APPENDIX B –
BORING LOGS

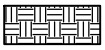
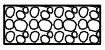
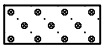
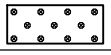
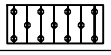
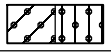
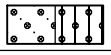
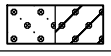
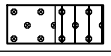
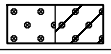
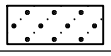
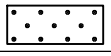
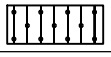
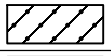
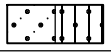
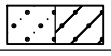
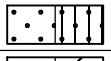
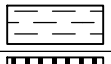
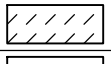
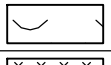
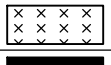
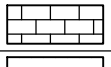
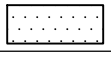
APPENDIX B.1

BACKGROUND SOIL BORINGS

Table of Contents

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.

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG01**
Client	Tennessee Valley Authority	Boring Location	573,590.26 N; 2,404,743.66 E NAD83
Project Number	175668043	Surface Elevation	771.7 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	3/28/19
Completed	3/28/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC 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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

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. %
0.0	771.7		Top of Hole						
0.5	771.2		ORGANIC SILT, OL, 10YR 4/6 (dark yellowish brown), loose, dry		HA01	0.0 - 0.5		0.5	
			FAT CLAY, CH, 10YR 5/6 (yellowish brown), high plasticity, moist		DP01	0.0 - 5.0	0.0 - 5.0	3.2	N/A
4.0	767.7		CLAYEY SILT, ML, 10YR 4/3 (brown), very dense, dry Shale fragments observed from 4.5' to 5.0'						
			Color change to 2.5Y 6/2 (pale red)		DP02	5.0 - 8.0	5.0 - 8.0	3.0	N/A
7.8	763.9								
8.0	763.7		Shale						
			Bedrock Refusal / Bottom of Hole at 8.0 Ft.						

HA[4] 1.5/3.5-20190328

6.0/8.0-20190328

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 (0.0/0.5-20190328) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG02**
Client	Tennessee Valley Authority	Boring Location	572,746.20 N; 2,403,194.85 E NAD83
Project Number	175668043	Surface Elevation	797.6 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	3/14/19
Completed	3/14/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	J. Andrew	Logger	M. Edmunds
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC 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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

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. %
0.0	797.6		Top of Hole						
0.1	797.5		Topsoil, roots, and sand		HA[4] HA01	0.0 - 0.5		0.5	
			LEAN CLAY WITH SILT, CL, 5YR 3/1 (very dark gray) to 5YR 4/6 (yellowish red), non-plastic to low plasticity, firm, moist	0.7/2.7-20190314	DP01	0.0 - 5.0	0.0 - 5.0	3.3	N/A
			Color change to 5YR 5/6 (yellowish red), low plasticity, firm to stiff, some manganese concretions at 5.0'	6.5/8.5-20190314	DP02	5.0 - 10.0	5.0 - 10.0	5.0	N/A
9.0	788.6								
			WELL GRADED SAND WITH CLAY, SW-SC, 5YR 3/3 (dark reddish brown), medium to coarse, loose to medium dense, moist, with abundant shale gravel and saprolitic shale clay						
10.0	787.6		SILTY LEAN CLAY, CL, 10YR 5/3 (brown), low plasticity, firm, dry, saprolitic bedrock, shale gravel, historical bedding structure maintained	11.0/14.0-20190314	DP03	10.0 - 15.0	10.0 - 15.0	5.0	N/A

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-BG02**
Client Tennessee Valley Authority
Boring Location 572,746.20 N; 2,403,194.85 E NAD83
Project Number 175668043
Surface Elevation 797.6 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. %
14			SILTY LEAN CLAY, CL, 10YR 5/3 (brown), low plasticity, firm, dry, saprolitic bedrock, shale gravel, historical bedding structure maintained *(Continued)*					
15								
15.5	782.1		Bedrock Refusal / Bottom of Hole at 15.5 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 (0.0/0.5-20190314) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG03**
Client	Tennessee Valley Authority	Boring Location	571,694.92 N; 2,405,055.07 E NAD83
Project Number	175668043	Surface Elevation	747.8 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/13/19
		Completed	3/13/19
Project Location	Harriman, Tennessee	Depth to Water	N/A
		Date/Time	N/A
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC 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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

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. %
0.0	747.8		Top of Hole						
0			ORGANIC SILT, OL, 7.5YR 5/2 (brown), firm, moist	HA[4]	HA01	0.0 - 0.5		0.5	
1.5	746.3		LEAN CLAY, CL, 7.5YR 5/4 (brown), low plasticity, firm, moist, chert fragments (coarse) throughout	1.5/3.5-20190313	DP01	0.0 - 5.0	0.0 - 5.0	2.7	N/A
			Dry at 6.0'						
			Color change to 7.5YR 6/1 (gray), low plasticity, very hard at 7.0'	6.5/8.5-20190313	DP02	5.0 - 10.0	5.0 - 10.0	4.5	N/A
				11.5/13.5-20190313	DP03	10.0 - 14.1	10.0 - 14.1	4.1	N/A
13.0	734.8								
14.1	733.7		Shale, dark gray, very hard, laminated, moderately weathered, bedrock, some mica (weathered) between laminations						
			Bedrock Refusal / Bottom of Hole at 14.1 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 (0.0/0.5-20190313) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG04**
Client	Tennessee Valley Authority	Boring Location	576,062.41 N; 2,406,622.14 E NAD83
Project Number	175668043	Surface Elevation	791.2 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/19/19
		Completed	3/19/19
Project Location	Harriman, Tennessee	Depth to Water	1.4 ft
		Date/Time	3/19/19 11:55
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC 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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

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. %
0.0	791.2		Top of Hole						
0.5	790.7		CLAYEY SILT, ML, low plasticity, soft, moist, some embedded tree roots		HA01	0.0 - 0.5		0.5	
			SILT, ML, 7.5YR 4/3 (brown), soft, moist		DP01	0.0 - 5.0		1.9	N/A
5.0	786.2		FAT CLAY, CH, 2.5Y 4/2 (dark grayish brown), high plasticity, firm, moist						
					DP02	5.0 - 10.0		2.7	N/A
9.0	782.2		Wet at 8.5'						
10.0	781.2		FAT CLAY, CH, 2.5Y 3/1 (very dark gray), medium plasticity, wet, with black shale fragments						
11.1	780.1		Shale, black, wet, fissile		DP03	10.0 - 11.1		1.1	N/A
			Bedrock Refusal / Bottom of Hole at 11.1 Ft.						

HA01 0.0/0.5-20190319
5.0/7.7-20190319
10.0/11.1-20190319
0.0 - 5.0
5.0 - 10.0
10.0 - 11.1

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 (0.0/0.5-20190319) sampled using hand auger

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG05**
Client	Tennessee Valley Authority	Boring Location	576,831.04 N; 2,406,882.84 E NAD83
Project Number	175668043	Surface Elevation	777.8 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/18/19
		Completed	3/18/19
Project Location	Harriman, Tennessee	Depth to Water	13.0 ft
		Date/Time	3/18/19 14:00
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC 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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

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. %
0.0	777.8		Top of Hole						
1.0	776.8		ORGANIC SILT, OL, 2.5YR 3/3 (dark reddish brown), loose, moist		HA[4]				
			No recovery		DP01	0.0 - 5.0	0.0 - 5.0	0.0	N/A
5.0	772.8		FAT CLAY, CH, 10YR 4/4 (dark yellowish brown), medium plasticity, soft, moist		6.5/8.5-20190318 DP02	5.0 - 10.0	5.0 - 10.0	3.4	N/A
			Limestone cobbles embedded at 9.5'						
			Wet at 13.0'		11.5/13.5-20190318 DP03	10.0 - 15.0	10.0 - 15.0	5.0	N/A
			Color change to 5GY 3/2 (very dark grayish green) at 14.0'						
			Color change to 10Y 2.5/1 (greenish black), wet, with limestone cobbles at 15.0'		16.5/18.5-20190318 DP04	15.0 - 20.0	15.0 - 20.0	5.0	N/A

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID N/A | Stantec Boring No. **KIF-BG05**

Client Tennessee Valley Authority | Boring Location 576,831.04 N; 2,406,882.84 E NAD83

Project Number 175668043 | Surface Elevation 777.8 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			FAT CLAY, CH, 10YR 4/4 (dark yellowish brown), medium plasticity, soft, moist *(Continued)*					
19								
20								
21								
22					21.0/24.0-20190318			
23	23.5	754.3			DP05	20.0 - 25.0	5.0	N/A
24			WELL GRADED GRAVEL, GW, N 4/ (dark gray), coarse, loose, wet					
25								
26								
27					26.5/28.5-20190318			
28					DP06	25.0 - 29.3	4.3	N/A
29	29.3	748.5	Limestone boulders at 28.9'					
			Bedrock Refusal / Bottom of Hole at 29.3 Ft.					

20.0 - 25.0

25.0 - 29.3

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 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG06**
Client	Tennessee Valley Authority	Boring Location	575,777.09 N; 2,406,717.09 E NAD83
Project Number	175668043	Surface Elevation	776.6 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	7/11/19
Completed	7/11/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	C. Sexton	Logger	C. Sexton
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC 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	A. Blair	Approved By	L. Price

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. %
0.0	776.6		Top of Hole						
0.6	776.0		CLAYEY SILT WITH GRAVEL, MH, 10YR 5/3 (brown) and 10GY 6/1 (greenish gray), low to medium plasticity, soft, dry, iron oxide staining		HA01 (HA[4])	0.0 - 0.5		0.5	
					DP01a	0.0 - 1.5			
			SILTY FAT CLAY SOME GRAVEL, CL, 5Y 5/3 (olive), medium to high plasticity, soft to firm, moist to wet, iron oxide staining		DP01bE (1.5/3.5-20190711)	1.5 - 3.5	0.0 - 5.0	3.9	N/A
					DP01cG	3.5 - 5.0			
					DP02aG	5.0 - 6.0			
			Color change to 10BG 5/1 (greenish gray) from 6.5' to 7.3'		DP02bE (6.0/8.0-20190711)	6.0 - 8.0	5.0 - 9.5	3.7	N/A
8.0	768.6		Mg nodules at 7.3' Highly weathered shale below 7.3'						
					DP02cG	8.0 - 9.5			
9.5	767.1		SILT, 2.5Y 5/1 (gray), soft to hard, dry, iron oxide staining, fissured, weathered shale						
			Bedrock Refusal / Bottom of Hole at 9.5 Ft.						
			Top of Rock = 9.5 Ft. Top of Rock Elevation = 767.1 Ft.						

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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 (0.0/0.5-20190711) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG07**
Client	Tennessee Valley Authority	Boring Location	570,793.51 N; 2,414,941.22 E NAD83
Project Number	175668043	Surface Elevation	783.4 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/12/19
		Completed	3/12/19
Project Location	Harriman, Tennessee	Depth to Water	27.0 ft
		Date/Time	3/27/19 14:20
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC 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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

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. %
0.0	783.4		Top of Hole						
			SANDY SILT, ML, 5YR 4/6 (yellowish red), firm, dry		HA01	0.0 - 0.5		0.5	
					DP01	0.0 - 5.0		5.0	N/A
					DP02	5.0 - 10.0		5.0	N/A
9.0	774.4								
			CLAYEY ELASTIC SILT, MH, 5YR 6/8 (reddish yellow), soft, moist Color change to 7.5YR 5/8 (strong brown) at 10.0'						
12.5	770.9				DP03	10.0 - 15.0		5.0	N/A
			CLAYEY SAND, SC, 7.5YR 6/8 (reddish yellow), non-plastic, medium dense, moist						
					DP04	15.0 - 20.0		5.0	N/A

HA[4] 1.5/3.5-20190312 6.5/8.5-20190312 11.5/13.5-20190312 16.5/18.5-20190312

0.0 - 5.0 5.0 - 10.0 10.0 - 15.0 15.0 - 20.0

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-BG07**
Client: Tennessee Valley Authority
Boring Location: 570,793.51 N; 2,414,941.22 E NAD83
Project Number: 175668043
Surface Elevation: 783.4 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. %
18.5	764.9							
			Sandstone, olive, weathered, moist, bedrock, very stiff					
20.0	763.4							
			FAT CLAY, CH, 7.5YR 6/8 (reddish yellow), high plasticity, soft, moist					
					21.5/23.5-20190312	DP05	20.0 - 25.0	5.0	N/A
			Wet at 27.0'		26.5/28.5-20190312	DP06	25.0 - 30.0	5.0	N/A
			Very soft at 30.0'		31.5/33.5-20190312	DP07	30.0 - 35.0	5.0	N/A
					36.5/38.5-20190312	DP08	35.0 - 40.0	5.0	N/A
			Color change to 10YR 4/3 (brown) at 40.0'					

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-BG07**
Client Tennessee Valley Authority
Boring Location 570,793.51 N; 2,414,941.22 E NAD83
Project Number 175668043
Surface Elevation 783.4 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. %
43			FAT CLAY, CH, 7.5YR 6/8 (reddish yellow), high plasticity, soft, moist *(Continued)* Coarse sandstone fragments from 43.0' to 45.0'		41.5/43.5-20190312 DP09	40.0 - 45.0	40.0 - 45.0	5.0	N/A
44									
45									
46									
47					46.5/48.5-20190312 DP10	45.0 - 50.0	45.0 - 50.0	5.0	N/A
48									
49									
50									
51									
52					51.5/53.5-20190312 DP11	50.0 - 53.5	50.0 - 53.5	3.5	N/A
53	53.0	730.4							
	53.5	729.9	Chert, fragmented to consolidated						
			Bedrock Refusal / Bottom of Hole at 53.5 Ft.						

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G = Geotechnical Sample Custody
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3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190312) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG08**
Client	Tennessee Valley Authority	Boring Location	580,466.24 N; 2,411,765.65 E NAD83
Project Number	175668043	Surface Elevation	758.1 ft — Elevation Datum NGVD29
Project Name	KIF TDEC Order	Date Started	3/26/19 — Completed 3/26/19
Project Location	Harriman, Tennessee	Depth to Water	17.5 ft — Date/Time 3/26/19 10:30
Inspector	J. Andrew — Logger D. Mihalek	Depth to Water	N/A — Date/Time N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC 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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

Lithology Depth Ft[3]	Elevation	Graphic	Description	Overburden: / Rock Core:	Sample[1,2] / RQD %	Depth Ft[3] / Run Ft	Rec. Ft / Rec. %	Blows/PSI
0.0	758.1		Top of Hole					
0 – 1.5	758.1 – 756.6		ORGANIC SILT, OL, 10YR 4/3 (brown), loose, moist, topsoil with organics		HA[4] HA01	0.0 - 0.5	0.5	
1.5 – 5.0	756.6 – 753.1		CLAYEY SILT, ML, 10YR 5/6 (yellowish brown), non-plastic, soft, moist		1.5/3.5-20190326 DP01	0.0 - 5.0	5.0	N/A
5.0 – 15.0	753.1 – 743.1		SILTY LEAN CLAY, CL, 10YR 5/6 (yellowish brown), low plasticity, firm to stiff, moist Medium plasticity, soft at 12.5'		6.5/8.5-20190326 DP02 11.5/13.5-20190326 DP03 DP04	5.0 - 10.0 10.0 - 12.5 12.5 - 15.0	5.0 3.2 3.4	N/A N/A N/A
15.0 – 17.5	743.1 – 740.6		FAT CLAY, CH, 10YR 5/6 (yellowish brown), high plasticity, soft, moist Wet at 17.5'		16.5/18.5-20190326 DP05	15.0 - 17.5	3.7	N/A

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 8/27/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-BG08**
Client: Tennessee Valley Authority
Boring Location: 580,466.24 N; 2,411,765.65 E NAD83
Project Number: 175668043
Surface Elevation: 758.1 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. %
18.5	739.6							
			CLAYEY SAND, SC, 7.5YR 5/8 (strong brown), very loose, wet		DP06	17.5 - 20.0	3.0	N/A
					DP07	20.0 - 22.5	3.7	N/A
					DP08	22.5 - 25.0	2.5	N/A
					DP09	25.0 - 27.5	2.5	N/A
27.0	731.1							
27.5	730.6		Sandstone, dark gray					
			Bedrock Refusal / Bottom of Hole at 27.5 Ft.					

21.5/23.5-20190326
26.5/27.5-20190326
17.5 - 20.0
20.0 - 22.5
22.5 - 25.0
25.0 - 27.5

DPT runs beyond 10.0 ft are 2.5 ft in length to allow for swelling soils. Recovery greater than run length due to swell

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G = Geotechnical Sample Custody
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3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190326) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG09**
Client	Tennessee Valley Authority	Boring Location	581,532.93 N; 2,412,635.80 E NAD83
Project Number	175668043	Surface Elevation	773.6 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/26/19
		Completed	3/26/19
Project Location	Harriman, Tennessee	Depth to Water	28.0 ft
		Date/Time	3/26/19 15:05
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC 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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

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. %
0.0	773.6		Top of Hole						
0.5	773.1		ORGANIC SILT, OL, 10YR 3/3 (dark brown), soft, dry, soft with organics		HA01	0.0 - 0.5		0.5	
			SILTY SAND, SM, 10YR 5/6 (yellowish brown), medium dense, moist		DP01	0.0 - 5.0	0.0 - 5.0	5.0	N/A
3.8	769.8								
5.0	768.6		SILTY LEAN CLAY, CL, 5YR 4/6 (yellowish red), low plasticity, firm, moist						
			SILTY SAND, SM, 10YR 5/6 (yellowish brown), medium dense, moist		DP02	5.0 - 10.0	5.0 - 10.0	4.5	N/A
7.5	766.1								
			SILTY LEAN CLAY, CL, 10YR 5/6 (yellowish brown), soft, moist						
			Wet at 11.0'		DP03	10.0 - 15.0	10.0 - 15.0	4.1	N/A
15.0	758.6								
			SILTY SAND, SM, 10YR 6/8 (brownish yellow), fine to medium, loose, wet						
			Weathered sandstone at 17.0'		DP04	15.0 - 20.0	15.0 - 20.0	4.2	N/A
17.5	756.1								

HA[4]
1.5/3.5-20190326
6.5/8.5-20190326
11.5/13.5-20190326
16.5/18.5-20190326

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 8/27/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-BG09**
Client: Tennessee Valley Authority
Boring Location: 581,532.93 N; 2,412,635.80 E NAD83
Project Number: 175668043
Surface Elevation: 773.6 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. %
20.0	753.6		SILTY LEAN CLAY, CL, 10YR 5/6 (yellowish brown), soft, wet *(Continued)*					
			SILTY SAND, SM, 10YR 6/8 (brownish yellow), fine to medium, loose	21.5/23.5-20190326	DP05	20.0 - 25.0	4.3	N/A
			Wet at 25.0'					
			Sandstone boulder embedded at 27.0'	26.5/28.5-20190326	DP06	25.0 - 30.0	5.0	N/A
28.0	745.6							
			LEAN CLAY, CL, 7.5YR 4/6 (strong brown), low plasticity, firm, moist					
30.7	742.9							
			Shale, dark gray, weathered, dry		DP07	30.0 - 31.8	1.8	N/A
31.8	741.8							

Bedrock Refusal /
Bottom of Hole at 31.8 Ft.

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3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190326) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG10**
Client	Tennessee Valley Authority	Boring Location	582,011.89 N; 2,407,288.66 E NAD83
Project Number	175668043	Surface Elevation	763.2 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	3/25/19
Completed	3/25/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC 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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

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. %
0.0	763.2		Top of Hole						
0.5	762.7		SILT, OL, 7.5YR 3/2 (dark brown), loose, dry to moist, with organics		HA01	0.0 - 0.5		0.5	
			FAT CLAY, CH, 7.5YR 5/4 (brown), high plasticity, firm, moist		DP01	0.0 - 5.0		2.2	N/A
					DP02	5.0 - 10.0		5.0	N/A
			Coarse chert fragments embedded in clay matrix from 11.5' to 15.0'		DP03	10.0 - 15.0		5.0	N/A
			Chert fragments and weathered chert from 15.0' to 17.5'		DP04	15.0 - 17.5		3.8	N/A
			Stiff, with gravel in clay matrix at 17.5'						

HA[4] 0.0/2.2-20190325
6.5/8.5-20190325
11.5/13.5-20190325
16.5/18.5-20190325
0.0 - 5.0
5.0 - 10.0
10.0 - 15.0
15.0 - 17.5

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-BG10**
Client: Tennessee Valley Authority
Boring Location: 582,011.89 N; 2,407,288.66 E NAD83
Project Number: 175668043
Surface Elevation: 763.2 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			FAT CLAY, CH, 7.5YR 5/4 (brown), high plasticity, firm, moist *(Continued)*		DP05	17.5 - 20.0	17.5 - 20.0	2.5	N/A
19									
20				20.0/22.2-20190325					
21					DP06	20.0 - 22.2	20.0 - 22.2	2.2	N/A
22	22.2	741.0							
			Bedrock Refusal / Bottom of Hole at 22.2 Ft.						

DPT runs beyond 15.0 ft are 2.5 ft in length to allow for swelling soils. Recovery greater than run length due to swell

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 (0.0/0.5-20190325) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG11**
Client	Tennessee Valley Authority	Boring Location	583,551.79 N; 2,410,057.63 E NAD83
Project Number	175668043	Surface Elevation	792.1 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/21/19
		Completed	3/22/19
Project Location	Harriman, Tennessee	Depth to Water	33.0 ft
		Date/Time	3/22/19 09:33
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC 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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

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. %
0.0	792.1		Top of Hole						
			SILT, ML, 7.5YR 5/4 (brown), very dense, dry, 90% fines		HA[4] HA01	0.0 - 0.5		0.5	
2.5	789.6		FAT CLAY, CH, 7.5YR 5/4 (brown), medium plasticity, stiff, moist	1.5/3.5-20190321	DP01	0.0 - 5.0	0.0 - 5.0	5.0	N/A
			Coarse sand embedded from 6.5' to 7.5'	6.5/8.5-20190321	DP02	5.0 - 7.5	5.0 - 7.5	3.1	N/A
					DP03	7.5 - 9.0	7.5 - 9.0	2.8	N/A
				11.5/13.5-20190321	DP04	10.0 - 12.5	10.0 - 12.5	3.5	N/A
					DP05	12.5 - 15.0	12.5 - 15.0	3.9	N/A
			Chert lens from 16.0' to 16.4'		DP06	15.0 - 17.5	15.0 - 17.5	3.6	N/A
			Color change to 7.5YR 5/6 (strong brown) at 17.5'	16.5/18.5-20190321	DP07	17.5 - 20.0	17.5 - 20.0	3.6	N/A
			Color change to 7.5YR 4/6 (strong brown) at 20.0'						

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-BG11**
Client: Tennessee Valley Authority
Boring Location: 583,551.79 N; 2,410,057.63 E NAD83
Project Number: 175668043
Surface Elevation: 792.1 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. %
21			FAT CLAY, CH, 7.5YR 5/4 (brown), medium plasticity, stiff, moist *(Continued)*		DP08	20.0 - 22.5	4.2	N/A
22								
23			Wet at 22.5'		DP09	22.5 - 25.0	4.1	N/A
24								
25								
26					DP10	25.0 - 27.5	4.1	N/A
27								
28								
29			Weathered chert lens from 28.5' to 29.3'		DP11	27.5 - 30.0	2.8	N/A
30			No chert observed from 30.0' to 32.5'					
31					DP12	30.0 - 32.5	4.5	N/A
32								
33 ▽								
34					DP13	32.5 - 35.0	3.7	N/A
35								
36					DP14	35.0 - 37.5	2.8	N/A
37	37.0	755.1	CLAYEY GRAVEL, GC, 7.5YR 5/4 (brown), coarse to cobbles, loose, wet, chert and limestone gravel					
38			Interbedded clay lenses from 37.5' to 40.0'		DP15	37.5 - 40.0	2.9	N/A
39								
40	40.0	752.1						
	40.4	751.7	Shale bedrock, refusal at 40.4'		DP16	40.0 - 40.4	0.0	N/A
			Bedrock Refusal / Bottom of Hole at 40.4 Ft.					

21.5/23.5-20190321
26.5/28.5-20190321
31.5/33.5-20190322
36.5/38.5-20190322
20.0 - 22.5
22.5 - 25.0
25.0 - 27.5
27.5 - 30.0
30.0 - 32.5
32.5 - 35.0
35.0 - 37.5
37.5 - 40.0
40.0 - 40.4

DPT runs beyond 5.0 ft are 2.5 ft in length to allow for swelling soils. Recovery greater than run length due to swell

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 (0.0/0.5-20190322) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG12**
Client	Tennessee Valley Authority	Boring Location	584,398.52 N; 2,411,876.07 E NAD83
Project Number	175668043	Surface Elevation	798.6 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/27/19
		Completed	3/27/19
Project Location	Harriman, Tennessee	Depth to Water	23.5 ft
		Date/Time	3/27/19 12:57
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC 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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

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. %
0.0	798.6		Top of Hole						
0.5	798.1		SILT, ML, 7.5YR 4/6 (strong brown), soft, dry		HA[4] HA01	0.0 - 0.5		0.5	
			SILTY LEAN CLAY, CL, 2.5YR 4/6 (red), low plasticity, firm, moist		1.5/3.5-20190327 DP01	0.0 - 5.0	0.0 - 5.0	5.0	N/A
5.0	793.6		SILTY LEAN CLAY, CL, 5YR 4/6 (yellowish red), firm, moist		6.5/8.5-20190327 DP02	5.0 - 7.5	5.0 - 7.5	3.8	N/A
					DP03	7.5 - 10.0	7.5 - 10.0	2.7	N/A
					11.5/13.5-20190327 DP04	10.0 - 12.5	10.0 - 12.5	3.0	N/A
			Soft at 12.0'						
					DP05	12.5 - 15.0	12.5 - 15.0	2.5	N/A
			Wet at 14.5'						
					16.5/18.5-20190327 DP06	15.0 - 17.5	15.0 - 17.5	3.0	N/A
17.0	781.6								
			SILTY LEAN CLAY WITH SAND, CL, 7.5YR 5/6 (strong brown), medium plasticity, soft, wet						
18.5	780.1								
			SILTY SAND, SM, 5YR 5/6 (yellowish red), loose, wet		DP07	17.5 - 20.0	17.5 - 20.0	2.4	N/A

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 8/27/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-BG12**
Client: Tennessee Valley Authority
Boring Location: 584,398.52 N; 2,411,876.07 E NAD83
Project Number: 175668043
Surface Elevation: 798.6 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. %
21.5	777.1		SILTY SAND, SM, 5YR 5/6 (yellowish red), loose, wet *(Continued)* Fragmented shale from 20.0' to 21.5'		DP08	20.0 - 22.5	3.2	N/A
			CLAYEY SAND, SC, 10YR 3/3 (dark brown), low plasticity, loose, wet, sand/clay mix, soft					
			Color change to 10YR 6/6 (brownish yellow) at 23.5'		DP09	22.5 - 25.0	3.0	N/A
					DP10	25.0 - 27.5	4.0	N/A
			Color change to 10YR 5/6 (yellowish brown) at 27.5' With weathered sandstone and shale from 27.5' to 32.5'		DP11	27.5 - 30.0	2.8	N/A
					DP12	30.0 - 32.5	3.8	N/A
			With sandstone and shale cobbles from 32.5' to 36.5'		DP13	32.5 - 35.0	3.0	N/A
36.5	762.1				DP14	35.0 - 37.0	3.0	N/A
37.0	761.6		Limestone and Shale					
			Bedrock Refusal / Bottom of Hole at 37.0 Ft.					

21.5/23.5-20190327
26.5/28.5-20190327
31.5/33.5-20190327
35.0/37.0-20190327

20.0 - 22.5
22.5 - 25.0
25.0 - 27.5
27.5 - 30.0
30.0 - 32.5
32.5 - 35.0
35.0 - 37.0

DPT runs beyond 5.0 ft are 2.5 ft in length to allow for swelling soils. Recovery greater than run length due to swell

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 (0.0/0.5-20190327) sampled using hand auger

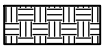
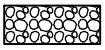
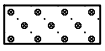
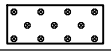
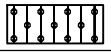
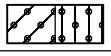
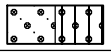
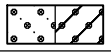
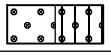
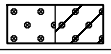
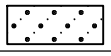
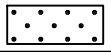
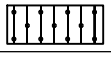
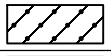
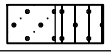
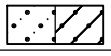
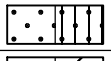
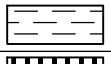
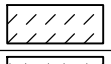
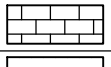
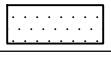
APPENDIX B.2

GEOTECHNICAL BORINGS

Table of Contents

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.

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B05**
Client	Tennessee Valley Authority	Boring Location	574,498.86 N; 2,408,062.70 E NAD83
Project Number	175668043	Surface Elevation	756.5 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	2/22/21
Completed	2/23/21		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
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 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-5/8" 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	89.8%
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	A. Welshans

Lithology Depth Ft[3]	Elevation	Graphic	Description	Overburden: / Rock Core:	Sample[1,2] / RQD %	Depth Ft[3] / Run Ft	Rec. Ft / Rec. Ft	Blows/PSI / Rec. %
0.0	756.5		Top of Hole					
0			Crushed stone		SS01G	0.0 - 1.5	1.3	11-10-15
1			Trace clay below 1.0 feet, dry					
2								
3.0	753.5				SS02aG	2.5 - 3.0	1.5	9-10-8
3			SILTY SAND TRACE GRAVEL, SM, 2.5Y 2.5/1 (black) to 2.5Y 5/4 (light olive brown), very fine to medium, medium dense, dry to moist, slight organic odor, iron oxide staining, minor lean clay intermixed, [CCR]		SS02bG	3.0 - 4.0		
4								
5.5	751.0				SS03aG	5.0 - 5.5	1.3	1-2-1
5			SANDY LEAN CLAY, CL, 7.5YR 5/4 (brown) to 7.5YR 3/1 (very dark gray), low to medium plasticity, soft to hard, moist, fine to medium sand, trace black gravelly sand ccr layers intermixed (<5" thick), [FILL]		SS03bG	5.5 - 6.5		
6								
7								
8					SS04G	7.5 - 9.0	1.4	1-5-9
9								
9.5	747.0							
10			CLAYEY SAND, SC, 7.5YR 5/4 (brown) to 7.5YR 3/1 (very dark gray), fine to coarse, low plasticity, loose to dense, moist, iron oxide staining, [FILL]		SS05G	10.0 - 11.5	1.4	1-2-6
11								
12								
13					SS06G	12.5 - 14.0	1.1	8-15-16
14								
15								
16					SS07G	15.0 - 16.5	0.7	2-3-16
17								
18								

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B05**
Client: Tennessee Valley Authority
Boring Location: 574,498.86 N; 2,408,062.70 E NAD83
Project Number: 175668043
Surface Elevation: 756.5 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, 7.5YR 5/4 (brown) to 7.5YR 3/1 (very dark gray), fine to coarse, low plasticity, loose to dense, moist, iron oxide staining, [FILL] *(Continued)*		SS08	17.5 - 19.0	17.5 - 19.0	0.9	5-6-7
19									
20					SS09	19.0 - 20.5	19.0 - 20.5	1.1	WH-2-4
21					SS10	20.5 - 22.0	20.5 - 22.0	1.0	2-3-4
22	22.5	734.0							
23			SILTY SAND, SM, 7.5YR 5/4 (brown) to 7.5YR 4/1 (dark gray), low to medium plasticity, very loose, moist to wet, iron oxide staining, fine to medium sand, [FILL]		SS11G	23.0 - 24.5	23.0 - 24.5	0.5	WH-WH-2
24									
25									
26					SS12G	25.5 - 27.0	25.5 - 27.0	0.7	WH-WH-WH
27									
28									
29					SS13G	28.0 - 29.5	28.0 - 29.5	0.9	1-1-2
30									
31					SS14G	30.5 - 32.0	30.5 - 32.0	1.3	1-2-3
32	32.5	724.0							
33			SANDY LEAN CLAY, CL, 10YR 3/2 (very dark grayish brown), medium plasticity, very soft, wet, slight organic odor, fine to medium sand, trace weathered shale fragments		SS15G	33.0 - 34.5	33.0 - 34.5	0.7	WH-WH-WH
34	34.5	722.0							
35			LEAN CLAY, CL, 7.5YR 5/6 (strong brown) to 7.5YR 6/2 (pinkish gray), very fine to fine, low to medium plasticity, hard to soft, moist						
36					ST01G	35.5 - 37.2	35.5 - 37.2	1.6	NR
37									
38					SS16aG	38.0 - 38.5	38.0 - 39.5	1.5	4-5-9
39					SS16b	38.5 - 39.5			
40									
41					SS17a	40.5 - 41.5	40.5 - 42.0	1.3	WH-WH-4
42					SS17bG	41.5 - 42.0			

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 8/4/21

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B05**
Client: Tennessee Valley Authority
Boring Location: 574,498.86 N; 2,408,062.70 E NAD83
Project Number: 175668043
Surface Elevation: 756.5 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. %
43			LEAN CLAY, CL, 7.5YR 5/6 (strong brown) to 7.5YR 6/2 (pinkish gray), very fine to fine, low to medium plasticity, hard to soft, moist *(Continued)*						
44			Color change to 7.5YR 6/8 (reddish yellow) to 7.5YR 6/1 (gray), increased sand content at 42.5'		SS18G	43.0 - 44.5	43.0 - 44.5	1.4	5-7-8
45									
46					SS19aG	45.5 - 46.0	45.5 - 47.0	1.5	WH-WH-5
47			Color change to 10YR 4/2 (dark grayish brown) to 7.5YR 3/1 (very dark gray) at 46.0'		SS19bG	46.0 - 47.0			
48	48.6	707.9			SS20G	48.0 - 48.7	48.0 - 48.7	0.6	WH-50/2"
49	49.0	707.5	Weathered sandstone						

Refusal /
Bottom of Hole at 49.0 Ft.

