	6' Acrylic	N: 557797.81'	E: 2442742.01'	8.2'	9:35	Ash > 50%	0.0 - 2.0
Deviations encountered: Core met refusal.							Total Depth	2.'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
3	R0010572	6' Acrylic	N: 557431.46'	E: 2442688.27'	7.4'	10:12	Ash > 50%	0.0 - 1.4
Deviations encountered: Core met refusal.							Total Depth	1.4'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
5	N/A	6' Acrylic	N: 557045.27'	E: 2442427.2'	12.6'	11:12		
Deviations encountered: No recovery at sampling location. Sediment in slurry appeared to be light brown native fines.							Total Depth	N/A

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
6	R0010572	6' Acrylic	N: 557117.07'	E: 2442543.08'	14.'	11:25	Ash > 50%	0.0 - 4.2
Deviations encountered: Core met refusal.							Total Depth	4.2'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
7	R0010572	6' Acrylic	N: 557096.55'	E: 2442763.35'	2.'	11:45	Orange Clay	0.0 - 1.0
Deviations encountered: Core met refusal.							Orange Clay w/ Sand	1.0 - 2.3
							Total Depth	2.3'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
8	R0010572	6' Acrylic	N: 557012.47'	E: 2442597.23'	13.9'	13:49	Ash >50 %	0.0 - 0.7
							Total Depth	.7'

Date: 06/08/2010 Weather: Mostly sunny and breezy Location: Behind Dike 2

River Flow: 235 cfs River Elevation: 740.65'

Crew: Arnold, Mathis, Schwartz, Shaw

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
42B1	N/A	Acrylic	N: 556608.'	E: 2442730.48'	4.2'	12:46	Orange clay	0.0-2.1
Deviations encountered: Core attempted multiple times. No ash. No photo since material fell out of core tube.							Total Depth	2.1'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
41B1	R0010614	Acrylic	N: 556734.94'	E: 2442726.07'	4.'	12:58	Mixed clay and hard ash (<50%)	0.0-0.4
Deviations encountered:							Mixed orange clay/brown clay	0.4-0.6
							Mixed orange clay	0.6-1.0
							Total Depth	1.'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
39B1	R0010615	Acrylic	N: 556956.18'	E: 2442733.31'	7.7'	13:09	Orange clay with trace ash (<50%)	0.0-0.3
Deviations encountered: Core met refusal							Total Depth	.3'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
38B1	R0010616	Acrylic	N: 557073.26'	E: 2442718.63'	6.'	13:17	Orange clay with mixed brown silt	0.0-1.3
Deviations encountered:							Total Depth	1.3'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
40B1	R0010623	Acrylic	N: 556832.21'	E: 2442736.99'	4.6'	16:09	Mixed sand and clay with some ash (<50%)	0.0-0.7
Deviations encountered: Core met very hard refusal.							Hard orange clay	0.7-1.0
							Total Depth	1.'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
36B1	R0010617	Acrylic	N: 557293.9'	E: 2442733.92'	6.5'	13:29	Very hard grey ash (>50%)	0.0-0.7
Deviations encountered: Core met refusal							Total Depth	.7'

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Vibecore Documentation

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
36B1.a	N/A	Acrylic	N: 557293.9'	E: 2442733.92'	6.5'	13:29	Hard grey ash (>50%)	0.0-0.8
Deviations encountered: Crew attempted deeper penetration with another core. Core met refusal again.								
							Total Depth	.8'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
35B1	R0010618	Acrylic	N: 557408.5'	E: 2442724.69'	6.6'	13:49	Grey ash (>50%) soft	0.0-0.5
Deviations encountered: Core met refusal in hard material							Grey ash (>50%) firm	0.5-0.8
							Grey ash (>50%) very firm	0.8-1.1
							Total Depth	1.1'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
34B1	R0010619	Acrylic	N: 557520.48'	E: 2442727.44'	5.7'	14:48	Grey ash (>50%)	0.0-1.1
Deviations encountered: Core met hard refusal							Hard grey ash (>50%)	1.1-1.5
							Total Depth	1.5'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
33B1	R0010620	Acyrlic	N: 55760.08'	E: 2442707.8'	7.4'	15:01	Grey ash (>50%)	0.0-0.5
Deviations encountered: Core met hard refusal							Grey ash (>50%) with sand	0.5-1.0
							Brown fines and grey ash (>50%)	1.0-1.3
							Total Depth	1.3'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
32B1	R0010621	Acrylic	N: 557750.92'	E: 2442729.93'	7.1'	15:29	Orange clay	0.0-0.8
Deviations encountered: Core met refusal							Coal slag	0.8-1.3
							Grey ash (>50%)	1.3-1.8
							No description: material fell from tube	1.8-2.2
							Total Depth	2.2'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
31B1	R0010622	Acrylic	N: 557811.93'	E: 2442787.89'	8.5'	15:52	Mixed ash (>50%) and brown fines	0.0-1.5
Deviations encountered:							Orange clay and ash (>50%) mixed	1.5-2.5
							Orange, brown and red clay	2.5-3.0
							Total Depth	3.'

