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**APPENDIX A.5  
EAST COVE GEOTECHNICAL BORINGS  
ECGT01 THROUGH ECGT03**

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# OVERBURDEN BORING LOG

<b>CLIENT:</b>	Confidential
<b>SITE NAME:</b>	Cottage Grove, MN Facility
<b>PROJECT NO.:</b>	02181-002-050-0001
<b>Area Name:</b>	EAST COVE
<b>Drilling Contractor:</b>	American Engineering Testing
<b>Drilling Equipment:</b>	HSA
<b>Logged By:</b>	D. Cairns
<b>Area Description:</b>	East Cove
<b>ELEVATION (GND):</b>	4958906.616760
<b>GPS NORTHING:</b>	508453.562796
<b>GPS EASTING:</b>	0
<b>Depth to Water (ft bgs):</b>	18
<b>Total Boring Depth (ft bgs):</b>	na
<b>Depth to Refusal (ft bgs):</b>	0
<b>Boring Diameter (inches):</b>	0
<b>Location Type:</b>	( ) GeolProbe ( ) Well
<b>Completion Zone:</b>	(X) Overburden ( ) Bedrock
<b>Completion Type:</b>	( ) Monitoring Well
<b>Other Comments:</b>	(X) Abandoned by Grant ( ) Other (Provide Comments)

Interval	Sample Interval (ft bgs)	Blow Count			Recovery (ft)	Moisture	Color	Grain Size					Consistency	Sample Interval (ft bgs)	Column	Lithologic Description
		6" 1	6" 2	6" 3				Gr	S	SI	CI	O				
0 - 2	0 0.6	W	H	H	1	0.6	Wet	10YR 2/1	5	90				5		Black f.g. - m.g. SAND, trace gravel and organics, some v.e.g. sand and pea gravel observed locally, moderate sorting, slight solvent odor
2 - 4	2 2.7	2	1	H	H	0.7	Wet	10YR 2/1	10	90						Black f.g. - c.g. SAND with few gravel particles, poor sorting, gravel horizon at 2.7 blocked shoe for recovery.
4 - 6	4 4.1	H	H	H	H	1.8	Wet	10YR 2/1	15	90						Black SAND with few gravel particles, as above
	4.1 4.7							10YR 4/1	70	30						Dark gray silty v.f.g. - f.g. SAND, sand well-sorted
	4.7 5.8							10YR 3/1	5	60	35					Variogated very dark gray to gray clayey SILT with trace clay particles, mucky texture, very soft, solvent odor
6 - 8	6 6.1	H	H	H	H	0.1	Wet	10YR 4/1	85	15	5					Dark gray v.f.g. - f.g. SAND with little silt and trace clay particles, slight solvent odor, sediment surface with "metallic" luster (light above)
																Sand thought to have prevented collection of mucky sediment in interval
8 - 10	8 9.2	H	1	2	1.7		Wet	10YR 2/1	10	70	20					Black SILT with little clay and few sand particles, mucky texture with light above on surfaces.
	9.2 9.7							10YR 4/1	2	58	20	20				Color change to lighter gray at 9.0 ftgs.
																Dark gray SILT with little clay and organics, trace sand, more competent, f.g. texture makes it difficult to quantify organic content in field, no fibrous organic texture observed, slight solvent odor
10 - 12	10 11.2	1	1	2	3	1.7	Wet	10YR 3/1	5	50	25	20				Very dark brown organic SILT, as above, organic material becoming coarser, more fibrous
	11 11.7							10YR 3/2			50	20	30			Very dark brown organic SILT with little clay, coarse "peaty" texture with visible organic fibers
12 - 14	12 13.3	H	2	1	2	1.3	Mst	10YR 2/2	10	10	10	70				Very dark brown PEAT with few sand, silt, and clay particles, coarse peaty texture, fibrous
	14 15.6							10YR 3/2								Very dark brown PEAT with few sand, silt, and clay particles, coarse peaty texture, fibrous
	15.6 15.9						Wet	10YR 3/1	5	87	5	3				Very dark gray f.g. - m.g. SAND with trace gravel, silt, and organic particles
16 - 18	16 17	H	1	2	2	1	Wet	10YR 3/1	5	20	35	40				Very dark gray clayey PEAT with little silt and trace v.f.g. - f.g. sand, organics vary vertically from predominantly mineral to predominantly organic interbeds.
																Boring terminated at 18 ftgs. Boring abandoned.

Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)      f.g. m.g. e.g.: Fine-, Medium-, and Coarse-grained      fgs.: feet below ground surface or sediment surface      Consistency: Very Soft (V. SO), Soft, Firm, Very Firm (V. Fm), Loose

# OVERBURDEN BORING LOG

**SITE ID: ECGT02**

Page 1 of 1 DATE / (TIME): 27 June 2008

<b>CLIENT:</b> Confidential Cottage Grove, MN Facility 02181-002-050-0001 <b>Area Name:</b> EAST COVE <b>Drilling Contractor:</b> American Engineering Testing <b>Drilling Equipment:</b> HSA <b>Logged By:</b> D. Cairns <b>Area Description:</b> East Cove	<b>ELEVATION (GND):</b> 4958936.636410 <b>GPS NORTHING:</b> 508452 069654 <b>GPS EASTING:</b> 0 Depth to Water (ft bgs): 16 Total Boring Depth (ft bgs): na Depth to Refusal (ft bgs): 6 Boring Diameter (inches): ( ) Other (Provide Comments)	<b>Location Type:</b> ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other <b>Completion Zone:</b> (X) Overburden ( ) Bedrock <b>Completion Type:</b> ( ) Monitoring Well (X) Abandoned by Grant ( ) Other (Provide Comments)
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Interval	Sample Interval (ft bgs)			Recovery (ft)	Moisture	Color	Grain Size					Consistency	Sample Interval (ft bgs)	Column	Lithologic Description
	6"	6"	6"				Gr	S	SI	Cl	O				
0-2	0	1.1	H 1 1	R 1.8	Wet	10YR 4/1	95	3	2			2	Soft		Dark Gray SAND, lg. - eg. poorly sorted, primarily quartz grains, trace silt and organic particles
	1.1	1.6			Wet	10YR 2/1	5	92	3				Soft		Black f.g. - c.g. SAND with trace gravel and silt, graded becoming coarser with depth. Gravel up to 0.5 inch.
	1.6	1.8			Wet	10YR 2/1	10	60	30				V-SH		Black clayey SILT with few f.g. sand particles, apparent sheen on surface, odor, mucky
2-4	2	2.5	H H H	H 0.5	Wet	10YR 2/1	5	55	30	10			V-SH		Black clayey SILT with trace f.g. sand and few organics, apparent sheen on surface, solvent odor, mucky
4-5.5	4	4.8	H H H	H 0.8	Wet										
5.5-7.5	5.5	6.3	R H H	H 2											As above
	6.3	6.8			Wet	10YR 3/1	5	70	20	5			Soft		As above
	6.9	7.5			Wet	10YR 3/1	3	60	35	2			Soft		Black SILT with little clay, and trace v.f.g. - f.g. sand and organics as lenses or laminae, slightly more competent contact at 6.8 with underlying mineral soil marked by gray-white "clay" (bentonite-like) texture ~2mm thick
7.5-9	7.5	8	H H 1	1 0.9	Wet	10YR 3/1	3	60	35	2			Soft		Very dark gray clayey silt with trace sand and organics, competent blocky texture, fractures underlying "contact" with gray-white material to approximately 5 centimeters below contact, (7.5 - 9 ) As Above, increased organics
	8	8.4			Wet	10YR 3/1	5	20	5	70			Soft		Very dark gray PEAT with little silt, few sand, and trace clay particles, Peat medium-grained with mineral laminae observed
9-11	9	10.7	H 2 1	2 1.7	Wet	10YR 3/1	10	7	3	80			Soft		Very dark gray to dark brown PEAT with few sand and silt, and trace clay particles, sand occurs primarily in lenses and laminae (9.3-9.32, 9.65-9.7)
11-12.5	11	11.6	H 1 2	1 0.6	Mst	10YR 3/3	4	4	2	90			Firm		Dark brown PEAT, coarse, fibrous, with trace sand, silt, and clay particles as laminae and lenses.
12.5-14.5	12.5	14	H 1 3	4 1.9	Wet	10YR 3/2	10	60		20			Soft		Very dark gray brown SILT with little organics, and few sand particles, interbedded as silt and organic silt.
	14	14.4			Wet	10YR 3/2	99	1					Loose		Very dark brown c.g. - v.c.g. SAND with trace silt, sub-rounded to sub-angular, poorly sorted
14.5-16	14.5	15	1 3 4	0.5	Wet	10YR 5/2	99	1					Loose		Grayish brown c.g. to v.c.g. SAND with trace silt, grading to m.g. to c.g. sand with depth, primarily quartz grains sub-rounded.
															Boring terminated at 16 ft bgs. Boring abandoned.

