Georgia-Pacific

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January 20, 2012

Mr. Chek Beng Ng, P.E.
New York Department of Environmental Conservation
625 Broadway, 11th Floor
Albany, NY 12233-7015

Subject:
Pre-Design Investigation Summary Report
Willsboro Black Ash Pond – Site #516009
Order of Consent No: A5-0771-07-11

Dear Mr. Ng:

In regard to the above-referenced site, on August 23, 2011, Georgia-Pacific LLC (Georgia-Pacific) entered into an Order on Consent and Administrative Settlement Index No. A5-0771-07-11 (AOC) with the New York State Department of Environmental Conservation (NYSDEC). In October 2011, Georgia-Pacific submitted to the NYSDEC a document entitled *Pre-Design Investigation and Remedial Action Work Plan* (Work Plan), which was prepared in accordance with Section I.A.1 of the AOC, the Statement of Work (SOW) attached to the AOC, and the NYSDEC Technical Guidance for Site Investigation and Remediation (DER-10). NYSDEC approved the Work Plan in a letter dated October 20, 2011 and Georgia-Pacific subsequently initiated pre-design investigation activities associated with portions of the Willsboro Black Ash Pond Site (the Site). This letter provides a brief overview of the pre-design investigations and presents the results of the activities completed in accordance with the Work Plan.

I. RECENT INVESTIGATION PROGRAM

As discussed in the Work Plan, the additional investigations (described below) were intended to address certain construction-related data needs to develop final plans and specifications for implementing the remedy consistent with the SOW in the AOC and the August 2011 Explanation of Significant Difference (ESD)[1]. To the extent practicable, the investigation activities were performed in accordance with the Work Plan as approved by NYSDEC. A Health and Safety Plan was also prepared for use at the site during this investigation. Pre-design investigation field activities were performed as soon as possible based on contractor availability, and occurred between November 14 through 17, November 21, and November 22, 2011. Associated analysis (e.g.,

[1] The ESD modified the remedy outlined in the March 2007 Record of Decision (ROD).

geotechnical laboratory analysis by ATL, interpretation of survey results) continued through early January 2012. The remainder of this section presents a summary of the investigation activities.

A. Geotechnical Program

A subsurface investigation (i.e., a drilling and test pit program) was completed in targeted areas of the Site to evaluate geotechnical properties where the stream bank will be stabilized, the ash consolidated, and the soil cover placed. Specifically, the investigation gathered information about how the material will support construction equipment; how compressible the material is and how much it will consolidate after the placement of ash and soil cover; whether the material will need to be stabilized to reduce settlement; and physical properties that will influence the final proposed grades.

Boring Program

A total of four borings (i.e., B-3, 5, 7 and 10), as located on the map included in Attachment A, were advanced using a 3¼-inch or 3¾-inch hollow-stem auger, based on field conditions and availability, driven to depths ranging from 18 to 22 feet below ground surface (bgs). At each location to the extent practicable, soil sampling and Standard Penetration Testing (SPT) was performed continuously throughout each boring using a two-inch outer-diameter (OD) 2-foot long split spoon sampler, in accordance with American Society for Testing Materials (ASTM) D1586. Three-inch undisturbed samples (Shelby Tubes) were collected in each boring at intervals specified in the field based on visual classification of materials encountered. All borings were advanced through the ash layer and terminated within the underlying natural soil deposits. Upon completion, the borings were backfilled with the cuttings produced during installation.

All samples were visually classified with respect to general material types and consistency, and stored for potential laboratory testing. Field data such as blow counts (N-values), groundwater elevations, and general details related to the advancement and sampling of each boring was recorded by the on-site professional. Subsurface logs for each of the borings are included in Attachment B.

In addition to visual classification and recording N-values (i.e., SPT ASTM D1586) at each of the boring locations, certain representative samples were selected for potential analysis of one or more of the following geotechnical properties:

- Moisture content as a percentage of dry weight (ASTM D2216);
- Particle size analysis with hydrometer (if sufficient fines are present) (ASTM D422);
- Specific gravity of soil (ASTM D854);
- Atterberg limits (ASTM D4318), as necessary;
- Direct-shear test (ASTM D3080); and
- Consolidated/undrained (CU) triaxial compression test for cohesive soils (ASTM D4767).

To date, one soil sample (sample S-4 [6 – 8 ft bgs] of boring B-3) was analyzed for CU strengths in accordance with ASTM D4767 and for particle size in accordance with ASTM D422. Based on review of the results received, it is anticipated an additional sample will be submitted for similar analysis in accordance with ASTM D4767 and ASTM D422. Associated geotechnical laboratory testing results received to date are included in Attachment C.

Test Pit Program

A total of 15 test pits (i.e., TP-1 through TP-15), as located on the map included in Attachment A, were excavated with a tracked excavator. A rubber-tired backhoe was specified in the PDI Work Plan, but due the

soft ground conditions, the selected test pit contractor choose a tracked excavator. At each location recovered materials were visually classified with respect to general material types and consistency, and stored for potential laboratory testing. Field data such as groundwater and general details related to the exploration and sampling of the test pits was recorded by the on-site professional. In addition, representative samples were selected for analysis of one or more of the geotechnical properties listed above. Specifically, four soil samples (TP-7, -11, -14, and -15) were analyzed for moisture content in accordance with ASTM D2216, three soil samples (TP-1, 3, and 12) were analyzed for specific gravity in accordance with ASTM D854, and eight soil samples (TP-1, 3, 7, 8, 11, 12, 13, and 15) were analyzed for particle size in accordance with ASTM D422 (five samples were analyzed with the Hydrometer and three were analyzed without Hydrometer). In addition, a Laboratory Compaction Test using the Modified Effort was performed in accordance with ASTM D1557 on a composite of six test pit soil samples (TP-4, 7, 11, 12, 14, and 15). Subsurface descriptions for each of the test pits are included in Attachment B. Associated geotechnical laboratory testing results are included in Attachment D.

B. Topographical Survey

A topographic survey was performed by Thew Associates to provide a 1-foot contour interval map of the proposed construction area. The survey data (in feet above mean sea level) is accurate to within 0.1 feet and provided in State Plane Coordinates (North American Datum 1983 [NAD83]) based on the National Geodetic Vertical Datum of 1929 (NGVD29). Spot elevations were measured at each intersection of a 50-foot square grid (or of equivalent density) as well as along transects spaced at 50-foot intervals at the grade break points including the toe of berm, top of berm, edge of water, toe of slope, and points approximately 25 feet from shore. These measurements were collected to the extent possible depending on safety conditions.

The surveyors located visible improvements and natural features within the work area (e.g., access roads, limits of exposed black ash, vegetation, edge of water). Surveyors also located physical evidence of above and below ground utilities, where present (e.g., manholes, catch basins, utility poles, monitoring wells).

During the topographic survey, two on-site benchmarks were established with the elevations determined to the nearest 0.01 foot. Following completion of the survey, surveyors interpreted the data collected in the field and developed topographic mapping and 30 associated cross-sections to represent the Site. The results of the topographic survey are included in Attachment A.

II. SUMMARY AND ANTICIPATED SCHEDULE

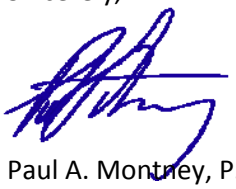
This document summarizes the performance and results of the pre-design investigation activities as proposed in the Work Plan. At this time, no additional data needs have been identified, and it is anticipated that the results recorded to date are sufficient to develop and the remedial design. Anticipated milestones are as follows:

Activity	Anticipated Schedule
Submittal of Draft Remedial Action Work Plan (RAWP)	March 15, 2012
NYSDEC Approval of RAWP (assuming 60 days after receipt of RAWP)	May 15, 2012
Submittal of Final RAWP	May 31, 2012
NYSDEC Approval of Final RAWP	June 2012
Procurement of Remedial Contractor	June/July 2012
Remedial Construction	Summer 2012
Submittal of Final Report and Final Engineering Report	60 days following completion of construction

If the receipt of approval on this letter or the forthcoming Draft of Final RAWP is delayed, or any other element of the schedule presented above is delayed such that the schedule identified herein requires modification, Georgia-Pacific will discuss such impacts with NYSDEC and propose an alternative schedule.

Please do not hesitate to contact me should you have questions or comments.

Sincerely,



Paul A. Montney, P.E.
Director, Remediation & Acquisition/Divestitures
Georgia-Pacific LLC

Attachments:

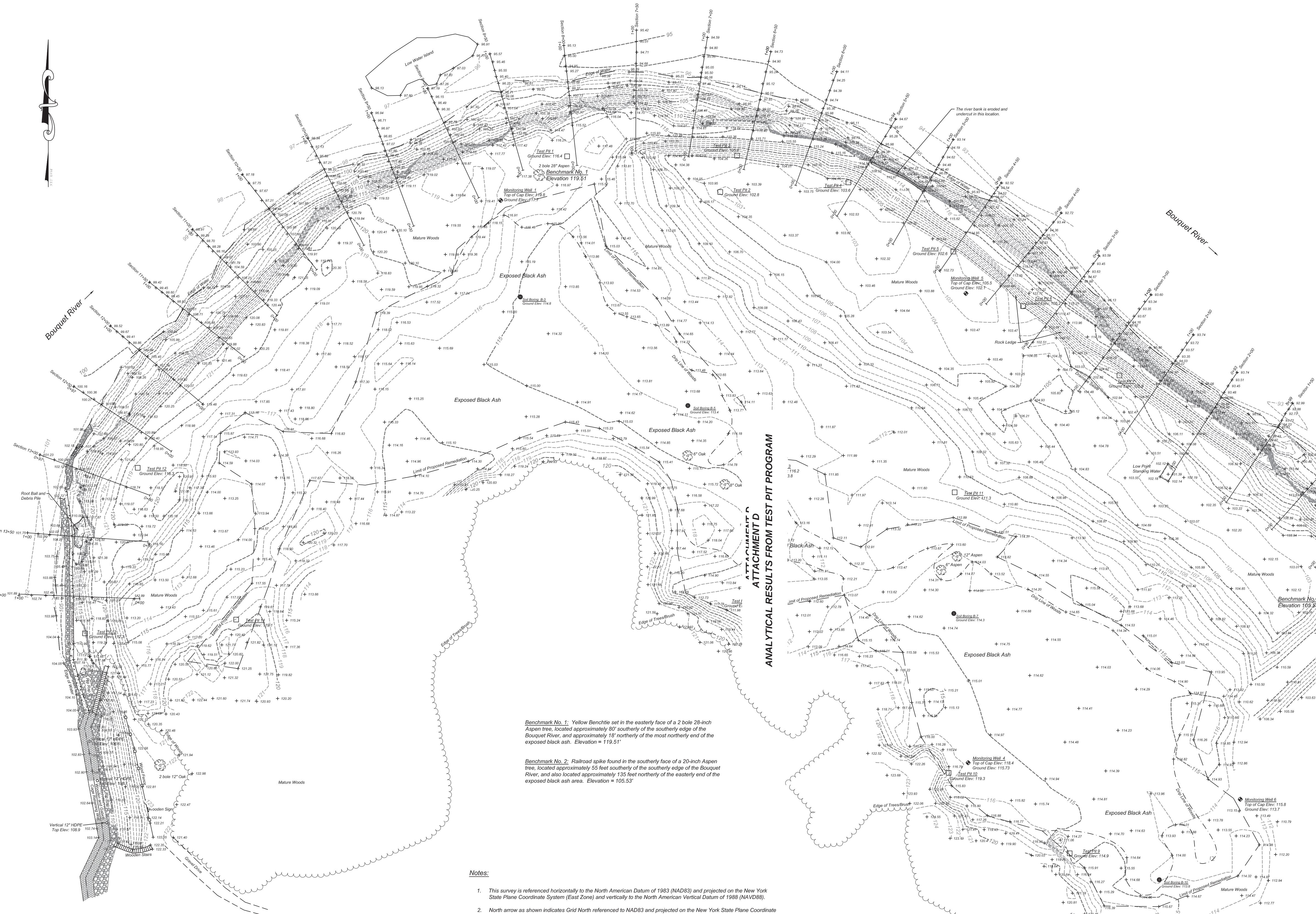
Attachment A – Topographic Survey and Related Cross-Sections
Attachment B – Subsurface Investigation Logs
Attachment C – Geotechnical Analytical Results from Boring Program
Attachment D – Geotechnical Analytical Results from Test Pit Program

cc: Andrew Gugliemi, Esq., NYSDEC
John Swartwout, NYSDEC
J. Michael Davis, Esq., Georgia-Pacific
John Greenthal, Esq., Nixon Peabody LLP
David Stout, ARCADIS
Lance Ketcham, P.E., ARCADIS
Dawn Penniman, P.E., ARCADIS