Date: 06/10/2010 Weather: ms in the A.M. becoming likely in the P.M. Highs in the lower to mi Location: Embayment/North Point

River Flow: 593 cfs River Elevation: 740.81'

Crew: David, Mathis, Tommy Davis, Kevin Shaw

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
E2-9	R0010631	6' Acrylic	557162.19'	2442507.11'	6.9'	9:27	> 50% Ash. Thin surface layer.	0-0.1
Deviations encountered:							Orange sandy clay loam mixed with few intermitent ribbons of of (>50%) ash.	0.1-0.7
							Refusal Met.	
							Total Depth	.7'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
E2-10	R0010632	6' Acryllic	557141.39'	2442581.11'	4.5'	9:43	Orange brown sandy clay loam mixed with intermitent ribbons and few pocket of >50% ash.	0-1.8
Deviations encountered:							> 50% Ash	1.8-2.1
							Refusal Met.	
							Total Depth	2.1'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
E2-11	R0010633	6' Acryllic	557087.29'	2442495.11'	12.5'	9:58	Mixed layer of orange and red clay with ribbons of ash.	0-0.3
Deviations encountered:							Refusal Met.	
							Total Depth	.3'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
E2-12	R0010634	6' Acryllic	557041.69'	2442530.11'	14.6'	10:20	> 50% Ash	0-1.3
Deviations encountered:							Refusal Met.	
							Total Depth	1.3'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
E2-12a	R0010638	3.5' Aluminum	N: 557041.69'	E: 2442530.11'	14.8'	13:51	> 50% Ash. Extremely compacted and de-watered.	0-2.0
Deviations encountered: Aluminum tube bent on retraction. Crew was only able to retrieve 2.0' of material.							Refusal Met.	
							Total Depth	2.'

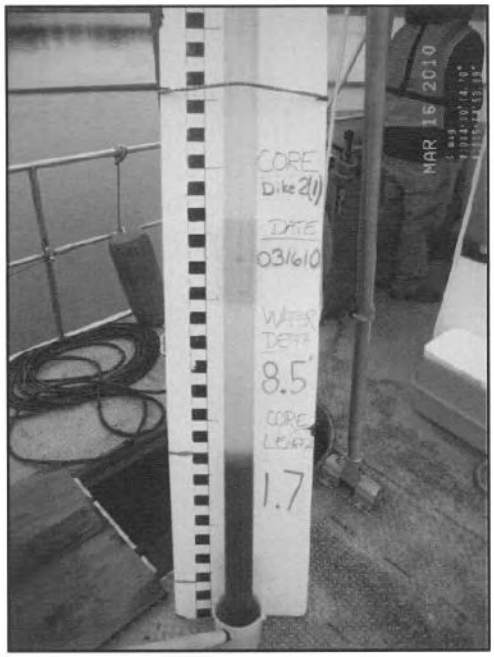
Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
36 B1.b	R0010639	5' Aluminum	N: 557299.98'	E: 2442720.18'	7.3'	14:45	> 50% Ash mixed with coal slag throughout.	0-5.0
Deviations encountered:							Refusal Met.	
							Total Depth	5.'

Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
35 B1.b	R0010640	5' Aluminum	N: 557406.7'	E: 2442711.39'	6.5'	15:22	> 50% Ash with coal slag/sand mixture.	0-3.0
Deviations encountered:							Refusal Met.	
							Total Depth	3.'