Top of Rock = 48.6 Ft.
Top of Rock Elevation = 707.9 Ft.

Mud rotary began at 12.0' bgs.

Vibrating wire piezometer installed. See KIF-B05 installation detail for backfill information.

Overburden Drilling and Sampling Tools (Type and Size): 4-1/4" HSA (from 0.0' to 12.0' bgs), 3-Wing Updraft Bit (from 12.0' bgs), 2" SS w/o liners, 3" Shelby Tubes.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B06**
Client	Tennessee Valley Authority	Boring Location	574,420.30 N; 2,408,131.50 E NAD83
Project Number	175668043	Surface Elevation	739.6 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	2/8/21
		Completed	2/8/21
Project Location	Harriman, Tennessee	Depth to Water	N/A
		Date/Time	N/A
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 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-5/8" 3-Wing Updraft Bit, 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	89.8%
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	A. Welshans

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. %
0.0	739.6		Top of Hole						
			Casing stickup						
2.9	736.7		Water						
5.7	733.9		No recovery, likely sediment		SS01	5.7 - 7.2	5.7 - 7.2	0.0	WR-WR-WR
					SS02	8.2 - 9.7	8.2 - 9.7	0.0	WR-WH-WH
					SS03	10.7 - 12.2	10.7 - 12.2	0.0	WR-WR-WR
13.2	726.4		SILTY SAND, SM, 7.5YR 4/3 (brown), low to medium plasticity, loose, wet, fine to medium sand, trace coarse sand and gravel, [FILL]		SS04G	13.2 - 14.7	13.2 - 14.7	0.4	WR-WH-WH
					SS05	15.7 - 17.2	15.7 - 17.2	0.0	WR-WR-WR
17.7	721.9								

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 9/29/21

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B06**
Client: Tennessee Valley Authority
Boring Location: 574,420.30 N; 2,408,131.50 E NAD83
Project Number: 175668043
Surface Elevation: 739.6 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. %
19									
20	20.2	719.4	LEAN CLAY, CL, 7.5YR 3/2 (dark brown), non-plastic to medium plasticity, very soft, wet, moderate organic odor, trace roots *(Continued)*		SS06G	18.2 - 19.7	18.2 - 19.7	0.9	WH-WH-WH
21			SANDY LEAN CLAY TRACE GRAVEL, CL, 10YR 5/2 (grayish brown), very fine to fine, low plasticity, very soft, moist, slight organic odor		SS07G	20.7 - 22.2	20.7 - 22.2	1.3	WH-WH-WH
22	22.7	716.9							
23			SANDY LEAN CLAY, CL, 7.5YR 5/1 (gray) with 7.5YR 6/8 (reddish yellow), low plasticity, soft, moist to wet, fine to medium sand		SS08G	23.2 - 24.7	23.2 - 24.7	1.4	1-1-2
24									
25									
26					SS09G	25.7 - 27.2	25.7 - 27.2	1.4	2-2-3
27	27.7	711.9							
28			SANDY SILT, ML, 7.5YR 5/1 (gray), fine to medium, non-plastic to low plasticity, very loose, moist		SS10G	28.2 - 29.7	28.2 - 29.7	1.4	1-1-1
29									
30									
31	31.4	708.2	Trace fine gravel below 30.7'		SS11aG	30.7 - 31.4	30.7 - 32.2	1.3	WH-2-2
32			LEAN CLAY WITH SAND, CL, 5YR 3/1 (very dark gray), medium plasticity, soft to very soft, wet, fine sand		SS11bG	31.4 - 32.2			
33	33.7	705.9			SS12aG	33.2 - 33.7	33.2 - 34.7	1.4	WH-10-34
34	34.7	704.9	Shale, dark gray to gray, very soft to soft, highly weathered, damp, 45° bedding angle		SS12bG	33.7 - 34.7			

No Refusal /
Bottom of Hole at 34.7 Ft.

Top of Rock = 33.7 Ft.
Top of Rock Elevation = 705.9 Ft.

Horizontal coordinates collected at time of drilling using Trimble Geo7x handheld unit. Surface elevation shown reflects the top of steel casing. Top of casing elevation was measured using automatic level and level rod referenced from temporary benchmark established by TVA. The temporary benchmark referenced for KIF-B06 was set at the SW corner of the KIF-106 concrete pad.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B07**
Client	Tennessee Valley Authority	Boring Location	574,401.90 N; 2,408,144.80 E NAD83
Project Number	175668043	Surface Elevation	739.9 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	2/9/21
Completed	2/9/21		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
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 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-5/8" 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	89.8%
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	A. Welshans

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. %
0.0	739.9		Top of Hole						
			Steel Casing						
3.0	736.9		Water						
8.3	731.6		SANDY LEAN CLAY WITH GRAVEL, CL, 7.5YR 5/1 (gray) to 7.5YR 4/2 (brown), non-plastic to medium plasticity, very soft, wet, fine to medium sand, fine to coarse gravel		SS01	8.3 - 9.8	8.3 - 9.8	0.0	WR-WH-WH
					SS02G	11.0 - 12.5	11.0 - 12.5	0.4	WH-WH-WH
					SS03G	13.5 - 15.5	13.5 - 15.5	0.4	WR-WR-WR
					SS04	16.5 - 18.0	16.5 - 18.0	0.0	WR-WR-WH
18.5	721.4								

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B07**
Client: Tennessee Valley Authority
Boring Location: 574,401.90 N; 2,408,144.80 E NAD83
Project Number: 175668043
Surface Elevation: 739.9 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. %
19			SILTY CLAY WITH SAND, CL-ML, 10YR 5/2 (grayish brown), low plasticity, very soft to soft, wet to moist, fine sand *(Continued)*		SS05G	19.0 - 20.5	19.0 - 20.5	1.1	WH-WH-2
20									
21.0	718.9		LEAN CLAY WITH SAND, CL, 7.5YR 5/1 (gray) with 7.5YR 6/8 (reddish yellow), low plasticity, firm, moist, fine sand		SS06G	21.5 - 23.0	21.5 - 23.0	1.5	3-3-4
22									
23									
24					ST01G	24.0 - 26.0	24.0 - 26.0	1.5	NR
25									
26					SS07G	26.0 - 27.5	26.0 - 27.5	1.5	4-4-4
27									
28.0	711.9		SILTY CLAYEY SAND, SC-SM, 7.5YR 5/1 (gray), fine to medium, low plasticity, loose, moist, trace fine gravel		SS08G	28.5 - 30.0	28.5 - 30.0	1.2	1-2-2
28									
29									
30									
31					SS09aG	31.0 - 31.9	31.0 - 32.5	1.5	6-7-7
31.9	708.0		SANDY SILTY CLAY, CL-ML, 5YR 3/1 (very dark gray), low plasticity, hard, moist		SS09bG	31.9 - 32.5			
32									
33									
34.0	705.9		Shale, dark gray to gray, very soft to soft, highly weathered, damp, 45° bedding angle		SS10aG	33.5 - 34.0	33.5 - 35.0	1.5	6-11-41
34					SS10bG	34.0 - 35.0			
35.0	704.9								
35									

No Refusal /
Bottom of Hole at 35.0 Ft.

Top of Rock = 34.0 Ft.
Top of Rock Elevation = 705.9 Ft.

Horizontal coordinates collected at time of drilling using Trimble Geo7x handheld unit. Surface elevation shown reflects the top of steel casing. Top of casing elevation was measured using automatic level and level rod referenced from temporary benchmark established by TVA. The temporary benchmark referenced for KIF-B07 was set at the SW corner of the KIF-106 concrete pad.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B08**
Client	Tennessee Valley Authority	Boring Location	574,378.30 N; 2,408,167.50 E NAD83
Project Number	175668043	Surface Elevation	739.3 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	2/10/21
Completed	2/10/21		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
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 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-5/8" 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	89.8%
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	A. Welshans

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. %
0.0	739.3		Top of Hole						
			Steel casing						
3.0	736.3								
			Water						
8.5	730.8								
			CLAYEY SILT WITH GRAVEL, ML, 7.5YR 5/1 (gray), non-plastic to medium plasticity, very soft, wet		SS01	8.5 - 10.0	8.5 - 10.0	0.0	WR-WR-WR
					SS02G	11.0 - 12.5	11.0 - 12.5	0.3	1-1-1
					SS03G	13.5 - 15.5	13.5 - 15.5	0.2	1-1-1
					SS04	16.5 - 18.0	16.5 - 18.0	0.0	WH-WH-WH

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 8/4/21

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B08**
Client: Tennessee Valley Authority
Boring Location: 574,378.30 N; 2,408,167.50 E NAD83
Project Number: 175668043
Surface Elevation: 739.3 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. %
19			CLAYEY SILT WITH GRAVEL, ML, 7.5YR 5/1 (gray), non-plastic to medium plasticity, very soft, wet *(Continued)*		SS05	19.0 - 20.5	19.0 - 20.5	0.0	WH-WH-WH
20									
21.0	718.3		SILTY SAND WITH GRAVEL, SM, 7.5YR 5/1 (gray), fine to medium, low plasticity, loose, moist		ST01G	21.5 - 22.0	21.5 - 22.0	0.4	NR
22									
23					ST02G	22.5 - 24.5	22.5 - 24.5	1.9	NR
24									
25.0	714.3				SS06aG	24.5 - 25.0	24.5 - 26.0	1.2	2-6-8
25			SILTY CLAY WITH SAND, CL-ML, 7.5YR 5/1 (gray) with 7.5YR 6/8 (reddish yellow), fine, non-plastic to low plasticity, firm, moist, iron oxide staining		SS06bG	25.0 - 26.0			
26									
27					SS07aG	27.0 - 27.7	27.0 - 28.5	1.2	2-1-1
28			Color change to 7.5YR 6/2 (pinkish gray) at 27.7'		SS07bG	27.7 - 28.5			
29									
30.3	709.0				SS08aG	29.5 - 30.3	29.5 - 31.0	1.5	WH-WH-5
30			SILTY SAND, SM, 7.5YR 5/1 (gray) to 5GY 4/2 (dark grayish green), fine to medium, loose, moist, Trace fine gravel		SS08bG	30.3 - 31.0			
31									
32.6	706.7				SS09aG	32.0 - 32.6	32.0 - 33.5	1.0	4-5-8
32					SS09bG	32.6 - 33.5			
33			SILTY SAND WITH GRAVEL, SM, 5YR 3/1 (very dark gray), non-plastic, medium dense, moist, medium grained sandstone fragments						
34.0	705.3								
34			Shale, dark gray to gray, very soft to soft, highly weathered, damp, 45° bedding angle						
35.3	704.0				SS10G	34.5 - 35.3	34.5 - 35.3	0.7	33-50/4"
35									

Refusal /
Bottom of Hole at 35.3 Ft.

Top of Rock = 34.0 Ft.
Top of Rock Elevation = 705.3 Ft.

Horizontal coordinates collected at time of drilling using Trimble Geo7x handheld unit. Surface elevation shown reflects the top of steel casing. Top of casing elevation was measured using automatic level and level rod referenced from temporary benchmark established by TVA. The temporary benchmark referenced for KIF-B08 was set at the SW corner of the KIF-106 concrete pad.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B09**
Client	Tennessee Valley Authority	Boring Location	574,620.91 N; 2,408,217.76 E NAD83
Project Number	175668043	Surface Elevation	754.5 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	2/24/21
Completed	2/25/21		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
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 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-5/8" 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	89.8%
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	A. Welshans

Lithology Depth Ft[3]	Elevation	Graphic	Description	Overburden: / Rock Core:	Sample[1,2] / RQD %	Depth Ft[3] / Run Ft	Rec. Ft / Rec. Ft	Blows/PSI / Rec. %
0.0	754.5		Top of Hole					
0			Crushed stone, trace clay		SS01G	0.0 - 1.5	1.0	4-4-13
2.0	752.5		SILTY SAND, SM, 7.5YR 2.5/1 (black), fine to medium, medium dense, dry, [CCR]		SS02aG	2.5 - 2.9	1.5	8-17-9
2.9	751.6		SILTY SAND WITH GRAVEL, SM, 7.5YR 7/2 (pinkish gray) to 7.5YR 4/4 (brown), fine to medium, low plasticity, hard to very hard, dry, with poorly graded gravel layers (<4" thick) throughout, [FILL] Increased sand content at 5.0'		SS02bG	2.9 - 4.0		
					SS03G	5.0 - 6.5	0.9	4-14-8
					SS04G	7.5 - 9.0	0.8	6-7-4
9.5	745.0		SILTY GRAVEL WITH SAND, GM, 2.5Y 7/1 (light gray), fine to coarse, dense, dry, [FILL]		SS05G	10.0 - 11.5	0.8	23-24-13
12.0	742.5		LEAN CLAY WITH GRAVEL, CL, 7.5YR 7/1 (light gray) and 7.5YR 4/4 (brown), coarse, low plasticity, hard to very hard, dry, with poorly graded gravel layers (<4" thick), [FILL]		SS06G	12.5 - 14.0	0.8	13-16-17
15.5	739.0		CLAYEY SAND, SC, 7.5YR 4/4 (brown), fine to coarse, medium plasticity, medium dense, dry, [FILL]		SS07G	15.0 - 16.5	1.4	7-8-9
17.0	737.5							

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 8/4/21

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B09**
Client: Tennessee Valley Authority
Boring Location: 574,620.91 N; 2,408,217.76 E NAD83
Project Number: 175668043
Surface Elevation: 754.5 ft
Elevation Datum: NGVD29

Depth Ft[3]	Elevation	Graphic	Description	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
			Overburden: / Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18–19			SANDY SILT, ML, 7.5YR 5/4 (brown) to 7.5YR 3/2 (dark brown), low to medium plasticity, very soft, moist to wet, iron oxide staining, with shale and sandstone fragments, [FILL] *(Continued)*	SS08G	17.5 - 19.0	0.5	WH-WH-WH
20–21				SS09aG SS09b	20.0 - 20.5 20.5 - 21.5	1.1	WH-WH-WH
22–23				SS10	22.5 - 24.0	1.5	WH-WH-WH
24–25				SS11a	25.0 - 25.5		
26				SS11bG	25.5 - 26.5	0.8	WH-WH-WH
27–28				SS12G	27.5 - 29.0	1.1	WH-WH-WH
29–30				SS13G	30.0 - 31.5	0.6	WH-WH-1
31–32	32.0	722.5					
32–33			SILT, ML, 10YR 3/1 (very dark gray), non-plastic to low plasticity, very soft, wet	SS14aG SS14b	32.5 - 33.0 33.0 - 34.0	1.3	WH-WH-WH
34	34.5	720.0					
35–36			LEAN CLAY, CL, 7.5YR 5/1 (gray) to 7.5YR 4/6 (strong brown), low to medium plasticity, hard, moist, trace fine sand, trace black iron oxide staining	SS15	35.0 - 36.5	1.5	WH-WH-WH
37–38				ST01G	37.5 - 39.5	1.7	NR
39–40			Increased sand content from 39.5' to 41.0'	SS16G	39.5 - 41.0	1.3	5-7-9
41–42							

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 8/4/21

SUBSURFACE LOG

Client Borehole ID N/A | Stantec Boring No. **KIF-B09**

Client Tennessee Valley Authority | Boring Location 574,620.91 N; 2,408,217.76 E NAD83

Project Number 175668043 | Surface Elevation 754.5 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. %
43			LEAN CLAY, CL, 7.5YR 5/1 (gray) to 7.5YR 4/6 (strong brown), low to medium plasticity, hard, moist, trace fine sand, trace black iron oxide staining *(Continued)*		ST02G	42.0 - 44.0	42.0 - 44.0	1.9	NR
44	44.7	709.8			SS17aG	44.0 - 44.5	44.0 - 45.5	1.5	4-5-3
45			SILT WITH SAND, ML, 7.5YR 4/1 (dark gray), very fine to fine, non-plastic to low plasticity, soft, moist to wet, decreasing clay content with depth		SS17bG	44.5 - 45.5			
46									
47					SS18	46.5 - 48.0	46.5 - 48.0	1.5	WH-1-1
48	48.5	706.0							
49			POORLY GRADED SAND WITH SILT, SP-SM, 7.5YR 4/1 (dark gray), very fine to medium, medium dense, wet		SS19a	49.0 - 50.0	49.0 - 50.5	1.2	3-6-12
50	50.7	703.8			SS19bG	50.0 - 50.5			
51	51.8	702.7	Sandstone, dark gray to tan, medium grained, soft, completely weathered to highly weathered, friable		SS20G	51.2 - 51.8	51.2 - 51.8	0.6	20-50/1"

Refusal /
Bottom of Hole at 51.8 Ft.

Top of Rock = 50.7 Ft.
Top of Rock Elevation = 703.8 Ft.

Mud Rotary began at 17.0' bgs.

Vibrating wire piezometer installed. See KIF-B09 installation detail for backfill information.

Overburden Drilling and Sampling Tools (Type and Size): 4-1/4" HSA (from 0.0' to 17.0' bgs), 4-5/8" 3-Wing Updraft Bit (from 17.0' bgs), 2" SS w/o liners, 3" Shelby Tubes.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B10**
Client	Tennessee Valley Authority	Boring Location	574,552.60 N; 2,408,280.40 E NAD83
Project Number	175668043	Surface Elevation	739.0 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	1/31/21
Completed	2/1/21		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
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 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	3-7/8" 3-wing Updraft Bit, 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	89.8%
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	A. Welshans

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. %
0.0	739.0		Top of Hole						
			Steel casing						
2.8	736.2		Water						
7.0	732.0		No recovery		SS01	7.0 - 8.5	7.0 - 8.5	0.0	WR-1-2
					SS02	9.5 - 11.0	9.5 - 11.0	0.0	WH-WH-WH
					SS03	12.0 - 13.5	12.0 - 13.5	0.0	WR-WR-WH
14.0	725.0		SILT, ML, 10YR 4/2 (dark grayish brown), non-plastic to low plasticity, very soft, wet		SS04G	14.5 - 16.0	14.5 - 16.0	0.8	WH-WH-WH
16.5	722.5		SILT WITH SAND, ML, 5YR 6/6 (reddish yellow) to 5YR 6/1 (gray), fine, non-plastic to low plasticity, very loose to loose, moist		SS05G	17.0 - 18.5	17.0 - 18.5	0.5	WH-WH-WH

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B10**
Client: Tennessee Valley Authority
Boring Location: 574,552.60 N; 2,408,280.40 E NAD83
Project Number: 175668043
Surface Elevation: 739.0 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. %
21.5	717.5				SS06G	19.5 - 21.0	19.5 - 21.0	0.4	WH-4-4
26.5	712.5		LEAN CLAY, CL, 7.5YR 5/1 (gray) to 7.5YR 4/6 (strong brown), medium plasticity, firm to hard, moist, trace fine sand		SS07G	22.0 - 23.5	22.0 - 23.5	1.3	3-4-7
					SS08G	24.5 - 26.0	24.5 - 26.0	1.3	3-3-5
31.5	707.5		CLAYEY SILTY SAND, SM, 7.5YR 4/1 (dark gray), very fine to fine, non-plastic to low plasticity, very loose, moist to wet, decreasing clay content with depth		SS09G	27.0 - 28.5	27.0 - 28.5	1.3	WH-WH-WH
					SS10aG	29.5 - 30.0	29.5 - 31.0	1.4	WH-WH-WH
					SS10bG	30.0 - 31.0			
35.0	704.0		POORLY GRADED SAND WITH SILT, SP-SM, 7.5YR 4/1 (dark gray), very fine to medium, very loose, wet		SS11G	32.0 - 33.5	32.0 - 33.5	0.8	WH-WH-1
					SS12a	34.5 - 35.0	34.5 - 36.0	1.2	10-15-24
36.5	702.5		Sandstone, dark gray to tan, medium grained, soft, completely weathered to highly weathered		SS12bG	35.0 - 36.0			
37.2	701.8		Shale, dark brown to gray, very soft, highly weathered		SS13G	37.0 - 37.2	37.0 - 37.2	0.2	50/2"

Refusal /
Bottom of Hole at 37.2 Ft.

Top of Rock = 35.0 Ft.
Top of Rock Elevation = 704.0 Ft.

Horizontal coordinates collected at time of drilling using Trimble Geo7x handheld unit. Surface elevation shown reflects the top of steel casing. Top of casing elevation was measured using automatic level and level rod referenced from temporary benchmark established by TVA. The temporary benchmark referenced for KIF-B10 was set at the SW corner of the KIF-AD-2 concrete pad.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B11**
Client	Tennessee Valley Authority	Boring Location	574,534.20 N; 2,408,302.40 E NAD83
Project Number	175668043	Surface Elevation	739.2 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	2/1/21
Completed	2/2/21		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
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 55T#1, #709
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	89.8%
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	A. Welshans

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. %
0.0	739.2		Top of Hole						
			Steel casing						
2.8	736.4		Water						
11.9	727.3		SILT WITH SAND, ML, 10YR 4/2 (dark grayish brown), non-plastic, very soft, wet		SS01G	11.9 - 13.4	11.9 - 13.4	0.2	WR-WR-WR
13.9	725.3		LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), low to medium plasticity, very soft, wet		SS02G	14.5 - 16.0	14.5 - 16.0	1.1	WH-WH-WH
16.5	722.7		LEAN CLAY, CL, 5YR 6/6 (reddish yellow) to 5YR 6/1 (gray), low to medium plasticity, very soft to firm, moist		SS03G	17.0 - 18.5	17.0 - 18.5	0.7	WH-1-2

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B11**
Client: Tennessee Valley Authority
Boring Location: 574,534.20 N; 2,408,302.40 E NAD83
Project Number: 175668043
Surface Elevation: 739.2 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. %
20			LEAN CLAY, CL, 5YR 6/6 (reddish yellow) to 5YR 6/1 (gray), low to medium plasticity, very soft to firm, moist *(Continued)*		ST01G	19.5 - 21.5	19.5 - 21.5	1.2	NR
21									
22	22.5	716.7			ST02G	21.5 - 23.5	21.5 - 23.5	0.9	NR
23			LEAN CLAY WITH SAND, CL, 7.5YR 5/1 (gray) to 7.5YR 4/6 (strong brown), medium plasticity, firm, moist						
24					SS04G	23.5 - 25.0	23.5 - 25.0	1.5	5-5-6
25	25.5	713.7							
26			SANDY LEAN CLAY, CL, 7.5YR 4/1 (dark gray), fine, low plasticity, very soft, moist to wet, decreasing clay content with depth		SS05G	26.0 - 27.5	26.0 - 27.5	1.5	WH-WH-WH
27									
28									
29					SS06G	28.5 - 30.0	28.5 - 30.0	1.5	WR-WR-WH
30									
31									
32					SS07G	31.0 - 32.5	31.0 - 32.5	0.9	WR-WH-1
33									
34	34.6	704.6	Color change to 2.5 Y 6/2 (light brownish gray) at 33.5'		SS08aG	33.5 - 34.6	33.5 - 35.0	1.2	1-4-13
35					SS08bG	34.6 - 35.0			
	35.8	703.4	Sandstone, dark gray to tan, medium grained, soft, completely weathered to highly weathered		SS09G	35.0 - 35.8	35.0 - 35.8	0.5	19-50/4"

Refusal /
Bottom of Hole at 35.8 Ft.

Top of Rock = 34.6 Ft.
Top of Rock Elevation = 704.6 Ft.

Overburden Drilling and Sampling Tools (Type and Size): 3-7/8" (to 21.5' below top of casing) and 5-7/8" Mud Rotary, 2" SS w/o liners, 3" Shelby Tubes.

Horizontal coordinates collected at time of drilling using Trimble Geo7x handheld unit. Surface elevation shown reflects the top of steel casing. Top of casing elevation was measured using automatic level and level rod referenced from temporary benchmark established by TVA. The temporary benchmark referenced for KIF-B11 was set at the SW corner of the KIF-AD-2 concrete pad.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B12**
Client	Tennessee Valley Authority	Boring Location	574,522.10 N; 2,408,318.70 E NAD83
Project Number	175668043	Surface Elevation	739.2 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	2/2/21
Completed	2/3/21		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
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 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	3-7/8" 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	89.8%
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	A. Welshans

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. %
0.0	739.2		Top of Hole						
			Steel casing						
2.8	736.4		Water						
13.6	725.6								
14.5	724.7		SANDY SILT, ML, 7.5YR 3/2 (dark brown), non-plastic, very soft, wet, sediment		SS01aG	13.6 - 14.6	13.6 - 15.1	0.9	WR-WR-WH
					SS01bG	14.6 - 15.1			
16.5	722.7		LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), low to medium plasticity, very soft, wet						
			SANDY LEAN CLAY TRACE GRAVEL, CL, 5YR 6/6 (reddish yellow) to 5YR 6/1 (gray), very fine to fine, low to medium plasticity, very soft to firm, moist		SS02G	16.0 - 17.5	16.0 - 17.5	0.3	WH-WH-WH
					ST01G	18.3 - 20.3	18.3 - 20.3	1.9	NR

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 8/4/21

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B12**
Client: Tennessee Valley Authority
Boring Location: 574,522.10 N; 2,408,318.70 E NAD83
Project Number: 175668043
Surface Elevation: 739.2 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. %
22.5	716.7		SANDY LEAN CLAY TRACE GRAVEL, CL, 5YR 6/6 (reddish yellow) to 5YR 6/1 (gray), very fine to fine, low to medium plasticity, very soft to firm, moist *(Continued)*		ST02G	21.3 - 23.3	21.3 - 23.3	0.9	NR
25.3	713.9		LEAN CLAY WITH SAND, CH, 7.5YR 4/6 (strong brown) with 7.5YR 5/1 (gray), medium plasticity, hard, moist, fine sand		SS03G	23.3 - 24.8	23.3 - 24.8	1.2	8-6-6
29.3	709.9		CLAYEY SILTY SAND, SM, 7.5YR 4/1 (dark gray), very fine to fine, non-plastic to low plasticity, very loose, moist to wet, decreasing clay content with depth		ST03G	25.8 - 27.8	25.8 - 27.8	1.9	NR
					SS04G	27.8 - 29.3	27.8 - 29.3	1.5	WR-WR-WR
32.3	706.9		SILTY SAND, SM, 7.5YR 4/1 (dark gray), very fine to fine, very loose, wet		SS05G	30.3 - 31.8	30.3 - 31.8	1.2	WR-WH-WH
35.3	703.9		POORLY GRADED SAND WITH SILT, SP-SM, 2.5Y 6/2 (light brownish gray), very fine to medium, medium dense, wet		SS06G	32.8 - 34.3	32.8 - 34.3	1.0	1-4-22
35.6	703.6		Auger refusal at 34.8'		SS07aG	34.8 - 35.3	34.8 - 36.3	1.2	4-15-38
36.3	702.9		Sandstone, dark gray to blue green, medium grained, soft, completely weathered		SS07bG	35.3 - 35.6			
			Shale, dark brown to dark gray, very fine grained, very soft, highly weathered, 45° bedding angle		SS07cG	35.6 - 36.3			

No Refusal /
Bottom of Hole at 36.3 Ft.

Top of Rock = 35.3 Ft.
Top of Rock Elevation = 703.9 Ft.

Horizontal coordinates collected at time of drilling using Trimble Geo7x handheld unit. Surface elevation shown reflects the top of steel casing. Top of casing elevation was measured using automatic level and level rod referenced from temporary benchmark established by TVA. The temporary benchmark referenced for KIF-B12 was set at the SW corner of the KIF-AD-2 concrete pad.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B13**
Client	Tennessee Valley Authority	Boring Location	574,919.10 N; 2,408,553.07 E NAD83
Project Number	175668043	Surface Elevation	753.2 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	2/13/21
Completed	2/14/21		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
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 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-5/8" 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	89.8%
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	A. Welshans

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. %
0.0	753.2		Top of Hole						
			Crushed stone		SS01G	0.0 - 1.5	0.0 - 1.5	1.5	8-16-23
2.9	750.3				SS02aG	2.5 - 2.9	2.5 - 4.0	1.5	12-10-14
			CLAYEY SAND, SC, 2.5YR 3/6 (dark red) to 2.5YR 2.5/1 (reddish black), low to medium plasticity, medium dense to dense, moist, moderate organic odor, [FILL] trace bottom ash layers intermixed below 3.6'		SS02bG	2.9 - 4.0			
					SS03G	5.0 - 6.5	5.0 - 6.5	0.8	6-5-8
7.5	745.7								
			GRAVELLY LEAN CLAY, CL, 7.5YR 5/4 (brown) to 7.5YR 3/1 (very dark gray), low plasticity, very hard, moist, weathered shale fill, [FILL]		SS04G	7.5 - 9.0	7.5 - 9.0	1.1	18-13-19
9.5	743.7								
			CLAYEY SAND WITH GRAVEL, SC, 7.5YR 5/4 (brown) to 7.5YR 3/2 (dark brown), low plasticity, very loose to loose, moist to wet, slight organic odor, iron oxide staining, fine to coarse sand, fine gravel, layers of silty to clayey medium-grained gravel up to 6" thick, [FILL]		SS05G	10.0 - 11.5	10.0 - 11.5	1.2	3-3-4
					SS06G	12.5 - 14.0	12.5 - 14.0	0.9	8-7-15
					SS07	15.0 - 16.5	15.0 - 16.5	1.4	1-1-5

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B13**
Client: Tennessee Valley Authority
Boring Location: 574,919.10 N; 2,408,553.07 E NAD83
Project Number: 175668043
Surface Elevation: 753.2 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			CLAYEY SAND WITH GRAVEL, SC, 7.5YR 5/4 (brown) to 7.5YR 3/2 (dark brown), low plasticity, very loose to loose, moist to wet, slight organic odor, iron oxide staining, fine to coarse sand, fine gravel, layers of silty to clayey medium-grained gravel up to 6" thick, [FILL] *(Continued)*		SS08G	17.5 - 19.0	17.5 - 19.0	0.2	10-2-3
19									
20									
21					SS09G	20.0 - 21.5	20.0 - 21.5	0.5	2-1-1
22	22.0	731.2							
23			SANDY LEAN CLAY, CL, 7.5YR 4/1 (dark gray) to 7.5YR 5/6 (strong brown), medium plasticity, very soft, moist, slight organic odor		SS10	22.5 - 24.0	22.5 - 24.0	1.3	1-1-1
24	24.0	729.2							
25			SANDY LEAN CLAY, CL, 7.5YR 5/6 (strong brown), low to medium plasticity, very soft, moist		SS11a	25.0 - 26.0	25.0 - 26.5	1.4	1-1-2
26					SS11bG	26.0 - 26.5			
27	27.0	726.2							
28			SILTY SAND, SM, 7.5YR 4/4 (brown) to 7.5YR 6/3 (light brown), fine to medium, very loose to loose, moist		SS12G	27.5 - 29.0	27.5 - 29.0	1.5	WH-1-2
29									
30									
31					ST01G	30.0 - 32.0	30.0 - 32.0	2.0	NR
32									
33					SS13	32.0 - 33.5	32.0 - 33.5	0.0	2-3-4
34									
35					SS14G	34.5 - 36.0	34.5 - 36.0	1.5	2-3-3
36	36.5	716.7							
37			SILTY SAND, SM, 5YR 5/8 (yellowish red) to 5YR 4/2 (dark reddish gray), fine, loose, moist		SS15G	37.0 - 38.5	37.0 - 38.5	1.4	2-2-3
38									
39	39.0	714.2							
40			SILTY SAND, SM, 7.5YR 4/4 (brown), fine to medium, very loose to loose, moist, trace fine black shale fragments		SS16aG	39.5 - 39.7	39.5 - 41.0	1.5	3-2-1
41					SS16b	39.7 - 41.0			
42									

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B13**
Client: Tennessee Valley Authority
Boring Location: 574,919.10 N; 2,408,553.07 E NAD83
Project Number: 175668043
Surface Elevation: 753.2 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. %
43			SILTY SAND, SM, 7.5YR 4/4 (brown), fine to medium, very loose to loose, moist, trace fine black shale fragments *(Continued)*		SS17	42.0 - 43.5	42.0 - 43.5	1.1	3-4-4
44	44.0	709.2							
44			SILTY GRAVEL WITH SAND, GM, 7.5YR 6/3 (light brown), medium dense, wet, fine to coarse sand, fine to coarse gravel		SS18	44.5 - 46.0	44.5 - 46.0	0.0	21-9-10
45									
46									
47					SS19G	47.0 - 48.5	47.0 - 48.5	0.9	12-9-11
48	48.8	704.4							
49	49.3	703.9	Sandstone, light tan to orange, medium grained, moderately hard, highly weathered		SS20G	48.8 - 50.3	48.8 - 50.3	0.9	17-18-21
50	50.3	702.9	Shale, dark brown to gray, very soft, very thin bedded, highly weathered, 60° bedding angle						

No Refusal /
Bottom of Hole at 50.3 Ft.

