Appendix A

Boring Logs and Well Construction Diagrams

AECOM	Client: CLEAN HARBORS	WELL ID: PF-20B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: 100'ft south of barn on Tract F	Sheet: 1 of 2
Logged By: Ashlin	Coordinates:	Well Inst.: 1" piezometer
Weather: 40°F, Clear	Sample Type(s): 2" Φ Acetate sleeve for logging only	Screen Interval: 22.2-32.2
Drilling Method: Direct Push / Geoprobe	Date/Time Started: 1/9/2012 1045	Depth of Boring: 32.5
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 1/9/2012 1215	Water Level: 13.4' bgs
Boring Diameter: 3.25" Φ	Ground Elevation:	Checked by: JAA

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
					expansion cap stickup 2.2'
1		Not Screened	CL	6" GRASS, ROOTS, VEGETATION MATERIALS LEAN CLAY WITH SAND: dark yellowish brown (10YR 3/6), moist, 85% high plasticity fines, 15% fine sand. No dilatancy, high toughness, high dry strength (1.8)	2" x 5' Φ Acetate ~~Macrocore~~ w/sand catcher
2					
3	60			LEAN CLAY (CL): brown (10YR 4/3), moist, 95% high plasticity fines, 5% fine sand. No dilatancy, high toughness, high dry strength. No observed staining or odor.	
4					1" Φ SCH 40 PVC RISER
5					
6				↓ yellowish brown (10YR 5/8) primarily color mottling w/brown and black. Trace crystalline material (calcite?) in 2 fracture zones	
7			CL		
8	60				
9					
10					
11					
12					
13	60			↓ (12.6) 90% high plasticity fines, 10% fine sand	~~12.2' BGS~~
14				(13.5) LEAN CLAY WITH SAND (CL): 85% high plasticity fines, 15% fine sand, some silt present. No dilatancy, Moderate to low toughness, high dry strength. Brownish yellow (10YR 6/6) ~~wet. No observed odor or staining~~	▽ (13.4) 1/10/7
15			CL		
16					
17			CL	LEAN CLAY (same as 12.5' bgs), moist	
18	60		CL	LEAN CLAY WITH SAND (same as 13.5' bgs), moist	
19			SM	(17.8) CLAYEY SAND (SM): wet, brownish yellow (10YR 6/6), 70% very fine sand, 30% fines, some silt present. (19.5)	
20				SEE NEXT PAGE	

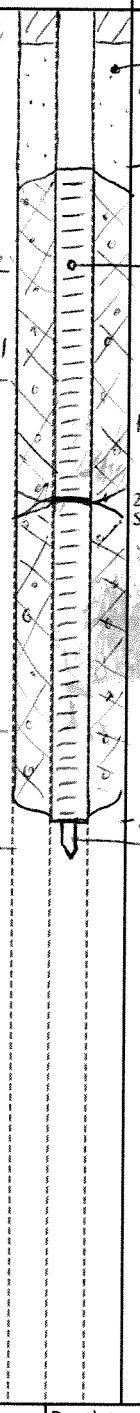
NOTES:

Checked by _____ Date: _____

Date	Time	Depth to water while drilling
1/9/2012	1100	13.5 - wet lithology
1/10/2012	0725	13.36 in well

AECOM	Client: CLEAN HARBORS	WELL ID: PF-20B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: 100'S of barn on Tract F	Sheet: 2 of 2
Logged By: J. Ashlin	Coordinates:	Total Depth: 32.5' bgs

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21		NOT SCREENED	SM	SILTY SAND (SM): brownish yellow (10YR 6/6), wet, 80% fine sand, 20% fines. Color mottling absent.	12/20 ~~10/20~~ SAND AND NATIVE SLOUGH
22	60				22.2'
23				↓ ~~70% f~~ 85% fine sand, 15% fines	
24			GM	23.6 SILTY GRAVEL (GM): yellowish brown (10YR 5/4), wet 80% fine gravel, 10% medium to coarse sand, 10% fines	1"Φ GEOPROBE PRE-PACK SCREEN 0.010" SLOT PVC
25					
26	21		GP	POORLY GRADED GRAVEL WITH SAND (GP): yellowish brown (10YR 5/4), wet, 80% medium gravel, 15% ~~me~~ fine to medium sand, 5% fines. Gravel subrounded yellowish brown rock Chert.	
27					27.2 SCREEN SECTIONS SCREW TOGETHER
28					
29	NR				
30					
31	30		ML Shale	30.3 SILT (ML) [BERROCK]: blue-gray shale Moderately indurated, Thin laminations, very friable	
32					32.2' BGS ENDCAP
33				Refusal @ 32.5 bgs	
34					
35				0.32' ENDCAP 1"	
36				SCREEN: 2 sections Geoprobe prepack	
37				RISER 5' sections, 1"Φ SCH 40 PVC STICK UP = 2.2' above ground	
38				Well materials = see notebook	
39					
40					



NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: PF-21B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: Tract F, 40' North SP-13	Sheet: 1 of 2
Logged By: J. Ashlin	Coordinates:	Well Inst.: Piezometer
Weather: 40°F, Clear	Sample Type(s): 2" ϕ Acetate sleeve for logging only	Screen Interval: ~~22.2-32.2~~ 21.1-31.1
Drilling Method: Direct Push / Geoprobe	Date/Time Started: 1/9/2012 1330	Depth of Boring: 31.0' bgs
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 1/9/2012 1503	Water Level: 13.83 bgs
Boring Diameter: 3.25"	Ground Elevation:	Checked by:

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
					expansion cap ← stickup 2.2'
1		NOT SCREENED	CL	(4") SILTY material, Vegetation, Roots	
2	60			LEAN CLAY WITH SAND: dark yellowish brown (10YR 3/6), moist, 80% high plasticity fines, 20% fine sand (1.6)	
3					
4				LEAN CLAY: brown (10YR 4/3) with some red-orange mottling, 95% high plasticity fines, 5% fine sand. No dilatancy, high toughness high dry strength. No observed odor or staining	
5					
6				↓ yellowish brown (10YR 5/4) brown and black (rare) color mottling.	2" ϕ SCH40 PVC RISER
7	60				
8			CL		BENTONITE SEAL
9					
10					
11					
12	60				
13				(12.9)	
14			ML	SILT WITH SAND (ML): yellowish brown (10YR 5/4) wet, 80% moderate plasticity fines, 20% very fine sand, some silt present. Rapid dilatancy low toughness, moderate dry strength	▽
15					
16				CLAYEY SAND (SP): wet, brownish yellow (10YR 6/6), 70% fine sand, 30% moderate plasticity fines, some silt present. Color mottling absent	
17	60				
18			SP		
19					
20					12/20 SAND FILTER PACK

NOTES:

Checked by _____ Date: _____

Date	Time	Depth to water while drilling
1/9/2012	1400	13.0 wet lithology
1/10/2012	0731	13.83 in well

AECOM	Client: CLEAN HARBORS	WELL ID: PF-21B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: Tract F, 40' North SP-13, W of Train tracks	Sheet: 2 of 2
Logged By: ASHLIN	Coordinates:	Total Depth: 31.0' bgs

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21		NOT SCREENED		CLAYEY SAND (continued from previous page)	12/20 SAND filter pack; 1400; ~~wet~~
22	60			80% fine sand, 20% fines, some silt present thin laminations 2-4mm of cemented sections, <50% by volume. Cement appears to be silica	21.1; 1"ØSCH 40 PVC RISER
23					
24			SP		
25					GEOPROBE pre-pack well screen 10/20 sand 0.010" slot screen
26				cemented laminations rare/absent	
27	60				
28					
29					
30			GP	29.5 POORLY GRADED GRAVEL WITH SAND (GP): yellowish brown (10 YR 5/4), wet, 80% fine to med gravel, 10% coarse sand 10% fines. Gravel is sub-rounded	
31				~~REFUSAL @ ~30.5' bgs in GRAVEL~~ 31	endcap; 31.0
32					
33				Refusal in gravel - bedrock not observed	
34					
35				- Well construction materials = see notebook	
36				STICKUP 2.2	
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: PF-22B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: Central West Tract F	Sheet: 1 of 2
Logged By: Ashlin	Coordinates:	Well Inst.: Piezometer
Weather: clear, 40°F	Sample Type(s): 2"Φ Acetate sleeve for logging only	Screen Interval: 21.1-31.1
Drilling Method: Direct Push/Geoprobe	Date/Time Started: 1/9/2012 1555	Depth of Boring: 31' bgs
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 1/10/2012 0830	Water Level: 13.8' bgs
Boring Diameter: 3.25"Φ	Ground Elevation:	Checked by: DM

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
				expansion-cap	stickup 2.15'
1		NOT SCREENED	CL	2" VEGETATION, GRASS ROOTS LEAN CLAY WITH SAND: dark yellowish brown (10YR 3/6), 85% high plasticity fines, 15% fine sand. No dilatancy, high to moderate toughness, high dry strength, moist	
2	60				
3			CL	LEAN CLAY (CL): brown (10YR 4/3), moist, 95% high plasticity fines, 5% fine sand. High toughness, no dilatancy, high dry strength. Some black (rare) and red orange color mottling. No observed odor or staining.	
4					
5				↓ yellowish brown (10YR 5/4) red-orange color dominant w/mottling of greenish-gray and black. Some small (1 mm) round nodules	
6					
7	60				BENTONITE SEAL
8				(7.9) ↓ color mottling absent	
9					
10					
11			SC	CLAYEY SAND (SC): moist, brownish yellow (10YR 6/6), 80% very fine sand, 20% high plasticity fines.	
12	60				
13					
14					
15				14.8	
16			SM	SILTY SAND (SM): brownish yellow (10YR 6/6), wet, 70% very fine sand, 30% low-plasticity fines	
17					▽ 15.9' 1/11/2012
18	60				
19				↓ 80% very fine sand, 20% fines	12/20 SAND FILTER PACK
20					

NOTES:

Checked by _____ Date: _____

Date	Time	Depth to water while drilling
1-11-2012	0719	13.76
1-9-2012	1615	15 wet lithology

AECOM	Client: CLEAN HARBORS	WELL ID: PF-22B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: Central West Tract F	Sheet: 2 of 2
Logged By: J. Ashlin	Coordinates:	Total Depth: 32.2' bgs

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21		NOT SCREENED	SM	SILTY SAND (SM): CONTINUED	GEOPROBE PRE-PACK SCREEN
22	60		SP-SM	POORLY GRADED SAND WITH SILT (SP-SM): brownish yellow (10 YR 6/6), wet, 90% fine sand, 10% fines	1" ϕ 0.010" SLOT PVC
23					
24			SM	SILTY SAND (SM): same as 19' bgs	
25			SP	POORLY GRADED SAND (SP): brownish yellow (10YR 6/6), wet, 99% fine sand 1% fines	Driller reports flowing sands
26					
27					
28	60		SP-SM	POORLY GRADED SAND WITH SILT (SP-SM): brownish yellow (10YR 6/6), wet, 90% fine sand, 10% fines. Small intervals (1-2") of lean clay interbedded (1 per foot), some cemented nodules	1630
29				1" layer, intense black mottling	
30		GP		POORLY GRADED GRAVEL (GP): brownish yellow (10YR 6/6) wet, 95% fine to med gravel, subrounded	ENDCAP
31	28		ML	SILT (ML): [SHALE BEDROCK] greyish-blue, moist moderately indurated/friable	very slow drilling
32				REFUSAL @ 32'~; BOTTOM OF BORING	32.2'
33					
34				slough	
35					
36					
37					
38				Well construction materials = see notebook	
39					
40					

