

APPENDIX B – BORING LOGS

APPENDIX B.1


































BACKGROUND SOIL BORINGS

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Subsurface Boring Legend

Lithology Graphics

Symbol	Lithology
	Fill
	Top Soil
	Gravel
	Well Graded Gravel (GW)
	Poorly Graded Gravel (GP)
	Silty Gravel (GM)
	Silty, Clayey Gravel (GC-GM)
	Clayey Gravel (GC)
	Well Graded Gravel with Silt (GW-GM)
	Well Graded Gravel with Clay (GW-GC)
	Poorly Graded Gravel with Silt (GP-GM)
	Poorly Graded Gravel with Clay (GP-GC)
	Well Graded Sand (SW)
	Poorly Graded Sand (SP)
	Silty Sand (SM)
	Silty, Clayey Sand (SC-SM)
	Clayey Sand (SC)
	Well Graded Sand with Silt (SW-SM)
	Well Graded Sand with Clay (SW-SC)
	Poorly Graded Sand with Silt (SP-SM)
	Poorly Graded Sand with Clay (SP-SC)
	Silt (ML)
	Silty Clay (CL-ML)
	Lean Clay (CL)
	Organic Silt (OL)
	Elastic Silt (MH)
	Fat Clay (CH)
	Organic Clay (OH)
	Shale
	Siltstone
	Coal
	Limestone
	Sandstone

Lithology Graphics are based on TVA drafting standards.

Other Graphics

Symbol	Description
	Denotes environmental analytical sample interval
	Denotes SS sample interval
	Denotes ST sample interval
	Denotes DP sample interval
	Denotes RS sample interval
	Denotes RC sample interval
	First water level reading
	Second water level reading

Common Abbreviations

Abbreviation	Definition
DP	Direct Push
HA	Hand Auger
HSA	Hollow Stem Auger
N/A	Not Applicable
NR	Not Recorded
RC	Rock Core
RQD	Rock Quality Designation
RS	Rotary Sonic
SS	Split Spoon
ST	Shelby Tube
WH	Weight of Hammer
WR	Weight of Rod

General Notes

The boring logs include sample numbering used during drilling. For assigned Environmental Analytical Sample ID numbers, see relevant Environmental Chain-of- Custody forms from the drilling date range listed on each log.

For pH readings and additional field data, see applicable field documentation (e.g., Soil pH Data Form) from the drilling date range listed on each log.

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG01
Client <u>Tennessee Valley Authority</u>	Boring Location <u>446,082.60 N; 2,364,268.87 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>706.8 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>9/11/19</u> Completed <u>9/11/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Hawkston (Subcontractor)</u>	Drill Rig Type and ID <u>Geoprobe 3230DT</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>DT37 Dual Tube Soil Sampling System w/ 60" PVC liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>GH70 Direct Push</u> Weight <u>N/A</u> Drop <u>N/A</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>E. Smith</u>	Approved By <u>C. Kocka</u>

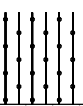



Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	706.8	Top of Hole					
1	1.0	705.8	Topsoil, sandy	HA ¹	HA01	0.0 - 0.5	0.5	
2			SILTY SAND SOME CLAY, SM, 7.5YR 4/3 (brown), fine, very loose, dry, with fragments of sandstone	1.5/3.5-20190911	DP01	0.0 - 5.0	3.0	N/A
3								
4								
5	5.0	701.8	SANDY LEAN CLAY TRACE GRAVEL, CL, 10YR 5/6 (yellowish brown) and 10YR 4/1 (dark gray), low plasticity, soft, moist Well graded sand with fine gravel lens from 5.2' to 5.6'	6.5/8.5-20190911	DP02	5.0 - 10.0	3.5	N/A
6								
7								
8			SANDY LEAN CLAY, CL, 10YR 4/1 (dark gray), low plasticity, soft to firm, moist	11.5/13.5-20190911	DP03	10.0 - 15.0	4.6	N/A
9								
10	9.8	697.0						
11			LEAN CLAY WITH SAND, CL, 10YR 4/4 (dark yellowish brown) and 10YR 4/1 (dark gray), low plasticity, firm, moist					
12								
13	13.3	693.5						
14								
15								
16								
17								

TVA/EIP BORING LOG 175668050, WBF TDEC ORDER GPJ, TDEC SUBSURF DT 20190930, GDT 7/29/20

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG01
Client <u>Tennessee Valley Authority</u>	Boring Location <u>446,082.60 N; 2,364,268.87 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>706.8 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
17			LEAN CLAY WITH SAND, CL, 10YR 4/4 (dark yellowish brown) and 10YR 4/1 (dark gray), low plasticity, firm, moist <i>(Continued)</i>	16.5/18.5-20190911	DP04	15.0 - 20.0	5.0	N/A
18								
19								
20	20.0	686.8						
21			SANDY FAT CLAY, CH, 10YR 4/6 (dark yellowish brown), medium plasticity, firm to soft, moist	21.5/23.5-20190911	DP05	20.0 - 25.0	5.0	N/A
22								
23								
24								
25			With fragments of weathered sandstone from 28.5' to 30.7'	26.5/28.5-20190911	DP06	25.0 - 27.5	3.4	N/A
26								
27								
28								
29			SANDY LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), low to medium plasticity, soft, moist to wet	27.5/30.0	DP07	27.5 - 30.0	3.6	N/A
30	30.7	676.1						
31								
32								
33			CLAYEY SAND, SC, 10YR 4/2 (dark grayish brown), fine, very loose, wet	31.5/33.5-20190911	DP08	30.0 - 32.5	3.7	N/A
34								
35	34.8	672.0						
36	35.5	671.3						
37	36.0	670.8	SANDY LEAN CLAY, CL, 5YR 5/6 (yellowish red) and 10YR 4/1 (dark gray), very soft, wet	36.5/38.5-20190911	DP10	35.0 - 37.5	5.0	N/A
38	36.7	670.1						
39								
			POORLY GRADED SAND, SP, 10YR 6/4 (light yellowish brown), very fine, very loose, wet					
			SILTY SAND, SM, 10YR 3/1 (very dark gray), very fine to fine, loose, wet, with organics, wood pieces 36.7' to 40.0'		DP11	37.5 - 40.0	4.7	N/A

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG01
Client <u>Tennessee Valley Authority</u>	Boring Location <u>446,082.60 N; 2,364,268.87 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>706.8 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
40								
41	41.2	665.6						
42	42.1	664.7			DP12	40.0 - 44.4	4.4	N/A
43			WELL GRADED SAND WITH GRAVEL, SW, 10YR 5/2 (grayish brown), very fine to coarse, loose, wet, multicolored gravel					
44	44.4	662.4						

Bedrock Refusal /
Bottom of Hole at 44.4 Ft.

Top of Rock = 42.1 Ft.
Top of Rock Elevation = 664.7 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190911) sampled using hand auger

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG03
Client <u>Tennessee Valley Authority</u>	Boring Location <u>445,040.43 N; 2,365,157.94 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>704.0 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>9/4/19</u> Completed <u>9/4/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Hawkston (Subcontractor)</u>	Drill Rig Type and ID <u>Geoprobe 3230DT</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>DT37 Dual Tube Soil Sampling System w/ 60" PVC liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>GH70 Direct Push</u> Weight <u>N/A</u> Drop <u>N/A</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>E. Smith</u>	Approved By <u>C. Kocka</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	704.0	Top of Hole					
1	1.0	703.0	Topsoil	HA ¹	HA01	0.0 - 0.5	0.5	
2			SANDY LEAN CLAY, CL, 7.5YR 5/6 (strong brown) and 7.5YR 6/1 (gray), firm, dry to moist, with some manganese	11/5/3 5-20/190904	DP01	0.0 - 5.0	4.7	N/A
3								
4								
5								
6								
7				6/5/18 5-20/190904	DP02	5.0 - 10.0	5.0	N/A
8								
9	9.0	695.0						
9.5	694.5		POORLY GRADED SAND WITH CLAY, SP-SC, 7.5YR 5/6 (strong brown), fine, very loose, moist					
10	10.0	694.0	POORLY GRADED SAND, SP, 7.5YR 5/6 (strong brown), fine, very loose, moist					
11								
12			POORLY GRADED SAND WITH CLAY, SP-SC, 7.5YR 5/6 (strong brown), fine, very loose, moist to dry	11/5/13 5-20/190904	DP03	10.0 - 15.0	4.3	N/A
13								
14								
15								
16								
17				16/5/18 5-20/190904	DP04	15.0 - 20.0	4.0	N/A
18								

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, TDEC SUBSURF DT 20190630, GDT 4/3/20

Client Borehole ID N/A Stantec Boring No. **WBF-BG03**
 Client Tennessee Valley Authority Boring Location 445,040.43 N; 2,365,157.94 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 704.0 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
19								
20	20.0	684.0						
21			WELL GRADED SAND WITH CLAY SOME GRAVEL, SW-SC, 10YR 4/4 (dark yellowish brown), very fine to coarse, very loose, wet, multicolored gravel, clay content decreases with depth					
22								
23								
24	24.2	679.8						
25	25.0	679.0	SANDY LEAN CLAY, CL, 10YR 4/4 (dark yellowish brown), low plasticity, very soft, wet					
26			POORLY GRADED SAND WITH CLAY, SP-SC, 10YR 4/4 (dark yellowish brown), fine, loose, wet					
27								
28	28.5	675.5						
29			WELL GRADED SAND WITH CLAY WITH GRAVEL, SW-SC, 10YR 4/4 (dark yellowish brown), fine to coarse, wet, fine to coarse, multicolored, gravel					
30	30.0	674.0						
31			WELL GRADED SAND WITH GRAVEL, SW, 10YR 4/4 (dark yellowish brown), very fine to coarse, loose, wet					
32								
33								
34	34.9	669.1						
35	35.0	669.0						

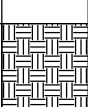
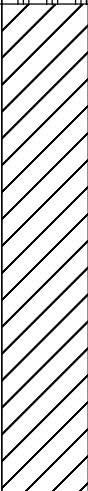
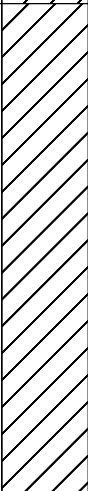
Shale, dark green gray, soft, weathered, wet, glauconitic

No Refusal /
Bottom of Hole at 35.0 Ft.

Top of Rock = 34.9 Ft.
Top of Rock Elevation = 669.1 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface
- 4: Grab sample (0.0/0.5-20190904) sampled using hand auger

Client Borehole ID	N/A			Stantec Boring No.	WBF-BG04		
Client	Tennessee Valley Authority			Boring Location	447,467.30 N; 2,365,012.21 E NAD27 Plant Local		
Project Number	175668050			Surface Elevation	704.1 ft	Elevation Datum	NGVD29
Project Name	WBF TDEC Order			Date Started	9/6/19	Completed	9/6/19
Project Location	Rhea Co, Spring City, Tennessee			Depth to Water	N/A	Date/Time	N/A
Inspector	G. Budd	Logger	G. Budd	Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)			Drill Rig Type and ID	Geoprobe 3230DT		
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" liners						
Rock Drilling and Sampling Tools (Type and Size)	N/A						
Overdrill Tooling (Type and Size)	N/A			Overdrill Depth	N/A		
Sampler Hammer Type	GH70 Direct Push	Weight	N/A	Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A			Borehole Inclination (from Vertical)	N/A		
Reviewed By	S. Bolden			Approved By	C. Kocka		

Lithology				Description	Overburden:	Sample ^{1,2}	Depth Ft ³		Rec. Ft	Blows/PSI		
Depth Ft ³	Elevation	Graphic	Rock Core:		RQD %	Run Ft	Rec. Ft	Rec. %				
0	0.0	704.1		Top of Hole								
1				Topsoil, sandy	HA ¹	HA01	0.0 - 0.5		0.5			
2	1.5	702.6		SANDY LEAN CLAY, CL, 7.5YR 5/6 (strong brown) and 7.5YR 6/1 (gray), firm, dry, with some manganese	1.5/3.5-20190906	DP01	0.0 - 5.0	0.0 - 5.0	3.7	N/A		
3												
4												
5												
6												
7							6.5/8.5-20190906	DP02	5.0 - 10.0	5.0 - 10.0	5.0	N/A
8												
9												
10	10.0	694.1		SANDY LEAN CLAY, CL, 10YR 4/6 (dark yellowish brown), low plasticity, firm, moist, sand increasing with depth	11.5/13.5-20190906	DP03	10.0 - 12.5	10.0 - 12.5	3.2	N/A		
11												
12												
13												
14												
15												
16							16.5/18.5-20190906	DP05	15.0 - 17.5	15.0 - 17.5	3.0	N/A
17												
18												
19						DP06	17.5 - 20.0	17.5 - 20.0	3.2	N/A		

Client Borehole ID N/A Stantec Boring No. **WBF-BG04**
 Client Tennessee Valley Authority Boring Location 447,467.30 N; 2,365,012.21 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 704.1 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
20			SANDY LEAN CLAY, CL, 10YR 4/6 (dark yellowish brown), low plasticity, firm, moist, sand increasing with depth <i>(Continued)</i>	21.5/23.5-20190906	DP07	20.0 - 22.5	3.4	N/A
21								
22								
23			Wet at 23.0'	26.5/28.5-20190906	DP08	22.5 - 25.0	3.6	N/A
24	23.8	680.3						
25			CLAYEY SAND, SC, 10YR 5/6 (yellowish brown), fine, loose, wet					
26	25.0	679.1	CLAYEY SAND WITH CLAY, SC, 10YR 5/6 (yellowish brown), fine, loose, wet, alternating clayey sand and sandy lean clay layers	26.5/28.5-20190906	DP09	25.0 - 27.5	5.0	N/A
27								
28								
29				31.5/33.5-20190906	DP10	27.5 - 30.0	5.0	N/A
30								
31								
32	31.2	672.9	WELL GRADED SAND WITH GRAVEL, SW, 5YR 3/4 (dark reddish brown), very fine to coarse, loose to medium dense, wet, iron oxide staining, multicolored gravel	31.5/33.5-20190906	DP11	30.0 - 31.2	1.8	N/A
33								
34								
35	33.5	670.6	WELL GRADED SAND WITH GRAVEL, SW, 2.5YR 5/4 (reddish brown), very fine to coarse, loose, wet, multicolored gravel	31.5/33.5-20190906	DP12	31.2 - 35.0	3.0	N/A
36								
37								
38	35.0	669.1	POORLY GRADED SAND TRACE CLAY, SP, 10YR 4/1 (dark gray), fine, loose, wet, trace brown, sandy clay	31.5/33.5-20190906	DP13	35.0 - 37.0	2.0	N/A
39								
40								
41	36.3	667.8	Trace multicolored, subangular to subrounded gravel from 36.0' to 36.3'	31.5/33.5-20190906	DP13	35.0 - 37.0	2.0	N/A
42								
43								
44	37.0	667.1	Shale, dark green gray, soft to moderately hard, weathered, glauconitic	31.5/33.5-20190906	DP13	35.0 - 37.0	2.0	N/A
45								
46								
47			Bedrock Refusal / Bottom of Hole at 37.0 Ft.	31.5/33.5-20190906	DP13	35.0 - 37.0	2.0	N/A
48								
49								

- Top of Rock = 36.3 Ft.
 Top of Rock Elevation = 667.8 Ft.
- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface
 4: Grab sample (0.0/0.5-20190906) sampled using hand auger

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG05
Client <u>Tennessee Valley Authority</u>	Boring Location <u>448,660.23 N; 2,364,859.47 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>712.1 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>9/9/19</u> Completed <u>9/9/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>18.8 ft</u> Date/Time <u>9/9/19 07:57</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Hawkston (Subcontractor)</u>	Drill Rig Type and ID <u>Geoprobe 3230DT</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>DT37 Dual Tube Soil Sampling System w/ 60" liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>GH70 Direct Push</u> Weight <u>N/A</u> Drop <u>N/A</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>S. Bolden</u> Approved By <u>C. Kocka</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	712.1	Top of Hole					
1	1.5	710.6	Topsoil	HA ¹	HA01	0.0 - 0.5	0.5	
2			SILTY SAND SOME CLAY, SP-SM, 7.5YR 5/6 (strong brown), fine, dry	1.5/5.5-20190909	DP01	0.0 - 5.0	4.7	N/A
3								
4								
5								
6	6.0	706.1	POORLY GRADED SAND TRACE SILT, SP, 7.5YR 5/6 (strong brown), fine, moist, iron oxide staining, with trace weathered sandstone lenses	6.5/6.5-20190909	DP02	5.0 - 10.0	4.3	N/A
7								
8								
9								
10								
11								
12			Iron staining from 11.5' to 12.5'	11.5/13.5-20190909	DP03	10.0 - 15.0	4.3	N/A
13								
14								
15	15.0	697.1	SILTY SAND, SP-SM, 10YR 6/6 (brownish yellow), very fine to fine, very loose, moist	16.5/18.5-20190909	DP04	15.0 - 20.0	5.0	N/A
16								
17	17.2	694.9						
18								

TVA EIP BORING LOG 175668050 WBF TDEC ORDER GP1 TDEC SUBSURF DT 20190930 GDT 4/3/20

Client Borehole ID N/A

Stantec Boring No. **WBF-BG05**

Client Tennessee Valley Authority

Boring Location 448,660.23 N; 2,364,859.47 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 712.1 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18	18.2	693.9	CLAYEY SAND, SC, 10YR 5/6 (yellowish brown), fine, very loose, moist to wet (Continued)					
19			Shale, dark red brown, soft to moderately hard, highly weathered, moist to dry, Water at 18.8'					
20	20.0	692.1	Trace coarse gravel at 18.5'					

No Refusal /
Bottom of Hole at 20.0 Ft.

Top of Rock = 18.2 Ft.
Top of Rock Elevation = 693.9 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190909) sampled using hand auger

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG06
Client <u>Tennessee Valley Authority</u>	Boring Location <u>448,314.22 N; 2,364,466.60 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>704.0 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>9/10/19</u> Completed <u>9/10/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Hawkston (Subcontractor)</u>	Drill Rig Type and ID <u>Geoprobe 3230DT</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>DT37 Dual Tube Soil Sampling System w/ 60" liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>GH70 Direct Push</u> Weight <u>N/A</u> Drop <u>N/A</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>S. Bolden</u>	Approved By <u>C. Kocka</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	704.0	Top of Hole					
1	1.5	702.5	Topsoil, sandy	HA ¹	HA01	0.0 - 0.5	0.5	
2			SANDY LEAN CLAY, CL, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), soft, dry, some manganese, trace organics	1.5/3.5-20190910	DP01	0.0 - 5.0	4.0	N/A
3								
4								
5								
6	6.5	697.5	SANDY LEAN CLAY, CL, 10YR 5/6 (yellowish brown), low plasticity, moist	6.5/6.5-20190910	DP02	5.0 - 10.0	5.0	N/A
7			With manganese from 6.5' to 15.0'					
8								
9								
10								
11				11.5/13.5-20190910	DP03	10.0 - 12.5	3.4	N/A
12								
13								
14					DP04	12.5 - 15.0	3.1	N/A
15								
16			Sand increasing with depth from 15.0'		DP05	15.0 - 17.5	3.3	N/A
17				16.5/18.5-20190910				
18	18.8	685.2			DP06	17.5 - 20.0	4.1	N/A
19								

TVA EIP BORING LOG 175668050 WBF TDEC ORDER GPJ TDEC SUBSURF DT 20190930 GDT 4/3/20

Client Borehole ID N/A

Stantec Boring No. **WBF-BG06**

Client Tennessee Valley Authority

Boring Location 448,314.22 N; 2,364,466.60 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 704.0 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
19			CLAYEY SAND, SC, 10YR 5/6 (yellowish brown), fine, loose, moist to wet (Continued) Wet at 19.5'					
20	20.0	684.0						
21			POORLY GRADED SAND WITH CLAY, SP-SC, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), fine, very loose, wet, with trace organics	21.5/23.5-20190910	DP07	20.0 - 22.5	3.4	N/A
22								
23								
24					DP08	22.5 - 25.0	4.0	N/A
25			Trace fine, subrounded to rounded, gravel from 28.5' to 29.5'					
26								
27					DP09	25.0 - 27.5	3.7	N/A
28								
29	29.0	675.0	POORLY GRADED SAND WITH SILT, SP-SM, 10YR 5/2 (grayish brown), very fine to fine, very loose, wet	28.5/28.5-20190910	DP10	27.5 - 30.0	4.4	N/A
30								
31	31.5	672.5	WELL GRADED SAND WITH GRAVEL, SP-SC, 10YR 4/6 (dark yellowish brown) and 10YR 4/1 (dark gray), fine to coarse, very loose, wet Gray, sandy clay lens with fine gravel from 32.1' to 32.5'					
32								
33				31.5/33.5-20190910	DP11	30.0 - 35.0	4.2	N/A
34								
35	35.2	668.8	Multicolored, fine to coarse gravel from 35.0' to 35.2'					
36	36.2	667.8			DP12	35.0 - 36.2	1.2	N/A

Bedrock Refusal /
Bottom of Hole at 36.2 Ft.

Top of Rock = 35.2 Ft.
Top of Rock Elevation = 668.8 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface
- 4: Grab sample (0.0/0.5-20190910) sampled using hand auger

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG07
Client <u>Tennessee Valley Authority</u>	Boring Location <u>446,505.33 N; 2,365,243.17 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>700.9 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>9/5/19</u> Completed <u>9/5/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Hawkston (Subcontractor)</u>	Drill Rig Type and ID <u>Geoprobe 3230DT</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>DT37 Dual Tube Soil Sampling System w/ 60" liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>GH70 Direct Push</u> Weight <u>N/A</u> Drop <u>N/A</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>S. Bolden</u>	Approved By <u>C. Kocka</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	700.9	Top of Hole					
1	1.0	699.9	Topsoil	HA ¹	HA01	0.0 - 0.5	0.5	
2			SANDY LEAN CLAY, CL, 7.5YR 5/6 (strong brown) and 7.5YR 6/1 (gray), firm, dry to moist, with organics, manganese	1.5/6.5-20190905	DP01	0.0 - 5.0	3.5	N/A
3								
4								
5								
6			SANDY LEAN CLAY, CL, 10YR 4/6 (dark yellowish brown) and 10YR 5/1 (gray), low plasticity, soft, moist to wet, increasing sand with depth	6.5/6.5-20190905	DP02	5.0 - 10.0	4.8	N/A
7								
8								
9								
10	10.0	690.9	SANDY LEAN CLAY, CL, 10YR 4/6 (dark yellowish brown) and 10YR 5/1 (gray), low plasticity, soft, moist to wet, increasing sand with depth	11.5/13.5-20190905	DP03	10.0 - 15.0	5.0	N/A
11								
12								
13								
14				16.5/18.5-20190905	DP04	15.0 - 17.5	4.0	N/A
15								
16								
17								
18								

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG07
Client <u>Tennessee Valley Authority</u>	Boring Location <u>446,505.33 N; 2,365,243.17 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>700.9 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SANDY LEAN CLAY, CL, 10YR 4/6 (dark yellowish brown) and 10YR 5/1 (gray), low plasticity, soft, moist to wet, increasing sand with depth <i>(Continued)</i>					
19					DP05	17.5 - 20.0	4.0	N/A
20								
21					DP06	20.0 - 22.5	4.4	N/A
22	22.5	678.4		21.5/23.5-20.190905				
23			CLAYEY SAND, SC, 10YR 5/6 (yellowish brown), fine, loose, wet Fine grained sand lens from 22.5' to 22.7'					
24					DP07	22.5 - 25.0	5.0	N/A
25	25.5	675.4						
26			CLAYEY SAND, SC, 10YR 5/1 (gray) and 10YR 5/6 (yellowish brown), very fine to fine, very loose, wet					
27					DP08	25.0 - 27.5	5.0	N/A
28								
29	29.0	671.9		26.5/28.5-20.190905				
30	30.0	670.9			DP09	27.5 - 30.0	4.0	N/A
31			WELL GRADED GRAVEL WITH SAND, GW, fine to coarse, very loose, wet, multicolored gravel, grayish brown sand					
32								
32	32.0	668.9			DP10	30.0 - 32.5	2.5	N/A
32	32.5	668.4						


Shale, dark green gray, moderately hard, weathered, moist, glauconitic

Bedrock Refusal /
Bottom of Hole at 32.5 Ft.

Top of Rock = 32.0 Ft.
Top of Rock Elevation = 668.9 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface
- 4: Grab sample (0.0/0.5-20190905) sampled using hand auger

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG08
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,961.97 N; 2,360,090.38 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>736.2 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>9/12/19</u> Completed <u>9/12/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Hawkston (Subcontractor)</u>	Drill Rig Type and ID <u>Geoprobe 3230DT</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>DT37 Dual Tube Soil Sampling System w/ 60" liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>GH70 Direct Push</u> Weight <u>N/A</u> Drop <u>N/A</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>S. Bolden</u>	Approved By <u>C. Kocka</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	736.2	Top of Hole					
0.5	735.7		Topsoil, trace limestone gravel	HA ¹	HA01	0.0 - 0.5	0.5	
1	1.5	734.7	SILTY SAND, SM, 10YR 6/6 (brownish yellow), very fine, very loose, dry, with organics	1.5/6.5-20190912				
2			SANDY LEAN CLAY, CL, 10YR 6/8 (brownish yellow) and 10YR 6/1 (gray), firm, dry to moist		DP01	0.0 - 5.0	3.9	N/A
3								
4								
5								
6								
7								
8	8.5	727.7		6.5/6.5-20190912	DP02	5.0 - 10.0	5.0	N/A
9			SANDY LEAN CLAY, CL, 5YR 5/8 (yellowish red) and 10YR 6/8 (brownish yellow), low plasticity, firm to hard, moist, and 10YR 7/1 (light gray)					
10								
11								
12				11.5/13.5-20190912	DP03	10.0 - 15.0	5.0	N/A
13								
14								
15	15.0	721.2						
16			SANDY LEAN CLAY, CL, 7.5YR 6/8 (reddish yellow) and 7.5YR 7/1 (light gray), low to medium plasticity, hard, moist		DP04	15.0 - 17.5	3.0	N/A
17			Iron oxide staining from 15.0' to 20.0'	16.5/18.5-20190912				
18								

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, TDEC SUBSURF DT 20190930, GDT 4/6/20

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG08
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,961.97 N; 2,360,090.38 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>736.2 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SANDY LEAN CLAY, CL, 7.5YR 6/8 (reddish yellow) and 7.5YR 7/1 (light gray), low to medium plasticity, hard, moist <i>(Continued)</i>					
19					DP05	17.5 - 20.0	4.4	N/A
20								
21			SANDY LEAN CLAY, CL, 10YR 5/1 (gray), low plasticity, soft, moist		DP06	20.0 - 22.5	4.5	N/A
22								
23	23.3	712.9			DP07	22.5 - 25.0	5.0	N/A
24			CLAYEY SAND, SC, 10YR 5/1 (gray), fine, loose, moist to wet Wet at 27.3'		DP08	25.0 - 27.5	4.2	N/A
25	26.0	710.2						
26					DP09	27.5 - 30.0	5.0	N/A
27			POORLY GRADED SAND WITH CLAY, SP-SC, 10YR 5/1 (gray), fine, very loose, wet, with fragments of wood 29.6' to 30.0', some, multicolored, subangular to subrounded fine, gravel 31.0' to 31.7'					
28	28.3	707.9			DP10	30.0 - 32.5	4.5	N/A
29								
30	31.7	704.5	Shale, dark green gray to dark gray, soft, highly weathered, moist to dry					
31								
32	32.5	703.7						

No Refusal /
Bottom of Hole at 32.5 Ft.

Top of Rock = 31.7 Ft.
Top of Rock Elevation = 704.5 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface
- 4: Grab sample (0.0/0.5-20190912) sampled using hand auger

Client Borehole ID N/A Stantec Boring No. **WBF-BG09**

Client Tennessee Valley Authority Boring Location 445,535.75 N; 2,361,033.94 E NAD27 Plant Local

Project Number 175668050 Surface Elevation 735.3 ft Elevation Datum NGVD29

Project Name WBF TDEC Order Date Started 9/13/19 Completed 9/13/19

Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A

Inspector G. Budd Logger G. Budd Depth to Water N/A Date/Time N/A

Drilling Contractor Hawkston (Subcontractor) Drill Rig Type and ID Geoprobe 3230DT

Overburden Drilling and Sampling Tools (Type and Size) DT37 Dual Tube Soil Sampling System w/ 60" liners

Rock Drilling and Sampling Tools (Type and Size) N/A

Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A

Sampler Hammer Type GH70 Direct Push Weight N/A Drop N/A Efficiency N/A

Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A

Reviewed By S. Bolden Approved By C. Kocka

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	735.3	Top of Hole					
1	1.0	734.3	Topsoil and limestone gravel fill, [FILL]					
2			SANDY LEAN CLAY, CL, 10YR 6/8 (brownish yellow) and 10YR 2/1 (black), hard, dry, with fragments of coal and CCR, [CCR]		DP01	0.0 - 5.0	4.2	N/A
3								
4								
5	5.0	730.3						

No Refusal /
Bottom of Hole at 5.0 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG09A
Client <u>Tennessee Valley Authority</u>	Boring Location <u>445,545.89 N; 2,361,056.97 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>736.5 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>9/13/19</u> Completed <u>9/13/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Hawkston (Subcontractor)</u>	Drill Rig Type and ID <u>Geoprobe 3230DT</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>DT37 Dual Tube Soil Sampling System w/ 60" liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>GH70 Direct Push</u> Weight <u>N/A</u> Drop <u>N/A</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>S. Bolden</u>	Approved By <u>C. Kocka</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	736.5						
	0.5	736.0						
1	1.5	735.0						
2								
3								
4								
5								
6	6.0	730.5						
7								
8								
9								
10	10.0	726.5						

No Refusal /
Bottom of Hole at 10.0 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG10
Client <u>Tennessee Valley Authority</u>	Boring Location <u>445,969.70 N; 2,361,722.26 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>729.6 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>9/16/19</u> Completed <u>9/16/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Hawkston (Subcontractor)</u>	Drill Rig Type and ID <u>Geoprobe 3230DT</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>DT37 Dual Tube Soil Sampling System w/ 60" liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>GH70 Direct Push</u> Weight <u>N/A</u> Drop <u>N/A</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>C. Kocka</u> Approved By <u>L. Price</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	729.6						
1	1.5	728.1			HA01	0.0 - 0.5	0.5	
2					DP01	0.0 - 5.0	5.0	N/A
3								
4								
5	5.0	724.6			DP02	5.0 - 7.5	2.5	N/A
6					DP03	7.5 - 10.0	3.0	N/A
7								
8								
9					DP04	10.0 - 12.5	3.0	N/A
10								
11								
12	12.5	717.1						

Bedrock Refusal /
Bottom of Hole at 12.5 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface
- 4: Grab sample (0.0/0.5-20190916) sampled using hand auger

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG11
Client <u>Tennessee Valley Authority</u>	Boring Location <u>446,543.41 N; 2,362,125.42 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>708.0 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>9/17/19</u> Completed <u>9/17/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Hawkston (Subcontractor)</u>	Drill Rig Type and ID <u>Geoprobe 3230DT</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>DT37 Dual Tube Soil Sampling System w/ 60" liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>GH70 Direct Push</u> Weight <u>N/A</u> Drop <u>N/A</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>E. Smith</u>	Approved By <u>C. Kocka</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	708.0						
			Top of Hole					
1	1.0	707.0	Topsoil, silty	HA ¹	HA01	0.0 - 0.5	0.5	
2			SANDY LEAN CLAY, CL, 7.5YR 5/6 (strong brown), soft, dry, with limestone gravel fill, [FILL]	1.5/6.5-20190917	DP01	0.0 - 5.0	3.5	N/A
5	5.0	703.0						
6			LEAN CLAY SOME SAND, CL, 5YR 5/8 (yellowish red) and 5YR 7/1 (light gray), low plasticity, soft, moist, iron oxide staining, with fragments of siltstone and sandstone, increasing with depth	6.5/8.5-20190917	DP02	5.0 - 10.0	2.7	N/A
11	11.0	697.0						
12			LEAN CLAY LITTLE SAND, CL, 10YR 4/2 (dark grayish brown) and 7.5YR 5/8 (strong brown), low plasticity, soft to firm, moist	11.5/13.5-20190917	DP03	10.0 - 15.0	3.7	N/A
13			Dark grayish brown from 11.2' to 11.7'					
14			Grading to strong brown from 11.7' to 15.0'					
16	16.0	692.0						
17			SANDY LEAN CLAY, CL, 7.5YR 6/8 (reddish yellow) and 7.5YR 6/1 (gray), firm to hard, iron oxide staining, with fragments of sandstone and siltstone	16.5/18.5-20190917	DP04	15.0 - 20.0	5.0	N/A
18	18.0	690.0						

TVA/EIP BORING LOG: 175668050, WBF, TDEC, ORDER GP, TDEC SUBSURF DT 20190930, GDT 4/3/20

Client Borehole ID N/A Stantec Boring No. **WBF-BG11**
 Client Tennessee Valley Authority Boring Location 446,543.41 N; 2,362,125.42 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 708.0 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18		x x x x x	Siltstone, red brown and gray, moderately hard, highly weathered, dry, iron oxide staining					
19		x x x x x						
		x x x x x						
20	20.0	688.0						

No Refusal /
Bottom of Hole at 20.0 Ft.

Top of Rock = 18.0 Ft.
Top of Rock Elevation = 690.0 Ft.




- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface
 4: Grab sample (0.0/0.5-20190917) sampled using hand auger

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG12
Client <u>Tennessee Valley Authority</u>	Boring Location <u>447,812.24 N; 2,362,082.92 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>707.4 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>9/17/19</u> Completed <u>9/17/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Hawkston (Subcontractor)</u>	Drill Rig Type and ID <u>Geoprobe 3230DT</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>DT37 Dual Tube Soil Sampling System w/ 60" liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>GH70 Direct Push</u> Weight <u>N/A</u> Drop <u>N/A</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>E. Smith</u>	Approved By <u>C. Kocka</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	707.4	Top of Hole					
1	1.5	705.9	Topsoil, silty, with gravel	HA ¹	HA01	0.0 - 0.5	0.5	
2			SANDY LEAN CLAY, CL, 7.5YR 5/6 (strong brown), soft, dry, with abundant fragments of sandstone and siltstone	1.5/5.5-20190817	DP01	0.0 - 5.0	3.1	N/A
3								
4								
5								
6								
7	7.0	700.4	SILTY LEAN CLAY, CL, 10YR 3/1 (very dark gray), low plasticity, very soft, moist, with organics	6.5/8.5-20190817	DP02	5.0 - 10.0	3.0	N/A
8								
9								
10	10.5	696.9	LEAN CLAY LITTLE SAND, CL, 10YR 4/3 (brown) and 10YR 4/1 (dark gray), low plasticity, moist	11.5/13.5-20190817	DP03	10.0 - 15.0	5.0	N/A
11								
12								
13								
14								
15								
16	16.5	690.9	SANDY LEAN CLAY, CL, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), low plasticity, firm, moist, with fragments of sandstone increasing with depth	16.5/18.5-20190817	DP04	15.0 - 20.0	5.0	N/A
17								
18								

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, TDEC SUBSURF DT 20190830, GDT 4/3/20

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-BG12
Client <u>Tennessee Valley Authority</u>	Boring Location <u>447,812.24 N; 2,362,082.92 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>707.4 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SANDY LEAN CLAY, CL, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), low plasticity, firm, moist, with fragments of sandstone increasing with depth (Continued)	 21.5/23.5-20190917	DP05	20.0 - 25.0	5.0	N/A
19								
20								
21								
22								
23			Sandstone, dark brown to tan, fine grained, moderately hard, highly weathered, dry					
24	24.1							
25	25.0							

No Refusal /
Bottom of Hole at 25.0 Ft.

Top of Rock = 24.1 Ft.
Top of Rock Elevation = 683.3 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface
- 4: Grab sample (0.0/0.5-20190917) sampled using hand auger

APPENDIX B.2


































GEOTECHNICAL BORINGS

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Subsurface Boring Legend

Lithology Graphics

Symbol	Lithology
	Fill
	Top Soil
	Gravel
	Well Graded Gravel (GW)
	Poorly Graded Gravel (GP)
	Silty Gravel (GM)
	Silty, Clayey Gravel (GC-GM)
	Clayey Gravel (GC)
	Well Graded Gravel with Silt (GW-GM)
	Well Graded Gravel with Clay (GW-GC)
	Poorly Graded Gravel with Silt (GP-GM)
	Poorly Graded Gravel with Clay (GP-GC)
	Well Graded Sand (SW)
	Poorly Graded Sand (SP)
	Silty Sand (SM)
	Silty, Clayey Sand (SC-SM)
	Clayey Sand (SC)
	Well Graded Sand with Silt (SW-SM)
	Well Graded Sand with Clay (SW-SC)
	Poorly Graded Sand with Silt (SP-SM)
	Poorly Graded Sand with Clay (SP-SC)
	Silt (ML)
	Silty Clay (CL-ML)
	Lean Clay (CL)
	Organic Silt (OL)
	Elastic Silt (MH)
	Fat Clay (CH)
	Organic Clay (OH)
	Non-Durable Shale
	Durable Shale
	Coal
	Limestone
	Sandstone

Lithology Graphics are based on TVA drafting standards.

Other Graphics

Symbol	Description
	Denotes environmental analytical sample interval
	Denotes SS sample interval
	Denotes ST sample interval
	Denotes DP sample interval
	Denotes RS sample interval
	Denotes RC sample interval
	First water level reading
	Second water level reading

Common Abbreviations

Abbreviation	Definition
DP	Direct Push
HA	Hand Auger
HSA	Hollow Stem Auger
N/A	Not Applicable
NR	Not Recorded
RC	Rock Core
RQD	Rock Quality Designation
RS	Rotary Sonic
SS	Split Spoon
ST	Shelby Tube
WH	Weight of Hammer
WR	Weight of Rod

General Notes

The boring logs include sample numbering used during drilling. For assigned Environmental Analytical Sample ID numbers, see relevant Environmental Chain-of- Custody forms from the drilling date range listed on each log.

For pH readings and additional field data, see applicable field documentation (e.g., Soil pH Data Form) from the drilling date range listed on each log.

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B01
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,291.73 N; 2,363,048.76 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>700.2 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>8/19/19</u> Completed <u>8/20/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>NQ-3 Wireline, Split Barrel, Surface Set Bit</u>	
Overdrill Tooling (Type and Size) <u>N/A</u>	Overdrill Depth <u>N/A</u>
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>K. Blakley</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	700.2						
			Top of Hole					
1			POORLY GRADED GRAVEL, GP, 10YR 7/1 (light gray), very dense, dry, angular to subangular, crushed limestone gravel, [FILL]		SS01G	0.0 - 1.5	1.4	26-28-24
2								
3	3.1	697.1			SS02aG	2.5 - 3.1		
4			SANDY SILT, ML, 7.5YR 3/3 (dark brown), non-plastic, firm, dry, [FILL]		SS02bG	3.1 - 4.0	1.5	10-8-8
5	5.0	695.2						
6			SILTY SAND, SM, 10YR 5/6 (yellowish brown), fine, loose to very loose, dry, some clay		SS03G	5.0 - 6.5	0.7	5-5-6
7								
8					SS04G	7.5 - 9.0	1.2	2-2-3
9								
10								
11					SS05G	10.0 - 11.5	1.3	4-2-3
12	12.5	687.7						
13			SILTY SAND, SM, 10YR 4/6 (dark yellowish brown) and 10YR 5/6 (yellowish brown), fine, very loose, moist to wet		SS06G	12.5 - 14.0	1.2	3-1-2
14								
15								
16			Wet at 16.0'		ST01G	15.0 - 17.0	2.0	400
17								
18								

Client Borehole ID N/A

Stantec Boring No. **WBF-B01**

Client Tennessee Valley Authority

Boring Location 444,291.73 N; 2,363,048.76 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 700.2 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SILTY SAND, SM, 10YR 4/6 (dark yellowish brown) and 10YR 5/6 (yellowish brown), fine, very loose, moist to wet <i>(Continued)</i>		SS07G	17.5 - 19.0	1.3	WH-WH-1
19								
20					SS08G	20.0 - 21.5	1.5	WH-WH-1
21								
22			SANDY LEAN CLAY, CL, 10YR 4/4 (dark yellowish brown) and 10YR 5/1 (gray), low plasticity, very soft, wet		ST02G	22.5 - 24.5	2.0	200
23								
24								
25	25.0	675.2			SS09G	25.0 - 26.5	1.5	WH-WH-1
26			LEAN CLAY WITH SAND, CL, 10YR 3/1 (very dark gray), low plasticity, very soft, wet, with organics and wood fragments					
27	27.5	672.7			SS10G	27.5 - 29.0	1.5	WH-WH-WH
28								
29					ST03G	30.0 - 32.0	2.0	300
30			POORLY GRADED SAND WITH SILT AND GRAVEL, SP-SM, 10YR 3/1 (very dark gray), fine to coarse, loose, wet		SS11aG	32.5 - 33.0		
31					SS11bG	33.0 - 33.7	1.5	2-6-22
32					SS11cG	33.7 - 34.0		
33			Shale, green gray, soft to hard, highly weathered, moist to dry					
34					SS12G	35.0 - 35.7	0.7	38-50/2" Began Core
35	35.5	664.7	Shale (80%) With Limestone (20%)					
36			Shale, green gray and light gray, very soft, highly weathered, shale fragments captured in mud tub with drill water return		0	35.5 - 41.0	1.2	22
37			Limestone, weathered, fractured throughout recovered core, with calcite and chlorite on fracture surfaces			5.5		
38								
39								
40								
41								
42								

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, J, TDEC SUBSURF DT 20190630, GDT 1/27/21

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B01
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,291.73 N; 2,363,048.76 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>700.2 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
43		⌒			0	41.0 - 46.0 5.0	0.8	16
44		⌒						
45		⌒						
46	46.0	⌒						

Bottom of Hole at 46.0 Ft.

Top of Rock = 33.7 Ft.

Top of Rock Elevation = 666.5 Ft.

Begin Core = 35.5 Ft.

Boring backfilled with 30% solids bentonite grout.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)

G = Geotechnical Sample Custody

2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples

3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B02
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,557.61 N; 2,362,444.29 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>719.1 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>7/31/19</u> Completed <u>8/1/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>NQ-2 Wireline, Solid Barrel, Surface Set Bit</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>K. Blakley</u> Approved By <u>A. Welshans</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	719.1	Top of Hole					
	0.5	718.6	Topsoil					
1			SANDY LEAN CLAY WITH GRAVEL, CL, 5YR 5/6 (yellowish red) to 5YR 6/1 (gray), medium plasticity, soft to firm, dry to moist, with fragments of siltstone and sandstone, [FILL]		SS01G	0.0 - 1.5	1.4	3-3-5
2					SS02aG	2.5 - 2.7		
3	2.7	716.4	SILT, ML, 10YR 2/1 (black), non-plastic, soft, moist, trace organics, [CCR]		SS02bG	2.7 - 4.0	1.5	5-8-9
4								
5					SS03G	5.0 - 6.5	1.5	3-2-2
6								
7	7.7	711.4	WELL GRADED SAND WITH SILT, SW-SM, 10YR 2/1 (black) and 10YR 3/6 (dark yellowish brown), fine to coarse, loose, moist, [CCR]		SS04aG	7.5 - 7.7		
8					SS04bG	7.7 - 9.0	1.5	5-6-5
9			SILTY SAND, SM, 10YR 2/1 (black), very fine to fine, very loose, moist to wet, [CCR]					
10					SS05aG	10.0 - 10.9	1.5	3-3-1
11	10.9	708.2	WELL GRADED SAND WITH SILT, SW-SM, 10YR 2/1 (black), very fine to coarse, very loose, wet, [CCR]		SS05bG	10.9 - 11.5		
12								
13	12.5	706.6			SS06G	12.5 - 14.0	0.3	3-1-WH
14								
15	15.0	704.1	SILTY SAND, SM, 10YR 3/1 (very dark gray) and 10YR 2/1 (black), very fine to fine, very loose, wet, with trace medium to coarse sand, [CCR]		SS07G	15.0 - 16.5	1.5	WR-WH-1
16								
17								
18								

Client Borehole ID N/A

Stantec Boring No. **WBF-B02**

Client Tennessee Valley Authority

Boring Location 444,557.61 N; 2,362,444.29 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 719.1 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³		Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
18			SILTY SAND, SM, 10YR 3/1 (very dark gray) and 10YR 2/1 (black), very fine to fine, very loose, wet, with trace medium to coarse sand, [CCR] (Continued)		SS08G	17.5 - 19.0	17.5 - 19.0	1.5	WH-WH-1
19									
20									
20.9	698.2				SS09aG	20.0 - 20.9	20.0 - 21.5	1.5	2-2-2
21	697.6		LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), low plasticity, soft, moist, hydrocarbon staining, with trace organics		SS09bG	20.9 - 21.5	21.5 - 23.5	1.6	800
22					ST01G	21.5 - 23.5			
23	695.6		LEAN CLAY WITH SAND, CL, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), very fine, low plasticity, firm, moist						
24			SANDY LEAN CLAY, CL, 5YR 4/6 (yellowish red) and 5YR 6/1 (gray), low plasticity, firm to hard, moist, with trace organics						
25					SS10G	25.0 - 26.5	26.0 - 26.5	1.5	4-5-9
26									
27					SS11G	27.5 - 29.0	27.5 - 29.0	1.5	6-9-13
28									
29									
30					SS12G	30.0 - 31.5	30.0 - 31.5	1.5	4-6-8
31									
32	686.6								
33			CLAYEY SAND, SC, 5YR 4/6 (yellowish red) and 5YR 6/1 (gray), fine, loose, moist, with trace organics		SS13G	32.5 - 34.0	32.5 - 34.0	1.5	3-4-5
34	685.1								
35			CLAYEY SAND, SC, 7.5YR 4/4 (brown), fine, very loose, moist to wet						
36	682.6		Wet at 36.0'		SS14G	35.0 - 36.5	36.0 - 36.5	1.5	1-3-4
37			SANDY SILT, ML, 7.5YR 4/4 (brown), non-plastic, very soft, wet						
38					SS15G	37.5 - 39.0	37.5 - 38.0	1.5	WR-WR-WH
39									
40	679.1								
41			CLAYEY SAND, SC, 7.5YR 4/4 (brown), fine, very loose, moist		SS16G	40.0 - 41.5	40.0 - 41.5	1.5	2-3-3
42									

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, TDEC SUBSURF DT 20190630, GDT 9/10/20

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B02
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,557.61 N; 2,362,444.29 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>719.1 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
42.5	676.6	///						
43		⌒	Shale, very dark gray brown, soft to hard, weathered, moist to dry, iron oxide staining		SS17G	42.5 - 43.6	1.1	15-34-50/1"
44	674.9	⌒						Began Core
45		⌒	Shale (90%) With Limestone (10%)		0	44.2 - 46.4	1.6	73
46		⌒	Shale, dark gray, soft, laminated, highly weathered, iron oxide staining,			2.2		
47		⌒	Limestone, light gray, hard, thin bedded, weathered					
48		⌒	Shale bedding breaks and mechanical breaks throughout the length of the recovered core associated with the very soft, weathered, laminated bedding		0	46.4 - 49.0	1.7	65
49		⌒						
50		⌒	Fracture, 45°, rough, at 49.9'					
51		⌒	Fracture, 15°, rough, matte surface, fracture along shale, limestone bedding contact, at 50.0'		0	49.0 - 54.0	4.6	92
52		⌒	Fracture, 15°, calcite coating, calcite infilling, smooth to striated, polished surface, at 50.1'			5.0		
53		⌒						
54	665.1	⌒						

Bottom of Hole at 54.0 Ft.

Top of Rock = 42.5 Ft.

Top of Rock Elevation = 676.6 Ft.

Begin Core = 44.2 Ft.

Vibrating Wire Piezometers installed. See installation log for backfill details.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)

G = Geotechnical Sample Custody

2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples

3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B03
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,612.30 N; 2,363,046.92 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>699.9 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>8/26/19</u> Completed <u>8/28/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>NQ-3 Wireline, Split Barrel, Surface Set Bit</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>K. Blakley</u> Approved By <u>A. Welshans</u>	

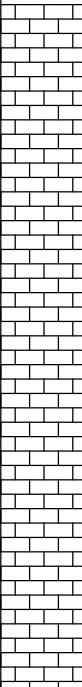
Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	699.9						
	0.5	699.4						
1			POORLY GRADED GRAVEL, GP, 10YR 7/1 (light gray), very dense, dry, angular to subangular, crushed limestone gravel, [FILL]		SS01G	0.0 - 1.5	1.4	6-10-21
2			SANDY LEAN CLAY WITH GRAVEL, CL, 7.5YR 4/4 (brown), low plasticity, firm to hard, dry, [FILL]		SS02aG	2.5 - 2.8		
3			SILTY SAND WITH GRAVEL, SM, 7.5YR 2.5/1 (black) and 7.5YR 4/4 (brown), very fine to coarse, very dense, dry, trace CCR, [FILL]		SS02bG	2.8 - 4.0	1.5	10-12-6
5	5.5	694.4			SS03aG	5.0 - 5.5		
6			POORLY GRADED SAND WITH CLAY, SP-SC, 10YR 4/6 (dark yellowish brown), fine, very loose to loose, moist		SS03bG	5.5 - 6.5	1.5	3-3-5
8					SS04G	7.5 - 9.0	1.1	1-2-2
10	10.4	689.5			SS05aG	10.0 - 10.4		
11			SANDY LEAN CLAY, CL, 10YR 4/6 (dark yellowish brown), low to medium plasticity, very soft, moist		SS05bG	10.4 - 11.5	1.3	2-1-2
13	13.0	686.9			SS06aG	12.5 - 13.0		
14			SILTY SAND, SM, 10YR 5/6 (yellowish brown), fine, very loose, moist		SS06bG	13.0 - 14.0	1.5	1-1-2
15	15.0	684.9			SS07aG	15.0 - 15.5		
16	15.5	684.4					1.5	1-2-1

Client Borehole ID N/A Stantec Boring No. **WBF-B03**
 Client Tennessee Valley Authority Boring Location 444,612.30 N; 2,363,046.92 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 699.9 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
16			POORLY GRADED SAND WITH CLAY, SP-SC, 10YR 5/6 (yellowish brown), fine, very loose, wet (Continued)		SS07bG	15.5 - 16.5		
17								
18					ST01G	17.5 - 19.5	0.0	200
20	20.3	679.6	SANDY LEAN CLAY, CL, 10YR 4/4 (dark yellowish brown) and 10YR 6/1 (gray), non-plastic to low plasticity, very soft, wet		SS08aG	20.0 - 20.3		
21					SS08bG	20.3 - 21.5	1.5	1-1-1
22	22.5	677.4	SILTY SAND, SM, 10YR 5/6 (yellowish brown), fine, very loose, wet					
23					ST02G	22.5 - 24.5	1.4	200
24								
25	25.0	674.9	SANDY SILT, ML, 10YR 5/6 (yellowish brown), non-plastic, very soft, wet Sand lens from 25.5' to 25.8' Color change to 10YR 5/1 (gray) at 27.5'		SS09G	25.0 - 26.5	1.5	WH-1-2
26								
27					SS10G	27.5 - 29.0	1.5	WH-WH-1
28								
29								
30								
31					ST03G	30.0 - 32.0	0.0	500
32	32.5	667.4	POORLY GRADED SAND, SP, 10YR 5/1 (gray), fine, very loose to loose, wet		SS11aG	32.5 - 33.3		
33	33.3	666.6			SS11bG	33.3 - 34.0	1.5	WH-8-12
34			POORLY GRADED SAND WITH SILT AND GRAVEL, SP-SM, 10YR 5/1 (gray), very fine to coarse, medium dense, wet					
35	35.3	664.6			SS12aG	35.0 - 35.3		
36			Shale, soft, weathered, wet to dry, glauconitic		SS12bG	35.3 - 36.5	1.2	8-23-21
37	37.3	662.6			SS13G	36.5 - 36.7	0.2	50/2"
								Began Core

TVA/EIP BORING LOG 175668050 WBF TDEC ORDER GPJ TDEC SUBSURF DT 20190630.GDT 1/27/21

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B03
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,612.30 N; 2,363,046.92 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>699.9 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI		
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %		
38	47.5	652.4		Limestone (80%) With Shale (20%) Limestone, light gray, hard, weathered, oolitic, Shale, dark gray, soft, highly weathered, glauconitic Fractured throughout recovered core along limestone/shale bedding contacts, abundant calcite observed within fractures, and numerous mechanical breaks along previously calcite-filled healed fractures (Continued) Artesian flow observed at 43.7'		0	37.3 - 38.7 1.4	37.3 - 38.7	1.4	100
39						0	38.7 - 40.9 2.2	38.7 - 40.9	1.7	77
40						0	40.9 - 43.7 2.8	40.9 - 43.7	1.2	43
41						0	43.7 - 45.6 1.9	43.7 - 45.6	0.6	32
42						0	45.6 - 47.5 1.9	45.6 - 47.5	0.6	32
43										
44										

Bottom of Hole at 47.5 Ft.

Top of Rock = 35.3 Ft.

Top of Rock Elevation = 664.6 Ft.

Begin Core = 37.3 Ft.

Vibrating Wire Piezometers installed. See installation log for backfill details.

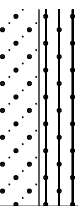




1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody

2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples

3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B04
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,821.39 N; 2,362,922.46 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>713.4 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>8/6/19</u> Completed <u>8/7/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>HQ-3 Wireline, Split Barrel, Surface Set Bit</u>	
Overdrill Tooling (Type and Size) <u>N/A</u>	Overdrill Depth <u>N/A</u>
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>K. Blakley</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	713.4	Top of Hole					
	0.5	712.9	Topsoil					
1			SANDY LEAN CLAY WITH GRAVEL, CL, 5YR 5/6 (yellowish red) and 5YR 5/1 (gray), medium plasticity, firm, dry, with fragments of siltstone and sandstone, [FILL]		SS01G	0.0 - 1.5	1.2	5-6-6
2								
3					SS02G	2.5 - 4.0	1.5	4-4-6
4			LEAN CLAY WITH SAND, CL, 5YR 5/6 (yellowish red) and 10YR 2/1 (black), low plasticity, firm, dry, [CCR]		SS03aG	5.0 - 5.3		
5	5.0	708.4			SS03bG	5.3 - 6.5	1.5	14-12-10
6	5.3	708.1	WELL GRADED SAND, SW, 10YR 3/2 (very dark grayish brown) and 10YR 2/1 (black), very fine to coarse, medium dense, dry, with fine to coarse fragments of glassy CCR, [CCR]					
7								
8	7.5	705.9	WELL GRADED SAND WITH SILT, SW-SM, 10YR 3/6 (dark yellowish brown) and 10YR 2/1 (black), very fine to coarse, very loose to loose, dry to moist, iron oxide staining, with fine to coarse glassy CCR, [CCR]		SS04G	7.5 - 9.0	1.2	3-5-9
9								
10	10.0	703.4	WELL GRADED SAND, SW, 10YR 4/2 (dark grayish brown) and 10YR 2/1 (black), fine to coarse, loose to medium dense, moist to wet, with fine to coarse glassy CCR, [CCR] Wet at 11.0 feet		SS05G	10.0 - 11.5	1.2	6-8-11
11								
12					SS06G	12.5 - 14.0	1.1	4-6-5
13								
14	15.0	698.4			SS07G	15.0 - 16.3	1.3	11-27-50/4"
15								

Client Borehole ID <u> N/A </u>				Stantec Boring No. WBF-B04					
Client <u> Tennessee Valley Authority </u>				Boring Location <u> 444,821.39 N; 2,362,922.46 E NAD27 Plant Local </u>					
Project Number <u> 175668050 </u>				Surface Elevation <u> 713.4 ft </u>		Elevation Datum <u> NGVD29 </u>			
Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI	
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %	
16	18.8	694.6			SS08aG	17.5 - 18.8	1.5	11-7-5	
17			WELL GRADED SAND WITH SILT AND GRAVEL, SW-SM, 10YR 2/1 (black) and 10YR 3/2 (very dark grayish brown), fine to coarse, medium dense to very dense, wet, with medium to coarse glassy CCR, [CCR] (Continued)						
18									
19	20.0	693.4			SS08bG	18.8 - 19.0			
20			LEAN CLAY, CL, 10GY 5/1 (greenish gray), low plasticity, firm, dry, glauconitic						
21			LEAN CLAY WITH SAND, CL, 10YR 4/6 (dark yellowish brown) and 10YR 5/1 (gray), low plasticity, firm, moist						
22	Trace organics from 22.5' to 24.0'								
23		SS09G		22.5 - 24.0	1.0	6-8-12			
24		SS10G		25.0 - 26.5	1.5	4-6-10			
25									
26									
27		SS11G		27.5 - 29.0	1.4	3-6-6			
28									
29									
30	32.5	680.9				SS12G	30.0 - 31.5	1.5	2-4-7
31			With manganese concretions from 30.0' to 31.5'						
32									
33					SS13G	32.5 - 34.0	1.5	2-3-5	
34									LEAN CLAY WITH SAND, CL, 10YR 4/4 (dark yellowish brown) and 10YR 5/1 (gray), low plasticity, soft to firm, moist
35									
36	36.5	676.9			ST02G	35.0 - 37.0	2.0	700	
37									LEAN CLAY WITH SAND, CL, 10YR 4/1 (dark gray), low plasticity, soft to very soft, moist

Client Borehole ID N/A


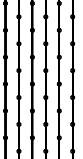


Stantec Boring No. **WBF-B04**

Client Tennessee Valley Authority

Boring Location 444,821.39 N; 2,362,922.46 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 713.4 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
38			LEAN CLAY WITH SAND, CL, 10YR 4/1 (dark gray), low plasticity, soft to very soft, moist (Continued)		SS14	37.5 - 39.0	1.5	WR-WH-WH
39								
40								
41					SS15G	40.0 - 41.5	1.5	WR-WR-WH
42	42.5	670.9						
43			SILTY SAND, SM, 10YR 4/1 (dark gray), fine, very loose, wet		SS16G	42.5 - 44.0	1.4	WR-WR-WR
44			Wood fragments at 44.0'					
45	45.0	668.4						
46	46.0	667.4	SANDY WELL GRADED GRAVEL, GW, 10YR 4/1 (dark gray), fine to coarse, loose to medium dense, wet, rounded, alluvial sand and multicolored gravel		SS17aG	45.0 - 46.0	1.5	9-21-30
47			Fragments of wood from 45.2' to 45.3'		SS17bG	46.0 - 46.5		
48	48.0	665.4	Shale, very dark green gray, soft to moderately hard, weathered to highly weathered, moist to dry, glauconitic, with some calcite		SS18G	47.5 - 47.7	0.2	50/2" Began Core
49			Shale (90%) With Limestone (10%)					
50			Shale, dark gray and light gray, soft to hard, highly weathered to moderately weathered,		0	48.0 - 52.0	0.0	0
51			Limestone, light gray, thin bedded, hard, weathered with evidence of calcite filled, healed, fractures			4.0		
52								
53								
54					0	52.0 - 57.0	0.7	14
55						5.0		
56								
57								
58					0	57.0 - 59.2	0.3	14
						2.2		

TVA EIP BORING LOG 175668050_WBF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190630.GDT 9/10/20

Client Borehole ID N/A

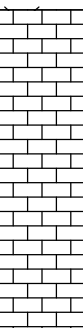
Stantec Boring No. **WBF-B04**

Client Tennessee Valley Authority

Boring Location 444,821.39 N; 2,362,922.46 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 713.4 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
59	59.2	654.2	 <p>Limestone (90%) With Shale (10%)</p> <p>Limestone, light gray, hard, thin bedded, weathered,</p> <p>Shale, dark gray, laminated, soft, with abundant calcite filled, healed fractures</p> <p>Fractures, 15° - 30°, healed, calcite and quartz filled, from 59.3' to 62.8'</p> <p>Vertical fracture, open, weathered, with calcite on surface from 59.7' to 60.3'</p> <p>Fractures, 15°, along limestone/shale bedding contact at 60.6', 60.7', 60.8', 61.0'</p> <p>Fracture zone, fresh from 61.4' to 61.8'</p> <p>Fracture zone, weathered, with calcite on surfaces from 62.1' to 62.4'</p>					
60								
61					37	59.2 - 63.8	3.6	78
62						4.6		
63	63.8	649.6						

Bottom of Hole at 63.8 Ft.

Top of Rock = 46.0 Ft.

Top of Rock Elevation = 667.4 Ft.

Begin Core = 48.0 Ft.

Vibrating Wire Piezometers installed. See installation log for backfill details.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)

G = Geotechnical Sample Custody

2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples

3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B05
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,830.68 N; 2,362,709.29 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>717.2 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>8/8/19</u> Completed <u>8/12/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>HQ-3 Wireline, Split Barrel, Surface Set Bit</u>	
Overdrill Tooling (Type and Size) <u>N/A</u>	Overdrill Depth <u>N/A</u>
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>K. Blakley</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	717.2	Top of Hole					
	0.5	716.7	Topsoil					
1			LEAN CLAY WITH SAND, CL, 5YR 5/6 (yellowish red) and 5YR 6/1 (gray), low plasticity, firm, dry, with fragments of siltstone and sandstone, [FILL]		SS01G	0.0 - 1.5	0.9	5-4-5
2								
3	3.5	713.7			SS02aG	2.5 - 3.5	1.2	2-6-8
4			SILT, ML, 10YR 2/1 (black), non-plastic, very soft, moist, [CCR] With glassy CCR fragments at 3.7' Some clay with fragments of siltstone and sandstone from 12.5' to 14.0'		SS02bG	3.5 - 4.0		
5								
6					SS03G	5.0 - 6.5	1.0	2-3-3
7								
8					SS04G	7.5 - 9.0	1.5	WR-1-WH
9								
10					SS05G	10.0 - 11.5	1.5	WR-WH-WH
11								
12								
13					SS06G	12.5 - 14.0	1.5	1-1-1
14								
15								
16					ST01G	15.0 - 17.0	NR	800
17	17.5	699.7						
18								

TVA/EIP BORING LOG 175668050, WBF, TDEC ORDER GP, TDEC SUBSURF DT 20190630, GDT 2/8/21

Client Borehole ID N/A Stantec Boring No. **WBF-B05**
 Client Tennessee Valley Authority Boring Location 444,830.68 N; 2,362,709.29 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 717.2 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³		Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
18			SILTY SAND, SM, 10YR 3/2 (very dark grayish brown), very fine to fine, very loose, moist, [CCR] (Continued)		SS07G	17.5 - 19.0	17.5 - 19.0	1.5	1-WH-WH
19									
20	20.0	697.2							
21			WELL GRADED SAND WITH SILT AND GRAVEL, SW-SM, 10YR 2/1 (black) and 10YR 3/2 (very dark grayish brown), very fine to coarse, very loose to loose, wet, [CCR] Wood fragments at 21.0'		SS08G	20.0 - 21.5	20.0 - 21.5	1.0	1-3-4
22									
23	22.8	694.4	SANDY LEAN CLAY WITH GRAVEL, CL, 10YR 5/4 (yellowish brown) and 10YR 5/1 (gray), fine to coarse, low plasticity, soft, wet		SS09aG	22.5 - 22.8	22.5 - 24.0	1.0	2-4-5
24					SS09bG	22.8 - 24.0			
25	25.0	692.2	LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), firm, moist, with organics						
26					SS10G	25.0 - 26.5	26.0 - 26.5	1.4	3-7-9
27	27.5	689.7	LEAN CLAY, CL, 10YR 5/4 (yellowish brown) and 10YR 5/1 (gray), low to medium plasticity, firm to soft, moist, mottled, with some fine sand and weathered fragments of sandstone, trace organics Some iron staining from 30.0' to 40.0'						
28					SS11G	27.5 - 29.0	27.5 - 29.0	1.5	4-6-7
29									
30			SANDY LEAN CLAY, CL, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), low to medium plasticity, soft, moist to wet						
31					SS12G	30.0 - 31.5	30.0 - 31.5	1.0	2-3-5
32									
33			Sand content increasing at 37.5'		ST02G	32.5 - 34.5	32.5 - 34.5	1.3	700
34									
35									
36			SANDY LEAN CLAY, CL, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), low to medium plasticity, soft, moist to wet		SS13G	35.0 - 36.5	36.0 - 36.5	1.5	3-6-7
37									
38					SS14G	37.5 - 39.0	37.5 - 39.0	1.5	4-6-6
39			SANDY LEAN CLAY, CL, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), low to medium plasticity, soft, moist to wet						
40	40.0	677.2			SS15G	40.0 - 41.5	40.0 - 41.5	1.5	2-4-3
41									
42									

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, J, TDEC SUBSURF DT 20190630, GDT 2/8/21

Client Borehole ID N/A


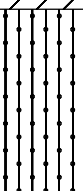



Stantec Boring No. **WBF-B05**

Client Tennessee Valley Authority

Boring Location 444,830.68 N; 2,362,709.29 E NAD27 Plant Local


Project Number 175668050

Surface Elevation 717.2 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
42.5	674.7		LEAN CLAY WITH SAND, CL, 10YR 4/1 (dark gray), low plasticity, very soft, wet		SS16G	42.5 - 44.0	1.5	1-1-1
45.0					ST03G	45.0 - 47.0	2.0	900
47.5	669.7		SILTY SAND, SM, 10YR 4/1 (dark gray), fine, loose to medium dense, wet, with some fine, subangular to subrounded, alluvial gravel		SS17G	47.5 - 49.0	1.5	1-1-1
50.6	666.6		Siltstone, light gray brown to dark gray brown, moderately hard, highly weathered, dry		SS18aG SS18bG	50.0 - 50.6 50.6 - 51.2	1.2	21-38-50/2"
51.6	665.6							Began Core
52.0			No recovery					
51.6					0	51.6 - 57.2 5.6	0.0	0
57.2	660.0		Shale (70%) With Limestone (30%)					
58.0			Shale, dark green gray, very soft, highly weathered in place to clay, limited recovery		0	57.2 - 62.2 5.0	2.0	40
60.0			Limestone, dark green gray and dark gray, moderately hard to very soft, highly weathered, highly fractured, staining and calcite on fracture surfaces					
62.2					0	62.2 - 67.2 5.0	1.1	22

TVA/EIP BORING LOG 175668050_WBF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190630.GDT 2/8/21

Client Borehole ID <u>N/A</u>				Stantec Boring No. WBF-B05			
Client <u>Tennessee Valley Authority</u>				Boring Location <u>444,830.68 N; 2,362,709.29 E NAD27 Plant Local</u>			
Project Number <u>175668050</u>				Surface Elevation <u>717.2 ft</u> Elevation Datum <u>NGVD29</u>			



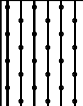
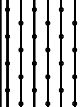
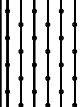
Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
67	67.2	650.0						
<p style="text-align: center;">Bottom of Hole at 67.2 Ft.</p> <p style="text-align: center;">Top of Rock = 50.6 Ft. Top of Rock Elevation = 666.6 Ft. Begin Core = 51.6 Ft.</p> <p style="text-align: center;">Vibrating Wire Piezometers installed. See installation log for backfill details.</p> <p>1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample) G = Geotechnical Sample Custody 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples 3: Depths are reported in feet below ground surface</p>								