Top of Rock = 48.8 Ft.
Top of Rock Elevation = 704.4 Ft.

Mud Rotary began at 17.0' bgs.

Overburden Drilling and Sampling Tools (Type and Size): 4-1/4" HSA (from 0.0' to 17.0' bgs), 4-5/8" 3-Wing Updraft Bit (from 17.0' bgs), 2" SS w/o liners, 3" Shelby Tubes.

Vibrating wire piezometer installed. See KIF-B13 installation detail for backfill information.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B14**
Client	Tennessee Valley Authority	Boring Location	574,839.50 N; 2,408,620.30 E NAD83
Project Number	175668043	Surface Elevation	738.4 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	1/28/21
Completed	1/29/21		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
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 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	3-7/8" 3-wing Updraft Bit, 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	89.8%
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	A. Welshans

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. %
0.0	738.4		Top of Hole						
			Top of casing stickup						
3.0	735.4		Water						
7.4	731.0		SANDY SILT, ML, 7.5YR 4/1 (dark gray) to 7.5YR 4/6 (strong brown), non-plastic to low plasticity, very soft, wet		SS01	7.5 - 9.0	7.5 - 9.2	0.0	WR-WR-WR
9.9	728.5				SS02aG	9.5 - 10.0			
10.7	727.7		POORLY GRADED SAND WITH SILT, SP-SM, 10YR 5/2 (grayish brown), fine to medium, very loose, wet		SS02bG	10.0 - 10.8	9.5 - 11.8	1.5	1-1-1
					SS02cG	10.8 - 11.8			
			SILTY SAND, SM, 7.5YR 4/4 (brown), fine to medium, very loose to loose, moist, poorly graded		SS03G	12.0 - 13.5	12.0 - 13.5	0.9	2-1-1
					SS04G	14.5 - 16.0	14.5 - 16.0	1.5	3-2-4
16.4	722.0								
			SILTY SAND, SM, 10YR 7/2 (light gray) and 5YR 4/6 (yellowish red), fine to medium, medium dense, moist		SS05G	17.0 - 18.5	17.0 - 18.5	1.1	4-7-7
18.9	719.5								

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 8/4/21

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B14**
Client: Tennessee Valley Authority
Boring Location: 574,839.50 N; 2,408,620.30 E NAD83
Project Number: 175668043
Surface Elevation: 738.4 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. %
19			CLAYEY SILTY SAND, SM, 7.5YR 4/4 (brown), fine to medium, very loose, moist *(Continued)*						
20					SS06G	19.5 - 21.0	19.5 - 21.0	1.5	1-1-1
21									
22									
22.9	715.5				SS07	22.0 - 23.5	22.0 - 23.5	0.0	1-1-2
23			SILTY SAND TRACE GRAVEL, SM, 7.5YR 5/8 (strong brown), fine, very loose to loose, wet						
24									
25					SS08G	24.5 - 26.0	24.5 - 26.0	1.3	1-2-2
26									
27									
28					SS09G	27.0 - 28.5	27.0 - 28.5	0.8	11-4-3
29									
29.8	708.6				SS10aG	29.5 - 29.8			
30			SILTY SAND WITH GRAVEL, SM, 7.5YR 6/3 (light brown), medium to coarse, dense to very dense, wet, fine to coarse sand, fine to coarse gravel		SS10bG	29.8 - 31.0	29.5 - 31.0	1.3	13-13-32
31									
32									
33					SS11G	32.0 - 33.5	32.0 - 33.5	1.2	26-40-31
34									
35					SS12aG	34.5 - 35.5	34.5 - 36.0	1.5	16-24-50
35.5	702.9								
36.0	702.4		Shale, dark brown to gray, very soft, very thin bedded, highly weathered		SS12bG	35.5 - 36.0			

Refusal /
Bottom of Hole at 36.0 Ft.

Top of Rock = 35.5 Ft.
Top of Rock Elevation = 702.9 Ft.

Horizontal coordinates collected at time of drilling using Trimble Geo7x handheld unit. Surface elevation shown reflects the top of steel casing. Top of casing elevation was measured using automatic level and level rod referenced from temporary benchmark established by TVA. The temporary benchmark referenced for KIF-B14 was set at the NE corner of the KIF-105 concrete pad.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B15**
Client	Tennessee Valley Authority	Boring Location	574,817.30 N; 2,408,631.80 E NAD83
Project Number	175668043	Surface Elevation	739.1 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	1/29/21
Completed	1/30/21		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
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 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	3-7/8" 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	89.8%
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	A. Welshans

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. %
0.0	739.1		Top of Hole						
			Steel casing						
2.9	736.2		Water						
11.5	727.6								
12.1	727.0		SILT WITH SAND, ML, 10YR 4/2 (dark grayish brown), non-plastic, very soft, wet		SS01aG	11.5 - 12.1	11.5 - 13.5	1.2	WR-WR-WH
			SANDY LEAN CLAY, CL, 2.5Y 4/4 (olive brown), low plasticity, very soft, wet		SS01bG	12.1 - 13.5			
14.5	724.6		CLAYEY SAND, SC, 5YR 6/6 (reddish yellow) to 5YR 6/1 (gray), very fine to fine, low plasticity, loose, moist		ST01G	14.5 - 16.5	14.5 - 16.5	1.9	150
16.5	722.6		SILTY SAND TRACE CLAY, SM, 7.5YR 6/4 (light brown), very fine to fine, loose, moist		SS02G	16.5 - 18.0	16.5 - 18.0	1.2	1-3-3

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B15**
Client: Tennessee Valley Authority
Boring Location: 574,817.30 N; 2,408,631.80 E NAD83
Project Number: 175668043
Surface Elevation: 739.1 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			SILTY SAND TRACE CLAY, SM, 7.5YR 6/4 (light brown), very fine to fine, loose, moist *(Continued)*						
19									
20					SS03G	19.0 - 20.5	19.0 - 20.5	1.0	3-4-3
21	21.0	718.1							
	21.8	717.3	SANDY LEAN CLAY, CL, 7.5YR 4/4 (brown), low plasticity, very soft, moist		SS04aG	21.5 - 21.8	21.5 - 23.0	1.1	WR-1-1
22			SILTY SAND, SM, 7.5YR 5/1 (gray), very fine to medium, very loose, moist		SS04bG	21.8 - 23.0			
23									
24									
25					SS05G	24.0 - 25.5	24.0 - 25.5	1.4	1-1-1
26	26.0	713.1							
27			SILTY SAND TRACE GRAVEL, SM, 7.5YR 5/8 (strong brown), fine to medium, loose, wet		SS06G	26.5 - 28.0	26.5 - 28.0	0.9	3-1-4
28									
29									
	29.8	709.3			SS07aG	29.0 - 29.8	29.0 - 30.5	1.2	8-29-19
30	30.5	708.6	SANDY POORLY GRADED GRAVEL TRACE SILT, GP, 7.5YR 6/3 (light brown), coarse, dense, wet		SS07bG	29.8 - 30.5			
31	31.1	708.0	Sandstone, moderately hard, highly weathered						

Refusal /
Bottom of Hole at 31.1 Ft.

Top of Rock = 30.5 Ft.
Top of Rock Elevation = 708.6 Ft.

Mud-rotary refusal at 30.5 feet btoc. Boring advanced using a 3-7/8 inch roller bit.

Horizontal coordinates collected at time of drilling using Trimble Geo7x handheld unit. Surface elevation shown reflects the top of steel casing. Top of casing elevation was measured using automatic level and level rod referenced from temporary benchmark established by TVA. The temporary benchmark referenced for KIF-B15 was set at the NE corner of the KIF-105 concrete pad.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B16**
Client	Tennessee Valley Authority	Boring Location	574,797.40 N; 2,408,648.30 E NAD83
Project Number	175668043	Surface Elevation	738.5 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	1/31/21
		Completed	1/31/21
Project Location	Harriman, Tennessee	Depth to Water	N/A
		Date/Time	N/A
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 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	3-7/8" 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	89.8%
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	A. Welshans

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. %
0.0	738.5		Top of Hole						
			Casing Stickup						
2.9	735.6		Water						
12.0	726.5								
12.5	726.0		SILT WITH SAND, ML, 10YR 4/2 (dark grayish brown), non-plastic, very soft, wet		SS01aG	12.0 - 12.5	12.0 - 13.5	0.9	WR-WR-WH
					SS01bG	12.5 - 13.5			
			SANDY LEAN CLAY, CL, 2.5Y 3/3 (dark olive brown), low to medium plasticity, very soft, wet						
15.5	723.0						14.5 - 16.5		
			SILTY SAND, SM, 5YR 6/6 (reddish yellow) to 5YR 6/1 (gray), very fine to fine, low plasticity, very loose, moist		ST01G	14.5 - 16.5		1.9	150
					SS02G	16.5 - 18.0	16.5 - 18.0	1.1	WR-1-2

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 8/4/21

SUBSURFACE LOG

Client Borehole ID N/A | Stantec Boring No. **KIF-B16**

Client Tennessee Valley Authority | Boring Location 574,797.40 N; 2,408,648.30 E NAD83

Project Number 175668043 | Surface Elevation 738.5 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									
18.5	720.0								
19			SILTY SAND TRACE CLAY, SM, 7.5YR 6/4 (light brown), very fine to fine, loose, moist						
20					SS03G	19.0 - 20.5	19.0 - 20.5	1.1	1-3-4
21									
22					SS04aG	21.5 - 22.3	21.5 - 23.0	1.4	1-1-1
22.3	716.2								
23			SILTY SAND, SM, 7.5YR 5/1 (gray), very fine to medium, very loose, moist		SS04bG	22.3 - 23.0			
24									
25					SS05G	24.0 - 25.5	24.0 - 25.5	1.0	WH-WH-4
26.0	712.5								
26			SILTY SAND WITH GRAVEL, SM, 7.5YR 5/4 (brown), fine to medium, loose, wet						
27					SS06G	26.5 - 28.0	26.5 - 28.0	0.9	1-3-1
28									
29.0	709.5								
29					SS07G	29.0 - 29.3	29.0 - 29.3	0.3	50/4"
29.3	709.2		Sandstone, light tan to orange, medium grained, moderately hard, highly weathered						

No Refusal /
Bottom of Hole at 29.3 Ft.

Horizontal coordinates collected at time of drilling using Trimble Geo7x handheld unit. Surface elevation shown reflects the top of steel casing. Top of casing elevation was measured using automatic level and level rod referenced from temporary benchmark established by TVA. The temporary benchmark referenced for KIF-B16 was set at the NE corner of the KIF-105 concrete pad.

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

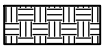
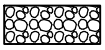
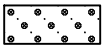
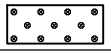
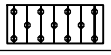
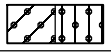
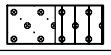
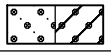
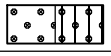
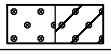
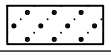
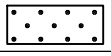
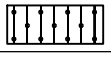
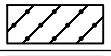
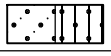
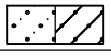
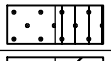
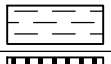
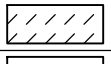
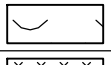
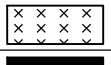
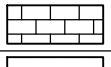
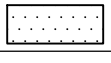
APPENDIX B.3

TEMPORARY WELLS

Table of Contents

Subsurface Boring Legend

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.

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B01a**
Client	Tennessee Valley Authority	Boring Location	576,069.92 N; 2,407,677.68 E NAD83
Project Number	175668043	Surface Elevation	771.3 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	12/2/19
		Completed	12/2/19
Project Location	Harriman, 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	Hawkston	Drill Rig Type and ID	Geoprobe 3230DT
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	No Coring		
Overdrill Tooling (Type and Size)	NA	Overdrill Depth	N/A
Sampler Hammer Type	No SPT	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	M. Aplin

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. %
0.0	771.3		Top of Hole					
			No sampling conducted from 0.0' to 35.0', boring advanced through this interval using DPT with closed tip. Refer to boring log for KIF-TW01 for 0.0' through 35.0'.					

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B01a**
Client: Tennessee Valley Authority
Boring Location: 576,069.92 N; 2,407,677.68 E NAD83
Project Number: 175668043
Surface Elevation: 771.3 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. %
			No sampling conducted from 0.0' to 35.0', boring advanced through this interval using DPT with closed tip. Refer to boring log for KIF-TW01 for 0.0' through 35.0'. *(Continued)*					
35.0	736.3		SILT, ML, 5Y 4/1 (dark gray) to 5Y 3/1 (very dark gray), non-plastic, soft to very soft, moist to wet, no odor, no staining, [CCR]		DP01aG	35.0 - 36.5		
				36.5/38.5-20191203	DP01bE	36.5 - 38.5	5.0	N/A
					DP01cG	38.5 - 40.0		
					DP02aG	40.0 - 41.5		

35.0 - 40.0

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B01a**
Client: Tennessee Valley Authority
Boring Location: 576,069.92 N; 2,407,677.68 E NAD83
Project Number: 175668043
Surface Elevation: 771.3 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. %
43			SILT, ML, 5Y 4/1 (dark gray) to 5Y 3/1 (very dark gray), non-plastic, soft to very soft, moist to wet, no odor, no staining, [CCR] *(Continued)*	41.5/43.5-20191203	DP02bE	41.5 - 43.5	40.0 - 45.0	5.0	N/A
44					DP02cG	43.5 - 45.0			
45					DP03a	45.0 - 46.5			
46				46.5/48.5-20191203					
47					DP03bE	46.5 - 48.5	45.0 - 50.0	5.0	N/A
48									
49					DP03c	48.5 - 49.8			
	49.8	721.5			DP03dG	49.8 - 50.0			
50			LEAN CLAY, CL, 5Y 3/1 (very dark gray), medium plasticity, firm to soft, moist to wet, moderate organic odor, no staining		DP04aG	50.0 - 51.3			
51	51.3	720.0							
52			SANDY SILT, ML, 5Y 5/1 (gray), low plasticity, soft, moist to wet, moderate organic odor, sand increases with depth, clay decreases with depth		DP04bG	51.3 - 53.0	50.0 - 55.0	5.0	N/A
	53.0	718.3							
53	53.7	717.6	WELL GRADED SAND, SW, 5Y 3/1 (very dark gray), very fine to medium, loose, moist to wet, moderate organic odor		DP04cG	53.0 - 53.7			
54					DP04dG	53.7 - 55.0			
	55.0	716.3	LEAN CLAY, CL, 7.5YR 6/4 (light brown) to 7.5YR 6/1 (gray), medium plasticity, firm, dry to moist, mottled gray						
55			No Refusal / Bottom of Hole at 55.0 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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B01b**
Client	Tennessee Valley Authority	Boring Location	576,072.41 N; 2,407,677.12 E NAD83
Project Number	175668043	Surface Elevation	771.3 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	12/3/19
		Completed	12/3/19
Project Location	Harriman, 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	Hawkston	Drill Rig Type and ID	Geoprobe 3230DT
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	No Coring		
Overdrill Tooling (Type and Size)	NA	Overdrill Depth	N/A
Sampler Hammer Type	No SPT	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	M. Aplin

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. %
0.0	771.3		Top of Hole					
			No sampling conducted from 0.0' to 35.0', boring advanced through this interval using DPT with closed tip. Refer to boring log for KIF-TW01 for 0.0' through 35.0'.					

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B01b**
Client: Tennessee Valley Authority
Boring Location: 576,072.41 N; 2,407,677.12 E NAD83
Project Number: 175668043
Surface Elevation: 771.3 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			No sampling conducted from 0.0' to 35.0', boring advanced through this interval using DPT with closed tip. Refer to boring log for KIF-TW01 for 0.0' through 35.0'. *(Continued)*					
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35.0	736.3							
35			SILT, ML, 5Y 4/1 (dark gray) to 5Y 3/1 (very dark gray), non-plastic, soft to very soft, moist to wet, no odor, no staining, [CCR]		DP01a	35.0 - 36.5		
36								
37					DP01bE	36.5 - 38.5	5.0	N/A
38								
39					DP01c	38.5 - 40.0		
40								
41					DP02a	40.0 - 41.5		
42								

36.5/38.5-20191203

35.0 - 40.0

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B01b**
Client: Tennessee Valley Authority
Boring Location: 576,072.41 N; 2,407,677.12 E NAD83
Project Number: 175668043
Surface Elevation: 771.3 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. %
43			SILT, ML, 5Y 4/1 (dark gray) to 5Y 3/1 (very dark gray), non-plastic, soft to very soft, moist to wet, no odor, no staining, [CCR] *(Continued)*	41.5/43.5-20191203	DP02bE	41.5 - 43.5	40.0 - 45.0	5.0	N/A
44					DP02c	43.5 - 45.0			
45					DP03a	45.0 - 46.5			
46									
47				46.5/48.5-20191203	DP03bE	46.5 - 48.5	45.0 - 50.0	5.0	N/A
48									
49					DP03c	48.5 - 49.8			
50					DP03d	49.8 - 50.0			
51	51.4	719.9			DP04aG	50.0 - 51.4	50.0 - 52.5	2.5	N/A
52	52.3	719.0	LEAN CLAY, CL, 5Y 3/1 (very dark gray), medium plasticity, firm to soft, moist to wet, moderate organic odor, no staining, weak cementation		DP04b	51.4 - 52.5			
53	52.5	718.8	SANDY SILT, ML, 5Y 5/1 (gray), low plasticity, soft, moist to wet, moderate organic odor		DP05a	52.5 - 54.2	52.5 - 55.0	2.5	N/A
54	54.2	717.1	WELL GRADED SAND, SW, 5Y 3/1 (very dark gray), very fine to coarse, loose, moist to wet, moderate organic odor						
55	55.0	716.3	LEAN CLAY, CL, 7.5YR 6/4 (light brown) to 7.5YR 6/1 (gray), medium plasticity, firm, dry to moist, mottled gray, expanding clay		DP05b	54.2 - 55.0			
			No Refusal / Bottom of Hole at 55.0 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

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B02a**
Client	Tennessee Valley Authority	Boring Location	575,556.85 N; 2,407,609.96 E NAD83
Project Number	175668043	Surface Elevation	772.3 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	12/3/19
		Completed	12/4/19
Project Location	Harriman, 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	Hawkston	Drill Rig Type and ID	Geoprobe 3230DT
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	No Coring		
Overdrill Tooling (Type and Size)	NA	Overdrill Depth	N/A
Sampler Hammer Type	No SPT	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	M. Aplin

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. %
0.0	772.3		Top of Hole					
			No sampling conducted from 0.0 to 35.0', boring advanced through this interval using DPT with closed tip. Refer to boring log KIF-TW02 for 0.0 - 35.0' details.					

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B02a**
Client: Tennessee Valley Authority
Boring Location: 575,556.85 N; 2,407,609.96 E NAD83
Project Number: 175668043
Surface Elevation: 772.3 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. %
18–34			No sampling conducted from 0.0 to 35.0', boring advanced through this interval using DPT with closed tip. Refer to boring log KIF-TW02 for 0.0 - 35.0' details. *(Continued)*					
35.0	737.3							
35–40			SILTY POORLY GRADED SAND WITH GRAVEL, SP, 5Y 2.5/1 (black), very fine, medium dense to dense, moist to wet, no odor, no staining, [CCR]		DP01G	35.0 - 40.0	5.0	N/A
40.0	732.3							
40–42			GRAVELLY POORLY GRADED SAND, SP, 5Y 3/1 (very dark gray), very fine to fine, loose to medium dense, moist to wet, [CCR]		DP02aG	40.0 - 41.0		

35.0 - 40.0

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B02a**
Client: Tennessee Valley Authority
Boring Location: 575,556.85 N; 2,407,609.96 E NAD83
Project Number: 175668043
Surface Elevation: 772.3 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. %
43.0	729.3				DP02bE	41.0 - 44.0	40.0 - 45.0	5.0	N/A
			SILT WITH SAND, ML, 5Y 3/1 (very dark gray), non-plastic, firm to hard, wet, [CCR]		DP02cG	44.0 - 45.0			
					DP03aG	45.0 - 46.5			
					DP03bE	46.5 - 48.5	45.0 - 50.0	5.0	N/A
					DP03cG	48.5 - 50.0			
					DP04a	50.0 - 50.7			
					DP04bE	50.7 - 52.3			
52.7	719.6				DP04c	52.3 - 52.7	50.0 - 55.0	5.0	N/A
			LEAN CLAY, CL, 10GY 5/1 (greenish gray) and 2.5Y 3/1 (very dark gray), low to medium plasticity, firm to hard, moist to dry, moderate organic odor		DP04dG	52.7 - 55.0			
			Color grades to 10Y 5/1 (greenish gray) mottled with 2.5Y 5/4 (light olive brown) by 55.0'		DP05G	55.0 - 57.5	55.0 - 57.5	2.5	N/A
57.5	714.8								

41.0/44.0-20191204
46.5/48.5-20191204
50.7/52.3-20191204

No Refusal /
Bottom of Hole at 57.5 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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B02b**
Client	Tennessee Valley Authority	Boring Location	575,555.09 N; 2,407,613.60 E NAD83
Project Number	175668043	Surface Elevation	772.5 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	12/4/19
		Completed	12/4/19
Project Location	Harriman, 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	Hawkston	Drill Rig Type and ID	Geoprobe 3230DT
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	No Coring		
Overdrill Tooling (Type and Size)	NA	Overdrill Depth	N/A
Sampler Hammer Type	No SPT	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	M. Aplin

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. %
0.0	772.5		Top of Hole					
			No sampling conducted from 0.0 to 35.0', boring advanced through this interval using DPT with closed tip. Refer to boring log KIF-TW02 for 0.0 - 35.0' details.					

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B02b**
Client: Tennessee Valley Authority
Boring Location: 575,555.09 N; 2,407,613.60 E NAD83
Project Number: 175668043
Surface Elevation: 772.5 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. %
			No sampling conducted from 0.0 to 35.0', boring advanced through this interval using DPT with closed tip. Refer to boring log KIF-TW02 for 0.0 - 35.0' details. *(Continued)*					
35.0	737.5							
			POORLY GRADED SAND WITH GRAVEL, SP, 5Y 2.5/1 (black), fine to medium, medium dense to dense, moist to wet, no odor, no staining, [CCR]		DP01aG	35.0 - 36.0	2.5	N/A
					DP01bE	36.0 - 37.5		
37.5	735.0							
			POORLY GRADED SAND, SP, 5Y 3/1 (very dark gray), very fine to fine, moist to wet, [CCR]		DP02aE	37.5 - 39.0	2.5	N/A
					DP02bG	39.0 - 40.0		
					DP03aG	40.0 - 41.0		

36.0/39.0-20191204

35.0 - 37.5

37.5 - 40.0

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B02b**
Client: Tennessee Valley Authority
Boring Location: 575,555.09 N; 2,407,613.60 E NAD83
Project Number: 175668043
Surface Elevation: 772.5 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. %
43.0	729.5			41.0/44.0-20191204	DP03bE	41.0 - 44.0	40.0 - 45.0	5.0	N/A
			SILT WITH SAND, ML, 5Y 3/1 (very dark gray), non-plastic, firm to hard, wet, [CCR]		DP03cG	44.0 - 45.0			
					DP04aG	45.0 - 46.5			
				46.5/48.5-20191204	DP04bE	46.5 - 48.5	45.0 - 50.0	5.0	N/A
					DP04cG	48.5 - 50.0			
					DP05a	50.0 - 50.7			
				50.7/52.3-20191204	DP05bE	50.7 - 52.3	50.0 - 52.5	2.5	N/A
52.3	720.2				DP05cG	52.3 - 52.5			
			LEAN CLAY, CL, 10GY 5/1 (greenish gray) and 2.5Y 3/1 (very dark gray), low to medium plasticity, firm to hard, moist to dry, moderate organic odor		DP06G	52.5 - 55.0	52.5 - 55.0	2.5	N/A
			Color grades to 10Y 5/1 (greenish gray) mottled with 2.5Y 5/4 (light olive brown) by 55.0'		DP07G	55.0 - 57.5	55.0 - 57.5	2.5	N/A
57.5	715.0								
			No Refusal / Bottom of Hole at 57.5 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

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B03a**
Client	Tennessee Valley Authority	Boring Location	575,720.46 N; 2,408,236.12 E NAD83
Project Number	175668043	Surface Elevation	776.3 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	12/5/19
Completed	12/5/19		
Project Location	Harriman, 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	Hawkston	Drill Rig Type and ID	Geoprobe 3230DT
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	No Coring		
Overdrill Tooling (Type and Size)	NA	Overdrill Depth	N/A
Sampler Hammer Type	No SPT	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	M. Aplin

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. %
0.0	776.3		Top of Hole					
			No sampling conducted from 0.0 to 40.0', boring advanced through this interval using DPT with closed tip. Refer to boring log KIF-TW03 for 0.0 - 40.0' details.					

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B03a**
Client: Tennessee Valley Authority
Boring Location: 575,720.46 N; 2,408,236.12 E NAD83
Project Number: 175668043
Surface Elevation: 776.3 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. %
19			No sampling conducted from 0.0 to 40.0', boring advanced through this interval using DPT with closed tip. Refer to boring log KIF-TW03 for 0.0 - 40.0' details. *(Continued)*					
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40	40.0	736.3						
41			SILT, ML, 5Y 2.5/1 (black), non-plastic, hard to very hard, moist to wet, [CCR]		DP01aG	40.0 - 41.5		
42				41.5/43.5-20191205				
43					DP01bE	41.5 - 43.5	5.0	N/A
44					DP01cG	43.5 - 45.0		

40.0 - 45.0

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B03a**
Client: Tennessee Valley Authority
Boring Location: 575,720.46 N; 2,408,236.12 E NAD83
Project Number: 175668043
Surface Elevation: 776.3 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. %
45			SILT, ML, 5Y 2.5/1 (black), non-plastic, hard to very hard, moist to wet, [CCR] *(Continued)*		DP02aG	45.0 - 46.5		
46								
47				46.5/48.5-20191205	DP02bE	46.5 - 48.5	5.0	N/A
48								
49					DP02cG	48.5 - 50.0		
50					DP03aG	50.0 - 51.5		
51								
52				51.5/53.5-20191205	DP03bE	51.5 - 53.5	5.0	N/A
53								
54	54.5	721.8			DP03cG	53.5 - 54.5		
					DP03dG	54.5 - 55.0		
55			SANDY SILT, ML, 10Y 3/2 (very dark grayish olive) to N 7/ (light gray), low plasticity, hard to very hard, moist, slight organic odor					
56					DP04G	55.0 - 57.5	2.5	N/A
57								
58	58.2	718.1			DP05aG	57.5 - 58.2		
			POORLY GRADED SAND, SP, 5Y 7/1 (light gray), very fine, very loose, wet		DP05bG	58.2 - 59.2	2.5	N/A
59	59.2	717.1						
	60.0	716.3	CLAYEY SAND, SC, 2.5Y 8/1 (white) with 2.5Y 5/4 (light olive brown), very fine to fine, very dense to medium dense, moist		DP05cG	59.2 - 60.0		
60			No Refusal / Bottom of Hole at 60.0 Ft.					

45.0 - 50.0
50.0 - 55.0
55.0 - 57.5
57.5 - 60.0

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 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B03b**
Client	Tennessee Valley Authority	Boring Location	575,718.86 N; 2,408,238.19 E NAD83
Project Number	175668043	Surface Elevation	776.5 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	12/5/19
		Completed	12/5/19
Project Location	Harriman, 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	Hawkston	Drill Rig Type and ID	Geoprobe 3230DT
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	No Coring		
Overdrill Tooling (Type and Size)	NA	Overdrill Depth	N/A
Sampler Hammer Type	No SPT	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	M. Aplin

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. %
0.0	776.5		Top of Hole					
			No sampling conducted from 0.0 to 40.0', boring advanced through this interval using DPT with closed tip. Refer to boring log KIF-TW03 for 0.0 - 40.0' details.					

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B03b**
Client: Tennessee Valley Authority
Boring Location: 575,718.86 N; 2,408,238.19 E NAD83
Project Number: 175668043
Surface Elevation: 776.5 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. %
19–39			No sampling conducted from 0.0 to 40.0', boring advanced through this interval using DPT with closed tip. Refer to boring log KIF-TW03 for 0.0 - 40.0' details. *(Continued)*					
40.0	736.5		SILT, ML, 5Y 2.5/1 (black), non-plastic, hard to very hard, moist to wet, no odor, grain size decreases with depth, [CCR]		DP01aG	40.0 - 41.5		
				41.5/43.5-20191205	DP01bE	41.5 - 43.5	5.0	N/A
					DP01cG	43.5 - 45.0		

40.0 - 45.0

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B03b**
Client: Tennessee Valley Authority
Boring Location: 575,718.86 N; 2,408,238.19 E NAD83
Project Number: 175668043
Surface Elevation: 776.5 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. %
45			SILT, ML, 5Y 2.5/1 (black), non-plastic, hard to very hard, moist to wet, no odor, grain size decreases with depth, [CCR] *(Continued)*		DP02aG	45.0 - 46.5		
46								
47				46.5/48.5-20191205	DP02bE	46.5 - 48.5	5.0	N/A
48								
49					DP02cG	48.5 - 50.0		
50								
51					DP03aG	50.0 - 51.5		
52				51.5/53.5-20191205				
53					DP03bE	51.5 - 53.5	5.0	N/A
54	54.5	722.0			DP03cG	53.5 - 54.5		
55			SANDY SILT, ML, 10Y 3/2 (very dark grayish olive) to N 7/ (light gray), low plasticity, hard to very hard, moist, slight organic odor		DP03dG	54.5 - 55.0		
56					DP04G	55.0 - 57.5	2.5	N/A
57								
58								
59					DP05G	57.5 - 60.0	2.5	N/A
60	60.0	716.5	Heavily iron stained 10YR 4/4 (dark yellowish brown) from 59.6' to 60.0'.					
			No Refusal / Bottom of Hole at 60.0 Ft.					

45.0 - 50.0
50.0 - 55.0
55.0 - 57.5
57.5 - 60.0

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 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-B04a**
Client	Tennessee Valley Authority	Boring Location	574,774.09 N; 2,407,874.27 E NAD83
Project Number	175668043	Surface Elevation	765.5 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	12/5/19
		Completed	12/5/19
Project Location	Harriman, 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	Hawkston	Drill Rig Type and ID	Geoprobe 3230DT
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	No Coring		
Overdrill Tooling (Type and Size)	NA	Overdrill Depth	N/A
Sampler Hammer Type	No SPT	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Musselman	Approved By	M. Aplin

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. %
0.0	765.5		Top of Hole					
0			No sampling conducted from 0.0 to 35.0', boring advanced through this interval using DPT with closed tip. Refer to boring log KIF-TW04 for 0.0 - 35.0' details.					
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B04a**
Client: Tennessee Valley Authority
Boring Location: 574,774.09 N; 2,407,874.27 E NAD83
Project Number: 175668043
Surface Elevation: 765.5 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. %
			No sampling conducted from 0.0 to 35.0', boring advanced through this interval using DPT with closed tip. Refer to boring log KIF-TW04 for 0.0 - 35.0' details. *(Continued)*					
35.0	730.5							
			POORLY GRADED SAND, SP, 10B 2.5/1 (bluish black), very fine, very loose, wet, poorly graded, [CCR]		DP01aG	35.0 - 36.5		
					DP01bE	36.5 - 38.5	5.0	N/A
					DP01cG	38.5 - 40.0		
40.0	725.5							
			SILT, ML, 10B 2.5/1 (bluish black), non-plastic, firm, wet, poorly graded, [CCR]		DP02aG	40.0 - 41.5		

36.5/38.5-20191205

35.0 - 40.0

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-B04a**
Client: Tennessee Valley Authority
Boring Location: 574,774.09 N; 2,407,874.27 E NAD83
Project Number: 175668043
Surface Elevation: 765.5 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. %
43			Minimal coarse angular gravel at 42.0' SILT, ML, 10B 2.5/1 (bluish black), non-plastic, firm, wet, poorly graded, [CCR] *(Continued)*		DP02bE	41.5 - 43.5	40.0 - 45.0	5.0	N/A
44	44.0	721.5			DP02cG	43.5 - 44.0			
45	45.0	720.5	LEAN CLAY, CL, 10B 2.5/1 (bluish black), very soft, wet, moderate organic odor		DP02dG	44.0 - 45.0			
46			LEAN CLAY, CL, 5Y 6/2 (light olive gray) to 5Y 5/2 (olive gray), firm to hard, moist to wet, moderate organic odor, iron oxide staining, color and moisture content change with depth, mottled 7.5YR 4/4 (brown)		DP03G	45.0 - 47.5	45.0 - 47.5	2.5	N/A
48									
49					DP04G	47.5 - 50.0	47.5 - 50.0	2.5	N/A
50	50.0	715.5	No Refusal / Bottom of Hole at 50.0 Ft.						