NOTES:

Date	Time	Depth to water while drilling
see page 1		

AECOM	Client: CLEAN HARBORS	WELL ID: PF-23B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: NE Corner Tract F, 100' N of SP-16	Sheet: 1 of 2
Logged By: J. ASHLIN	Coordinates:	Well Inst.: Piezo
Weather: CLEAR, 40°F	Sample Type(s): 2" Φ Acetate sleeves for logging only	Screen Interval: 21-31' bgs
Drilling Method: DIRECT PUSH/GEOPROBE	Date/Time Started: 1/10/2012 1059	Depth of Boring: 31.05 bgs
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 1/10/2012 1250	Water Level: 15' bgs
Boring Diameter: 3.25" Φ	Ground Elevation:	Checked by:

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1				SANDY SILT (ML): dark gray (10YR 4/1), moist, 60% low plasticity fines, 40% fine sand. Rapid dilatancy, moderate toughness, low dry strength. Plant roots	expansion cap; stickup 1.9
2				↓ VEGETATIVE MATERIAL ABSENT	
3	50			LEAN CLAY (CL): dark gray (10YR 4/1), moist, 95% high plasticity fines, 5% fine sand. No dilatancy, high toughness, high dry strength	
4					
5	NR				
6				↓ color mottled. Primarily yellowish brown (10YR 5/6) with grayish brown 10YR (5/2) Small 1-3mm lenses w/crystalline mineral material (calcite?) clear/white.	
7					
8	60				
9					
10					
11					
12					BENTONITE SEAL
13	60				
14					▽ 14.35 1/11/2012
15					1" Φ SCH 40 PVC RISER
16					
17					
18	60				
19				SILTY SAND (SM): yellowish brown (10YR 5/6), moist, 70% very fine sand, 30% fines (low-plasticity)	19 ▽ 12/20 SAND FILTER PACK
20					

NOTES:

Date	Time	Depth to water while drilling
1/10/2011	1505	16.32 TOC

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: PF-23B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: NE Corner Tract F, 100' N of SP-16	Sheet: 2 of 2
Logged By: J. Ashlin	Coordinates:	Total Depth: 13.05

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				SILTY SAND (SM): continued	1" ϕ SCH40 PVC RISER; 12/20 SAND FILTER PACK; 21
				↓ wet	
22	60				3" ϕ Geoprobe pre-pack screen
23					
24					1" ϕ Sch 40 PVC screen 0.010" SLOT
25					
26					
27	60				Driller reports very hard drilling
28				LEAN CLAY	
29				28.9 POORLY GRADED SAND WITH SILT (SP-SM): yellowish brown (10YR 5/6), wet, 90% fine sand, 10% fines	
30				POORLY GRADED GRAVEL WITH SILT (GP-GM): yellowish brown (10YR 5/6), wet, 80% fine to medium gravel, 10% fine to medium sand, 10% fines.	
31	12				31.05; 12/15 ENDCAP
32				Refusal @ 31' (Bedrock? Not observed)	
33					
34				Stickup 1.9	
35				TD = ~~35 (inc)~~ 32.95	
36				Well construction materials = see notebook	
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: PF-24B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: 100' W of SP-16, NE corner Tract F	Sheet: 1 of 2
Logged By: J. Ashlin	Coordinates:	Well Inst.: Piezo
Weather: Clear, 50°F	Sample Type(s): 2" Φ Acetate sleeves for logging only	Screen Interval: 22.7-32.7' bgs
Drilling Method: Direct Push/Geoprobe	Date/Time Started: 1/10/2012 1338	Depth of Boring: 32' bgs
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 1/10/2012 1500	Water Level: 14.27' bgs
Boring Diameter: 3.25" Φ	Ground Elevation:	Checked by:

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1		NOT SCREENED	ML	SANDY SILT (ML): dark gray (10YR 4/1), moist, 60% low-plasticity fines, 40% fine sand. Rapid dilatancy, low toughness. Roots, grass,	expansion cap; stickup 3.3
2	60			↓ plant material absent	
3				LEAN CLAY (CL): dark gray (10YR 4/1), moist, 99% high plasticity fines, 1% fine sand. No dilatancy, high toughness, high dry strength.	
4					1" Φ SCH 40 PVC RISER
5					
6				↓ color mottled. Primarily yellowish brown (10YR 5/6), with grayish brown (10YR 5/2)	
7			CL		
8	60				Bentonite seal
9					
10					
11					
12					
13	60				
14					
15				14.5 ~~↓ primarily grayish brown less (10YR 5/2) with <20% yellowish brown~~	
16				SILTY SAND (SM): yellowish brown (10YR 5/2), wet, 80% fine sand, 20% fines	
17	60		SM		▽
18				interval of black discoloration. No odor	
19				↓ some clay present	
20					

NOTES:

Date	Time	Depth to water while drilling
1/10/2012	1530	17.57 in well (toc)

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: PF-24B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: 100' W of SP-16, NE corner Tract F	Sheet: 2 of 2
Logged By: JA	Coordinates:	Total Depth: 32' bgs

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21		NOT SCREENED	SM	SILTY SAND (SM): continued	12/20 sand TOP OF SAND 21.5
22					1"Φ SCH 40 PVC RISER
23	60			23.5	TOP OF SCREEN 22.7
24			SP	POORLY GRADED SAND (SP): wet, brown (10YR 4/3) 95% fine sand, 5% fines	driller reports flowing sands into drill rod
25					
26				↓ trace fine gravel, subrounded to subangular	
27					1"Φ SCH 40 PVC SCREEN 0.010 SLOT
28	60			28.3	
29				POORLY GRADED GRAVEL WITH SAND (GP-SP): yellowish brown (10YR 5/6), wet, 90% fine to medium gravel, 10% medium to coarse sand. Gravel subrounded limestone and chert fragments	3"Φ Geoprobe pre pack filter pack
30					
31	24				
32	NR			[Bedrock] Blue-gray thinly bedded shale	PVC ENDCAP
33				Refusal @ 32.7 Bottom of boring @ 32.7	32.7
34				stickup 3.3	
35					
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: PF-25B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: 100' N of SP14 south edge of tract F	Sheet: 1 of 2
Logged By: TH	Coordinates:	Well Inst.: Piezo
Weather: clear 55°	Sample Type(s): 2" Acetate sleeve for logging only	Screen Interval: 31-21
Drilling Method: Direct push Geoprobe	Date/Time Started: 01/16/2012 0920	Depth of Boring: 31'
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 01/18/2012 0900	Water Level: 16.35
Boring Diameter: 3.25'	Ground Elevation:	Checked by:

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
					expansion cap 2.50'
1			ML	Sandy Silt (ML) dark gray, Moist, 60% low plasticity fines, 40% sand, slow dilatancy, low toughness, plant Material	Used 2"x5' Acetate liners with sand catch
2				Lean Clay (CL) dark gray, Moist, 95% high plasticity fines, 5% sand, No dilatancy, high toughness, high dry strength	
3	60				
4					1" PVC riser
5					
6					
7			CL	Color mottled, Primarily yellowish light brown with grayish brown	Bentonite seal
8	60				
9		Not Screened			
10					
11					
12					
13					
14				14.0	
15				Silty Sand (SM), yellowish brown, wet 80% Fine sands, 20% low plasticity fines	
16					
17					
18	60		SM	Some clay present	
19					
20					

NOTES:

Date	Time	Depth to water while drilling

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: PF-2SB
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: 100' N of SP-14 south edge of tract F	Sheet: of
Logged By: TH	Coordinates:	Total Depth: 31'

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21		Not screened		Silty sand (SM) continued	12/20 sand
22			SM		
23	48			22.5 Poorly graded sand (SP) wet, light brown, 90% Fine sand, 5% Fines	Geoprobe prepack screen 0.010" slot PVC
24					
25			SP		
26					Screen section screw together
27					
28	24			28.0	
29				Poorly Graded gravel with sand, light gray, wet, 80% Fine to medium gravel	
30					
31	12			refusal 31'	31 BGS end cap
32					
33					
34					
35					
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: PF-26B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: Between PF-25B + North Fence Line	Sheet: 1 of 2
Logged By: TH	Coordinates:	Well Inst.: Piezo
Weather: clear 36°	Sample Type(s): 2" Acetate liners	Screen Interval: 33-23
Drilling Method: Direct Push Geoprobe	Date/Time Started: 01/18/12 0945	Depth of Boring: 33'
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 01/18/ 1100	Water Level: 16.25
Boring Diameter: 3.25"	Ground Elevation:	Checked by:

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
					expansion cap 2.15'
1		Not screened	ML	Sandy silt (ML) dark gray, moist 60% low plasticity fines, 40% sand slow dilatancy, low toughness, plant material	
2				lean Clay (CL) dark gray, moist, 95% high plasticity fines, 5% sand, No dilatancy high toughness, high dry strength	
3	60				
4					1' PVC riser
5					
6				color ~~not~~ light brown mottled with grayish + dark brown	
7			CL		Bentonite seal
8	60				
9					
10					
11					
12					
13	60				
14					
15					
16				Clayey Sand (SP) wet brownish yellow 70% fine sand, 30% moderate plasticity fines, some silt present	
17					
18	60		SP		
19					
20					

NOTES:

Date	Time	Depth to water while drilling

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: PF-26B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: Between PF-25B + North fence line	Sheet: of
Logged By:	Coordinates:	Total Depth: 33'

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				Clayey Sand continued	
22					12/20 sand
23	60				
24					Geoprobe
25			SP		prepack screen 0.010" slot PVC
26					
27				80% fine sands, 20% Fines some silt	
28	60				
29					screen sections screw together
30					
31					
32	36			31.5 poorly Graded gravel with sand, light gray wet, 80% Fine to medium gravel	
33				refusal 33'	33 BGS endcap
34					
35					
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: RF-27B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: west of RF-24B	Sheet: 1 of 2
Logged By: TH	Coordinates:	Well Inst.: Piezo
Weather: 30° clear	Sample Type(s): 2" Acetate sleve for logging only	Screen Interval: 32-22
Drilling Method: Direct push geoprobe	Date/Time Started: 01/18/12 1130	Depth of Boring: 32
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 01/18/12 1330	Water Level: 16.62
Boring Diameter: 3.25"	Ground Elevation:	Checked by:

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1		Not Screend	ML	Sandy Silt (ML) dark gray, moist 60% low plasticity fines, 40% fine sand, Rapid dilatancy low toughness, roots grass	expansion cap; stick up 2.60
2					1' PVC riser
3				2.5	
4			CL	Lean Clay (CL) dark gray moist 95% high plasticity fines, 5% fine sand No dilatancy, high toughness, high dry strength	Bentonite seal
5					
6				color mottled, primarily yellow brown with grayish brown + dark ~~gray~~ brown mottling	
7					
8					
9					
10					
11					
12					
13				13.5	
14			SM	Silty Sand (SM) yellowish brown, wet 80% fine sand, 20% low plasticity fines	
15					
16					
17				some clay	
18					
19					
20					

NOTES:

Date	Time	Depth to water while drilling

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: PF-27B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: west of PF-24B	Sheet: 2 of 2
Logged By: TH	Coordinates:	Total Depth: 32'