Client Borehole ID N/A Stantec Boring No. **WBF-B06**
 Client Tennessee Valley Authority Boring Location 445,156.54 N; 2,363,046.90 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 699.7 ft Elevation Datum NGVD29
 Project Name WBF TDEC Order Date Started 8/21/19 Completed 8/21/19
 Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A
 Inspector G. Budd Logger G. Budd Depth to Water N/A Date/Time N/A
 Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 850XR, #953
 Overburden Drilling and Sampling Tools (Type and Size) 4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes
 Rock Drilling and Sampling Tools (Type and Size) NQ-3 Wireline, Split Barrel, Surface Set Bit
 Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A
 Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency N/A
 Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A
 Reviewed By K. Blakley Approved By A. Welshans

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	699.7	Top of Hole					
1	0.5	699.2	POORLY GRADED GRAVEL, GP, 10YR 7/1 (light gray), very dense, dry, angular to subangular, crushed limestone gravel, [FILL]		SS01G	0.0 - 1.5	1.3	8-36-42
2			WELL GRADED GRAVEL WITH SILT, SW-SM, 10YR 2/1 (black), fine to coarse, dense, dry, with limestone gravel, [CCR]		SS02G	2.5 - 4.0	1.4	11-13-14
5	5.0	694.7	WELL GRADED SAND WITH CLAY, SW-SC, 10YR 2/1 (black) and 10YR 3/6 (dark yellowish brown), very fine to coarse, very loose to loose, dry, with some sandy clay and gravel, [CCR]		SS03G	5.0 - 6.5	1.5	4-3-6
8	7.5	692.2	WELL GRADED SAND, SW, 10YR 2/1 (black), very fine to coarse, loose, moist, with fragments of glassy CCR, [CCR]		SS04G	7.5 - 9.0	0.8	3-3-3
10	10.0	689.7	SANDY LEAN CLAY, CL, 10YR 3/1 (very dark gray) to 10YR 4/2 (dark grayish brown), low plasticity, very soft to soft, moist to wet		SS05G	10.0 - 11.5	1.2	2-5-4
13			Wet at 13.0'		SS06G	12.5 - 14.0	1.0	1-1-1
15	15.0	684.7	SILTY SAND, SM, 10YR 5/4 (yellowish brown), fine, loose, wet		ST01G	15.0 - 17.0	2.0	500
17	17.5	682.2						

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, TDEC SUBSURF DT 20190830, GDT 2/8/21

Client Borehole ID N/A Stantec Boring No. **WBF-B06**
 Client Tennessee Valley Authority Boring Location 445,156.54 N; 2,363,046.90 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 699.7 ft Elevation Datum NGVD29

Lithology				Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI								
Depth Ft ³	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %								
18			CLAYEY SAND, SC, 10YR 5/6 (yellowish brown), fine, very loose, wet (Continued)		SS07G	17.5 - 19.0	17.5 - 19.0	1.2	WH-1-1							
19																
20																
21	20.8	678.9			SS08aG	20.0 - 20.8	20.0 - 21.5	1.5	1-1-2							
22					SS08bG	20.8 - 21.5										
23	22.5	677.2					ST02G	22.5 - 24.5	22.5 - 24.5	2.0	500					
24																
25			SILTY SAND, SM, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), fine, very loose, wet				SS09G	25.0 - 26.5	25.0 - 26.5	1.5	WH-WH-WH					
26																
27					SILTY SAND, SM, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), fine, dense, moist Color change to 10YR 4/1 (dark gray) at 29.0'		SS10aG	27.5 - 28.3	27.5 - 29.0	1.5	WH-3-6					
28	28.3	671.4		SS10bG			28.3 - 29.0									
29							ST03G	30.0 - 32.0	30.0 - 32.0	2.0	500					
30																
31					POORLY GRADED SAND WITH SILT AND GRAVEL, SP-SM, 10YR 4/1 (dark gray), very fine to coarse, very loose to dense, wet, with organics and wood fragments		SS11G	32.5 - 34.0	32.5 - 34.0	0.9	1-1-5					
32	32.5	667.2		SS12aG			34.0 - 34.5	34.0 - 35.2	1.2	13-43-50/2"						
33							SS12bG	34.5 - 35.2			Began Core					
34	34.5	665.2			Shale (80%) With Limestone (20%)		0	35.2 - 39.0 3.8	35.2 - 39.0	1.4	37					
35	35.2	664.5										Shale, green gray and light gray, very soft, highly weathered, shale captured in mud tub with drill water return		0	39.0 - 42.2 3.2	39.0 - 42.2
36			Limestone, weathered, fractured throughout recovered core, with calcite on fracture surfaces													
37					Evidence of glauconitic, micaceous, bioturbated, shale, with trace marine shell fossils along limestone/shale bedding contacts											
38																
39																
40																
41																
42																

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, TDEC SUBSURF DT 20190630, GDT 2/8/21

Client Borehole ID <u>N/A</u>				Stantec Boring No. WBF-B06			
Client <u>Tennessee Valley Authority</u>				Boring Location <u>445,156.54 N; 2,363,046.90 E NAD27 Plant Local</u>			
Project Number <u>175668050</u>				Surface Elevation <u>699.7 ft</u> Elevation Datum <u>NGVD29</u>			

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI	
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %	
43		—							
44		—			20	42.2 - 45.2 3.0	42.2 - 45.2	0.6	20
45	45.2	654.5							

Bottom of Hole at 45.2 Ft.

Top of Rock = 34.5 Ft.
Top of Rock Elevation = 665.2 Ft.
Begin Core = 35.2 Ft.

Boring backfilled with 30% solids bentonite grout.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID N/A Stantec Boring No. **WBF-B07**

Client Tennessee Valley Authority Boring Location 445,445.88 N; 2,362,653.63 E NAD27 Plant Local

Project Number 175668050 Surface Elevation 716.5 ft Elevation Datum NGVD29

Project Name WBF TDEC Order Date Started 8/13/19 Completed 8/15/19

Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A

Inspector G. Budd Logger G. Budd Depth to Water N/A Date/Time N/A

Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 850XR, #953

Overburden Drilling and Sampling Tools (Type and Size) 4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes

Rock Drilling and Sampling Tools (Type and Size) HQ-3 Wireline, Split Barrel, Surface Set Bit

Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A

Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency N/A

Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A

Reviewed By K. Blakley Approved By A. Welshans

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	716.5	Top of Hole					
	0.5	716.0	Topsoil					
1			FAT CLAY WITH SAND, CH, 5YR 5/6 (yellowish red) and 5YR 6/1 (gray), high plasticity, firm, dry, with fragments of siltstone and sandstone, [FILL]		SS01G	0.0 - 1.5	1.5	7-7-8
2								
3					SS02G	2.5 - 4.0	0.9	2-4-4
4	4.0	712.5	SILTY SAND, SM, 10YR 2/1 (black), fine, loose, dry, [CCR]					
5					SS03G	5.0 - 6.5	1.3	4-6-6
6	6.5	710.0	WELL GRADED SAND WITH SILT, SW-SM, 10YR 2/1 (black), fine to coarse, loose, moist to wet, with trace coarse fragments of glassy CCR, [CCR]					
7					SS04G	7.5 - 9.0	1.5	4-7-8
8								
9					SS05G	10.0 - 11.5	1.0	4-4-5
10			Wet at 10.0					
11					SS06G	12.5 - 14.0	1.0	4-6-8
12								
13					SS07G	15.0 - 16.5	1.3	2-3-5
14								
15								
16								
17								

Client Borehole ID N/A

Stantec Boring No. **WBF-B07**

Client Tennessee Valley Authority

Boring Location 445,445.88 N; 2,362,653.63 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 716.5 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
17			WELL GRADED SAND WITH SILT, SW-SM, 10YR 2/1 (black), fine to coarse, loose, moist to wet, with trace coarse fragments of glassy CCR, [CCR] (Continued)					
18					SS08aG	17.5 - 18.8	1.5	2-1-8
18.8	697.7				SS08bG	18.8 - 19.0		
19			LEAN CLAY, CL, 10YR 4/1 (dark gray), medium plasticity, firm, wet, with fragments of shale					
20								
21					ST01G	20.0 - 22.0	0.0	500
22	694.0							
22.5			LEAN CLAY WITH SAND, CL, 7.5YR 5/8 (strong brown) and 7.5YR 5/1 (gray), medium plasticity, very soft to soft, moist, sand increasing with depth					
23					SS09G	22.5 - 24.0	1.0	WH-2-3
24								
25								
26					ST02G	25.0 - 27.0	2.0	700
27								
28					SS10G	27.5 - 29.0	1.5	WH-2-4
29								
30								
31					SS11G	30.0 - 31.5	1.5	1-3-3
32	684.0							
32.5			CLAYEY SAND, SC, 7.5YR 5/8 (strong brown) and 7.5YR 5/1 (gray), fine, very loose, moist to wet					
33					SS12G	32.5 - 34.0	1.5	1-3-4
34								
35								
36			Wet at 35.0'		SS13G	35.0 - 36.5	1.5	WH-WH-1
37	679.0							
37.5			SILTY SAND, SM, 10YR 5/4 (yellowish brown), fine, very loose, wet					
38					ST03G	37.5 - 39.5	2.0	500
39								

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, J, TDEC SUBSURF DT 20190630, GDT 5/15/20

Client Borehole ID N/A

Stantec Boring No. **WBF-B07**

Client Tennessee Valley Authority

Boring Location 445,445.88 N; 2,362,653.63 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 716.5 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
40			SILTY SAND, SM, 10YR 5/4 (yellowish brown), fine, very loose, wet <i>(Continued)</i>		SS14G	40.0 - 41.5	1.5	WH-1-1
41								
42								
43					SS15G	42.5 - 44.0	1.5	WH-WH-1
44								
45	45.0	671.5	WELL GRADED GRAVEL WITH SAND, GW, 10YR 5/4 (yellowish brown), very fine to coarse, very loose, wet, alluvial sand and multicolored gravel		SS16G	45.0 - 46.5	1.0	WR-12-12
46								
47								
48					SS17G	47.5 - 49.0	1.5	13-14-18
49								
50	50.0	666.5	Shale, gray, soft, highly weathered, wet to dry		SS18G	50.0 - 50.6	0.6	21-50/1" Began Core
	50.6	665.9						
51			Shale (90%) With Limestone (10%)					
52			Shale, dark gray, highly weathered to clay, with very little recovery					
53			Limestone, light gray, hard, weathered, water staining, with calcite on surfaces					
54					0	50.7 - 57.3 6.6	0.6	9
55								
56								
57								
58								
59								
60					0	57.3 - 62.3 5.0	0.9	18
61								
62								

TVA/EIP BORING LOG 175668050 WBF TDEC ORDER GPJ TDEC SUBSURF DT 20190630 GDT 5/15/20

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B07
Client <u>Tennessee Valley Authority</u>	Boring Location <u>445,445.88 N; 2,362,653.63 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>716.5 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
63		—						
64		—			0	62.3 - 65.7	0.0	0
65		—				3.4		
65.7	650.8							

Bottom of Hole at 65.7 Ft.

Top of Rock = 50.0 Ft.

Top of Rock Elevation = 666.5 Ft.

Begin Core = 50.7 Ft.

Boring backfilled with 30% solids bentonite grout.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)

G = Geotechnical Sample Custody


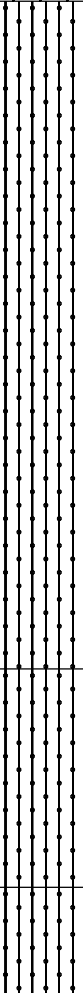

2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples

3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B08
Client <u>Tennessee Valley Authority</u>	Boring Location <u>445,657.35 N; 2,362,938.00 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>700.7 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>8/22/19</u> Completed <u>8/23/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>T. Greenwell</u> Logger <u>T. Greenwell</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>NQ-3 Wireline, Split Barrel, Surface Set Bit</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>K. Blakley</u> Approved By <u>A. Welshans</u>	




Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	700.7						
	0.5	700.2						
1			POORLY GRADED GRAVEL, GP, 10YR 7/1 (light gray), very dense, dry, angular to subangular, crushed limestone gravel, [FILL]		SS01G	0.0 - 1.5	1.5	12-15-27
2			WELL GRADED SAND WITH SILT AND GRAVEL, SW-SM, 10YR 5/2 (grayish brown) to 10YR 7/1 (light gray), very fine to medium, medium dense, dry, [FILL]		SS02aG	2.5 - 3.2		
3	3.2	697.5	Black weathered coal fragments and coarse, glassy CCR (with brown oxide staining) from 1.3' to 3.2'		SS02bG	3.2 - 4.0	1.3	19-14-12
4	4.5	696.2						
5			CLAYEY GRAVEL, GC, 10YR 4/2 (dark grayish brown) and 10YR 4/6 (dark yellowish brown), medium to coarse, medium dense, dry, strong hydrocarbon odor, trace organics and sand, [FILL]		SS03G	5.0 - 6.5	1.2	3-4-9
6								
7			CLAYEY SAND WITH GRAVEL, SC, 10YR 4/3 (brown) to 10YR 6/6 (brownish yellow), fine, very loose to very dense, dry, iron oxide staining, [FILL]		SS04G	7.5 - 9.0	0.2	WH-WH-WH
8	8.5	692.2						
9			CLAYEY SAND, SC, 7.5YR 4/4 (brown) to 7.5YR 3/2 (dark brown), very fine to fine, non-plastic, very dense, moist, well graded		SS05G	10.0 - 11.5	1.5	WH-1-2
10								
11	11.4	689.3						
12			LEAN CLAY, CL, 10YR 5/3 (brown) to 10YR 6/6 (brownish yellow), low to medium plasticity, very soft to soft, moist		SS06G	12.5 - 14.0	1.4	1-1-3
13								
14								
15								
16					ST01G	15.0 - 17.0	2.0	500
17								
18								

Client Borehole ID N/A Stantec Boring No. **WBF-B08**
 Client Tennessee Valley Authority Boring Location 445,657.35 N; 2,362,938.00 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 700.7 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³		Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
18					SS07G	17.5 - 19.0	17.5 - 19.0	1.5	2-2-3
19	19.5	681.2							
20			SILTY SAND, SM, 10YR 5/6 (yellowish brown) with 10YR 6/2 (light brownish gray), very fine to medium, low plasticity, very loose, moist to wet		SS08G	20.0 - 21.5	20.0 - 21.5	1.5	WH-1-3
21									
22									
23					SS09G	22.5 - 24.0	22.5 - 24.0	1.5	WH-1-1
24									
25									
26			Color change to 10YR 3/1 (very dark gray) to 10YR 4/2 (dark grayish brown) at 26.0'		ST02G	25.0 - 27.0	25.0 - 27.0	1.7	400
27									
28					SS10G	27.5 - 29.0	27.5 - 29.0	1.5	WH-WH-WH
29									
30	30.2	670.5							
31			SILTY SAND, SM, 10YR 5/1 (gray), fine to medium, very loose, wet, well graded, with trace clay		SS11G	30.0 - 31.5	30.0 - 31.5	1.5	WH-1-1
32									
33	33.7	667.0			ST03G	32.5 - 34.5	32.5 - 34.5	1.5	800
34			SILTY SAND, SM, 10YR 5/2 (grayish brown) to 10YR 3/1 (very dark gray), medium to coarse, medium dense to dense, wet, with some gravel						
35	35.6	665.1			SS12aG	35.0 - 35.6	35.0 - 35.6	1.2	12-27-50/2"
36	35.8	664.9			SS12bG	35.6 - 36.2	35.6 - 36.2		Began Core
36	36.2	664.5	FAT CLAY, CH, 10YR 5/2 (grayish brown), medium to high plasticity, hard, moist						
37			Shale, dark gray, very fine grained, weathered, iron oxide staining						
38			Shale (90%) With Limestone (10%)		0	36.2 - 40.8	36.2 - 40.8	0.4	9
39			Shale, green gray and light gray, very soft to hard, highly weathered to weathered, shale captured in mud tub with drill water return			4.6			
40									
41			Limestone, weathered, fractured throughout recovered core, with calcite on surfaces						
42									

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, J, TDEC SUBSURF DT 20190630, GDT 9/10/20

Client Borehole ID <u>N/A</u>				Stantec Boring No. WBF-B08			
Client <u>Tennessee Valley Authority</u>				Boring Location <u>445,657.35 N; 2,362,938.00 E NAD27 Plant Local</u>			
Project Number <u>175668050</u>				Surface Elevation <u>700.7 ft</u> Elevation Datum <u>NGVD29</u>			

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
43			Shale (90%) With Limestone (10%)					
44			Shale, green gray and light gray, very soft to hard, highly weathered to weathered, shale captured in mud tub with drill water return		0	40.8 - 46.2 5.4	0.8	15
45			Limestone, weathered, fractured throughout					
46	46.2	654.5	recovered core, with calcite on surfaces <i>(Continued)</i>					

Bottom of Hole at 46.2 Ft.

Top of Rock = 35.8 Ft.
Top of Rock Elevation = 664.9 Ft.
Begin Core = 36.2 Ft.

Boring backfilled with 30% solids bentonite grout.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B09
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,124.61 N; 2,362,289.75 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>711.7 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>8/30/19</u> Completed <u>8/30/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>K. Blakley</u> Approved By <u>T. Greenwell</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	711.7						
	0.5	711.2						
1			Topsoil					
2			SANDY FAT CLAY, CH, 5YR 5/6 (yellowish red), high plasticity, hard to soft, dry, with fragments of chert, siltstone, sandstone, [FILL]		SS01G	0.0 - 1.5	1.2	3-4-5
3					SS02G	1.5 - 3.0	1.2	4-3-4
4					SS03G	3.0 - 4.5	0.7	1-1-2
5	4.5	707.2	Trace CCR from 4.4' to 4.5'		SS04G	4.5 - 6.0	1.5	1-1-1
6			SILT WITH SAND, ML, 10YR 2/1 (black), non-plastic, very soft, moist to wet, [CCR]		SS05G	6.0 - 7.5	0.5	WH-1-1
7			Trace organics from 4.5' to 6.0'		SS06G	7.5 - 9.0	1.1	1-WH-WH
8					SS07G	9.0 - 10.5	1.3	1-WH-WH
9					SS08G	10.5 - 12.0	1.3	1-WH-WH
10					SS09G	12.0 - 13.5	1.1	WH-WH-WH
11					SS10G	13.5 - 15.0	1.5	WH-WH-WH
12					SS11G	15.0 - 16.5	1.5	WH-WH-WH
13					SS12G	16.5 - 18.0	1.3	1-1-WH
14			Trace lean clay, reddish brown from 13.3' to 20.4'					
15								
16								
17								
18	18.0	693.7						

Client Borehole ID N/A

Stantec Boring No. **WBF-B09**

Client Tennessee Valley Authority

Boring Location 444,124.61 N; 2,362,289.75 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 711.7 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SILT, ML, 10YR 2/1 (black), non-plastic, very soft, moist to wet, [CCR]					
19					SS13G	18.0 - 19.5	1.5	WH-WH-WH
20					SS14aG	19.5 - 20.4		
20.4	691.3		SILTY CLAYEY SAND WITH GRAVEL, SC-SM, 10YR 2/1 (black) and 10YR 4/2 (dark grayish brown), fine to coarse, very loose to loose, wet, with coarse CCR, [CCR]		SS14bG	20.4 - 21.0	1.5	WH-2-5
20.8	690.9							
21	690.7							

LEAN CLAY, CL, 2.5YR 4/4 (reddish brown), low plasticity, firm, moist

No Refusal /
Bottom of Hole at 21.0 Ft.

Boring backfilled with 30% solids bentonite grout.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B10
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,192.47 N; 2,362,047.63 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>714.2 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>8/29/19</u> Completed <u>8/29/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>K. Blakley</u> Approved By <u>T. Greenwell</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	714.2						
	0.5	713.7						
1			Topsoil					
2			GRAVELLY FAT CLAY WITH SAND, CH, 5YR 5/8 (yellowish red), high plasticity, hard to firm, dry to moist, with fragments of chert and siltstone, [FILL]		SS01G	0.0 - 1.5	1.3	3-6-6
3					SS02G	1.5 - 3.0	1.5	5-7-6
4					SS03G	3.0 - 4.5	0.7	4-3-2
5	4.5	709.7			SS04G	4.5 - 6.0	0.6	1-1-1
6			SANDY LEAN CLAY, CL, 5YR 5/8 (yellowish red) and 10YR 4/2 (dark grayish brown), low to medium plasticity, very soft to firm, moist, with fragments of chert, sandstone, siltstone, and fine CCR, trace organics, [FILL]		SS05G	6.0 - 7.5	1.3	1-3-2
7	7.5	706.7			SS06G	7.5 - 9.0	0.9	WH-WH-1
8			SILT, ML, 10YR 2/1 (black) and 10YR 5/6 (yellowish brown), non-plastic, very soft, wet, trace clay, [CCR]		SS07G	9.0 - 10.5	0.6	WH-WH-1
9					SS08G	10.5 - 12.0	1.4	WH-WH-WH
10					SS09G	12.0 - 13.5	0.6	WH-WH-WH
11					SS10G	13.5 - 15.0	1.1	WH-WH-WH
12					SS11aG	15.0 - 16.2	1.2	WR-WH-1
13	16.2	698.0			SS11bG	16.2 - 16.5		
14			CLAYEY SAND, SC, 10YR 4/2 (dark grayish brown) and 10YR 6/4 (light yellowish brown), very fine to coarse, very loose, wet, with fragments of siltstone		SS12aG	16.5 - 17.7	1.5	1-1-1
15	17.7	696.5			SS12bG	17.7 - 18.0		

Client Borehole ID N/A Stantec Boring No. **WBF-B10**
 Client Tennessee Valley Authority Boring Location 444,192.47 N; 2,362,047.63 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 714.2 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			and sandstone					
19			SANDY SILTY CLAY, CL-ML, 10YR 5/2 (grayish brown), low plasticity, very soft, wet, some sandy, lean clay and trace gravel (Continued)		SS13G	18.0 - 19.5	1.5	WH-WH-WH
20	20.3	693.9			SS14aG	19.5 - 20.3		
21	21.0	693.2	SILTY, CLAYEY SAND WITH GRAVEL, SC-SM, 10YR 5/1 (gray), very fine to coarse, low plasticity, very loose, wet, with some gravel		SS14bG	20.3 - 21.0	1.3	WH-WH-3

No Refusal /
Bottom of Hole at 21.0 Ft.

Boring backfilled with 30% solids bentonite grout.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B11
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,514.30 N; 2,362,125.99 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>711.5 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>9/18/19</u> Completed <u>9/18/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Hawkston (Subcontractor)</u>	Drill Rig Type and ID <u>Geoprobe 3230DT</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>DPT-Direct Push</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>N/A</u> Weight <u>N/A</u> Drop <u>N/A</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>K. Blakley</u>	Approved By <u>T. Greenwell</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	711.5	Top of Hole					
	0.5	711.0	Topsoil					
1			SANDY FAT CLAY, CH, 5YR 5/8 (yellowish red), high plasticity, dry, with fragments of sandstone, limestone, and chert, [FILL]		DP01aG	0.0 - 1.5		
2					DP01bG	1.5 - 2.5	2.5	N/A
3								
4					DP01c	2.5 - 5.0		
5	5.0	706.5	SILT, ML, 10YR 2/1 (black), non-plastic, soft, moist to wet, [CCR] Wet at 5.3'					
6					DP02aG	5.0 - 6.5		
7					DP02bG	6.5 - 8.0	5.0	N/A
8								
9					DP02cG	8.0 - 9.5		
10					DP02dG	9.5 - 10.0		
11					DP03aG	10.0 - 11.5		
12					DP03bG	11.5 - 13.0	4.5	N/A
13								
14					DP03cG	13.0 - 14.5		
15			With coarse, glassy particles from 15.0' to 19.5'		DP03d	14.5 - 15.0		
16					DP04aG	15.0 - 16.5		
17								
18					DP04bG	16.5 - 18.0	5.0	N/A

Client Borehole ID N/A

Stantec Boring No. **WBF-B11**

Client Tennessee Valley Authority

Boring Location 444,514.30 N; 2,362,125.99 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 711.5 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SILT, ML, 10YR 2/1 (black), non-plastic, soft, moist to wet, [CCR] <i>(Continued)</i>					
19	19.5	692.0			DP04cG	18.0 - 19.5		
20	20.3	691.2	SANDY LEAN CLAY, CL, 10YR 5/1 (gray), medium, very soft, wet, [CCR]		DP04dG DP05aG	19.5 - 20.0 20.0 - 20.3		
21	21.5	690.0	CLAYEY SAND, SC, 10YR 4/4 (dark yellowish brown) and 10YR 5/1 (gray), dense, dry to moist, highly weathered shale		DP05bG	20.3 - 21.5		
22	22.5	689.0			DP05cG	21.5 - 22.5		

Shale, green gray, soft to moderately hard, highly weathered

Bedrock Refusal /
Bottom of Hole at 22.5 Ft.

Top of Rock = 21.5 Ft.
Top of Rock Elevation = 690.0 Ft.

Boring backfilled with 30% solids bentonite grout.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B12
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,505.64 N; 2,363,054.94 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>699.4 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/10/20</u> Completed <u>6/10/20</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>13.0 ft</u> Date/Time <u>6/10/20 10:05</u>
Inspector <u>T. Greenwell</u> Logger <u>T. Greenwell</u>	Depth to Water <u>6.1 ft</u> Date/Time <u>6/11/20 08:37</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 55#4, #713</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>K. Blakley</u> Approved By <u>A. Welshans</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	699.4	Top of Hole					
1	0.5	698.9	GRAVELLY LEAN CLAY WITH SAND, CL, 7.5YR 4/3 (brown), non-plastic to low plasticity, firm, dry, [FILL]		SS01G	0.0 - 1.5	1.4	3-5-9
2			SILTY SAND, SM, 7.5YR 3/4 (dark brown), very fine to fine, medium dense, dry, trace clay, [FILL]		SS02G	1.5 - 3.0	1.3	3-9-10
3					SS03G	3.0 - 4.5	1.0	6-5-6
4	4.5	694.9	CLAYEY SAND, SC, 7.5YR 4/3 (brown) to 7.5YR 5/6 (strong brown), very fine to fine, loose, moist		SS04G	4.5 - 6.0	1.3	4-3-4
5	6.5	692.9	POORLY GRADED SAND WITH CLAY, SP-SC, 7.5YR 6/4 (light brown), fine to medium, loose, moist		SS05aG	6.0 - 6.5	1.4	3-4-4
6					SS05bG	6.5 - 7.5	1.5	3-3-2
7	8.3	691.1	SILT WITH SAND, ML, 7.5YR 4/3 (brown), non-plastic, soft, moist		SS06aG	7.5 - 8.4	1.3	2-2-4
8					SS06bG	8.4 - 9.0	1.5	2-3-2
9					SS07G	9.0 - 10.5	1.5	2-2-2
10					SS08G	10.5 - 12.0	1.5	1-2-2
11	12.8	686.6	SILTY SAND, SM, 10YR 5/6 (yellowish brown) to 7.5YR 4/3 (brown), very fine to medium, very loose to loose, thin seams of brown clayey sand interbedded throughout		SS09aG	12.0 - 12.8	1.5	1-2-2
12					SS09bG	12.8 - 13.5	1.5	1-2-2
13			Wet at 13.0'		SS10G	13.5 - 15.0	1.5	1-2-2
14					SS11G	15.0 - 16.5	1.5	2-1-2
15					SS12G	16.5 - 18.0	1.5	1-2-2
16					SS13G	18.0 - 19.5	1.5	1-2-2

Client Borehole ID N/A Stantec Boring No. **WBF-B12**
 Client Tennessee Valley Authority Boring Location 444,505.64 N; 2,363,054.94 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 699.4 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
19	680.2		SILTY SAND, SM, 10YR 4/4 (dark yellowish brown), fine to coarse, very loose, moist to wet, trace sandstone and shale fragments					
20					SS14G	19.5 - 21.0	1.5	1-1-2
21								
22	676.8		SANDY SILT, ML, 2.5Y 4/1 (dark gray), non-plastic, very soft, wet, trace angular rock fragments		SS15aG	22.0 - 22.6	1.5	2-2-1
23					SS15bG	22.6 - 23.5		
24								
25			Split spoon sample obtained from 25.5 to 27.0 following attempted shelly tube with no recovery					
26					ST01G	25.5 - 27.5	0.0	150
27								
28					SS16G	28.0 - 29.5	1.5	WH-WH-2
29								
30								
31			SILTY SAND, SM, 2.5Y 5/1 (gray) and 2.5Y 5/3 (light olive brown), fine to medium, medium dense, moist		SS17G	30.5 - 32.0	1.5	WH-WH-1
32	666.9							
33					SS18G	33.0 - 34.5	1.5	WH-11-15
34			Increasing gravel content below 34.2 feet					
35								
36	663.5							
36.8	662.6		Weathered shale bedrock		SS19G	35.5 - 36.8	1.2	3-19-50/4"

Refusal /
Bottom of Hole at 36.8 Ft.

Top of Rock = 35.9 Ft.
Top of Rock Elevation = 663.5 Ft.

Vibrating wire piezometers installed. See installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B13
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,836.96 N; 2,363,057.56 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>699.6 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/11/20</u> Completed <u>6/12/20</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>11.3 ft</u> Date/Time <u>6/12/20 07:30</u>
Inspector <u>T. Greenwell</u> Logger <u>T. Greenwell</u>	Depth to Water <u>18.4 ft</u> Date/Time <u>6/12/20 10:29</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 55#4, #713</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>K. Blakley</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	699.6	Top of Hole					
1	1.5	698.1	Auger Without Sampling - Crushed stone and riprap					
2	2.6	697.0	CLAYEY GRAVEL, GC, 5YR 5/2 (reddish gray), fine to medium, medium dense, dry, [FILL]		SS01G	1.5 - 3.0	1.3	4-8-9
3	4.9	694.7	WELL GRADED SAND WITH SILT, SW-SM, 7.5YR 2.5/1 (black), medium to coarse, medium dense, dry, trace gravel, [CCR]		SS02G	3.0 - 4.5	1.2	5-13-12
4			SILTY SAND, SM, 5YR 3/2 (dark reddish brown), very fine to fine, loose, dry to moist, trace CCR mixed with brown lean clay, [FILL]		SS03aG	4.5 - 4.9	1.4	3-4-4
5					SS03bG	4.9 - 6.0	1.4	3-4-3
6					SS04G	6.0 - 7.5	1.5	1-1-2
7	8.2	691.4	SANDY LEAN CLAY, CL, 7.5YR 4/3 (brown), low plasticity, soft to firm, moist, slight organic odor, trace fine roots		SS05aG	7.5 - 8.2	1.4	2-2-2
8	9.0	690.6			SS05bG	8.2 - 9.0	1.0	2-2-3
9			SILTY SAND, SM, 7.5YR 4/3 (brown), very fine to fine, loose, moist to wet, iron oxide staining, trace clay content decreasing with depth Trace dark brown staining from 9.0' to 9.5'		SS06G	9.0 - 10.5	1.1	2-3-2
10					SS07G	10.5 - 12.0	1.2	1-2-2
11					SS08G	12.0 - 13.5	1.4	2-2-2
12					SS09G	13.5 - 15.0	1.3	WH-2-3
13	15.8	683.8	POORLY GRADED SAND WITH CLAY, SP-SC, 10YR 3/4 (dark yellowish brown), very fine to fine, loose, wet		SS10aG	15.0 - 15.8	1.3	1-2-4
14	16.5	683.1			SS10bG	15.8 - 16.5		
15			SILTY SAND, SM, 10YR 4/3 (brown), very fine to fine, loose, wet		SS11G	16.5 - 18.0		
16					SS12aG	18.0 - 19.0		
17	19.0	680.6						

Client Borehole ID N/A Stantec Boring No. **WBF-B13**
 Client Tennessee Valley Authority Boring Location 444,836.96 N; 2,363,057.56 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 699.6 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
19			CLAYEY SAND, SC, 10YR 5/6 (yellowish brown) and 10YR 6/4 (light yellowish brown), very fine to fine, loose, moist		SS12bG	19.0 - 19.5		
20								
21								
22					ST01G	21.5 - 23.5	1.6	400
23	23.5	676.1	SANDY SILT, ML, 7.5YR 5/4 (brown) with 7.5YR 7/1 (light gray), non-plastic, soft, wet, trace clay Split spoon sample obtained from 23.5 to 25.0 following attempted shelly tube with no recovery		ST02G	23.5 - 25.5	0.0	400
24					SS13G	25.0 - 26.5	1.4	WH-3-4
25								
26					SS14G	27.5 - 29.0	0.3	WH-1-1
27			SILTY SAND, SM, 10YR 4/1 (dark gray), very fine to medium, very loose, wet, Laminated, poorly graded With clay from 30.0' to 30.7'		SS15G	30.0 - 31.5	1.4	WH-WH-WH
28								
29	29.5	670.1			SS16aG	32.5 - 33.6	1.5	WH-1-1
30					SS16bG	33.6 - 34.0		
31			Shale, light gray green to gray, very soft to soft, thin bedded, completely weathered to highly weathered, 75° bedding angle		SS17G	35.0 - 36.1	1.0	10-26-50/1"
32								
33								
34								
35	35.0	664.6						
36	36.1	663.5						

Refusal /
Bottom of Hole at 36.1 Ft.

Top of Rock = 35.0 Ft.
Top of Rock Elevation = 664.6 Ft.