ATTACHMENT A

TOPOGRAPHIC SURVEY AND RELATED CROSS-SECTIONS

ATTACHMENT D
ANALYTICAL RESULTS FROM TEST PIT PROGRAM



U.S.G.S. Quadrangle
Willsboro, New York

Benchmark No. 1: Yellow Benchtie set in the easterly face of a 2 bole 28-inch Aspen tree, located approximately 80' southerly of the southerly edge of the Bouquet River, and approximately 18' northerly of the most northerly end of the exposed black ash. Elevation = 119.51'

Benchmark No. 2: Railroad spike found in the southerly face of a 20-inch Aspen tree, located approximately 55 feet southerly of the southerly edge of the Bouquet River, and also located approximately 135 feet northerly of the easterly end of the exposed black ash area. Elevation = 105.53'

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Notes:

1. This survey is referenced horizontally to the North American Datum of 1983 (NAD83) and projected on the New York State Plane Coordinate System (East Zone) and vertically to the North American Vertical Datum of 1988 (NAVD88).
2. North arrow as shown indicates Grid North referenced to NAD83 and projected on the New York State Plane Coordinate System (East Zone).
3. The reference horizontal and vertical control station is a Cooperative Base Network Control Station Monument stamped "Keesville". Keesville is an A Order horizontal and a second order class 2 control monument established by the National Geodetic Survey. Elevation = 490.87'
4. Location of spot elevation is indicated by the tick "+" mark located adjacent to the elevation.
5. The "limit of proposed remediation" line shown hereon was staked by representatives of ARCADIS and located during the field survey. The "limit of proposed remediation" line is coincident with the edge of the mature woods on the northerly and easterly edges of the exposed black ash area, and is coincident with the brush line on the southerly and westerly edges of the exposed black ash area.
6. The stationing shown at the cross sections protruding into the river are approximate and for reference only. The cross sections are marked by lath set during the survey marked with the appropriate station. There was no baseline established during the survey.
7. The slope along the southerly edge of the exposed black ash area is mostly comprised of root balls, concrete, trash, construction materials and other debris.
8. Contours shown hereon were generated from a Digital Terrain Model utilizing Autodesk Land Desktop Surveying and Engineering software.
8. Elevations and contours shown reference the North American Vertical Datum of 1988 (NAVD88-Geoid09).
9. The information shown hereon is based on an instrument survey completed on November 22, 2011.

Legend:

- Edge of Water
- Limits of Proposed Remediation
- Drip Line of Mature Woods
- Edge of Gravel
- Edge of Woods
- Contour Major
- Contour Minor
- Wooden Fence
- Soil Boring
- Monitoring Well
- Test Pit
- Deciduous Tree

REV	DESCRIPTION	DATE
1	Added Sheet 2 - Cross Sections	12/21/11

PROJECT NUMBER: CK3343-11-11

DRAWN:

CHECKED:

SCALE: 1" = 40'

DATE: 11/30/11

Map Showing Existing Topographic Conditions Willsboro Black Ash Pond Remediation Project

Town of Willsboro
County of Essex
State of New York

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P.O. Box 463
6431 US Highway 11
Canton, New York 13617
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F: 315/386-1012
9478 River Road
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T: 315/733-7278
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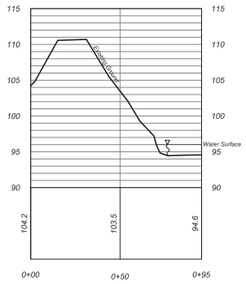

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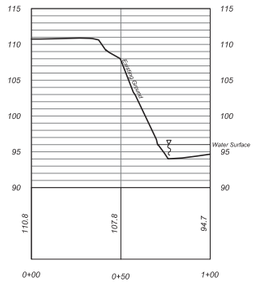

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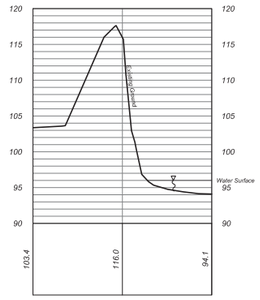

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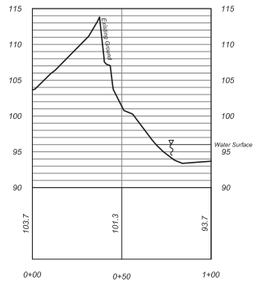

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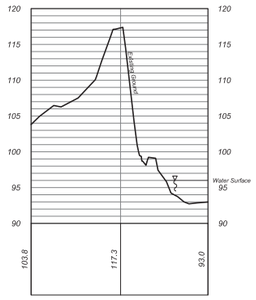

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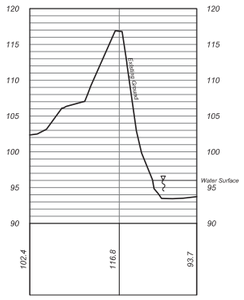

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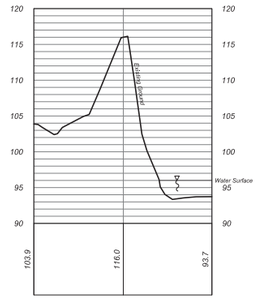

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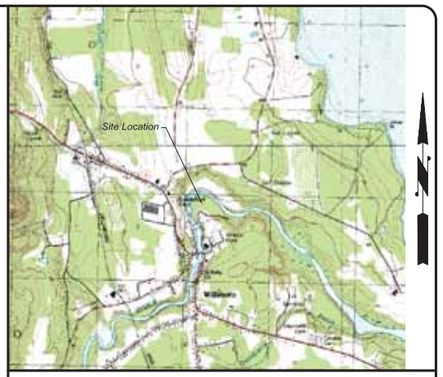
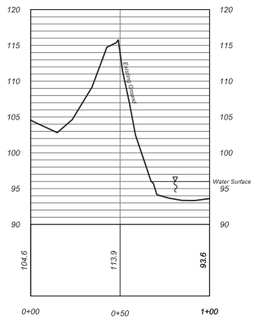


U.S.G.S. Quadrangle
Willsboro, New York



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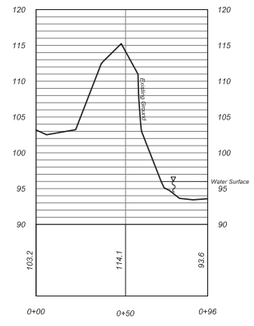

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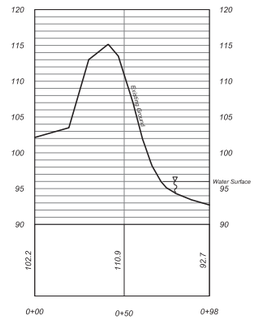

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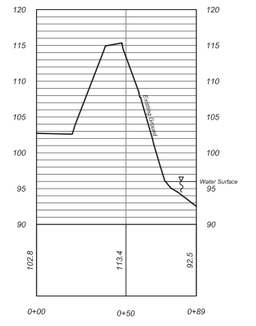

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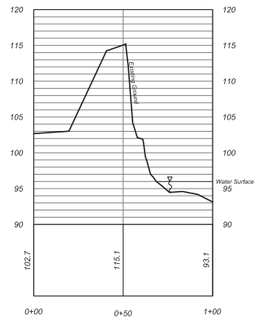

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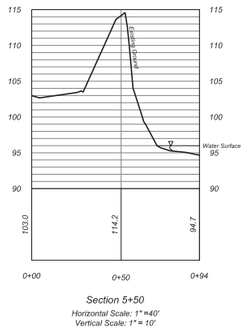

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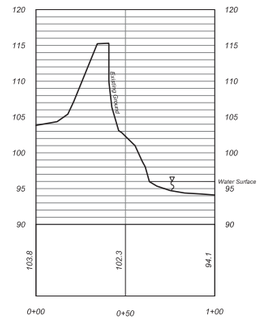

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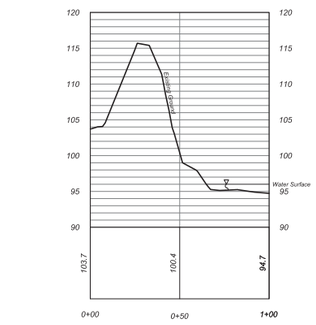

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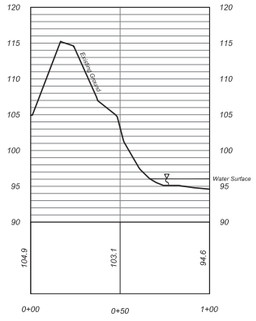

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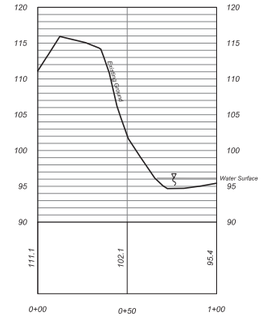

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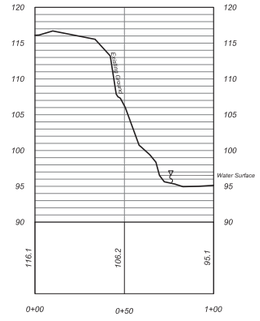

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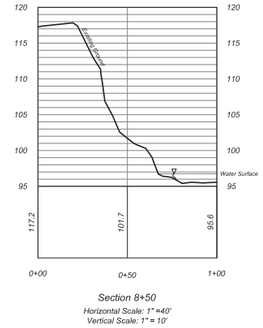

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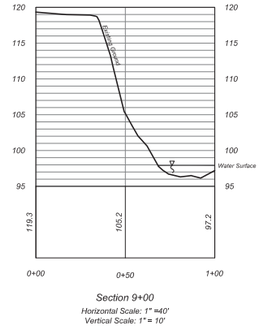

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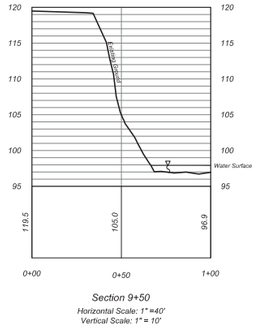

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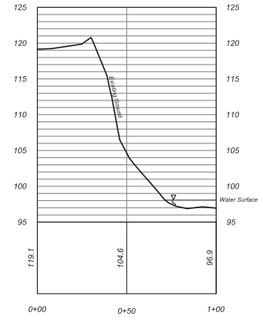

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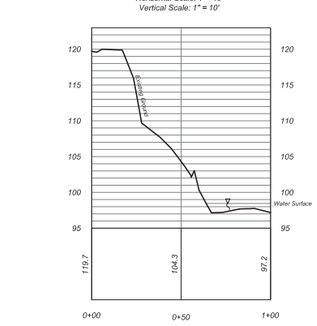

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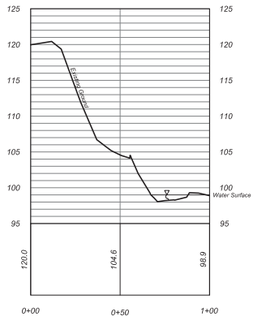

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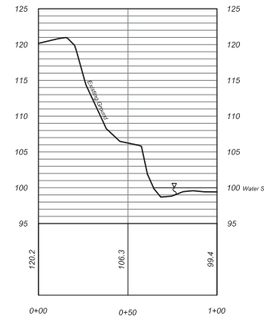

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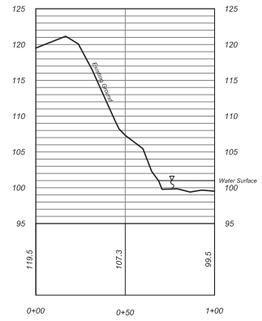

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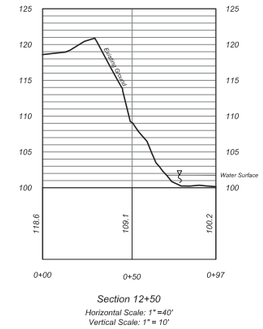

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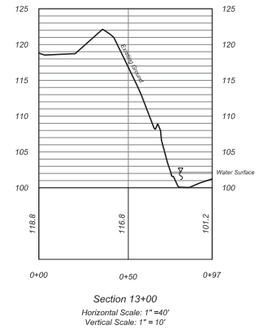

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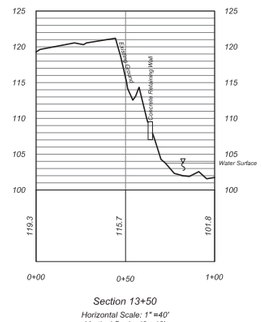
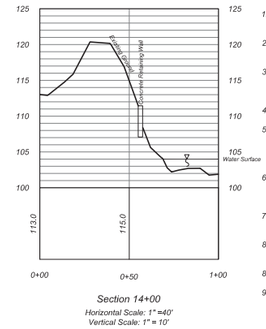
Vertical Scale: 1" = 10'



Section 13+50
Horizontal Scale: 1" =40'
Vertical Scale: 1" = 10'



Section 14+00
Horizontal Scale: 1" =40'
Vertical Scale: 1" = 10'

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

1 inch = 40 ft.