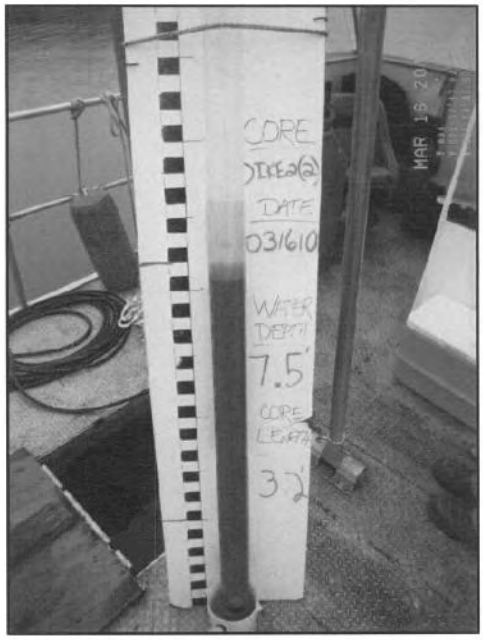
Core #	Photo #	Tube Type	Core Coordinates		River Depth	Time	Core Description	Interval (ft)
34 B1.b	NA	5' Aluminum	N: 557512.36'	E: 2442721.05'	5.6'	15:47	>50% Ash	0-3.7
Deviations encountered: On this core the tube bent durint retraction. Just above the bend at 3.7' there was a plug of ash. No recovery below the bend. Based on previous cores under similar circumstances the crew made a call the the entire 3.7' depth was >50% ash to refusal of compacted ash.							Refusal Met.	
							Total Depth	3.7'

Vibecore Sampling Photos

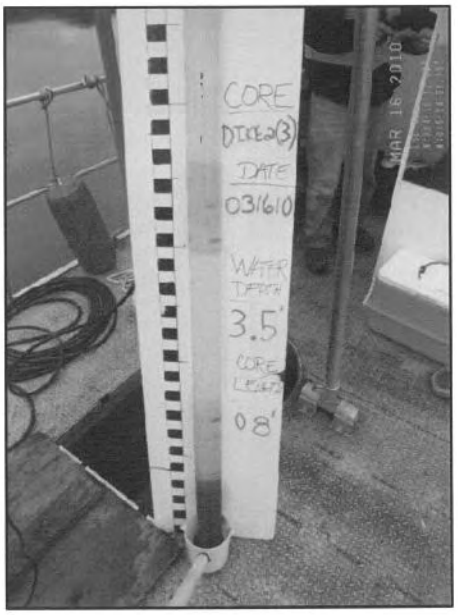
East of Dike 2 (Swan Pond Embayment)



Core 2(1), 3/16/10
Total core depth = 1.7'
Ash thickness = 1.3'
Water depth = 8.5'



Core 2(2), 3/16/10
Total core depth = 3.2'
Ash thickness = 2.2'
Water depth = 7.5'



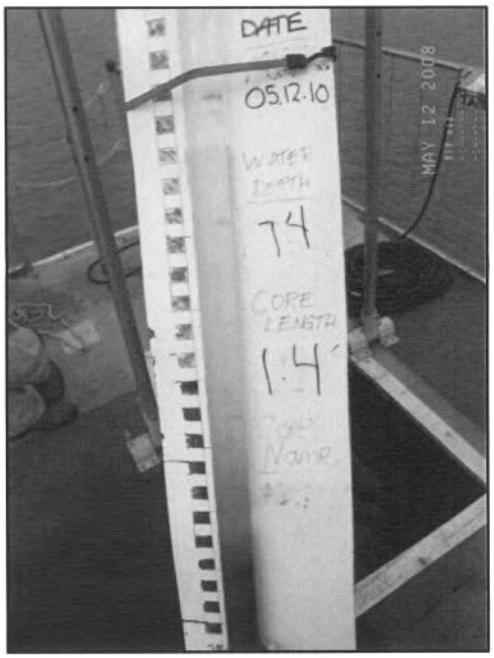
Core 2(3), 3/16/10
Total core depth = 0.8'
Ash thickness = 0.8'
Water depth = 3.5'

NO PHOTO
Core met refusal.