Figs. : feet below ground surface or sediment surface  
 Fig., mg., c.g. : Fine, Medium, and Coarse-grained  
 Moisture, Dry, Moist (Mst), Wet, Saturated (Sat)  
 Consistency, Very Soft (V. Sft), Soft, Firm, Very Firm (V. Firm), Loose

# OVERBURDEN BORING LOG

**SITE ID: ECGT03**

Page 1 of 1 DATE / (TIME): 27 June 2008

**CLIENT:** Confidential  
**SITE NAME:** Cottage Grove, MN Facility  
**PROJECT NO.:** 02181-002-050-0001  
**Area Name:** EAST COVE  
**Drilling Contractor:** American Engineering Testing  
**Drilling Equipment:** HSA  
**Logged By:** D. Cairns  
**Area Description:** East Cove  
 Depth to Sediment = 0.1 ft below top-of-water  
 Approximately 460 feet upstream from mouth of creek.

**ELEVATION (GND):**  
**GPS NORTHING:**  
**GPS EASTING:**  
 Depth to Water (ft bgs)  
 Total Boring Depth (ft bgs)  
 Depth to Refusal (ft bgs)  
 Boring Diameter (inches):

**4958989.325540**  
**508471.609059**  
 0  
 16  
 na  
 6  
 Location Type: ( ) GeoProbe ( ) Well  
 ( ) Soil Boring ( ) Other:  
 Completion Zones: (X) Overburden ( ) Bedrock  
 Completion Type: ( ) Monitoring Well  
 (X) Abandoned by Grout  
 ( ) Other (Provide Comments)

Interval	Sample Interval (ft bgs)	Blow Count			Recovery (ft)	Moisture	Color	Grain Size					Consistency	Sample Interval	Column	Lithologic Description	
		6"	6"	6"				Gr	S	SI	Cl	O					
0 - 2	0	0.5	1	1	1	H	0.5	Wet	10YR 3/1	20	75	5				Loose	Very dark gray c.g. to v.e.g. SAND with gravel, pea gravel to 1.1 inch diameter, sub-angular to sub-rounded poorly sorted.
2 - 4	2	3.1	R	H	3	4	1.1	Wet	10YR 2/1	90	10					Loose	Black m.g. to c.g. SAND with a few silt-sized particles, sand moderately sorted with a light sheen (metallic luster)
4 - 5.5	4	4.15	H	1	1	1	0.2	Wet	10YR 2/1	90	10					Loose	As above
		4.15	4.2						10YR 2/1	90	5	5				Loose	Black v.f.g. to m.g. SAND with trace silt and organics (wood fragments), poorly sorted sand
5.5 - 7.5	5.5	6.4	H	H	5	5	0.9	Wet	10YR 3/1	40	40	20				Soft	Very dark gray f.g. silty SAND to f.g. sandy SILT with little organics (fibrous)
7.5 - 9	7.5	7.9	1	1	1	1	0.4	Wet	10YR 4/1	10	80	10				Soft	Interbedded Dark gray f.g. to c.g. SAND, with few gravel (pea) and silt particles, poor sorting and
										40	40	20				Soft	Dark gray f.g. silty SAND to f.g. sandy SILT with little organics, beds 0.05 to 0.15 ft thick
9 - 11	9	9.6	1	3	5	7	1.5	Wet	10YR 3/1	2	95	3				Loose	Very dark gray f.g. to c.g. SAND, trace gravel (pea) and silt particles, very poor sorting
		9.6	10.5						10YR 3/1	2	40	18				Soft	Very dark gray silty f.g. - m.g. SAND to f.g. - m.g. sandy SILT with little organics, thinly bedded, with fibrous "peaty" beds and mineral beds with little organic content.
11 - 12.5	11	11.8	2	3	4	4	0.8	Wet	10YR 3/1	5	90	5				Loose	Very dark gray m.g. to c.g. SAND, trace gravel and silty particles, sand moderately sorted.
12.5 - 14.5	12.5	12.9	1	1	2	3	1.1	Wet	10YR 4/1	5	90	5				Loose	As above
		12.9	13.3							5	87	5	3			Loose	As above with organic "peaty" laminae to thin beds
		13.3	13.6													Loose	Very dark gray m.g. to c.g. SAND, trace gravel and silty particles, sand moderately sorted.
14.5 - 16	14.5	14.6	H	1	2	2	0.1		10YR 4/2	5	90	5				Loose	As above, with trace v.e.g. sand laminae
																Loose	Boring terminated at 16 feet below top of sediment.

Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)      E.g., m.g., c.g., Fine-, Medium-, and Coarse-grained      fgs.: feet below ground surface or sediment surface      Consistency: Very Soft (V. Sft), Soft, Firm, Very Firm (V. Fm), Loose