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21		Not Screened		Silty sand continued	12/20 Sand
22			SM		
				22.5	
23	60			Poorley Graded sand wet light brown	
24				95% Fine sand, 5% Fines	
25					Geoprobe prepack well Screen
26			SP		
27					
28	60				
29					
				29.5	
30				Poorley graded Gravel with Sand	
31	24				
32					end cap
				refusal 32'	
33					
34					
35					
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS		WELL ID: PF-28B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS		
	Project Number: 60240275-200		
	Boring Location: South of SP-16		Sheet: 1/2
Logged By: TH	Coordinates:		Well Inst.: Piezo
Weather: Clear 36°	Sample Type(s): 2" Acetate liner for logging only		Screen Interval: 32-22
Drilling Method: Direct Push Geoprobe	Date/Time Started: 01/18/12 1420		Depth of Boring: 32
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 01/18/12 1540		Water Level: 15.82
Boring Diameter: 3.25"	Ground Elevation:		Checked by:

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
					expansion cap; stick up 1.95
1			ML	Sandy silt ~~at~~ gray, Moist, 60% low plasticity fines, 40% Fine sand, ~~sled~~ dilatancy low toughness roots grass	
2				2.0	
3	60			Lean clay, gray, Moist, 95% high plasticity fines, 5% fine sand, No dilatancy, high toughness, high dry strength	PVC riser
4					
5					
6				↓ color mottled primarily yellowish brown with grayish brown and dk brown	
7					Bentonite seal
8	60	Not Screened	CL		
9					
10					
11					
12					
13	60				
14					
15					
16				15.5	
17				Silty Sand, yellowish brown, wet 80% fine sand 20% low plasticity fines	
18	60		SM		
19					
20					

NOTES:

Date	Time	Depth to water while drilling

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: PF-28B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: South of SP-16	Sheet: 2 of 2
Logged By: TH	Coordinates:	Total Depth: 32

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				Silty Sand continued	12/20 Sand Filter pack
22					geoprobe prepack well screen .010 screen slot
23	60		SM		
24					
25				25.0	
26				Poorly Graded sand, wet, brown 95% Fine sand, 5% fines	
27	36		SP	Trace fine gravel	
28				27.0	
29				Poorly graded gravel with sand	
30					
31	24				
32					endcap
33				refusal 32'	
34					
35					
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: PF-29B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: West of SP-15	Sheet: 1/2
Logged By: TH	Coordinates:	Well Inst.: Piezo
Weather: 36° Clear	Sample Type(s): 2" Acetate liner for logging only	Screen Interval: 32.5-22.5
Drilling Method: Direct Push Geoprobe	Date/Time Started: 01/18/12 1355	Depth of Boring: 32.5
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 01/18/12 1715	Water Level: 16.81
Boring Diameter: 3.25"	Ground Elevation:	Checked by:

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1			ML	Sandy silt, gray, moist, 60% low plasticity fines, 40% fine sand, med dilatancy, low toughness, roots grass	expansion cap; stickup 3.17
2					
3	60			Lean clay, gray, moist, 95% high plasticity fines, 5% fine sand, No dilatancy high toughness, high dry strength	PVC riser
4					
5					
6				Color mottled primarily yellowish brown with grayish brown + dk brown	
7					Bentonite Seal
8	60	Not Screened	CL		
9					
10					
11					
12					
13	60				
14					
15					
16				Silty sand, yellowish brown, wet, 80% fine sand 20% low plasticity fines	
17					
18	60		SM		
19					
20					

NOTES:

Date	Time	Depth to water while drilling

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: PF-29B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: West of SP-15	Sheet: 2 of 2
Logged By: TH	Coordinates:	Total Depth: 32.5

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				Silty Sand continued	12/20 sand filter pack
22			SM		
23					
				23.5	
24				Poorly graded sand, ~~wet~~ moist, brown, 95% fine sand, 5% fines	
25	—				geoprobe prepack well screen 0.010 slot
26			SP		
27		Not screened			
28					
				28.0	
29				Poorly graded gravel with sand	
30	—				
31					
32					
					endcap
33				refusal 32.5'	
34					
35					
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: PF-30B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: SE corner of site	Sheet: 1 / 2
Logged By: TH	Coordinates:	Well Inst.: Piezo
Weather: 26° clear	Sample Type(s): 2" Acetate liner for logging only	Screen Interval: 34-24
Drilling Method: Direct push Geoprobe	Date/Time Started: 01/19/12 0910	Depth of Boring: 34
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 01/19/12 1030	Water Level: 17.41
Boring Diameter: 3.25"	Ground Elevation:	Checked by:

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1			ML	Sandy Silt, dark gray, moist, 60% low plasticity fines, 40% fine sand, slow dilatancy, med toughness, med dry strength, Plant roots	expansion cap; stickup 2.80
2				2.0	
3	60			Lean clay, dark gray, moist, 95% high plasticity fines, 5% fine sand, NO dilatancy, high toughness, high dry strength	
4					Bentonite seal
5				color mottled, primarily yellowish brown with grayish brown + dk brown,	
6					
7		Not screened			
8	60		CL		
9					
10					
11					1" PVC risers
12					
13	60				
14					
15					
16					
17					
18	60				
19					
20			SM	Silty sand, yellowish brown, moist, 70% very fine sand, 30% low plasticity fines	

NOTES:

Date	Time	Depth to water while drilling

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: PF-30B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: SE corner of site	Sheet: 2 of 2
Logged By: TH	Coordinates:	Total Depth: 34'

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				Continue silty sand	1" PVC riser
22					12/20 sand filter pack
23	60			↓ wet	
24			SM		3" geoprobe prepack screen
25					
26					1" sch 40 PVC screen .010 slot
27					
28	60				
29					
30				Poorly graded gravel, with silt (GP-GM) brown, wet, 80% fine to medium gravel, 10% fine to medium sand, 10% fines	
31					
32					
33	~~18~~ 24				
34					
35	~~44~~			refusal 34'	
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS		WELL ID: PF-31B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS		
	Project Number: 60240275-200		
	Boring Location: SE corner of site N of PF-30B		Sheet: 1/2
Logged By: TH	Coordinates:		Well Inst.: Piezo
Weather: 35° clear	Sample Type(s): 2" Acetate liner for logging only		Screen Interval: 29-19
Drilling Method: Direct push Geoprobe	Date/Time Started: 01/19/12 1050		Depth of Boring: 29
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished:		Water Level: 17.71
Boring Diameter: 3.25"	Ground Elevation:		Checked by:

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1			ML	Sandy silt, dark gray, moist, 60% low plasticity fines, 40% fine sand, slow dilatancy, med toughness, med dry strength	expansion cap stickup 3.86
2					
3	60			Lean clay, dk gray, moist, 95% high plasticity fines, 5% fine sand, No dilatancy high toughness, high dry strength	
4					
5				↓ color mottled, primarily yellowish brown with grayish brown + dk brown	
6					
7					
8	60				
9			CL		
10					
11					
12					
13	60				
14					
15					1 inch PVC riser
16					
17					
18	60				12/20 sand filter pack
19			SM	Silty sand, yellowish brown, moist, 70% very fine sand, 30% low plasticity fines	
20					

NOTES:

Checked by _____ Date: _____

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: PF-31B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: SE corner of site N of PF-30B	Sheet: 2 of 2
Logged By: TH	Coordinates:	Total Depth: 29

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				Continue silty sand	
22					
23					Sch 40 PVC screen .010 slot
24					
25					
26					geoprobe prepack
27					
28					
29				refusal sandstone 29'	
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: PF-32B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: ~~PF-32B~~ E of Tract F	Sheet: 1 of 2
Logged By: S. Walston	Coordinates:	Well Inst.: PIEZO
Weather: M-30's, overcast	Sample Type(s): 2" Ø acetate sleeves for logging only	Screen Interval: 20-30
Drilling Method: direct push	Date/Time Started: 2/7/12 0905	Depth of Boring: 30'
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 2/7/12 1140	Water Level: 13.28
Boring Diameter: 3.25"	Ground Elevation: Surveyed 2-8-12	Checked by: @ 1150 2-7-12

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1	NR			Sandy silt, moist; veg. roots, ~~v. stiff~~, dark gray, mod plasticity, damp	1" PVC riser
2					
3	44			Silty clay, gray, moist, v. stiff, damp	
4					
5					Bentonite Wyo-Ben Enviro-plug #8
6				mottled ~~gr~~ brown-gray, ~~red~~, ~~mod~~ low plasticity, damp	
7					
8	60			@7.5 mottled red streaks	
9				mottled yellowish-brown with small 1-3 mm dark lenses @ 9.5 ft bgs ~~damp~~, stiff, moist	
10					
11				lean clay, yellow-brown with small 1-3mm crystalline lenses (white) @ 11 ft bgs, stiff ~~dry~~ ~~damp~~ moist	
12	60				
13					
14					driller reports hard drilling
15				Lean clay, ~~mottled~~ primarily brown-~~tan~~ lt., stiff, ~~dry~~ moist, ~~damp~~ w/ lt. tan/yellow lenses (same matl)	
16					
17	60				
18					
19					sand
20					

EXP. PLUG
Stickup 2.3'

NOTES:

Checked by _____ Date: _____

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: PF-32B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location:	Sheet: 2 of 2
Logged By:	Coordinates:	Total Depth: 30' bgs

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				@20.5 plastic liner crumpled in top of tube	
22	60			Lean clay, brown-gray, stiff	pre-pack screen (10')
23					
24					~~(2/12) sand~~
25				@ 24.5 bgs, moist, mod. plasticity, gray	SW
26	NR			NR 25-25.6; gray-tan moist silty clay	
27				@ 27' gravel 15% in silty clay; red-yellow-brown moist below	
28	50			REFUSAL @ ~~28~~ 30 ft bgs	
29				(difficulty in retrieving rod)	
30				Sandy 29-30' fine silty clay	
31				Swelling soil	
32					
33					
34					
35					
36					
37					
38					
39					
40					

NOTES:
2 screen (pre-pack)
2 PVC full length (10-ft)

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: PF-33B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: E of TRACT F	Sheet: 1 of 2
Logged By: SWalston	Coordinates:	Well Inst.: PIEZO
Weather: rain	Sample Type(s): 2" acetate sleeves for logging only	Screen Interval: 14-24
Drilling Method: direct push	Date/Time Started: 2/7/12 1150	Depth of Boring: 24
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 2/7/12 1220	Water Level: 13.98
Boring Diameter: 3.25"	Ground Elevation: Surveyed 2-8-12	Checked by: @ 12:25 2-7-12

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1	NR			0-2 ft tan moist clay, veg. roots	
2				2-2.5 ft gray moist clay, no odor, stiff	
3	51			2.5-5 ft gray-brown clay, red streaks, stiff	bentonite Wyo-Ben
4					Enviro-plug #8
5					
6				5-5.5 ft gray-brown clay w/ red/brown lenses, stiff	
7	60			5.5-8.5 ft yellow-brown clay, stiff	
8				8.5 ft black mineral 2-5 mm (similar to slag), stiff	
9				8.5-10 ft yellow-brown clay, stiff	1-in PVC
10					
11				10-14 ft ~~yellow~~ red-brown clay, stiff, mottled 13.5	
12					sand
13	60			14-15 ft gray clay, moist, no odor 13.5 blue	
14				occas. black mineral lenses (2-5 mm) 2.5 mm	top of prepack
15					
16	NR			clayey-sand, lt. brown, moist	prepack screen
17				@17 ft gray/black mottled, no odor moist, clay predominant	
18	45			17-20 ft sandy silty clay brown, moist 50% 30% 20%	
19					
20					

exp. plug

~3' stickup

NOTES:

Date	Time	Depth to water while drilling

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: PF-33B
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location:	Sheet: 2 of 2
Logged By:	Coordinates:	Total Depth: 23.5' bgs

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				lt. brown sandy silty clay, moist 60% 30% 20%	driller reports hitting hard layer @ about 25-26' (not likely bedrock; does not want to hammer through & risk rig damage (SW concern)
22					
23	60	full core	recovered		
24					
25				refusal @ 25' 23.5 reported by driller	
26					
27				Swelling soil	
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

PRE-PACK SCREEN (total 10 ft.)