Core 1, 5/12/10
Total core depth = 2.0'
Ash thickness = 2.0'
Water depth = 8.2'

Vibecore Sampling Photos

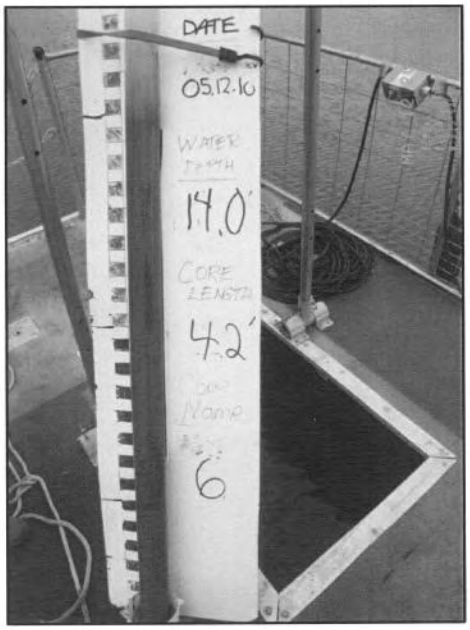
East of Dike 2 (Swan Pond Embayment)



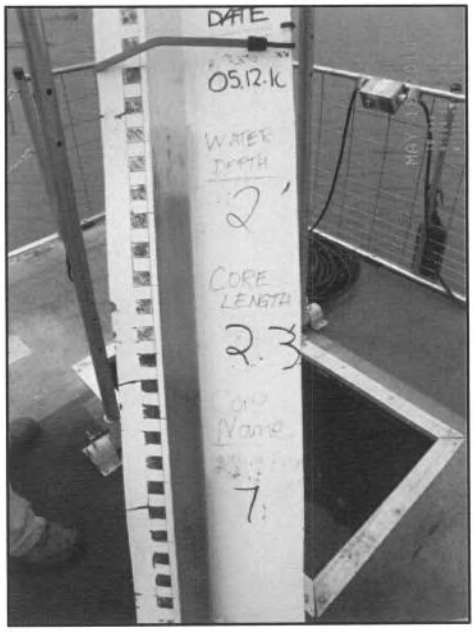
Core 3, 5/12/10
Total core depth = 1.4'
Ash thickness = 1.4'
Water depth = 7.4'

No Core Recovered
(Slurry in Tube appeared light brown - native sediments)

Core 5, 5/12/10
Total core depth = NA
Ash thickness = NA
Water depth = 12.6'



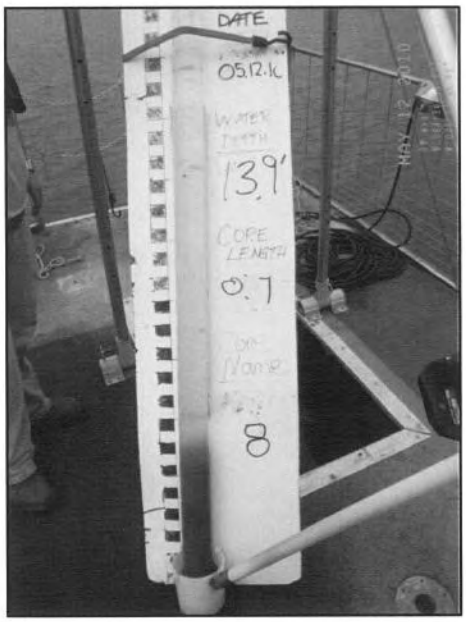
Core 6, 5/12/10
Total core depth = 4.2'
Ash thickness = 4.2'
Water depth = 14.0'



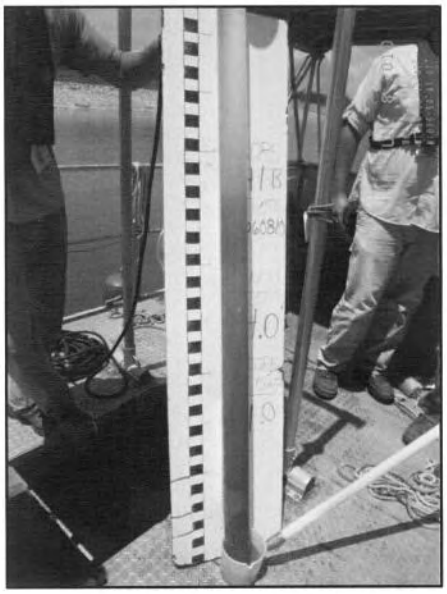
Core 7, 5/12/10
Total core depth = 2.3'
Ash thickness = 0.0'
Water depth = 2.0'