Vibrating wire piezometers installed. See installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B14
Client <u>Tennessee Valley Authority</u>	Boring Location <u>445,034.59 N; 2,363,044.22 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>700.9 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/16/20</u> Completed <u>6/16/20</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>19.4 ft</u> Date/Time <u>6/16/20 12:30</u>
Inspector <u>T. Greenwell</u> Logger <u>T. Greenwell</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 55#4, #713</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>K. Blakley</u> Approved By <u>A. Welshans</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	700.9						
			Top of Hole					
1			Auger Without Sampling - Crushed stone and riprap					
2	2.0	698.9						
3	3.2	697.7	CLAYEY GRAVEL, GC, 5YR 5/2 (reddish gray), fine to medium, medium dense, dry, [FILL]		SS01aG	2.0 - 3.2	1.5	12-14-18
4			WELL GRADED SAND WITH SILT AND GRAVEL, SW-SM, 7.5YR 2.5/1 (black), medium to coarse, medium dense, dry, [CCR]		SS01bG	3.2 - 3.5		
5					SS02G	3.5 - 5.0	1.2	3-6-8
6					SS03G	5.0 - 6.5	1.2	4-9-10
7	7.0	693.9			SS04aG	6.5 - 7.0		
8	8.0	692.9	LEAN CLAY WITH GRAVEL, CL, 5YR 5/8 (yellowish red) to 10YR 6/2 (light brownish gray), low to medium plasticity, firm, moist, [FILL]		SS04bG	7.0 - 8.0	1.4	3-2-3
9			SILTY SAND, SM, 10YR 2/2 (very dark brown), fine, medium dense to loose, moist		SS05G	8.0 - 9.5	1.2	3-8-8
10			Yellowish - brown poorly graded sand from 8.2' to 8.4'		SS06G	9.5 - 11.0	1.0	3-3-4
11	11.8	689.1			SS07aG	11.0 - 11.8	1.2	3-2-3
12	12.5	688.4	SILTY SAND, SM, 7.5YR 5/4 (brown), fine to medium, loose, moist		SS07bG	11.8 - 12.5		
13			SILTY CLAYEY SAND, SC-SM, 10YR 2/2 (very dark brown), fine, very loose to loose, moist to wet, Mottled gray		SS08G	12.5 - 14.0	1.3	WH-3-2
14	14.3	686.6			SS09aG	14.0 - 14.3		
15			SILTY SAND, SM, 7.5YR 5/4 (brown), fine to medium, loose, wet, poorly graded, trace clay		SS09bG	14.3 - 15.5	1.4	1-2-3
16					SS10G	15.5 - 17.0	1.3	2-3-3
17					SS11G	17.0 - 18.5	1.3	1-3-2
18								
19								

Client Borehole ID N/A Stantec Boring No. **WBF-B14**
 Client Tennessee Valley Authority Boring Location 445,034.59 N; 2,363,044.22 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 700.9 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
19			SILTY SAND, SM, 7.5YR 5/4 (brown), fine to medium, loose, wet, poorly graded, trace clay (Continued)		SS12G	18.5 - 20.0	1.4	2-3-3
20					SS13G	20.0 - 21.5	1.5	2-2-2
21								
22								
23			LEAN CLAY WITH SAND, CL, 10YR 4/2 (dark grayish brown) with 7.5YR 6/3 (light brown), low to medium plasticity, hard, moist, iron oxide staining, Mottled with gray silt		SS14G	22.5 - 24.0	1.3	2-3-3
24								
25	25.3	675.6			SS15aG	25.0 - 25.3		
26					SS15bG	25.3 - 26.5	1.3	3-5-7
27			SILTY SAND, SM, 10YR 5/2 (grayish brown), very fine to fine, loose, wet, poorly graded Lens of lean clay with sand from 30.0' to 30.3' Wood fragments (less than 1/2" diameter) at 31.5' and 33.8'		SS16aG	27.5 - 28.0	1.3	3-4-4
28	28.0	672.9			SS16bG	28.0 - 29.0		
29								
30					SS17aG	30.0 - 30.3		
31					SS17bG	30.3 - 31.5	1.4	WH-1-1
32								
33					SS18G	32.5 - 34.0	1.5	WH-1-4
34	34.5	666.4	Shale, gray, fine grained, very soft, completely weathered to highly weathered					
35	35.6	665.3			SS19G	35.0 - 35.6	0.6	13-50/1"

Refusal /
Bottom of Hole at 35.6 Ft.

Top of Rock = 34.5 Ft.
Top of Rock Elevation = 666.4 Ft.

Vibrating wire piezometers installed. See installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

Client Borehole ID N/A Stantec Boring No. **WBF-B15**

Client Tennessee Valley Authority Boring Location 444,684.49 N; 2,362,031.93 E NAD27 Plant Local

Project Number 175668050 Surface Elevation 714.7 ft Elevation Datum NGVD29

Project Name WBF TDEC Order Date Started 6/18/20 Completed 6/18/20

Project Location Rhea Co, Spring City, Tennessee Depth to Water 9.4 ft Date/Time 6/18/20 14:17

Inspector T. Greenwell Logger T. Greenwell Depth to Water N/A Date/Time N/A

Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 55#4, #713

Overburden Drilling and Sampling Tools (Type and Size) 4-1/4" HSA, 2" SS w/o liners

Rock Drilling and Sampling Tools (Type and Size) N/A

Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A

Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency N/A

Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A

Reviewed By K. Blakley Approved By A. Welshans

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	714.7	Top of Hole					
0.2	714.5		Topsoil					
1			FAT CLAY WITH SAND, CH, 5YR 4/6 (yellowish red) to 5YR 3/2 (dark reddish brown), high plasticity, firm, moist, slight organic odor, trace fine roots, [FILL]		SS01G	0.0 - 1.5	1.1	3-3-4
2					SS02G	1.5 - 3.0	0.8	4-4-3
3					SS03G	3.0 - 4.5	1.0	2-2-3
4					SS04G	5.0 - 6.5	1.4	2-3-3
5					SS05aG	7.5 - 7.8		
6					SS05bG	7.8 - 9.0	1.5	1-1-1
7								
8	7.8	706.9	SILT, ML, 5YR 2.5/1 (black), non-plastic to low plasticity, very soft, wet, occasional reddish-brown to brown Fat clay intermixed with silty CCR, [CCR]					
9								
10			Reddish brown clay layer from 10.0' to 10.6'		SS06aG	10.0 - 10.6		
11					SS06bG	10.6 - 11.5	1.4	WH-WH-WH
12								
13					SS07G	12.5 - 14.0	1.4	1-1-1
14								
15					SS08G	15.0 - 16.5	1.2	3-1-1
16								
17								
18								

Client Borehole ID N/A

Stantec Boring No. **WBF-B15**

Client Tennessee Valley Authority

Boring Location 444,684.49 N; 2,362,031.93 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 714.7 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SILT, ML, 5YR 2.5/1 (black), non-plastic to low plasticity, very soft, wet, occasional reddish-brown to brown Fat clay intermixed with silty CCR, [CCR] (Continued)		SS09G	17.5 - 19.0	1.5	1-1-1
19								
20								
21	21.1	693.6	Coarse CCR below 20.9'		SS10aG	20.0 - 21.1	1.5	1-3-12
					SS10bG	21.1 - 21.5		
22			CLAYEY GRAVEL, GC, 10YR 7/3 (very pale brown) and 10YR 5/2 (grayish brown), fine to medium, medium dense, wet, with CCR intermixed					
23	22.9	691.8			SS11aG	22.5 - 22.9		
	23.9	690.8	Shale, gray, very fine grained, soft, thin bedded, highly weathered, 60° bedding angle		SS11bG	22.9 - 23.9	0.9	9-46-50/5"

Refusal /
Bottom of Hole at 23.9 Ft.

Top of Rock = 22.9 Ft.
Top of Rock Elevation = 691.8 Ft.



Vibrating wire piezometers installed. See installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B16A
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,673.23 N; 2,362,147.89 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>713.6 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/17/20</u> Completed <u>6/17/20</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>8.5 ft</u> Date/Time <u>6/17/20 14:48</u>
Inspector <u>T. Greenwell</u> Logger <u>T. Greenwell</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 55#4, #713</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>K. Blakley</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	713.6	Top of Hole					
1	0.8	712.8	Topsoil		SS01G	0.0 - 1.5	1.1	4-5-4
2			LEAN CLAY WITH SAND, CL, 7.5YR 4/6 (strong brown) to 7.5YR 6/3 (light brown), medium plasticity, firm, dry, trace fine roots, [FILL]		SS02G	1.5 - 3.0	0.8	3-4-4
3	3.0	710.6	LEAN CLAY WITH SAND, CL, 7.5YR 5/4 (brown) to 7.5YR 6/1 (gray), low to medium plasticity, firm to soft, moist, trace CCR streaks, intermixed soil fill, trace fine roots, [FILL]		SS03G	3.0 - 4.5	0.9	3-3-2
4					SS04G	5.0 - 6.5	0.5	2-2-2
5					SS05G	6.5 - 8.0	1.3	2-3-3
6	8.0	705.6	LEAN CLAY, CL, 2.5Y 4/1 (dark gray), low plasticity, soft to firm, moist, moderate organic odor, trace sand, trace fine roots, occasionally mixed with red fat clay, [FILL]		SS06G	8.0 - 9.5	1.2	2-1-2
7					SS07G	9.5 - 11.0	1.5	2-3-2
8	11.3	702.3	LEAN CLAY, CL, 2.5Y 7/3 (pale brown) to 2.5Y 6/2 (light brownish gray), medium plasticity, firm, moist, [FILL]		SS08G	11.0 - 12.5	1.4	2-2-2
9			Mottled orange, dark gray lean clay from 12.5' to 13.2'		SS09aG	12.5 - 13.2	1.5	1-2-3
10	14.0	699.6	FAT CLAY WITH SAND, CH, 2.5Y 7/3 (pale brown) to 2.5Y 6/2 (light brownish gray), high plasticity, firm to very hard, moist, mottled orange, trace shale lenses with iron oxide staining		SS09bG	13.2 - 14.0	1.5	1-2-4
11					SS10G	14.0 - 15.5	1.5	1-2-4
12					SS11G	15.5 - 17.0	1.0	3-6-8
13					SS12G	17.0 - 18.5	1.5	2-12-22

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B16A
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,673.23 N; 2,362,147.89 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>713.6 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			FAT CLAY WITH SAND, CH, 2.5Y 7/3 (pale brown) to 2.5Y 6/2 (light brownish gray), high plasticity, firm to very hard, moist, mottled orange, trace shale lenses with iron oxide staining (Continued)					
19					SS13G	18.5 - 20.0	1.2	2-12-26
20	20.7							
21	692.9		Shale, light gray brown to gray, fine grained, soft, thin bedded, highly weathered, damp, iron oxide staining, 60° bedding angle		SS14G	20.0 - 21.5	1.3	9-22-30
22								
	22.8				SS15G	21.5 - 22.8	1.2	16-46-50/4"


Refusal /
Bottom of Hole at 22.8 Ft.

Top of Rock = 20.7 Ft.
Top of Rock Elevation = 692.9 Ft.

Vibrating wire piezometers installed. See installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B17
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,654.23 N; 2,363,045.72 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>700.2 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/14/21</u> Completed <u>6/15/21</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>B. Herries</u> Logger <u>B. Herries</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 85#2, #951</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>89.9%</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>M. McDonald</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	700.2						
	0.5	699.7						
1			CRUSHED LIMESTONE GRAVEL, 10YR 7/1 (light gray), moist, angular to subangular					
2			LEAN CLAY WITH SAND, CL, 7.5YR 4/3 (brown), low plasticity, soft, moist		ST01G	1.0 - 3.5	2.4	250
3								
4								
5								
6					ST02G	4.5 - 7.0	2.3	300
7								
8	8.0	692.2						
9			LEAN CLAY LITTLE SAND, CL, 7.5YR 4/3 (brown) with 7.5YR 3/3 (dark brown), low to medium plasticity, moist		ST03G	8.0 - 10.5	2.5	210
10								
11	11.5	688.7						
12			CLAYEY SAND, SC, 7.5YR 4/3 (brown), fine to medium, moist to wet		ST04G	11.5 - 14.0	2.1	170
13								
14								
15								
16					ST05G	15.0 - 17.5	1.7	150
17								
18	18.5	681.7						
19								

TVA/EIP BORING LOG: 175668050_WBF_TDEC_ORDER.GPJ, TDEC SUBSURF DT 20190330 GDT 3/16/22

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B17
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,654.23 N; 2,363,045.72 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>700.2 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
19			SILTY SAND, SM, 7.5YR 4/3 (brown), fine to medium, non-plastic, moist to wet <i>(Continued)</i>		ST06G	18.5 - 21.0	2.5	170
20								
21								
22								
23					ST07G	22.0 - 24.5	2.5	220
24								
25	25.5	674.7						
26			POORLY GRADED SAND, SP, 7.5YR 4/1 (dark gray) with 7.5YR 5/1 (gray), fine to medium, moist to wet		ST08G	25.5 - 28.0	2.5	140
27								
28								
29	29.0	671.2						
30			SILTY SAND, SM, 7.5YR 4/1 (dark gray) with 7.5YR 5/1 (gray), fine to medium, non-plastic, moist to wet, with wood fragments throughout		ST09G	29.0 - 31.5	2.5	210
31								
32								
33	33.1	667.1			ST10G	32.5 - 33.1	0.4	350
34	34.4	665.8	POORLY GRADED GRAVEL SOME SAND, GP, 7.5YR 4/1 (dark gray), moist to wet					
35	35.5	664.7			SS01G	34.4 - 35.5	1.1	22-29-50/1"

Refusal /
Bottom of Hole at 35.5 Ft.

Top of Rock = 34.4 Ft.
Top of Rock Elevation = 665.8 Ft.

3.34-inch (85mm) DGSI inclinometer casing installed to 35.5 feet for deviation survey, nuclear magnetic resonance logging, and compression and Seismic Wave Crosshole Testing.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID N/A Stantec Boring No. **WBF-B18**

Client Tennessee Valley Authority Boring Location 444,646.65 N; 2,363,033.42 E NAD27 Plant Local

Project Number 175668050 Surface Elevation 700.3 ft Elevation Datum NGVD29

Project Name WBF TDEC Order Date Started 6/21/21 Completed 6/21/21

Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A

Inspector B. Herries Logger B. Herries Depth to Water N/A Date/Time N/A

Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 85#2, #951

Overburden Drilling and Sampling Tools (Type and Size) 4-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" Shelby Tubes

Rock Drilling and Sampling Tools (Type and Size) N/A

Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A

Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency 89.9%


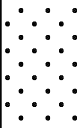
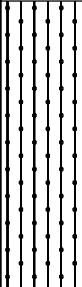
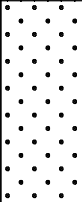


Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A

Reviewed By M. McDonald Approved By A. Welshans

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	700.3	Top of Hole					
1			CRUSHED LIMESTONE GRAVEL, 10YR 7/1 (light gray), moist, angular to subangular, [FILL]					
2	2.0	698.3	LEAN CLAY WITH SAND, CL, 7.5YR 4/3 (brown), low plasticity, soft, moist					
3								
4								
5								
6					SS01G	5.0 - 6.5	1.5	1-2-2
7								
8								
9								
10								
11	11.0	689.3	SILTY SAND, SM, 7.5YR 4/3 (brown), fine to medium, non-plastic, loose, moist		ST01G	11.0 - 13.5	2.4	210
12								
13								
14	14.5	685.8	LEAN CLAY WITH SAND, CL, 7.5YR 4/3 (brown), low plasticity, soft, moist		ST02G	14.5 - 17.0	2.5	210
15								
16								
17								
18								
19								

TVA EIP BORING LOG: 175668050_WBF_TDEC_ORDER.GPJ, TDEC SUBSURF DT 20190330 GDT 3/16/22

Client Borehole ID N/A Stantec Boring No. **WBF-B18**
 Client Tennessee Valley Authority Boring Location 444,646.65 N; 2,363,033.42 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 700.3 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
19					ST03G	20.0 - 22.5	2.5	190
20								
21								
22	22.5	677.8						
23					ST04G	25.0 - 27.5	2.5	200
24								
25	25.0	675.3						
26					ST05G	30.0 - 32.5	2.3	220
27								
28								
29					SS02aG	33.5 - 34.0	1.1	12-19-41
30	30.0	670.3						
31								
32					SS02bG	34.0 - 35.0	1.1	12-19-41
33	33.5	666.8						
34	34.0	666.3						
35	35.0	665.3						

Shale, purple gray with gray, soft, moderately weathered, damp








Refusal /
Bottom of Hole at 35.0 Ft.

Top of Rock = 34.0 Ft.
Top of Rock Elevation = 666.3 Ft.

3.34-inch (85mm) DGSi inclinometer casing installed to 35.5 feet for deviation survey, nuclear magnetic resonance logging, and compression and Seismic Wave Crosshole Testing.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B19
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,639.24 N; 2,363,045.82 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>700.1 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/13/21</u> Completed <u>6/14/21</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>B. Herries</u> Logger <u>B. Herries</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 85#2, #951</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>89.9%</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>M. McDonald</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	700.1						
	0.5	699.6			SS01aG	0.0 - 0.5		
1			CRUSHED LIMESTONE GRAVEL, 10YR 7/1 (light gray), dense, moist, angular to subangular, [FILL]		SS01bG	0.5 - 1.5	1.4	11-14-19
	1.5	698.6						
2			CLAYEY SAND, SC, 7.5YR 4/3 (brown), fine to medium, dense, moist, [CCR]					
			Small lens of CCR from 1.2' to 1.3'					
3			CLAYEY SAND, SC, 7.5YR 4/3 (brown), fine to medium, loose, moist		SS02G	2.5 - 4.0	1.5	5-4-4
4								
5	5.0	695.1			SS03G	5.0 - 6.5	1.3	3-4-3
6			POORLY GRADED SAND, SP, 7.5YR 4/3 (brown), fine to medium, loose, moist					
7								
	7.5	692.6			SS04G	7.5 - 9.0	1.4	WH-2-3
8			SANDY LEAN CLAY, CL, 7.5YR 4/3 (brown), low to medium plasticity, soft to firm, moist					
9								
10								
11					SS05G	10.0 - 11.5	1.5	WH-WH-2
12	12.5	687.6			SS06G	12.5 - 14.0	1.3	WH-WH-WH
13			CLAYEY SAND, SC, 7.5YR 4/3 (brown), fine to medium, very loose, moist to wet					
14								
15	15.0	685.1			SS07aG	15.0 - 15.8		
16	15.8	684.3	POORLY GRADED SAND TRACE CLAY, SP, 7.5YR 4/3 (brown), fine to medium, very loose, moist to wet		SS07bG	15.8 - 16.5	1.5	WH-WH-WH
17								
			SANDY SILTY CLAY, CL-ML, 7.5YR 4/3 (brown), low plasticity, very soft, moist					
17	17.5	682.6						
18								

TVA/EIP BORING LOG: 175668050, WBF, TDEC, ORDER GP, TDEC SUBSURF DT 20190330 GDT 3/16/22

Client Borehole ID N/A Stantec Boring No. **WBF-B19**
 Client Tennessee Valley Authority Boring Location 444,639.24 N; 2,363,045.82 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 700.1 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			CLAYEY SAND, SC, 7.5YR 4/3 (brown), fine to medium, very loose, moist to wet <i>(Continued)</i>		SS08G	17.5 - 19.0	1.5	1-WH-1
19								
20	20.0	680.1	SILTY SAND, SM, 7.5YR 4/3 (brown) with 7.5YR 4/1 (dark gray), fine to medium, very loose, moist to wet		SS09G	20.0 - 21.5	1.4	WH-WH-WH
21								
22	22.5	677.6	SILTY SAND, SM, 7.5YR 4/3 (brown), fine to medium, non-plastic, very loose, moist to wet		SS10G	22.5 - 24.0	1.5	WH-1-WH
23								
24	25.0	675.1	SILTY SAND, SM, 7.5YR 5/1 (gray) with 7.5YR 4/1 (dark gray), fine to medium, very loose, moist to wet		SS11aG	25.0 - 25.5	1.4	WH-WH-WH
25	25.5	674.6			SS11bG	25.5 - 26.5		
26			POORLY GRADED SAND, SP, 7.5YR 5/1 (gray) with 7.5YR 4/1 (dark gray), fine to medium, very loose, moist to wet					
27	27.5	672.6						
28			SILTY SAND, SM, 7.5YR 5/1 (gray) to 7.5YR 3/1 (very dark gray), fine to medium, non-plastic, very loose, moist, stratified		SS12G	27.5 - 29.0	1.4	WR-WR-WR
29								
30					SS13G	30.0 - 31.5	1.1	WH-3-3
31								
32					SS14G	32.5 - 34.0	1.2	2-7-15
33								
34	34.5	665.6	Limestone, gray with white, soft, weathered, moist		SS15G	34.5 - 34.7	0.2	50/2"
	34.7	665.4						

Refusal /
Bottom of Hole at 34.7 Ft.

Top of Rock = 34.5 Ft.
Top of Rock Elevation = 665.6 Ft.

3.34-inch (85mm) DGSI inclinometer casing installed to 35.5 feet for deviation survey, nuclear magnetic resonance logging, and compression and Seismic Wave Crosshole Testing.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface

Client Borehole ID N/A Stantec Boring No. **WBF-B20**
 Client Tennessee Valley Authority Boring Location 444,656.28 N; 2,362,919.86 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 714.4 ft Elevation Datum NGVD29
 Project Name WBF TDEC Order Date Started 6/25/21 Completed 6/26/21
 Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A
 Inspector B. Herries Logger B. Herries Depth to Water N/A Date/Time N/A
 Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 85#2, #951
 Overburden Drilling and Sampling Tools (Type and Size) 4-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" Shelby Tubes
 Rock Drilling and Sampling Tools (Type and Size) N/A
 Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A
 Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency 89.9%
 Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A
 Reviewed By M. McDonald Approved By A. Welshans


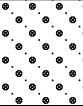

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	714.4						
1			FAT CLAY LITTLE GRAVEL, CH, 7.5YR 5/4 (brown) and 7.5YR 7/8 (reddish yellow), hard, dry, [FILL]		SS01G	0.0 - 1.5	1.0	5-6-8
2	2.5	711.9						
3			ELASTIC SILT WITH SAND, MH, 2.5YR 5/8 (red) and 7.5YR 5/4 (brown), low to medium plasticity, stiff, dry to moist, [FILL]		SS02G	2.5 - 4.0	1.3	3-6-6
4								
5	5.5	708.9			ST01G	5.0 - 5.6	0.6	360
6			POORLY GRADED GRAVEL SOME SAND, GP, 7.5YR 5/1 (gray) to 7.5YR 5/8 (strong brown), medium to coarse, medium dense, dry to moist, [CCR]		SS03aG	5.6 - 6.1	1.5	5-7-6
7					SS03bG	6.1 - 7.1		
8	8.5	705.9						
9			SANDY LEAN CLAY, CL, 7.5YR 5/8 (strong brown) to 10YR 6/8 (brownish yellow), fine to medium, firm, dry to moist, [CCR]		SS04G	8.5 - 10.0	1.0	1-5-4
10								
11	11.0	703.4			SS05G	11.0 - 12.5	1.2	1-WH-6
12			SILT, ML, 7.5YR 2.5/1 (black), low plasticity, firm, moist to wet, [CCR]					
13	13.5	700.9			SS06G	13.5 - 15.0	1.0	3-4-4
14			POORLY GRADED GRAVEL LITTLE SAND, GP, 7.5YR 2.5/1 (black), coarse, loose to medium dense, moist to wet, some roots, [CCR]					
15					SS07G	16.0 - 17.5	1.0	3-4-7
16								
17								
18								

Client Borehole ID N/A Stantec Boring No. **WBF-B20**
 Client Tennessee Valley Authority Boring Location 444,656.28 N; 2,362,919.86 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 714.4 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18	18.5	695.9	SILTY SAND WITH GRAVEL, SM, 7.5YR 2.5/1 (black), coarse, non-plastic, medium dense, moist to wet, some roots, [CCR]					
19					SS08G	18.5 - 20.0	1.2	13-12-15
20								
21					ST02G	21.0 - 22.2	1.2	200
22	22.7	691.7	LEAN CLAY TRACE SAND, CL, 7.5YR 5/3 (brown) with 7.5YR 5/1 (gray), medium plasticity, firm, moist		SS09aG	22.2 - 22.7		
23					SS09bG	22.7 - 23.7	1.1	1-3-4
24								
25					SS10G	24.5 - 26.0	1.2	2-4-4
26								
27								
28					ST03G	27.0 - 29.5	1.8	360
29								
30			SANDY LEAN CLAY, CL, 7.5YR 5/1 (gray), fine to medium, low to medium plasticity, very soft, moist to wet		SS11G	30.0 - 31.5	1.5	1-2-5
31								
32					ST04G	32.5 - 35.0	2.2	200
33								
34								
35								
36	36.0	678.4			SS12G	36.0 - 37.5	1.5	WH-WH-WH
37								
38					SS13G	38.5 - 40.0	1.5	1-WH-WH
39								
40								
41								
42								

TVA EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, TDEC SUBSURF DT 20190630, GDT 3/16/22

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B20
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,656.28 N; 2,362,919.86 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>714.4 ft</u> Elevation Datum <u>NGVD29</u>


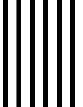




Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
43			SANDY LEAN CLAY, CL, 7.5YR 5/1 (gray), fine to medium, low to medium plasticity, very soft, moist to wet (Continued)		ST05G	41.0 - 43.5	2.3	250
44								
45					SS14G	44.5 - 46.0	1.4	WH-1-WH
46	46.0	668.4						
47			WELL GRADED GRAVEL WITH SAND, GW, 7.5YR 5/1 (gray) with 7.5YR 8/1 (white), fine to coarse, medium dense, moist to wet		SS15G	46.0 - 47.5	0.8	6-5-13
48	47.7	666.7						
			Shale, purple gray, soft, thin bedded, weathered, dry		SS16G	47.7 - 48.6	0.8	26-50/5"
48	48.6	665.8						

Refusal /
Bottom of Hole at 48.6 Ft.

Top of Rock = 47.7 Ft.
Top of Rock Elevation = 666.7 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B21
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,650.23 N; 2,362,824.28 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>716.2 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/27/21</u> Completed <u>6/28/21</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>B. Herries</u> Logger <u>B. Herries</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 85#2, #951</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>89.9%</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>M. McDonald</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	716.2	Top of Hole					
0.5	715.7		TOPSOIL, 7.5YR 6/3 (light brown), stiff, dry to moist, [FILL]		SS01G	0.0 - 1.5	1.2	4-7-8
1			ELASTIC SILT WITH SAND, MH, 7.5YR 5/4 (brown) and 7.5YR 7/8 (reddish yellow), medium plasticity, stiff, dry, [FILL]		SS02G	2.5 - 4.0	1.4	5-9-9
4.0	712.2		SILT, ML, 7.5YR 2.5/1 (black), non-plastic, very soft, moist to wet, [CCR]		SS03G	5.0 - 6.5	1.1	1-WH-WH
5			SILTY SAND, SM, 7.5YR 2.5/1 (black), fine to coarse, loose to dense, moist to wet, [CCR]		SS04aG	14.5 - 15.5	1.5	WR-5-16
15.5	700.7				SS04bG	15.5 - 16.0		
17					SS05G	17.0 - 18.5	0.9	11-12-12

Client Borehole ID N/A Stantec Boring No. **WBF-B21**
 Client Tennessee Valley Authority Boring Location 444,650.23 N; 2,362,824.28 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 716.2 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SILTY SAND, SM, 7.5YR 2.5/1 (black), fine to coarse, loose to dense, moist to wet, [CCR] (Continued)					
19								
20					SS06G	19.5 - 21.0	1.0	3-2-3
21			POORLY GRADED GRAVEL LITTLE SAND, GP, 7.5YR 2.5/1 (black), coarse, medium dense, moist to wet, some roots, [CCR]					
22	22.0	694.2			SS07G	22.0 - 23.5	1.0	2-5-10
23								
24			FAT CLAY, CH, 7.5YR 5/3 (brown) with 7.5YR 5/1 (gray), high plasticity, stiff, moist		ST03G	24.5 - 27.0	0.9	200
25								
26								
27	27.0	689.2	LEAN CLAY, CL, 7.5YR 5/3 (brown) with 7.5YR 5/1 (gray), medium plasticity, firm to stiff, moist		SS08G	27.0 - 28.5	1.4	5-6-9
28					SS09G	28.5 - 30.0	1.5	3-5-6
29								
30			SANDY LEAN CLAY, CL, 7.5YR 5/1 (gray), medium plasticity, very soft, moist to wet		ST04G	31.0 - 33.5	1.9	300
31								
32								
33	33.5	682.7			SS10G	33.5 - 35.0	1.5	1-4-6
34					SS11G	35.0 - 36.5	1.3	WH-1-4
35								
36					ST05G	37.5 - 40.0	2.1	300
37	37.5	678.7						
38					SS12G	40.0 - 41.5	0.6	WH-WH-WH
39								
40								
41								
42								

TVA/EIP BORING LOG 175668050, WBF, TDEC ORDER GP, TDEC SUBSURF DT 20190630, GDT 3/16/22

Client Borehole ID N/A

Stantec Boring No. **WBF-B21**

Client Tennessee Valley Authority

Boring Location 444,650.23 N; 2,362,824.28 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 716.2 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
43	43.0	673.2	SILTY SAND WITH CLAY, SM, 7.5YR 5/1 (gray), non-plastic, loose, moist to wet		SS13G	41.5 - 43.0	1.2	WH-WH-WH
44					SS14G	43.0 - 44.5	1.1	1-WH-3
45								
46					ST06G	45.5 - 48.0	2.1	300
47								
48	48.2	668.0	Shale, bluish gray, soft, thin bedded, weathered, dry					
49					SS15G	48.2 - 49.7	0.9	5-8-13
50								
51	51.3	664.9			SS16G	50.0 - 51.3	1.3	20-35-50/4"

Refusal /
Bottom of Hole at 51.3 Ft.

Top of Rock = 48.2 Ft.
Top of Rock Elevation = 668.0 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B22
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,924.13 N; 2,363,030.88 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>700.5 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/23/21</u> Completed <u>6/24/21</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>B. Herries</u> Logger <u>B. Herries</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 85#2, #951</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>89.9%</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>M. McDonald</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	700.5						
1			Top of Hole					
2			CRUSHED LIMESTONE GRAVEL, 10YR 7/1 (light gray), moist, angular to subangular, with some clay, [FILL]		SS01G	0.0 - 1.5	1.1	8-21-42
3	3.0	697.5			SS02aG	2.5 - 3.0		
4			POORLY GRADED SAND WITH CLAY AND GRAVEL, SP-SC, 7.5YR 2.5/2 (very dark brown) with 2.5YR 3/6 (dark red), medium to coarse, dense, dry to moist		SS02bG	3.0 - 4.0	1.3	40-17-13
5	5.4	695.1			ST01G	5.0 - 5.2	0.2	360
6			POORLY GRADED SAND, SP, 7.5YR 6/3 (light brown) with 7.5YR 5/1 (gray), medium, medium dense, moist		SS03aG	5.2 - 5.4		
7					SS03bG	5.4 - 6.7	0.9	8-7-6
8	8.5	692.0						
9			SILTY CLAYEY SAND, SC-SM, 7.5YR 4/3 (brown) with 7.5YR 5/1 (gray), medium to coarse, low plasticity, loose, moist		SS04G	8.5 - 10.0	1.3	WH-2-4
10								
11								
12					ST02G	11.0 - 13.5	2.5	220
13								
14	14.5	686.0						
15			SANDY LEAN CLAY, CL, 7.5YR 4/3 (brown), low plasticity, very soft, moist		SS05G	14.5 - 16.0	1.5	WH-WH-WH
16								
17								
18								

Client Borehole ID N/A Stantec Boring No. **WBF-B22**
 Client Tennessee Valley Authority Boring Location 444,924.13 N; 2,363,030.88 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 700.5 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SANDY LEAN CLAY, CL, 7.5YR 4/3 (brown), low plasticity, very soft, moist <i>(Continued)</i>		ST03G	17.0 - 19.5	2.5	230
19								
20	20.5	680.0						
21			SANDY LEAN CLAY, CL, 7.5YR 4/3 (brown) with 7.5YR 5/1 (gray), medium plasticity, firm, moist		SS06G	20.5 - 22.0	1.5	2-2-3
22								
23	23.5	677.0	SILTY CLAYEY SAND, SC-SM, 7.5YR 4/3 (brown), low plasticity, firm, moist		ST04G	23.0 - 25.5	2.5	320
24								
25								
26	26.5	674.0	LEAN CLAY WITH SAND, CL, 7.5YR 5/1 (gray) with 7.5YR 4/1 (dark gray), fine to medium, medium plasticity, very soft, moist to wet		SS07G	26.5 - 28.0	1.5	WH-WH-WH
27								
28								
29	29.0	671.5	SILTY SAND, SM, 7.5YR 5/1 (gray) with 7.5YR 4/1 (dark gray), fine to medium, non-plastic, moist		ST05G	29.0 - 31.5	2.5	220
30								
31								
32	32.5	668.0	POORLY GRADED SAND, SP, 7.5YR 5/1 (gray) with 7.5YR 4/1 (dark gray), fine to medium, very loose, moist to wet, stratified		SS08G	32.5 - 34.0	1.5	WH-WH-1
33	34.0	666.5						
34			Shale, bluish gray, soft, thin bedded, weathered, damp		SS09G	34.0 - 35.2	1.2	25-31-50/2"
35	35.2	665.3						


Refusal /
Bottom of Hole at 35.2 Ft.