NOTES:
2-5' prepack screens
2-10' PVC; cut 3' off

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: M-10
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: N CENTRAL - PHASE 1 GATE	Sheet: 1 of 2
Logged By: J. ASHLIN	Coordinates:	Well Inst.: YES
Weather: Clear, 30°F	Sample Type(s): Acetate sleeve for logging only	Screen Interval: 19.9-29.9
Drilling Method: Direct Push/Geoprobe	Date/Time Started: 1/11/2012 0840	Depth of Boring: 29.9
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 1/11/2012 1000	Water Level: 9.89' bgs
Boring Diameter: 3.25" Ø	Ground Elevation:	Checked by: JA

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
					expansion cap; stickup 2.6'
1		NOT SCREENED		Top 6"- plant material and roots [BACKFILL]	
2	60			LEAN CLAY (CL): brown (10YR 4/3), moist, 99% high plasticity fines, no dilatancy, high toughness, high dry strength	BENTONITE SEAL
3				↓ color mottled brown, with yellowish brown 10YR 5/4	
4					
5					2" Ø SCH 40 PVC RISER
6					
7	48		CL	↓ very dark greenish gray (1GLEY 3/1) mottling absent, some 1-2" areas cemented amorphous "blobs". Some fine sand present (<10%),	
8					
9					
10					▽
11				↓ dark greenish gray (10YR 4/1) some Black discolorations, iron oxide nodules (1-2mm) rare	
12				SANDY CLAY (CL): dark greenish gray (10YR 4/1), very moist, 70% high plasticity fines, 30% fine sand	
13	50				▽
14					
15					
16				↓ 65% high plasticity fines, 35% fine sand wet	
17					
18	50			17.6	
19			Fe	IRON FILINGS	18 Slough Iron Filings No Sand Pack
20					

NOTES:

Checked by _____ Date: _____

Date	Time	Depth to water while drilling
1/12/2012	1200	12.49 After Install

AECOM	Client: CLEAN HARBORS	WELL ID: M-10
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: N Central, Phase 1 Gate	Sheet: 2 of 2
Logged By: JA	Coordinates:	Total Depth: 29.9' bgs

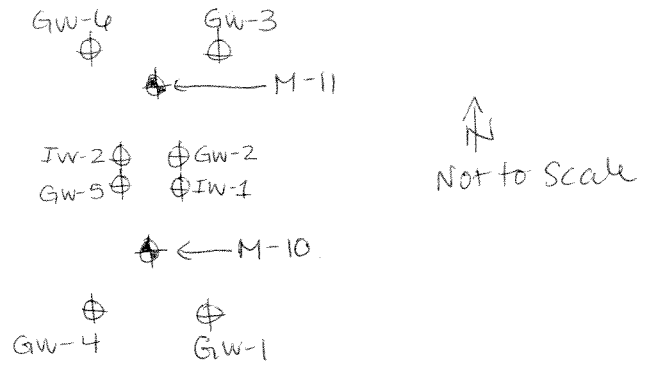
Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				IRON FILINGS (continued)	NO FILTER PACK
22	NR		Fe		
23					
24	24	NOT SCREENED			
				24.3	
25			CL	SAND/CLAY/GRAVEL Mixture [FILL]	2"ϕ PVC 0.010 SLOT SCREEN
26					
27				IRON FILINGS (as above)	IRON FILINGS "Slough" No filter pack added
28					
29					
30					29.9'
31				Refusal at 30 ft bgs	
32					
33					
34					
35					
36				Location Map: See M-11	
37				TD = 32.55 (toc)	
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: M-11
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: Phase 1 Gate, South Central	Sheet: 1 of 1
Logged By: J. Ashlin	Coordinates:	Well Inst.: Yes
Weather: Clear, 28°F	Sample Type(s): Acetate sleeves for logging only	Screen Interval: 19.5-29.5
Drilling Method: Direct Push/Geoprobe	Date/Time Started: 1/11/2012 1010	Depth of Boring: 25.5
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 1/11/2012 1115	Water Level: 10.2' bgs
Boring Diameter: 3.25"Φ	Ground Elevation:	Checked by:

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
2		NOT SCREENED		SOIL LOG — SEE M-10	Stickup 2.4
4					Expansion cap
6					Bentonite Seal
8					
10					2"Φ SCH 40 PVC RISER
12					▽
14					
16					
18					
20					19.55
22					
24					2"Φ SCH 40 0.010 SLOT PVC SCREEN
26					
28					IRON FILINGS SLOUGH
30					29.55



NO SAND PACK ADDED

NOTES:

Checked by _____ Date: _____

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: EXPLORATORY PHASE 2 GATE 1
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: South central portion Phase II Gate 1	Sheet: 1 of 1
Logged By: J. ASHLIN	Coordinates:	Well Inst.: NO
Weather: clear, 40°F	Sample Type(s): 2"Φ Acetate sleeves for logging only	Screen Interval: N/A
Drilling Method: DIRECT PUSH / GEOPROBE	Date/Time Started: 1/10/2012; 0943	Depth of Boring: 26'
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 1/10/2012; 1020	Water Level: N/A
Boring Diameter: 3.25"Φ	Ground Elevation:	Checked by:

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
0				[NATIVE BACKFILL] LEAN CLAY (CL): dark grayish brown (10YR 4/2), moist, 95% high plasticity fines, 5% fine sand. High toughness, no dilatancy, high dry strength. Upper 1" - plant material	
2	31				
4					
6				↓ color mottling with yellowish brown (10YR 5/4) and dark gray (10YR 5/1)	
8	41		CL		
10		NOT SCREENED		↓ some silt present	
12	60			[BENTONITE AMMENDED BACKFILL]	
14					
16					
18	60				
20				21.0'	
22	20		Fe	[IRON FILING/SAND MIXTURE] black, wet	
24					
26				NO RECOVERY	
				BOTTOM OF BORING @ 26'	
				Iron filings acting as "flowing sands" - unable to advance dual-tube geoprobe sampler.	

NOTES:

Checked by _____ Date: _____

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	BORING ID: gw-20
	Site: COFFEYVILLE - NW AREA, W OF HWY 169	
	Project Number: 60240275-200	
	Boring Location: W OF HWY 169, S OF 2600 RD	Sheet: 1 OF 2
Logged By: ASHLIN	Coordinates: 37°5'34.88"N, 95°35'31.61"W	Monitoring Well Inst.: NO
Weather: WARM, WINDY	Sample Type(s): GROUNDWATER ONLY	Screened Interval: NA
Drilling Method: GEOPROBE (DUAL TUBE)	Date/Time Started: 5/2/12/0805	Depth of Boring: 30.0
Drilling Contractor: PLAINS	Date/Time Finished: 5/2/12 0920	Water Level: NA
Boring Diameter: 3"	Ground Elevation: not surveyed	Checked by: NA

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Sample ID + Notes	Sample Depth (ft bgs)
1		NOT SCREENED	ML	SILT (ML): dark brown, and VEG/PLANT material.	0805 Begin	
2–4	23		CL	LEAN CLAY (CL); moist, reddish brown (5YR 4/4), 99% fines, high plasticity, high toughness, no dilatancy. Roots absent below 3 feet, 1% fine sand.		
5–7	60		CL	LEAN CLAY (CL); moist, yellowish brown (10YR 5/4), 100% fines, moderate to high plasticity, high toughness, no dilatancy. Dk. brown color mottling 10%		
8–10			ML	~~POORLY GRADED SAND WITH~~ SILT (ML): moist yellowish brown (10YR 5/4), moderate plasticity, rapid dilatancy, 90% fines, 10% fine sand		
11–12	50			↓ wet	▽	
13–15			SP-SM	POORLY GRADED SAND WITH SILT: wet, 70% fine sand, 30% low to moderate plasticity fines.		
16–18	38			↓ red-orange and black color mottling, 10% no odor observed, moist	No odor or staining observed (0-30' bgs)	
19–22	41		SP	~~SAND~~ POORLY GRADED SAND (SP): moist, yellowish brown (10YR 5/4), 95% fine sand, 5% fines, trace medium sand 22' bgs - Color change: dark gray (5Y 4/1)		
23–24						

NOTES: Backfilled w/ bentonite. No odor or staining observed

Checked by _____ Date: _____

Date	Time	Depth to water while drilling
5/2/12	0815	12.0

AECOM	Client: CLEAN HARBORS	BORING ID: gw-20
	Site: CH - COFFEYVILE NW AREA	
	Project Number: 60240275-200	
	Boring Location: W OF HWY 169, S OF 2600 RD	Sheet: 2 of 2
Logged By: ASHLIN	Coordinates: SEE PG 1 OF 2	Total Depth: 30' bgs

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Sample ID & NOTES	~~Sample Depth (ft bgs)~~
25		NOT SCREENED		POORLY GRADED SAND (Continued)	Driller reports flowing sand	
26			SP			
27	28					
28			GM	SILTY GRAVEL (GM): wet, dark gray (5Y 4/1), 80% fine gravel, 20% low plasticity fines. Gravel subangular to subrounded limestone.		
29						
30				Bottom of boring @ 30'		
31						
32						
33						
34						
35				0850 - Temp pvc screen (5') pushed to 25'	grab groundwater gw20-20200502 0920	
				0920 - sampled 3 VOAs for VOCs		

NOTES:

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	BORING ID: gw-21
	Site: CH-COFFEYVILLE NW AREA	
	Project Number: 60240275-200	
	Boring Location: W OF HWY 169, S OF 2600 RD	Sheet: 1 OF 1
Logged By: ASHLIN	Coordinates: 37°5' 33.1" N, 95°35' 33.45" W	Monitoring Well Inst.: NO
Weather: HOT, WINDY	Sample Type(s): GROUNDWATER	Screened Interval: NA
Drilling Method: GEOPROBE (DUAL-TUBE)	Date/Time Started: 5/2/12 / 0930	Depth of Boring: 23.5' bgs
Drilling Contractor: PLAINS	Date/Time Finished: 5/2/12/ 1000	Water Level: NA
Boring Diameter: 2"	Ground Elevation:	Checked by: NA

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Sample ID & NOTES	~~Sample Depth (ft bgs)~~
		NOT SCREENED	ML	SILT (ML): wet, 80% VEG/PLANT/ROOT Material (4")		
1, 2, 3, 4	49		CL	LEAN CLAY (CL): dark grayish brown (10YR 4/2), moist 95% fines, 5% fine sand, veg material. Very high plasticity, high toughness, no dilatancy, high dry strength ↓ yellowish brown (10YR 5/4) red orange/black color mottling 3-6' bgs		
5, 6, 7, 8, 9, 10	55		ML	SILT (ML): moist, yellowish brown (10YR 5/4), moderate toughness, 95% fines, 5% fine sand, slow dilatancy, moderate to low plasticity, moderate dry strength (some clay present)		
11, 12, 13, 14, 15	60		SP	SILTY SAND (SP): wet, yellowish brown (10YR 5/4), 80% fine to medium sand, 20% low-plasticity fines.	No odor or staining observed (0-23.5 ft bgs)	
16, 17, 18, 19, 20	25		GP GM	POORLY GRADED GRAVEL WITH SILT (GP-GM): wet, yellowish brown (10YR 5/4), 90% fine gravel, 10% fines, trace coarse sand. Gravel subrounded to subangular limestone, sparsely fossiliferous, some silicified limestone (chert). ↓ 70% fine gravel, 20% coarse sand, 10% fines	Grab groundwater: gw21-20120502 1000	
21, 22, 23	20			REFUSAL AT 23.5 FT		
24						

NOTES: BACKFILLED W/ BENTONITE
No odor or staining observed.