Vibecore Sampling Photos

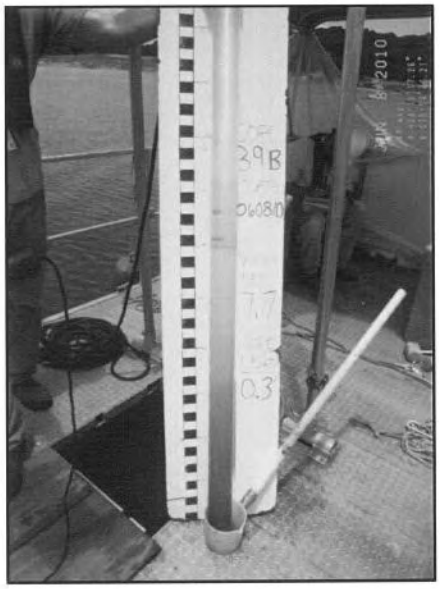
East of Dike 2 (Swan Pond Embayment)



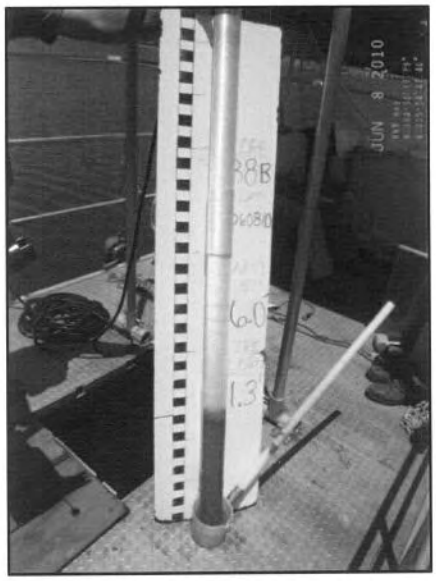
Core 8, 6/08/10
Total core depth = 0.7'
Ash thickness = 0.7'
Water depth = 6.5'



Core 41B1, 6/08/10
Total core depth = 1.0'
Ash thickness = 0.4'
Water depth = 4.0'



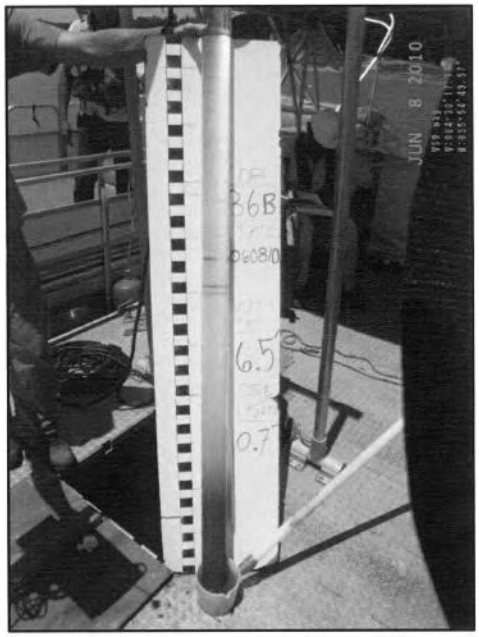
Core 39B1, 6/08/10
Total core depth = 0.3'
Ash thickness = 0.0'
Water depth = 7.7'



Core 38B1, 6/08/10
Total core depth = 1.3'
Ash thickness = 0.0'
Water depth = 6.0'

Vibecore Sampling Photos

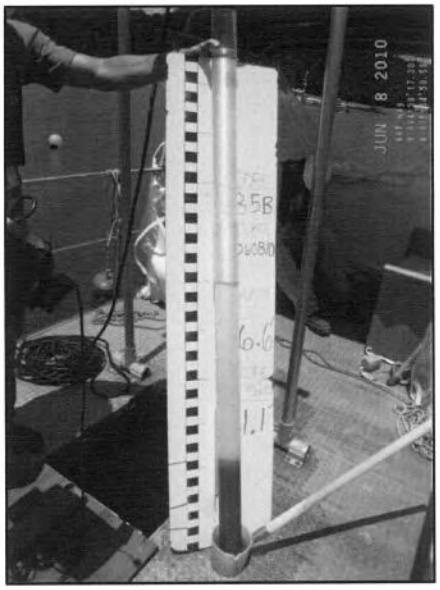
East of Dike 2 (Swan Pond Embayment)