41.5/43.5-20191205

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 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 3/18/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TW01**
Client	Tennessee Valley Authority	Boring Location	576,050.03 N; 2,407,660.05 E NAD83
Project Number	175668043	Surface Elevation	771.8 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	1/24/19
		Completed	1/28/19
Project Location	Harriman, Tennessee	Depth to Water	15.5 ft
		Date/Time	1/25/19 09:05
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Stantec Consulting Services Inc.	Drill Rig Type and ID	CME 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	8-1/4" HSA overdrill of boring	Overdrill Depth	44.0 ft
Sampler Hammer Type	Automatic	Weight	140
Drop	30	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	E. Smith	Approved By	L. Price

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. %
0.0	771.8		Top of Hole						
0.3	771.5		Top Soil, [FILL]		SS01G	0.0 - 1.5	0.0 - 1.5	1.2	2-3-8
1.9	769.9		FAT CLAY, CH, 5YR 4/6 (yellowish red), high plasticity, firm, with sand and interbedded chert pebbles, [FILL]		SS02aG	1.5 - 1.9			
				2.0/4.0-20190124	SS02b	1.9 - 2.0	1.5 - 3.0	1.5	9-16-19
			SANDY SILT, ML, 5Y 4/1 (dark gray), non-plastic, firm, dry, [CCR]		SS02cE	2.0 - 3.0			
					SS03aE	3.0 - 4.0	3.0 - 4.5	1.5	11-15-18
					SS03bG	4.0 - 4.5			
					SS04aG	4.5 - 5.5	4.5 - 6.0	1.3	19-42-17
5.5	766.3								
6.0	765.8		WELL GRADED GRAVEL, GW, 10YR 6/1 (gray), dense, riprap, limestone, [FILL]		SS04bG	5.5 - 6.0			
6.5	765.3				SS05aG	6.0 - 6.5			
7.0	764.8		SILT, ML, 5Y 4/1 (dark gray), low plasticity, firm, dry, [CCR]		SS05bG	6.5 - 7.0	6.0 - 7.5	1.5	5-6-31
				7.0/9.0-20190124	SS05cE	7.0 - 7.5			
			FAT CLAY, CH, 7.5YR 4/4 (brown), high plasticity, firm, moist, [FILL]		SS06E	7.5 - 9.0	7.5 - 9.0	1.5	23-32-35
			SILT, ML, 5Y 4/1 (dark gray), low plasticity, hard, dry, [CCR]		SS07aG	9.0 - 9.5			
					SS07bG	9.5 - 10.0	9.0 - 10.5	1.5	7-25-48
					SS07cG	10.0 - 10.5			
					SS08aG	10.5 - 11.5	10.5 - 12.0	1.5	17-24-19
11.8	760.0								
12.0	759.8		FAT CLAY, CH, 7.5YR 4/4 (brown), high plasticity, firm, moist, [FILL]	11.5/13.5-20190124	SS08bE	11.5 - 12.0			
					SS09E	12.0 - 13.5	12.0 - 13.5	1.5	8-11-14
13.5	758.3		SILT, ML, 5Y 4/1 (dark gray), low plasticity, firm, dry, [CCR]						
			SILTY SAND, SM, 10YR 3/1 (very dark gray), medium dense, moist, [CCR]		SS10G	13.5 - 15.0	13.5 - 15.0	1.5	12-11-11
			Wet at 15.5'		SS11G	15.0 - 16.5	15.0 - 16.5	1.5	9-9-6
			Very loose at 16.5'	16.5/18.5-20190125	SS12E	16.5 - 18.0	16.5 - 18.0	1.5	3-2-3

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 4/9/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-TW01**
Client: Tennessee Valley Authority
Boring Location: 576,050.03 N; 2,407,660.05 E NAD83
Project Number: 175668043
Surface Elevation: 771.8 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			SILTY SAND, SM, 10YR 3/1 (very dark gray), medium dense, moist, [CCR] *(Continued)*		SS13aE	18.0 - 18.5	18.0 - 19.5	1.5	2-1-2
19					SS13bG	18.5 - 19.5			
20					ST01G	19.5 - 21.5	19.5 - 21.5	0.0	NR
21									
22				21.5/23.5-20190128	SS15E	21.5 - 22.5	21.5 - 22.5	1.0	3-3
23					SS16aE	22.5 - 23.5	22.5 - 24.0	1.5	2-2-3
24					SS16bG	23.5 - 24.0			
25					ST02G	24.0 - 26.0	24.0 - 26.0	0.0	NR
26	26.0	745.8			SS18a	26.0 - 26.5	26.0 - 27.0	0.7	WH-2-4
27			SILTY SAND WITH GRAVEL, SM, 5YR 2.5/1 (black), coarse, very loose, wet, [CCR]	26.5/28.5-20190128	SS18bE	26.5 - 27.0			
28					SS19E	27.0 - 28.5	27.0 - 28.5	1.5	2-5-7
29					SS20G	28.5 - 30.0	28.5 - 30.0	1.5	5-5-5
30					SS21aG	30.0 - 30.5			
31	31.0	740.8			SS21b	30.5 - 31.0	30.0 - 31.5	1.2	4-4-4
32	32.0	739.8	SILTY SAND, SM, 5YR 2.5/1 (black), fine to medium, loose, wet, [CCR]		SS21cG	31.0 - 31.5			
33	33.0	738.8	WELL GRADED SAND, SW, 5YR 2.5/1 (black), coarse, very loose, wet, [CCR]	31.5/33.5-20190128	SS22E	31.5 - 33.0	31.5 - 33.0	1.5	3-3-6
34			SILTY SAND, SM, 5YR 2.5/1 (black), fine to medium, very loose, wet, [CCR]		SS23aE	33.0 - 33.5	33.0 - 34.5	1.5	3-5-5
35					SS23bG	33.5 - 34.5			
36					SS24G	34.5 - 36.0	34.5 - 36.0	1.5	1-3-5
37				36.5/38.5-20190128	SS25aG	36.0 - 36.5	36.0 - 37.5	1.5	2-4-9
38					SS25bE	36.5 - 37.5			
39	38.8	733.0			SS26aE	37.5 - 38.5	37.5 - 39.0	1.5	10-7-8
40	40.5	731.3	SILT, ML, 7.5YR 3/1 (very dark gray), non-plastic, very loose, wet, [CCR]		SS26bG	38.5 - 39.0			
41	41.5	730.3	SILTY SAND, SM, 5YR 3/1 (very dark gray), very loose, wet, [CCR]		SS27G	39.0 - 40.5	39.0 - 40.5	1.5	1-1-1
42					SS28G	40.5 - 42.0	40.5 - 42.0	1.5	1-2-1

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-TW01**
Client Tennessee Valley Authority
Boring Location 576,050.03 N; 2,407,660.05 E NAD83
Project Number 175668043
Surface Elevation 771.8 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. %
43			SILT, ML, 5YR 3/1 (very dark gray), non-plastic, very loose, wet, [CCR] *(Continued)*		ST03G	42.0 - 44.0	42.0 - 44.0	1.2	NR
44	44.0	727.8							

No Refusal /
Bottom of Hole at 44.0 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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TW02**
Client	Tennessee Valley Authority	Boring Location	575,548.50 N; 2,407,585.76 E NAD83
Project Number	175668043	Surface Elevation	771.9 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	2/5/19
		Completed	2/5/19
Project Location	Harriman, Tennessee	Depth to Water	18.3 ft
		Date/Time	
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Stantec Consulting Services Inc.	Drill Rig Type and ID	CME 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	8-1/4" HSA overdrill of boring	Overdrill Depth	44.5 ft
Sampler Hammer Type	Automatic	Weight	140
		Drop	30
		Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	E. Smith	Approved By	L. Price

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. %
0.0	771.9		Top of Hole						
0.8	771.1		ORGANIC SILT, OL, 7.5YR 4/3 (brown), low plasticity, stiff, moist, with organic matter, [FILL]		SS01G	0.0 - 1.5	0.0 - 1.5	1.3	1-4-5
2.3	769.6		FAT CLAY WITH SAND, CH, 7.5 4/3 (brown), high plasticity, soft, moist, some limestone cobbles interbedded, [FILL]		SS02aG	1.5 - 2.25	1.5 - 3.0	1.5	4-6-8
				2.25/4.0-20190205	SS02bE	2.25 - 3.0			
3.5	768.4		SILTY SAND, SM, 2.5Y 4/1 (dark gray), very loose, moist, [CCR]		SS03aE	3.0 - 4.0	3.0 - 4.5	1.3	1-16-23
			SILTY GRAVEL WITH SAND, GM, 2.5Y 4/1 (dark gray), medium dense, dry, [CCR]		SS03bG	4.0 - 4.5			
5.5	766.4				SS04aG	4.5 - 5.5	4.5 - 6.0	1.5	18-21-50
			SILTY SAND, SM, 2.5Y 4/2 (dark grayish brown), medium dense to dense, dry to moist, [CCR] Geofabric at 5.5'		SS04bG	5.5 - 6.0			
					SS05aG	6.0 - 6.5	6.0 - 7.5	1.5	23-44-46
				6.5/8.5-20190205	SS05bE	6.5 - 7.5			
					SS06aE	7.5 - 8.5	7.5 - 9.0	1.4	13-29-30
					SS06bG	8.5 - 9.0			
					SS07G	9.0 - 10.5	9.0 - 10.5	1.5	6-18-22
					SS08aG	10.5 - 11.5	10.5 - 12.0	1.5	12-28-32
				11.5/13.5-20190205	SS08bE	11.5 - 12.0			
					SS09E	12.0 - 13.5	12.0 - 13.5	1.5	21-20-20
			Loose at 13.5'		SS10G	13.5 - 15.0	13.5 - 15.0	1.5	8-12-13
15.5	756.4								
			SILTY SAND, SM, 2.5Y 4/2 (dark grayish brown), loose, wet, [CCR]		SS11G	15.0 - 16.5	15.0 - 16.5	1.5	6-9-9
			Organic material (twigs) at 16.5'	16.5/18.5-20190205					
					SS12E	16.5 - 18.0	16.5 - 18.0	1.5	2-6-13

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-TW02**
Client: Tennessee Valley Authority
Boring Location: 575,548.50 N; 2,407,585.76 E NAD83
Project Number: 175668043
Surface Elevation: 771.9 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 ▽			SILTY SAND, SM, 2.5Y 4/2 (dark grayish brown), loose, wet, [CCR] *(Continued)*		SS13aE	18.0 - 18.5	18.0 - 19.5	1.5	11-12-10
19					SS13bG	18.5 - 19.5			
20					SS14G	19.5 - 21.0	19.5 - 21.0	1.5	1-4-6
21									
22					ST01G	21.0 - 23.0	21.0 - 23.0	1.8	NR
23	23.5	748.4							
24			SILTY SAND WITH GRAVEL, SM, 5Y 3/1 (very dark gray), very loose, wet, [CCR]		SS16G	23.0 - 24.0	23.0 - 24.0	1.0	6-10
25					SS17G	24.0 - 25.5	24.0 - 25.5	1.5	2-3-11
26					SS18aG	25.5 - 26.5	25.5 - 27.0	1.5	6-6-7
27				26.5/28.5-20190205	SS18bE	26.5 - 27.0			
28					SS19E	27.0 - 28.5	27.0 - 28.5	1.5	4-6-6
29					SS20G	28.5 - 30.0	28.5 - 30.0	1.5	5-6-2
30									
31	31.0	740.9			SS21aG	30.0 - 31.0	30.0 - 31.5	1.5	1-1-1
	31.5	740.4	CLAYEY SILT, ML, 5Y 4/1 (dark gray), medium plasticity, very soft, wet, [CCR]		SS21bG	31.0 - 31.5			
32			SILTY SAND, SM, 5Y 2.5/1 (black), very loose, wet, [CCR]	31.5/33.5-20190205	SS22E	31.5 - 33.0	31.5 - 33.0	1.5	1-2-2
33					SS23aE	33.0 - 33.5	33.0 - 34.5	1.5	1-2-2
34					SS23bG	33.5 - 34.5			
35					SS24G	34.5 - 36.0	34.5 - 36.0	1.5	2-2-3
36					SS25aG	36.0 - 36.5	36.0 - 37.5	1.5	1-2-3
37				36.5/38.5-20190205	SS25bE	36.5 - 37.5			
38	38.5	733.4			SS26aE	37.5 - 38.5	37.5 - 39.0	1.5	2-2-3
39			SILT WITH SAND, ML, 5Y 2.5/1 (black) to 5Y 4/1 (dark gray), non-plastic, soft, wet, [CCR]		SS26bG	38.5 - 39.0			
40					SS27G	39.0 - 40.5	39.0 - 40.5	1.5	2-3-3
41					SS28aG	40.5 - 41.5	40.5 - 42.0	1.5	1-1-1
42					SS28b	41.5 - 42.0			

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 7/9/20

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-TW02**
Client Tennessee Valley Authority
Boring Location 575,548.50 N; 2,407,585.76 E NAD83
Project Number 175668043
Surface Elevation 771.9 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. %
43			SILT WITH SAND, ML, 5Y 2.5/1 (black) to 5Y 4/1 (dark gray), non-plastic, soft, wet, [CCR] *(Continued)*		SS29aG	42.0 - 42.5	42.0 - 43.5	1.5	WH-WH-1
					SS29bG	42.5 - 43.5			
44									
					ST02G	43.5 - 45.5	43.5 - 45.5	1.9	1540
45	45.5	726.4							

No Refusal /
Bottom of Hole at 45.5 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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TW03**
Client	Tennessee Valley Authority	Boring Location	575,720.53 N; 2,408,211.78 E NAD83
Project Number	175668043	Surface Elevation	776.0 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	2/25/19
		Completed	2/26/19
Project Location	Harriman, Tennessee	Depth to Water	19.3 ft
		Date/Time	2/25/19
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Stantec Consulting Services Inc.	Drill Rig Type and ID	CME 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	8-1/4" HSA overdrill of boring	Overdrill Depth	44.5 ft
Sampler Hammer Type	Automatic	Weight	140
Drop	30	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	E. Smith	Approved By	L. Price

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. %
0.0	776.0		Top of Hole						
0.8	775.2		FAT CLAY, CH, 10YR 3/4 (dark yellowish brown), high plasticity, very soft, moist, with organic matter, [FILL]		SS01G	0.0 - 1.5	0.0 - 1.5	1.5	1-1-6
2.5	773.5		LEAN CLAY, CL, 5YR 5/6 (yellowish red), medium plasticity, firm, moist, [FILL]	1.5/5.5-20190225	SS02E	1.5 - 3.0	1.5 - 3.0	1.5	4-7-9
			SANDY SILT WITH GRAVEL, ML, 7.5YR 3/1 (very dark gray), fine, loose, moist, [CCR]		SS03aE	3.0 - 3.5	3.0 - 4.5	1.3	5-9-14
					SS03bG	3.5 - 4.5			
					SS04G	4.5 - 6.0	4.5 - 6.0	1.4	4-10-16
6.0	770.0								
			SILTY GRAVEL, GM, 7.5YR 3/1 (very dark gray), very fine to coarse, dense, dry, [CCR]		SS05aG	6.0 - 6.5	6.0 - 7.5	1.5	24-20-19
7.5	768.5			6.5/8.5-20190225	SS05bE	6.5 - 7.5			
			SILTY SAND, SM, 7.5YR 3/1 (very dark gray), fine, very dense, dry, [CCR]		SS06aE	7.5 - 8.5	7.5 - 9.0	1.5	15-32-50
9.3	766.7				SS06bG	8.5 - 9.0			
			WELL GRADED GRAVEL, GW, 10YR 5/1 (gray), medium to coarse, very dense, dry, [FILL]		SS07aG	9.0 - 10.0	9.0 - 10.5	1.5	41-44-23
10.3	765.7				SS07bG	10.0 - 10.5			
10.5	765.5		SILTY SAND, SM, 7.5YR 3/1 (very dark gray), medium dense, dry, [CCR]		SS08aG	10.5 - 11.5	10.5 - 12.0	1.5	8-19-49
11.5	764.5			11.5/13.5-20190225	SS08bE	11.5 - 12.0			
			SILT, ML, 5YR 5/6 (yellowish red), low plasticity, firm to hard, dry, [FILL]		SS09E	12.0 - 13.5	12.0 - 13.5	1.5	25-24-23
			SILTY SAND WITH GRAVEL, SM, 5YR 5/6 (yellowish red), fine to medium, very dense, dry, [CCR]		SS10G	13.5 - 15.0	13.5 - 15.0	1.5	10-15-19
15.0	761.0								
			POORLY GRADED SAND, SP, 5YR 5/6 (yellowish red), fine to medium, loose, dry, [CCR]		SS11G	15.0 - 16.5	15.0 - 16.5	1.5	7-9-10
16.5	759.5			16.5/18.5-20190225					
			SANDY SILT, ML, 5YR 5/6 (yellowish red), fine to medium, loose, moist, [CCR]		SS12E	16.5 - 18.0	16.5 - 18.0	1.5	4-5-6

SUBSURFACE LOG

Client Borehole ID N/A | Stantec Boring No. **KIF-TW03**

Client Tennessee Valley Authority | Boring Location 575,720.53 N; 2,408,211.78 E NAD83

Project Number 175668043 | Surface Elevation 776.0 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 SILT, ML, 5YR 5/6 (yellowish red), fine to medium, loose, moist, [CCR] *(Continued)*		SS13aE	18.0 - 18.5	18.0 - 19.5	1.4	4-6-7
19 ▽			Wet at 19.3'		SS13bG	18.5 - 19.5			
20					SS14G	19.5 - 21.0	19.5 - 21.0	1.5	3-2-6
21									
22					ST01G	21.0 - 23.0	21.0 - 23.0	1.0	NR
23	23.0	753.0	SILT, ML, 5YR 5/6 (yellowish red), very loose, wet, [CCR]		SS15E	23.0 - 24.5	23.0 - 24.5	1.5	3-5-6
24				23.0/26.0-20190226					
25					SS16E	24.5 - 26.0	24.5 - 26.0	1.5	4-5-3
26									
27					SS17G	26.0 - 27.5	26.0 - 27.5	1.5	4-5-5
28					SS18G	27.5 - 29.0	27.5 - 29.0	1.5	2-2-3
29									
30	30.0	746.0	SILTY SAND WITH GRAVEL, SM, 10YR 2/1 (black), very loose to loose, wet, [CCR]		SS19G	29.0 - 30.5	29.0 - 30.5	1.5	3-7-6
31					SS20a	30.5 - 31.5	30.5 - 32.0	1.0	2-4-5
32				31.5/33.5-20190226	SS20bE	31.5 - 32.0			
33					SS21E	32.0 - 33.5	32.0 - 33.5	1.5	4-7-6
34					SS22G	33.5 - 35.0	33.5 - 35.0	1.5	4-4-4
35	35.5	740.5	SILT WITH SAND, ML, 5YR 5/6 (yellowish red), very loose, wet, [CCR]		SS23G	35.0 - 36.5	35.0 - 36.5	1.5	3-4-4
36									
37				36.5/38.5-20190226	SS24E	36.5 - 38.0	36.5 - 38.0	1.5	2-2-4
38					SS25aE	38.0 - 38.5	38.0 - 39.5	1.5	2-2-5
39					SS25bG	38.5 - 39.5			
40					SS26G	39.5 - 41.0	39.5 - 41.0	1.5	2-2-4
41					SS27aG	41.0 - 41.5	41.0 - 42.5	1.5	2-3-4
42					SS27bE	41.5 - 42.5			

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-TW03**
Client Tennessee Valley Authority
Boring Location 575,720.53 N; 2,408,211.78 E NAD83
Project Number 175668043
Surface Elevation 776.0 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. %
43			SILT WITH SAND, ML, 5YR 5/6 (yellowish red), very loose, wet, [CCR] *(Continued)*		SS28aE	42.5 - 43.5	42.5 - 44.0	1.5	1-1-3
44					SS28bG	43.5 - 44.0			
	45.0	731.0			SS29aG	44.0 - 45.0	44.0 - 45.5	1.5	1-2-3
45					SS29bG	45.0 - 45.5			
46			SILT, ML, 10YR 3/1 (very dark gray), non-plastic, soft, wet, [CCR]						
					ST02G	45.5 - 47.5	45.5 - 47.5	2.0	NR
47	47.5	728.5							

No Refusal /
Bottom of Hole at 47.5 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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TW03a**
Client	Tennessee Valley Authority	Boring Location	575,741.10 N; 2,407,987.58 E NAD83
Project Number	175668043	Surface Elevation	771.4 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	1/31/19
		Completed	1/31/19
Project Location	Harriman, Tennessee	Depth to Water	15.0 ft
		Date/Time	1/31/19
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Stantec Consulting Services Inc.	Drill Rig Type and ID	CME 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-1/4" HSA, 3" 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
Drop	30	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	E. Smith	Approved By	L. Price

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. %
0.0	771.4		Top of Hole						
0.5	770.9		ORGANIC SILT, OL, 7.5YR 6/4 (light brown), low plasticity, moist, top soil, [FILL]		SS01G	0.0 - 1.5	0.0 - 1.5	1.5	2-6-8
2.0	769.4		FAT CLAY, CH, 7.5YR 5/6 (strong brown), high plasticity, soft, moist, [FILL]		SS02aG	1.5 - 2.0	1.5 - 3.0	1.5	4-14-17
					SS02b	2.0 - 3.0			
4.0	767.4		SANDY SILT WITH GRAVEL, ML, 10YR 4/1 (dark gray), loose, dry, [CCR]		SS03a	3.0 - 4.0	3.0 - 4.5	1.4	18-22-18
					SS03bG	4.0 - 4.5			
6.0	765.4		WELL GRADED GRAVEL, GW, 10YR 7/1 (light gray), medium dense, [FILL]		SS04G	4.5 - 6.0	4.5 - 6.0	1.4	16-29-32
			Encountered geofabric at 6.0'						
			SILTY SAND, SM, 10YR 5/1 (gray), medium dense, dry, [CCR]		SS05	6.0 - 7.5	6.0 - 7.5	1.5	17-21-23
					SS06	7.5 - 9.0	7.5 - 9.0	1.5	5-5-4
9.5	761.9		Moist at 8.75'		SS07aG	9.0 - 9.5	9.0 - 10.5	1.5	5-14-46
			POORLY GRADED GRAVEL, GP, 10YR 5/1 (gray), dense, dry, [CCR]		SS07bG	9.5 - 10.5			
			Augured to 15.0'		SS08G	10.5 - 10.6	10.5 - 10.6	0.1	50+/1"

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-TW03a**
Client Tennessee Valley Authority
Boring Location 575,741.10 N; 2,407,987.58 E NAD83
Project Number 175668043
Surface Elevation 771.4 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. %
13			POORLY GRADED GRAVEL, GP, 10YR 5/1 (gray), dense, dry, [CCR] *(Continued)*					
14								
15 ▽ 15.3	756.1		Wet at 15.0'		SS09	15.0 - 15.3	0.0	36/4"
			Refusal / Bottom of Hole at 15.3 Ft.					

15.0 - 15.3

Encountered obstruction at 15.3 feet, boring terminated and backfilled in accordance with Exploratory Drilling SAP

Since boring was terminated, all Environmental Samples were disposed of as investigative derived waste.

As-drilled boring location not surveyed. Horizontal coordinates based on proposed boring location. Vertical coordinates based on 2017 LIDAR surfaces.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TW03b**
Client	Tennessee Valley Authority	Boring Location	575,741.10 N; 2,407,967.58 E NAD83
Project Number	175668043	Surface Elevation	771.9 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	1/31/19
Completed	1/31/19		
Project Location	Harriman, Tennessee	Depth to Water	9.7 ft
Date/Time	1/31/19 16:05		
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Stantec Consulting Services Inc.	Drill Rig Type and ID	CME 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-1/4" HSA, 3" 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
Drop	30	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	E. Smith	Approved By	L. Price

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. %
0.0	771.9		Top of Hole						
0.7	771.2		ORGANIC SILT, OL, 10YR 4/4 (dark yellowish brown), firm, moist, [FILL]		SS01G	0.0 - 1.5	0.0 - 1.5	1.2	4-7-9
2.0	769.9		FAT CLAY, CH, 7.5YR 4/6 (strong brown), high plasticity, firm, moist, [FILL]		SS02aG	1.5 - 2.5	1.5 - 3.0	1.5	9-12-19
3.0	768.9		SILTY SAND WITH GRAVEL, SM, 10YR 3/1 (very dark gray), fine to coarse, loose, [CCR]		SS02b	2.5 - 3.0			
4.5	767.4		SILTY SAND, SM, 10YR 3/1 (very dark gray), fine to medium, medium dense, dry, [CCR]		SS03a	3.0 - 3.5	3.0 - 4.5	1.5	17-21-22
					SS03bG	3.5 - 4.5			
6.0	765.9		SILTY SAND WITH GRAVEL, SM, 7.5Y 6/1 (very dark gray), fine to coarse, dense, dry, [CCR]		SS04G	4.5 - 6.0	4.5 - 6.0	1.4	10-21-42
7.5	764.4		SILTY SAND, SM, 10YR 3/1 (very dark gray), fine to medium, dense, dry, [CCR] Geofabric encountered at 6.5' and 7.5'		SS05	6.0 - 7.5	6.0 - 7.5	1.5	17-21-22
9.0	762.9		SILT WITH SAND, ML, 10YR 5/1 (gray), soft, moist, [CCR]		SS06	7.5 - 9.0	7.5 - 9.0	1.5	5-7-6
▽ 9.8	762.1		SILTY SAND, SM, 10YR 4/1 (dark gray), medium dense, moist to wet, [CCR] Wet at 9.7'		SS07aG	9.0 - 10.0	9.0 - 10.5	1.5	5-9-11
10.5	761.4		SILT WITH SAND AND GRAVEL, ML, 7.5Y 6/1 (dark gray), fine to coarse, medium dense, moist, [CCR] Geofabric encountered in sample		SS07bG	10.0 - 10.5			
					SS08aG	10.5 - 11.0	10.5 - 12.0	1.2	17-22-40
11.5	760.4		SILT, ML, 10YR 5/1 (gray), soft, wet, with limestone cobbles, [CCR]		SS08b	11.0 - 12.0			
			GRAVEL WITH SAND, GW, 5Y 6/2 (light olive gray), medium to coarse, dense, moist, [FILL]		SS09a	12.0 - 13.5	12.0 - 13.5	1.5	22-16-30

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-TW03b**
Client Tennessee Valley Authority
Boring Location 575,741.10 N; 2,407,967.58 E NAD83
Project Number 175668043
Surface Elevation 771.9 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. %
13 13.5	758.4		Geofabric encountered in sample		SS09b	13.0 - 13.5		

Refusal /
Bottom of Hole at 13.5 Ft.

Encountered obstruction at 13.5 feet, boring terminated and backfilled in accordance with Exploratory Drilling SAP

Since boring was terminated, all Environmental Samples were disposed of as investigative derived waste.

As-drilled boring location not surveyed. Horizontal coordinates based on proposed boring location. Vertical coordinates based on 2017 LIDAR surfaces.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TW04**
Client	Tennessee Valley Authority	Boring Location	574,754.11 N; 2,407,855.14 E NAD83
Project Number	175668043	Surface Elevation	765.2 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	2/8/19
Completed	2/13/19		
Project Location	Harriman, Tennessee	Depth to Water	21.5 ft
Date/Time	2/11/19 14:25		
Inspector	J. Andrew	Logger	M. Edmunds, D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Stantec Consulting Services Inc.	Drill Rig Type and ID	CME 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	8-1/4" HSA overdrill of boring	Overdrill Depth	37.0 ft
Sampler Hammer Type	Automatic	Weight	140
Drop	30	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	E. Smith	Approved By	L. Price

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. %
0.0	765.2		Top of Hole						
			SANDY LEAN CLAY, CL, 10YR 3/6 (dark yellowish brown), low plasticity, firm, moist, with silt, sand, and gravel, [FILL]		SS01G	0.0 - 1.5	0.0 - 1.5	0.9	1-5-4
2.0	763.2				SS02aG	1.5 - 2.0	1.5 - 3.0	1.5	5-3-5
			FAT CLAY, CH, 2.5YR 6/4 (light reddish brown), medium plasticity, firm, moist, [FILL]		SS02bG	2.0 - 3.0			
3.5	761.7				SS03aG	3.0 - 3.5	3.0 - 4.5	1.5	6-4-2
			SILT WITH SAND, ML, 5YR 3/1 (very dark gray), non-plastic to low plasticity, very soft to firm, moist, [CCR]	3.5/5.5-20190208	SS03bE	3.5 - 4.5			
					SS04aE	4.5 - 5.5	4.5 - 6.0	1.5	1-1-1
					SS04bG	5.5 - 6.0			
					SS05aG	6.0 - 6.5	6.0 - 7.5	1.5	WH-1-1
				6.5/8.5-20190208	SS05bE	6.5 - 7.5			
					SS06aE	7.5 - 8.5	7.5 - 9.0	1.5	1-0-1
					SS06bG	8.5 - 9.0			
10.0	755.2				SS07G	9.0 - 10.5	9.0 - 10.5	1.5	1-WR-WR
			SILTY SAND, SM, 10YR 4/1 (dark gray), fine, very loose, moist, [CCR]		SS08aG	10.5 - 11.5	10.5 - 12.0	1.5	1-1-2
12.0	753.2			11.5/13.5-20190211	SS08bE	11.5 - 12.0			
			SILT, ML, 10YR 4/1 (dark gray), very soft to firm, moist, [CCR]		SS09E	12.0 - 13.5	12.0 - 13.5	1.5	WH-WH-WH
					SS10G	13.5 - 15.0	13.5 - 15.0	1.5	1-3-5
					SS11G	15.0 - 16.5	15.0 - 16.5	1.5	1-1-3

SUBSURFACE LOG

Client Borehole ID N/A | Stantec Boring No. **KIF-TW04**

Client Tennessee Valley Authority | Boring Location 574,754.11 N; 2,407,855.14 E NAD83

Project Number 175668043 | Surface Elevation 765.2 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. %
17			SILT, ML, 10YR 4/1 (dark gray), very soft to firm, moist, [CCR] *(Continued)*		16.5/18.5-20190211	SS12E	16.5 - 18.0	1.5	2-4-5
18						SS13aE	18.0 - 18.5	1.5	2-2-2
19	19.5	745.7				SS13bG	18.5 - 19.5		
20			SILTY SAND, SM, 10YR 4/1 (dark gray), very loose, wet, [CCR]			SS14G	19.5 - 21.0	1.5	1-1-1
21						SS15a	21.0 - 21.5	1.5	WH-1-1
22					21.5/23.5-20190211	SS15bE	21.5 - 22.5		
23						SS16aE	22.5 - 23.5	1.5	1-3-6
24						SS16b	23.5 - 24.0		
25						ST01G	24.0 - 26.0	1.9	NR
26	26.0	739.2				SS17aG	26.0 - 26.5	1.0	5-5
27			SILTY GRAVEL, GM, 5Y 2.5/1 (black), very loose, wet, [CCR]		26.5/28.5-20190211	SS17bE	26.5 - 27.0		
28						SS18E	27.0 - 28.5	1.2	1-2-2
29						SS19G	28.5 - 30.0	1.5	2-2-3
30	30.0	735.2							
31			SILTY SAND, SM, 5Y 2.5/1 (black), very loose, wet, [CCR]			SS20G	30.0 - 31.5	1.5	1-2-3
32					31.5/33.5-20190213	SS21E	31.5 - 33.0	1.5	3-2-3
33						SS22aE	33.0 - 33.5		
34						SS22bG	33.5 - 34.5	1.3	1-3-2
35						SS23G	34.5 - 36.0	1.5	1-2-3
36	36.0	729.2				SS24aG	36.0 - 36.5		
37	37.5	727.7	CLAYEY SAND, SC, 5Y 2.5/1 (black), low plasticity, very loose, wet, [CCR]		36.5/38.5-20190213	SS24bE	36.5 - 37.5	1.5	1-1-2
38			SILT, ML, 10Y 3/1 (very dark greenish gray), non-plastic, firm, wet, [CCR]			SS25aE	37.5 - 38.5	1.5	2-2-3
39						SS25bG	38.5 - 39.0		