Checked by _____ Date: _____

Date	Time	Depth to water while drilling
5/2/12	0955	10' bgs

AECOM	Client: CLEAN HARBORS	BORING ID: GW-22
	Site: COFFEYVILLE NW AREA	
	Project Number: 60240275-200	
	Boring Location: W OF HWY 169, S OF 2600 RD	Sheet: 1 of 1
Logged By: ASHLIN	Coordinates: 37°5'31.066"N, 95°35'34.575"W	Monitoring Well Inst.: NO
Weather: HOT, WINDY	Sample Type(s): GROUNDWATER	Screened Interval: NA
Drilling Method: GEOPROBE	Date/Time Started: 5/2/12 1031	Depth of Boring: 24.0' bgs
Drilling Contractor: PLAINS	Date/Time Finished: 5/2/12 1050	Water Level: NA
Boring Diameter: 3"	Ground Elevation: not surveyed	Checked by: NA

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES ~~Sample ID~~ + SAMPLES	~~Sample Depth (ft bgs)~~
1		NOT SCREENED	ML	(7") SILT (ML): dark brown, >50% VEG/ROOTS		
2–4	50		CL	LEAN CLAY (CL): moist, dark brown (10YR 4/2), 99% fines, 1% fine sand, very high plasticity, high toughness, high dry strength ↓ (2.5) yellowish brown (10YR 5/4)		
5–9	60		ML	SILT WITH SAND (ML): moist, yellowish brown (10YR 5/4), 80% fines, 20% fine sand. Black mottling 5%, some small zones of clay with sand (2-3")		
10–14	55			SANDY SILT (ML): wet, yellowish brown (10YR 5/4) 70% fines, 30% fine sand. Fines moderate plasticity. Mottling absent. very wet	No odor or staining observed (0-24' bgs)	
15–20	40		GP	POORLY GRADED GRAVEL (GP): wet, yellowish brown (10YR 5/4), 40% fine gravel, 40% coarse sand, 10% fines, Gravel is subangular to subrounded limestone and chert.	Driller reports flowing sand grab groundwater sample gw22-20120502 1050 4 VOAS	
21–23	10			1" black fragment. wood? No odor, sheen or surrounding staining ↓ gravel includes a mafic lithology, rounded, v. weathered		
24				REFUSAL @ 24' BGS, brown weathed limestone in shoe		

NOTES: Backfilled w/bentonite

Date	Time	Depth to water while drilling
5/2/12	1040	9.0

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	BORING ID: gw-23
	Site: COFFEYVILLE (NW AREA)	
	Project Number: 60240275-200	
	Boring Location: W OF HWY 169, S OF 2600 RD	Sheet: 1 OF 1
Logged By: ASHLIN	Coordinates: 37°5'29.191"N, 95°35'35.874"W	Monitoring Well Inst.: NO
Weather: HOT, HUMID	Sample Type(s): GROUNDWATER (GRAB)	Screened Interval: NA
Drilling Method: GEOPROBE DIRECT PUSH	Date/Time Started: 5/2/2012 1100	Depth of Boring: 21.0' bgs
Drilling Contractor: PLAINS	Date/Time Finished: 5/2/2012 1135	Water Level: NA
Boring Diameter: 3"	Ground Elevation: not surveyed ~192.9 msl	Checked by: NA

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Sample ID & NOTES	~~Sample Depth (ft bgs)~~
1		NOT SCREENED	ML	SILT (ML): dark brown, >50% VEG/ROOTS		
2	48		CL	LEAN CLAY (CL): moist, dark brown (10YR 4/2), 99% high plasticity fines, 1% fine sand. High toughness, no dilatancy, high dry strength.		
3						
4				↓ (3.5') yellowish brown (10YR 5/4)		
5						
6						
7	49		ML	SILT WITH SAND (ML): moist, yellowish brown, 80% low plasticity fines, 20% fine sand.		
8				SANDY SILT (ML): wet, yellowish brown (10YR 5/4), 70% low to moderate plasticity fines, 30% fine sand.		
9				very wet		
10						
11			SP	POORLY GRADED SAND (SP): wet, brownish yellow (10YR 6/6), 95% fine to medium sand, 5% fines.		
12	48					
13			GP	POORLY GRADED GRAVEL (GP): wet, brownish yellow (10YR 6/6), 85% fine gravel, 10% coarse sand, 5% fines. Gravel is subrounded limestone, ocassionally fossiferous or silicified	No odor or staining observed (0-21' bgs)	
14						
15						
16						
17	39					
18						
19				↓ Gravel includes a aphanitic black lithology, rounded, ~10%	grab groundwater sample gw23-20120502 1135	
20						
21	2			REFUSAL @ 21' bgs, grey limestone sand in shoe [BEDROCK]		

NOTES: BACKFILLED W/BENTONITE
No odor or staining observed 0-21' bgs.

Checked by _____ Date: _____

Date	Time	Depth to water while drilling
5/2/12	1115	9.5

AECOM	Client: CLEAN HARBORS	BORING ID: gw24
	Site: COFFEYVILLE NW AREA	
	Project Number: 60240275-200	
	Boring Location: W OF HWY 169, S OF 2600 RD	Sheet: 1 OF 1
Logged By: ASHLIN	Coordinates: 37°5'25.868"N, 95°35'37.553"W	Monitoring Well Inst.: NO
Weather: HOT, HUMID	Sample Type(s): GROUNDWATER (GRAB)	Screened Interval: NA
Drilling Method: GEOPROBE (DUAL TUBE)	Date/Time Started: 5/2/12 : 1230	Depth of Boring: 24.0' bgs
Drilling Contractor: PLAINS DRILLING	Date/Time Finished: 5/2/12 1431	Water Level: NA
Boring Diameter: 3"	Ground Elevation: not surveyed ~192.0 MSL	Checked by: NA

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Sample ID / NOTES	~~Sample Depth (ft bgs)~~
1		NOT SCREENED	ML	SILT (ML): very dark grayish brown (10 YR 3/2), moist, 50% VEG upper 6", low plasticity, 95% fines, 5% fine sand		
2–5	36		CL	LEAN CLAY (CL): moist, brown (10 YR 5/3), 95% high-plasticity fines, 5% fine sand. Moderate to high toughness, no dilatancy, high dry strength. Red orange/black/grey mottled color - 90%		
6–8	60			8'		
9–10			SM	SILTY SAND (SM): moist to wet, light brownish gray (10 YR 6/2), 70% fine sand, 30% low to moderate plasticity fines.	No odor or staining observed (0-24' bgs)	
11–13	58			↓ wet 85% fine sand, 15% fines brownish yellow (10 YR 6/8)	▽ Driller reports flowing sands. Sample liner sand locked in push tube 1335	
14–17	16		SP	~~COARS~~ POORLY GRADED SAND (SP): wet, yellowish brown (10 YR 5/6), ~~95%~~ 80% coarse sand, 15% fine to medium sand, 5% fines. Coarse sand subrounded red-orange limestone and trace chert		
18–20					Switch to 1" Φ discrete sampler	
21–22	20				grab groundwater sample gw24-20120502 ~~1331~~ 1431	
23–24				↓ REFUSAL @ 24.0' bgs. Trace gravel in shoe		

NOTES: Backfilled w/ bentonite. No odor or staining observed 0-24' bgs.

Checked by _____ Date: _____

Date	Time	Depth to water while drilling
5/2/12	1400	12' bgs

AECOM	Client: CLEAN HARBORS	BORING ID: GW-25
	Site: COFFEYVILLE - NW AREA, W OF HWY 169	
	Project Number: 60240275-200	
	Boring Location: W of HWY 169, S OF 2600 RD	Sheet: 1 of 2
Logged By: ASHLIN	Coordinates: 37° 5' 31.265" N, 95° 35' 31.789" W	Monitoring Well Inst.: NO
Weather: WARM, WINDY	Sample Type(s): GROUNDWATER ONLY	Screened Interval: N/A
Drilling Method: GEOPROBE (DUAL TUBE)	Date/Time Started: 5/3/12 0930	Depth of Boring: 30.5 bgs
Drilling Contractor: PLAINS	Date/Time Finished: 5/3/12 1030	Water Level: 19.5 bgs (?)
Boring Diameter: 3"	Ground Elevation: Not surveyed. ~190.0 msl	Checked by: N/A

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Sample ID & NOTES	~~Sample Depth (ft bgs)~~
1		NOT SCREENED	ML	4" SILT (ML): moist, dark brown veg/roots	No odor or staining observed (0-30.5' bgs)	
2	55		CL	LEAN CLAY (CL): moist, brown (10YR 5/3), 95% high plasticity fines, 5% fine sand, calc. concretions. Very high toughness, no dilatancy, high dry strength. black/red-orange/grey color mottling. ↓ yellowish brown (10YR 5/6)		
3						
4						
5						
6			ML	SILT (ML): moist, yellowish brown (10YR 5/6); 99% moderate to low plasticity fines, 1% fine sand. Slow dilatancy, high toughness, grey/red-orange color mottling 20% ↓ some clay present		
7	60					
8						
9						
10						
11						
12	60					
13						
14						
15						
16						
17	60		SP-SM	SILT WITH SAND (SP-SM): moist; yellowish brown (10YR 5/4), 90% low to moderate plasticity fines, 10% fine sand, some small 1-2cm concretions. grey/red orange mottling - 80%		
18						
19						
20			SM	SILTY SAND (SM): ~~moist~~ wet, yellowish brown (10YR 5/4), 80% fine sand, 20% fines		
21						
22	50					
23				↓ brown 10YR 5/3		
24				↓ sand fine to medium		

NOTES:

Checked by _____ Date: _____

Date	Time	Depth to water while drilling
5/3/12	1000	20

AECOM	Client: CLEAN HARBORS	BORING ID: gw-25
	Site: COFFEYVILLE	
	Project Number: 60240275-200	
	Boring Location: SEE PG 1	Sheet: 2 of 2
Logged By: ASHLIN	Coordinates: SEE PG 1	Total Depth: 30.5 bgs

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Sample ID ~~NOTES~~	~~Sample Depth (ft bgs)~~
25			GP-GM	POORLY GRADED GRAVEL W ~~SAND~~ SILT AND SAND Wet, yellowish brown (10 YR 5/4), 50% fine gravel, 40% medium to coarse sand, 10% fines Gravel is subrounded limestone, chert and a mafic lithology (rare). Limestone heavily weathered, sometimes silicified, not fossiliferous in this location		
26						
27	41					
28					grab groundwater gw25-20120503 1010	
29				4" medium to coarse sand		
30				REFUSAL @ 30.5' in coarse gravel	1006	
31						

NOTES: Backfilled w/bentonite.