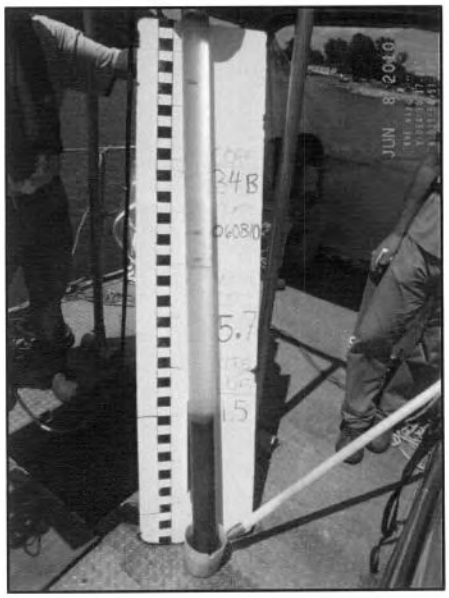
Core 36B1, 6/08/10
Total core depth = 0.7'
Ash thickness = 0.7'
Water depth = 6.5'

NO PHOTO
Core met refusal.

Core 36B1.a, 6/08/10
Total core depth = 0.8'
Ash thickness = 0.8'
Water depth = 6.5'



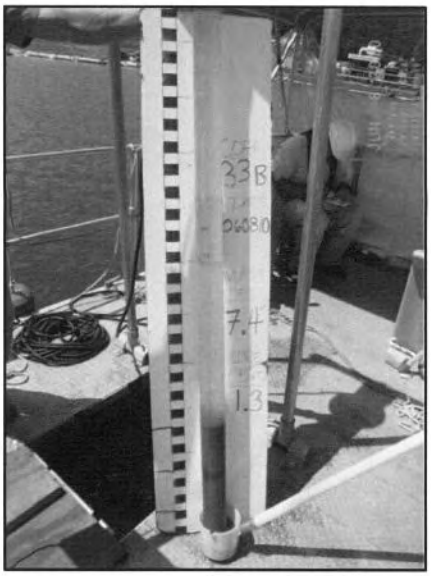
Core 35B1, 6/08/10
Total core depth = 1.1'
Ash thickness = 1.1'
Water depth = 6.6'



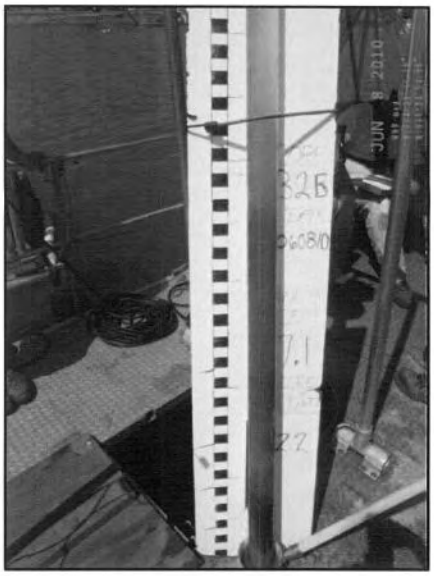
Core 34B1, 6/08/10
Total core depth = 1.5'
Ash thickness = 1.5'
Water depth = 5.7'

Vibecore Sampling Photos

East of Dike 2 (Swan Pond Embayment)

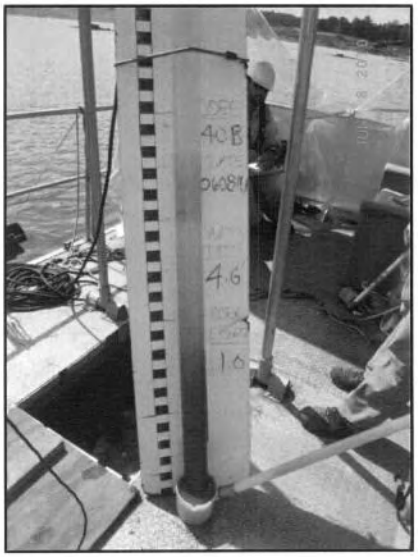


Core 33B1, 6/08/10
Total core depth = 1.3'
Ash thickness = 1.3'
Water depth = 7.4'



Core 32B1, 6/08/10
Total core depth = 2.2'
Ash thickness = 1.0'
Water depth = 7.1'