Top of Rock = 34.0 Ft.
Top of Rock Elevation = 666.5 Ft.

3.34-inch (85mm) DGSI inclinometer casing installed to 34.0 feet for nuclear magnetic resonance downhole testing.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

Client Borehole ID N/A Stantec Boring No. **WBF-B23**
 Client Tennessee Valley Authority Boring Location 445,218.77 N; 2,363,005.82 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 700.3 ft Elevation Datum NGVD29
 Project Name WBF TDEC Order Date Started 6/24/21 Completed 6/25/21
 Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A
 Inspector B. Herries Logger B. Herries Depth to Water N/A Date/Time N/A
 Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 85#2, #951
 Overburden Drilling and Sampling Tools (Type and Size) 4-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" Shelby Tubes
 Rock Drilling and Sampling Tools (Type and Size) N/A
 Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A
 Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency 89.9%
 Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A
 Reviewed By M. McDonald Approved By A. Welshans

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	700.3	Top of Hole					
0.5	699.8		CRUSHED LIMESTONE GRAVEL, 10YR 7/1 (light gray), moist, angular to subangular, [FILL]		SS01aG	0.0 - 0.5		
1	1.5	698.8	POORLY GRADED SAND WITH GRAVEL, SP, 7.5YR 2.5/1 (black) and 7.5YR 2.5/2 (very dark brown), medium to coarse, dense, dry to moist, [CCR]		SS01bG	0.5 - 1.5	1.3	8-13-15
2								
3					SS02G	2.5 - 4.0	1.2	2-5-6
4	4.0	696.3	FAT CLAY LITTLE GRAVEL, CH, 2.5YR 5/8 (red) with 7.5YR 6/6 (reddish yellow), medium to high plasticity, firm, dry to moist, [FILL]					
5			SANDY SILT, ML, 7.5YR 4/3 (brown), fine to medium, non-plastic, firm, moist		SS03G	5.0 - 6.5	1.0	4-4-4
6								
7								
8					ST01G	7.5 - 10.0	2.3	150
9								
10								
11					SS04G	11.0 - 12.5	1.4	1-3-3
12								
13					ST02G	13.5 - 16.0	2.2	220
14								
15								
16								
17	17.0	683.3	LEAN CLAY SOME SAND, CL, 7.5YR 4/3 (brown) with 7.5YR 5/1 (gray), medium plasticity, firm, moist		SS05G	17.0 - 18.5	1.2	WH-3-4
18								

TVA EIP BORING LOG - 175668050, WBF, TDEC ORDER GPJ, TDEC SUBSURF DT 20190330 GDT 3/16/22

Client Borehole ID N/A Stantec Boring No. **WBF-B23**
 Client Tennessee Valley Authority Boring Location 445,218.77 N; 2,363,005.82 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 700.3 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			LEAN CLAY SOME SAND, CL, 7.5YR 4/3 (brown) with 7.5YR 5/1 (gray), medium plasticity, firm, moist (Continued)					
19								
20								
21					ST03G	19.5 - 22.0	2.5	200
22			POORLY GRADED SAND SOME CLAY, SP, 7.5YR 4/3 (brown) and 7.5YR 5/1 (gray), fine to medium, very loose, moist to wet					
23	23.0	677.3			SS06G	23.0 - 24.5	1.5	WH-WH-WH
24			SILTY SAND, SM, 7.5YR 5/1 (gray) with 7.5YR 4/1 (dark gray), fine to medium, moist to wet, moderately graded					
25	25.5	674.8						
26					ST04G	25.5 - 28.0	2.5	210
27								
28			POORLY GRADED SAND WITH SILT, SP, 7.5YR 5/1 (gray), fine to medium, very loose, moist to wet					
29	29.0	671.3			SS07G	29.0 - 30.5	1.5	WH-WH-WH
30			SILTY SAND, SM, 7.5YR 5/1 (gray) with 7.5YR 4/1 (dark gray), fine to medium, non-plastic, very loose, moist to wet, stratified					
31	31.5	668.8			SS08G	31.5 - 33.0	1.5	1-WH-1
32	33.2	667.1	Shale, bluish gray, soft, thin bedded, weathered, moist to wet		SS09G	33.2 - 33.4	0.2	50/2"
33	33.4	666.9						

Refusal /
Bottom of Hole at 33.4 Ft.

Top of Rock = 33.2 Ft.
Top of Rock Elevation = 667.1 Ft.

3.34-inch (85mm) DGSI inclinometer casing installed to 33.2 feet for nuclear magnetic resonance downhole testing.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B24
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,451.03 N; 2,363,028.87 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>700.5 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/22/21</u> Completed <u>6/23/21</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>B. Herries</u> Logger <u>B. Herries</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 85#2, #951</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>89.9%</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>M. McDonald</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	700.5						
1			Top of Hole					
2			CRUSHED LIMESTONE GRAVEL, 10YR 7/1 (light gray), dry to moist, angular to subangular, [FILL]		SS01G	0.0 - 1.5	1.3	11-12-37
3	2.5	698.0						
4			SANDY LEAN CLAY, CL, 7.5YR 5/4 (brown), low to medium plasticity, hard, dry to moist		SS02G	2.5 - 4.0	1.2	15-10-9
5								
6					ST01G	5.0 - 7.5	2.5	240
7								
8	8.5	692.0						
9			CLAYEY SAND, SC, 7.5YR 5/4 (brown), fine to medium, very loose, moist		SS03G	8.5 - 10.0	1.4	WH-WH-WH
10								
11								
12					ST02G	11.0 - 13.5	2.1	190
13								
14	14.5	686.0						
15			SANDY SILTY CLAY, CL-ML, 7.5YR 5/4 (brown), low plasticity, very soft, moist		SS04G	14.5 - 16.0	1.5	WH-WH-WH
16								
17	17.0	683.5						
18			SANDY LEAN CLAY, CL, 7.5YR 5/4 (brown), low plasticity, very soft, moist					



Stantec



SUBSURFACE LOG

Page: 2 of 2

Client Borehole ID N/A

Stantec Boring No. **WBF-B24**

Client Tennessee Valley Authority

Boring Location 444,451.03 N; 2,363,028.87 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 700.5 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SANDY LEAN CLAY, CL, 7.5YR 5/4 (brown), low plasticity, very soft, moist <i>(Continued)</i>		ST03G	17.0 - 19.5	2.5	210
19								
20	20.5	680.0	SILTY SAND, SM, 7.5YR 4/3 (brown) with 7.5YR 4/1 (dark gray), fine to medium, very loose, moist to wet		SS05aG	20.5 - 21.0	1.5	WH-WH-WH
21	21.0	679.5			SS05bG	21.0 - 22.0		
22			POORLY GRADED SAND SOME SILT, SP, 7.5YR 4/3 (brown) with 7.5YR 5/1 (gray), fine to medium, very loose, moist to wet					
23	23.0	677.5						
24			LEAN CLAY WITH SAND, CL, 7.5YR 4/1 (dark gray), medium plasticity, soft, moist to wet		ST04G	23.0 - 25.5	2.3	200
25								
26					SS06G	26.5 - 28.0	1.5	WH-WH-4
27								
28			POORLY GRADED SAND, SP, 7.5YR 5/1 (gray), fine to medium, moist to wet					
29	29.0	671.5			ST05G	29.0 - 31.5	2.5	320
30			POORLY GRADED SAND, SP, 7.5YR 5/1 (gray) with 7.5YR 4/1 (dark gray), fine to medium, loose, moist to wet, stratified					
31								
32	32.5	668.0			SS07G	32.5 - 34.0	1.4	WH-2-3
33								
34	34.5	666.0	Shale, gray to black, soft, moderately weathered, damp		SS08G	34.5 - 34.9	0.4	50/5"
	34.9	665.6						

Refusal /
Bottom of Hole at 34.9 Ft.

Top of Rock = 34.5 Ft.
Top of Rock Elevation = 666.0 Ft.

3.34-inch (85mm) DGSi inclinometer casing installed to 34.6 feet for nuclear magnetic resonance downhole testing.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface



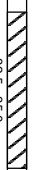
TVA/EIP BORING LOG 175668050_WBF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190630.GDT 3/16/22

Client Borehole ID N/A Stantec Boring No. **WBF-B25**
 Client Tennessee Valley Authority Boring Location 443,695.75 N; 2,362,968.82 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 711.2 ft Elevation Datum NGVD29
 Project Name WBF TDEC Order Date Started 6/12/21 Completed 6/13/21
 Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A
 Inspector B. Herries Logger B. Herries Depth to Water N/A Date/Time N/A
 Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 85#2, #951
 Overburden Drilling and Sampling Tools (Type and Size) 4-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" Shelby Tubes
 Rock Drilling and Sampling Tools (Type and Size) N/A
 Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A
 Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency 89.9%
 Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A
 Reviewed By M. McDonald Approved By A. Welshans

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	711.2	Top of Hole					
1	0.5	710.7	CRUSHED LIMESTONE GRAVEL, 10YR 7/1 (light gray), moist, angular to subangular, [FILL]					
2			LEAN CLAY LITTLE SAND, CL, 7.5YR 4/4 (brown), low plasticity, firm, dry to moist, [FILL]					
4	4.5	706.7						
5			LEAN CLAY LITTLE SAND, CL, 2.5YR 3/1 (dark reddish gray), low to medium plasticity, moist, [FILL]		ST01G	4.5 - 7.0	2.2	500
6								
7								
8								
9					ST02G	8.0 - 10.5	2.2	750
10								
11	11.5	699.7						
12			POORLY GRADED SAND TRACE CLAY, SP, 7.5YR 5/4 (brown), very fine to fine, moist		ST03G	11.5 - 14.0	2.5	650
13								
14	14.0	697.2						
15			SANDY LEAN CLAY, CL, 5Y 4/1 (dark gray), low to medium plasticity, moist					
16								
17								
18								



TVA EIP BORING LOG - 175668050, WBF, TDEC, ORDER, GPJ, TDEC, SUBSURF, DT, 20190330, GDT, 3/16/22

Client Borehole ID N/A Stantec Boring No. **WBF-B25**
 Client Tennessee Valley Authority Boring Location 443,695.75 N; 2,362,968.82 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 711.2 ft Elevation Datum NGVD29

Lithology				Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI	
Depth Ft ³	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %	
18			SANDY LEAN CLAY, CL, 5Y 4/1 (dark gray), low to medium plasticity, moist (Continued)						
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32	32.5			678.7					
33			SANDY LEAN CLAY, CL, 10Y 3/2 (very dark grayish olive) to 5GY 3/2 (very dark grayish green), low plasticity, moist		ST04G	32.5 - 35.0		2.5	230
34									
35									
36									
37									
38									
39									
40									
41									
42									

TVA/EIP BORING LOG 175668050_WBF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190330 GDT 3/16/22

Client Borehole ID N/A Stantec Boring No. **WBF-B25**
 Client Tennessee Valley Authority Boring Location 443,695.75 N; 2,362,968.82 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 711.2 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
43			SANDY LEAN CLAY, CL, 10Y 3/2 (very dark grayish olive) to 5GY 3/2 (very dark grayish green), low plasticity, moist (Continued)		ST05G	43.0 - 44.6	1.6	375
44								
45								
46	46.3	664.9	SANDY WELL GRADED GRAVEL, GW, 2.5Y 3/1 (very dark gray), very dense, moist		SS01	46.3 - 47.4	1.1	29-34-50/1"
46.8	664.4							
47	47.4	663.8						

Refusal /
Bottom of Hole at 47.4 Ft.

Top of Rock = 46.8 Ft.
Top of Rock Elevation = 664.4 Ft.


3.34-inch (85mm) DGSi inclinometer casing installed to 46.3 feet for deviation survey, nuclear magnetic resonance logging, and compression and Seismic Wave Crosshole Testing.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

Client Borehole ID N/A Stantec Boring No. **WBF-B26**
 Client Tennessee Valley Authority Boring Location 443,702.63 N; 2,362,954.39 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 711.0 ft Elevation Datum NGVD29
 Project Name WBF TDEC Order Date Started 6/9/21 Completed 6/10/21
 Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A
 Inspector B. Herries Logger B. Herries Depth to Water N/A Date/Time N/A
 Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 85#2, #951
 Overburden Drilling and Sampling Tools (Type and Size) 4-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" Shelby Tubes
 Rock Drilling and Sampling Tools (Type and Size) N/A
 Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A
 Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency 89.9%
 Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A
 Reviewed By M. McDonald Approved By A. Welshans

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	711.0	Top of Hole					
1	0.7	710.3	CRUSHED LIMESTONE GRAVEL, 10YR 7/1 (light gray), moist, angular to subangular, Crushed stone, [FILL]		SS01G	0.0 - 1.5	1.4	7-3-3
2			SANDY LEAN CLAY, CL, 7.5YR 4/4 (brown), low to medium plasticity, firm, dry to moist, [FILL]		SS02G	2.5 - 4.0	1.4	2-3-4
5	5.5	705.5	LEAN CLAY, CL, 2.5YR 3/1 (dark reddish gray), medium plasticity, hard, moist, [FILL]		SS03aG	5.0 - 5.5	1.5	6-8-12
6					SS03bG	5.5 - 6.5		
8					SS04G	7.5 - 9.0	1.3	3-5-8
10					SS05G	10.0 - 11.5	1.3	4-7-10
12	12.5	698.5	LEAN CLAY LITTLE SAND, CL, 5YR 5/6 (yellowish red), low to medium plasticity, firm, moist, [FILL]		SS06aG	12.5 - 13.5	1.3	3-4-4
13	13.5	697.5			SS06bG	13.5 - 14.0		
14			SANDY LEAN CLAY, CL, 5Y 4/1 (dark gray), low to medium plasticity, firm, moist		SS07G	15.0 - 16.5	1.3	2-2-3
17	17.5	693.5						

Client Borehole ID N/A Stantec Boring No. **WBF-B26**
 Client Tennessee Valley Authority Boring Location 443,702.63 N; 2,362,954.39 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 711.0 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³		Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
18			LEAN CLAY SOME SAND, CL, 7.5YR 5/4 (brown), low to medium plasticity, very soft to firm, moist (Continued)		SS08G	17.5 - 19.0	17.5 - 19.0	1.2	2-2-1
19									
20									
21					SS09G	20.0 - 21.5	20.0 - 21.5	1.2	WH-2-3
22									
23					SS10G	22.5 - 24.0	22.5 - 24.0	1.5	WH-WH-WH
24									
25									
26					SS11G	25.0 - 26.5	25.0 - 26.5	1.5	WH-WH-WH
27									
28					SS12G	27.5 - 29.0	27.5 - 29.0	1.5	WH-WH-WH
29									
30									
31					SS13G	30.0 - 31.5	30.0 - 31.5	1.5	WH-WH-WH
32									
33	33.0	678.0	SANDY LEAN CLAY, CL, 7.5YR 3/3 (dark brown), low plasticity, very soft, moist to wet		SS14aG	32.5 - 33.0	32.5 - 34.0	1.5	WH-WH-2
34					SS14bG	33.0 - 34.0			
35	35.0	676.0	LEAN CLAY SOME SAND, CL, 10Y 3/2 (very dark grayish olive) to 5GY 3/2 (very dark grayish green), low to medium plasticity, very soft, moist						
36					SS15G	35.0 - 36.5	35.0 - 36.5	1.5	WR-WR-WR
37									
38	38.5	672.5	SILTY SAND, SM, 10Y 3/2 (very dark grayish olive) to 5GY 3/2 (very dark grayish green), fine, non-plastic, very loose, moist to wet		SS16aG	37.5 - 38.5	37.5 - 38.0	1.5	WR-WH-WH
39					SS16bG	38.5 - 39.0			
40	40.0	671.0	SANDY LEAN CLAY, CL, 2.5Y 3/1 (very dark gray), low plasticity, very soft to firm, moist, stratified						
41					SS17G	40.0 - 41.5	40.0 - 41.5	1.5	WH-WH-1
42									

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, J, TDEC SUBSURF DT 20190630, GDT 4/21/22

Client Borehole ID N/A


Stantec Boring No. **WBF-B26**

Client Tennessee Valley Authority

Boring Location 443,702.63 N; 2,362,954.39 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 711.0 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
43			SANDY LEAN CLAY, CL, 2.5Y 3/1 (very dark gray), low plasticity, very soft to firm, moist, stratified (Continued)		SS18G	42.5 - 44.0	1.5	WH-1-4
44								
45	45.0	666.0	POORLY GRADED GRAVEL WITH SAND, GP-GM, 2.5Y 3/1 (very dark gray), fine to coarse, dense, moist		SS19G	45.0 - 45.9	0.9	25-50/5"
	45.9	665.1						

Refusal /
Bottom of Hole at 45.9 Ft.

Top of Rock = 45.9 Ft.
Top of Rock Elevation = 665.1 Ft.

3.34-inch (85mm) DGSi inclinometer casing installed to 45.0 feet for deviation survey, nuclear magnetic resonance logging, and compression and Seismic Wave Crosshole Testing.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID N/A Stantec Boring No. **WBF-B27**

Client Tennessee Valley Authority Boring Location 443,687.96 N; 2,362,955.53 E NAD27 Plant Local

Project Number 175668050 Surface Elevation 710.7 ft Elevation Datum NGVD29

Project Name WBF TDEC Order Date Started 6/10/21 Completed 6/12/21

Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A

Inspector B. Herries Logger B. Herries Depth to Water N/A Date/Time N/A

Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 85#2, #951

Overburden Drilling and Sampling Tools (Type and Size) 4-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" Shelby Tubes


Rock Drilling and Sampling Tools (Type and Size) N/A

Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A

Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency 89.9%

Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A

Reviewed By M. McDonald Approved By A. Welshans

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	710.7	Top of Hole					
0.7	710.0		Crushed stone					
1			LEAN CLAY LITTLE SAND, CL, 7.5YR 4/4 (brown), low plasticity, dry to moist, [FILL]					
2					ST01G	1.0 - 3.5	2.1	450
3								
4	4.5	706.2						
5			LEAN CLAY, CL, 7.5YR 5/6 (strong brown), medium plasticity, very stiff, moist, [FILL]		SS01G	4.5 - 6.0	1.1	N/A
6					ST02G	4.5 - 7.0	0.0	450
7								
8								
9					ST03G	8.0 - 9.2	1.1	300
10								
11	11.5	699.2						
12			LEAN CLAY TRACE SAND, CL, 5Y 4/1 (dark gray), low plasticity, dry to moist		ST04G	11.5 - 12.5	1.0	300
13								
14								
15	15.0	695.7						
16			SANDY LEAN CLAY, CL, 5Y 4/1 (dark gray), low to medium plasticity, moist		ST05G	15.0 - 17.5	2.4	350
17								
18								

Client Borehole ID N/A

Stantec Boring No. **WBF-B27**

Client Tennessee Valley Authority

Boring Location 443,687.96 N; 2,362,955.53 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 710.7 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18	18.5	692.2	LEAN CLAY SOME SAND, CL, 7.5YR 5/4 (brown), low to medium plasticity, moist					
19					ST06G	18.5 - 21.0	2.5	300
20								
21								
22								
23					ST07G	22.0 - 24.5	2.5	200
24								
25								
26								
27					ST08G	25.5 - 28.0	2.5	200
28								
29								
30					ST09G	29.0 - 31.5	2.5	180
31								
32	32.5	678.2	SILTY SAND, SM, 10Y 3/2 (very dark grayish olive) to 5GY 3/2 (very dark grayish green), fine to medium, moist to wet					
33					ST10G	32.5 - 35.0	2.5	60
34								
35								
36	36.0	674.7	SANDY LEAN CLAY, CL, 10Y 3/2 (very dark grayish olive) to 5GY 3/2 (very dark grayish green), medium plasticity, moist					
37					ST11G	36.0 - 38.5	2.5	200
38								
39	39.5	671.2	SANDY ORGANIC SILT, OH, 10Y 3/2 (very dark grayish olive) to 5GY 3/2 (very dark grayish green), high plasticity, moist					
40					ST12G	39.5 - 42.0	2.5	220
41								
42								

TVA/EIP BORING LOG 175668050_WBF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190630.GDT 4/21/22

Client Borehole ID N/A

Stantec Boring No. **WBF-B27**

Client Tennessee Valley Authority

Boring Location 443,687.96 N; 2,362,955.53 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 710.7 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
43	43.0	667.7	CLAYEY SAND, SC, 10Y 3/2 (very dark grayish olive) to 5GY 3/2 (very dark grayish green), fine to medium, moist					
44					ST13G	43.0 - 45.5	1.1	300
45	45.5	665.2	SANDY WELL GRADED GRAVEL, GW, 2.5Y 3/1 (very dark gray), very dense, moist					
46	46.4	664.3			SS02G	45.5 - 46.4	0.9	46-50/5"

Refusal /
Bottom of Hole at 46.4 Ft.

Top of Rock = 46.4 Ft.
Top of Rock Elevation = 664.3 Ft.

3.34-inch (85mm) DGSi inclinometer casing installed to 45.1 feet for deviation survey, nuclear magnetic resonance logging, and compression and Seismic Wave Crosshole Testing.

Split spoon sample SS01G was obtained following attempted Shelby Tube ST02 with no recovery

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody

2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples

3: Depths are reported in feet below ground surface

Client Borehole ID N/A Stantec Boring No. **WBF-B28**

Client Tennessee Valley Authority Boring Location 443,683.09 N; 2,362,976.13 E NAD27 Plant Local

Project Number 175668050 Surface Elevation 711.3 ft Elevation Datum NGVD29

Project Name WBF TDEC Order Date Started 6/8/21 Completed 6/9/21

Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A

Inspector B. Herries Logger B. Herries Depth to Water N/A Date/Time N/A

Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 85#2, #951

Overburden Drilling and Sampling Tools (Type and Size) 5-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" ST


Rock Drilling and Sampling Tools (Type and Size) N/A

Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A

Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency 89.9%

Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A

Reviewed By M. McDonald Approved By A. Welshans

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	711.3						
	0.6	710.7						
1			CRUSHED LIMESTONE GRAVEL, 10YR 7/1 (light gray), moist, angular to subangular, [FILL]					
2			Observations from auger cuttings. Geotechnical sampling was not performed from 0.0' - 20.0'.					
3			LEAN CLAY, CL, 2.5YR 3/1 (dark reddish gray), low plasticity, moist, [FILL]					
4								
5								
6								
7								
8								
9								
10								
11	11.5	699.8						
12			Observations from auger cuttings. Geotechnical sampling was not performed from 0.0' - 20.0'.					
13			LEAN CLAY, CL, 2.5YR 3/1 (dark reddish gray), low plasticity, moist					
14								
15								
16								
17								
18								

Client Borehole ID N/A Stantec Boring No. **WBF-B28**
 Client Tennessee Valley Authority Boring Location 443,683.09 N; 2,362,976.13 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 711.3 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			LEAN CLAY, CL, 2.5YR 3/1 (dark reddish gray), low plasticity, moist (Continued)					
19								
20	20.0	691.3	SANDY LEAN CLAY, CL, 7.5YR 5/4 (brown), fine, low plasticity, very soft, dry to moist					
21					SS01G	20.0 - 21.5	1.5	WH-WH-1
22	22.5	688.8	LEAN CLAY WITH SAND, CL, 7.5YR 3/3 (dark brown), low to medium plasticity, very soft, moist					
23					SS02G	22.5 - 24.0	1.5	WH-WH-WH
24								
25					SS03G	25.0 - 26.5	1.5	WH-WH-WH
26								
27					SS04G	27.5 - 29.0	1.5	WH-WH-WH
28	28.1	683.2	POORLY GRADED SAND, SP, 7.5YR 3/3 (dark brown), fine, very loose, moist					
29	28.3	683.0						
30			LEAN CLAY WITH SAND, CL, 7.5YR 3/3 (dark brown), low to medium plasticity, very soft, moist					
31					SS05G	30.0 - 31.5	1.5	WH-WH-WH
32								
33					SS06G	32.5 - 34.0	1.3	WH-WH-1
34								
35	35.0	676.3			SS07G	35.0 - 36.5	1.5	WH-WH-1
36			SANDY LEAN CLAY, CL, 7.5YR 4/4 (brown), low to medium plasticity, very soft, moist					
37	37.5	673.8			SS08G	37.5 - 39.0	1.5	WH-WH-WH
38								
39					SS09aG	40.0 - 40.5		
40	40.5	670.8	SILTY SAND, SM, 7.5YR 4/2 (brown), fine, non-plastic, very loose, wet					
41					SS09bG	40.5 - 41.5	1.4	WH-WH-WH
42								

TVA EIP BORING LOG 175668050 WBF TDEC ORDER GPF TDEC SUBSURF DT 20190330 GDT 3/16/22

Client Borehole ID N/A Stantec Boring No. **WBF-B28**
 Client Tennessee Valley Authority Boring Location 443,683.09 N; 2,362,976.13 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 711.3 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
43	43.5	667.8	SILTY SAND, SM, 7.5YR 4/2 (brown), fine, non-plastic, very loose, wet (Continued)		SS10aG	42.5 - 43.5	1.2	1-2-4
44					SS10bG	43.5 - 44.0		
45	45.0	666.3	POORLY GRADED SAND SOME CLAY, SP, 2.5Y 3/1 (very dark gray), fine, loose, wet				1.5	5-13-17
46	46.0	665.3	POORLY GRADED SAND LITTLE CLAY, SP, 2.5Y 3/1 (very dark gray), fine, dense, moist		SS11aG	45.0 - 46.0		
47			POORLY GRADED SAND WITH SILT AND GRAVEL, SP-SM, 2.5Y 4/2 (dark grayish brown), medium to coarse, very dense		SS11bG	46.0 - 46.5		
47.8	663.5				SS12G	47.2 - 47.8	0.6	47-50/1"

Refusal /
Bottom of Hole at 47.8 Ft.

Top of Rock = 47.7 Ft.
Top of Rock Elevation = 663.6 Ft.

Three vibrating wire piezometers installed. See installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

APPENDIX B.3

TEMPORARY WELLS

Table of Contents

Subsurface Boring Legend.....1

WBF-TW012

WBF-TW024


































WBF-TW036

WBF-TW048

WBF-TW0510









Subsurface Boring Legend

Lithology Graphics

Symbol	Lithology
	Fill
	Top Soil
	Gravel
	Well Graded Gravel (GW)
	Poorly Graded Gravel (GP)
	Silty Gravel (GM)
	Silty, Clayey Gravel (GC-GM)
	Clayey Gravel (GC)
	Well Graded Gravel with Silt (GW-GM)
	Well Graded Gravel with Clay (GW-GC)
	Poorly Graded Gravel with Silt (GP-GM)
	Poorly Graded Gravel with Clay (GP-GC)
	Well Graded Sand (SW)
	Poorly Graded Sand (SP)
	Silty Sand (SM)
	Silty, Clayey Sand (SC-SM)
	Clayey Sand (SC)
	Well Graded Sand with Silt (SW-SM)
	Well Graded Sand with Clay (SW-SC)
	Poorly Graded Sand with Silt (SP-SM)
	Poorly Graded Sand with Clay (SP-SC)
	Silt (ML)
	Silty Clay (CL-ML)
	Lean Clay (CL)
	Organic Silt (OL)
	Elastic Silt (MH)
	Fat Clay (CH)
	Organic Clay (OH)
	Non-Durable Shale
	Durable Shale
	Coal
	Limestone
	Sandstone

Lithology Graphics are based on TVA drafting standards.

Other Graphics

Symbol	Description
	Denotes environmental analytical sample interval
	Denotes SS sample interval
	Denotes ST sample interval
	Denotes DP sample interval
	Denotes RS sample interval
	Denotes RC sample interval
	First water level reading
	Second water level reading

Common Abbreviations

Abbreviation	Definition
DP	Direct Push
HA	Hand Auger
HSA	Hollow Stem Auger
N/A	Not Applicable
NR	Not Recorded
RC	Rock Core
RQD	Rock Quality Designation
RS	Rotary Sonic
SS	Split Spoon
ST	Shelby Tube
WH	Weight of Hammer
WR	Weight of Rod

General Notes

The boring logs include sample numbering used during drilling. For assigned Environmental Analytical Sample ID numbers, see relevant Environmental Chain-of- Custody forms from the drilling date range listed on each log.

For pH readings and additional field data, see applicable field documentation (e.g., Soil pH Data Form) from the drilling date range listed on each log.

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-TW01
Client <u>Tennessee Valley Authority</u>	Boring Location <u>443,411.36 N; 2,362,522.71 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>713.1 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>7/9/19</u> Completed <u>7/10/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>22.6 ft</u> Date/Time <u>7/10/19 07:26</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>22.6 ft</u> Date/Time <u>7/10/19 14:30</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>E. Smith</u> Approved By <u>C. Kocka</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	713.1	Top of Hole					
	0.5	712.6	Topsoil					
1			FAT CLAY WITH SAND, CH, 5YR 4/6 (yellowish red), high plasticity, very soft to firm, dry, with fragments of limestone and chert, [FILL]		SS01G	0.0 - 1.5	1.4	2-6-5
2	2.0	711.1			SS02E	1.5 - 3.0	0.8	5-6-10
3			SANDY SILT, ML, 5YR 2.5/1 (black), non-plastic, soft to firm, dry to moist, with trace fragments of gravel-sized CCR and minor amounts of lean clay, [CCR]		SS03aE	3.0 - 3.5		
4					SS03bG	3.5 - 4.5	1.3	7-8-10
5					SS04G	4.5 - 6.0	1.5	7-10-13
6			Lean clay (CL) lens, 7.5YR (brown), moist from 5.2' to 5.3'		SS05aG	6.0 - 6.5		
7					SS05bE	6.5 - 7.5	1.5	6-8-10
8					SS06aE	7.5 - 8.5	1.5	3-3-4
9					SS06bG	8.5 - 9.0		
10			Silt with Sand (ML) from 9.0' to 10.5'		SS07G	9.0 - 10.5	1.5	2-3-5
11	10.8	702.3			SS08aG	10.5 - 10.8		
12	11.7	701.4	LEAN CLAY, CL, 7.5YR 4/3 (brown), low plasticity, firm, moist, hydrocarbon staining, with fragments of CCR, trace limestone gravel, [CCR]		SS08bG	10.8 - 11.5	1.5	6-5-7
13					SS08cE	11.5 - 12.0		
14			SILT, ML, 5YR 2.5/1 (black), non-plastic, very soft to soft, moist, with trace fragments of gravel-sized CCR and minor amounts of lean clay, [CCR]		SS09E	12.0 - 13.5	1.5	4-6-7
15					SS10G	13.5 - 15.0	1.5	1-2-2
16					ST01G	15.0 - 17.0	1.9	500
17					SS11E	17.0 - 18.5	1.5	WH-1-1

Client Borehole ID N/A

Stantec Boring No. **WBF-TW01**

Client Tennessee Valley Authority

Boring Location 443,411.36 N; 2,362,522.71 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 713.1 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SILT, ML, 5YR 2.5/1 (black), non-plastic, very soft to soft, moist, with trace fragments of gravel-sized CCR and minor amounts of lean clay, [CCR] <i>(Continued)</i>	17.0/19.0-201/907/09	SS12aE	18.5 - 19.0	1.0	WH-1-2
19						19.0 - 20.0		
20					SS13G	20.0 - 21.5	1.5	1-2-3
21	21.5	691.6				21.5 - 22.1		
22	22.1	691.0	SILTY SAND, SM, 5YR 2.5/1 (black), very fine, very loose, moist, [CCR]		SS14aG	21.5 - 22.1	1.5	1-3-9
23			FAT CLAY, CH, 7.5YR 4/4 (brown), high plasticity, soft to firm, moist		SS14bG	22.1 - 23.0		
24					ST02G	23.0 - 25.0	1.4	700
25	25.0	688.1						

No Refusal /
Bottom of Hole at 25.0 Ft.

Boring backfilled with 30% solids bentonite grout.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-TW02
Client <u>Tennessee Valley Authority</u>	Boring Location <u>443,688.39 N; 2,362,820.92 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>714.3 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>7/10/19</u> Completed <u>7/12/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>8-1/4" HSA overdrill of boring</u> Overdrill Depth <u>23.0 ft</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>C. Kocka</u>	Approved By <u>L. Price</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	714.3	Top of Hole					
	0.5	713.8	Topsoil					
1			FAT CLAY WITH SAND, CH, 5YR 4/6 (yellowish red), high plasticity, soft, dry, with abundant fragments of limestone and chert, [FILL]		SS01G	0.0 - 1.5	1.4	1-3-3
2	2.0	712.3			SS02E	1.5 - 3.0	1.5	3-14-29
3			SILT WITH SAND, ML, 5YR 2.5/1 (black), non-plastic, hard to firm, dry, with trace fragments of gravel-sized CCR, [CCR]		SS03aE	3.0 - 3.5	1.5	24-17-22
4					SS03bG	3.5 - 4.5	1.5	
5					SS04G	4.5 - 6.0	1.5	9-12-16
6					SS05aG	6.0 - 6.5	1.5	5-7-9
7					SS05bE	6.5 - 7.5	1.5	
8					SS06aE	7.5 - 8.5	1.5	6-7-8
9					SS06bG	8.5 - 9.0	1.5	
10			Density decreases with depth from 9.0'		SS07G	9.0 - 10.5	1.5	3-3-5
10	10.5	703.8	Abundant organics from 10.0' to 10.5'		SS08aG	10.5 - 11.5	1.5	3-4-7
11			SILT, ML, 5YR 2.5/1 (black), non-plastic, firm to very soft, moist to wet, with trace amounts of fine sand and gravel-sized CRR, [CCR]		SS08bE	11.5 - 12.0	1.5	
12					SS09E	12.0 - 13.5	1.5	2-3-4
13					SS10G	13.5 - 15.0	1.5	2-2-3
14					ST01G	15.0 - 17.0	0.6	400
15					SS11E	17.0 - 18.5	1.5	WR-WR-WH

Client Borehole ID N/A

Stantec Boring No. **WBF-TW02**

Client Tennessee Valley Authority

Boring Location 443,688.39 N; 2,362,820.92 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 714.3 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SILT, ML, 5YR 2.5/1 (black), non-plastic, firm to very soft, moist to wet, with trace amounts of fine sand and gravel-sized CRR, [CCR] <i>(Continued)</i>	17/0/20.0-20190710				
19					SS12E	18.5 - 20.0	1.5	WH-WH-WH
20	20.8	693.5			SS13aG	20.0 - 20.8	1.5	WH-WH-6
21	21.7	692.6	SANDY LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), low plasticity, firm, moist, with very fine sand, with some fine CCR and organics, [CCR]		SS13bG	20.8 - 21.5		
22					SS14G	21.5 - 23.0	1.5	7-10-15
23			LEAN CLAY, CL, 10YR 3/3 (dark brown) and 10YR 4/1 (dark gray), medium plasticity, firm, moist					
24					ST02G	23.0 - 25.0	1.5	700
25	25.0	689.3						

No Refusal /
Bottom of Hole at 25.0 Ft.