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 8/26/20

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-TW04**
Client Tennessee Valley Authority
Boring Location 574,754.11 N; 2,407,855.14 E NAD83
Project Number 175668043
Surface Elevation 765.2 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. %
40			SILT, ML, 10Y 3/1 (very dark greenish gray), non-plastic, firm, wet, [CCR] *(Continued)*		ST02G	39.0 - 41.0	39.0 - 41.0	1.7	NR
41 41.0	724.2		No Refusal / Bottom of Hole at 41.0 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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TW05**
Client	Tennessee Valley Authority	Boring Location	575,382.75 N; 2,408,921.34 E NAD83
Project Number	175668043	Surface Elevation	770.5 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	11/13/18
		Completed	11/14/18
Project Location	Harriman, Tennessee	Depth to Water	16.5 ft
		Date/Time	11/13/18
Inspector	B. Lucente	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, 3" SS w/o liners, 3" Shelby Tubes		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	8-1/4" HSA overdrill of boring	Overdrill Depth	39.0 ft
Sampler Hammer Type	Automatic	Weight	140
		Drop	30
		Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	E. Smith	Approved By	L. Price

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. %
0.0	770.5		Top of Hole						
			SILTY SAND WITH GRAVEL, SM, 10YR 3/1 (very dark gray), loose to dense, dry to moist, placed fill material, [CCR]		SS01G	0.0 - 1.5	0.0 - 1.5	1.3	4-8-6
				1.5/3.5-20181113	SS02E	1.5 - 3.0	1.5 - 3.0	1.5	5-6-4
					SS03aE	3.0 - 3.5	3.0 - 4.5	1.5	4-2-2
					SS03b	3.5 - 4.5			
5.2	765.3				SS04G	4.5 - 6.0	4.5 - 6.0	1.2	5-3-6
			LEAN CLAY, CL, 5YR 4/4 (reddish brown), firm, dry to moist, with fragments of chert, [FILL]		SS05a	6.0 - 6.5	6.0 - 7.5	1.5	11-17-20
6.5	764.0			6.5/8.5-20181113	SS05bE	6.5 - 7.5			
7.5	763.0		POORLY GRADED GRAVEL, GP, 10YR 3/1 (very dark gray), fine to coarse, dense, dry, fill material, [CCR]		SS06aE	7.5 - 8.5	7.5 - 9.0	1.5	24-35-50+
			SILTY SAND WITH GRAVEL, SM, 10YR 3/1 (very dark gray) and 10YR 5/6 (yellowish brown), dense to very dense, dry, [CCR]		SS06b	8.5 - 9.0			
					SS07G	9.0 - 10.5	9.0 - 10.5	1.5	39-62-106
					SS08a	10.5 - 11.5	10.5 - 12.0	1.5	45-56-55
12.0	758.5			11.5/13.5-20181113	SS08bE	11.5 - 12.0			
			WELL GRADED SAND, SW, 10YR 3/1 (very dark gray), medium dense to dense, dry to moist, [CCR]		SS09E	12.0 - 13.5	12.0 - 13.5	1.5	27-30-34
					SS10G	13.5 - 15.0	13.5 - 15.0	1.5	25-30-25
15.0	755.5								
			WELL GRADED SAND WITH SILT AND GRAVEL, SW-SM, 10YR 2/1 (black), medium dense, moist to wet, [CCR]		SS11G	15.0 - 16.5	15.0 - 16.5	1.5	19-15-17

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-TW05**
Client: Tennessee Valley Authority
Boring Location: 575,382.75 N; 2,408,921.34 E NAD83
Project Number: 175668043
Surface Elevation: 770.5 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. %
17			WELL GRADED SAND WITH SILT AND GRAVEL, SW-SM, 10YR 2/1 (black), medium dense, moist to wet, [CCR] *(Continued)*		SS12E	16.5 - 18.0	16.5 - 18.0	1.5	13-11-10
18				16.5/19.5-20181113	SS13aE	18.0 - 18.5	18.0 - 19.5	1.5	17-22-19
19					SS13b	18.5 - 19.5			
20					SS14G	19.5 - 21.0	19.5 - 21.0	1.5	11-17-13
21									
22					SS15G	21.0 - 22.5	21.0 - 22.5	1.5	11-11-11
23	23.3	747.2		22.5/24.5-20181113	SS16E	22.5 - 24.0	22.5 - 24.0	1.5	14-26-30
24			SILTY SAND, SM, 10YR 4/1 (dark gray), very fine to fine, loose to medium dense, moist to wet, [CCR]		SS17aE	24.0 - 24.5	24.0 - 25.5	0.6	11-21-17
25					SS17b	24.5 - 25.5			
26	25.8	744.7	WELL GRADED SAND, SW, 10YR 2/1 (black), fine to coarse, loose, wet, [CCR]		SS18a	25.5 - 26.5	25.5 - 27.0	1.5	5-6-6
27	27.7	742.8		26.5/28.5-20181113	SS18bE	26.5 - 27.0			
28			SILT WITH SAND, ML, 10YR 4/1 (dark gray), very fine to fine, very loose to loose, wet, [CCR]		SS19E	27.0 - 28.5	27.0 - 28.5	1.5	9-9-10
29					SS20G	28.5 - 30.0	28.5 - 30.0	1.5	4-3-6
30									
31					SS21G	30.0 - 31.5	30.0 - 31.5	1.5	2-3-4
32				31.5/33.5-20181113	SS22E	31.5 - 33.0	31.5 - 33.0	1.5	4-7-9
33					SS23aE	33.0 - 33.5	33.0 - 34.5	1.5	3-5-8
34					SS23bG	33.5 - 34.5			
35					SS24G	34.5 - 36.0	34.5 - 36.0	1.5	2-2-2
36									
37					SS25	36.0 - 37.5	36.0 - 37.5	1.5	WR-WR-WR
38	38.0	732.5			SS26	37.5 - 39.0	37.5 - 39.0	1.5	1-2-2
39			LEAN CLAY WITH SAND, CL, 10YR 5/1 (gray) and 10YR 4/6 (dark yellowish brown), medium plasticity, moist to wet, with organics						

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 1/28/20

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-TW05**
Client Tennessee Valley Authority
Boring Location 575,382.75 N; 2,408,921.34 E NAD83
Project Number 175668043
Surface Elevation 770.5 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. %
40					ST01G	39.0 - 41.0	39.0 - 41.0	1.8	400
41.0	729.5		No Refusal / Bottom of Hole at 41.0 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

Stantec

SUBSURFACE LOG

Project Number	175618610	Location	N 575427.15, E 2410207.27 (NAD 83)
Project Name	KIF Stilling Pond	Boring No.	**GP-17-101** Total Depth 24.0 ft
County	Roane County, TN	Surface Elevation	759.5 ft
Project Type	Geotechnical Exploration	Date Started	11/9/17 Completed 11/10/17
Supervisor	Edgar Smith Driller S&ME	Depth to Water	14.7 ft Date/Time 11/13/17
Logged By	Edgar Smith	Depth to Water	N/A Date/Time N/A

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
759.5	0.0	Top of Hole							
		Clayey Fill Material, dark reddish brown, moist, stiff		Grab-1	0.0 - 4.0	3.0		--	Geoprobe 7730 DT Rig, 3.25" HSA with 1.125"/2.25" Dual Tube
753.5	6.0			Grab-2	4.0 - 8.0	2.6		--	
		Limestone Gravel Fill Material, gray, dry to wet, with some ash		Grab-3	8.0 - 12.0	1.4		--	
747.2	12.3								
		Fly Ash Fill Material, gray to dark gray, soft, wet to saturated		Grab-4	12.0 - 16.0	2.6		--	
				Grab-5	16.0 - 20.0	3.0		--	
737.5	22.0			Grab-6	20.0 - 22.0	2.0		--	
735.5	24.0	Clayey Sand, tan and olive, moist, soft, becomes increasingly silty with depth							
		No Refusal / Bottom of Hole							

STANTEC/FMSM_LEGACY_STANDARD.GINT DATABASE.GPJ FMSM-GRAPHIC LOG.GDT 1/24/18

Stantec

SUBSURFACE LOG

Project Number	175618610	Location	N 575719.69, E 2410631.90 (NAD 83)
Project Name	KIF Stilling Pond	Boring No.	**GP-17-102** Total Depth 28.0 ft
County	Roane County, TN	Surface Elevation	756.5 ft
Project Type	Geotechnical Exploration	Date Started	11/8/17 Completed 11/9/17
Supervisor	Edgar Smith Driller S&ME	Depth to Water	10.2 ft Date/Time 11/9/17
Logged By	Edgar Smith	Depth to Water	10.4 ft Date/Time 11/13/17

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
756.5	0.0	Top of Hole							
		Clayey Fill Material, dark reddish brown, moist, stiff		Grab-1	0.0 - 4.0	3.0		--	Geoprobe 7730 DT Rig, 3.25" HSA with 1.125"/2.25" Dual Tube
				Grab-2	4.0 - 8.0	3.0		--	
				Grab-3	8.0 - 12.0	3.0		--	
742.5	14.0			Grab-4	12.0 - 16.0	3.0		--	
		Fly Ash Fill Material, gray, moist to wet, soft		Grab-5	16.0 - 20.0	0.5		--	
734.6	21.9			Grab-6	20.0 - 24.0	4.0		--	
		Clayey Sand, tan and olive, wet, clay content increases with depth		Grab-7	24.0 - 28.0	4.0		--	
728.5	28.0								
		No Refusal / Bottom of Hole							

STANTEC/FMSM_LEGACY_STANDARD.GINT DATABASE.GPJ FMSM-GRAPHIC LOG.GDT 1/24/18

SUBSURFACE LOG

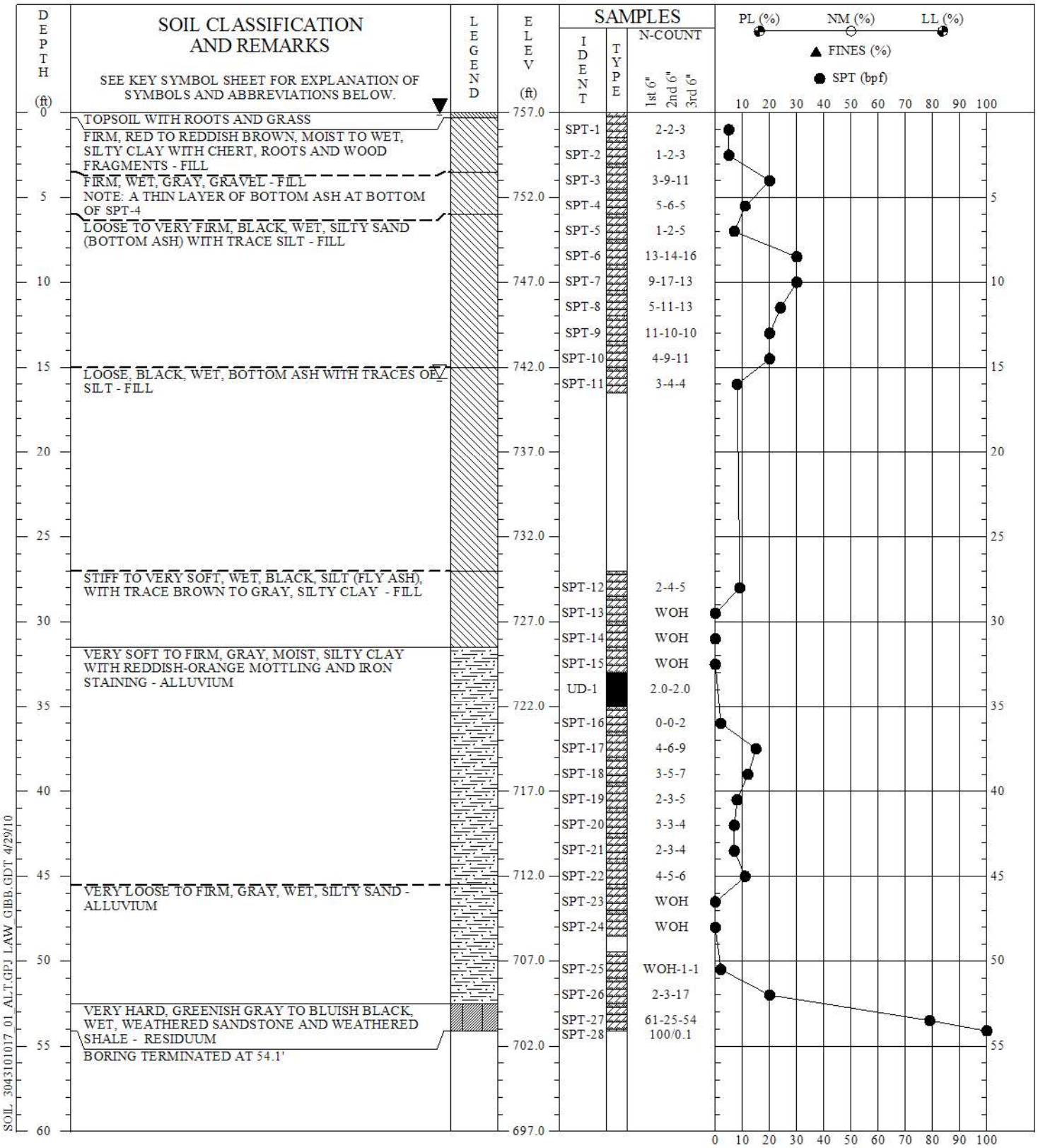
Project Number	175618610	Location	N 575791.99, E 2411046.62 (NAD 83)
Project Name	KIF Stilling Pond	Boring No.	**GP-17-103** Total Depth 28.0 ft
County	Roane County, TN	Surface Elevation	751.2 ft
Project Type	Geotechnical Exploration	Date Started	11/6/17 Completed 11/8/17
Supervisor	Edgar Smith Driller S&ME	Depth to Water	7.8 ft Date/Time 11/8/17
Logged By	Edgar Smith	Depth to Water	7.2 ft Date/Time 11/13/17

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
751.2	0.0	Top of Hole							
		Clayey Fill Material (Cap), dark reddish brown, moist, stiff		Grab-1	0.0 - 4.0	2.0		--	Geoprobe 7730 DT Rig, 3.25" HSA with 1.125"/2.25" Dual Tube
747.2	4.0								
		Fly Ash Fill Material, gray, wet, soft to very soft		Grab-2	4.0 - 8.0	3.0		--	
				Grab-3	8.0 - 12.0	4.0		--	
739.2	12.0								
		Ash (No Recovery)		Grab-4	12.0 - 16.0	0.0		--	
735.2	16.0								
		Fly Ash Fill Material, gray, wet to saturated, very soft		Grab-5	16.0 - 20.0	4.0		--	
731.2	20.0	- 1" fat clay lense at 20', light grayish brown, soft							
		Fly Ash Fill Material, gray, wet to saturated, interfaced with black hydric clayey silt at 23.6', soft moist, contains plant matter and fine roots, grades to alluvial sandy clay below 24', gray/olive, wet		Grab-6	20.0 - 24.0	4.0		--	
				Grab-7	24.0 - 28.0	4.0		--	
723.2	28.0								
		No Refusal / Bottom of Hole							

APPENDIX B.4

PIEZOMETERS

Table of Contents



REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Tri-State
Logged By: N.J.S.
Checked By:

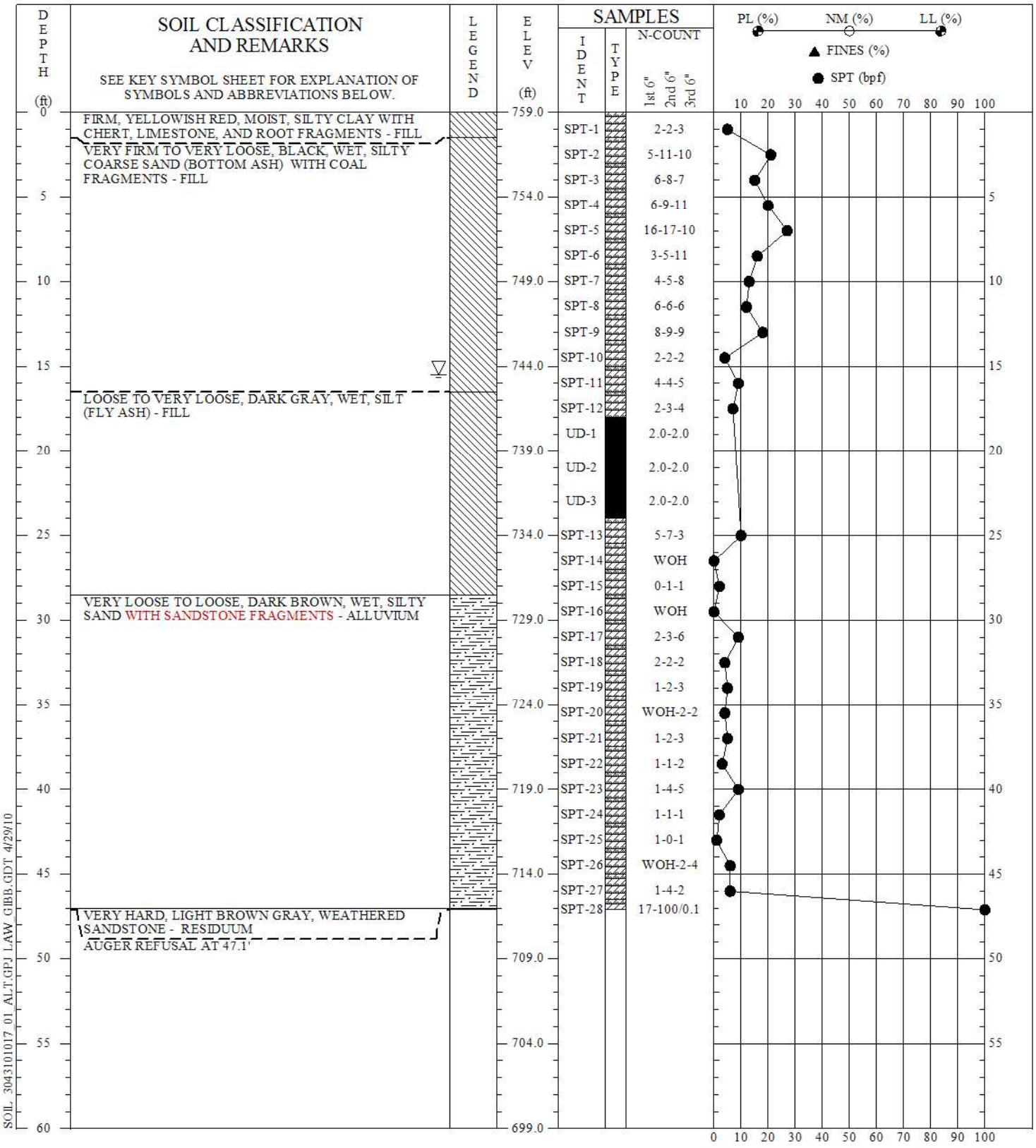
SOIL TEST BORING RECORD

PROJECT: TVA Kingston Seep Area

DRILLED: March 31, 2010 **BORING NO.:** A-1

PROJ. NO.: 3043-10-1017 **PAGE 1 OF 1**

MACTEC



SOIL_3043101017_01_ALT.GPJ LAW_GIBB.GDT 4/29/10

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Tri-State
Logged By: N.J.S.
Checked By:

SOIL TEST BORING RECORD

PROJECT: TVA Kingston Seep Area

DRILLED: April 1, 2010 **BORING NO.:** B-1

PROJ. NO.: 3043-10-1017 **PAGE 1 OF 1**

MACTEC

Written by: J. Sura / Y. Cao **Date:** 10/29/10 **Reviewed by:** Neil Davis **Date:** 10/29/10

Client: TVA **Project:** Dredge Cells Recovery **Project/ Proposal No.:** GR4327 **Task No.:** 105

MACTEC SOIL TEST BORING FIELD REPORT BORING NO. PZ-C1B PG. 1 OF 1

RIG TYPE CME-550 TRACK HAMMER TYPE AUTO

JOB NO. 3043101038 DRILLER Tristate/George A. HOURS DRILLING 5 GROUND SURFACE ELEV. Appx 748.44

JOB NAME TVA Kingston EAST DIKE STABILITY STUDY LOGGED BY Rodney Clark HOURS MOVING 0.25 DATE: 8/27/10 WEATHER: Sunny 80°F

SAMPLING No.	DEPTH	"N" 1ST 6"	2ND 6"	3RD 6"	SCALE	UD	REC	SOIL CLASSIFICATION	REMARKS
								Begin drilling from 0.0' w/ 3¼" HSA's / Charge augers at 5.0'	
								-Driller indicates obstruction (hard drill) at target test depth / drill appx grind. 0.5' to 3.5' & charge auger	
UD-1	5.5-7.5'	NA	NA	NA	/	UD-1	1.3'	-Push tube via piston sampler 2.0' -Wait appx 10 minutes prior to pulling tube / Material is brown fat CLAY (CH) w/ some gravel	
UD-2	11.0-13.0'	NA	NA	NA	/	UD-2		-Drill to 11.0' / Charge Augers @ 10.0' -Push tube via piston sampler 2.0' -Wait appx. 10 minutes prior to pulling tube from boring Material is brown fat CLAY w/ some gravel	
UD-3	21.0-23.0'	NA	NA	NA	/	UD-3		-Drill to 21.0' / Charge augers @ 15.0' & 20.0' / push tube via piston sampler 2.0' -Wait appx 10.0' minutes prior to pulling tube from boring -Drill Boring to 30.5' for installation of piezometer / Charge Augers at 25.5' & 30' prior to well installation (see piezometer installation record for more details)	

STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT-BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES.

BORING TERMINATED: 30.5'

BORING REFUSAL: NA

WATER TOB DEPTH: 2.85' bgs

WATER 24 HR DEPTH:

WATER LOSSES: NA

CAVE-IN DEPTHS: NA

CASING: SIZE NA LENGTH NA

STANDBY TIME: NA BORING LAYOUT Appx 5' North of C-1 boring

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0.0 TO 30.5'
HAND SHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO
CORE SIZE	TO
UNDISTURBED SAMPLES No. 3 SIZE 2.5" tube	
BAG SAMPLES No. SIZE	

F1024

Written by: J. Sura / Y. Cao **Date:** 10/29/10 **Reviewed by:** Neil Davis **Date:** 10/29/10

Client: TVA **Project:** Dredge Cells Recovery **Project/ Proposal No.:** GR4327 **Task No.:** 105

MACTEC SOIL TEST BORING FIELD REPORT BORING NO. C-2 PG. 1 OF 3

RIG TYPE CME-550ATV HAMMER TYPE AUTO

JOB NO. 3043101038 DRILLER George Akins HOURS DRILLING 9 HRS GROUND SURFACE ELEV. 443.9'

JOB NAME TVA KINGSTON EAST DIKE LOGGED BY Rodney Clark HOURS MOVING 1.0 HRS DATE: 8/13-16/10 WEATHER: Sunny, 90's some rain on 8/16/10

SAMPLING No.	DEPTH	"N" 1ST 6"	2ND 6"	3RD 6"	SCALE	UD	REC	SOIL CLASSIFICATION	REMARKS
NA	0.0'-1.5'							1.5' OF SURFICIAL GRAVEL	
1	1.5'-3.0'	2	3	4	/	/	1.0'	grayish brown fat CLAY w/gravel moist, firm, gravel is angular limestone, # shale, large wood stick, FILL MATERIAL	FILL
2	3.0'-4.5'	7	6	3	/	/	1.4'	same as above except stiff, abundant shale fragments	
3	4.5'-6.0'	2	2	2	/	/	1.5'	brown fat CLAY(CH) w/gravel, moist, soft, high plasticity, low toughness, gravel is primarily granule sized shale fragments	
4	6.0'-7.5'	1	3	3	/	/	0.8'	same as above except firm	
5	7.5'-9.0'	1	1	1	/	/	1.3'	same as above except very soft & wet	
6	9.0'-10.5'	WOR	WOH	1	/	/	0.0'	No recovery, catcher intact	
7	10.5'-12.0'	WOR	WOH	1	/	/	1.2'	same as above	
8	12.0'-13.5'	WOH			/	/	1.2'	grayish brown elastic SILT w/sand w/some fine sand, wet, very soft	
9	13.5'-15.0'	WOH			/	/	1.3	same as above	
10	15.0'-16.5'	3	4	6	/	/	1.5'	yellowish brown mottled w/ light gray SILT w/sand (ML) wet, stiff, low plasticity	
11	16.5'-18.0'	1	3	4	/	/	1.4'	yellowish brown mottled & gray fat CLAY w/sand (CH) wet, firm, medium plasticity, medium toughness	
12	18.0'-19.5'	WOH	2	4	/	/	1.5'	same as above	

STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES.

BORING TERMINATED: 43.4'

BORING REFUSAL: 43.4'

WATER TOB DEPTH: 3.00' bgs (tremie pipe) 1.63' bgs (borehole)

WATER 24 HR DEPTH: 0.15' bgs (tremie pipe) 1.88' bgs (borehole)

WATER LOSSES: None

CAVE-IN DEPTHS: NA (set tremie pipe)

CASING: SIZE NA LENGTH NA

STANDBY TIME: 8/16/10 1245 → RAIN DELAY

BORING LAYOUT Gravel pad adjacent to river/East Dike

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0.0 TO 43.4'
HAND SHOP: W/MUD: W/WATER	___ TO ___
ROTARY DRILL: W/MUD: W/WATER	___ TO ___
DIAMOND CORE	___ TO ___
CORE SIZE	___ TO ___
UNDISTURBED SAMPLES No. NA SIZE NA	
BAG SAMPLES No. NA SIZE NA	

F1024

Written by: J. Sura / Y. Cao **Date:** 10/29/10 **Reviewed by:** Neil Davis **Date:** 10/29/10

Client: TVA **Project:** Dredge Cells Recovery **Project/ Proposal No.:** GR4327 **Task No.:** 105

MACTEC SOIL TEST BORING FIELD REPORT BORING NO. C-2 PG. 2 OF 3

RIG TYPE CME-550 TRACK HAMMER TYPE AUTO

JOB NO. 3043101038 DRILLER George Akins HOURS DRILLING 9 HRS GROUND SURFACE ELEV. 743.9

JOB NAME TVA KINGSTON EAST DIKE LOGGED BY Rodney Clark HOURS MOVING 1 HRS DATE: 8/13-16/10 WEATHER: Sunny 90F some rain on 8/16/10

SAMPLING No.	DEPTH	"N" 1ST 6"	2ND 6"	3RD 6"	SCALE	UD	REC	SOIL CLASSIFICATION	REMARKS
13	19.5' → 21.0'	1	3	5	/	/	1.5'	yellowish reddish brown mottled light gray, fat CLAY w/ sand moist-wet, firm, medium plasticity (8-14-10) stop drilling (8/16/10) restart drilling W.L. = appx 12' bgs	All wet
14	21.0' → 22.5'	1	3	4	/	/	1.5'	reddish brown fat CLAY (CH) w/ some sand moist firm medium plasticity, low toughness (brown fat CLAY cuttings begin to surface from augers drilling from 22.0' wet	
15	22.5' → 24.0'	1	1	2			0.0'	No recovery / No catcher in split spoon	
16	24.0' - 25.5'	WOH	1	1			1.5'	reddish brown, fat CLAY w/ some to few fine sand, wet, very soft, high plasticity, low toughness	
17	25.5' - 27.0'	WOH	WOH	WOH			1.5'	light yellowish brown, elastic SILT w/ sand, wet, very soft, medium plasticity, low toughness, sand is very fine	
18	27.0 - 28.5'	WOH	WOH	1	/	/	1.25'	same as above	
19	28.5' - 30.0'	WOH	WOH	WOH	/	/	1.5'	light yellowish brown CLAYEY SAND (SC) wet, very loose, mostly very fine grained sand, some fines	
20	30.0' → 31.5'	2	1	2	/	/	1.0'	same as above	
21	31.5' → 33.0'	1	5	6	/	/	1.5'	same as above, except firm	
22	33.0' - 34.5'	1	2	3	/	/	1.5'	same as above except loose	

STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES.

BORING TERMINATED:
BORING REFUSAL:
WATER TOB DEPTH:
WATER 24 HR DEPTH:
WATER LOSSES:
CAVE-IN DEPTHS:
CASING: SIZE LENGTH
STANDBY TIME: BORING LAYOUT

(see page 1)

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	___ TO ___
HAND SHOP: W/MUD: W/WATER	___ TO ___
ROTARY DRILL: W/MUD: W/WATER	___ TO ___
DIAMOND CORE	___ TO ___
CORE SIZE	___ TO ___
UNDISTURBED SAMPLES No. ____ SIZE ____	
BAG SAMPLES No. ____ SIZE ____	

F1024

Written by: J. Sura / Y. Cao **Date:** 10/29/10 **Reviewed by:** Neil Davis **Date:** 10/29/10

Client: TVA **Project:** Dredge Cells Recovery **Project/ Proposal No.:** GR4327 **Task No.:** 105

MACTEC SOIL TEST BORING FIELD REPORT BORING NO. C-2 PG. 3 OF 3

JOB NO. 3043101038 DRILLER George Akins RIG TYPE CME-55D TRACK HAMMER TYPE AUTO HOURS DRILLING 9 HRS GROUND SURFACE ELEV. ~~713.9~~ 713.9'

JOB NAME TVA KINGSTON EAST DIKE LOGGED BY Rodney Clark HOURS MOVING 1.0 HRS DATE ~~8/13~~ 8/13-16/10 WEATHER: 90°F+ ~~Mostly~~ rain

SAMPLING No.	DEPTH	"N" 1ST 6"	2ND 6"	3RD 6"	SCALE	UD	REC	SOIL CLASSIFICATION	REMARKS
23	34.5-36.0	WOH	2	4	/	/	1.5'	light grayish brown, silty SAND, SM, wet, loose, mostly fine quartz sand	
24	36.0-37.5	WOH	4	3	/	/	1.5'	same as above w/trace gravel (shale fragments, quartz, limestone) & dark grayish brown	
25	37.5-39.0	1	3	4			1.3'	same as above	
26	39.0-40.5	24	18	16	/	/	1.0	light gray, silty SAND (SM) w/some gravel, wet, dense, gravel is subrounded. SANDSTONE, & weathered shale fragments, mostly fine quartz sand	
27	40.5-42.0	10	5	9	/	/	1.4'	At 40.7' dark gray, weathered SHALE friable, severely weathered, platy bedding	
28	42.5-43.8	15	28	50/0.3	/	/	1.3'	same as above Auger Refusal @ 43.4	Top of SHALE @ 40.7' ↑ Terminated

STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES.

BORING TERMINATED:
BORING REFUSAL:
WATER TOB DEPTH:
WATER 24 HR DEPTH: (See page 1)
WATER LOSSES:
CAVE-IN DEPTHS:
CASING: SIZE LENGTH
STANDBY TIME: BORING LAYOUT

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	___ TO ___
HAND SHOP: W/MUD: W/WATER	___ TO ___
ROTARY DRILL: W/MUD: W/WATER	___ TO ___
DIAMOND CORE	___ TO ___
CORE SIZE	___ TO ___
UNDISTURBED SAMPLES No. ____ SIZE ____	
BAG SAMPLES No. ____ SIZE ____	

F1024

Written by: J. Sura / Y. Cao **Date:** 10/29/10 **Reviewed by:** Neil Davis **Date:** 10/29/10

Client: TVA **Project:** Dredge Cells Recovery **Project/ Proposal No.:** GR4327 **Task No.:** 105

MACTEC SOIL TEST BORING FIELD REPORT

BORING NO. D-1 PG. 1 OF 3
RIG TYPE CME-550 ATV HAMMER TYPE AUTO
JOB NO. 3043101038 DRILLER George Akins HOURS DRILLING 11.5 HRS GROUND SURFACE ELEV. 748.7
JOB NAME TVA KINGSTON EAST DIKE LOGGED BY Rodney Clark HOURS MOVING 0.5 HRS DATE: 8/12/10 8/13/10 WEATHER: 90°F+ Minimal Rain

No.	DEPTH	"N" 1ST 6"	"N" 2ND 6"	"N" 3RD 6"	SCALE	UD	REC	SOIL CLASSIFICATION	REMARKS
								0.3' OF SURFICAL GRAVEL, BORING IN ROADWAY	0.3' of gravel
1	0.0'-1.5'	3	6	10			1.3'	reddish brown, fat CLAY (CH) w/gravel, moist, very stiff, gravel is angular chert & limestone, FILL MATERIAL	
2	1.5'-3.0'	3	4	9	—	—	1.4'	same as above except stiff instead of very stiff	↑
3	3.0'-4.5'	2	4	3	—	—	1.2'	same as above except firm instead of very stiff	FILL
4	4.5'-6.0'	1	2	3	—	—	1.0'	same as above, except firm color change @ 5.8' to yellowish gray, reddish gray to reddish brown	↓
5	6.0'-7.5'	3	8	4	—	—	1.0'	fat CLAY (CH), moist (increased moisture) w/gravel, hard material @ 6.5' (angular gravel is limestone/chert) - Driller indicated cobble, pushing augar to side	
6	7.5'-9.0'	1	2	1	—	—	1.2'	brown, fat CLAY (CH) w/some angular gravel (chert/limestone) moist, soft, high plasticity, low toughness	↑ FILL
7	9.0'-10.5'	1	4	3	—	—	1.4'	brown to dark brown fat CLAY (CH) w/ some angular gravel, moist to wet, wet zone at appx 10.0'-10.2' bgs high plasticity, low toughness	↓
8	10.5'-12.0'	1	1	3	—	—	1.5'	grayish brown fat CLAY, CH, moist, soft, some angular gravel, shale frag. FILL MATERIAL, high plasticity, low toughness	
9	12.0-13.5'	1	2	2	—	—	0.5'	brown, fat CLAY w/gravel (CH) wet, soft gravel is angular, shale, [illegible]	▽ WT encountered
10	13.5'-15.0'	WOH	1	1	—	—	1.5'	same as above except very soft instead of soft	15.0' Top of Alluvium
11	15.0-16.5'	WOR	WOH	1	—	—	0.9	light brown, fat CLAY (CH) w/some sand, high plasticity, low toughness shale fragments in upper-most portion of sample	
12	16.5'-18.0'	WOH	WOH	WOH	—	—	1.2'	~~elastic SILT~~ fat CLAY (CH) moist, very soft	↓

STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES.