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	BORING ID: gw26
	Site: COFFEYVILLE	
	Project Number: 60240275-200	
	Boring Location: W OF HWY 169, S OF 2600 RD	Sheet: 1 of 2
Logged By: ASHLIN	Coordinates: 37°5'32.582"N, 95°35'31.335"W	Monitoring Well Inst.: NO
Weather: WARM	Sample Type(s): GROUNDWATER ONLY	Screened Interval: N/A
Drilling Method: GEOPROBE	Date/Time Started: 5/3/2012 1040	Depth of Boring: 34.5 bgs
Drilling Contractor: PLAINS	Date/Time Finished: 5/3/2012 1120	Water Level: 16 ftbgs
Boring Diameter: 3"	Ground Elevation:	Checked by: JMA

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Sample ID & Notes	~~Sample Depth (ft bgs)~~
			ML	SILT (ML) and VEG/ROOTS (8")		
1–4	50	NOT SCREENED	ML	SILT (ML): moist, yellowish brown (10YR 5/2), 95% moderate plasticity fines, 5% fine sand, some clay present. Slow dilatancy, high toughness, low dry strength		
5				↓ grey/red-orange color mottling 60% some calcite cavities and concretions <5%		
6–9	60					
10						
11						
12–14	60		ML	SANDY SILT (ML): moist to very moist, yellowish brown (10YR 5/2), grey/black mottling 10%, 75% low-plasticity fines, 25% fine sand		
15						
16–17				very moist (?)	▽	
18	55					
19				POORLY GRADED SAND WITH SILT (SP-SM): moist light yellowish brown (10YR 6/4), 90% fine sand, 10% fines		
20			SP-SM			
21						
22	60			2mm		
23				← 23.7' SMALL SHELL		
24						

No observed staining or odor (0-34.5' bgs)

NOTES: No odor or staining observed.

Date	Time	Depth to water while drilling

Checked by _____ Date: _____

AECOM

Client: CLEAN HARBORS
Site: COFFEYVILLE
Project Number: 60240275-200
Boring Location: SEE PG 1
Coordinates: SEE PG 1

BORING ID: gw-26
Sheet: 2 of 2
Total Depth: 34.5' bgs

Logged By: JA

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Sample ID	Sample Depth (ft bgs)
25		NOT SCREENED	SP-SM	POORLY GRADED SAND W/SILT (continued)		
26						
27			GP	POORLY GRADED GRAVEL W/SAND: wet yellowish brown (10YR 5/2), 80% fine gravel, 20% coarse sand.	1115	
28	27			Gravel subrounded to subangular limestone, rare chert, mafics		
29				4" Medium sand		
30						
31						
32	12		LS	~~REFUSAL @ 32' bgs~~ [BEDROCK]: highly weathered, gray limestone	grab groundwater gw26-20110523 1145	
33						
34						
35				REFUSAL @ 34.5' bgs		

NOT LOGGED:
gw-27
gw-28
gw-29

NOTES: Backfilled w/ bentonite.

Date	Time	Depth to water while drilling

AECOM	Client: CLEAN HARBORS	WELL ID: SW-3D
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-300	
	Boring Location: County Road 2600 (South of)	Sheet:
Logged By: D Blank	Coordinates: N 37°05.614' W 095°36.551'	Well Inst.: No
Weather: 50° windy	Sample Type(s): gw only	Screen Interval: x
Drilling Method: Geoprobe 7720DT	Date/Time Started: 10/24/12 1410	Depth of Boring: 25'
Drilling Contractor: ~~Thiele Geotech, Inc~~	Date/Time Finished: 10/24/12 1435	Water Level: x
Boring Diameter: 2"	Ground Elevation: X	Checked by: D

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1				lean clay, dark brown to light brown/gray, low to med plasticity, med stiff, organics to ~3', 30-20% silt 70-80% clay, rust colored mottling	
2	60%				
3					
4					
5				As ABOVE, brown to dark gray, no organics, 15-20% silt high plasticity, stiff to hard, rust colored mottling	
6					
7					
8					
9					
10					
11				AS ABOVE	
12					
13				lean clay, dark gray, saturated, med plasticity, med stiff, 5% fine sand, 20% silt, 75% clay	
14					
15				Clay, moist, light tan to dark gray, high plasticity, stiff, 5% silt, 95% clay	
			15'-16'	poorly graded sand, saturated, non plastic, loose to med dense, 99% fine grained sand, 1% silt	
16					
17					
18			18'-18½"	clay, grey, wet, high plast, 100% clay	
19				Sandy gravel, saturated, med dense, 60% gravel, 30% sand, 10% silt	
20					

NOTES:

Date	Time	Depth to water while drilling
10/24/12	1420	13'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS		WELL ID: GW-30
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS		
	Project Number: 60240275-300		
	Boring Location: County Road 2600 (South of)		Sheet:
Logged By: DBlack	Coordinates: N 37° 05. 614' W 095° 35. 551'		Well Inst.: No
Weather: 80°F windy	Sample Type(s): GW only		Screen Interval: X
Drilling Method: Geoprobe 7720 DT	Date/Time Started: 10/24/12 1410		Depth of Boring: 25'
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plains	Date/Time Finished: 10/24/12 1435		Water Level: X
Boring Diameter: 2"	Ground Elevation: X		Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				Sandy gravel, saturated, reddish brown, non plastic, med dense, 15% fine to coarse grained sand, 85% gravel	
22					
23	70%				
24				Clay, wet, dark gray, high plasticity, stiff, 5% silt 95% clay	
25					
26				End of Boring @ 25'	
27				gravel in end of sleeve no odor / staining	
28				Way point 018	
29				1450 - Sample GW-30 / ~~GW-D~~ → GW DUP 10/12	
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling
10/24/12	1420	13'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: SW-21
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-500	
	Boring Location: County Road 2600 (South of)	Sheet:
Logged By: DBlack	Coordinates: N 37° 05.617' W 095° 35.582'	Well Inst.: No
Weather: 75° windy	Sample Type(s): SW only	Screen Interval: X
Drilling Method: Geoprobe 7720 DT	Date/Time Started: 10/24/12 1255	Depth of Boring: 29'
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plaza	Date/Time Finished: 10/24/12 1330	Water Level: X
Boring Diameter: 2"	Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1				clay, moist, reddish brown to gray, high plasticity, med stiff, rust colored mottling, rootlets, ~5% silt, 95% clay	
2	20%				
3					
4					
5					
6				AS ABOVE, stiff, no rootlets, trace fine sand <1%	
7					
8	100%				
9				→ reddish brown to gray	
10				gravelly clay, moist, high plast, stiff, rust colored mottling, 10% gravel, 5% silt, trace sand, 85% clay, gravel sub-to SR gray limestone	
11					
12					
13	100%			clay, moist, high plasticity, reddish br. to gray, hard to stiff, rust colored mottling, 5% silt, trace sand, 95% clay	
14					
15		11		→ small sat layer from 14½' to 14¾'	
16					
17	100%				
18				AS ABOVE, gray @ 17', rust colored mottling	
19					
20				lean clay, moist, gray, high to med plast, stiff, rust colored mottling, 25% silt, 5% fine sand, 70% clay	

NOTES:

Date	Time	Depth to water while drilling
10/24/12	1315	14½'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS		WELL ID: SW-31
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS		
	Project Number: 60240275-300		
	Boring Location: County Road 2600 (South of)		Sheet:
Logged By: DBlack	Coordinates: N 37° 05.617' W 095° 35.582'		Well Inst.: No
Weather: 75° windy	Sample Type(s): SW only		Screen Interval: X
Drilling Method: Geoprobe 7720 DT		Date/Time Started: 10/24/12 1255	Depth of Boring: 29'
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plaza		Date/Time Finished: 10/24/12 1330	Water Level: X
Boring Diameter: 2"		Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				poorly graded sand w/clay saturated, light br to br. low plasticity, loose, 10% clay 90% fine sand	
22					
23					
24				Sandy gravel, saturated, yellowish to reddish brown, non plastic, med dense, 70% gravel, 20% sand, 10% silt, gravel SA to SR, yellowish br, 1/2" to less	
25				poorly graded sand, sat, reddish br, dense, 100% med grained sand	
26				Sandy gravel AS ABOVE	
27					
28				clay, moist, dark gray, high plasticity, stiff, 100% clay	
29					
30				End of Boring @ 29'	
31				Refusal	
12				no odor / staining	
13				Way point 017	
14				Sample SW-31 @ 1345	
15					
16					
17					
18					
19					
20					

NOTES:

Checked by _____ Date: _____

Date	Time	Depth to water while drilling
10/24/12	1315	14½'

AECOM	Client: CLEAN HARBORS	WELL ID: GW-32
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-500	
	Boring Location: County Road 2600 (South of)	Sheet:
Logged By: DBlank	Coordinates: N 37° 05.619' W 095° 35.602'	Well Inst.: No
Weather: 80°F sunny	Sample Type(s): SW only	Screen Interval: X
Drilling Method: Geoprobe 7720DT	Date/Time Started: 10/24/12 1115	Depth of Boring:
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plains	Date/Time Finished: 10/24/12 1140	Water Level: X
Boring Diameter: 2"	Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1				lean clay, moist, dark to light brown, med to low plasticity, med stiff, organics, rust colored mottling, trace fine sand, 30% silt 70% clay	
2	60%				
3					
4					
5				AS ABOVE, moist, reddish brown, to dark grey, med stiff to soft, rust colored mottling 70% silt, 70% clay, trace fine sand	
6					
7	45%				
8					
9				AS ABOVE, moist, reddish br. to dark grey, med stiff to soft, rust colored mottling. 30% silt, 70% clay trace fine sand	
10					
11					
12					
13	80%	▼		lean clay, saturated, reddish brown, med to low plasticity, soft, rust colored mottling, 10% silt, 30% fine sand, 60% clay	
14					
15					
16				AS ABOVE, saturated	
17	100%				
18					
19					
20					

NOTES:

Date	Time	Depth to water while drilling
10/24/12	1120	12½'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: GW-32
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-300	
	Boring Location: County Road 2600 (South of)	Sheet:
Logged By: DDlark	Coordinates: N 37°05. 619' W 095°35. 602'	Well Inst.: No
Weather: 80°F sunny	Sample Type(s): GW only	Screen Interval: X
Drilling Method: Geoprobe 7720 DT	Date/Time Started: 10/24/12 1115	Depth of Boring: 30'
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plains	Date/Time Finished: 10/24/12 1140	Water Level: X
Boring Diameter: 2"	Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				AS ABOVE, rust colored mottling	
22	90%				
23				poorly graded sand, saturated, reddish br., med dense, 99% sand 1% silt	
24				lean clay, saturated, reddish br. to dark gray, med to high plasticity, 20% silt, 80% clay	
25				well graded sand, saturated, reddish brown, loose, 95% coarse to med grained sand, 10% gravel	
26					
27	90%			silty gravel, saturated, reddish brown, 80% gravel, 15% silt, 5% coarse to fine grained sand, ~~gravel~~ gravel subangular to subrounded limestone	
28					
29					
30					
31				End of Boring @ 30' no odor / staining	
32				Way point 016	
33				1150 Sample GW-32	
34					
35					
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling
10/24/12	1120	12'k

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID:
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	SW-D3 33
	Project Number: 60240275-500	
	Boring Location: Trout D	Sheet:
Logged By: DBlack	Coordinates: N 37°05.477' W 095°35.721'	Well Inst.: NO
Weather: 60° cloudy	Sample Type(s): SW only	Screen Interval: X
Drilling Method: Geoprobe 7720 DT	Date/Time Started: 10/23/12 0900	Depth of Boring: 26½'
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plains	Date/Time Finished: 10/23/12 0925	Water Level: X
Boring Diameter: 2"	Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1				clay, moist, dk br., ~~[illegible]~~, high plast, stiff to medstiff, 5% silt, c 5% fine sand, 90+% clay	
2	60%				
3				lean clay, moist, light to dk br, ~~[illegible]~~, low plast, med. stiff, 20% silt, 80% clay	
4					
5				~~Sandy silt, dry, yellowish br. 100%, noplast, loose, 20% sand 80% silt~~	
6				Sandy silt, moist, ~~[illegible]~~, lowplast., loose to dense, 10% clay, 80% silt, 10% fine sand, yellowish br to dark br., rust-colored mottling	
7	85%				
8					
9					
10					
11				Sandy silt, moist, low to med plast, dense, 15-20% clay, 70% silt, 10-5% fine sand, light to dk br., & mottled	
12	90%				
13				clay, moist, dk br. high plast, stiff, 10% silt, 90% clay	
14					
15				lean clay, moist, light to dk br, stiff to med stiff, 20-40% silt 70-60% clay, mottled	
16		PID		AS ABOVE, ~~[illegible]~~ moist	
17	100%			clay, wet, med stiff to stiff, high plast, 5% silt 95% clay, gray to light br., rust-colored mottling	
18					
19					
20					