Temporary well installed. See well installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-TW03
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,293.51 N; 2,362,769.94 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>717.0 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>7/18/19</u> Completed <u>7/30/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>13.2 ft</u> Date/Time <u>7/31/19 09:12</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>8-1/4" HSA overdrill of boring</u> Overdrill Depth <u>28.5 ft</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>E. Smith</u> Approved By <u>C. Kocka</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	717.0	Top of Hole					
	0.5	716.5	Topsoil					
1			SANDY LEAN CLAY WITH GRAVEL, CL, 5YR 5/6 (yellowish red), medium plasticity, soft to firm, moist, with fragments of siltstone and sandstone, [FILL] Trace CCR from 1.5' to 3.5'		SS01G	0.0 - 1.5	1.3	3-5-5
2					SS02E	1.5 - 3.0	1.3	3-4-6
3	3.5	713.5			SS03aE	3.0 - 3.5		
4	4.0	713.0	LEAN CLAY, CL, 10YR 6/6 (brownish yellow) and 10YR 6/1 (gray), fine, medium plasticity, firm, moist, with some fine sand, with fragments of siltstone and sandstone, [FILL]		SS03bG	3.5 - 4.0	1.5	3-6-5
					SS03cG	4.0 - 4.5		
5					SS04G	4.5 - 6.0	1.5	3-4-4
6			SILT WITH SAND, ML, 10YR 2/1 (black), non-plastic, very soft to soft, dry to moist, [CCR] Trace lean clay from 7.0' to 7.5'		SS05E	6.0 - 7.5	1.5	2-1-1
7					SS06E	7.5 - 9.0	1.5	WH-1-1
8					SS07G	9.0 - 10.5	1.5	WH-1-WH
9			Trace lean clay from 12.0' to 13.5'		SS08aG	10.5 - 11.5	1.5	WH-1-WH
10					SS08bE	11.5 - 12.0		
11					SS09E	12.0 - 13.5	1.5	WH-WH-WH
12			SILT, ML, 10YR 2/1 (black), non-plastic, very soft, moist to wet Wet at 15.0'		SS10G	13.5 - 15.0	1.5	WH-WH-WH
13	13.5	703.5			SS11G	15.0 - 16.5	1.5	WH-WH-5
14					SS12E	16.5 - 17.2	0.7	WR-50/2"
15			WELL GRADED SAND, SW, 10YR 2/1 (black) and 10YR 6/8 (brownish yellow), fine to coarse, very loose to dense, wet, subangular, [CCR]		SS13E	17.5 - 18.0	0.5	50
16	16.3	700.7						

Client Borehole ID N/A Stantec Boring No. **WBF-TW03**
 Client Tennessee Valley Authority Boring Location 444,293.51 N; 2,362,769.94 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 717.0 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			WELL GRADED SAND, SW, 10YR 2/1 (black) and 10YR 6/8 (brownish yellow), fine to coarse, very loose to dense, wet, subangular, [CCR] <i>(Continued)</i>	16.5/20.5-20.1/90.7/18	SS14E	19.0 - 20.5	1.5	24-30-33
19								
20	20.5	696.5						
21			WELL GRADED SAND WITH SILT, SW-SM, 10YR 2/1 (black), very fine to coarse, medium dense, wet, subangular, [CCR]	22.0/25.0-20.1/90.7/18	SS15G	20.5 - 22.0	1.5	17-22-23
22								
23	23.5	693.5						
24			WELL GRADED SAND WITH GRAVEL, SW, 10YR 2/1 (black), fine to coarse, medium dense, wet, subangular, [CCR]		SS16E	22.0 - 23.5	1.5	14-16-20
25								
26								
27	27.6	689.4	FAT CLAY, CH, 7.5YR 3/4 (dark brown) and 7.5YR 5/1 (gray), high plasticity, firm, moist, with trace organics		SS17E	23.5 - 25.0	1.5	16-37-23
28								
29								
30	30.0	687.0			SS18G	25.0 - 26.5	1.5	17-12-6
					SS19aG	26.5 - 27.6	1.5	16-11-11
					SS19bG	27.6 - 28.0	1.5	16-11-11
					ST01G	28.0 - 30.0	1.4	900

No Refusal /
Bottom of Hole at 30.0 Ft.

Temporary well installed. See well installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-TW04
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,739.38 N; 2,362,524.31 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>715.3 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>7/11/19</u> Completed <u>7/11/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>8-1/4" HSA overdrill of boring</u> Overdrill Depth <u>20.5 ft</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>C. Kocka</u>	Approved By <u>L. Price</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	715.3	Top of Hole					
	0.5	714.8	Topsoil					
1			SANDY LEAN CLAY WITH GRAVEL, CL, 10YR 5/6 (yellowish brown) and 10YR 6/1 (gray), medium plasticity, soft to firm, dry, with abundant fragments of sandstone, [FILL]		SS01G	0.0 - 1.5	1.5	4-11-12
2	2.2	713.1			SS02E	1.5 - 3.0	1.2	9-13-16
3			SILT WITH SAND, ML, 10YR 2/1 (black), non-plastic, firm to very soft, moist to wet, with trace coarse CCR and organics, [CCR]		SS03aE	3.0 - 3.5		
4					SS03bG	3.5 - 4.5	1.5	7-9-9
5					SS04G	4.5 - 6.0	1.3	4-2-4
6					SS05aG	6.0 - 6.5		
7					SS05bE	6.5 - 7.5	1.5	1-1-1
8					SS06aE	7.5 - 8.5	1.5	WH-1-1
9					SS06bG	8.5 - 9.0		
10					SS07G	9.0 - 10.5	1.5	WH-WH-1
11			Wet at 10.5'		SS08aG	10.5 - 11.5	1.5	WR-WR-WR
12					SS08bE	11.5 - 12.0		
13	13.5	701.8			SS09E	12.0 - 13.5	1.5	WH-WH-1
14			SILT, ML, 10YR 3/1 (very dark gray) and 10YR 4/1 (dark gray), non-plastic, very soft, wet, [CCR]		SS10G	13.5 - 15.0	1.5	1-2-2
15					ST01G	15.0 - 17.0	1.3	500
16					SS11E	17.0 - 18.5	1.5	WH-WH-WH

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-TW04
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,739.38 N; 2,362,524.31 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>715.3 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SILT, ML, 10YR 3/1 (very dark gray) and 10YR 4/1 (dark gray), non-plastic, very soft, wet, [CCR] (Continued)	17.0/19.0-20.1/90711	SS12aE SS12bG SS12cG	18.5 - 19.0	1.5	WR-1-5
19	19.2	696.1				19.0 - 19.2		
20			LEAN CLAY WITH SAND, CL, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), medium plasticity, firm, moist, iron oxide staining, mottled, with medium to coarse rounded sandstone pebbles		ST02G	19.2 - 20.0	1.3	800
21						20.0 - 22.0		
22	22.0	693.3						

No Refusal /
Bottom of Hole at 22.0 Ft.

Temporary well installed. See well installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-TW05
Client <u>Tennessee Valley Authority</u>	Boring Location <u>445,258.05 N; 2,362,872.96 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>714.5 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>7/16/19</u> Completed <u>7/16/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>8.9 ft</u> Date/Time <u>7/17/19 08:16</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>8-1/4" HSA overdrill of boring</u> Overdrill Depth <u>23.0 ft</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>C. Kocka</u> Approved By <u>L. Price</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	714.5	Top of Hole					
	0.5	714.0	Topsoil					
1			GRAVELLY SILT WITH SAND, ML, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), low plasticity, firm, dry, with abundant fragments of sandstone and siltstone, [FILL]	1.5/5.5-20190716	SS01G	0.0 - 1.5	1.5	4-7-11
2					SS02E	1.5 - 3.0	1.5	10-12-12
3					SS03aE	3.0 - 3.5		
4					SS03bG	3.5 - 4.5	1.5	5-5-5
5					SS04G	4.5 - 6.0	1.5	6-10-14
6			Iron stained from 4.5' to 7.3'	6.5/5.5-20190716	SS05aG	6.0 - 6.5		
7	7.3	707.2			SS05bE	6.5 - 7.5	1.5	5-7-11
8			WELL GRADED SAND WITH SILT AND GRAVEL, SW-SM, 10YR 4/1 (dark gray) and 10YR 2/1 (black), very fine to coarse, loose to dense, dry to wet, [CCR]	11.5/13.5-20190716	SS06aE	7.5 - 8.5	1.5	8-6-7
9					SS06bG	8.5 - 9.0		
10					SS07G	9.0 - 10.5	1.3	9-13-7
11					SS08aG	10.5 - 11.5	1.4	4-3-3
12					SS08bE	11.5 - 12.0		
13			Wet at 10.0'	16.5/18.5-20190716	SS09E	12.0 - 13.5	1.5	3-3-4
14					SS10G	13.5 - 15.0	1.5	11-24-33
15					SS11aG	15.0 - 16.0	1.5	23-46-46
16	16.0	698.5			SS11bG	16.0 - 16.5		
17	17.1	697.4			SS12aE	16.5 - 17.1	1.5	19-13-14
18			SANDY WELL GRADED GRAVEL WITH CLAY, GW-GC, 10YR 4/1 (dark gray), fine to coarse, medium dense to dense, wet, subrounded to rounded, [CCR]		SS12bE	17.1 - 18.0		

Client Borehole ID N/A

Stantec Boring No. **WBF-TW05**

Client Tennessee Valley Authority

Boring Location 445,258.05 N; 2,362,872.96 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 714.5 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18	18.2	696.3	SILT WITH SAND, ML, 10YR 3/1 (very dark gray), low plasticity, firm, moist to wet, hydrocarbon staining, trace fragments of sandstone, [CCR] (Continued)		SS13aE	18.0 - 18.5		
19	19.0	695.5			SS13bG	18.5 - 19.5	1.5	5-7-11
20			LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), low plasticity, firm, moist, with very fine sand, fine CCR, and organics, [CCR]		ST01G	19.5 - 21.5	1.5	800
21								
22			LEAN CLAY, CL, 10YR 3/4 (dark yellowish brown) and 10YR 4/1 (dark gray), low to medium plasticity, firm to hard, moist		SS14G	21.5 - 23.0	1.5	5-9-13
23								
24	24.5	690.0			SS15G	23.0 - 24.5	1.5	14-18-19

No Refusal /
Bottom of Hole at 24.5 Ft.

Temporary well installed. See well installation log for backfill details.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)

G = Geotechnical Sample Custody

2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples

3: Depths are reported in feet below ground surface

APPENDIX B.4

PIEZOMETERS

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Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B02
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,557.61 N; 2,362,444.29 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>719.1 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>7/31/19</u> Completed <u>8/1/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>NQ-2 Wireline, Solid Barrel, Surface Set Bit</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>K. Blakley</u> Approved By <u>A. Welshans</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	719.1	Top of Hole					
	0.5	718.6	Topsoil					
1			SANDY LEAN CLAY WITH GRAVEL, CL, 5YR 5/6 (yellowish red) to 5YR 6/1 (gray), medium plasticity, soft to firm, dry to moist, with fragments of siltstone and sandstone, [FILL]		SS01G	0.0 - 1.5	1.4	3-3-5
2								
3	2.7	716.4	SILT, ML, 10YR 2/1 (black), non-plastic, soft, moist, trace organics, [CCR]		SS02aG	2.5 - 2.7		
4					SS02bG	2.7 - 4.0	1.5	5-8-9
5								
6					SS03G	5.0 - 6.5	1.5	3-2-2
7			WELL GRADED SAND WITH SILT, SW-SM, 10YR 2/1 (black) and 10YR 3/6 (dark yellowish brown), fine to coarse, loose, moist, [CCR]					
8					SS04aG	7.5 - 7.7		
9					SS04bG	7.7 - 9.0	1.5	5-6-5
10								
11	10.9	708.2	SILTY SAND, SM, 10YR 2/1 (black), very fine to fine, very loose, moist to wet, [CCR]		SS05aG	10.0 - 10.9	1.5	3-3-1
12					SS05bG	10.9 - 11.5		
13	12.5	706.6	WELL GRADED SAND WITH SILT, SW-SM, 10YR 2/1 (black), very fine to coarse, very loose, wet, [CCR]					
14					SS06G	12.5 - 14.0	0.3	3-1-WH
15	15.0	704.1	SILTY SAND, SM, 10YR 3/1 (very dark gray) and 10YR 2/1 (black), very fine to fine, very loose, wet, with trace medium to coarse sand, [CCR]					
16					SS07G	15.0 - 16.5	1.5	WR-WH-1
17								
18								

Client Borehole ID N/A

Stantec Boring No. **WBF-B02**

Client Tennessee Valley Authority

Boring Location 444,557.61 N; 2,362,444.29 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 719.1 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³		Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
18			SILTY SAND, SM, 10YR 3/1 (very dark gray) and 10YR 2/1 (black), very fine to fine, very loose, wet, with trace medium to coarse sand, [CCR] (Continued)		SS08G	17.5 - 19.0	17.5 - 19.0	1.5	WH-WH-1
19									
20									
20.9	698.2				SS09aG	20.0 - 20.9	20.0 - 21.5	1.5	2-2-2
21	697.6		LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), low plasticity, soft, moist, hydrocarbon staining, with trace organics		SS09bG	20.9 - 21.5	21.5 - 23.5	1.6	800
22					ST01G	21.5 - 23.5			
23	695.6		LEAN CLAY WITH SAND, CL, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), very fine, low plasticity, firm, moist						
24			SANDY LEAN CLAY, CL, 5YR 4/6 (yellowish red) and 5YR 6/1 (gray), low plasticity, firm to hard, moist, with trace organics						
25					SS10G	25.0 - 26.5	26.0 - 26.5	1.5	4-5-9
26									
27					SS11G	27.5 - 29.0	27.5 - 29.0	1.5	6-9-13
28									
29									
30									
31					SS12G	30.0 - 31.5	30.0 - 31.5	1.5	4-6-8
32	686.6								
33			CLAYEY SAND, SC, 5YR 4/6 (yellowish red) and 5YR 6/1 (gray), fine, loose, moist, with trace organics		SS13G	32.5 - 34.0	32.5 - 34.0	1.5	3-4-5
34	685.1								
35			CLAYEY SAND, SC, 7.5YR 4/4 (brown), fine, very loose, moist to wet						
36					SS14G	35.0 - 36.5	36.0 - 36.5	1.5	1-3-4
36.5	682.6		Wet at 36.0'						
37			SANDY SILT, ML, 7.5YR 4/4 (brown), non-plastic, very soft, wet						
38					SS15G	37.5 - 39.0	37.5 - 38.0	1.5	WR-WR-WH
39									
40	679.1		CLAYEY SAND, SC, 7.5YR 4/4 (brown), fine, very loose, moist						
41					SS16G	40.0 - 41.5	40.0 - 41.5	1.5	2-3-3
42									

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, TDEC SUBSURF DT 20190630, GDT 9/10/20

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B02
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,557.61 N; 2,362,444.29 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>719.1 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
42.5	676.6	///						
43		⌒	Shale, very dark gray brown, soft to hard, weathered, moist to dry, iron oxide staining		SS17G	42.5 - 43.6	1.1	15-34-50/1"
44	674.9	⌒						Began Core
45		⌒	Shale (90%) With Limestone (10%)		0	44.2 - 46.4	1.6	73
46		⌒	Shale, dark gray, soft, laminated, highly weathered, iron oxide staining,			2.2		
47		⌒	Limestone, light gray, hard, thin bedded, weathered					
48		⌒	Shale bedding breaks and mechanical breaks throughout the length of the recovered core associated with the very soft, weathered, laminated bedding		0	46.4 - 49.0	1.7	65
49		⌒						
50		⌒	Fracture, 45°, rough, at 49.9'					
51		⌒	Fracture, 15°, rough, matte surface, fracture along shale, limestone bedding contact, at 50.0'		0	49.0 - 54.0	4.6	92
52		⌒	Fracture, 15°, calcite coating, calcite infilling, smooth to striated, polished surface, at 50.1'			5.0		
53		⌒						
54	665.1	⌒						

Bottom of Hole at 54.0 Ft.

Top of Rock = 42.5 Ft.

Top of Rock Elevation = 676.6 Ft.

Begin Core = 44.2 Ft.

Vibrating Wire Piezometers installed. See installation log for backfill details.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)

G = Geotechnical Sample Custody

2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples

3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B03
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,612.30 N; 2,363,046.92 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>699.9 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>8/26/19</u> Completed <u>8/28/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>NQ-3 Wireline, Split Barrel, Surface Set Bit</u>	
Overdrill Tooling (Type and Size) <u>N/A</u>	Overdrill Depth <u>N/A</u>
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>K. Blakley</u>	Approved By <u>A. Welshans</u>












Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	699.9						
	0.5	699.4						
1			POORLY GRADED GRAVEL, GP, 10YR 7/1 (light gray), very dense, dry, angular to subangular, crushed limestone gravel, [FILL]		SS01G	0.0 - 1.5	1.4	6-10-21
2			SANDY LEAN CLAY WITH GRAVEL, CL, 7.5YR 4/4 (brown), low plasticity, firm to hard, dry, [FILL]		SS02aG	2.5 - 2.8		
3			SILTY SAND WITH GRAVEL, SM, 7.5YR 2.5/1 (black) and 7.5YR 4/4 (brown), very fine to coarse, very dense, dry, trace CCR, [FILL]		SS02bG	2.8 - 4.0	1.5	10-12-6
5	5.5	694.4			SS03aG	5.0 - 5.5		
6			POORLY GRADED SAND WITH CLAY, SP-SC, 10YR 4/6 (dark yellowish brown), fine, very loose to loose, moist		SS03bG	5.5 - 6.5	1.5	3-3-5
8					SS04G	7.5 - 9.0	1.1	1-2-2
10	10.4	689.5			SS05aG	10.0 - 10.4		
11			SANDY LEAN CLAY, CL, 10YR 4/6 (dark yellowish brown), low to medium plasticity, very soft, moist		SS05bG	10.4 - 11.5	1.3	2-1-2
13	13.0	686.9			SS06aG	12.5 - 13.0		
14			SILTY SAND, SM, 10YR 5/6 (yellowish brown), fine, very loose, moist		SS06bG	13.0 - 14.0	1.5	1-1-2
15	15.0	684.9			SS07aG	15.0 - 15.5		
16	15.5	684.4					1.5	1-2-1

TVA/EIP BORING LOG 175668050_WBF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190830.GDT 1/27/21

Client Borehole ID N/A Stantec Boring No. **WBF-B03**
 Client Tennessee Valley Authority Boring Location 444,612.30 N; 2,363,046.92 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 699.9 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
16			POORLY GRADED SAND WITH CLAY, SP-SC, 10YR 5/6 (yellowish brown), fine, very loose, wet (Continued)		SS07bG	15.5 - 16.5		
17								
18					ST01G	17.5 - 19.5	0.0	200
20	20.3	679.6	SANDY LEAN CLAY, CL, 10YR 4/4 (dark yellowish brown) and 10YR 6/1 (gray), non-plastic to low plasticity, very soft, wet		SS08aG	20.0 - 20.3		
21					SS08bG	20.3 - 21.5	1.5	1-1-1
22	22.5	677.4	SILTY SAND, SM, 10YR 5/6 (yellowish brown), fine, very loose, wet					
23					ST02G	22.5 - 24.5	1.4	200
24								
25	25.0	674.9	SANDY SILT, ML, 10YR 5/6 (yellowish brown), non-plastic, very soft, wet Sand lens from 25.5' to 25.8' Color change to 10YR 5/1 (gray) at 27.5'		SS09G	25.0 - 26.5	1.5	WH-1-2
26								
27					SS10G	27.5 - 29.0	1.5	WH-WH-1
28								
29								
30								
31					ST03G	30.0 - 32.0	0.0	500
32	32.5	667.4	POORLY GRADED SAND, SP, 10YR 5/1 (gray), fine, very loose to loose, wet		SS11aG	32.5 - 33.3		
33	33.3	666.6			SS11bG	33.3 - 34.0	1.5	WH-8-12
34			POORLY GRADED SAND WITH SILT AND GRAVEL, SP-SM, 10YR 5/1 (gray), very fine to coarse, medium dense, wet					
35	35.3	664.6			SS12aG	35.0 - 35.3		
36			Shale, soft, weathered, wet to dry, glauconitic		SS12bG	35.3 - 36.5	1.2	8-23-21
37	37.3	662.6			SS13G	36.5 - 36.7	0.2	50/2"
								Began Core

TVA/EIP BORING LOG 175668050 WBF TDEC ORDER GPJ TDEC SUBSURF DT 20190630.GDT 1/27/21

Client Borehole ID <u>N/A</u>				Stantec Boring No. <u>WBF-B03</u>					
Client <u>Tennessee Valley Authority</u>				Boring Location <u>444,612.30 N; 2,363,046.92 E NAD27 Plant Local</u>					
Project Number <u>175668050</u>				Surface Elevation <u>699.9 ft</u>		Elevation Datum <u>NGVD29</u>			
Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI	
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %	
38			Limestone (80%) With Shale (20%)		0	37.3 - 38.7 1.4	37.3 - 38.7 1.4	1.4	100
39			Limestone, light gray, hard, weathered, oolitic,						
40			Shale, dark gray, soft, highly weathered, glauconitic		0	38.7 - 40.9 2.2	38.7 - 40.9 2.2	1.7	77
41			Fractured throughout recovered core along						
42			limestone/shale bedding contacts, abundant calcite						
43			observed within fractures, and numerous mechanical						
44			breaks along						
45			previously calcite-filled healed fractures (Continued)		0	40.9 - 43.7 2.8	40.9 - 43.7 2.8	1.2	43
46			Artesian flow observed at 43.7'						
47									
47.5	652.4				0	43.7 - 45.6 1.9	43.7 - 45.6 1.9	0.6	32
					0	45.6 - 47.5 1.9	45.6 - 47.5 1.9	0.6	32
Bottom of Hole at 47.5 Ft.									
Top of Rock = 35.3 Ft.									
Top of Rock Elevation = 664.6 Ft.									
Begin Core = 37.3 Ft.									
Vibrating Wire Piezometers installed. See installation log for backfill details.									
1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)									
G = Geotechnical Sample Custody									
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples									
3: Depths are reported in feet below ground surface									

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B04
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,821.39 N; 2,362,922.46 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>713.4 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>8/6/19</u> Completed <u>8/7/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>HQ-3 Wireline, Split Barrel, Surface Set Bit</u>	
Overdrill Tooling (Type and Size) <u>N/A</u>	Overdrill Depth <u>N/A</u>
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>K. Blakley</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	713.4	Top of Hole					
	0.5	712.9	Topsoil					
1			SANDY LEAN CLAY WITH GRAVEL, CL, 5YR 5/6 (yellowish red) and 5YR 5/1 (gray), medium plasticity, firm, dry, with fragments of siltstone and sandstone, [FILL]		SS01G	0.0 - 1.5	1.2	5-6-6
2								
3					SS02G	2.5 - 4.0	1.5	4-4-6
4			LEAN CLAY WITH SAND, CL, 5YR 5/6 (yellowish red) and 10YR 2/1 (black), low plasticity, firm, dry, [CCR]		SS03aG	5.0 - 5.3		
5	5.0	708.4			SS03bG	5.3 - 6.5	1.5	14-12-10
6	5.3	708.1	WELL GRADED SAND, SW, 10YR 3/2 (very dark grayish brown) and 10YR 2/1 (black), very fine to coarse, medium dense, dry, with fine to coarse fragments of glassy CCR, [CCR]					
7								
8	7.5	705.9	WELL GRADED SAND WITH SILT, SW-SM, 10YR 3/6 (dark yellowish brown) and 10YR 2/1 (black), very fine to coarse, very loose to loose, dry to moist, iron oxide staining, with fine to coarse glassy CCR, [CCR]		SS04G	7.5 - 9.0	1.2	3-5-9
9								
10	10.0	703.4	WELL GRADED SAND, SW, 10YR 4/2 (dark grayish brown) and 10YR 2/1 (black), fine to coarse, loose to medium dense, moist to wet, with fine to coarse glassy CCR, [CCR] Wet at 11.0 feet		SS05G	10.0 - 11.5	1.2	6-8-11
11								
12					SS06G	12.5 - 14.0	1.1	4-6-5
13								
14	15.0	698.4			SS07G	15.0 - 16.3	1.3	11-27-50/4"
15								

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B04
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,821.39 N; 2,362,922.46 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>713.4 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
16			WELL GRADED SAND WITH SILT AND GRAVEL, SW-SM, 10YR 2/1 (black) and 10YR 3/2 (very dark grayish brown), fine to coarse, medium dense to very dense, wet, with medium to coarse glassy CCR, [CCR] <i>(Continued)</i>					
17								
18					SS08aG	17.5 - 18.8	1.5	11-7-5
18.8	694.6							
19			LEAN CLAY, CL, 10GY 5/1 (greenish gray), low plasticity, firm, dry, glauconitic		SS08bG	18.8 - 19.0		
20								
20.0	693.4							
21			LEAN CLAY WITH SAND, CL, 10YR 4/6 (dark yellowish brown) and 10YR 5/1 (gray), low plasticity, firm, moist		ST01G	20.0 - 22.0	1.8	800
22								
23			Trace organics from 22.5' to 24.0'		SS09G	22.5 - 24.0	1.0	6-8-12
24								
25								
26					SS10G	25.0 - 26.5	1.5	4-6-10
27								
28					SS11G	27.5 - 29.0	1.4	3-6-6
29								
30			With manganese concretions from 30.0' to 31.5'					
31					SS12G	30.0 - 31.5	1.5	2-4-7
32								
32.5	680.9							
33			LEAN CLAY WITH SAND, CL, 10YR 4/4 (dark yellowish brown) and 10YR 5/1 (gray), low plasticity, soft to firm, moist		SS13G	32.5 - 34.0	1.5	2-3-5
34								
35								
36					ST02G	35.0 - 37.0	2.0	700
36.5	676.9							
37			LEAN CLAY WITH SAND, CL, 10YR 4/1 (dark gray), low plasticity, soft to very soft, moist					

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, TDEC SUBSURF DT 20190630, GDT 9/10/20

Client Borehole ID N/A





Stantec Boring No. **WBF-B04**

Client Tennessee Valley Authority

Boring Location 444,821.39 N; 2,362,922.46 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 713.4 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
38			LEAN CLAY WITH SAND, CL, 10YR 4/1 (dark gray), low plasticity, soft to very soft, moist (Continued)		SS14	37.5 - 39.0	1.5	WR-WH-WH
39								
40								
41					SS15G	40.0 - 41.5	1.5	WR-WR-WH
42	42.5	670.9						
43			SILTY SAND, SM, 10YR 4/1 (dark gray), fine, very loose, wet		SS16G	42.5 - 44.0	1.4	WR-WR-WR
44			Wood fragments at 44.0'					
45	45.0	668.4						
46	46.0	667.4	SANDY WELL GRADED GRAVEL, GW, 10YR 4/1 (dark gray), fine to coarse, loose to medium dense, wet, rounded, alluvial sand and multicolored gravel		SS17aG	45.0 - 46.0	1.5	9-21-30
47			Fragments of wood from 45.2' to 45.3'		SS17bG	46.0 - 46.5		
48	48.0	665.4	Shale, very dark green gray, soft to moderately hard, weathered to highly weathered, moist to dry, glauconitic, with some calcite		SS18G	47.5 - 47.7	0.2	50/2" Began Core
49			Shale (90%) With Limestone (10%)					
50			Shale, dark gray and light gray, soft to hard, highly weathered to moderately weathered,		0	48.0 - 52.0	0.0	0
51			Limestone, light gray, thin bedded, hard, weathered with evidence of calcite filled, healed, fractures			4.0		
52								
53								
54					0	52.0 - 57.0	0.7	14
55						5.0		
56								
57								
58					0	57.0 - 59.2	0.3	14
						2.2		

TVA EIP BORING LOG 175668050_WBF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190630.GDT 9/10/20

Client Borehole ID N/A

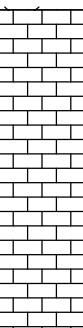
Stantec Boring No. **WBF-B04**

Client Tennessee Valley Authority

Boring Location 444,821.39 N; 2,362,922.46 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 713.4 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
59	59.2	654.2	 <p>Limestone (90%) With Shale (10%)</p> <p>Limestone, light gray, hard, thin bedded, weathered,</p> <p>Shale, dark gray, laminated, soft, with abundant calcite filled, healed fractures</p> <p>Fractures, 15° - 30°, healed, calcite and quartz filled, from 59.3' to 62.8'</p> <p>Vertical fracture, open, weathered, with calcite on surface from 59.7' to 60.3'</p> <p>Fractures, 15°, along limestone/shale bedding contact at 60.6', 60.7', 60.8', 61.0'</p> <p>Fracture zone, fresh from 61.4' to 61.8'</p> <p>Fracture zone, weathered, with calcite on surfaces from 62.1' to 62.4'</p>					
60								
61					37	59.2 - 63.8	3.6	78
62						4.6		
63	63.8	649.6						

Bottom of Hole at 63.8 Ft.

Top of Rock = 46.0 Ft.

Top of Rock Elevation = 667.4 Ft.

Begin Core = 48.0 Ft.