BORING TERMINATED: 53.7 bgs
BORING REFUSAL: 53.7 bgs
WATER TOB DEPTH: 15.13' bgs
WATER 24 HR DEPTH: 3.03' bgs (tremie p. & bore hole)
WATER LOSSES: None
CAVE-IN DEPTHS: NA (set tremie pipe)
CASING: SIZE NA LENGTH NA
STANDBY TIME: 1 HR 15 MIN RAIN DELAY
BORING LAYOUT On East Dike Gravel Road

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0.0? TO 53.7
HAND SHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO
CORE SIZE	TO

UNDISTURBED SAMPLES No. NA SIZE NA
BAG SAMPLES No. NA SIZE NA

* Begin "charging" auger @ 41.5'

F1024

Written by: J. Sura / Y. Cao **Date:** 10/29/10 **Reviewed by:** Neil Davis **Date:** 10/29/10

Client: TVA **Project:** Dredge Cells Recovery **Project/ Proposal No.:** GR4327 **Task No.:** 105

MACTEC SOIL TEST BORING FIELD REPORT BORING NO. D-1 PG. 2 OF 3

RIG TYPE CME-550ATV HAMMER TYPE AUTO

JOB NO. 3043101038 DRILLER George Akins HOURS DRILLING 11.5 HRS GROUND SURFACE ELEV. 748.7

JOB NAME TVA KINGSTON EAST DIKE LOGGED BY Rodney Clark HOURS MOVING 0.5 HRS DATE: 8/12/10 WEATHER: 90°F Minimal Rain

SAMPLING No.	DEPTH	"N" 1ST 6"	2ND 6"	3RD 6"	SCALE	UD	REC	SOIL CLASSIFICATION	REMARKS
13	18.5-19.5	WOH	WOH	WOH	/	/	1.3'	light yellowish brown, fat, CLAY (CH), moist, very soft, high plasticity, low toughness, little fine sand	Allow
14	19.5-21.0	2	5	6			1.2'	yellowish brown mottled w/ light gray lean CLAY w/sand, CL, moist, trace angular shale fragments, mottled	
15	21.0-22.5	7	9	11			1.5'	some very fine sand, stiff yellowish brown mottled w/ light gray lean CLAY w/sand (CL), moist, some fine sand, very stiff	
16	22.5-24.0	3	4	5	/	/	1.4'	light yellowish brown/ slight mottling fat CLAY (CH) w/sand, stiff, high plasticity, medium toughness	
17	24.0-25.5	2	3	5	/	/	1.5	same as above except firm	
18	25.5-27.0	1	3	5	/	/	1.5	same as above, vertical striations/ mottling	
19	27.0-28.5	3	5	6	/	/	1.4'	grades into clayey SAND (SC) wet, yellowish brown w/trace grace, small silty SAND (SM) lenses, firm	
20	28.5→30.0	1	4	3	/	/	1.0'	grades into light gray, silty SAND (SM) wet, loose, mostly fine-very fine sand	
21	30.0-31.5	1	2	2	/	/	0.0'	No recovery, cuttings intact light gray	
22	31.5→33.0	1	0	0	/	/	1.7'	clayey, SAND (SC) wet, very loose, lensing w/ silty sand (SM), trace shale fragments	
23	33.0-34.5	WOR	WOR	WOH	/	/	1.5	light greyish brown, lean SILT (ML) w/ sand, medium to low plasticity, some clay, sand is very fine, very soft	

STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES.

BORING TERMINATED: _____

BORING REFUSAL: _____

WATER TOB DEPTH: _____

WATER 24 HR DEPTH: _____

WATER LOSSES: _____

CAVE-IN DEPTHS: _____

CASING: SIZE _____ LENGTH _____

STANDBY TIME: _____ BORING LAYOUT _____

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	___ TO ___
HAND SHOP: W/MUD: W/WATER	___ TO ___
ROTARY DRILL: W/MUD: W/WATER	___ TO ___
DIAMOND CORE	___ TO ___
CORE SIZE	___ TO ___
UNDISTURBED SAMPLES No. _____ SIZE _____	
BAG SAMPLES No. _____ SIZE _____	

F1024

Written by: J. Sura / Y. Cao **Date:** 10/29/10 **Reviewed by:** Neil Davis **Date:** 10/29/10

Client: TVA **Project:** Dredge Cells Recovery **Project/ Proposal No.:** GR4327 **Task No.:** 105

MACTEC SOIL TEST BORING FIELD REPORT BORING NO. D-1 PG. 3 OF 3

JOB NO. 3043101038 DRILLER George Akins RIG TYPE CME-550ATV HAMMER TYPE AUTO

JOB NAME TVA KINGSTON EAST DIKE LOGGED BY Rodney Clarke HOURS DRILLING 11.5 HRS HOURS MOVING 0.5 HRS GROUND SURFACE ELEV. 748.7 DATE: 8/12/10 8/13/10 WEATHER: 90°F

SAMPLING No.	DEPTH	"N" 1ST 6"	2ND 6"	3RD 6"	SCALE	UD	REC	SOIL CLASSIFICATION	REMARKS
24	34.5→36.0'	WOR	WOH	WOH			1.4'	gray, elastic SILT w/sand, MH, wet, very soft, medium plasticity	Alluvium
25	36.0'-37.5'	WOR	WOH	WOH			1.4'	←same as above	
26	37.5→39.0'	WOH	WOH	1			1.5'	gray, silty SAND (SM), wet, very loose, mostly very fine quartz sand	
27	39.0'-41.5'	WOH	WOH	1			1.3'	←same as above	
28	41.5'-43.0	WOH	WOH	1			1.3'	yellowish brown, silty, SAND (SM) wet, very loose, mostly fine quartz sand ALLUVIUM	Alluvium *NOTE
29	43.0-44.5'	1	5	6			1.4'	grayish brown grades to yellowish brown, silty, SAND (SM) wet, firm, mostly fine quartz sand ALLUVIUM	
30	44.5-46.0'	5	15	23			1.5'	dark gray, SILT, ML, WEATHERED SHALE, RESIDUUM, moist, platy bedding, friable, fissile, hard	TOP OF SHALE @ 44.5
31	46.0→47.5'	10	15	19			1.3'	dark gray, weathered SHALE moist, platy bedding, friable fissile	weathered Shale
32	47.5'-49.0'	7	19	26			1.0'	same as above	
33	49.0-50.5'	15	23	22			1.3'	same as above	
34	50.5-52.0'	6	13	9			0.5	same as above	
35	52.0→53.7'	15	30	50/0.3'				Refusal @ 53.7 bgs	

STANDARD PENETRATION RESISTANCE (NUM. OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES.

*NOTE: drillers began adding water @ 41.5' to prevent sand upheaval

BORING TERMINATED:
BORING REFUSAL:
WATER TOB DEPTH:
WATER 24 HR DEPTH: (See page 1)
WATER LOSSES:
CAVE-IN DEPTHS:
CASING: SIZE LENGTH
STANDBY TIME: BORING LAYOUT

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	___ TO ___
HAND SHOP: W/MUD: W/WATER	___ TO ___
ROTARY DRILL: W/MUD: W/WATER	___ TO ___
DIAMOND CORE	___ TO ___
CORE SIZE	___ TO ___
UNDISTURBED SAMPLES No. ____ SIZE ____	
BAG SAMPLES No. ____ SIZE ____	

F1024

Written by: J. Sura / Y. Cao **Date:** 10/29/10 **Reviewed by:** Neil Davis **Date:** 10/29/10

Client: TVA **Project:** Dredge Cells Recovery **Project/ Proposal No.:** GR4327 **Task No.:** 105

MACTEC SOIL TEST BORING FIELD REPORT BORING NO. Pz-D1B PG. 1 OF 1

RIG TYPE CME 550 TRACK HAMMER TYPE AUTO

JOB NO. 3043101038 DRILLER George Akins HOURS DRILLING 1.0 GROUND SURFACE ELEV. Appx 748.7

JOB NAME TVA KINGSTON LOGGED BY Rodney Clark HOURS MOVING 0.25 DATE: 8/25/10 WEATHER: Sunny 80°

EAST DIKE STABILITY STUDY

SAMPLING No.	DEPTH	"N" 1ST 6"	"N" 2ND 6"	"N" 3RD 6"	SCALE	UD	REC	SOIL CLASSIFICATION	REMARKS
1	3'-5'	NA	NA	NA	NA	1	1.25'	Drill to 3'bgs w/ 3¼" HSAs, push tube via piston sampler after charging boring w/ water / wait appx 10 minutes prior to pulling tube. Material is reddish brown fat CLAY (CH) w/ some gravel - Charge boring at 5' intervals when adding augers - At 6' bgs encounter obstruction "large cobble" Auger refusal / Offset to new location	

STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES.

BORING TERMINATED: 6'

BORING REFUSAL: 6'

WATER TOB DEPTH: 4.5' bgs

WATER 24 HR DEPTH: NA

WATER LOSSES: NA

CAVE-IN DEPTHS: NA

CASING: SIZE NA LENGTH NA

STANDBY TIME: NA BORING LAYOUT 6' South of D-1

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0.0 TO 6.0'
HAND SHOP: W/MUD: W/WATER	___ TO ___
ROTARY DRILL: W/MUD: W/WATER	___ TO ___
DIAMOND CORE	___ TO ___
CORE SIZE	___ TO ___
UNDISTURBED SAMPLES No. NA SIZE NA	
BAG SAMPLES No. NA SIZE NA	

F1024

SUBSURFACE LOG

Project No.	175669015	Location	N 555194.95, E 2442895.83 (NAD27)
Project Name	KIF-TVA; New Dike C PZ's	Boring No.	**PZ-126** Total Depth 33.0 ft
Location	Roane County, Tennessee	Surface Elevation	754.0 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/6/10 Completed 7/6/10
Supervisor	M. Jones Driller S. Snow	Depth to Water	13.0 ft Date/Time 7/6/10
Logged By	M. Jones	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
754.0'	0.0'	Top of Hole							
751.0'	3.0'	GRAVEL							Boring advanced with 4.25" HSA and center plug.
749.0'	5.0'	LEAN CLAY, dark reddish brown, moist, very stiff, trace organics and sand		SPT-1	3.0 - 5.0	1.6	4-4-7-10	--	
747.0'	7.0'	SILTY SAND with Bottom Ash and Coal Fragments, gray to black and brown, moist, medium dense		SPT-2	5.0 - 7.0	2.0	6-20-13-8	--	
				SPT-3	7.0 - 9.0	2.0	4-7-12-19	--	
		BOTTOM ASH with Fly Ash, black, moist, loose to medium dense -increasingly coarse Bottom Ash below 11 feet		SPT-4	9.0 - 11.0	1.8	7-9-7-7	--	
				SPT-5	11.0 - 13.0	2.0	5-4-5-5	--	
				SPT-6	13.0 - 15.0	2.0	5-5-4-4	--	
737.6'	16.4'			SPT-7	15.0 - 17.0	1.6	5-3-2-2	--	
		SILTY SAND, grayish brown, wet, very loose		SPT-8	17.0 - 19.0	1.5	WOH-WOH-WOH-1	--	
				SPT-9	19.0 - 21.0	1.0	3-2-1-1	--	
				SPT-10	21.0 - 23.0	1.4	WOH-WOH-1-1	--	
729.9'	24.1'			SPT-11	23.0 - 25.0	2.0	WOH-4-2-3	--	
729.0'	25.0'	SANDY SILT, brown, moist to wet, soft		SPT-12	25.0 - 27.0	2.0	WOH-WOH-WOH-WOH	--	
		SANDY SILTY CLAY, brown mottled gray, moist, very soft		SPT-13	27.0 - 29.0	2.0	WOH-WOH-WOH-5	--	
723.7'	30.3'			SPT-14	29.0 - 31.0	2.0	4-3-5-5	--	
721.0'	33.0'	SILTY SAND, orange brown, wet, loose to medium dense		SPT-15	31.0 - 33.0	2.0	2-4-3-3	--	
		No Refusal / Bottom of Hole							

FMSM_LEGACY NEW DIKE C PZ BORINGS.GPJ FMSM.GDT 7/29/10

Stantec

SUBSURFACE LOG (DRAFT)

Project No.	175661005	Location	N 554950.52, E 2442001.66 (NAD27)
Project Name	TVA KIF: Lateral Expansion	Boring No.	**PZ-E17** Total Depth 54.0 ft
Location	Roane County, Tennessee	Surface Elevation	762.5 ft. (NGVD29)
Project Type	Instrumentation Installation	Date Started	3/30/11 Completed 3/30/11
Supervisor	M. Jones Driller K. Clements	Depth to Water	N/A Date/Time N/A
Logged By	M. Jones	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
762.5'	0.0'	Top of Hole							
		Blank drill to 30 feet. OVERBURDEN (Ash)							Boring advanced with 4.25" I.D. hollow stem augers.
732.5'	30.0'								
		FLY ASH, gray, wet, very soft		SPT-1	30.0 - 31.5	1.5	WOH-WOH-WOH	--	
				SPT-2	31.5 - 33.0	0.0	WOH-WOH-1	--	
				SPT-3	33.0 - 34.5	1.5	1-WOH-1	--	
				SPT-4	34.5 - 36.0	0.8	1-WOH-WOH	--	
725.2'	37.3'			SPT-5	36.0 - 37.5	0.3	WOH-WOH-WOH	--	
723.5'	39.0'	SILTY CLAY, dark gray, moist, very soft, trace organics		SPT-6	37.5 - 39.0	0.7	WOH-WOH-WOH	--	
		LEAN CLAY, light gray, moist, soft to medium stiff		SPT-7	39.0 - 40.5	0.6	WOH-WOH-3	--	
				SPT-8	40.5 - 42.0	0.8	WOH-2-3	--	
719.5'	43.0'			SPT-9	42.0 - 43.5	1.0	2-3-3	--	

Stantec

SUBSURFACE LOG (DRAFT)

Project No.	175661005	Location	N 554950.52, E 2442001.66 (NAD27)
Project Name	TVA KIF: Lateral Expansion	Boring No.	**PZ-E17**
		Total Depth	54.0 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		LEAN CLAY, orange brown and gray, moist, medium stiff *(Continued)*		SPT-10	43.5 - 45.0	1.1	2-2-4	--	
				SPT-11	45.0 - 46.5	1.5	1-2-3	--	
715.0'	47.5'			SPT-12	46.5 - 48.0	1.5	4-4-5	--	
713.7'	48.8'	SANDY LEAN CLAY, gray, moist, stiff		SPT-13	48.0 - 49.5	1.5	3-5-6	--	
		SILTY SAND, gray, wet, medium dense, fine to medium grained		SPT-14	49.5 - 51.0	1.5	WOH-WOH-WOH	--	
				SPT-15	51.0 - 52.5	1.5	3-2-4	--	
708.5'	54.0'			SPT-16	52.5 - 54.0	1.0	3-5-8	--	
		No Refusal / Bottom of Hole							

WOH = Weight of Hammer

Three vibrating wire piezometers installed; tip elevations are at 731.2', 720.2', and 709.2'. See installation log for backfill details.

FMSM_LEGACY 175661005 PIEZOMETER BORINGS.GPJ FMSM.GDT 5/3/11

5/3/11

SUBSURFACE LOG

Client Borehole Identification	SPT-17-01	Stantec Boring No.	**SPT-17-01**
Client	Tennessee Valley Authority	Boring Location	575562.7 N; 2410537.6 E (NAD 83)
Project Number	175664009	Surface Elevation	755.0 ft
Elevation Datum	NGVD29		
Project Name	Kington Fossil Plant	Date Started	10/7/17
Completed	10/7/17		
Project Location	Roane County, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	Nate Peterson	Depth to Water	N/A
Date/Time	N/A		
Drilling Contractor	Stantec Consulting Services Inc.	Drill Rig Type and ID	CME 55
Overburden Drilling and Sampling Tools (Type and Size)	Mud Rotary - 5 7/8" Bit, 2" Split Spoon, NWJ Rods		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Sampler Hammer Type	Automatic	Weight	140 lb
Drop	30"	Efficiency	90%
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	Vertical

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows/ Press.(psi) / Rec. %	NMC % / Depth	Remarks
755.0'	0.0'	Top of Hole							
		Fat clay (CH), reddish brown, moist, soft, few chert fragments [Cover Materials]							Set 4' of 6" surface casing Augered from 0' - 7.5'.
746.5'	8.5'			SPT-1	7.5' - 9.0'	1.2'	WOH(16")-1	21	Mud at Start (2 batches: Density = 8.3 lb/gal, Viscosity = 68 s; Density = 8.3 lb/gal, Viscosity = 60 s
		Ash (ML), dark gray, saturated, very loose, saturated [Sluiced Ash]		SPT-2	10.0' - 11.5'	1.6'	1-1-WOH	47	
				SPT-3	12.5' - 14.0'	0.2'	3-WOH-WOH	27	
				SPT-4	15.0' - 16.5'	1.6'	WOR-WOR-WOR	34	
				SPT-5	17.5' - 19.0'	0.7'	WOR-WOR-WOR	32	

TVA RO BORING LOG_175664009 - KIF SEISMIC.GPJ FMSM-GRAPHIC LOG.GDT 3/29/18

SUBSURFACE LOG

Client Borehole Identification: SPT-17-01 | Stantec Boring No.: **SPT-17-01**

Client: Tennessee Valley Authority | Boring Location: 575562.7 N; 2410537.6 E (NAD 83)

Project Number: 175664009 | Surface Elevation: 755.0 ft | Elevation Datum: NGVD29

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows/ Press.(psi) / Rec. %	NMC % / Depth	Remarks
734.4'	20.6'								
		Lean clay with sand (CL), yellowish brown to brownish yellow, wet, very soft [Subunit 1]		SPT-6	20.0' - 21.5'	1.5'	WOR-WOR-WOR	40	
				SPT-7	22.5' - 24.0'	1.5'	1-2-WOH	23	Mud at 22.5': Density = 8.8 lb/gal, Viscosity = 64 s
				SPT-8	25.0' - 26.5'	1.5'	WOH-WOH-WOH	36	
				SPT-9	27.5' - 29.0'	1.7'	WOH-WOH-WOH	29	
725.5'	29.5'								
		Silty Sand (SM), fine grained, strong brown, wet, medium dense [Subunit 2]		SPT-10	30.0' - 31.5'	0.9'	3-7-9	25	Mud after lunch: Density = 8.9 lb/gal, Viscosity = 62 s
723.0'	32.0'								
		Silty, clayey sand with gravel (SC-SM), fine to medium grained, light yellowish brown to brownish yellow, wet, medium dense [Subunit 3]		SPT-11	32.5' - 34.0'	0.8'	4-6-7	25	
719.5'	35.5'								
		Weathered shale, dark gray		SPT-12	35.0' - 36.5'	1.3'	33-45-45	16	
718.5'	36.5'								

Auger Refusal / Bottom of Hole

WOR = Weight of Rods
WOH = Weight of Hammer

TVA RO BORING LOG 175664009 - KIF SEISMIC.GPJ FMSM-GRAPHIC LOG.GDT 3/29/18

SUBSURFACE LOG

Client Borehole Identification: SPT-17-02 | Stantec Boring No.: **SPT-17-02**

Client: Tennessee Valley Authority | Boring Location: 576021.6 N; 2410907.0 E (NAD 83)

Project Number: 175664009 | Surface Elevation: 754.3 ft | Elevation Datum: NGVD29

Project Name: Kington Fossil Plant | Date Started: 10/22/17 | Completed: 10/22/17

Project Location: Roane County, Tennessee | Depth to Water: N/A | Date/Time: N/A

Inspector: Nate Peterson | Depth to Water: N/A | Date/Time: N/A

Drilling Contractor: Stantec Consulting Services Inc. | Drill Rig Type and ID: CME 55

Overburden Drilling and Sampling Tools (Type and Size): Mud Rotary - 5 7/8" Bit, 2" Split Spoon, NWJ Rods

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

Sampler Hammer Type: Automatic | Weight: 140 lb | Drop: 30" | Efficiency: 90%

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

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows/ Press.(psi) / Rec. %	NMC % / Depth	Remarks
754.3'	0.0'	Top of Hole							
		Fat clay (CH), reddish brown to very dark grayish brown, moist to wet, soft, with trace chert fragments, fly ash, and roots [Cover Materials]							Augered from 0' - 7.5'.
				SPT-1	7.5' - 9.0'	0.6'	WOH-1-2	24	Mud at Start (2 batches: Density = 8.3 lb/gal, Viscosity = 68 s; Density = 8.3 lb/gal, Viscosity = 60 s
743.3'	11.0'			SPT-2	10.0' - 11.5'	0.4'	WOH-WOH-WOH	26	
		Ash (ML), black to very dark gray, saturated, very loose [Sluiced Ash]		SPT-3	12.5' - 14.0'	0.9'	1-1-2	36	
				SPT-4	15.0' - 16.5'	0.3'	1-WOH-WOH	58	Mud after lunch: Density = 8.7 lb/gal, Viscosity = 64 s
				SPT-5	17.5' - 19.0'	0.0'	WOR-WOR-WOR	--	

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SUBSURFACE LOG

Client Borehole Identification: SPT-17-02 | Stantec Boring No.: **SPT-17-02**

Client: Tennessee Valley Authority | Boring Location: 576021.6 N; 2410907.0 E (NAD 83)

Project Number: 175664009 | Surface Elevation: 754.3 ft | Elevation Datum: NGVD29

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows/ Press.(psi) / Rec. %	NMC % / Depth	Remarks
		Ash (ML), black to very dark gray, saturated, very loose [Sluiced Ash] *(Continued)*		SPT-6	20.0' - 21.5'	1.1'	WOR-WOR-WOR	41	
730.5'	23.8'			SPT-7	22.5' - 24.0'	1.0'	WOR-WOR-WOR	39	
		Silt with sand (ML), dark gray and black, wet, very loose [Subunit 2]		SPT-8	25.0' - 26.5'	1.3'	WOR-WOH-WOH	45	Mud at 25.0': Density = 9.0 lb/gal, Viscosity = 63 s
727.3'	27.0'								
		Sandy silty clay (CL-ML), light olive brown to gray, moist to wet, medium to stiff [Subunit 2]		ST-1	27.5' - 29.5'	2.0'		--	Pocket penetrometer = 1.0 tsf
				SPT-9	30.0' - 31.5'	1.4'	WOR(8")-2-7	21	
				SPT-10	32.5' - 34.0'	1.2'	1-4-8	20	
				SPT-11	35.0' - 36.5'	1.2'	4-4-3	18	
715.3'	39.0'			ST-2	37.5' - 39.5'	2.0'		--	Pocket penetrometer = 0.5 tsf
		Silty sand (SM), fine grained, gray, wet, very loose [Subunit 2]		SPT-12	40.0' - 41.5'	1.4'	WOR-WOR-WOR	23	Mud at 40.0': Density = 9.2 lb/gal, Viscosity = 70 s
				SPT-13	42.5' - 44.0'	1.4'	WOR(4")-WOR(14")	24	
				SPT-14	45.0' - 46.5'	1.7'	WOR-WOH-WOH	25	

SUBSURFACE LOG

Client Borehole Identification: SPT-17-02 | Stantec Boring No. **SPT-17-02**

Client: Tennessee Valley Authority | Boring Location: 576021.6 N; 2410907.0 E (NAD 83)

Project Number: 175664009 | Surface Elevation: 754.3 ft | Elevation Datum: NGVD29

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows/ Press.(psi) / Rec. %	NMC % / Depth	Remarks
707.3'	47.0'	Silty sand (SM), fine grained, gray, wet, loose [Subunit 3]		SPT-15	47.5' - 49.0'	1.2'	4-4-5	21	
704.6'	49.7'	Auger Refusal / Bottom of Hole							

WOR = Weight of Rods
WOH = Weight of Hammer

SUBSURFACE LOG

Client Borehole Identification	SPT-17-03	Stantec Boring No.	**SPT-17-03**
Client	Tennessee Valley Authority	Boring Location	575650.2 N; 2411000.1 E (NAD 83)
Project Number	175664009	Surface Elevation	749.0 ft
Elevation Datum	NGVD29		
Project Name	Kington Fossil Plant	Date Started	10/20/17
Completed	10/21/17		
Project Location	Roane County, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	Nate Peterson	Depth to Water	N/A
Date/Time	N/A		
Drilling Contractor	Stantec Consulting Services Inc.	Drill Rig Type and ID	CME 55
Overburden Drilling and Sampling Tools (Type and Size)	Mud Rotary - 5 7/8" Bit, 2" Split Spoon, NWJ Rods		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Sampler Hammer Type	Automatic	Weight	140 lb
Drop	30"	Efficiency	90%
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	Vertical

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows/ Press.(psi) / Rec. %	NMC % / Depth	Remarks
749.0'	0.0'	Top of Hole							
		Fat clay (CH), reddish brown, with chert fragments [Cover Materials]							
745.0'	4.0'								Augered from 0' - 7.5'.
		Ash (ML), black, wet, very loose [Sluiced Ash]							
				SPT-1	7.5' - 9.0'	1.1'	1-1-WOH	57	Mud at Start (2 batches): Density = 8.7 lb/gal, Viscosity = 60 s; Density = 8.7 lb/gal, Viscosity = 75 s
				SPT-2	10.0' - 11.5'	0.5'	1-1-1	46	
736.0'	13.0'								
		Silt (ML), dark gray, wet, loose [Subunit 2]		SPT-3	12.5' - 14.0'	1.4'	WOR-WOR-WOR	44	
				SPT-4	15.0' - 16.5'	1.5'	WOR-WOR-WOR	52	
				SPT-5	17.5' - 19.0'	1.5'	WOR-WOH-WOH	39	

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SUBSURFACE LOG

Client Borehole Identification: SPT-17-03 | Stantec Boring No.: **SPT-17-03**

Client: Tennessee Valley Authority | Boring Location: 575650.2 N; 2411000.1 E (NAD 83)

Project Number: 175664009 | Surface Elevation: 749.0 ft | Elevation Datum: NGVD29

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows/ Press.(psi) / Rec. %	NMC % / Depth	Remarks
		Silt (ML), dark gray, wet, loose [Subunit 2] *(Continued)*		SPT-6	20.0' - 21.5'	1.6'	WOR-WOR-WOR	36	Mud after lunch: Density = 8.8 lb/gal, Viscosity = 62 s
727.0'	22.0'								
		Lean clay (CL), olive brown, wet, very soft to medium [Subunit 1]		SPT-7	22.5' - 24.0'	1.9'	WOH-WOH-WOH	33	
				SPT-8	25.0' - 26.5'	1.6'	WOH-WOH-WOH	23	
				SPT-9	27.5' - 29.0'	1.4'	WOH-2-4	20	
				ST-1	30.0' - 32.0'	1.9'		--	Mud at 30.0': Density = 9.1 lb/gal, Viscosity = 63 s
717.0'	32.0'								
		Sandy silty clay (CL-ML), light olive brown, wet, very soft [Subunit 2]		SPT-10	32.5' - 34.0'	'	WOR-WOR-WOR	26	Pocket penetrometer = 1.0 tsf
				SPT-11	35.0' - 36.5'	'	WOR-WOR-WOR	25	
				ST-2	37.0' - 39.0'	1.6'		--	Pocket penetrometer = 0 tsf
708.0'	41.0'			SPT-12	40.0' - 41.5'	1.7'	WOR(15")-WOH	30	Mud at 40.0': Density = 9.5 lb/gal, Viscosity = 64 s
		Sandy silt (ML), dark gray, wet, very loose [Subunit 2]		SPT-13	42.5' - 44.0'	1.4'	WOR(4")-WOH(14")	41	
704.5'	44.5'								
		Silty sand (SM), very dark gray, very loose [Subunit 2]		SPT-14	45.0' - 46.5'	1.4'	WOH-1-1	38	

TVA RO BORING LOG 175664009 - KIF SEISMIC.GPJ FMSM-GRAPHIC LOG.GDT 3/29/18

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SUBSURFACE LOG

Client Borehole Identification: SPT-17-03 | Stantec Boring No.: **SPT-17-03**

Client: Tennessee Valley Authority | Boring Location: 575650.2 N; 2411000.1 E (NAD 83)

Project Number: 175664009 | Surface Elevation: 749.0 ft | Elevation Datum: NGVD29

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows/ Press.(psi) / Rec. %	NMC % / Depth	Remarks
701.5'	47.5'								
700.7'	48.3'	Silty sand with gravel (SM), medium grained, greenish gray to yellowish brown, wet [Subunit 3]		SPT-15	47.5' - 48.3'	0.8'	34-50/3"	16	
		Auger Refusal / Bottom of Hole							

WOR = Weight of Rods
WOH = Weight of Hammer

SUBSURFACE LOG

Project No.	175569042	Location	N 553773.29, E 2441154.53 (NAD27)
Project Name	Kingston Ash Pond	Boring No.	**STN-48** Total Depth 54.0 ft
Location	Kingston, Tennessee	Surface Elevation	765.3 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	3/31/09 Completed 3/31/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	20.0 ft Date/Time 3/31/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
765.3'	0.0'	Top of Hole							
		LEAN CLAY (Fill), red brown, moist, medium stiff, some chert		SPT-1	0.0 - 1.5	1.2	1-3-3	25	Boring advanced using 3 1/4 " Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.4	3-4-5	22	
				SPT-3	3.0 - 4.5	1.1	5-6-7	21	All ST samples recovered using a fixed head piston sampler
				ST-1	4.5 - 6.5	1.7		--	
				SPT-4	6.5 - 8.0	1.3	5-7-7	24	
755.8'	9.5'			SPT-5	8.0 - 9.5	1.2	3-5-7	25	
		FAT CLAY (Fill), red brown, saturated, very soft, little chert		SPT-6	9.5 - 11.0	1.1	3-5-5	28	
				SPT-7	11.0 - 12.5	1.3	3-7-5	31	
				SPT-8	12.5 - 14.0	1.0	6-6-7	28	
				ST-2	14.0 - 16.0	1.0		--	
				SPT-9	16.0 - 17.5	0.8	WOR-1-2	30	
				SPT-10	17.5 - 19.0	1.2	WOR-2-2	32	
745.3'	20.0'			ST-3	19.0 - 21.0	1.0		--	ST-3: refused at 1.0 ft, ash in bottom of tube
		Bottom Ash 60% / Fly Ash 40% (Fill), black, saturated, loose		SPT-11	20.0 - 21.5	1.3	6-7-7	25	
				SPT-12	21.5 - 23.0	1.2	7-9-3	29	
741.3'	24.0'			SPT-13	23.0 - 24.5	1.1	1-WOH-WOH	24	
		LEAN CLAY, light brown, saturated, very soft, some silt, some fine grained sand		SPT-14	24.5 - 26.0	1.4	WOR-WOR-WOR	21	SPT-14: roots in tip of spoon
737.8'	27.5'			SPT-15	26.0 - 27.5	1.0	WOR-1-2	23	
		SAND with Clay, light brown, saturated, very loose to loose, some silt		SPT-16	27.5 - 29.0	1.1	2-2-2	22	
				SPT-17	29.0 - 30.5	1.4	3-1-2	21	
				SPT-18	30.5 - 32.0	1.2	2-2-3	21	
				SPT-19	32.0 - 33.5	0.9	WOR-1-1	20	
				ST-4	33.5 - 35.5	1.8		--	ST-4: sand in bottom of tube
				SPT-20	35.5 - 37.0	1.3	1-1-1	19	

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SUBSURFACE LOG

Project No. 175569042 Location N 553773.29, E 2441154.53 (NAD27)

Project Name Kingston Ash Pond Boring No. **STN-48** Total Depth 54.0 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
728.3'	37.0'	SAND, light brown, saturated, very loose, fine grained, trace clay		SPT-21	37.0 - 38.5	1.3	WOR-WOR-WOR	21	Water added at 38.0 ft to keep augers clear
				SPT-22	38.5 - 40.0	1.1	WOR-WOH-1	23	
				SPT-23	40.0 - 41.5	1.3	1-2-2	21	
				SPT-24	41.5 - 43.0	1.2	1-1-2	23	
				SPT-25	43.0 - 44.5	1.3	WOR-1-1	21	
719.8'	45.5'			SPT-26	44.5 - 46.0	1.2	5-6-10	21	
		SAND, light gray, saturated, loose, fine grained		SPT-27	46.0 - 47.5	1.1	4-5-5	24	
				SPT-28	47.5 - 48.3	0.8	6-50	19	SPT-28: sandstone in tip of spoon
716.3'	49.0'								
				SPT-29	49.0 - 50.5	1.0	9-11-17	--	
		Shale, (Augered)		SPT-30	50.5 - 52.0	1.0	15-18-17	--	Boring backfilled with bentonite cement grout from 0.0 ft to 54.0 ft
				SPT-31	52.0 - 52.9	0.6	35-50/0.4	--	
711.3'	54.0'								
		Auger Refusal / Bottom of Hole							

WOH = Weight of Hammer
WOR = Weight of Rods

SUBSURFACE LOG

Project No.	175569042	Location	N 553769.40, E 2441163.30 (NAD27)
Project Name	Kingston Ash Pond	Boring No.	**STN-48B** Total Depth 48.2 ft
Location	Kingston, Tennessee	Surface Elevation	765.3 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	4/21/09 Completed 4/21/09
Supervisor	Ben Halada Driller Steve Bradford	Depth to Water	N/A Date/Time N/A
Logged By	Adam Smith	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
765.3'	0.0'	Top of Hole							
		Overburden, See log for STN-48							Boring advanced using 3 1/4 " Hollow Stem Augers

FMSM_LEGACY 171469117 KINGSTON ASH POND.GPJ FMSM.GDT 7/16/09

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SUBSURFACE LOG

Project No.	175569042	Location	N 553769.40, E 2441163.30 (NAD27)
Project Name	Kingston Ash Pond	Boring No.	**STN-48B** Total Depth 48.2 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		Overburden, See log for STN-48 *(Continued)*							
717.1'	48.2'	No Refusal / Bottom of Hole							

PZ Installed, tip at elevation 720.1'

Protective well cover and concrete pad installed.