Notes:

1. This survey is referenced horizontally to the North American Datum of 1983 (NAD83) and projected on the New York State Plane Coordinate System (East Zone) and vertically to the North American Vertical Datum of 1988 (NAVD88).
2. North arrow as shown indicates Grid North referenced to NAD83 and projected on the New York State Plane Coordinate System (East Zone).
3. The reference horizontal and vertical control station is a Cooperative Base Network Control Station Monument stamped "Keesville". Keesville is an A Order horizontal and a second order class 2 control monument established by the National Geodetic Survey. Elevation = 490.87'
4. Location of spot elevation is indicated by the tick "+" mark located adjacent to the elevation.
5. The "limit of proposed remediation" line shown hereon was staked by representatives of ARCADIS and located during the field survey. The "limit of proposed remediation" line is coincident with the edge of the mature woods on the northerly and easterly edges of the exposed black ash area, and is coincident with the brush line on the southerly and westerly edges of the exposed black ash area.
6. The stationing shown at the cross sections protruding into the river are approximate and for reference only. The cross sections are marked by lath set during the survey marked with the appropriate station. There was no baseline established during the survey.
7. The slope along the southerly edge of the exposed black ash area is mostly comprised of root balls, concrete, trash, construction materials and other debris.
8. Contours shown hereon were generated from a Digital Terrain Model utilizing Autodesk Land Desktop Surveying and Engineering software.
8. Elevations and contours shown reference the North American Vertical Datum of 1988 (NAVD88-Geoid09).
9. The information shown hereon is based on an instrument survey completed on November 22, 2011.

REV	DESCRIPTION	DATE
1	Added Sheet 2 - Cross Sections	12/21/11

PROJECT NUMBER: CK3343-11-11

DRAWN:
CHECKED:
SCALE: 1" = 40'
DATE: 11/30/11

Map Showing Cross Sections Willsboro Black Ash Pond Remediation Project

Town of Willsboro
County of Essex
State of New York

Thew Associates LAND SURVEYORS
www.ThewAssociates.com
P.O. Box 463, 6431 US Highway 11, Canton, New York 13617, T: 315/386-2776, F: 315/386-1012
9478 River Road, Marcy, New York 13403, T: 315/733-7278, F: 315/797-1907

T:\Projects Civil 3D\2011\CK3343\DWG\CK3343.dwg, 12/22/2011 10:34:10 AM

ATTACHMENT B

SUBSURFACE INVESTIGATION LOGS

SUBSURFACE BORING LOGS

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: CD3350D-01-01-12

Client: ARCADIS

Boring Location: See Boring Location Plan

Project: Subsurface Investigation

Former Black Ash Pond

Willsboro, Essex County, New York

Start Date: 11/22/2011 Finish Date: 11/22/2011

Boring No.: B-3 Sheet 1 of 1

Groundwater Observations

Date	Time	Depth	Casing
11/22/2011	AM	12.0'	14.0'
11/22/2011	AM	7.5'	OUT

Coordinates

Northing _____

Easting _____

Sampler Hammer

Weight: 140 lbs.

Fall: 30 in.

Hammer Type: Automatic

Ground Elev.: --

Boring Advance By: 3 1/4" Auger

Borehole caved at 8.0 feet.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (inches)
1	AUGER	1	0.0	2.0	SS	WH/24"		Black ASH Material (moist)	5
2		2	2.0	4.0	SS	WH/24"		Similar Soil (moist)	4
3									
4		3	4.0	6.0	SS	WH/24"		Similar Soil (moist)	10
5									
6		4	6.0	8.0	SH	SHELBY	6.0	Shelby Tube - Black Ash Material	24
7									
8		5	8.0	10.0	SS	WH/24"	8.0	White ASH Material (wet)	9
9									
10		6	10.0	12.0	SS	WH/24"	10.0	Black ASH Material (moist)	2
11									
12		7	12.0	14.0	SH	SHELBY		Shelby Tube -- No Recovery	0
13									
14		8	14.0	16.0	SH	SHELBY		Shelby Tube -- No Recovery	0
15									
16		9	16.0	18.0	SS	WH/18" 34		Black Ash Material	14
17							17.5		
18		10	18.0	20.0	SS	6 16 23 14		Brown SILT; some mf SAND; little mf GRAVEL (wet) Brown SILT; and mf SAND; little mf GRAVEL (wet)	10
19									
20							20.0		
21								Boring terminated at 20.0 feet.	
22								Notes: 1. Borehole backfilled with onsite soil. 2. Soil classifications based on driller's field classifications.	
23									
24									
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Tony Mallory; Cory Farmer

Inspector: Mandy Glampaolo, PE (ARCADIS)

ATL-LOG1 CD3350 ARCADIS WILLSBORO.GPJ LOG-WELL.GDT 1/17/12

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: CD3350D-01-01-12

Client: ARCADIS

Boring Location: See Boring Location Plan

Project: Subsurface Investigation
Former Black Ash Pond
Willsboro, Essex County, New York

Start Date: 11/21/2011 Finish Date: 11/21/2011

Boring No.: B-5 Sheet 1 of 1

Groundwater Observations

Date	Time	Depth	Casing
11/21/2011	AM	12.2'	14.0'

Coordinates
Northing
Easting

Sampler Hammer
Weight: 140 lbs.
Fall: 30 in.
Hammer Type: Automatic

Ground Elev.: --

Boring Advance By: 3 1/4" Auger

Borehole caved at 5.0 feet.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (Inches)
1	AUGER	1	0.0	2.0	SS	WH/24"		Black ASH Material	10
2		2	2.0	4.0	SS	WH/24"		Similar Soil	9
3									
4		3	4.0	6.0	SS	WH/24"		Similar Soil	1
5							6.0		
6		4	6.0	8.0	SH	SHELBY		Shelby Tube	19
7							8.0		
8		5	8.0	10.0	SS	WH/24"		White ASH Material	17
9									
10		6	10.0	12.0	SS	WH/24"		Similar Soil	22
11									
12		7	12.0	14.0	SH	SHELBY		Shelby Tube -- No Recovery	0
13									
14		8	14.0	16.0	SH	SHELBY		Shelby Tube	20
15									
16		9	16.0	18.0	SS	WH/24"		Greyish-White ASH Material (wet)	20
17							18.0		
18		10	18.0	20.0	SS	WH/12" 15 19		Brown SILT; some f SAND; little mf GRAVEL (moist)	7
19							20.0		
20								Boring terminated at 20.0 feet.	
21									
22								Notes:	
23								1. Borehole backfilled with onsite soil.	
24								2. Soil classifications based on driller's field classifications.	
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Tony Mallory; Cory Farmer

Inspector: Mandy Glampaolo, PE (ARCADIS)

ATL-LOG1 CD3350 ARCADIS WILLSBORO.GPJ LOG-WELL.GDT 1/17/12

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: CD3350D-01-01-12

Client: ARCADIS

Boring Location: See Boring Location Plan

Project: Subsurface Investigation

Former Black Ash Pond

Willsboro, Essex County, New York

Start Date: 11/21/2011 Finish Date: 11/21/2011

Boring No.: B-7 Sheet 1 of 1

Groundwater Observations

Date	Time	Depth	Casing
11/21/2011	PM	12.5'	14.0'

Coordinates

Northing

Easting

Sampler Hammer

Weight: 140 lbs.

Fall: 30 in.

Hammer Type: Automatic

Ground Elev.: --

Boring Advance By: 3 1/4" Auger

Borehole caved at 4.0 feet.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (inches)
1	AUGER	1	0.0	2.0	SS	WH/24"		Black ASH Material	12
2									
3		2	2.0	4.0	SS	WH/24"		Similar Soil	11
4									
5		3	4.0	6.0	SS	WH/24"		Similar Soil (wet)	10
6									
7		4	6.0	8.0	SS	WH/24"	7.0	Similar Soil (wet)	19
8								White ASH Material (wet)	
9		5	8.0	10.0	SH	SHELBY		Shelby Tube	22
10									
11		6	10.0	12.0	SS	WH/24"		White ASH Material	2
12									
13		7	12.0	14.0	SS	WH/18" 2		Similar Soil	10
14							14.0		
15		8	14.0	16.0	SH	SHELBY		Shelby Tube	24
16							16.0		
17		9	16.0	17.3	SS	52 15 50/4"		Brown SILT; and mf SAND; little mf GRAVEL	5
18							18.0		
19								Boring terminated at 18.0 feet.	
20									
21								Notes:	
22								1. Borehole backfilled with onsite soil.	
23								2. Soil classifications based on driller's field classifications.	
24									
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Tony Mallory; Cory Farmer

Inspector: Mandy Giampaolo, PE (ARCADIS)

ATL-LOG1 CD3350 ARCADIS WILLSBORO.GPJ LOG-WELL.GDT 1/17/12

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: CD3350D-01-01-12

Client: ARCADIS

Boring Location: See Boring Location Plan

Project: Subsurface Investigation
Former Black Ash Pond
Willsboro, Essex County, New York

Start Date: 11/21/2011 Finish Date: 11/21/2011

Boring No.: B-10 Sheet 1 of 1

Groundwater Observations

Date	Time	Depth	Casing
11/21/2011	PM	DRY	20.0'

Coordinates
Northing
Easting

Sampler Hammer
Weight: 140 lbs.
Fall: 30 in.
Hammer Type: Automatic

Ground Elev.: --

Boring Advance By: 3 1/4" Auger

Borehole caved at 5.0 feet.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (inches)
1	AUGER	1	0.0	2.0	SS	WH/24"		Black ASH Material (dry)	20
2		2	2.0	4.0	SS	WH/24"		Similar Soil	20
3									
4		3	4.0	6.0	SS	WH/24"		Similar Soil (wet)	4
5									
6		4	6.0	8.0	SH	SHELBY		Shelby Tube	14
7									
8		5	8.0	10.0	SS	WR/18" WH	9.0	Black ASH Material	24
9							10.0	White ASH Material	
10		6	10.0	12.0	SS	WH/24"		Black ASH Material	2
11									
12		7	12.0	14.0	SS	WH 1/18"		Similar Soil	13
13									
14		8	14.0	16.0	SH	SHELBY		Shelby Tube	11
15									
16		9	16.0	18.0	SS	WH/24"		Black Ash Material	1
17									
18		10	18.0	20.0	SS	WH/18' 1		Similar Soil	
19							20.0		
20		11	20.0	22.0	SS	7 8 8 10		Grey SILT; and mf SAND; little mf GRAVEL (wet)	22
21							22.0		
22								Boring terminated at 22.0 feet.	
23								Notes:	
24								1. Borehole backfilled with onsite soil.	
25								2. Soil classifications based on driller's field classifications.	