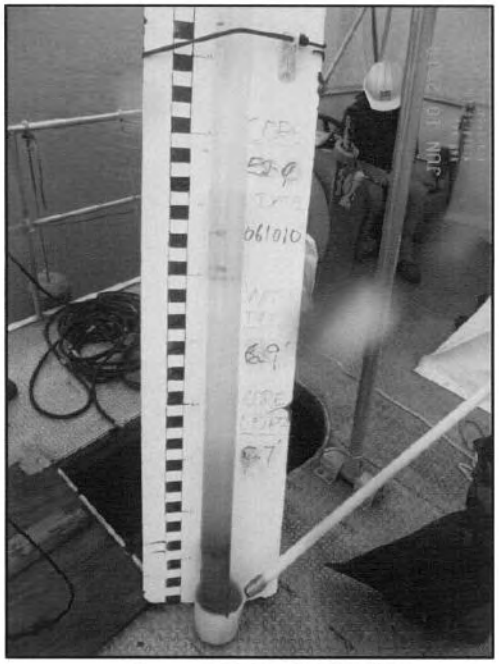
Core 31B1, 6/08/10
Total core depth = 3.0'
Ash thickness = 2.5'
Water depth = 8.5'



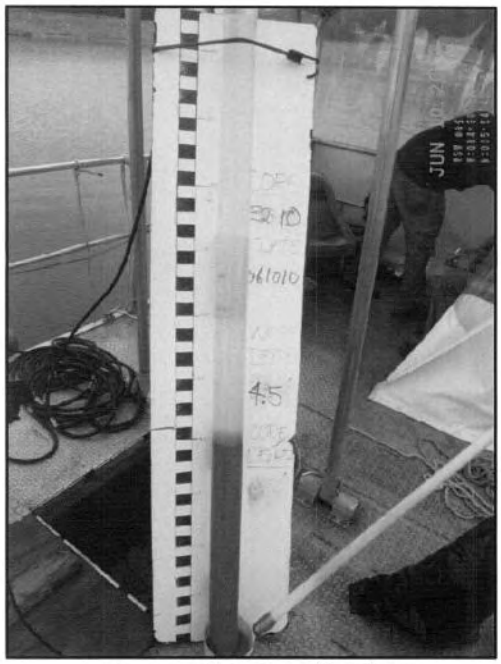
Core 40B1, 6/08/10
Total core depth = 1.0'
Ash thickness = 0.0'
Water depth = 4.6'

Vibecore Sampling Photos

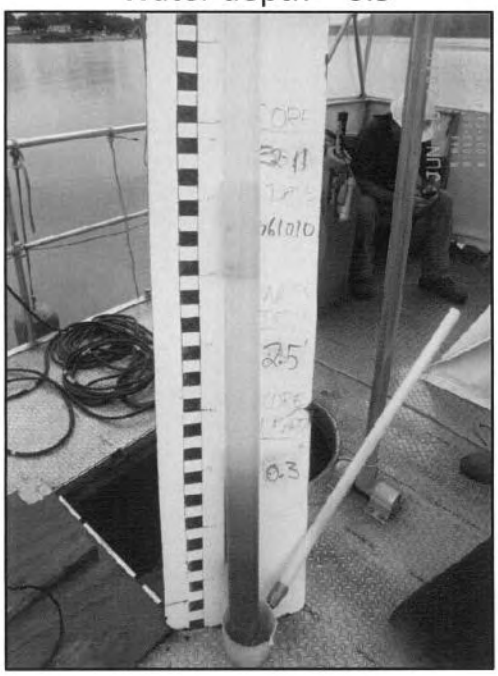
East of Dike 2 (Swan Pond Embayment)



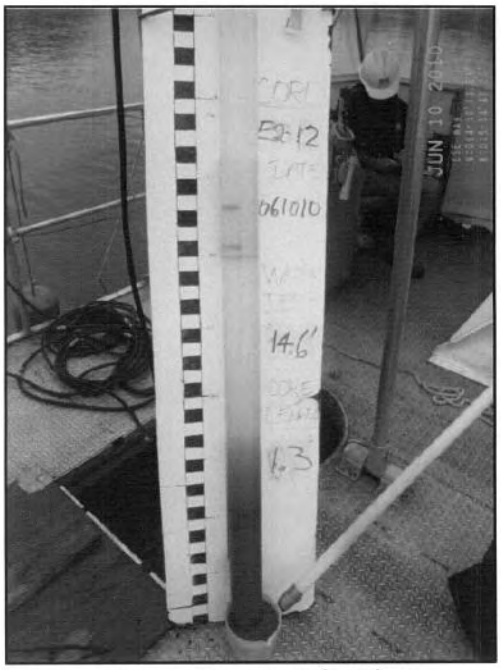
Core E2-9, 6/10/10
Total core depth = 0.7'
Ash thickness = 0.1'
Water depth = 6.9'