FMSM_LEGACY 171468117 KINGSTON ASH POND.GPJ FMSM.GDT 7/16/09

7/16/09

SUBSURFACE LOG

Project No.	175669015	Location	N 555194.95, E 2442895.83 (NAD27)
Project Name	KIF-TVA; New Dike C PZ's	Boring No.	**STN-75** Total Depth 33.0 ft
Location	Roane County, Tennessee	Surface Elevation	754.0 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/6/10 Completed 7/6/10
Supervisor	M. Jones Driller S. Snow	Depth to Water	13.0 ft Date/Time 7/6/10
Logged By	M. Jones	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
754.0'	0.0'	Top of Hole							
751.0'	3.0'	GRAVEL							Boring advanced with 4.25" HSA and center plug.
749.0'	5.0'	LEAN CLAY, dark reddish brown, moist, very stiff, trace organics and sand		SPT-1	3.0 - 5.0	1.6	4-4-7-10	--	
747.0'	7.0'	SILTY SAND with Bottom Ash and Coal Fragments, gray to black and brown, moist, medium dense		SPT-2	5.0 - 7.0	2.0	6-20-13-8	--	
				SPT-3	7.0 - 9.0	2.0	4-7-12-19	--	
		BOTTOM ASH with Fly Ash, black, moist, loose to medium dense		SPT-4	9.0 - 11.0	1.8	7-9-7-7	--	
		-increasingly coarse Bottom Ash below 11 feet		SPT-5	11.0 - 13.0	2.0	5-4-5-5	--	
				SPT-6	13.0 - 15.0	2.0	5-5-4-4	--	
737.6'	16.4'			SPT-7	15.0 - 17.0	1.6	5-3-2-2	--	
		SILTY SAND, grayish brown, wet, very loose		SPT-8	17.0 - 19.0	1.5	WOH-WOH-WOH-1	--	
				SPT-9	19.0 - 21.0	1.0	3-2-1-1	--	
				SPT-10	21.0 - 23.0	1.4	WOH-WOH-1-1	--	
729.9'	24.1'			SPT-11	23.0 - 25.0	2.0	WOH-4-2-3	--	
729.0'	25.0'	SANDY SILT, brown, moist to wet, soft		SPT-12	25.0 - 27.0	2.0	WOH-WOH-WOH-WOH	--	
		SANDY SILTY CLAY, brown mottled gray, moist, very soft		SPT-13	27.0 - 29.0	2.0	WOH-WOH-WOH-5	--	
723.7'	30.3'			SPT-14	29.0 - 31.0	2.0	4-3-5-5	--	
721.0'	33.0'	SILTY SAND, orange brown, wet, loose to medium dense		SPT-15	31.0 - 33.0	2.0	2-4-3-3	--	
		No Refusal / Bottom of Hole							

FMSM_LEGACY NEW DIKE C PZ BORINGS.GPJ FMSM.GDT 8/18/10

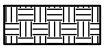
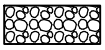
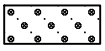
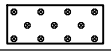
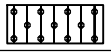
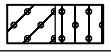
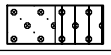
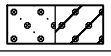
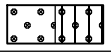
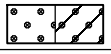
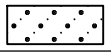
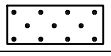
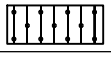
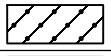
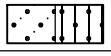
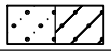
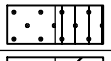
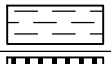
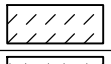
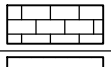
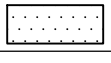
APPENDIX B.5

PERMANENT WELLS

Table of Contents

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.

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**6AR-D**
Client	Tennessee Valley Authority	Boring Location	575,317.72 N; 2,411,234.32 E NAD83
Project Number	182603369	Surface Elevation	754.1 ft
Elevation Datum	NGVD29		
Project Name	KIF Vacatur	Date Started	10/4/18
Completed	10/10/18		
Project Location	Harriman, Tennessee	Depth to Water	22.5 ft
Date/Time	10/4/18		
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)	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 lbs
Drop	30"	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Snider	Approved By	C. Millhollin

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. %
0.0	754.1		Top of Hole						
0			Placed limestone gravel, No. 57 and No. 2 stone. No sampling conducted through road bed material.						
6.0	748.1		LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), soft, dry to moist, with some weathered siltstone fragments Trace organics from 6.0' to 7.5'		SS05	6.0 - 7.5	6.0 - 7.5	1.2	2-4-4
					SS06	7.5 - 9.0	7.5 - 9.0	1.0	4-3-4
			with chert 9.0-10.5'		SS07	9.0 - 10.5	9.0 - 10.5	1.3	3-3-6
			Stiff with interbedded weathered limestone fragments at 10.5'		SS08	10.5 - 12.0	10.5 - 12.0	1.1	12-9-13

SUBSURFACE LOG

Client Borehole ID N/A | Stantec Boring No. **6AR-D**

Client Tennessee Valley Authority | Boring Location 575,317.72 N; 2,411,234.32 E NAD83

Project Number 182603369 | Surface Elevation 754.1 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. %
13.5	740.6		LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), soft, dry to moist, with some weathered siltstone fragments *(Continued)* Medium stiff at 12.0' Color change to 7.5YR 4/6 (strong brown), soft at 12.3'		SS09	12.0 - 13.5	12.0 - 13.5	1.1	6-3-3
			FAT CLAY, CH, 7.5YR 4/6 (strong brown), soft, moist, with gray and tan chert fragments		SS10	13.5 - 15.0	13.5 - 15.0	1.1	2-3-2
			Very soft at 15.0-16.5'		SS11	15.0 - 16.5	15.0 - 16.5	1.1	WH-2-1
			Wet, with gray weathered siltstone fragments at 16.5'		SS12	16.5 - 18.0	16.5 - 18.0	0.5	3-2-2
					SS13	18.0 - 19.5	18.0 - 19.5	0.8	1-2-1
					SS14	19.5 - 21.0	19.5 - 21.0	1.2	2-2-2
			Color change to 7.5YR 4/6 (strong brown) and 7.5YR 3/1 (very dark grey) from 20.8' to 22.5' Very soft at 21.0'		SS15	21.0 - 22.5	21.0 - 22.5	1.0	1-1-1
			With chert at 22.5'		SS16	22.5 - 24.0	22.5 - 24.0	1.1	WH-1-1
			Color change to 5YR 4/6 (yellowish red) with tan fragments of chert at 24.0'		SS17	24.0 - 25.5	24.0 - 25.5	1.5	WH-WH-WH
			With abundant multicolored fragments of chert at 25.5'		SS18	25.5 - 27.0	25.5 - 27.0	1.5	WH-WH-WH
					SS19	27.0 - 28.5	27.0 - 28.5	1.5	WH-2-3

SUBSURFACE LOG

Client Borehole ID N/A | Stantec Boring No. **6AR-D**

Client Tennessee Valley Authority | Boring Location 575,317.72 N; 2,411,234.32 E NAD83

Project Number 182603369 | Surface Elevation 754.1 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. %
28.4	725.7								
			SILT, OL, 10YR 3/1 (very dark gray), very soft, moist to wet		SS20	28.5 - 30.0	28.5 - 30.0	1.4	WH-WH-WH
30.0	724.1								
			SILTY LEAN CLAY, CL, 10YR 3/1 (very dark gray), very soft, moist Soft, with some very fine sand at 39.0'		SS21	30.0 - 31.5	30.0 - 31.5	1.5	WH-WH-2
					SS22	31.5 - 33.0	31.5 - 33.0	1.5	WH-WH-WH
33.5	720.6								
			SANDY LEAN CLAY, CL, 10YR 4/4 (dark yellowish brown) and 10YR 3/2 (very dark grayish brown), very soft, moist, with very fine sand		SS23	33.0 - 34.5	33.0 - 34.5	1.5	WH-WH-WH
					SS24	34.5 - 36.0	34.5 - 36.0	1.5	WH-WH-WH
					SS25	36.0 - 37.5	36.0 - 37.5	1.5	WH-WH-WH
			Color change to 10YR 5/3 (brown) and 10YR 6/1 (gray), wet at 37.5'		SS26	37.5 - 39.0	37.5 - 39.0	1.5	WH-2-4
					SS27	39.0 - 40.5	39.0 - 40.5	0.9	4-5-5
40.5	713.6								
			FAT CLAY, CH, 10YR 5/3 (brown) and 10YR 6/1 (gray), soft to medium stiff, moist, with manganese		SS28	40.5 - 42.0	40.5 - 42.0	1.5	3-5-8
					SS29	42.0 - 43.5	42.0 - 43.5	1.5	7-5-8
43.5	710.6								
			FAT CLAY, CH, 10YR 5/3 (brown) and 10YR 6/1 (gray), soft, moist, with abundant manganese at 43.5'						

SUBSURFACE LOG

Client Borehole ID N/A | Stantec Boring No. **6AR-D**

Client Tennessee Valley Authority | Boring Location 575,317.72 N; 2,411,234.32 E NAD83

Project Number 182603369 | Surface Elevation 754.1 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. %
45			FAT CLAY, CH, 10YR 5/3 (brown) and 10YR 6/1 (gray), soft, moist, with abundant manganese at 43.5' *(Continued)*		SS30	43.5 - 45.0	43.5 - 45.0	1.5	3-3-4
45.5	708.6								
			FAT CLAY, CH, 7.5YR 5/1 (gray), soft, moist		SS31	45.0 - 46.5	45.0 - 46.5	1.5	2-3-4
46									
47					SS32	46.5 - 48.0	46.5 - 48.0	1.5	WH-2-3
48									
49.0	705.1				SS33	48.0 - 49.5	48.0 - 49.5	1.5	WH-WH-WH
49			SANDY LEAN CLAY, CL, 10YR 3/1 (very dark gray), soft, moist, trace organics						
50			Fine sand lens from 49.8' to 50.0'		SS34	49.5 - 51.0	49.5 - 51.0	1.2	WH-2-3
51.0	703.1								
51			SILTY SAND, SM, 10YR 4/1 (dark gray), very loose, moist		SS35	51.0 - 52.5	51.0 - 52.5	1.5	WH-2-3
52									
53					SS36	52.5 - 54.0	52.5 - 54.0	1.5	WH-WH-4
54			Very loose to loose, moist to wet at 54.0'						
55.3	698.8				SS37	54.0 - 55.5	54.0 - 55.5	1.5	2-5-6
55									
56.3	697.8		SILTY SAND, SM, 10YR 6/4 (light yellowish brown), loose, wet, with weathered siltstone fragments and wood pieces, fine to medium		SS38	55.5 - 56.8	55.5 - 56.8	1.3	3-4-50+/4"
56									
56.6	697.5		Shale, dark gray, weathered, fissile						
56.8	697.3								
57			Shale, green, highly weathered, calcareous						Began Core
57.6	696.5		Limestone, light gray, hard, medium bedded						
58			Shale, dark gray, soft, laminated to very thin bedded, highly weathered Vertical fracture, calcite coating, from 57.6' to 58.1'		0	57.3 - 59.0 1.7	57.3 - 59.0	0.9	53
59.0	695.1		Fracture, 45°, calcite infilling, open, at 57.9'						
59			Limestone, light gray, fine, hard, thin bedded, weathered Fracture zone from 59.2' to 59.7'		0	59.0 - 60.8 1.8	59.0 - 60.8	0.9	50
60									

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **6AR-D**
Client Tennessee Valley Authority
Boring Location 575,317.72 N; 2,411,234.32 E NAD83
Project Number 182603369
Surface Elevation 754.1 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. %
61			Highly weathered with chlorite mineralization from 59.2' to 59.4' Fracture, 30°, quartz infilling, healed, at 59.6' High angle fracture, chlorite coating, at 59.8'					
61.6	692.5		Limestone, light gray, fine, hard, thin bedded, weathered *(Continued)* Fracture, 45°, chlorite coating, at 60.8' Fracture, 30°, weathered, stained, at 61.0' Fracture, 45°, calcite coating, weathered, stained, at 61.3' With brown from 61.5' to 61.6'		14	60.8 - 63.6 2.8	1.3	46
64								
64.3	689.8		Interbedded Shale And Sandstone, dark gray, soft, laminated,					
64.5	689.6				0	63.6 - 65.8 2.2	1.3	59
65			Sandstone, brown, very fine, soft Fracture, 45°, weathered, stained, at 61.6'					
65.8	688.3		Bedding breaks from 61.7' to 62.1' along shale and sandstone contacts, weathered, stained, some healed with calcite filling Fractured zone in shale, highly weathered from 63.6' to 64.0'					
66								
67.1	687.0		Breaks along bedding contacts, weathered, stained, with calcite from 64.0' to 64.3'		35	65.8 - 68.1 2.3	1.0	43
68			Limestone, light gray, fine, hard, thin bedded					
69			Siltstone, gray and brown, very soft, weathered, clayey No recovery		0	68.1 - 70.1 2.0	0.2	10
70.1	684.0		Limestone, light gray, fine, hard, Fracture, 30°, chlorite coating, weathered, stained, at 67.1' Vertical fracture, calcite infilling, from 67.2' to 67.8' Fracture, 45°, calcite infilling, at 67.4' Fractured, weathered, with chlorite mineralization at 68.1'					
71			No recovery					
72					0	70.1 - 75.1 5.0	0.0	0
73								
74								
75								
75.1	679.0							
75.2	678.9		Interbedded Limestone And Siltstone, light gray, fine, hard, with calcite					
76			Siltstone, dark reddish brown, very soft					

60.8 - 63.6
63.6 - 65.8
65.8 - 68.1
68.1 - 70.1
70.1 - 75.1

TVA EIP BORING LOG KIF_VACATUR_REV4_20220519.GPJ TDEC SUBSURF DT 20190530.GDT 5/19/22

SUBSURFACE LOG

Client Borehole ID N/A | Stantec Boring No. **6AR-D**

Client Tennessee Valley Authority | Boring Location 575,317.72 N; 2,411,234.32 E NAD83

Project Number 182603369 | Surface Elevation 754.1 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. %
77			No recovery *(Continued)*		0	75.1 - 80.1 5.0	75.1 - 80.1	0.1	2
78									
79									
80	80.1	674.0							
81			Limestone, light gray, fine, hard, weathered, fractured, stained, with chlorite mineralization on surfaces Healed fracture, 15°, quartz infilling, from 80.6' to 80.8'		0	80.1 - 82.1 2.0	80.1 - 82.1	0.8	40
82	82.1	672.0							
83			Siltstone, dark grayish brown, highly weathered, decomposed, clayey		0	82.1 - 84.0 1.9	82.1 - 84.0	0.2	11
84	84.0	670.1							
85	85.0	669.1	No recovery		0	84.0 - 85.0 1.0	84.0 - 85.0	0.0	0
86			Interbedded Limestone And Shale, grayish brown, soft, vertical bedding, grading to shale Shale, greenish gray, soft, very thin bedded, weathered Fracture zone from 85.0' to 86.0' Vertical fracture, calcite coating, open, stained, from 86.0' to 86.5'		0	85.0 - 87.4 2.4	85.0 - 87.4	1.5	62
87	87.4	666.7							
88			Interbedded Limestone And Shale, light gray, fine, very hard, Shale, greenish gray, soft, very thin bedded to laminated Fracture zone from 87.4' to 87.8' Fracture, 40°, calcite and quartz coating, open, weathered, stained, at 87.8' Numerous healed, calcite filled fractures from 88.0' to 88.8' Fracture, 45°, along shale contact, at 88.0' Fracture, 45°, partially open, weathered, at 88.7' Vertical fracture, thin, healed, from 88.8' to 89.1' Fractures, 45°, weathered, with calcite on surfaces, along shale contacts at 89.3', 89.4'		50	87.4 - 90.0 2.6	87.4 - 90.0	2.6	100
89									
90									
91									
92					0	90.0 - 94.2 4.2	90.0 - 94.2	2.3	55

TVA EIP BORING LOG KIF_VACATUR_REV.4_20220519.GPJ TDEC SUBSURF DT 20190530.GDT 5/19/22

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **6AR-D**
Client Tennessee Valley Authority
Boring Location 575,317.72 N; 2,411,234.32 E NAD83
Project Number 182603369
Surface Elevation 754.1 ft
Elevation Datum NGVD29

Lithology			Description	Overburden: / Rock Core:	Sample[1,2] / RQD %	Depth Ft[3] / Run Ft		Rec. Ft / Rec. %	Blows/PSI
Depth Ft[3]	Elevation	Graphic							
93			Fractures, 45°, weathered, stained, with brown clay and calcite on surfaces at 89.6', 89.7', 89.8'						
94	94.2	659.9	Fracture zone from 90.0' to 90.4', weathered, stained, with some clay Fracture, 20°, weathered, stained, from 90.4' to 90.5'						
95	95.2	658.9	Vertical fracture, calcite and quartz coating, weathered, stained, from 90.7' to 91.7' Fracture, 45°, quartz, weathered, stained, at 91.9' Fracture, 45°, along shale contact, at 92.2'		0	94.2 - 95.2 1.0	94.2 - 95.2	0.0	0
			No recovery						
96			Interbedded Shale And Limestone, greenish gray, soft, laminated, highly weathered, calcareous, friable, stained						
97									
98			Limestone, light gray, fine, very hard, weathered, stained Fracture zone, vertical, weathered, iron stained, with calcite and quartz on surface from 95.2' to 96.3' Vertical fracture, slightly open with weathered shale filling and trace quartz, from 96.3' to 96.8'		NR	95.2 - 100.2 5.0	95.2 - 100.2	2.8	56
99			Fracture zone, highly weathered, iron stained, with calcite and quartz on surface from 96.9' to 97.4' Joint, open, weathered, iron stained, at 97.9'						
100	100.2	653.9							

Bottom of Hole at 100.2 Ft.

Top of Rock = 56.8 Ft.
Top of Rock Elevation = 697.3 Ft.
Begin Core = 57.3 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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-107**
Client	Tennessee Valley Authority	Boring Location	575,325.18 N; 2,408,959.78 E NAD83
Project Number	182603369	Surface Elevation	759.5 ft
Elevation Datum	NGVD29		
Project Name	KIF Vacatur	Date Started	10/11/18
Completed	10/12/18		
Project Location	Harriman, Tennessee	Depth to Water	9.0 ft
Date/Time	10/11/18		
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)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	Automatic	Weight	140 lb
Drop	30"	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	C. Kocka	Approved By	P. Dunne

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. %
0.0	759.5		Top of Hole						
0.2	759.3		Topsoil						
			LEAN CLAY, CL, 5YR 4/4 (reddish brown), low plasticity, soft to medium stiff, moist, with abundant chert fragments, [FILL] With trace coal fragments from 0.2' to 3.0'		SS01	0.0 - 1.5	0.0 - 1.5	1.4	2-5-4
					SS02	1.5 - 3.0	1.5 - 3.0	1.0	4-4-6
					SS03	3.0 - 4.5	3.0 - 4.5	1.5	5-7-7
					SS04	4.5 - 6.0	4.5 - 6.0	1.5	3-3-4
6.0	753.5		FAT CLAY, CH, 5YR 4/4 (reddish brown), soft, moist, with chert fragments, [FILL]		SS05	6.0 - 7.5	6.0 - 7.5	1.5	4-3-5
8.0	751.5		LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), soft, moist, with fragments of siltstone, [FILL]		SS06	7.5 - 9.0	7.5 - 9.0	1.1	WH-2-2
9.0	750.5		SILTY SAND, SM, 10YR 4/2 (dark grayish brown), very fine to fine, very loose, moist to wet, with some silty clay, [FILL]		SS07	9.0 - 10.5	9.0 - 10.5	1.5	1-2-2
					SS08a	10.5 - 11.3	10.5 - 12.0	1.5	1-1-15
11.3	748.2								
11.9	747.6		LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), very soft, moist, [FILL]		SS08b	11.3 - 11.9			
12.0	747.5				SS09	12.0 - 12.1	12.0 - 12.1	0.1	50+/1"
			Limestone, light gray, hard, (augered) [FILL]						
			Shale, greenish gray, highly weathered, calcareous, (augered) [FILL]						

TVA EIP BORING LOG_KIF_VACATUR.GPJ TDEC SUBSURF DT 20190530.GDT 10/2/20

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-107**
Client Tennessee Valley Authority
Boring Location 575,325.18 N; 2,408,959.78 E NAD83
Project Number 182603369
Surface Elevation 759.5 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. %
14			Shale, greenish gray, highly weathered, calcareous, (augered) [FILL] *(Continued)*		SS10	13.5 - 15.0	13.5 - 15.0	0.5	5-4-6
15.0	744.5								
15			Shale With Limestone, (augered) [FILL]						
16			Shale, dark gray, soft, laminated, weathered, clayey		SS11	15.0 - 16.5	15.0 - 16.5	0.6	5-9-13
16.5	743.0		Limestone, light gray, fine grained, hard, weathered, trace iron staining						
			No Refusal / Bottom of Hole at 16.5 Ft.						

Borehole off center from ~12'. Move rig 6' east to offset.

FILL annotation is added to the boring log based on a review of historical information that indicates the original ground surface is at approximately 732 feet NGVD29 in this location.

As-drilled boring location not surveyed. Horizontal coordinates based on field measurements. Vertical coordinates based on survey of KIF-107 Offset.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**AD-2-D**
Client	Tennessee Valley Authority	Boring Location	574,654.66 N; 2,408,274.19 E NAD83
Project Number	182603369	Surface Elevation	753.9 ft
		Elevation Datum	NGVD29
Project Name	KIF Vacatur	Date Started	10/15/18
		Completed	10/16/18
Project Location	Harriman, Tennessee	Depth to Water	19.5 ft
		Date/Time	10/16/18 08:21
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)	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 lbs
Drop	30"	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Snider	Approved By	C. Millhollin

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. %
0.0	753.9		Top of Hole						
			Placed crush and run stone and riprap. No samples collected to 3.0'., [FILL]						
3.5	750.4								
			POORLY GRADED SAND, SP, fine to coarse, [FILL]		SS03	3.0 - 4.5	3.0 - 4.5	1.1	9-7-5
4.5	749.4								
			LEAN CLAY, CL, 7.5YR 4/6 (strong brown), low plasticity, soft, moist With trace fragments of coal, chert from 4.5' to 6.0'		SS04	4.5 - 6.0	4.5 - 6.0	0.3	4-2-2
			Color change to 10YR 4/6 (yellowish brown), with fragments of weathered siltstone at 6.0'		SS05	6.0 - 7.5	6.0 - 7.5	0.9	3-2-3
8.0	745.9								
			LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), low plasticity, medium stiff to very stiff, moist		SS06	7.5 - 9.0	7.5 - 9.0	1.1	6-5-29
9.0	744.9		With weathered shale and limestone fragments at 8.5'		SS07	9.0 - 10.5	9.0 - 10.5	1.0	9-10-11
			wet, Interbedded limestone and shale, light gray to dark gray, fine, soft to hard, laminated, highly weathered, clayey		SS08	10.5 - 12.0	10.5 - 12.0	0.8	8-10-6
					SS09	12.0 - 13.5	12.0 - 13.5	0.5	2-4-11
13.5	740.4								
			LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), medium stiff to stiff, moist to wet, highly weathered interbedded limestone and shale		SS10	13.5 - 15.0	13.5 - 15.0	1.2	5-6-10
14.8	739.1								
			LEAN CLAY, CL, 10YR 4/4 (dark yellowish brown), low plasticity, stiff, wet, weathered siltstone Grading to weathered light gray limestone at 15.5'		SS11	15.0 - 16.5	15.0 - 16.5	0.5	12-10-10
16.5	737.4								
			LEAN CLAY, CL, 10YR 4/4 (dark yellowish brown), low plasticity, soft, moist, with fragments of siltstone		SS12	16.5 - 18.0	16.5 - 18.0	0.4	2-2-1

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **AD-2-D**
Client Tennessee Valley Authority
Boring Location 574,654.66 N; 2,408,274.19 E NAD83
Project Number 182603369
Surface Elevation 753.9 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			LEAN CLAY, CL, 10YR 4/4 (dark yellowish brown), low plasticity, soft, moist, with fragments of siltstone *(Continued)*		SS13	18.0 - 19.5	18.0 - 19.5	0.7	1-1-2
19 ▽			Very soft, wet at 19.5'		SS14	19.5 - 21.0	19.5 - 21.0	0.7	WH-1-1
20					SS15	21.0 - 22.5	21.0 - 22.5	0.6	1-1-3
21					SS16	22.5 - 24.0	22.5 - 24.0	0.8	WH-WH-1
22					SS17	24.0 - 25.5	24.0 - 25.5	0.5	WH-WH-1
23					SS18	25.5 - 27.0	25.5 - 27.0	1.0	WH-WH-WH
24					SS19	27.0 - 28.5	27.0 - 28.5	1.0	WH-WH-2
25					SS20	28.5 - 30.0	28.5 - 30.0	0.5	WH-WH-WH
26					SS21	30.0 - 31.5	30.0 - 31.5	1.5	WH-WH-1
27					SS22	31.5 - 33.0	31.5 - 33.0	1.1	WH-WH-3
28					SS23	33.0 - 34.5	33.0 - 34.5	1.1	WH-WH-WH
29					SS24	34.5 - 36.0	34.5 - 36.0	1.3	WH-WH-2
30	30.0	723.9	FAT CLAY, CH, 10YR 4/1 (dark gray), high plasticity, very soft, wet		SS25	36.0 - 37.5	36.0 - 37.5	1.5	WH-3-3
31			Color change to 10YR 4/1 (dark gray) and 10YR 4/3 (brown) at 31.5'		SS26	37.5 - 39.0	37.5 - 39.0	1.5	WH-WH-4
32					SS27	39.0 - 40.5	39.0 - 40.5	1.5	4-4-5
33			With fine sand and fragments of siltstone at 33.0'		SS28	40.5 - 42.0	40.5 - 42.0	0.6	5-6-7
34	34.5	719.4							
35			FAT CLAY, CH, 10YR 5/1 (gray) and 10YR 5/4 (yellowish brown), high plasticity, very soft, wet, with fine sand						
36			Very soft to soft, with manganese at 36.0-37.5'						
37									
38									
39									
40									
41			Medium stiff at 40.5'						
42									

TVA EIP BORING LOG KIF_VACATUR_REV.4_20220519.GPJ TDEC SUBSURF DT 20190530.GDT 5/19/22

SUBSURFACE LOG

Client Borehole ID N/A | Stantec Boring No. **AD-2-D**

Client Tennessee Valley Authority | Boring Location 574,654.66 N; 2,408,274.19 E NAD83

Project Number 182603369 | Surface Elevation 753.9 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. %
43					SS29	42.0 - 43.5	42.0 - 43.5	0.8	7-5-7
43.7	710.2								
44			CLAYEY SILTY SAND, SM, 10YR 3/1 (very dark gray), fine, very loose, wet		SS30	43.5 - 45.0	43.5 - 45.0		WH-WH-2
45									
46					SS31	45.0 - 46.5	45.0 - 46.5	0.9	WH-2-3
47			POORLY GRADED SAND, SP, loose at 46.5'		SS32	46.5 - 48.0	46.5 - 48.0	1.0	WH-4-6
48			Cobble in shoe at 48.0'						
49					SS33	48.0 - 49.5	48.0 - 49.5	0.3	4-8-12
49.5	704.4								
50			WELL GRADED SAND, SW, 10YR 3/1 (very dark gray), fine to medium, very dense, wet, with weathered grayish brown sandstone fragments		SS34	49.5 - 51.0	49.5 - 51.0	1.5	50-45-43
51			Color change to 10YR 4/2 (dark grayish brown) and 10YR 5/3 (brown), dense at 51.0'						
52					SS35	51.0 - 52.5	51.0 - 52.5	1.3	30-22-29
52.5	701.4								
52.8	701.1		Shale, dark gray, soft, laminated, weathered		SS36	52.5 - 52.8	52.5 - 52.8	0.3	50+/4" Began Core
53			Limestone, gray, fine to medium, hard, fossiliferous with weathered gray brown clayey siltstone, fractured zone		0	52.8 - 55.7 2.9	52.8 - 55.7	0.8	28
54									
55									
55.7	698.2								
56			Limestone, gray, highly weathered, fractured, clayey		0	55.7 - 60.7 5.0	55.7 - 60.7	0.5	10
57									
58									
59									
60									
60.7	693.2								
61			Interbedded Limestone And Shale, gray, hard, weathered,		0	60.7 - 65.7 5.0	60.7 - 65.7	2.1	42
62			Shale, dark gray, soft, laminated, highly weathered Fractured from 60.7' to 62.8'						
63									
64									
65									
66									

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **AD-2-D**
Client: Tennessee Valley Authority
Boring Location: 574,654.66 N; 2,408,274.19 E NAD83
Project Number: 182603369
Surface Elevation: 753.9 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. %
67			Interbedded Limestone And Shale, gray, hard, weathered,		0	65.7 - 69.7 4.0	65.7 - 69.7	2.2	55
68			Shale, dark gray, soft, laminated, highly weathered *(Continued)*						
69									
70			Fractured, highly weathered, decomposed, clayey, with quartz and calcite on limestone surface at 69.7'		0	69.7 - 70.7 1.0	69.7 - 70.7	0.3	30
71			With quartz and chlorite on limestone surfaces at 70.7'		0	70.7 - 73.2 2.5	70.7 - 73.2	0.4	16
72									
73									
74					0	73.2 - 75.7 2.5	73.2 - 75.7	0.8	32
75									
76					0	75.7 - 78.2 2.5	75.7 - 78.2	1.3	52
77									
78	78.2	675.7							
79			Shale, dark gray, soft, highly weathered, fractured, decomposed		0	78.2 - 80.7 2.5	78.2 - 80.7	1.3	52
80	80.7	673.2							
81			Interbedded Limestone And Shale, light gray, fine, hard, weathered, fractured		0	80.7 - 85.7 5.0	80.7 - 85.7	1.5	30
82			Shale, dark gray, soft, laminated to very thin bedded, weathered, decomposed, fractured						
83									
84									
85									
86					0	85.7 - 90.7 5.0	85.7 - 90.7	2.3	46
87									
88									
89									
90									

TVA EIP BORING LOG KIF_VACATUR_REV4_20220519.GPJ TDEC SUBSURF DT 20190530.GDT 5/19/22

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **AD-2-D**
Client Tennessee Valley Authority
Boring Location 574,654.66 N; 2,408,274.19 E NAD83
Project Number 182603369
Surface Elevation 753.9 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. %
91			Interbedded Limestone And Shale, light gray, fine, hard, weathered, fractured						
92			Shale, dark gray, soft, laminated to very thin bedded, weathered, decomposed, fractured *(Continued)*						
93					0	90.7 - 95.7 5.0	90.7 - 95.7	2.3	46
94									
95									
	95.7	658.2							
96			Limestone, light gray, fine, hard, weathered, fractured with calcite and quartz on surfaces						
97									
98					0	95.7 - 100.7 5.0	95.7 - 100.7	1.2	24
99									
100									
	100.7	653.2							

Bottom of Hole at 100.7 Ft.