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Tony Mallory; Cory Farmer

Inspector: Mandy Glampaolo, PE (ARCADIS)

ATL-LOG1 CD3350 ARCADIS WILLSBORO.GPJ LOG-WELL.GDT 1/17/12

SUBSURFACE TEST PIT LOGS

Willsboro, New York

Test Pit Logs - November 15-16, 2011

TP-1	**Opposite small island. Between MW-1 to MW-5.**
0 - 6' -8"	Ash and slag. **Sample**
6.8 - 7.5	Brown silty sand.
7.5 - 12	Finer black ash.
6 - 12'	Brown silty sand.
TP-2	**Floodplain. Near B-6.**
0 - 0.5	Topsoil.
0.5 - 2'	Black ash. Wet. No sample.
2'+	Grey silty fine sand. Wet with running water.
TP-3	**Bank 100' S TP-1.**
	Depth is from top of bank
0 - 12'	Slag. **Sample** - Dry.
12 - 12.5	Brown silty sand - Dry.
12.5	Organic peat and silty fine sand. Wet.
TP-4	
0 - 14	Black ash (no slag). **Sample** .
14 - 15	Medium fine sand brown, trace silt. Some lime sludge.
TP-5	**Just north of MW-5.**
0 - 10	Wollastonite (a.k.a. Wolsinite) rock-like facing. No sample.
10 - 12	Red brick. Metal pipe to river
12+	Grey silty fine sand.
TP-6	**40' south of MW-5.**
	STA 3+80.
From TOB 0 - 8'	Wollastonite (a.k.a. Wolsinite) Face
8 - 10'	At toe of slope. Black ash. No sample.
	Wolsinite at top of bank. Large tree and layered slag on river side.
TP-7	**~STA 2+70.**
	Pipe present toward river.
From TOB 0 - 5'	Black/grey slag.
5 - 7'	Brown silty sand.
7 - 10'	Black ash. **Sample**.
TP-8	**STA 0+60.**
0 - 4'	Wollastonite (a.k.a. Wolsinite) cap.
4 - 6'	Cinders/slag. Grey/black. **Sample.**
6 - 9'	Black ash.
TP-9	**Town debris.**
0 - 6'	Road sand.
TP-10	
0 - 4'	Road sand.
TP-11/B-8 location	
0 - 8"	Topsoil/ash. Root mat.
8" - 5'	Black ash. Moist. **Sample**
5'+	White sludge. Wet.

See Notes on Page 2.

Willsboro, New York

Test Pit Logs - November 15-16, 2011

TP-12	**STA 12+75.**
0 - 1'	Black ash/topsoil.
1 - 15'	Black ash. Roots to 5'. End of reach. **Sample.**
TP-13	**STA 13.**
	Hand sample sloughed area near fish access stairs. Coarse to fine slag. **Sample.**
TP-14/ near B-1	
0 - 1'	Black topsoil/ash.
1 - 11'	Black ash. Moist.
11'	White lime sludge.
TP-15/ near B-6	
0 - 5'	Black ash. Moist. Sample.
5'	Lime. Wet (standing water).

Notes:
TP - Test Pit
TOB - Top of Bank

ATTACHMENT C

GEOTECHNICAL ANALYTICAL RESULTS FROM BORING PROGRAM

TRIAXIAL COMPRESSION TEST RESULTS

ATLANTIC TESTING LABORATORIES

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

ASTM D 4767

Project Information

Client: ARCADIS

Report No.: CD3350SL-10-12-11

Project: Black Ash Pond, Willsboro, New York

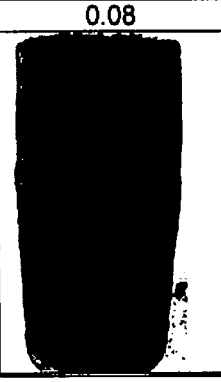
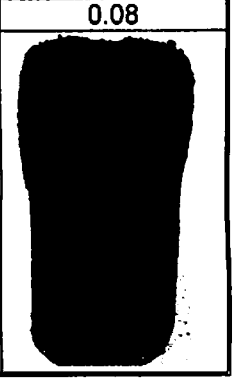
Date: December 27, 2011

Sample Information

Boring No.: B-3 Sample No.: S-4 Depth: 6.0 – 8.0' ATL Sample No.: CD3350S10

Soil Classification: Black Ash

Sample Type: Undisturbed

Confining Pressure, (psi)	3.0	12.0
Dry Unit Weight, (pcf)	12.4	11.1
Moisture Content, (%)	346.2	391.7
Height of Sample, (in)	5.998	5.980
Diameter of Sample, (in)	2.846	2.846
Height/Diameter Ratio	2.11	2.10
Deviator Stress, (psi)	15.9	23.1
Effective Minor Principal Stress, (psi)	10.4	20.8
Effective Major Principal Stress, (psi)	23.0	40.2
Axial Strain at Failure, (%)	15.0	8.6
Rate of Axial Strain, (%/min)	0.08	0.08
Picture at Failure		

Remarks

1. Due to insufficient sample only two specimens were able to be obtained for testing.
2. The Particle Size Distribution Report is attached.