Core E2-10, 6/10/10
Total core depth = 2.1'
Ash thickness = 0.3'
Water depth = 4.5'



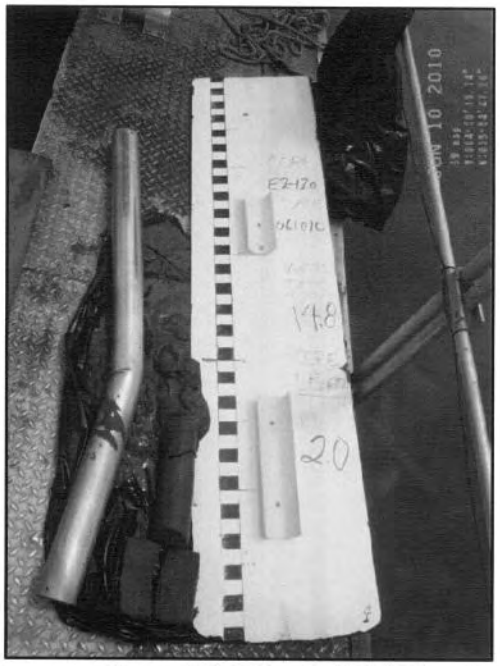
Core E2-11, 6/10/10
Total core depth = 0.3'
Ash thickness = 0.0'
Water depth = 12.5'



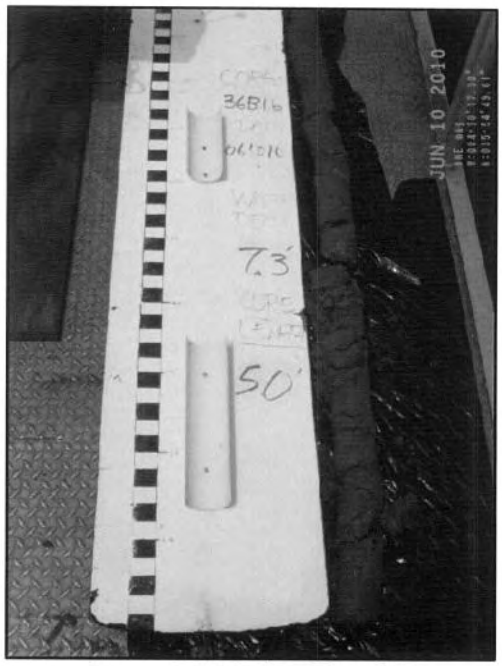
Core E2-12, 6/10/10
Total core depth = 1.3'
Ash thickness = 1.3'
Water depth = 14.6'

Vibecore Sampling Photos

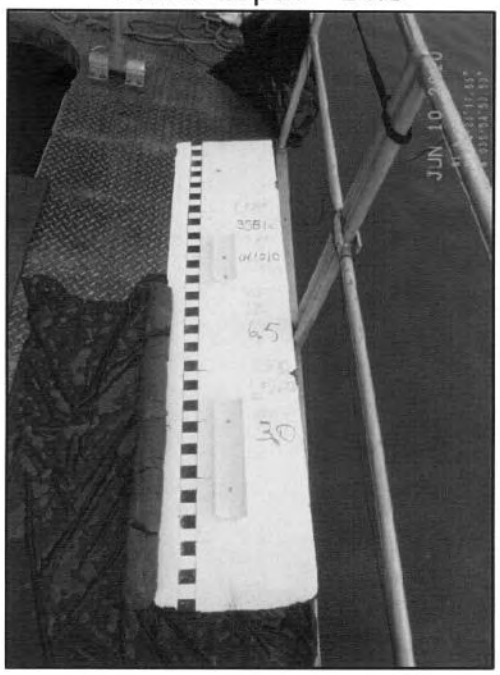
East of Dike 2 (Swan Pond Embayment)



Core E2-12a, 6/10/10
Total core depth = 2.0'
Ash thickness = 2.0'
Water depth = 14.8'



Core 36 B1.b, 6/10/10
Total core depth = 5.0'
Ash thickness = 5.0'
Water depth = 7.3'



Core 35 B1.b, 6/10/10
Total core depth = 3.0'
Ash thickness = 3.0'
Water depth = 6.5'

Core 34B1.b, 6/10/10
Total core depth = 3.7'
Ash thickness = 3.7'
Water depth = 5.6'