Vibrating Wire Piezometers installed. See installation log for backfill details.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)

G = Geotechnical Sample Custody

2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples

3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B05
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,830.68 N; 2,362,709.29 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>717.2 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>8/8/19</u> Completed <u>8/12/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>HQ-3 Wireline, Split Barrel, Surface Set Bit</u>	
Overdrill Tooling (Type and Size) <u>N/A</u>	Overdrill Depth <u>N/A</u>
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>K. Blakley</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	717.2	Top of Hole					
	0.5	716.7	Topsoil					
1			LEAN CLAY WITH SAND, CL, 5YR 5/6 (yellowish red) and 5YR 6/1 (gray), low plasticity, firm, dry, with fragments of siltstone and sandstone, [FILL]		SS01G	0.0 - 1.5	0.9	5-4-5
2								
3	3.5	713.7			SS02aG	2.5 - 3.5	1.2	2-6-8
4			SILT, ML, 10YR 2/1 (black), non-plastic, very soft, moist, [CCR] With glassy CCR fragments at 3.7' Some clay with fragments of siltstone and sandstone from 12.5' to 14.0'		SS02bG	3.5 - 4.0		
5								
6					SS03G	5.0 - 6.5	1.0	2-3-3
7								
8					SS04G	7.5 - 9.0	1.5	WR-1-WH
9								
10					SS05G	10.0 - 11.5	1.5	WR-WH-WH
11								
12								
13					SS06G	12.5 - 14.0	1.5	1-1-1
14								
15								
16					ST01G	15.0 - 17.0	NR	800
17	17.5	699.7						
18								

TVA/EIP BORING LOG 175668050, WBF, TDEC ORDER GP, TDEC SUBSURF DT 20190630, GDT 2/8/21

Client Borehole ID N/A

Stantec Boring No. **WBF-B05**

Client Tennessee Valley Authority



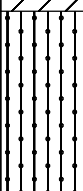
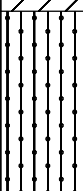











Boring Location 444,830.68 N; 2,362,709.29 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 717.2 ft Elevation Datum NGVD29


Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³		Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
18			SILTY SAND, SM, 10YR 3/2 (very dark grayish brown), very fine to fine, very loose, moist, [CCR] (Continued)		SS07G	17.5 - 19.0	17.5 - 19.0	1.5	1-WH-WH
19									
20	20.0	697.2							
21			WELL GRADED SAND WITH SILT AND GRAVEL, SW-SM, 10YR 2/1 (black) and 10YR 3/2 (very dark grayish brown), very fine to coarse, very loose to loose, wet, [CCR] Wood fragments at 21.0'		SS08G	20.0 - 21.5	20.0 - 21.5	1.0	1-3-4
22									
23	22.8	694.4	SANDY LEAN CLAY WITH GRAVEL, CL, 10YR 5/4 (yellowish brown) and 10YR 5/1 (gray), fine to coarse, low plasticity, soft, wet		SS09aG	22.5 - 22.8	22.5 - 24.0	1.0	2-4-5
24					SS09bG	22.8 - 24.0			
25	25.0	692.2	LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), firm, moist, with organics						
26					SS10G	25.0 - 26.5	26.0 - 26.5	1.4	3-7-9
27	27.5	689.7	LEAN CLAY, CL, 10YR 5/4 (yellowish brown) and 10YR 5/1 (gray), low to medium plasticity, firm to soft, moist, mottled, with some fine sand and weathered fragments of sandstone, trace organics						
28					SS11G	27.5 - 29.0	27.5 - 29.0	1.5	4-6-7
29			Some iron staining from 30.0' to 40.0'						
30									
31					SS12G	30.0 - 31.5	30.0 - 31.5	1.0	2-3-5
32									
33					ST02G	32.5 - 34.5	32.5 - 34.5	1.3	700
34									
35									
36					SS13G	35.0 - 36.5	36.0 - 36.5	1.5	3-6-7
37			Sand content increasing at 37.5'						
38					SS14G	37.5 - 39.0	37.5 - 39.0	1.5	4-6-6
39									
40	40.0	677.2							
41			SANDY LEAN CLAY, CL, 10YR 5/6 (yellowish brown) and 10YR 5/1 (gray), low to medium plasticity, soft, moist to wet		SS15G	40.0 - 41.5	40.0 - 41.5	1.5	2-4-3
42									

TVA/EIP BORING LOG 175668050, WBF, TDEC, ORDER GP, J, TDEC SUBSURF DT 20190630, GDT 2/8/21

Client Borehole ID <u>N/A</u>				Stantec Boring No. <u>WBF-B05</u>					
Client <u>Tennessee Valley Authority</u>				Boring Location <u>444,830.68 N; 2,362,709.29 E NAD27 Plant Local</u>					
Project Number <u>175668050</u>				Surface Elevation <u>717.2 ft</u>		Elevation Datum <u>NGVD29</u>			
Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI	
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %	
43	42.5	674.7			SS16G	42.5 - 44.0	42.5 - 44.0	1.5	1-1-1
44									
45									
46					ST03G	45.0 - 47.0	45.0 - 47.0	2.0	900
47	47.5	669.7							
48					SS17G	47.5 - 49.0	47.5 - 49.0	1.5	1-1-1
49									
50	50.6	666.6			SS18aG	50.0 - 50.6	50.0 - 51.2	1.2	21-38-50/2"
51	51.6	665.6			SS18bG	50.6 - 51.2			Began Core
52									
53									
54					0	51.6 - 57.2	51.6 - 57.2	0.0	0
55						5.6			
56									
57	57.2	660.0							
58									
59									
60					0	57.2 - 62.2	57.2 - 62.2	2.0	40
61						5.0			
62									
63									
64									
65					0	62.2 - 67.2	62.2 - 67.2	1.1	22
66						5.0			

TVA/EIP BORING LOG 175668050_WBF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190630.GDT 2/8/21

Client Borehole ID <u>N/A</u>				Stantec Boring No. WBF-B05			
Client <u>Tennessee Valley Authority</u>				Boring Location <u>444,830.68 N; 2,362,709.29 E NAD27 Plant Local</u>			
Project Number <u>175668050</u>				Surface Elevation <u>717.2 ft</u> Elevation Datum <u>NGVD29</u>			

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
67	67.2	650.0						
<p style="text-align: center;">Bottom of Hole at 67.2 Ft.</p> <p style="text-align: center;">Top of Rock = 50.6 Ft. Top of Rock Elevation = 666.6 Ft. Begin Core = 51.6 Ft.</p> <p style="text-align: center;">Vibrating Wire Piezometers installed. See installation log for backfill details.</p> <p>1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample) G = Geotechnical Sample Custody 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples 3: Depths are reported in feet below ground surface</p>								

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B12
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,505.64 N; 2,363,054.94 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>699.4 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/10/20</u> Completed <u>6/10/20</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>13.0 ft</u> Date/Time <u>6/10/20 10:05</u>
Inspector <u>T. Greenwell</u> Logger <u>T. Greenwell</u>	Depth to Water <u>6.1 ft</u> Date/Time <u>6/11/20 08:37</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 55#4, #713</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>K. Blakley</u> Approved By <u>A. Welshans</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	699.4	Top of Hole					
1	0.5	698.9	GRAVELLY LEAN CLAY WITH SAND, CL, 7.5YR 4/3 (brown), non-plastic to low plasticity, firm, dry, [FILL]		SS01G	0.0 - 1.5	1.4	3-5-9
2			SILTY SAND, SM, 7.5YR 3/4 (dark brown), very fine to fine, medium dense, dry, trace clay, [FILL]		SS02G	1.5 - 3.0	1.3	3-9-10
3					SS03G	3.0 - 4.5	1.0	6-5-6
4	4.5	694.9	CLAYEY SAND, SC, 7.5YR 4/3 (brown) to 7.5YR 5/6 (strong brown), very fine to fine, loose, moist		SS04G	4.5 - 6.0	1.3	4-3-4
5	6.5	692.9	POORLY GRADED SAND WITH CLAY, SP-SC, 7.5YR 6/4 (light brown), fine to medium, loose, moist		SS05aG	6.0 - 6.5	1.4	3-4-4
6					SS05bG	6.5 - 7.5	1.5	3-3-2
7	8.3	691.1	SILT WITH SAND, ML, 7.5YR 4/3 (brown), non-plastic, soft, moist		SS06aG	7.5 - 8.4	1.3	2-2-4
8					SS06bG	8.4 - 9.0	1.5	2-3-2
9					SS07G	9.0 - 10.5	1.5	2-2-2
10					SS08G	10.5 - 12.0	1.5	1-2-2
11	12.8	686.6	SILTY SAND, SM, 10YR 5/6 (yellowish brown) to 7.5YR 4/3 (brown), very fine to medium, very loose to loose, thin seams of brown clayey sand interbedded throughout		SS09aG	12.0 - 12.8	1.5	1-2-2
12					SS09bG	12.8 - 13.5	1.5	1-2-2
13			Wet at 13.0'		SS10G	13.5 - 15.0	1.5	1-2-2
14					SS11G	15.0 - 16.5	1.5	2-1-2
15					SS12G	16.5 - 18.0	1.5	1-2-2
16					SS13G	18.0 - 19.5	1.5	1-2-2

Client Borehole ID N/A Stantec Boring No. **WBF-B12**
 Client Tennessee Valley Authority Boring Location 444,505.64 N; 2,363,054.94 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 699.4 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
19	680.2		SILTY SAND, SM, 10YR 4/4 (dark yellowish brown), fine to coarse, very loose, moist to wet, trace sandstone and shale fragments					
19.2								
20								
21					SS14G	19.5 - 21.0	1.5	1-1-2
22	676.8		SANDY SILT, ML, 2.5Y 4/1 (dark gray), non-plastic, very soft, wet, trace angular rock fragments					
22.6								
23					SS15aG	22.0 - 22.6	1.5	2-2-1
24					SS15bG	22.6 - 23.5		
25								
26			Split spoon sample obtained from 25.5 to 27.0 following attempted shelly tube with no recovery					
27					ST01G	25.5 - 27.5	0.0	150
28								
29					SS16G	28.0 - 29.5	1.5	WH-WH-2
30								
31					SS17G	30.5 - 32.0	1.5	WH-WH-1
32	666.9		SILTY SAND, SM, 2.5Y 5/1 (gray) and 2.5Y 5/3 (light olive brown), fine to medium, medium dense, moist					
33								
34					SS18G	33.0 - 34.5	1.5	WH-11-15
35			Increasing gravel content below 34.2 feet					
35.9	663.5		Weathered shale bedrock					
36					SS19G	35.5 - 36.8	1.2	3-19-50/4"
36.8	662.6							

Refusal /
Bottom of Hole at 36.8 Ft.

Top of Rock = 35.9 Ft.
Top of Rock Elevation = 663.5 Ft.

Vibrating wire piezometers installed. See installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

Client Borehole ID N/A Stantec Boring No. **WBF-B13**
 Client Tennessee Valley Authority Boring Location 444,836.96 N; 2,363,057.56 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 699.6 ft Elevation Datum NGVD29
 Project Name WBF TDEC Order Date Started 6/11/20 Completed 6/12/20
 Project Location Rhea Co, Spring City, Tennessee Depth to Water 11.3 ft Date/Time 6/12/20 07:30
 Inspector T. Greenwell Logger T. Greenwell Depth to Water 18.4 ft Date/Time 6/12/20 10:29
 Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 55#4, #713
 Overburden Drilling and Sampling Tools (Type and Size) 4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes
 Rock Drilling and Sampling Tools (Type and Size) N/A
 Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A
 Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency N/A
 Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A
 Reviewed By K. Blakley Approved By A. Welshans

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	699.6	Top of Hole					
1	1.5	698.1	Auger Without Sampling - Crushed stone and riprap					
2	2.6	697.0	CLAYEY GRAVEL, GC, 5YR 5/2 (reddish gray), fine to medium, medium dense, dry, [FILL]		SS01G	1.5 - 3.0	1.3	4-8-9
3	4.9	694.7	WELL GRADED SAND WITH SILT, SW-SM, 7.5YR 2.5/1 (black), medium to coarse, medium dense, dry, trace gravel, [CCR]		SS02G	3.0 - 4.5	1.2	5-13-12
4			SILTY SAND, SM, 5YR 3/2 (dark reddish brown), very fine to fine, loose, dry to moist, trace CCR mixed with brown lean clay, [FILL]		SS03aG	4.5 - 4.9	1.4	3-4-4
5					SS03bG	4.9 - 6.0	1.4	3-4-3
6					SS04G	6.0 - 7.5	1.5	1-1-2
7	8.2	691.4	SANDY LEAN CLAY, CL, 7.5YR 4/3 (brown), low plasticity, soft to firm, moist, slight organic odor, trace fine roots		SS05aG	7.5 - 8.2	1.4	2-2-2
8	9.0	690.6			SS05bG	8.2 - 9.0	1.0	2-2-3
9			SILTY SAND, SM, 7.5YR 4/3 (brown), very fine to fine, loose, moist to wet, iron oxide staining, trace clay content decreasing with depth Trace dark brown staining from 9.0' to 9.5'		SS06G	9.0 - 10.5	1.1	2-3-2
10					SS07G	10.5 - 12.0	1.2	1-2-2
11					SS08G	12.0 - 13.5	1.4	2-2-2
12					SS09G	13.5 - 15.0	1.3	WH-2-3
13	15.8	683.8			SS10aG	15.0 - 15.8	1.3	1-2-4
14	16.5	683.1	POORLY GRADED SAND WITH CLAY, SP-SC, 10YR 3/4 (dark yellowish brown), very fine to fine, loose, wet		SS10bG	15.8 - 16.5		
15			SILTY SAND, SM, 10YR 4/3 (brown), very fine to fine, loose, wet		SS11G	16.5 - 18.0		
16					SS12aG	18.0 - 19.0		
17	19.0	680.6						

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B13
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,836.96 N; 2,363,057.56 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>699.6 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
19			CLAYEY SAND, SC, 10YR 5/6 (yellowish brown) and 10YR 6/4 (light yellowish brown), very fine to fine, loose, moist		SS12bG	19.0 - 19.5		
20								
21								
22					ST01G	21.5 - 23.5	1.6	400
23	23.5	676.1	SANDY SILT, ML, 7.5YR 5/4 (brown) with 7.5YR 7/1 (light gray), non-plastic, soft, wet, trace clay Split spoon sample obtained from 23.5 to 25.0 following attempted shelly tube with no recovery		ST02G	23.5 - 25.5	0.0	400
24					SS13G	25.0 - 26.5	1.4	WH-3-4
25								
26					SS14G	27.5 - 29.0	0.3	WH-1-1
27			SILTY SAND, SM, 10YR 4/1 (dark gray), very fine to medium, very loose, wet, Laminated, poorly graded With clay from 30.0' to 30.7'		SS15G	30.0 - 31.5	1.4	WH-WH-WH
28								
29	29.5	670.1			SS16aG	32.5 - 33.6	1.5	WH-1-1
30					SS16bG	33.6 - 34.0		
31			Shale, light gray green to gray, very soft to soft, thin bedded, completely weathered to highly weathered, 75° bedding angle		SS17G	35.0 - 36.1	1.0	10-26-50/1"
32								
33								
34								
35	35.0	664.6						
36	36.1	663.5						

Refusal /
Bottom of Hole at 36.1 Ft.

Top of Rock = 35.0 Ft.
Top of Rock Elevation = 664.6 Ft.

Vibrating wire piezometers installed. See installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface

Client Borehole ID N/A Stantec Boring No. **WBF-B14**
 Client Tennessee Valley Authority Boring Location 445,034.59 N; 2,363,044.22 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 700.9 ft Elevation Datum NGVD29
 Project Name WBF TDEC Order Date Started 6/16/20 Completed 6/16/20
 Project Location Rhea Co, Spring City, Tennessee Depth to Water 19.4 ft Date/Time 6/16/20 12:30
 Inspector T. Greenwell Logger T. Greenwell Depth to Water N/A Date/Time N/A
 Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 55#4, #713
 Overburden Drilling and Sampling Tools (Type and Size) 4-1/4" HSA, 2" SS w/o liners
 Rock Drilling and Sampling Tools (Type and Size) N/A
 Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A
 Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency N/A
 Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A
 Reviewed By K. Blakley Approved By A. Welshans

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	700.9	Top of Hole					
1			Auger Without Sampling - Crushed stone and riprap					
2	2.0	698.9						
3	3.2	697.7	CLAYEY GRAVEL, GC, 5YR 5/2 (reddish gray), fine to medium, medium dense, dry, [FILL]		SS01aG	2.0 - 3.2	1.5	12-14-18
4			WELL GRADED SAND WITH SILT AND GRAVEL, SW-SM, 7.5YR 2.5/1 (black), medium to coarse, medium dense, dry, [CCR]		SS01bG	3.2 - 3.5		
5					SS02G	3.5 - 5.0	1.2	3-6-8
6					SS03G	5.0 - 6.5	1.2	4-9-10
7	7.0	693.9			SS04aG	6.5 - 7.0		
8	8.0	692.9	LEAN CLAY WITH GRAVEL, CL, 5YR 5/8 (yellowish red) to 10YR 6/2 (light brownish gray), low to medium plasticity, firm, moist, [FILL]		SS04bG	7.0 - 8.0	1.4	3-2-3
9			SILTY SAND, SM, 10YR 2/2 (very dark brown), fine, medium dense to loose, moist		SS05G	8.0 - 9.5	1.2	3-8-8
10			Yellowish - brown poorly graded sand from 8.2' to 8.4'		SS06G	9.5 - 11.0	1.0	3-3-4
11	11.8	689.1			SS07aG	11.0 - 11.8	1.2	3-2-3
12	12.5	688.4	SILTY SAND, SM, 7.5YR 5/4 (brown), fine to medium, loose, moist		SS07bG	11.8 - 12.5		
13			SILTY CLAYEY SAND, SC-SM, 10YR 2/2 (very dark brown), fine, very loose to loose, moist to wet, Mottled gray		SS08G	12.5 - 14.0	1.3	WH-3-2
14	14.3	686.6			SS09aG	14.0 - 14.3		
15			SILTY SAND, SM, 7.5YR 5/4 (brown), fine to medium, loose, wet, poorly graded, trace clay		SS09bG	14.3 - 15.5	1.4	1-2-3
16					SS10G	15.5 - 17.0	1.3	2-3-3
17					SS11G	17.0 - 18.5	1.3	1-3-2
18								
19								

Client Borehole ID N/A

Stantec Boring No. **WBF-B14**

Client Tennessee Valley Authority

Boring Location 445,034.59 N; 2,363,044.22 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 700.9 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
19			SILTY SAND, SM, 7.5YR 5/4 (brown), fine to medium, loose, wet, poorly graded, trace clay (Continued)		SS12G	18.5 - 20.0	1.4	2-3-3
20					SS13G	20.0 - 21.5	1.5	2-2-2
21								
22								
23					SS14G	22.5 - 24.0	1.3	2-3-3
24			LEAN CLAY WITH SAND, CL, 10YR 4/2 (dark grayish brown) with 7.5YR 6/3 (light brown), low to medium plasticity, hard, moist, iron oxide staining, Mottled with gray silt		SS15aG	25.0 - 25.3	1.3	3-5-7
25	25.3	675.6			SS15bG	25.3 - 26.5		
26			SILTY SAND, SM, 10YR 5/2 (grayish brown), very fine to fine, loose, wet, poorly graded Lens of lean clay with sand from 30.0' to 30.3' Wood fragments (less than 1/2" diameter) at 31.5' and 33.8'		SS16aG	27.5 - 28.0	1.3	3-4-4
27					SS16bG	28.0 - 29.0		
28	28.0	672.9			SS17aG	30.0 - 30.3	1.4	WH-1-1
29					SS17bG	30.3 - 31.5		
30					SS18G	32.5 - 34.0	1.5	WH-1-4
31			Shale, gray, fine grained, very soft, completely weathered to highly weathered		SS19G	35.0 - 35.6	0.6	13-50/1"
32								
33								
34	34.5	666.4						
35	35.6	665.3						

Refusal /
Bottom of Hole at 35.6 Ft.

Top of Rock = 34.5 Ft.
Top of Rock Elevation = 666.4 Ft.

Vibrating wire piezometers installed. See installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
- 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
- 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B15
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,684.49 N; 2,362,031.93 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>714.7 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/18/20</u> Completed <u>6/18/20</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>9.4 ft</u> Date/Time <u>6/18/20 14:17</u>
Inspector <u>T. Greenwell</u> Logger <u>T. Greenwell</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 55#4, #713</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>K. Blakley</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	714.7	Top of Hole					
0.2	714.5		Topsoil					
1			FAT CLAY WITH SAND, CH, 5YR 4/6 (yellowish red) to 5YR 3/2 (dark reddish brown), high plasticity, firm, moist, slight organic odor, trace fine roots, [FILL]		SS01G	0.0 - 1.5	1.1	3-3-4
2					SS02G	1.5 - 3.0	0.8	4-4-3
3					SS03G	3.0 - 4.5	1.0	2-2-3
4					SS04G	5.0 - 6.5	1.4	2-3-3
5					SS05aG	7.5 - 7.8		
6					SS05bG	7.8 - 9.0	1.5	1-1-1
7								
7.8	706.9		SILT, ML, 5YR 2.5/1 (black), non-plastic to low plasticity, very soft, wet, occasional reddish-brown to brown Fat clay intermixed with silty CCR, [CCR]					
8								
9								
10			Reddish brown clay layer from 10.0' to 10.6'		SS06aG	10.0 - 10.6		
11					SS06bG	10.6 - 11.5	1.4	WH-WH-WH
12								
13					SS07G	12.5 - 14.0	1.4	1-1-1
14								
15					SS08G	15.0 - 16.5	1.2	3-1-1
16								
17								
18								

Client Borehole ID N/A

Stantec Boring No. **WBF-B15**

Client Tennessee Valley Authority

Boring Location 444,684.49 N; 2,362,031.93 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 714.7 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			SILT, ML, 5YR 2.5/1 (black), non-plastic to low plasticity, very soft, wet, occasional reddish-brown to brown Fat clay intermixed with silty CCR, [CCR] (Continued)		SS09G	17.5 - 19.0	1.5	1-1-1
19								
20								
21	21.1	693.6	Coarse CCR below 20.9'		SS10aG	20.0 - 21.1	1.5	1-3-12
					SS10bG	21.1 - 21.5		
22			CLAYEY GRAVEL, GC, 10YR 7/3 (very pale brown) and 10YR 5/2 (grayish brown), fine to medium, medium dense, wet, with CCR intermixed		SS11aG	22.5 - 22.9		
23	22.9	691.8			SS11bG	22.9 - 23.9	0.9	9-46-50/5"
	23.9	690.8	Shale, gray, very fine grained, soft, thin bedded, highly weathered, 60° bedding angle					

Refusal /
Bottom of Hole at 23.9 Ft.

Top of Rock = 22.9 Ft.
Top of Rock Elevation = 691.8 Ft.



Vibrating wire piezometers installed. See installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B16A
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,673.23 N; 2,362,147.89 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>713.6 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/17/20</u> Completed <u>6/17/20</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>8.5 ft</u> Date/Time <u>6/17/20 14:48</u>
Inspector <u>T. Greenwell</u> Logger <u>T. Greenwell</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 55#4, #713</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>N/A</u> Overdrill Depth <u>N/A</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u>	Borehole Inclination (from Vertical) <u>N/A</u>
Reviewed By <u>K. Blakley</u>	Approved By <u>A. Welshans</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	713.6	Top of Hole					
1	0.8	712.8	Topsoil		SS01G	0.0 - 1.5	1.1	4-5-4
2			LEAN CLAY WITH SAND, CL, 7.5YR 4/6 (strong brown) to 7.5YR 6/3 (light brown), medium plasticity, firm, dry, trace fine roots, [FILL]		SS02G	1.5 - 3.0	0.8	3-4-4
3	3.0	710.6	LEAN CLAY WITH SAND, CL, 7.5YR 5/4 (brown) to 7.5YR 6/1 (gray), low to medium plasticity, firm to soft, moist, trace CCR streaks, intermixed soil fill, trace fine roots, [FILL]		SS03G	3.0 - 4.5	0.9	3-3-2
4					SS04G	5.0 - 6.5	0.5	2-2-2
5					SS05G	6.5 - 8.0	1.3	2-3-3
6	8.0	705.6	LEAN CLAY, CL, 2.5Y 4/1 (dark gray), low plasticity, soft to firm, moist, moderate organic odor, trace sand, trace fine roots, occasionally mixed with red fat clay, [FILL]		SS06G	8.0 - 9.5	1.2	2-1-2
7					SS07G	9.5 - 11.0	1.5	2-3-2
8	11.3	702.3	LEAN CLAY, CL, 2.5Y 7/3 (pale brown) to 2.5Y 6/2 (light brownish gray), medium plasticity, firm, moist, [FILL]		SS08G	11.0 - 12.5	1.4	2-2-2
9			Mottled orange, dark gray lean clay from 12.5' to 13.2'		SS09aG	12.5 - 13.2	1.5	1-2-3
10	14.0	699.6	FAT CLAY WITH SAND, CH, 2.5Y 7/3 (pale brown) to 2.5Y 6/2 (light brownish gray), high plasticity, firm to very hard, moist, mottled orange, trace shale lenses with iron oxide staining		SS09bG	13.2 - 14.0	1.5	1-2-4
11					SS10G	14.0 - 15.5	1.5	1-2-4
12					SS11G	15.5 - 17.0	1.0	3-6-8
13					SS12G	17.0 - 18.5	1.5	2-12-22

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-B16A
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,673.23 N; 2,362,147.89 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>713.6 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			FAT CLAY WITH SAND, CH, 2.5Y 7/3 (pale brown) to 2.5Y 6/2 (light brownish gray), high plasticity, firm to very hard, moist, mottled orange, trace shale lenses with iron oxide staining (Continued)					
19					SS13G	18.5 - 20.0	1.2	2-12-26
20	20.7				SS14G	20.0 - 21.5	1.3	9-22-30
21			Shale, light gray brown to gray, fine grained, soft, thin bedded, highly weathered, damp, iron oxide staining, 60° bedding angle					
22	22.8				SS15G	21.5 - 22.8	1.2	16-46-50/4"

Refusal /
Bottom of Hole at 22.8 Ft.

Top of Rock = 20.7 Ft.
Top of Rock Elevation = 692.9 Ft.

Vibrating wire piezometers installed. See installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID N/A Stantec Boring No. **WBF-B28**

Client Tennessee Valley Authority Boring Location 443,683.09 N; 2,362,976.13 E NAD27 Plant Local

Project Number 175668050 Surface Elevation 711.3 ft Elevation Datum NGVD29

Project Name WBF TDEC Order Date Started 6/8/21 Completed 6/9/21

Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A

Inspector B. Herries Logger B. Herries Depth to Water N/A Date/Time N/A

Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 85#2, #951

Overburden Drilling and Sampling Tools (Type and Size) 5-7/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" ST



Rock Drilling and Sampling Tools (Type and Size) N/A

Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A

Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency 89.9%

Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A

Reviewed By M. McDonald Approved By A. Welshans

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	711.3	Top of Hole					
0.6	710.7		CRUSHED LIMESTONE GRAVEL, 10YR 7/1 (light gray), moist, angular to subangular, [FILL]					
1			Observations from auger cuttings. Geotechnical sampling was not performed from 0.0' - 20.0'. LEAN CLAY, CL, 2.5YR 3/1 (dark reddish gray), low plasticity, moist, [FILL]					
2								
3								
4								
5								
6								
7								
8								
9								
10								
11	11.5	699.8						
12			Observations from auger cuttings. Geotechnical sampling was not performed from 0.0' - 20.0'. LEAN CLAY, CL, 2.5YR 3/1 (dark reddish gray), low plasticity, moist					
13								
14								
15								
16								
17								
18								

TVA EIP BORING LOG - 175668050, WBF, TDEC ORDER GPJ, TDEC SUBSURF DT 20190330 GDT 3/16/22

Client Borehole ID N/A Stantec Boring No. **WBF-B28**
 Client Tennessee Valley Authority Boring Location 443,683.09 N; 2,362,976.13 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 711.3 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			LEAN CLAY, CL, 2.5YR 3/1 (dark reddish gray), low plasticity, moist (Continued)					
19								
20	20.0	691.3	SANDY LEAN CLAY, CL, 7.5YR 5/4 (brown), fine, low plasticity, very soft, dry to moist		SS01G	20.0 - 21.5	1.5	WH-WH-1
21								
22	22.5	688.8	LEAN CLAY WITH SAND, CL, 7.5YR 3/3 (dark brown), low to medium plasticity, very soft, moist		SS02G	22.5 - 24.0	1.5	WH-WH-WH
23								
24					SS03G	25.0 - 26.5	1.5	WH-WH-WH
25								
26					SS04G	27.5 - 29.0	1.5	WH-WH-WH
27								
28	28.1	683.2	POORLY GRADED SAND, SP, 7.5YR 3/3 (dark brown), fine, very loose, moist		SS05G	30.0 - 31.5	1.5	WH-WH-WH
29	28.3	683.0						
30			LEAN CLAY WITH SAND, CL, 7.5YR 3/3 (dark brown), low to medium plasticity, very soft, moist		SS06G	32.5 - 34.0	1.3	WH-WH-1
31								
32					SS07G	35.0 - 36.5	1.5	WH-WH-1
33								
34	35.0	676.3	CLAYEY SAND, SC, 7.5YR 3/3 (dark brown), fine, very loose, moist to wet		SS08G	37.5 - 39.0	1.5	WH-WH-WH
35								
36					SS09aG	40.0 - 40.5	1.4	WH-WH-WH
37	37.5	673.8						
38			SANDY LEAN CLAY, CL, 7.5YR 4/4 (brown), low to medium plasticity, very soft, moist		SS09bG	40.5 - 41.5		
39								
40	40.5	670.8						
41								
42			SILTY SAND, SM, 7.5YR 4/2 (brown), fine, non-plastic, very loose, wet					

TVA EIP BORING LOG: 175668050, WBF, TDEC, ORDER GPJ, TDEC SUBSURF DT, 20190330 GDT, 3/16/22

Client Borehole ID N/A Stantec Boring No. **WBF-B28**
 Client Tennessee Valley Authority Boring Location 443,683.09 N; 2,362,976.13 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 711.3 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
43	43.5	667.8	SILTY SAND, SM, 7.5YR 4/2 (brown), fine, non-plastic, very loose, wet (Continued)		SS10aG	42.5 - 43.5	1.2	1-2-4
44					SS10bG	43.5 - 44.0		
45	45.0	666.3	POORLY GRADED SAND SOME CLAY, SP, 2.5Y 3/1 (very dark gray), fine, loose, wet				1.5	5-13-17
46	46.0	665.3	POORLY GRADED SAND LITTLE CLAY, SP, 2.5Y 3/1 (very dark gray), fine, dense, moist		SS11aG	45.0 - 46.0		
47			POORLY GRADED SAND WITH SILT AND GRAVEL, SP-SM, 2.5Y 4/2 (dark grayish brown), medium to coarse, very dense		SS11bG	46.0 - 46.5		
47.8	663.5				SS12G	47.2 - 47.8	0.6	47-50/1"

Refusal /
Bottom of Hole at 47.8 Ft.

Top of Rock = 47.7 Ft.
Top of Rock Elevation = 663.6 Ft.

Three vibrating wire piezometers installed. See installation log for backfill details.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

APPENDIX B.5


































PERMANENT WELLS

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Subsurface Boring Legend

Lithology Graphics

Symbol	Lithology
	Fill
	Top Soil
	Gravel
	Well Graded Gravel (GW)
	Poorly Graded Gravel (GP)
	Silty Gravel (GM)
	Silty, Clayey Gravel (GC-GM)
	Clayey Gravel (GC)
	Well Graded Gravel with Silt (GW-GM)
	Well Graded Gravel with Clay (GW-GC)
	Poorly Graded Gravel with Silt (GP-GM)
	Poorly Graded Gravel with Clay (GP-GC)
	Well Graded Sand (SW)
	Poorly Graded Sand (SP)
	Silty Sand (SM)
	Silty, Clayey Sand (SC-SM)
	Clayey Sand (SC)
	Well Graded Sand with Silt (SW-SM)
	Well Graded Sand with Clay (SW-SC)
	Poorly Graded Sand with Silt (SP-SM)
	Poorly Graded Sand with Clay (SP-SC)
	Silt (ML)
	Silty Clay (CL-ML)
	Lean Clay (CL)
	Organic Silt (OL)
	Elastic Silt (MH)
	Fat Clay (CH)
	Organic Clay (OH)
	Non-Durable Shale
	Durable Shale
	Coal
	Limestone
	Sandstone

Lithology Graphics are based on TVA drafting standards.

Other Graphics

Symbol	Description
	Denotes environmental analytical sample interval
	Denotes SS sample interval
	Denotes ST sample interval
	Denotes DP sample interval
	Denotes RS sample interval
	Denotes RC sample interval
	First water level reading
	Second water level reading

Common Abbreviations

Abbreviation	Definition
DP	Direct Push
HA	Hand Auger
HSA	Hollow Stem Auger
N/A	Not Applicable
NR	Not Recorded
RC	Rock Core
RQD	Rock Quality Designation
RS	Rotary Sonic
SS	Split Spoon
ST	Shelby Tube
WH	Weight of Hammer
WR	Weight of Rod

General Notes

The boring logs include sample numbering used during drilling. For assigned Environmental Analytical Sample ID numbers, see relevant Environmental Chain-of- Custody forms from the drilling date range listed on each log.

For pH readings and additional field data, see applicable field documentation (e.g., Soil pH Data Form) from the drilling date range listed on each log.

Page 1 of 2

**CLIENT: Wright Brothers Construction Company
Charleston, TN**

GRAPHIC LOG	LOCATION: See Exhibit A-2		Stantec Survey 02/28/2017		INSTALLATION DETAILS		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	Latitude: 35.60561° Longitude: 84.78114°		N35 36 20.05, W84 46 52.26 (NAD83) Top of Well Casing Elev. - 711.92' Ground Surface Elev. - 709.4		2.5' above surface				
DEPTH	0.5	TOPSOIL							
	0.7	GRAVEL , (limestone)							
		LEAN CLAY (CL) , reddish-brown, limestone fragments, slightly moist							
	7.5	FAT CLAY (CH) , reddish-brown							
	9.0	LEAN CLAY (CL) , brown, with rock fragments - sandy below 10'							
		Surge blocked 40-45 minutes during development 8/21/14 Initial water level 9.22' during development 8/21/14 Water level 11' at 20 gallons purged Water level at 11.15' at 13.5 gallons purged Water level 12' at 9 gallons purged			2" diameter Sch. 40 well riser				
		- moist below 15.3'							
		- watertable at 16'			4 bags of Bentonite was used				
					7 bags of Filter Sand was used				

Hammer Type: Automatic

No samples collected below 15.5' due to saturation, very few cuttings were recovered.
Difficult drilling/increased down pressure at 29'
Start Time 9:35am, Finish Time (Drilling) 10:25am
Surface completion includes 4" square aluminum covers extending 3' into boring, 5'X5' square reinforced concrete pads, and 4" steel bollards as pad corners.

Well Completed: 7/25/2014

Driller: C. Penton

Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL E2144503 WATTS BAR MONITORING WELL INSTALLATION.GPJ TEMPLATE UPDATE 3-31-14.GPJ 8/26/14

WELL LOG NO. MW-1

Page 2 of 2

PROJECT: Watts Bar Monitoring Well Installation

CLIENT: Wright Brothers Construction Company
Charleston, TN

SITE: 6868 Watts Bar Highway
Spring City, Tennessee

GRAPHIC LOG	LOCATION: See Exhibit A-2	<u>Stantec Survey 02/28/2017</u> N35 36 20.05, W84 46 52.26 (NAD83) Top of Well Casing Elev. - 711.92' Ground Surface Elev. - 709.4		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	Latitude: 35.60561° Longitude: 84.78114°					
	DEPTH					

LEAN CLAY (CL), brown, with rock fragments *(continued)*

2" diameter
Sch. 40 well
screen

30

1' sand filter
below well
base

33.4

Boring Terminated at 33.37 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Augers

Abandonment Method:
Monitoring Well Installed

Notes:

WATER LEVEL OBSERVATIONS

- Encountered groundwater at 16'
- Water level during development activities 8/21/14

Terracon
51 Lost Mound Drive, Suite 135
Chattanooga, Tennessee

Well Started: 7/25/2014

Well Completed: 7/25/2014

Drill Rig: D009-Simco

Driller: C. Penton

Project No.: E2144503

Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL E2144503 WATTS BAR MONITORING WELL INSTALLATION.GPJ TEMPLATE UPDATE 3-31-14.GPJ 8/26/14

BORING LOG NO. MW-2

Page 1 of 2

PROJECT: Watts Bar Monitoring Well Installation

CLIENT: Wright Brothers Construction Company
Charleston, TN

SITE: 6868 Watts Bar Highway
Spring City, Tennessee

GRAPHIC LOG	LOCATION: See Exhibit A-2	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	Latitude: 35.60325° Longitude: 84.77917° Stantec Survey 02/28/2017 N35 36 15.01, W84 46 43.71 (NAD83) Top of Well Casing Elev. - 696.22 Ground Surface Elev. - 693.2				
DEPTH	0.5' GRAVEL	-2.5' above surface			
	LEAN CLAY (CL) , dark brown to medium brown, slightly moist with rock fragments, sandy				
	medium brown, below 8.5'				
	Surge blocked 30 minutes during development 8/21/14 Initial water level 20.27' during development 8/21/14 Water level 21.4' at 4.5 gallons purged Water level at 21.5' at 9 gallons purged Water level 21.25' at 20 gallons purged				
	15.5' - higher sand content below 15'	-2" diameter Sch. 40 well riser			
	CLAYEY SAND (SC)	4 bags of Bentonite was used			
	- wet below 20'	8 bags of Filter Sand was used			
			25		

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Augers

Abandonment Method:
Monitoring Well Installed

Notes:

Start Time 11:30am
Finish Time (Drilling) 12:00pm
Surface completion includes 4" square aluminum covers extending 3' into boring, 5'X5' square reinforced concrete pads, and 4" steel bollards as pad corners.