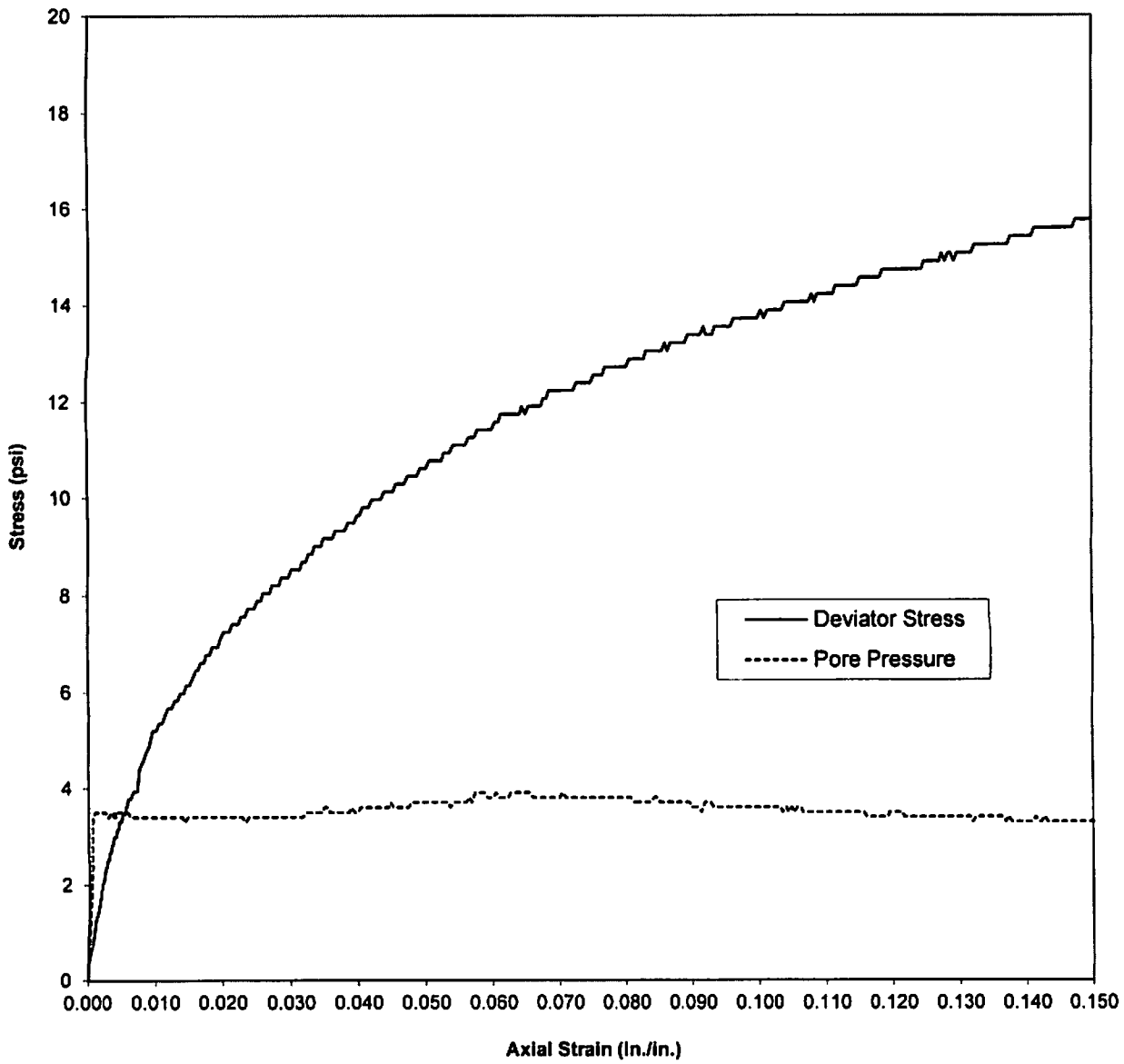
Reviewed by: _____ Date: 1/5/11

ATLANTIC TESTING LABORATORIES

ARCADIS
Black Ash Pond, Willsboro, New York
ATL Report No. CD3350SL-10-12-11

Consolidated-Undrained Triaxial Compression Test
ASTM D 4767

Deviator Stress and Pore Pressure
3.0 psi

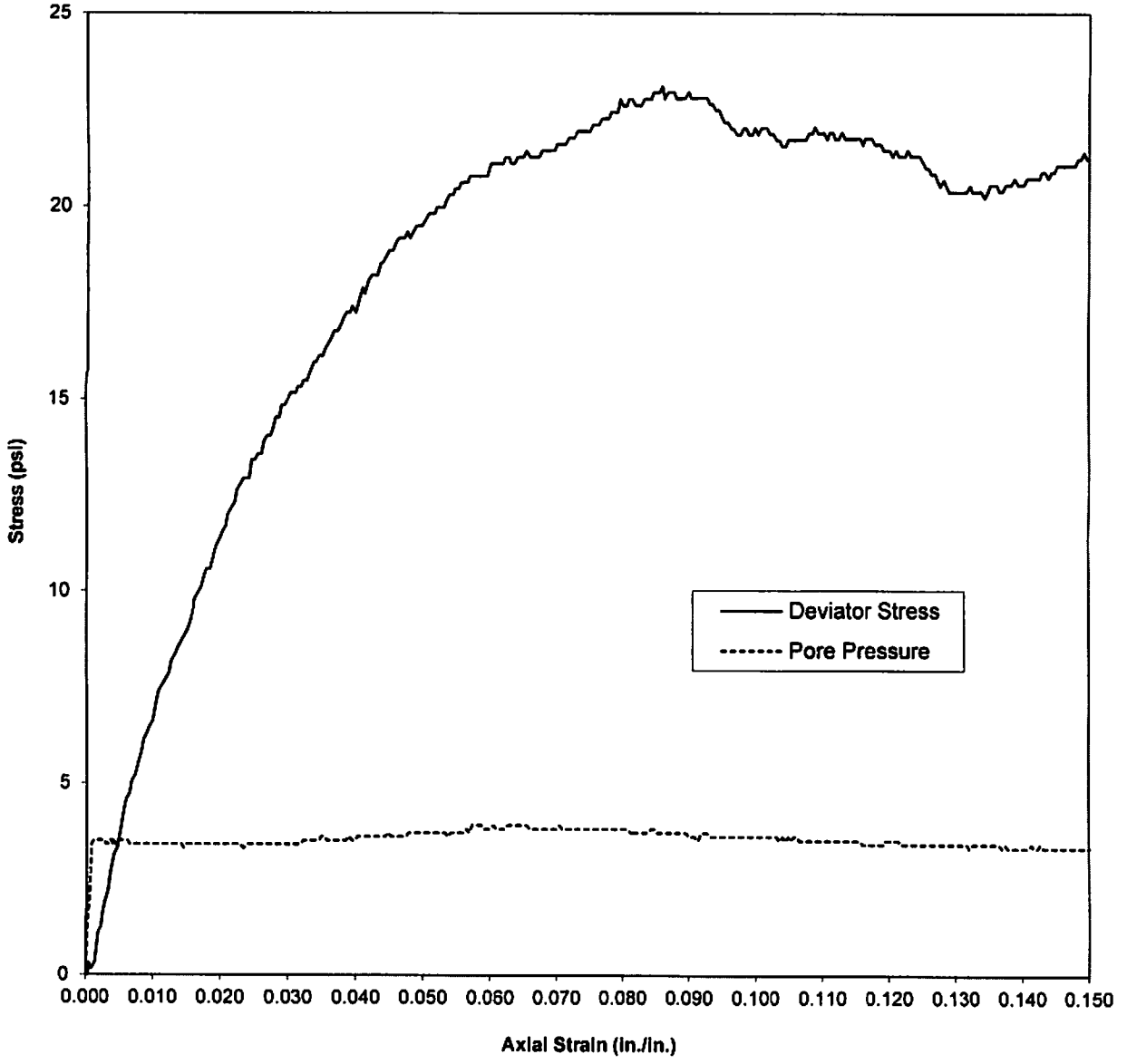


ATLANTIC TESTING LABORATORIES

ARCADIS
Black Ash Pond, Willsboro, New York
ATL Report No. CD3350SL-10-12-11

Consolidated-Undrained Triaxial Compression Test
ASTM D 4767

Deviator Stress and Pore Pressure
12.0 psi

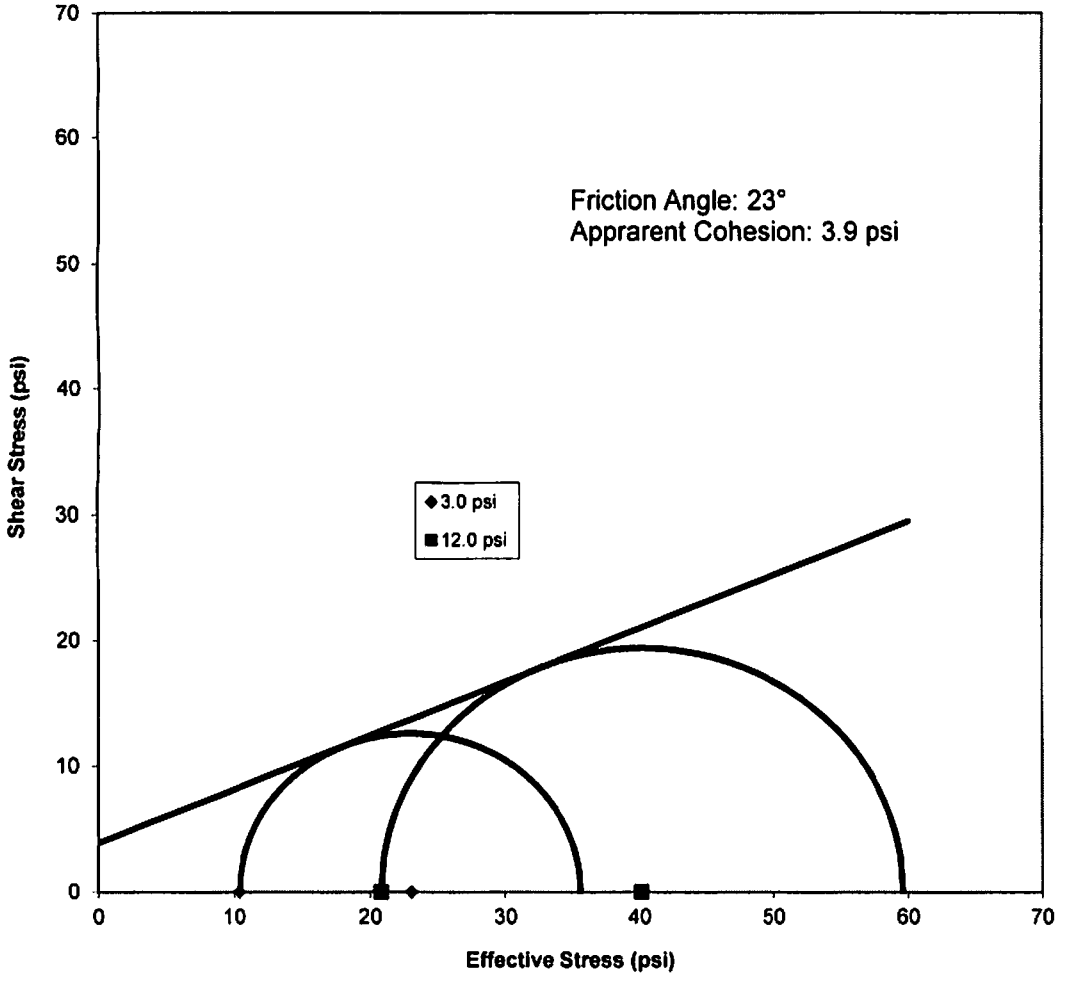


ATLANTIC TESTING LABORATORIES

ARCADIS
Black Ash Pond, Willsboro, New York
ATL Report No. CD3350SL-10-12-11

Consolidated-Undrained Triaxial Compression Test
ASTM D 4767

Mohr's Circle for Effective Stress



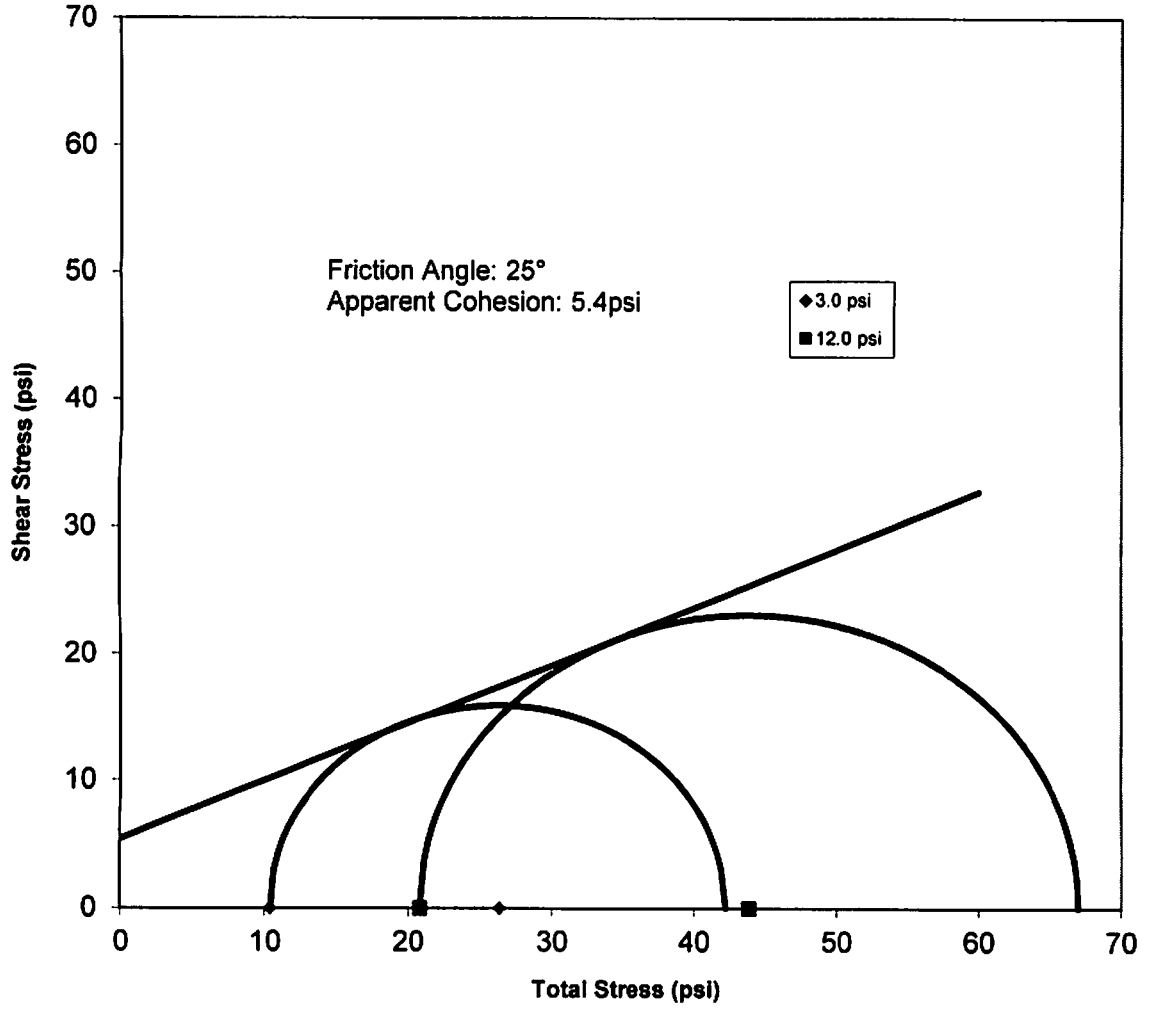
Confining Stress (psi)	Major Principal Stress (psi)	Minor Principal Stress (psi)
3.0	23.0	10.4
12.0	40.2	20.8

ATLANTIC TESTING LABORATORIES

ARCADIS
Black Ash Pond, Willsboro, New York
ATL Report No. CD3350SL-10-12-11

Consolidated-Undrained Triaxial Compression Test
ASTM D 4767

Mohr's Circle for Total Stress



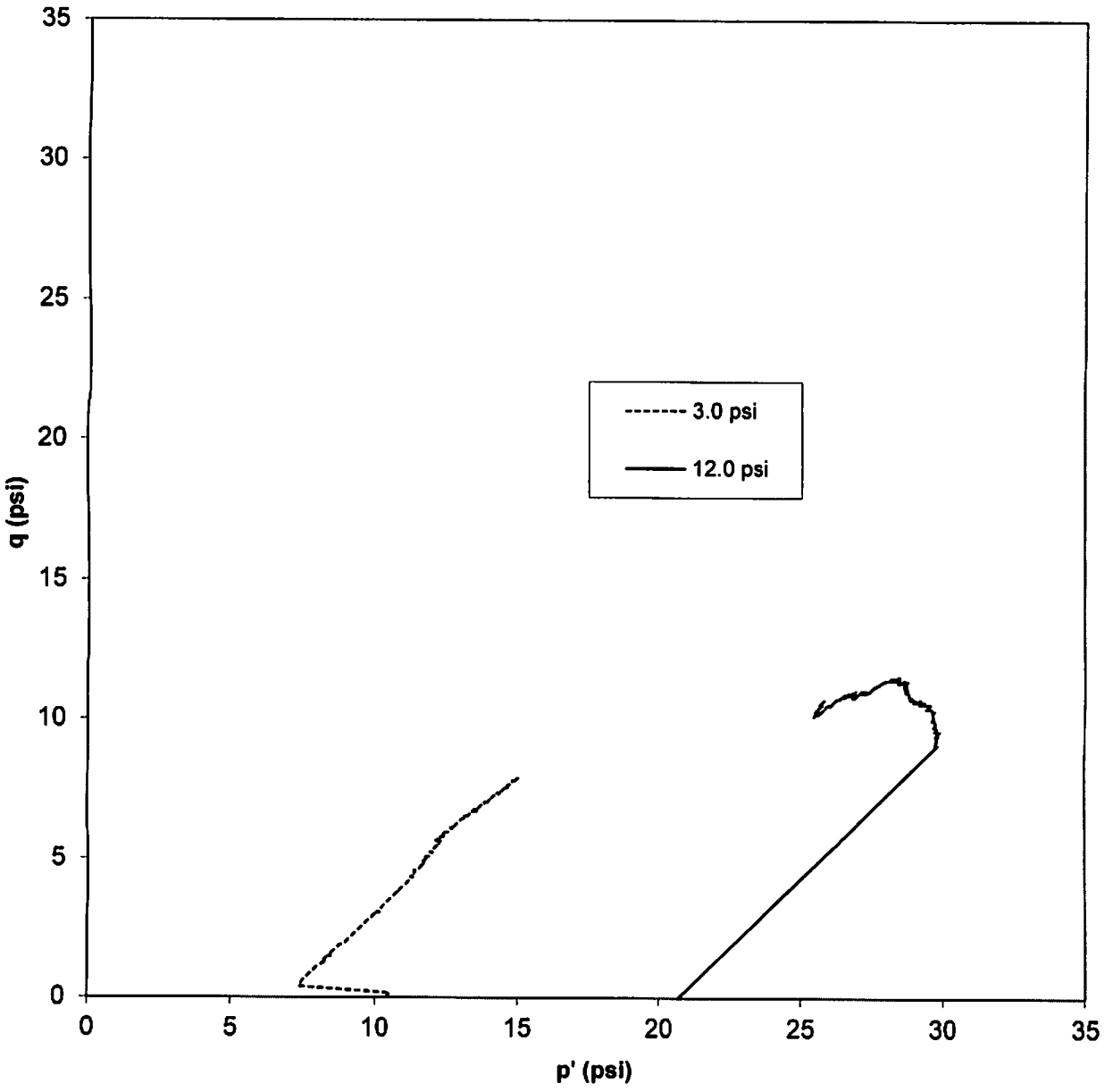
Confining Stress (psi)	Major Principal Stress (psi)	Minor Principal Stress (psi)
3.0	26.3	10.4
12.0	43.9	20.8