NOTES:

Date	Time	Depth to water while drilling
10/23/12	0920	16'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID:
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	SW-33
	Project Number: 60240275-200	
	Boring Location: N37°05.477' W 095°35.721'	Sheet:
Logged By: DBlack	Coordinates: Tract D	Well Inst.: No
Weather: 60° cloudy	Sample Type(s): SW only	Screen Interval: X
Drilling Method: Geoprobe 7720DT	Date/Time Started: 10/23/12 0900	Depth of Boring: 26½'
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plaza	Date/Time Finished: 10/23/12 0925	Water Level: X
Boring Diameter: 2"	Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				Clay, wet, reddish br. to dark gray, high plasticity, stiff to very stiff, rust colored mottling, 95% clay, 5% silt	
22					
23	100%				
24				24'-24'2" → Sandy silt, dry, dk reddish br., non plastic, dense (cemented), 20% fine sand, 80% silt	
25					
26	100%			→ Clay As above, dry @ 25', light to dk gray	
27				refusal @ 26½	
28				↳ no odor or staining	
29					
30				waypoint 004 / 015	
31				Sample @ 1035 10/24/12	
32					
33					
34					
35					
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling
10/23/12	0920	16'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS		WELL ID:
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS		SW-34
	Project Number: 60240275-500		
	Boring Location: Tract D		Sheet:
Logged By: DBlack	Coordinates: N 37° 05. 535' W 095° 35. 754'		Well Inst.: NO
Weather: 60°F cloudy	Sample Type(s): SW only		Screen Interval: X
Drilling Method: Geoprobe 7720DT	Date/Time Started: 10/23/12 1040		Depth of Boring: 23'
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Pioneer	Date/Time Finished: 10/23/12 1100		Water Level: X
Boring Diameter: 2"	Ground Elevation: X		Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1				lean clay, dark to yellowish br., moist, low to med plast, med stiff, 40% silt, 60% clay	
2					
3	70%				
4					
5				Sandy silt, moist to dry, light to yellowish br., loose to med, dense, low plast 10% clay 20% fine sand, 70% silt	
6					
7	60%				
8				lean clay, moist, brown to dark br., stiff to med stiff, low to med plast, 20% silt, 80% clay, rust-colored mottling	
9					
10					
11				AS ABOVE ↑ plasticity w/ depth ↓ silt content	
12	80%				
13					
14		▼		→ wet @ 14' 10% silt 70% clay	
15					
16				clay, dark br, wet, high plast., stiff, 10% silt 70% clay	
17	70%				
18				→ 18' 9" 10% silt 10% fine sand, 80% clay	
19			½" coal	clay, dark gray, saturated, stiff, high plast., 5% gravel, 10% sand 10% silt, 75% clay	
20					

NOTES:

Date	Time	Depth to water while drilling
10/23/12	1055	14'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: SW-34
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-800	
	Boring Location: Track D	Sheet:
Logged By: DBlack	Coordinates: N 37° 05.535' W 095° 35.754'	Well Inst.: No
Weather: 60°F cloudy	Sample Type(s): SW only	Screen Interval: X
Drilling Method: Geoprobe 7720DT	Date/Time Started: 10/23/12 1040	Depth of Boring: 23'
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Pioneer	Date/Time Finished: 10/23/12 1100	Water Level: X
Boring Diameter: 2"	Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				Clay, yellowish brown to gray, saturated, high plasticity, med stiff to soft. ~ 5% silt, 95% clay	
22				Gravelly clay, yellowish br, saturated, high plasticity, stiff to med stiff. ~ 15% fine sand/silt, 25% gravel, 60% clay	
23					
4				Refusal @ 23'	
5				no staining, no odor	
6				way point 005/014	
7				Sample SW-34@ 1550	
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

NOTES:

Date	Time	Depth to water while drilling
10/23/12	1055	14'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: SW-35
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-000	
	Boring Location: TRACT D	Sheet:
Logged By: DBlack	Coordinates: N 37°05.568' W 095°35.863'	Well Inst.: No
Weather: 70°F Cloudy	Sample Type(s): SW only (SW-35 @ 1205)	Screen Interval: X
Drilling Method: Geoprobe 7720DT	Date/Time Started: 10/23/12 1130	Depth of Boring: X
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plains	Date/Time Finished: 10/23/12 1150	Water Level: X
Boring Diameter: 2"	Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1–2				Silty sand, moist, light brown, loose, nonplastic, rootlets 70% fine sand, 30% silt	
3–5	80%			lean clay, moist, light to dark brown, stiff to med stiff, low to med plasticity, 40-75% silt, 20-60% clay ↑ plasticity w/ depth	
6–10	80%			clay, moist, very dark brown, very stiff, high plasticity, 10% silt, 90% clay, rust colored mottling AS ABOVE	
11–14	70%			AS ABOVE → DB @ 14½' ~~(still moist)~~ wet	
15–18	100%			AS ABOVE, dark brown to grey, very stiff, very high plast, <5% fine sand, 95% clay, sand yellowish brown, rust colored mottling, trace gravel, rootlets (granules)	
19–20					

NOTES:

Date	Time	Depth to water while drilling
10/23/12	1140	14½'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: SW-35
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-800	
	Boring Location: Trust D	Sheet:
Logged By: DBlack	Coordinates: N 37°05.568' W 095°35.863'	Well Inst.: No
Weather: 70° Cloudy	Sample Type(s): SW only	Screen Interval: X
Drilling Method: Geoprobe 7720 DT	Date/Time Started: 10/23/12 1130	Depth of Boring: 25'
Drilling Contractor: ~~Thiele Geotech, Inc~~ Clayton	Date/Time Finished: 10/23/12 1150	Water Level: X
Boring Diameter: 2"	Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				AS ABOVE, moist	
22				→ gravel angular to SA	
23	80%			Gravelly clay, wet, gray to yellowish brown, high plasticity, med stiff, 30% gravel, 15% fine sand/silt, 55% clay	
24	▼			Gravelly clay saturated, light to dark gray, high plasticity, med stiff, 40% gravel, 10% sand/silt, 50% clay	
25			24'5"	2" clay @ 24'3" to 24'5", high plast, saturated	
6			25'4"	clay, clay, dark gray, high plast, very stiff, 10% silt 90% clay	
7				Refusal @ 25'	
8				no odor or staining	
9				Way point 006/013	
10					
11				Sample SW-35 @ 1205	
12					
13					
14					
15					
16					
17					
18					
19					
20					

NOTES:

Date	Time	Depth to water while drilling
10/23/12	1140	14½'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS		WELL ID: SW-36
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS		
	Project Number: 60240275-300		
	Boring Location: Track D		Sheet:
Logged By: DBlack	Coordinates: N 37°05.617' N 095°35.922'		Well Inst.: No
Weather: 80° Cloudy	Sample Type(s): SW only		Screen Interval: X
Drilling Method: Geoprobe 7720DT	Date/Time Started: 10/23/12 1340		Depth of Boring: 23½
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plains	Date/Time Finished: 10/23/12 1405		Water Level: X
Boring Diameter: 2"	Ground Elevation: X		Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1				lean clay, moist to dry, light to dark brown, low to med plasticity, med stiff, 30% silt, 70% clay, rootlets	
2	40%				
3				AS ABOVE	
4					
5					
6				AS ABOVE, rust colored mottling	
7	50%				
8				clay, moist, very dark brown to dark grey, high plasticity, stiff, 5% silt, 95% clay, mottled	
9					
10					
11				As above, moist, trace coarse sand <1%, dk brown mottled, rootlets	
12	80%				
13				AS ABOVE, rootlets	
14					
15				Clay, moist, brown to light grey (10'), high plasticity, stiff to med stiff, 1% silt, 99% clay, rust colored mottling w/ some black	
16					
17	100%			↑ silt content w/ depth	
18					
19				10% silt	
20				lean clay, moist, light grey, med plast, med stiff	

NOTES: 10% fine sand, 20% silt, 70% clay, mottled

Date	Time	Depth to water while drilling
10/23/12	1405	21'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: GW-36
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-500	
	Boring Location: N 37°05. 617' N 095° 35.922'	Sheet:
Logged By: DBlack	Coordinates: Tract D	Well Inst.: No
Weather: 80° cloudy	Sample Type(s): GW only	Screen Interval: x
Drilling Method: Geoprobe 7720DT	Date/Time Started: 10/23/12 1340	Depth of Boring: 23½
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plaza	Date/Time Finished: 10/23/12 1405	Water Level: X
Boring Diameter: 2"	Ground Elevation: x	Checked by: x

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				AS ABOVE, ↑ sand 20% silt, 20%, sand, 60% clay	
22				Silty sand, saturated, light brown to light gray, very low plasticity, loose to med dense, 5% clay, 20% silt, 70% fine to med grained sand	
23	80%				
24				23½ ↑	
25					
6				Refusal @ 23½	
7				↳ black shale / siltstone?	
8				no odor / staining	
9				Way point 007 / 012	
10				Sample GW-36 @ 1410	
11				Hole backfilled w/ bentonite	
12					
13					
14					
15					
16					
17					
18					
19					
20					

NOTES:

Checked by _____ Date: _____

Date	Time	Depth to water while drilling
10/23/12	1405	21'

AECOM	Client: CLEAN HARBORS		WELL ID: SU-77
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS		
	Project Number: 60240275-100		
	Boring Location: Tract D		Sheet:
Logged By: DOhel	Coordinates: N 37°05.624' W 095°36.048'		Well Inst.: No
Weather: 80°F, cloudy	Sample Type(s): SU only		Screen Interval: X
Drilling Method: Geoprobe	Date/Time Started: 10/23/12 1440		Depth of Boring: 32½'
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 10/23/12 1510		Water Level: X
Boring Diameter: 2"	Ground Elevation: X		Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1				lean clay, moist, dark brown, med plasticity, med. stiff, rootlets to ~4', rust colored mottling	
2					
3	60%			AS ABOVE	
4					
5					
6					
7	60%			lean clay, moist, light brown to light gray, med to low plasticity, med stiff, rust colored mottling 5% fine sand, 20% silt, 75% clay	
8					
9					
10					
11					
12	70%			AS ABOVE, wet @ 13', 10% fine sand, 20% silt 70% clay, rust colored mottling	
13		1.4			
14					
15				AS ABOVE	
16					
17	80%			lean clay, saturated, light brown, med to high plasticity, soft, little mottling, 20% fine sand, 20% silt 60% clay	
18					
19					
20					

NOTES:

Date	Time	Depth to water while drilling
10/23/12	1450	13'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID:
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	SW-37
	Project Number: 60240275-300	
	Boring Location: Tract D	Sheet:
Logged By: D Black	Coordinates: N 37°05.624' W 095°36.048'	Well Inst.: No
Weather: 80° cloudy	Sample Type(s): SW only	Screen Interval: X
Drilling Method: Geoprobe 7720 DT	Date/Time Started: 10/23/12 1440	Depth of Boring: 32½
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plasma	Date/Time Finished: 10/23/12 1510	Water Level: X
Boring Diameter: 2"	Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				AS ABOVE	
22					
23	100%			Silty sand, saturated, light brown to light grey, low plasticity, med dense, 5-10% clay, 5-10% silt, 85% fine sand	
24					
25					
26				Poorly graded sand, saturated, brown, non plastic, loose, 100% fine grained sand	
27				lean clay, saturated, dark brown to dark grey, med to high plasticity, 10% fine sand, 20% silt, 70% clay, rust colored mottling	
28					
29					
30			29½'	gravelly clay, saturated, dark grey (gravelly dark grey to yellowish brown), med to high plasticity, dense, 30% gravel, 50% clay, 20% fine sand/silt, gravel angular to SA	
31					
32				Clay, wet, dark grey, high plasticity, stiff to med stiff, 10% silt, 90% clay, trace gravel <1%	
33				Refusal @ 32½'	
34				no odor/staining	
35				Way point 008/009	
				Sample SW-37 @ 1525	
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling
10/23/12	1450	13'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: SGW-38
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-100	
	Boring Location: Tract D	Sheet:
Logged By: D Clark	Coordinates: N 37° 05.580' W 095°36.054'	Well Inst.: No
Weather: 70° part cloudy	Sample Type(s): SGW only	Screen Interval: X
Drilling Method: Geoprobe 7720DT	Date/Time Started: 10/24/12 0820	Depth of Boring: 30½
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plaza	Date/Time Finished: 10/24/12 0855	Water Level: X
Boring Diameter: 2"	Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1–5	60%			lean clay, moist, dark brown, med plasticity, med stiff, rootlets to ~4', rust colored mottling, 20% silt, 80% clay, <1% trace fine sand AS ABOVE	
6–9	80%			clay, moist, ~~light~~ brown to grey, med to high plast, med stiff, black and rust colored mottling, 10-5% silt, 90-95% clay AS ABOVE, high plasticity	
10–13	100%	▼		lean clay, brown to grey, saturated, high plasticity, soft, rust colored mottling, 30% silt, 70% clay	
14–20	100%			AS ABOVE, saturated, brown to grey, high plasticity, soft to med stiff, rust colored mottling	

NOTES:

Date	Time	Depth to water while drilling
10/24/12	0835	12½'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS		WELL ID: SW-38
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS		
	Project Number: 60240275-300		
	Boring Location: Tract D		Sheet:
Logged By: DDlade	Coordinates: N 37°05.580' W 095°76.054'		Well Inst.: No
Weather: 70° part cloudy	Sample Type(s):		Screen Interval: X
Drilling Method: Geoprobe 7720 DT		Date/Time Started: 10/24/12 0820	Depth of Boring: 20½
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plaintiff		Date/Time Finished: 10/24/12 0855	Water Level: X
Boring Diameter: 2"		Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				lean clay, saturated, dark brown to dark gray, high plasticity, soft to med stiff, some organics, 20% silt, 5% fine sand, 75% clay	
22					
23	100%				
24				AS ABOVE, dark gray @ 23½' 8", stiff, rust colored mottling	
25					
26					
27					
28	60%			lean clay, saturated, dark gray, high plasticity, med stiff to stiff, 20% silt, 5% fine sand 75% clay	
29				29 - ½" coal, saturated	
30				lean clay saturated, dark gray, high plasticity, stiff, 20% silt, 5% fine sand, 5% gravel, 70% clay	
31				30 - ¼" coal AS ABOVE 10% angular to sub yellowish br. gravel	
32				Refusal @ 30½' no odor or staining	
33				5 - 20% gravel ¼" to 1cm	
34				Sample SW-38 @ 0905	
35				Way point 010	
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling
10/24/12	0935	12½'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: SW-39
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-~~200~~ 500	
	Boring Location: Tract D	Sheet:
Logged By: DOlsen	Coordinates: N 37°05.515' W 095°36.058'	Well Inst.: No
Weather: 70° part cloudy	Sample Type(s): SW only	Screen Interval: X
Drilling Method: Geoprobe 7720DT	Date/Time Started: 10/24/12 0920	Depth of Boring: 30½'
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plaintiff	Date/Time Finished: 10/24/12 0950	Water Level: X
Boring Diameter: 2"	Ground Elevation:	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
1				lean clay, moist, dark brown, low to med plasticity, med stiff, rootlets, 30% silt, 70% clay, trace fine sand	
2					
3	60%				
4					
5				As ABOVE, moist, dark to light brown, med plasticity, med stiff, rust colored mottling, 20% silt, 80% clay, trace fine sand	
6					
7	70%				
8					
9					
10				As ABOVE, light brown to gray, moist, med to high plasticity, med stiff, rust colored mottling, 20% silt, 80% clay, trace fine sand	
11					
12	70%				
13		▼		clay, light br. to gray, saturated, high plasticity, soft, rust colored mottling, 5-10% silt, 90-95% clay	
14				lean clay, light brown, saturated, high plast, soft, rust colored mottling, 30% silt, 10% fine sand, 60% clay	
15					
16					
17	80%			As ABOVE, 20% silt, 10% fine sand, 70% clay	
18					
19					
20					

NOTES:

Date	Time	Depth to water while drilling
10/24/12	0935	13'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: SW-37
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200 500	
	Boring Location: Tract D	Sheet:
Logged By: DBlank	Coordinates: N 37°05.515' W 095°36.058'	Well Inst.: No
Weather: 70° part cloudy	Sample Type(s): SW only	Screen Interval: x
Drilling Method: Geoprobe 7720 DT	Date/Time Started: 10/24/12 0950	Depth of Boring: 30½
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plains	Date/Time Finished: 10/24/12 0950	Water Level: x
Boring Diameter: 2"	Ground Elevation:	Checked by: x

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				AS ABOVE	
22	80%				
23				AS ABOVE	
24					
25				Poorly graded sand, saturated, brown, nonplastic, med dense, 99% fine grained sand, 1% silt	
26				Clay, moist, dark gray, high plasticity, med stiff to stiff, rust colored mottling, 5% silt, 95% clay	
27	55%				
28					
29				Gravelly clay, saturated, med to high plasticity, stiff, rust colored mottling, ~30% gravel, 10% silt/fine sand, 60% clay	
30					
31				Refusal @ 30½'	
32				Way point 011	
33				Sample SW-39 @ 1005	
34					
35					
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS		WELL ID: GW-40
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS		
	Project Number: 60240275-300		
	Boring Location: Robertson's Property		Sheet:
Logged By: DBlack	Coordinates: N 37° 05.660' W 095° 36.597'		Well Inst.: No
Weather: 70's cloudy	Sample Type(s): GW only		Screen Interval: X
Drilling Method: Geoprobe 7720 DT	Date/Time Started: 10/25/12 0810		Depth of Boring: 30'
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plains	Date/Time Finished: 10/25/12 0835		Water Level: X
Boring Diameter: 2"	Ground Elevation: X		Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (if Known)	NOTES
1				Sandy lean clay, moist, dark brown, low to med plast, med stiff, trace gravel, 20% sand, 10% silt 70% clay, rootlets	
2					
3	70%			clay, dark to reddish brown, med to high plast, med stiff to stiff, rust colored mottling 5% silt, 95% clay, trace fine sand	
4					
5					
6				lean clay, reddish brown to gray, med plasticity, med stiff, rust colored mottling, 15% silt, 85% clay, trace fine sand	
7	70%				
8					
9					
10				silt w/ clay, light to reddish brown, very low plast, loose to med stiff, rust colored mottling, 80% silt 20% clay	
11					
12	70%			AS ABOVE, wet	
13		▼			
14					
15					
16				poorly graded sand, reddish brown, saturated, nonplastic, loose, rust colored mottling, 99% fine sand, 1% silt/clay	
17	100%				
18				lean clay, saturated, reddish br to gray, low plast, rust colored mottling, 20% fine sand, 20% silt, 60% clay	
19				poorly graded sand, saturated, reddish br, loose, rust colored mottling, 100% fine sand	
20					

NOTES:

Date	Time	Depth to water while drilling
10/25/12	0825	13'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: SW-40
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-300	
	Boring Location: Robertson's Property	Sheet:
Logged By: DBlank	Coordinates: N 37°05.660' W 095°35.597'	Well Inst.: No
Weather: 70's cloudy	Sample Type(s): SW only	Screen Interval: X
Drilling Method: Geoprobe 7720DT	Date/Time Started: 10/25/12 0810	Depth of Boring: 30'
Drilling Contractor: ~~Thiele Geotech, Inc.~~ Plaines	Date/Time Finished: 10/25/12 0835	Water Level: X
Boring Diameter: 2"	Ground Elevation: X	Checked by: X

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
21				lean clay, saturated, reddish brown, low to med plasticity, rust colored mottling, 10% fine sand, 20% silt, 70% clay	
22					
23	100%				
24				Sandy gravel, saturated, reddish br., non plastic, rust colored mottling, 50% gravel, 30% sand, 20% silt, trace clay, gravel ½" to 1cm, yellowish br. limestone	
25					
26				AS ABOVE	
27					
28	60%			→ 1/4 coal	
29				AS ABOVE	
30					
31				End of Boring @ 30'	
32				Waypoint 020	
33				0850 Sample SW-40	
34					
35					
36					
37					
38					
39					
40					

NOTES:

Date	Time	Depth to water while drilling
10/25/12	0825	13'

Checked by _____ Date: _____

AECOM	Client: CLEAN HARBORS	WELL ID: M-10
	Site: CLEAN HARBORS COFFEYVILLE FACILITY, COFFEYVILLE, KS	
	Project Number: 60240275-200	
	Boring Location: N CENTRAL - PHASE 1 GATE	Sheet: 1 of 2
Logged By: J. ASHLIN	Coordinates:	Well Inst.: YES
Weather: Clear, 30°F	Sample Type(s): Acetate sleeve for logging only	Screen Interval: 19.9-29.9
Drilling Method: Direct Push/Geoprobe	Date/Time Started: 1/11/2012 0840	Depth of Boring: 29.9
Drilling Contractor: Thiele Geotech, Inc.	Date/Time Finished: 1/11/2012 1000	Water Level: 9.89' bgs
Boring Diameter: 3.25" Ø	Ground Elevation:	Checked by: JA

Depth (ft)	Recovery (in)	PID Screening as Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	NOTES
					expansion cap; stickup 2.6'
1		NOT SCREENED		Top 6"- plant material and roots [BACKFILL]	
2	60			LEAN CLAY (CL): brown (10YR 4/3), moist, 99% high plasticity fines, no dilatancy, high toughness, high dry strength	BENTONITE SEAL
3				↓ color mottled brown, with yellowish brown 10YR 5/4	
4					
5					2" Ø SCH 40 PVC RISER
6					
7	48		CL	↓ very dark greenish gray (1GLEY 3/1) mottling absent, some 1-2" areas cemented amorphous "blobs". Some fine sand present (<10%),	
8					
9					
10					▽
11				↓ dark greenish gray (10YR 4/1) some Black discolorations, iron oxide nodules (1-2mm) rare	
12				SANDY CLAY (CL): dark greenish gray (10YR 4/1), very moist, 70% high plasticity fines, 30% fine sand	
13	50				▽
14					
15					
16				↓ 65% high plasticity fines, 35% fine sand wet	
17					
18	50			17.6	
19			Fe	IRON FILINGS	18 Slough Iron Filings No Sand Pack
20					

NOTES:

Checked by _____ Date: _____

Date	Time	Depth to water while drilling
1/12/2012	1200	12.49 After Install