WATER LEVEL OBSERVATIONS

No Free Water Encountered During Drilling

Water level during development activities 8/21/14

Terracon
51 Lost Mound Drive, Suite 135
Chattanooga, Tennessee

Boring Started: 7/25/2014

Boring Completed: 7/25/2014

Drill Rig: D009-Simco

Driller: C. Penton

Project No.: E2144503

Exhibit: A-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL E2144503 WATTS BAR MONITORING WELL INSTALLATION.GPJ TEMPLATE UPDATE 3-31-14.GPJ 8/26/14

BORING LOG NO. MW-2

Page 2 of 2

PROJECT: Watts Bar Monitoring Well Installation

CLIENT: Wright Brothers Construction Company
Charleston, TN

SITE: 6868 Watts Bar Highway
Spring City, Tennessee

GRAPHIC LOG	LOCATION: See Exhibit A-2 Latitude: 35.60325° Longitude: 84.77917° DEPTH	Stantec Survey 02/28/2017 N35 36 15.01, W84 46 43.71 (NAD83) Top of Well Casing Elev. - 696.22 Ground Surface Elev. - 693.2		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
-------------	--	--	--	-------------	-----------------------------	-------------

CLAYEY SAND (SC) (continued)

- very moist below 27'

2" diameter
Sch. 40 well
screen

1' sand filter
below well
base

30

33.8

Boring Terminated at 33.82 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Augers

Notes:

Abandonment Method:
Monitoring Well Installed

WATER LEVEL OBSERVATIONS

No Free Water Encountered During Drilling

Water level during development activities 8/21/14

Terracon
51 Lost Mound Drive, Suite 135
Chattanooga, Tennessee

Boring Started: 7/25/2014

Boring Completed: 7/25/2014

Drill Rig: D009-Simco

Driller: C. Penton

Project No.: E2144503

Exhibit: A-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL E2144503 WATTS BAR MONITORING WELL INSTALLATION.GPJ TEMPLATE UPDATE 3-31-14.GPJ 8/26/14

Page 1 of 2

**CLIENT: Wright Brothers Construction Company
Charleston, TN**

[illegible]

Hammer Type: Automatic

Exhibit: A-6

Terracon
51 Lost Mound Drive, Suite 135
Chattanooga, Tennessee

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL E2144503 WATTS BAR MONITORING WELL INSTALLATION.GPJ TEMPLATE UPDATE 3-31-14.GPJ 8/26/14

BORING LOG NO. MW-3

Page 2 of 2

PROJECT: Watts Bar Monitoring Well Installation

CLIENT: Wright Brothers Construction Company
Charleston, TN

SITE: 6868 Watts Bar Highway
Spring City, Tennessee

GRAPHIC LOG	LOCATION: See Exhibit A-2	<u>Stantec Survey 02/28/2017</u> N35 36 11.66, W84 46 44.88 (NAD83) Top of Well Casing Elev. - 704.29 Ground Surface Elev. - 701.3		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	Latitude: 35.60406° Longitude: 84.77872°					
	DEPTH					

CLAYEY SAND (SC), brown (continued)
light brown, below 25'

8 bags of
Filter Sand
was used

2" diameter
Sch. 40 well
screen

1' sand filter
below well
base

30

32.8

Boring Terminated at 32.78 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Augers

Notes:

Abandonment Method:
Monitoring Well Installed

WATER LEVEL OBSERVATIONS

No Free Water Encountered During Drilling

Water level during development activities 8/21/14

Terracon
51 Lost Mound Drive, Suite 135
Chattanooga, Tennessee

Boring Started: 7/25/2014

Boring Completed: 7/25/2014

Drill Rig: Geoprobe

Driller: C. Penton

Project No.: E2144503

Exhibit: A-6

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL E2144503 WATTS BAR MONITORING WELL INSTALLATION.GPJ 8/26/14

Project Number		175565303		Location		N35°36'13.99", W84°46'54.12" (NAD83)				
Project Name		TVA - WBF Well Installations		Boring No.		WBF-100		Total Depth		58.5 ft
County		Rhea, TN		Surface Elevation		737.4 ft (NGVD29)				
Project Type		Well Installations		Date Started		11/9/16		Completed		11/9/16
Supervisor		B. Bryant		Driller		G. Thompson		Depth to Water		44.0 ft
Logged By		C. Sutherland		Depth to Water		41.0 ft		Date/Time		11/9/16

Lithology		Description	Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	Remarks
Elevation	Depth		Rock Core						
737.4	0.0	Top of Hole							
		Clayey Sand, light brown, damp, medium dense (Fill)		SPT-1	0.0 - 1.5	0.0	13-9-9	--	4" Monitoring Well Installed
				SPT-2	2.5 - 4.0	0.0	8-5-3	--	
732.4	5.0								
		Sandy Lean Clay, dark gray, damp, medium stiff (Fill)		SPT-3	5.0 - 6.5	1.0	6-4-6	--	
729.9	7.5								
		Lean Clay with Sand, orange-brown with gray mottling, damp, medium stiff (Fill)		SPT-4	7.5 - 9.0	0.5	2-2-4	--	
725.9	11.5			SPT-5	10.0 - 11.5	1.4	2-3-3	--	
		Clayey Sand, gray, damp, medium dense (Fill)		SPT-6	12.5 - 14.0	0.8	3-3-3	--	
722.4	15.0								
		Sandy Lean Clay, orange-brown, damp, medium stiff (Fill)		SPT-7	15.0 - 16.5	0.1	4-5-5	--	
719.9	17.5								
		Clayey Sand, orange-brown, damp to moist, medium dense (Fill)		SPT-8	17.5 - 19.0	1.3	2-3-4	--	
				SPT-9	20.0 - 21.5	1.3	3-6-6	--	
				SPT-10	22.5 - 24.0	1.7	2-2-4	--	
				SPT-11	25.0 - 26.5	1.6	4-3-5	--	
709.9	27.5								
		Sandy Lean Clay, red-orange to orange-brown, damp to moist, medium stiff to stiff		SPT-12	27.5 - 29.0	1.5	2-3-6	--	
				SPT-13	30.0 - 31.5	1.5	WH-2-3	--	
				SPT-14	32.5 - 34.0	1.5	2-6-21	--	
				SPT-15	35.0 - 36.5	1.3	6-20-10	--	

Project Number 175565303				Location N35°36'13.99", W84°46'54.12" (NAD83)					
Project Name TVA - WBF Well Installations				Boring No. WBF-100 Total Depth 58.5 ft					
Lithology		Description	Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	Remarks
Elevation	Depth		Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	
696.9	40.5	Sandy Lean Clay, red-orange to orange-brown, damp to moist, medium stiff to stiff (Continued)		SPT-16	37.5 - 39.0	0.6	13-17-17	--	Analytical Sample (SPT-20) Analytical Sample (SPT-21) Analytical Sample (SPT-22)
				SPT-17	40.0 - 41.5	1.4	5-8-10	--	
678.9	58.5	Clay Sand, orange-brown to brown, moist to wet, medium dense to dense - Gravels and cobbles 53.5 - 58.5		SPT-18	42.5 - 44.0	1.9	5-10-11	--	
				SPT-19	45.0 - 46.5	1.2	5-7-7	--	
				SPT-20	47.5 - 49.0	1.4	11-17-19	--	
				SPT-21	50.0 - 51.5	1.5	2-1-1	--	
				SPT-22	52.5 - 54.0	1.5	7-6-22	--	
				SPT-23	55.0 - 56.2	1.2	41-35-50+(1.2')	--	
Auger Refusal / Bottom of Hole									

Client Borehole ID N/A Stantec Boring No. **WBF-101**

Client Tennessee Valley Authority Boring Location 443,876.99 N; 2,362,987.15 E NAD27 Plant Local

Project Number 175668050 Surface Elevation 698.7 ft Elevation Datum NGVD29

Project Name WBF TDEC Order Date Started 6/11/19 Completed 6/12/19

Project Location Rhea Co, Spring City, Tennessee Depth to Water 10.5 ft Date/Time 6/12/19 12:30

Inspector G. Budd Logger G. Budd Depth to Water N/A Date/Time N/A

Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 850XR, #953

Overburden Drilling and Sampling Tools (Type and Size) 4-1/4" HSA, 2" SS w/o liners

Rock Drilling and Sampling Tools (Type and Size) N/A

Overdrill Tooling (Type and Size) 8-1/4" HSA overdrill of boring Overdrill Depth 34.0 ft


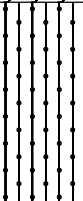
Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency N/A

Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A

Reviewed By C. Kocka Approved By L. Price

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	698.7	Top of Hole					
1	0.7	698.0	Crushed stone, grass and topsoil, [FILL] Limestone gravel from 0.0' to 0.4'		SS01aG	0.0 - 0.7	0.9	12-8-7
2	1.5	697.2	LEAN CLAY, CL, 7.5YR 5/6 (strong brown) and 7.5YR 6/1 (gray), stiff to medium stiff, dry, with limestone and chert gravel, [FILL]		SS01bG	0.7 - 1.5		
3	3.5	695.2	SANDY LEAN CLAY, CL, 7.5YR 5/6 (strong brown), low plasticity, very stiff, dry, with sandstone gravel, [FILL]		SS02G	1.5 - 3.0	1.1	6-5-7
4			LEAN CLAY, CL, 7.5YR 3/4 (dark brown), low to medium plasticity, soft, moist, with some very fine sand, with organics		SS03aG	3.0 - 3.5	1.2	3-4-5
5					SS03bG	3.5 - 4.5		
6					SS04G	4.5 - 6.0	1.5	3-4-4
7					SS05G	6.0 - 7.5	1.3	3-2-4
8					SS06G	7.5 - 9.0	1.4	2-2-3
9					SS07G	9.0 - 10.5	1.5	2-2-3
10	10.5	688.2	SANDY LEAN CLAY, CL, 7.5YR 4/6 (strong brown), low to medium plasticity, very soft to soft, moist		SS08G	10.5 - 12.0	1.5	2-1-3
11					SS09G	12.0 - 13.5	1.5	1-2-2
12			Clayey sand lens, wet from 13.5' to 14.0'		SS10G	13.5 - 15.0	1.4	WH-1-1
13			Trace organics from 15.0' to 16.5'		SS11G	15.0 - 16.5	1.5	1-2-2
14					SS12G	16.5 - 18.0	1.5	1-1-2
15	18.0	680.7						

Client Borehole ID N/A Stantec Boring No. **WBF-101**
 Client Tennessee Valley Authority Boring Location 443,876.99 N; 2,362,987.15 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 698.7 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			CLAYEY SAND, SC, 10YR 5/6 (yellowish brown), fine, very loose, wet Sandy clay lenses from 19.5' to 21.0' With fragments of sandstone from 23.8' to 24.0' Color change to 10YR 5/1 (gray) at 24.0' Color change to 10YR 5/6 (yellowish brown), with sandy clay at 25.5'					
19					SS13G	18.0 - 19.5	1.5	WH-1-1
20					SS14G	19.5 - 21.0	1.5	WH-WH-1
21					SS15G	21.0 - 22.5	1.5	WH-1-1
22					SS16G	22.5 - 24.0	1.2	WH-1-1
23					SS17G	24.0 - 25.5	1.5	WH-WH-WH
24					SS18G	25.5 - 27.0	1.0	WH-WH-WH
25					SS19G	27.0 - 28.5	1.5	WH-WH-1
26					SS20aG	28.5 - 29.5	1.5	WH-1-1
27					SS20bG	29.5 - 30.0		
28			SILTY SAND, SM, 10YR 5/1 (gray), fine, very loose, wet Abundant wood fragments from 31.3' to 32.7' Sandy clay lens at 32.0'		SS21G	30.0 - 31.5	1.5	1-1-4
29	29.5				SS22aG	31.5 - 32.7	1.5	2-4-9
30					SS22bG	32.7 - 33.0		
31					SS23aG	33.0 - 34.0	1.5	3-24-19
32	32.7		WELL GRADED SAND WITH GRAVEL, SW, 10YR 5/1 (gray), very fine to coarse, medium dense, wet, gravel subangular to subrounded		SS23bG	34.0 - 34.5		
33	34.0							
34	34.5							

Shale, green gray, moderately hard, calcareous, Weathered

No Refusal /
Bottom of Hole at 34.5 Ft.

Top of Rock = 34.0 Ft.
Top of Rock Elevation = 664.7 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
 G = Geotechnical Sample Custody
 2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
 3: Depths are reported in feet below ground surface

Client Borehole ID N/A Stantec Boring No. **WBF-102Alt2 (Sonic)**
 Client Tennessee Valley Authority Boring Location 443,745.53 N; 2,362,237.49 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 719.2 ft Elevation Datum NGVD29
 Project Name WBF TDEC Order Date Started 6/21/19 Completed 7/8/19
 Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A
 Inspector E. Smith Logger E. Smith Depth to Water N/A Date/Time N/A
 Drilling Contractor M&W Drilling (Subcontractor); Stantec Drill Rig Type and ID Geoprobe GV5 Sonic; CME 850XR, #953
 Overburden Drilling and Sampling Tools (Type and Size) Sonic 6" Core Barrel, 8" Steel Casing; 8-1/4" HSA
 Rock Drilling and Sampling Tools (Type and Size) N/A
 Overdrill Tooling (Type and Size) N/A Overdrill Depth N/A
 Sampler Hammer Type N/A Weight N/A Drop N/A Efficiency N/A
 Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A
 Reviewed By B. Evans Approved By L. Price

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	719.2						
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11	11.0	708.2						
12	12.0	707.2						
13								
14	14.0	705.2						
15								
16	16.0	703.2						
17	17.0	702.2						
18								

Client Borehole ID N/A

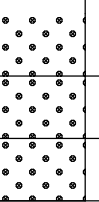

Stantec Boring No. **WBF-102Alt2 (Sonic)**

Client Tennessee Valley Authority

Boring Location 443,745.53 N; 2,362,237.49 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 719.2 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³		Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
18					RS02E	16.0 - 21.0	16.0 - 21.0	5.0	N/A
19	19.0	700.2							
20	20.0	699.2							
21	21.0	698.2							

SANDY POORLY GRADED GRAVEL, GP, 2.5YR 3/1 (dark reddish gray), fine to coarse, low plasticity, loose, moist, homogeneous (Continued)

SANDY POORLY GRADED GRAVEL, GP, 5YR 5/4 (reddish brown), fine to coarse, non to low plasticity, loose, moist, homogeneous, weak cementation

SILTY POORLY GRADED GRAVEL, GP, 5YR 5/3 (reddish brown), fine to coarse, low plasticity, loose, wet, homogeneous, weak cementation

No Refusal /
Bottom of Hole at 21.0 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-103
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,765.49 N; 2,361,678.22 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>721.1 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/6/19</u> Completed <u>6/11/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>10.0 ft</u> Date/Time <u>6/11/19 12:28</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 3" SS w/o liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>8-1/4" HSA overdrill of boring</u> Overdrill Depth <u>18.5 ft</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>C. Kocka</u> Approved By <u>L. Price</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	721.1	Top of Hole					
	0.3	720.8	Topsoil, grass					
1			LEAN CLAY WITH GRAVEL, CL, 7.5YR 5/8 (strong brown), medium stiff, dry, limestone gravel and fragments of siltstone, [FILL]		SS01G	0.0 - 1.5	1.5	8-11-9
2	2.6	718.5			SS02aG	1.5 - 2.6	1.4	8-6-10
3	3.5	717.6	Limestone gravel, 7.5YR 5/1 (gray), [FILL]		SS02bG SS03aG	2.6 - 3.0 3.0 - 3.5	1.4	25-21-24
4	4.5	716.6	LEAN CLAY, CL, 7.5YR 5/8 (strong brown), very stiff, moist, with limestone and siltstone gravel, organics, manganese, [FILL]		SS03bG	3.5 - 4.5	1.4	25-21-24
5	5.6	715.5			SS04aG	4.5 - 5.6	1.5	10-14-15
6	6.0	715.1	LEAN CLAY SOME SAND, CL, 7.5YR 5/8 (strong brown) and 7.5YR 5/2 (brown), stiff, moist, with fine sand, siltstone gravel, manganese, and organics, [FILL]		SS04bG	5.6 - 6.0	1.5	4-7-8
7					SS05G	6.0 - 7.5	1.5	4-7-8
8			LEAN CLAY, CL, 7.5YR 3/2 (dark brown), moist, with abundant organics		SS06G	7.5 - 9.0	1.2	3-5-6
9			SANDY LEAN CLAY, CL, 10YR 5/4 (yellowish brown), low plasticity, soft to medium stiff, moist, very fine sand		SS07G	9.0 - 10.5	1.5	5-6-7
10			Color change to 10YR 6/8 (brownish yellow) and 10YR 6/1 (gray), low to medium plasticity, medium still to very stiff, with fragments of sandstone, angular to subangular, increasing with depth at 9.0'		SS08G	10.5 - 12.0	1.5	14-19-26
12	12.2	708.9						
13			POORLY GRADED SAND, SP, 10YR 6/8 (brownish yellow), fine to medium, medium dense, wet, trace fragments of weathered sandstone		SS09E	12.0 - 13.5	1.2	9-11-10
14			Color change to N 2.5/ (black) at 12.9'					
15	15.0	706.1	Color change to 10YR 5/6 (yellowish brown), loose to medium dense at 13.5', weathered sandstone fragments from 14.7' to 15.0'		SS10E	13.5 - 15.0	1.0	9-11-16
16	16.5	704.6			SS11G	15.0 - 16.5	1.5	21-36-32
17	17.0	704.1	LEAN CLAY, CL, 10YR 5/6 (yellowish brown), very stiff to hard, dry to moist, iron oxide staining, with highly weathered siltstone		SS12aG	16.5 - 17.0	1.5	14-32-48
18			CLAYEY SAND, SC, 10YR 5/6 (yellowish brown),		SS12bG	17.0 - 18.0	1.5	14-32-48

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-103
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,765.49 N; 2,361,678.22 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>721.1 ft</u> Elevation Datum <u>NGVD29</u>

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18	18.5	702.6	////					

fine to medium, wet
LEAN CLAY, CL, 10YR 5/6 (yellowish brown), very
stiff to hard, dry to moist, iron oxide staining, with
highly weathered siltstone *(Continued)*

No Refusal /
Bottom of Hole at 18.5 Ft.

- 1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-104
Client <u>Tennessee Valley Authority</u>	Boring Location <u>444,336.57 N; 2,363,103.76 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>694.1 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/13/19</u> Completed <u>6/13/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>10.2 ft</u> Date/Time <u>6/13/19 13:20</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>8-1/4" HSA overdrill of boring</u> Overdrill Depth <u>27.7 ft</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>C. Kocka</u> Approved By <u>L. Price</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	694.1						
			Top of Hole					
1	1.5	692.6	Crushed stone, grass, topsoil, limestone gravel, chert, [FILL]		SS01G	0.0 - 1.5	0.5	3-7-5
2			SANDY LEAN CLAY, CL, 10YR 2/2 (very dark brown), soft to very soft, moist to wet		SS02G	1.5 - 3.0	0.5	5-3-2
3			Wet from 3.0' to 4.5'		SS03G	3.0 - 4.5	0.8	WH-WH-WH
4					SS04aG	4.5 - 5.0		
5	5.0	689.1			SS04bG	5.0 - 6.0	1.2	1-1-2
6			CLAYEY SAND, SC, 10YR 4/4 (dark yellowish brown), fine, very loose, moist		SS05G	6.0 - 7.5	0.7	WH-1-1
7					SS06G	7.5 - 9.0	1.0	1-WH-1
8					SS07G	9.0 - 10.5	0.9	WH-WH-WH
9	9.0	685.1	SANDY LEAN CLAY, CL, 10YR 4/4 (dark yellowish brown), low plasticity, very soft, moist		SS08aG	10.5 - 11.0		
10	10.5	683.6	Sand lens, fine from 9.3' to 9.5'		SS08bG	11.0 - 12.0	1.2	1-1-1
11	11.0	683.1	SILTY SAND, SM, 10YR 4/4 (dark yellowish brown) and 10YR 2/1 (black), very fine to fine, very loose, wet		SS09G	12.0 - 13.5	1.0	WH-1-1
12	12.0	682.1			SS10G	13.5 - 15.0	1.1	WH-1-1
13			SANDY LEAN CLAY, CL, 10YR 4/3 (brown) and 10YR 5/1 (gray), low plasticity, very soft, moist		SS11G	15.0 - 16.5	1.0	1-1-1
14			CLAYEY SAND, SC, 10YR 4/3 (brown) and 10YR 5/1 (gray), fine, very loose, moist, with organics and gravel, fine, subangular to subrounded		SS12G	16.5 - 18.0	0.5	2-4-4
15								
16								
17								
18	18.0	676.1						

Client Borehole ID N/A

Stantec Boring No. **WBF-104**

Client Tennessee Valley Authority

Boring Location 444,336.57 N; 2,363,103.76 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 694.1 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			POORLY GRADED SAND, SP, 10YR 4/4 (dark yellowish brown), fine, very loose, wet					
19	19.5	674.6			SS13G	18.0 - 19.5	0.9	2-1-1
20			CLAYEY SAND, SC, 10YR 4/4 (dark yellowish brown), fine, very loose, wet					
21					SS14G	19.5 - 21.0	0.9	1-1-2
22	22.5	671.6	Color change to 10YR 4/4 (dark yellowish brown) and 10YR 5/1 (gray) at 22.0'					
23	23.5	670.6			SS15G	21.0 - 22.5	1.5	WH-1-1
24			SANDY LEAN CLAY, CL, 10YR 4/6 (dark yellowish brown) and 10YR 5/1 (gray), very soft, moist					
25					SS16aG	22.5 - 23.5	1.5	WH-1-2
26			SILTY SAND, SM, 10YR 4/1 (dark gray), fine, very loose, wet					
27					SS16bG	23.5 - 24.0		
28	25.5	668.6	GRAVELLY WELL GRADED SAND, SW, 10YR 4/1 (dark gray), very fine to coarse, very loose, wet, with gravel, fine to medium, multicolored, subrounded					
29					SS17G	24.0 - 25.5	0.5	1-1-3
30			Shale, green gray, soft to moderately hard, highly weathered, moist to dry					
31					SS18G	25.5 - 27.0	0.6	2-1-2
32	27.5	666.6						
33					SS19aG	27.0 - 27.5		
34	28.5	665.6			SS19bG	27.5 - 28.5	1.2	8-12-29

No Refusal /
Bottom of Hole at 28.5 Ft.

Top of Rock = 27.5 Ft.
Top of Rock Elevation = 666.6 Ft.

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G = Geotechnical Sample Custody
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Client Borehole ID N/A Stantec Boring No. **WBF-105**

Client Tennessee Valley Authority Boring Location 445,050.70 N; 2,363,041.85 E NAD27 Plant Local

Project Number 175668050 Surface Elevation 699.8 ft Elevation Datum NGVD29

Project Name WBF TDEC Order Date Started 6/24/19 Completed 6/25/19

Project Location Rhea Co, Spring City, Tennessee Depth to Water N/A Date/Time N/A

Inspector G. Budd Logger G. Budd Depth to Water N/A Date/Time N/A

Drilling Contractor Stantec Consulting Services Inc. Drill Rig Type and ID CME 850XR, #953

Overburden Drilling and Sampling Tools (Type and Size) 4-1/4" HSA, 2" SS w/o liners

Rock Drilling and Sampling Tools (Type and Size) N/A

Overdrill Tooling (Type and Size) 8-1/4" HSA overdrill of boring Overdrill Depth 18.0 ft

Sampler Hammer Type Automatic Weight 140 lb Drop 30" Efficiency N/A

Borehole Azimuth N/A Borehole Inclination (from Vertical) N/A

Reviewed By C. Kocka Approved By L. Price

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	699.8	Top of Hole					
1	1.5	698.3	Crushed stone, limestone gravel with some clay		SS01G	0.0 - 1.5	1.5	7-15-12
2			WELL GRADED SAND TRACE CLAY, SW, 10YR 2/1 (black), very fine to coarse, medium dense to loose, dry, [CCR]		SS02G	1.5 - 3.0	1.4	13-14-13
3					SS03G	3.0 - 4.5	1.5	6-8-10
4					SS04G	4.5 - 6.0	1.5	7-7-13
5	6.2	693.6			SS05aG	6.0 - 6.2		
6	6.8	693.0	SANDY LEAN CLAY, CL, 5YR 4/4 (reddish brown) and 10YR 5/4 (yellowish brown), stiff, dry to moist, with fragments of siltstone, [FILL]		SS05bG	6.2 - 6.8	1.5	10-11-11
7	7.8	692.0			SS05cG	6.8 - 7.5		
8			WELL GRADED SAND, SW, 10YR 5/6 (yellowish brown), very fine to coarse, medium dense, moist, [FILL]		SS06aG	7.5 - 7.8		
9	9.0	690.8			SS06bG	7.8 - 9.0	1.1	6-4-3
10	10.5	689.3	LEAN CLAY, CL, 10YR 3/2 (very dark grayish brown), soft, moist, with very fine sand and some fragments of CCR, [FILL]		SS07G	9.0 - 10.5	1.5	WH-WH-WH
11					SS08G	10.5 - 12.0	1.5	WH-WH-2
12	12.0	687.8	SANDY LEAN CLAY, CL, 10YR 3/3 (dark brown), low plasticity, very soft, moist		SS09G	12.0 - 13.5	1.5	WH-1-1
13			SILTY SAND SOME CLAY, SM, 10YR 4/3 (brown), fine, very loose, moist		SS10G	13.5 - 15.0	1.3	1-2-4
14			CLAYEY SAND, SC, 7.5YR 4/6 (strong brown), fine, very loose, moist to wet		SS11G	15.0 - 16.5	1.3	2-3-3
15	16.5	683.3			SS12G	16.5 - 18.0	1.5	1-2-3
16								
17			SANDY LEAN CLAY, CL, 7.5YR 4/6 (strong brown) and 7.5YR 5/1 (gray), low to medium plasticity, very soft, moist					
18								



Stantec



SUBSURFACE LOG

Page: 2 of 2

Client Borehole ID N/A Stantec Boring No. **WBF-105**
 Client Tennessee Valley Authority Boring Location 445,050.70 N; 2,363,041.85 E NAD27 Plant Local
 Project Number 175668050 Surface Elevation 699.8 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18								
19	19.5	680.3			SS13G	18.0 - 19.5	1.5	WH-2-2

No Refusal /
Bottom of Hole at 19.5 Ft.

The boring was overdrilled to 18.0' bgs and 10-inch diameter permanent PVC surface casing was installed to a depth of 19.4' bgs. Advancement of the boring to depth will continue to depth through the permanent casing using Roto-sonic drilling methods.

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 3: Depths are reported in feet below ground surface

Client Borehole ID <u>N/A</u>	Stantec Boring No. WBF-106
Client <u>Tennessee Valley Authority</u>	Boring Location <u>445,872.50 N; 2,362,862.26 E NAD27 Plant Local</u>
Project Number <u>175668050</u>	Surface Elevation <u>701.7 ft</u> Elevation Datum <u>NGVD29</u>
Project Name <u>WBF TDEC Order</u>	Date Started <u>6/26/19</u> Completed <u>6/26/19</u>
Project Location <u>Rhea Co, Spring City, Tennessee</u>	Depth to Water <u>12.1 ft</u> Date/Time <u>6/26/19 12:35</u>
Inspector <u>G. Budd</u> Logger <u>G. Budd</u>	Depth to Water <u>N/A</u> Date/Time <u>N/A</u>
Drilling Contractor <u>Stantec Consulting Services Inc.</u>	Drill Rig Type and ID <u>CME 850XR, #953</u>
Overburden Drilling and Sampling Tools (Type and Size) <u>4-1/4" HSA, 2" SS w/o liners</u>	
Rock Drilling and Sampling Tools (Type and Size) <u>N/A</u>	
Overdrill Tooling (Type and Size) <u>8-1/4" HSA overdrill of boring</u> Overdrill Depth <u>34.5 ft</u>	
Sampler Hammer Type <u>Automatic</u> Weight <u>140 lb</u> Drop <u>30"</u> Efficiency <u>N/A</u>	
Borehole Azimuth <u>N/A</u> Borehole Inclination (from Vertical) <u>N/A</u>	
Reviewed By <u>C. Kocka</u> Approved By <u>L. Price</u>	

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
0	0.0	701.7	Top of Hole					
0.2	701.5		Grass and topsoil					
1			LEAN CLAY, CL, 5YR 5/8 (yellowish red), low plasticity, very soft, moist, with siltstone and sandstone gravel, trace CCR, [FILL]		SS01G	0.0 - 1.5	0.6	1-2-2
2					SS02G	1.5 - 3.0	1.0	1-1-1
3					SS03G	3.0 - 4.5	0.3	WH-WH-WH
4	4.8	696.9			SS04aG	4.5 - 4.8		
5			SANDY LEAN CLAY, CL, 10YR 2/2 (very dark brown), low plasticity, very soft, moist, with trace organics, CCR, [FILL]		SS04bG	4.8 - 6.0	1.0	WH-1-3
6					SS05aG	6.0 - 6.8	1.1	1-2-2
7	6.8	694.9	CLAYEY SAND, SC, 10YR 4/4 (dark yellowish brown), fine, very loose, moist to wet		SS05bG	6.8 - 7.5		
8			Trace CCR from 6.8' to 7.5'		SS06aG	7.5 - 8.3	0.5	2-1-2
9			Sandstone fragments at 7.5'		SS06bG	8.3 - 9.0		
10					SS07G	9.0 - 10.5	1.2	2-2-2
11					SS08G	10.5 - 12.0	1.5	1-2-2
12	12.0	689.7	LEAN CLAY, CL, 10YR 4/4 (dark yellowish brown), low to medium plasticity, soft to medium stiff, moist		SS09G	12.0 - 13.5	1.5	2-3-5
13					SS10G	13.5 - 15.0	1.5	1-4-5
14					SS11G	15.0 - 16.5	1.5	2-4-6
15					SS12G	16.5 - 18.0	1.4	2-3-4

Client Borehole ID N/A

Stantec Boring No. **WBF-106**

Client Tennessee Valley Authority

Boring Location 445,872.50 N; 2,362,862.26 E NAD27 Plant Local

Project Number 175668050

Surface Elevation 701.7 ft Elevation Datum NGVD29

Lithology			Description	Overburden:	Sample ^{1,2}	Depth Ft ³	Rec. Ft	Blows/PSI
Depth Ft ³	Elevation	Graphic		Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			LEAN CLAY, CL, 10YR 4/4 (dark yellowish brown), low to medium plasticity, soft to medium stiff, moist (Continued) Some very fine sand, manganese at 19.0'					
19	19.5	682.2			SS13G	18.0 - 19.5	1.5	2-2-4
20					SS14G	19.5 - 21.0	1.5	2-4-7
21					SS15G	21.0 - 22.5	1.5	2-4-4
22					SS16G	22.5 - 24.0	1.5	1-2-4
23			FAT CLAY, CH, 10YR 4/4 (dark yellowish brown) and 10YR 6/1 (gray), medium to high plasticity, soft to medium stiff, moist, with manganese and some very fine sand, increasing with depth					
24					SS17G	24.0 - 25.5	1.5	2-3-4
25	25.5	676.2			SS18G	25.5 - 27.0	1.3	4-1-2
26	27.0	674.7			SS19G	27.0 - 28.5	1.5	WH-WH-WH
27					SS20aG	28.5 - 29.1	1.5	WH-WH-1
28			SANDY LEAN CLAY, CL, 10YR 4/1 (dark gray), low plasticity, soft to very soft, moist					
29	29.1	672.6			SS20bG	29.1 - 30.0	1.5	WH-WH-WH
30			CLAYEY SAND, SC, 10YR 4/1 (dark gray), fine, very loose, moist to wet Wet at 28.0'					
31	31.5	670.2			SS21G	30.0 - 31.5	1.5	WH-WH-WH
32			POORLY GRADED SAND WITH CLAY, SP-SC, 10YR 4/1 (dark gray), fine, very loose, wet Organics from 30.0' to 31.5'					
33	33.0	668.7			SS22G	31.5 - 33.0	1.2	WH-1-1
34	34.5	667.2	POORLY GRADED SAND WITH SILT, SP-SM, 10YR 4/1 (dark gray), fine, very loose, wet		SS23G	33.0 - 34.5	1.5	2-10-19
			WELL GRADED GRAVEL WITH SAND, GW, 10YR 4/1 (dark gray), very fine to coarse, wet, subangular to rounded, multi colored					

No Refusal /
Bottom of Hole at 34.5 Ft.

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3: Depths are reported in feet below ground surface