ATLANTIC TESTING LABORATORIES

ARCADIS
Black Ash Pond, Willsboro, New York
ATL Report No. CD3350SL-10-12-11

Consolidated-Undrained Triaxial Compression Test
ASTM D 4767

p' vs. q



PARTICLE SIZE ANALYSIS RESULTS

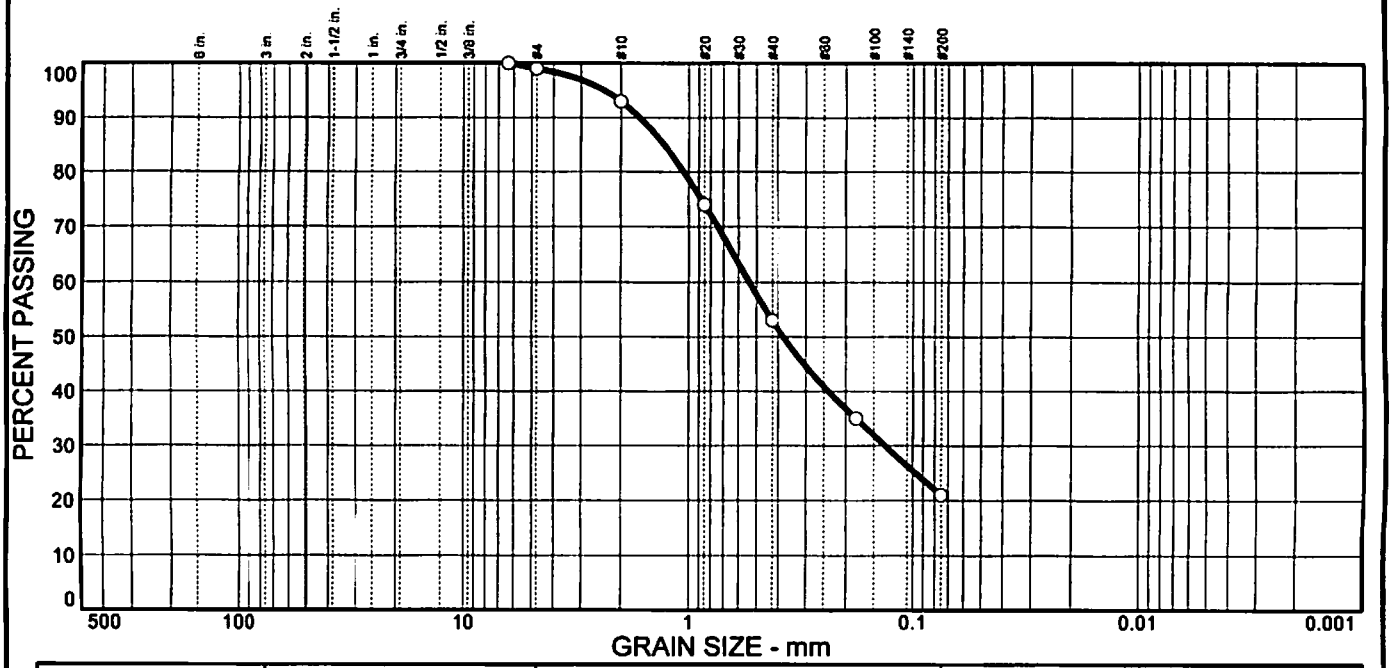
Particle Size Distribution Report

Project: Black Ash Pond, Willsboro, New York **Report No.:** CD3350SL-10-12-11

Client: ARCADIS **Date:** 12/29/11

Sample No: B-3; S-4 **Source of Sample:** Shleby Tube Sample

Location: In-Situ **Elev./Depth:** 6.0 - 8.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	1	6	40	32	21	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/4 in.	100		
#4	99		
#10	93		
#20	74		
#40	53		
#80	35		
#200	21		

Soil Description

Black Ash

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 1.29 D_{60}= 0.540 D_{50}= 0.379

D_{30}= 0.133 D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture content 373%

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 1/5/11

ATTACHMENT D

GEOTECHNICAL ANALYTICAL RESULTS FROM TEST PIT PROGRAM

TABLE OF MOISTURE CONTENT AND SPECIFIC GRAVITY RESULTS

ATLANTIC TESTING LABORATORIES

ARCADIS
Former Black Ash Pond
Willsboro, New York
ATL Report No. CD3350D-12-11

Table of Laboratory Values

Test Pit	Depth (ft)	Moisture Content (%)	Specific Gravity
TP-1	0.0 – 6.0	--	1.872
TP-3	0.0 – 12.0	--	1.882
TP-7	7.0 – 10.0	120.8	--
TP-11	1.0 – 5.0	355.3	--
TP-12	1.0 – 15.0	--	1.849
TP-14	Composite	337.3	--
TP-15	1.0 – 5.0	387.1	--

PARTICLE SIZE ANALYSIS RESULTS

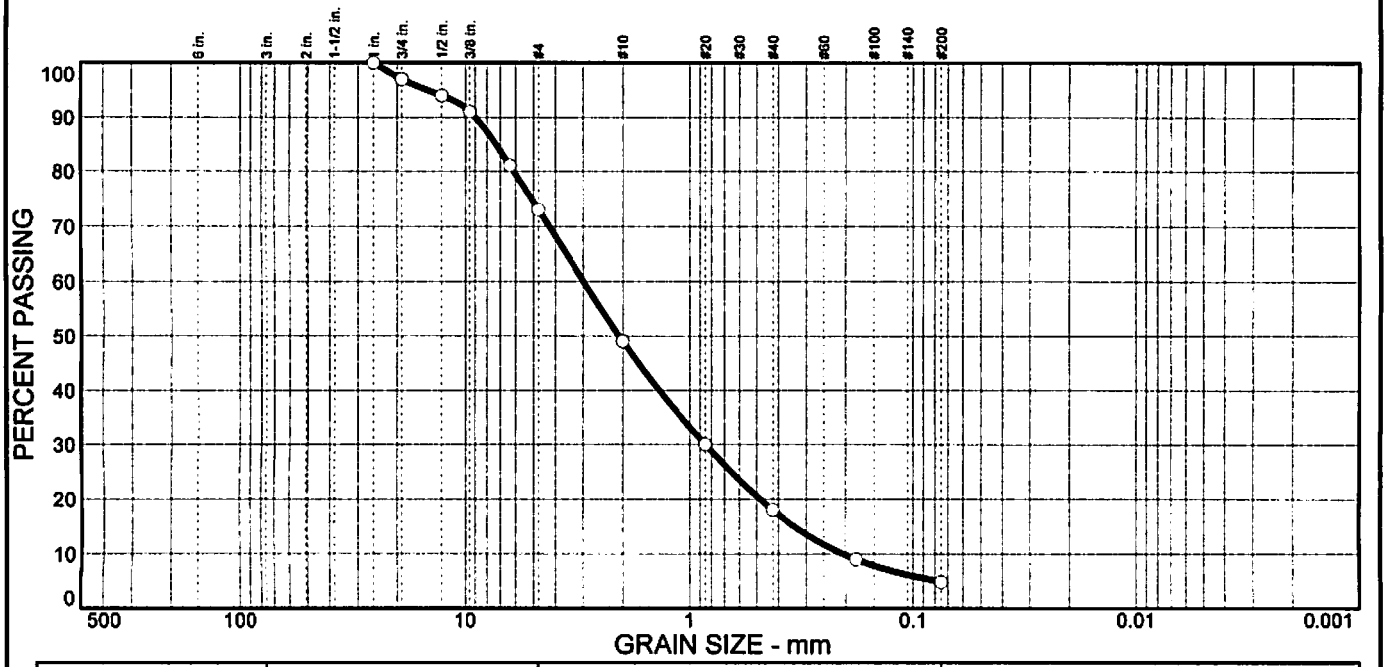
Particle Size Distribution Report

Project: Black Ash Pond, Willsboro, New York **Report No.:** CD3350SL-01-12-11

Client: ARCADIS **Date:** 12/6/11

Sample No: TP-1 **Source of Sample:** Test Pit Sample

Location: In-situ **Elev./Depth:** 0.0 - 6.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	3	24	24	31	13	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1 in.	100		
3/4 in.	97		
1/2 in.	94		
3/8 in.	91		
1/4 in.	81		
#4	73		
#10	49		
#20	30		
#40	18		
#80	9		
#200	4.9		

* (no specification provided)

Soil Description

Black Ash and Slag

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 7.33 D_{60}= 3.00 D_{50}= 2.08

D_{30}= 0.850 D_{15}= 0.339 D_{10}= 0.206

C_u= 14.55 C_c= 1.17

Classification

USCS= AASHTO=

Remarks

Specific gravity 1.872

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/8/11

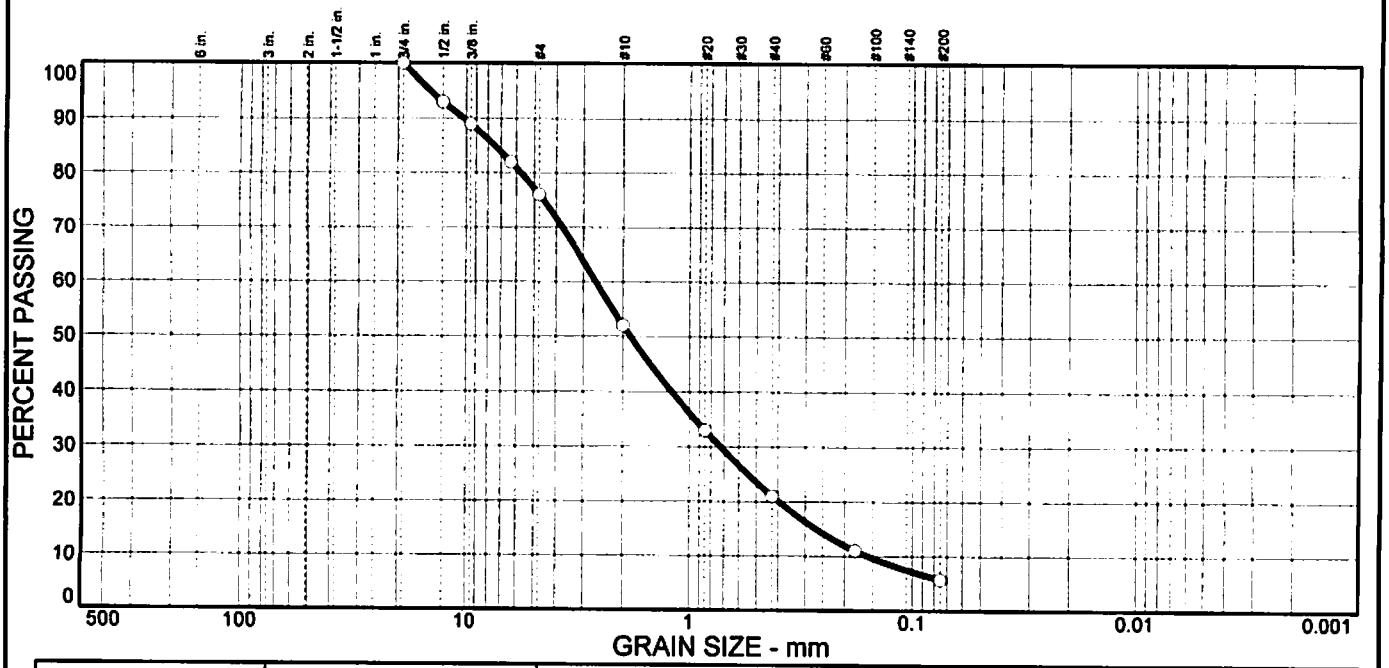
Particle Size Distribution Report

Project: Black Ash Pond, Willsboro, New York **Report No.:** CD3350SL-02-12-11

Client: ARCADIS **Date:** 12/6/11

Sample No: TP-3 **Source of Sample:** Test Pit Sample

Location: In-situ **Elev./Depth:** 0.0 - 12.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	24	24	31	15	6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
3/4 in.	100		
1/2 in.	93		
3/8 in.	89		
1/4 in.	82		
#4	76		
#10	52		
#20	33		
#40	21		
#80	11		
#200	5.7		

Soil Description

Black Slag

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 7.47 D_{60}= 2.65 D_{50}= 1.85

D_{30}= 0.724 D_{15}= 0.270 D_{10}= 0.158

C_u= 16.74 C_c= 1.25

Classification

USCS= AASHTO=

Remarks

Specific gravity 1.882

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/8/11

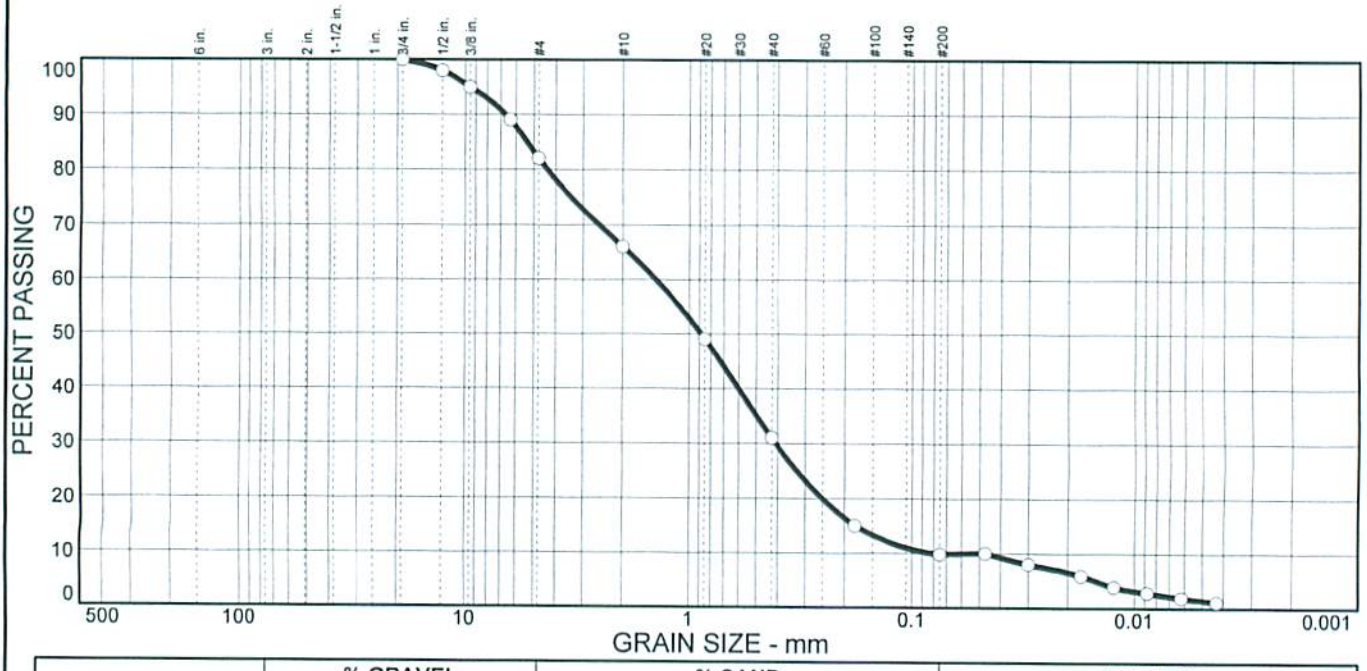
Particle Size Distribution Report

Project: Black Ash Pond, Willsboro, New York **Report No.:** CD3350SL-04-12-11

Client: ARCADIS **Date:** 12/6/11

Sample No: TP-7 **Source of Sample:** Test Pit Sample

Location: In-situ **Elev./Depth:** 7.0 - 10.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	18	16	35	21	8	1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
3/4 in.	100		
1/2 in.	98		
3/8 in.	95		
1/4 in.	89		
#4	82		
#10	66		
#20	49		
#40	31		
#80	15		
#200	9.8		

* (no specification provided)

Soil Description

Black Ash

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 5.36 D_{60}= 1.42 D_{50}= 0.886

D_{30}= 0.408 D_{15}= 0.180 D_{10}= 0.0472

C_u= 30.17 C_c= 2.48

Classification

USCS= AASHTO=

Remarks

Moisture content 120.8%

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/8/11

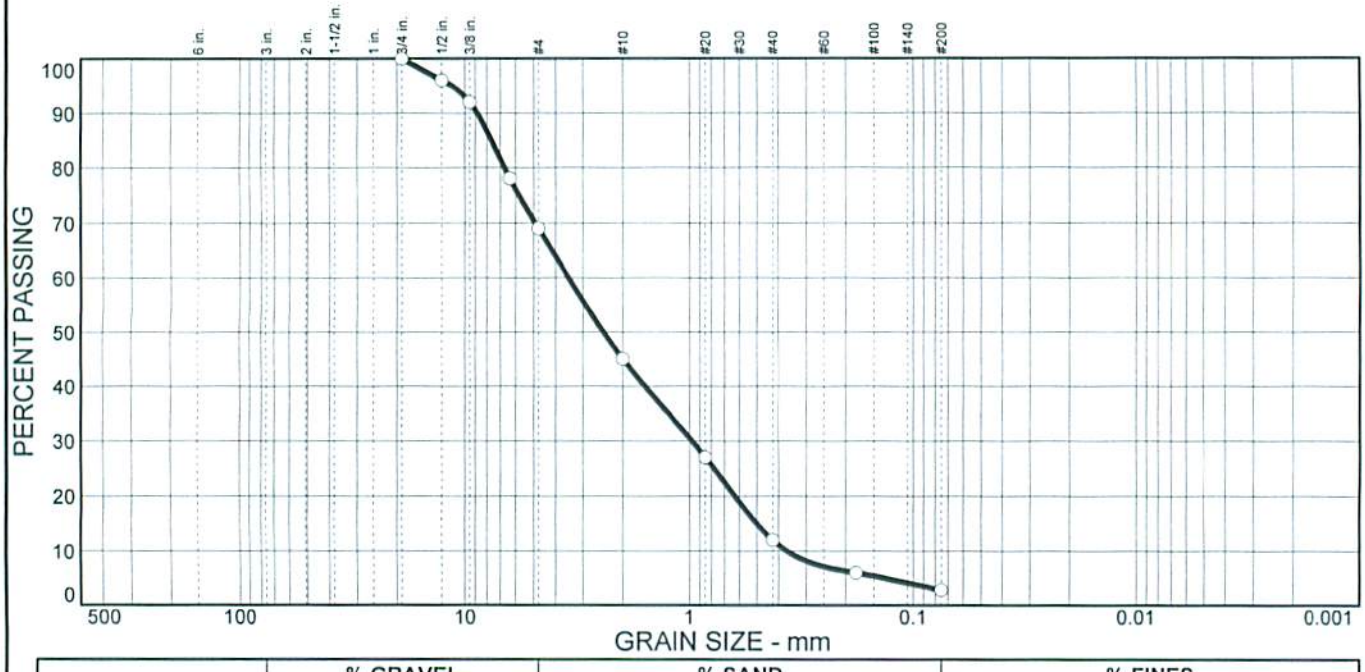
Particle Size Distribution Report

Project: Black Ash Pond, Willsboro, New York **Report No.:** CD3350SL-05-12-11

Client: ARCADIS **Date:** 12/6/11

Sample No: TP-8 **Source of Sample:** Test Pit Sample

Location: In-situ **Elev./Depth:** 4.0 - 6.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	31	24	33	9	3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
3/4 in.	100		
1/2 in.	96		
3/8 in.	92		
1/4 in.	78		
#4	69		
#10	45		
#20	27		
#40	12		
#80	6		
#200	2.8		

* (no specification provided)

Soil Description

Black Cinders and Slag

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 7.65 D_{60}= 3.49 D_{50}= 2.44

D_{30}= 0.976 D_{15}= 0.502 D_{10}= 0.367

C_u= 9.52 C_c= 0.74

Classification

USCS= AASHTO=

Remarks

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/8/11

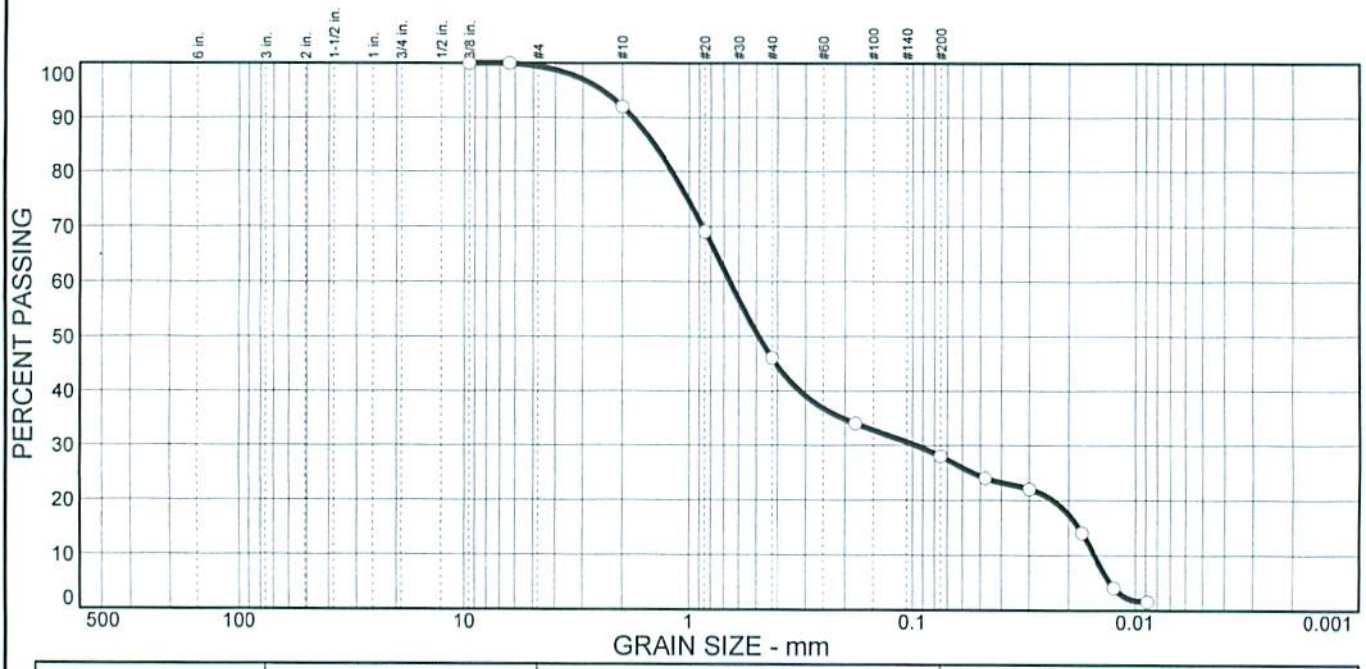
Particle Size Distribution Report

Project: Black Ash Pond, Willsboro, New York **Report No.:** CD3350SL-06-12-11

Client: ARCADIS **Date:** 12/6/11

Sample No: TP-11 **Source of Sample:** Test Pit Sample

Location: In-situ **Elev./Depth:** 1.0 - 5.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	1	7	46	18	28	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
3/8 in.	100		
1/4 in.	100		
#10	92		
#20	69		
#40	46		
#80	34		
#200	28		

* (no specification provided)

Soil Description

Black Ash

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 1.44 D_{60}= 0.659 D_{50}= 0.490

D_{30}= 0.0968 D_{15}= 0.0181 D_{10}= 0.0153

C_u= 43.04 C_c= 0.93

Classification

USCS= AASHTO=

Remarks

Moisture content 355.3%

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/8/11

Particle Size Distribution Report

Project: Black Ash Pond, Willsboro, New York **Report No.:** CD3350SL-07-12-11

Client: ARCADIS **Date:** 12/6/11

Sample No: TP-12 **Source of Sample:** Test Pit Sample

Location: In-situ **Elev./Depth:** 1.0 - 15.0'

% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	7	19	31	13	30	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
3/4 in.	100		
1/2 in.	98		
3/8 in.	96		
1/4 in.	95		
#4	93		
#10	74		
#20	54		
#40	43		
#80	35		
#200	30		

Soil Description

Black Ash

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 3.07 D_{60}= 1.13 D_{50}= 0.683

D_{30}= 0.0750 D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Specific gravity 1.849

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/8/11

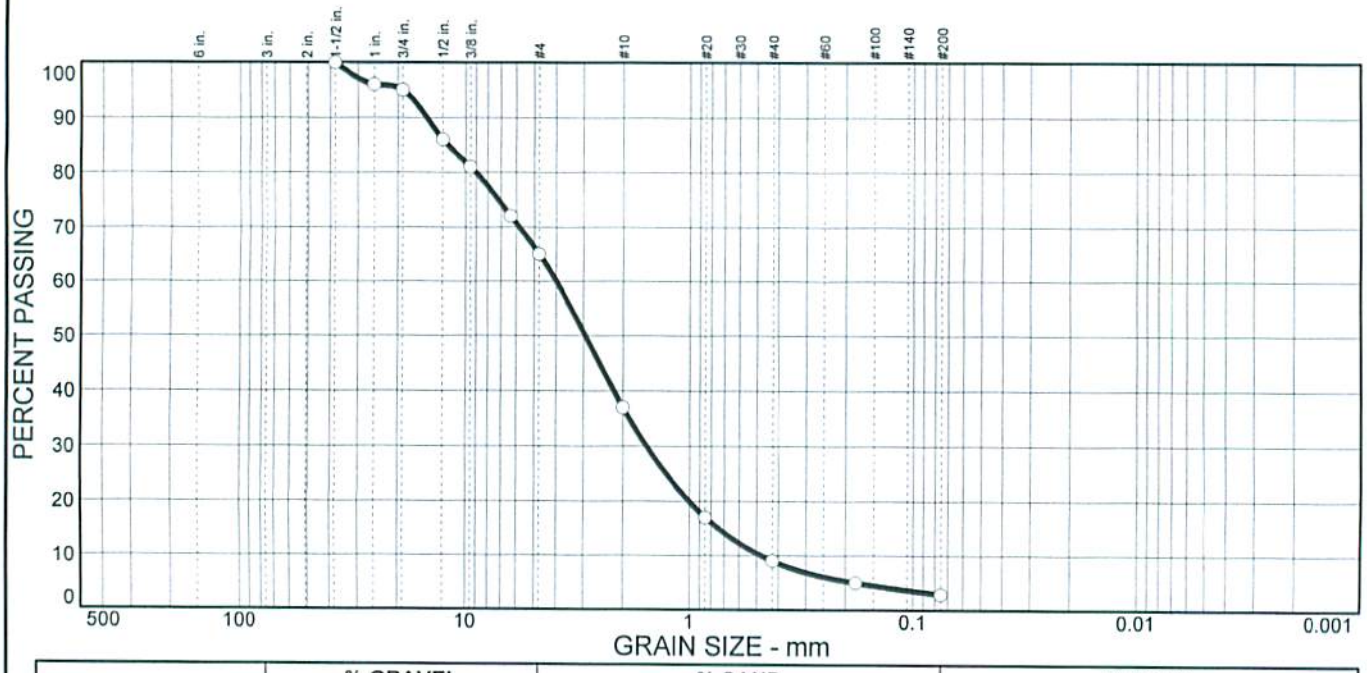
Particle Size Distribution Report

Project: Black Ash Pond, Willsboro, New York **Report No.:** CD3350SL-08-12-11

Client: ARCADIS **Date:** 12/6/11

Sample No: TP-13 **Source of Sample:** Test Pit Sample

Location: In-situ **Elev./Depth:** --



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	5	30	28	28	6	3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1.5 in.	100		
1 in.	96		
3/4 in.	95		
1/2 in.	86		
3/8 in.	81		
1/4 in.	72		
#4	65		
#10	37		
#20	17		
#40	9		
#80	5		
#200	2.9		

* (no specification provided)

Soil Description

Black Slag

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 12.1 D_{60}= 3.99 D_{50}= 2.95

D_{30}= 1.57 D_{15}= 0.745 D_{10}= 0.480

C_u= 8.32 C_c= 1.28

Classification

USCS= AASHTO=

Remarks

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/8/11

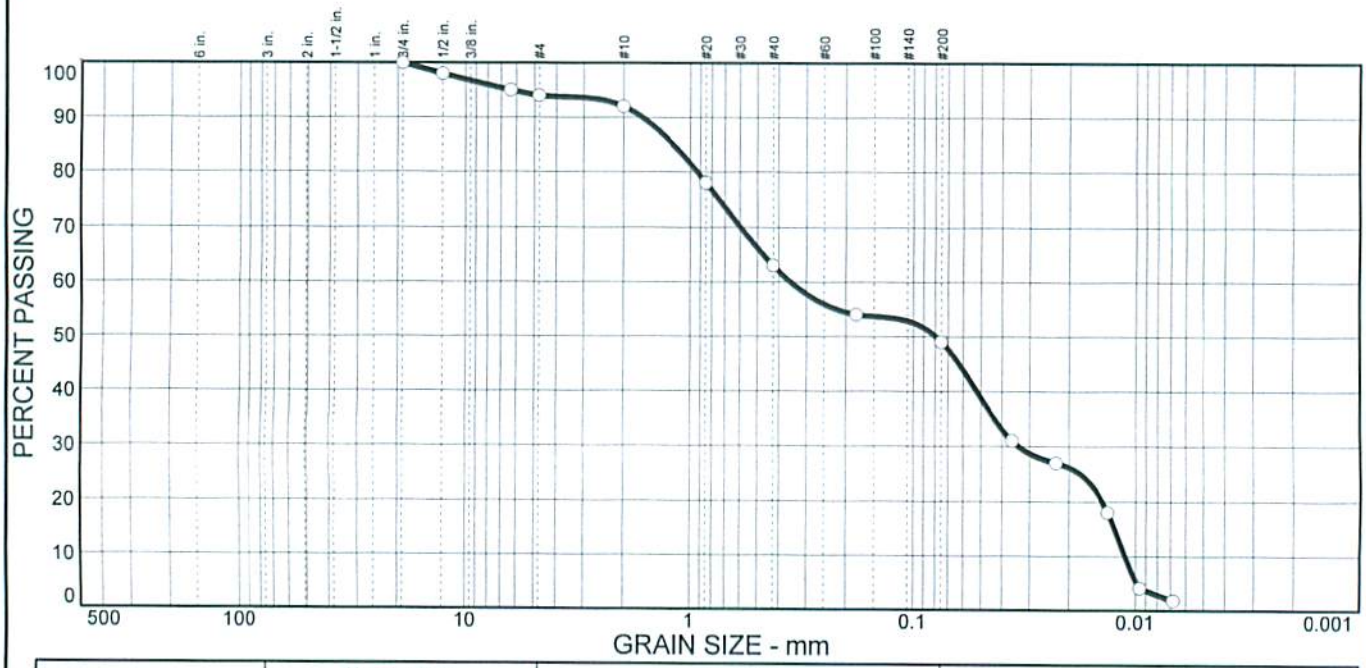
Particle Size Distribution Report

Project: Black Ash Pond, Willsboro, New York **Report No.:** CD3350SL-09-12-11

Client: ARCADIS **Date:** 12/6/11

Sample No: TP-15 **Source of Sample:** Test Pit Sample

Location: In-situ **Elev./Depth:** 1.0 - 5.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	6	2	29	14	49	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
3/4 in.	100		
1/2 in.	98		
1/4 in.	95		
#4	94		
#10	92		
#20	78		
#40	63		
#80	54		
#200	49		

* (no specification provided)

Soil Description

Black Ash

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 1.20 D_{60}= 0.354 D_{50}= 0.0795

D_{30}= 0.0337 D_{15}= 0.0125 D_{10}= 0.0112

C_u= 31.69 C_c= 0.29

Classification

USCS= AASHTO=

Remarks

Moisture content 387.1%

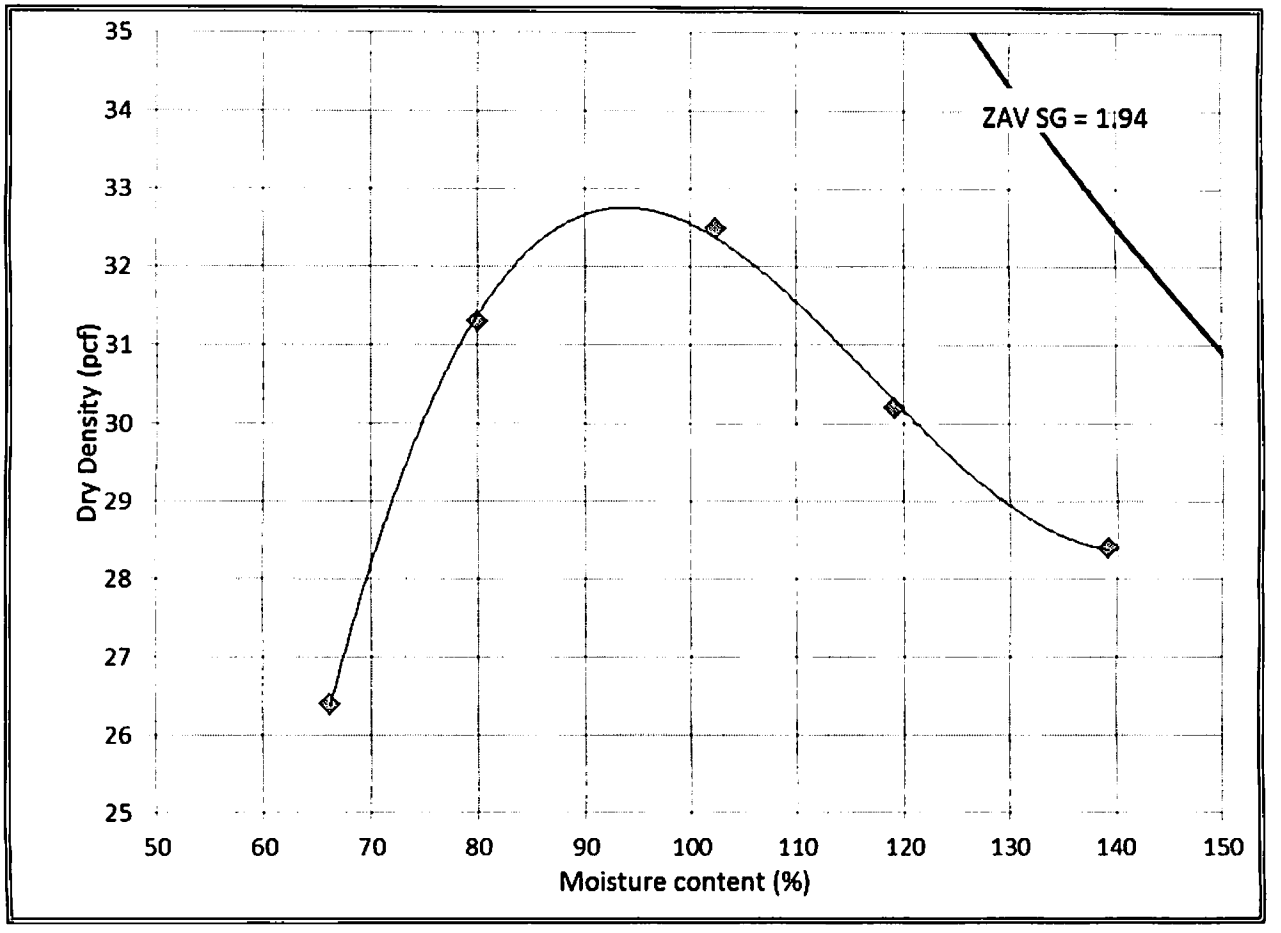
ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/8/11

LABORATORY COMPACTION TEST
USING MODIFIED EFFORT

LABORATORY COMPACTION TEST
ASTM D 1557

ATL Sample No.	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Method Used	Preparation	Rammer	Material Coarser than 3/8" (%)	Assumed Specific Gravity*
S-1	32.8	93.8	B	Dry	Mechanical	3	1.94



Note: Sample S-1 is a composite sample of TP-4, -7, -11, -12, -14, and -15.