Top of Rock = 52.5 Ft.
Top of Rock Elevation = 701.4 Ft.
Begin Core = 52.8 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

GW-02

Drilling Company: Tri-State Drilling	Start Date: 080910	Logged By:
Driller: G.Akins	End Date: 082310	R.Josefczyk, R.Lee

Sample	Blow Counts	Recovery (ft)	PID (ppm)	Depth (ft bgs)	Lithology	Description
	6 6 5 6	1.6	0.0			gravel (GP) fill
	5 6 7 5	1.4	0.0			gravel (GP) fill SILTY CLAY (CL) dark yellowish brown (10YR4/4) with less than 10% gravel, damp.
	2 4 4 3	1.2	0.0	5		SILTY CLAY (CL) dark yellowish brown (10YR4/4) with less than 10% gravel, damp.
	3 5 8 8	1.8	0.0			SILTY CLAY (CL) dark yellowish brown (10YR4/4) and yellowish brown (10YR5/4) with less than 10% gravel, damp.
	2 5 7 9	1.8	0.0			SILTY CLAY (CL) dark yellowish brown (10YR4/4) and light brownish gray (10YR6/2) with less than 10% gravel, damp.
	NA	1.0	0.0	10		shelby tube
	5 7 7 10	2.2	0.0			SILTY CLAY (CL) yellowish red (5YR4/6) manganese staining, with approximately 25% sandstone gravel.
	8 9 15 21	1.9	0.0			CLAY (CL) brown (7.5 YR4/4) minor silt
	5 13 17 7	1.9	0.0	15		shale dark grayish brown (2.5YR4/2) weathered, friable slough shale dark grayish brown (2.5YR4/2) weathered, friable
	7 7 6 9	1.4	0.0			sandstone olive brown (2.5Y4/3) fine-medium grained shale dark grayish brown (2.5YR4/2) weathered
	9 50/4"	1.2	0.0	20		auger refusal at 20 ft bgs
				25		
				30		
				35		

Notes:

NA = not applicable
solid sample = shelby tube
2-inch steel split spoons used for SPT

Drill Rig:	Central Mining Equipment 55
Drilling Method:	Hollow Stem Auger
Total Depth (ft bgs):	20 ft bgs
1st Water Encountered (ft bgs):	17 ft bgs
Water Level after 24 hr (ft bgs):	NA

Tennessee Valley Authority

Kingston Fossil Plant

KIF

Harriman, TN, 37748

GROUP SYMBOLS	TYPICAL NAMES	GROUP SYMBOLS	TYPICAL NAMES
	TOPSOIL		**CONCRETE**
	ASPHALT		**DOLOMITE**
	GRAVEL		**LIMESTONE**
	FILL		**SHALE**
	SUBSOIL		**LIMESTONE/SHALE** - Limestone with shale interbeds
	ALLUVIUM		**SANDSTONE**
	COLLUVIUM		**SILTSTONE**
	RESIDUUM - Soft to firm		**AUGER BORING**
	RESIDUUM - Stiff to very hard		**UNDISTURBED SAMPLE ATTEMPT**

	Undisturbed Sample 1.5-2.0 = Recovered (ft) / Pushed (ft)		
	Split Spoon Sample		Auger Cuttings
	Rock Core 60-100 = RQD / Recovery		Dilatometer
	No Sample		Crandall Sampler
	Rotary Drill		Pressure Meter
	Water Table at time of drilling		No Recovery
			Water Table after 24 hours

Correlation of Penetration Resistance with Relative Density and Consistency

SAND & GRAVEL		SILT & CLAY	
No. of Blows	Relative Density	No. of Blows	Consistency
0 - 4	Very Loose	0 - 2	Very Soft
5 - 10	Loose	3 - 4	Soft
11 - 20	Firm	5 - 8	Firm
21 - 30	Very Firm	9 - 15	Stiff
31 - 50	Dense	16 - 30	Very Stiff
Over 50	Very Dense	31 - 50	Hard
		Over 50	Very Hard

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

No.200 No.40 No.10 No.4 3/4" 3" 12"

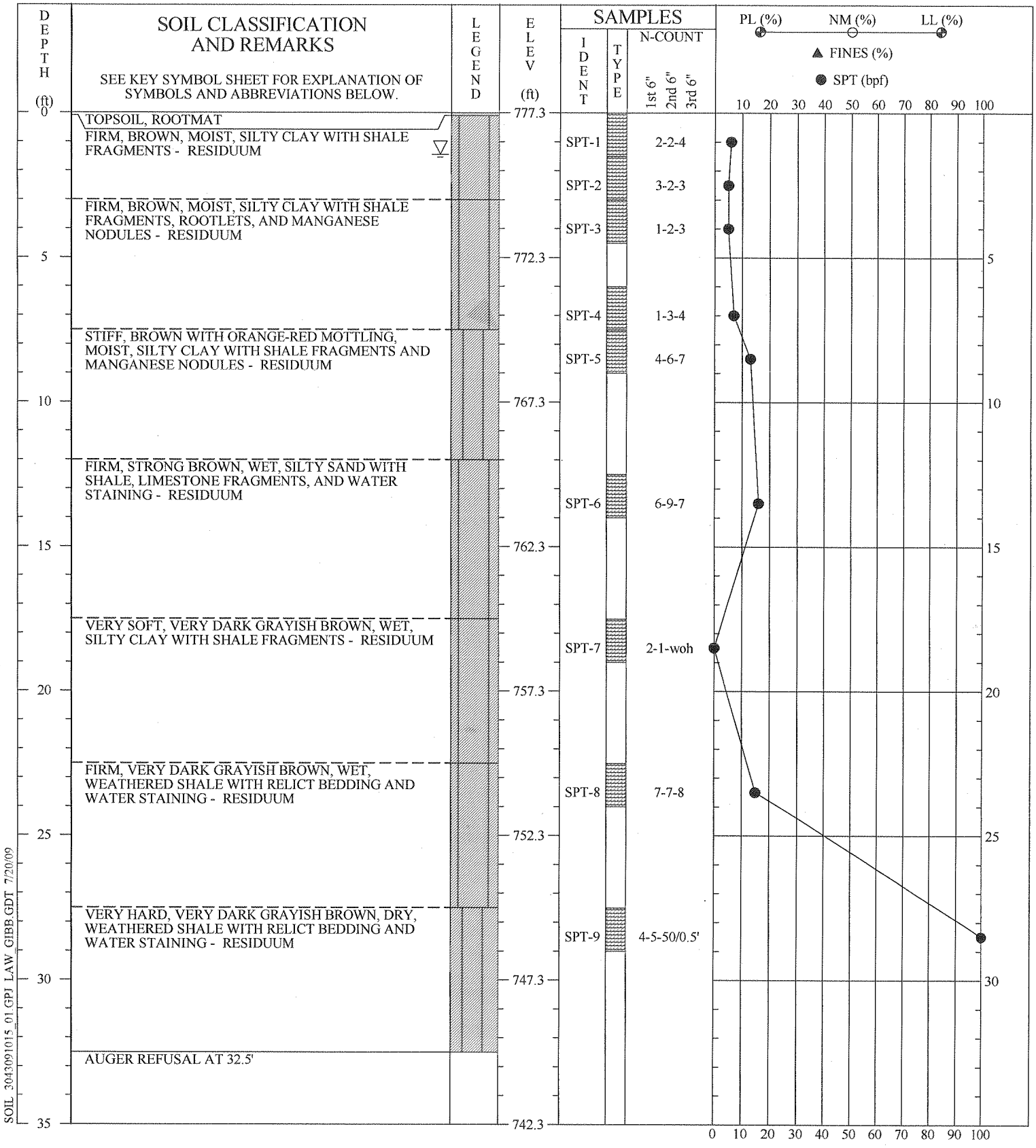
U.S. STANDARD SIEVE SIZE

Reference: The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953 (Revised April, 1960)

KEY TO SYMBOLS AND DESCRIPTIONS

MACTEC

MACTEC Engineering and Consulting of Georgia, Inc.
9725 Cogdill Road
Knoxville, Tennessee 37932
865-588-8544 • Fax: 865-588-8026



SOIL 3043091015_01.GPJ LAW_GIBB.GDT 7/20/09

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Tri-State
Logged By: N.J.S.
Checked By: H.A.B.

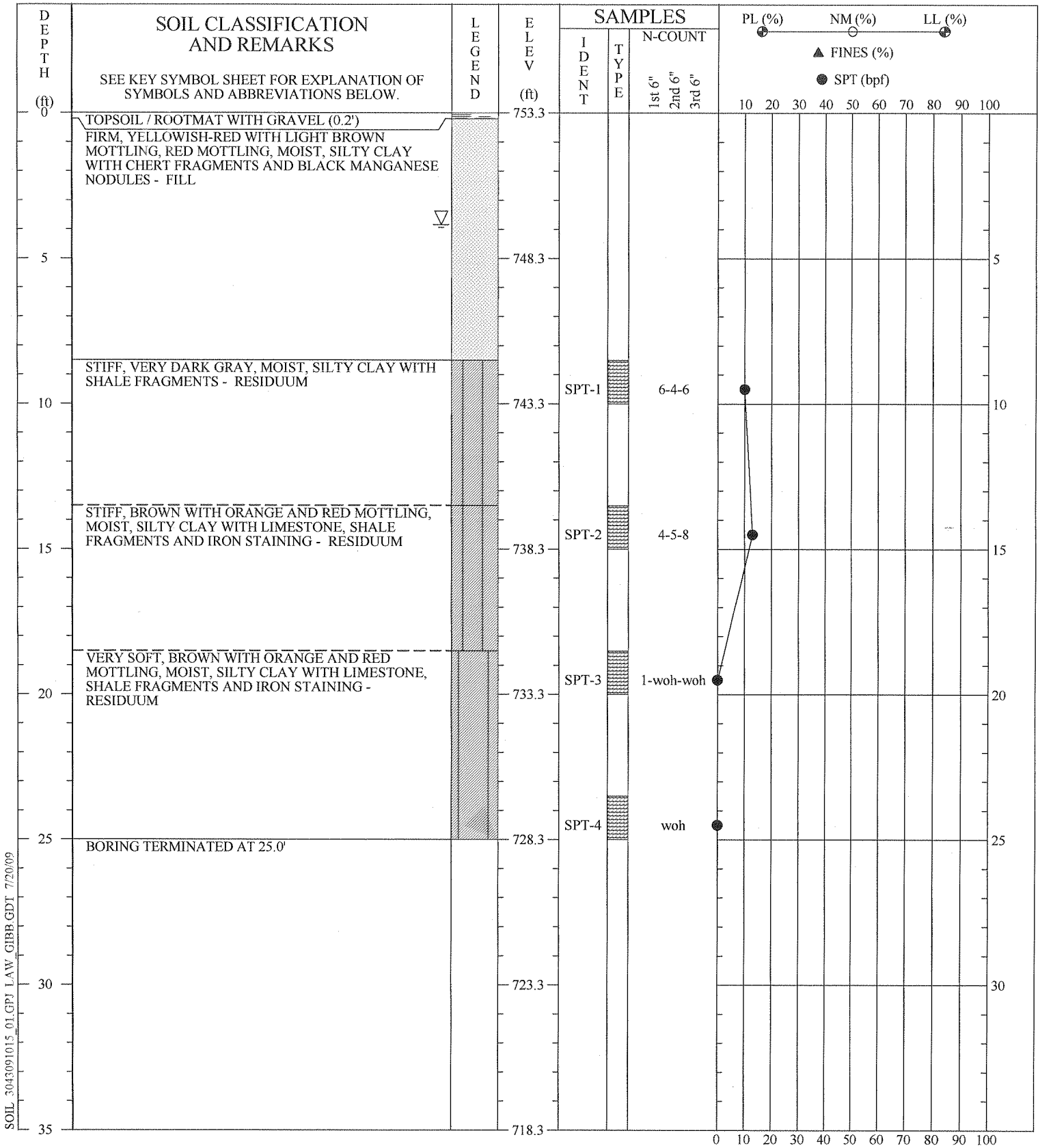
SOIL TEST BORING RECORD

PROJECT: TVA - Kingston Monitoring Well Installation

DRILLED: May 5, 2009 **BORING NO.:** MW-AD1

PROJ. NO.: 3043-09-1015 **PAGE 1 OF 1**

MACTEC



SOIL 3043091015_01.GPJ LAW_GIBB.GDT 7/20/09

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Tri-State
Logged By: N.J.S.
Checked By: H.A.B.

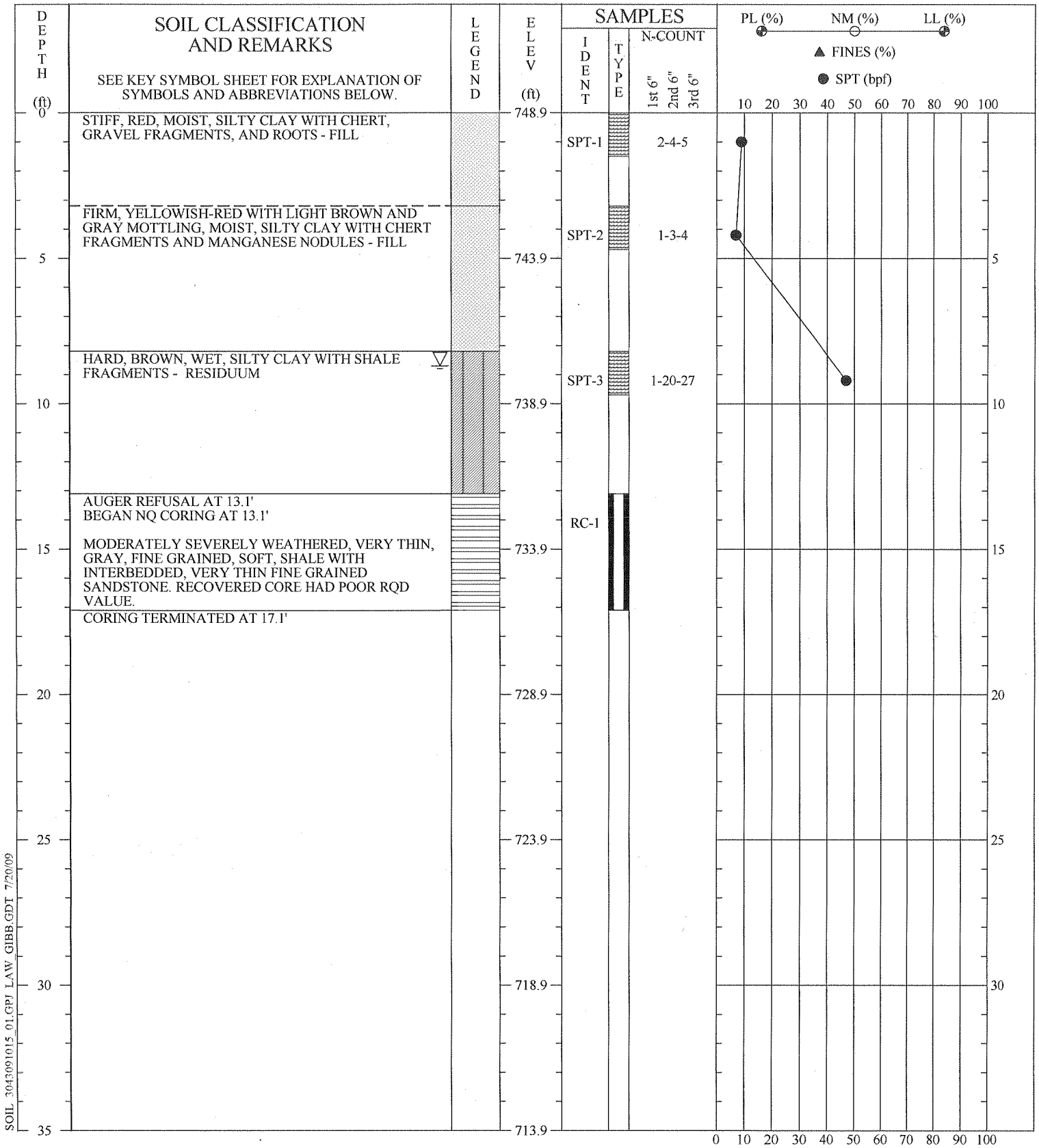
SOIL TEST BORING RECORD

PROJECT: TVA - Kingston Monitoring Well Installation

DRILLED: March 18, 2009 **BORING NO.:** MW-AD2

PROJ. NO.: 3043-09-1015 **PAGE** 1 **OF** 1

MACTEC



SOIL 3043091015 01.GPJ LAW_GIBB.GDT 7/20/09

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Tri-State
Logged By: N.J.S.
Checked By: H.A.B.

SOIL TEST BORING RECORD

PROJECT: TVA - Kingston Monitoring Well Installation

DRILLED: April 3, 2009 **BORING NO.:** MW-AD3

PROJ. NO.: 3043-09-1015 **PAGE 1 OF 1**

MACTEC

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-102**
Client	Tennessee Valley Authority	Boring Location	576,056.37 N; 2,406,617.47 E NAD83
Project Number	175668043	Surface Elevation	790.6 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	11/5/18
Completed	11/5/18		
Project Location	Harriman, 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, 3" 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
Drop	30	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	C. Kocka	Approved By	L. Price

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. %
0.0	790.6		Top of Hole						
0.3	790.3		Grass and Topsoil with gravel, trace asphalt						
			LEAN CLAY, CL, 7.5YR 4/4 (brown), low plasticity, firm, moist, with fragments of siltstone		SS01G	0.0 - 1.5	0.0 - 1.5	1.3	7-4-5
			Color change to 7.5YR 4/6 (strong brown) at 1.5'		SS02G	1.5 - 3.0	1.5 - 3.0	1.4	3-6-7
					SS03G	3.0 - 4.5	3.0 - 4.5	1.5	5-10-15
			Color change to 10YR 4/6 (dark yellowish brown), dry, with abundent weathered interbedded siltstone, shale, sandstone at 4.5'		SS04G	4.5 - 6.0	4.5 - 6.0	1.5	10-30-28
			Color change to 10YR 5/6 (yellowish brown), hard, weathered siltstone at 6.0'		SS05G	6.0 - 7.5	6.0 - 7.5	1.5	24-36-45
7.5	783.1		Siltstone, brown and gray, hard, weathered		SS06G	7.5 - 8.3	7.5 - 8.3	0.8	31-50+/4"
9.8	780.8				SS07G	9.0 - 9.8	9.0 - 9.8	0.8	43-50+/4"

Refusal /
Bottom of Hole at 9.8 Ft.

Top of Rock = 7.5 Ft.
Top of Rock Elevation = 783.1 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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-102a**
Client	Tennessee Valley Authority	Boring Location	576,046.37 N; 2,406,617.47 E NAD83
Project Number	175668043	Surface Elevation	789.8 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	11/6/18
Completed	11/6/18		
Project Location	Harriman, 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, 3" 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
Drop	30	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	C. Kocka	Approved By	L. Price

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. %
0.0	789.8		Top of Hole						
0.3	789.5		Grass and Topsoil with gravel, trace asphalt						
			LEAN CLAY, CL, 7.5YR 4/4 (brown), low plasticity, soft, moist, with fragments of siltstone, organics		SS01G	0.0 - 1.5	0.0 - 1.5	1.5	2-1-2
			Color change to 7.5YR 4/6 (strong brown) at 1.5'		SS02G	1.5 - 3.0	1.5 - 3.0	1.1	3-3-6
					SS03G	3.0 - 4.5	3.0 - 4.5	1.5	6-9-12
			Color change to 10YR 4/6 (dark yellowish brown) with interbedded fragments of siltstone and shale at 4.5'		SS04G	4.5 - 6.0	4.5 - 6.0	1.5	8-9-18
					SS05G	6.0 - 7.5	6.0 - 7.5	1.5	11-15-27
7.3	782.5		Siltstone, brown and gray, very stiff to hard, dry, weathered with some clay		SS06G	7.5 - 9.0	7.5 - 9.0	1.5	20-32-27
					SS07G	9.0 - 10.2	9.0 - 10.2	1.2	20-41-50+/2"
10.2	779.6		No Refusal / Bottom of Hole at 10.2 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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-103**
Client	Tennessee Valley Authority	Boring Location	575,021.43 N; 2,410,351.42 E NAD83
Project Number	175668043	Surface Elevation	756.7 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	10/2/18
		Completed	10/3/18
Project Location	Harriman, Tennessee	Depth to Water	28.0 ft
		Date/Time	10/3/18
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 850 Track
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	35.5 ft
Sampler Hammer Type	Automatic	Weight	140
		Drop	30
		Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	C. Kocka	Approved By	L. Price

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. %
0.0	756.7		Top of Hole						
			LEAN CLAY, CL, 5YR 5/6 (yellowish red), soft, dry, with grass sod, [FILL] Fragments of tan chert from 0.0' to 1.5'		SS01	0.0 - 1.5	0.0 - 1.5	0.9	4-3-2
			Limestone gravel fragments and chert from 1.5' to 3.2'		SS02	1.5 - 3.0	1.5 - 3.0	0.4	2-2-4
3.2	753.5		POORLY GRADED GRAVEL, GP, loose, dry, limestone, [FILL]		SS03	3.0 - 4.5	3.0 - 4.5	1.3	6-10-14
					SS04	4.5 - 6.0	4.5 - 6.0	1.0	11-8-11
7.2	749.5				SS05	6.0 - 7.5	6.0 - 7.5	0.8	7-5-3
7.7	749.0		WELL GRADED SAND, SW, loose, dry, [FILL]						
			LEAN CLAY, CL, 5YR 4/6 (yellowish red), soft, moist, with coal fragments		SS06	7.5 - 9.0	7.5 - 9.0	1.0	2-1-2
9.4	747.3								
9.6	747.1		SAND, SM, 10YR 5/1 (gray), fine, loose, dry		SS07	9.0 - 10.5	9.0 - 10.5	0.9	1-1-2
11.0	745.7		LEAN CLAY, CL, 7.5YR 6/1 (gray) and 7.5YR 5/8 (strong brown), soft, moist, mottled		SS08	10.5 - 12.0	10.5 - 12.0	1.2	2-6-5
			LEAN CLAY, CL, 10YR 5/4 (yellowish brown), firm to stiff, moist, with weathered siltstone fragments		SS09	12.0 - 13.5	12.0 - 13.5	0.9	4-6-7
13.5	743.2		LEAN CLAY, CL, 10YR 4/1 (dark gray), firm to stiff, moist, with interbedded fragments of limestone and siltstone		SS10	13.5 - 15.0	13.5 - 15.0	0.9	13-13-15
15.9	740.8				SS11	15.0 - 16.5	15.0 - 16.5	1.4	10-5-3
			FAT CLAY, CH, 7.5YR 5/6 (strong brown), soft to stiff, moist, with trace very fine sand		SS12	16.5 - 18.0	16.5 - 18.0	1.4	3-4-7
18.0	738.7		FAT CLAY, CH, 7.5YR 5/6 (strong brown), soft, moist, with trace very fine sand		SS13	18.0 - 19.5	18.0 - 19.5	1.4	1-3-3

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-103**
Client: Tennessee Valley Authority
Boring Location: 575,021.43 N; 2,410,351.42 E NAD83
Project Number: 175668043
Surface Elevation: 756.7 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. %
19									
20			FAT CLAY, CH, 7.5YR 5/6 (strong brown), soft, moist, with trace very fine sand *(Continued)*		SS14	19.5 - 21.0	19.5 - 21.0	0.6	2-3-4
21									
22					SS15	21.0 - 22.5	21.0 - 22.5	0.6	6-7-7
23	23.1	733.6							
24			LEAN CLAY, CL, 10YR 4/1 (dark gray), soft, moist, with interbedded fragments of limestone and siltstone		SS16	22.5 - 24.0	22.5 - 24.0	1.5	3-4-5
25					SS17	24.0 - 25.5	24.0 - 25.5	0.9	3-3-4
26					SS18	25.5 - 27.0	25.5 - 27.0	1.5	2-3-4
27									
28	▽28.0	728.7			SS19	27.0 - 28.5	27.0 - 28.5	1.5	4-5-5
	28.5	728.2	LEAN CLAY, CL, 10YR 4/1 (dark gray), soft to stiff, moist to wet, with interbedded fragments of limestone and siltstone, with very fine sand						
29					SS20	28.5 - 30.0	28.5 - 30.0	1.5	WH-WH-WH
30			LEAN CLAY, CL, 10YR 4/6 (dark yellowish brown) and 10YR 5/2 (grayish brown), soft, moist, mottled, with fine sand						
31					SS21	30.0 - 31.5	30.0 - 31.5	1.5	WH-3-4
32			Soft to medium stiff from 31.5' to 33.0'		SS22	31.5 - 33.0	31.5 - 33.0	1.5	WH-2-7
33	33.0	723.7							
34	34.5	722.2	SANDY LEAN CLAY, CL, 10YR 4/6 (dark yellowish brown) and 10YR 5/2 (grayish brown), soft to stiff, mottled, with trace fine subrounded gravel		SS23	33.0 - 34.5	33.0 - 34.5	1.5	3-4-7
35			CLAYEY SAND, SC, 10YR 5/1 (gray) and 10YR 5/6 (yellowish brown), very loose to loose, moist, mottled		SS24	34.5 - 36.0	34.5 - 36.0	1.5	3-5-7
36	36.0	720.7							
			No Refusal / Bottom of Hole at 36.0 Ft.						

Boring converted to 4-inch monitoring well. See well installation notes.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-104**
Client	Tennessee Valley Authority	Boring Location	575,781.72 N; 2,411,399.23 E NAD83
Project Number	175668043	Surface Elevation	754.5 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	10/1/18
		Completed	10/1/18
Project Location	Harriman, Tennessee	Depth to Water	28.5 ft
		Date/Time	10/1/18
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 850 Track
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
Drop	30	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	E. Smith	Approved By	C. Kocka

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. %
0.0	754.5		Top of Hole						
			POORLY GRADED GRAVEL, GP, loose, dry, limestone, [FILL]		SS01G	0.0 - 1.5	0.0 - 1.5	1.0	5-5-6
					SS02G	1.5 - 3.0	1.5 - 3.0	0.8	8-6-6
					SS03G	3.0 - 4.5	3.0 - 4.5	0.9	6-2-3
					SS04G	4.5 - 6.0	4.5 - 6.0	0.2	6-5-7
6.9	747.6		Brown sand from 6.0' to 6.9'		SS05aG	6.0 - 6.9	6.0 - 7.5	1.3	5-8-9
7.3	747.2		LEAN CLAY, CL, 7.5YR 3/3 (dark brown), firm to stiff, dry		SS05bG	6.9 - 7.5			
			SILTY SAND, SM, 7.5YR 2.5/1 (black), loose, dry, [CCR] Medium dense from 7.5' to 10.0'		SS06G	7.5 - 9.0	7.5 - 9.0	1.3	18-17-23
10.0	744.5		Moist from 9.0' to 10.0'		SS07G	9.0 - 10.5	9.0 - 10.5	1.5	23-12-11
10.5	744.0		POORLY GRADED SAND WITH SILT, SP-SM, 10YR 6/4 (light yellowish brown) to 10YR 3/4 (dark yellowish brown), fine to medium, moist, [CCR]		SS08G	10.5 - 12.0	10.5 - 12.0	1.5	10-14-12
12.5	742.0		POORLY GRADED SAND, SP, 10YR 2/1 (black), medium dense, moist, fine to coarse, [CCR] Wet from 12.0' to 12.5'		SS09aG SS09bG	12.0 - 12.5 12.5 - 13.5	12.0 - 13.5	1.1	11-4-6
14.6	739.9		LEAN CLAY, CL, 10YR 5/4 (yellowish brown), soft to stiff, moist, with weathered siltstones, fragments Soft from 13.5' to 14.6'		SS10G	13.5 - 15.0	13.5 - 15.0	1.4	3-4-5
15.0	739.5		FAT CLAY, CH, 5YR 4/6 (yellowish red), soft, with fine sand		SS11G	15.0 - 16.5	15.0 - 16.5	0.0	2-4-4
16.5	738.0		No recovery from 15.0' to 16.5'		SS12G	16.5 - 18.0	16.5 - 18.0	1.5	3-7-7
			SANDY FAT CLAY, CH, 5YR 4/6 (yellowish red), low plasticity, soft, moist		SS13G	18.0 - 19.5	18.0 - 19.5	1.5	2-2-4

SUBSURFACE LOG

Client Borehole ID N/A | Stantec Boring No. **KIF-104**

Client Tennessee Valley Authority | Boring Location 575,781.72 N; 2,411,399.23 E NAD83

Project Number 175668043 | Surface Elevation 754.5 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. %
19			SANDY FAT CLAY, CH, 5YR 4/6 (yellowish red), low plasticity, soft, moist *(Continued)*		SS14G	19.5 - 21.0	19.5 - 21.0	1.3	2-2-3
21.0	733.5								
21			CLAYEY SAND, SC, 5YR 4/6 (yellowish red), very fine to fine, loose, moist		SS15G	21.0 - 22.5	21.0 - 22.5	1.5	2-3-4
22.5	732.0								
23			SANDY FAT CLAY, CH, 5YR 4/6 (yellowish red), very fine, very soft, moist		SS16G	22.5 - 24.0	22.5 - 24.0	1.4	WH-WH-WH
24.0	730.5								
24			CLAYEY SAND, SC, 5YR 5/8 (yellowish red), very fine to fine, very loose, moist		SS17G	24.0 - 25.5	24.0 - 25.5	1.5	WH-WH-WH
25									
26					SS18G	25.5 - 27.0	25.5 - 27.0	1.5	WH-WH-WH
27									
28					SS19G	27.0 - 28.5	27.0 - 28.5	1.5	WH-WH-WH
▽28.5	726.0								
29			SILTY SAND, SM, 7.5YR 4/1 (dark gray), very fine to fine, very loose, wet		SS20G	28.5 - 30.0	28.5 - 30.0	1.5	WH-WH-1
30									
31					SS21G	30.0 - 31.5	30.0 - 31.5	1.5	WH-WH-WH
32					SS22G	31.5 - 33.0	31.5 - 33.0	1.5	WH-WH-WH
33					SS23aG	33.0 - 33.7	33.0 - 34.5	1.5	WH-2-2
33.7	720.8								
34			SANDY LEAN CLAY, CL, 10YR 5/1 (gray) and 10YR 3/4 (dark yellowish brown), very soft to soft, mottled, with trace manganese		SS23bG	33.7 - 34.5			
35					SS24G	34.5 - 36.0	34.5 - 36.0	1.5	WH-2-3
36.0	718.5								
36			No Refusal / Bottom of Hole at 36.0 Ft.						

Boring abandoned and backfilled with grout due to presence of CCR material. An off-set boring was advanced using 4-1/4 HSA and 8-1/4 HSA to 20'. 10-inch PVC casing is set to 20' bgs and backfilled with grout. The boring was then advanced to depth through the casing using 6"x8" roto-sonic drilling methods. The boring was advanced to a final depth of 36' bgs to facilitate the installation of monitoring well KIF-104.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-104b**
Client	Tennessee Valley Authority	Boring Location	575,765.61 N; 2,411,402.90 E NAD83
Project Number	175668043	Surface Elevation	755.1 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	10/29/18
Completed	10/30/18		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	B. Evans	Logger	B. Evans
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Stantec / M&W Drilling	Drill Rig Type and ID	CME 850XR #853/Geoprobe 8150LS Sonic
Overburden Drilling and Sampling Tools (Type and Size)	4-1/4" & 8-1/4" HSA to 20'; 6"x8" Sonic to depth		
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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	E. Smith	Approved By	C. Kocka

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. %
0.0	755.1		Top of Hole					
			Boring offset due to CCR encountered in KIF-104. Overburden not sampled. See KIF-104 boring log for overburden sampling.					

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 10/8/20

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-104b**
Client Tennessee Valley Authority
Boring Location 575,765.61 N; 2,411,402.90 E NAD83
Project Number 175668043
Surface Elevation 755.1 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. %
30 31 32 33 34 35			Boring offset due to CCR encountered in KIF-104. Overburden not sampled. See KIF-104 boring log for overburden sampling. *(Continued)*					
35.0	720.1		No Refusal / Bottom of Hole at 35.0 Ft.					

Monitoring Well KIF-104 installed in boring. Refer to KIF-104 Well Installation Detail dated 10/30/18.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-105**
Client	Tennessee Valley Authority	Boring Location	574,807.16 N; 2,408,437.15 E NAD83
Project Number	175668043	Surface Elevation	751.5 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	10/23/18
		Completed	10/23/18
Project Location	Harriman, Tennessee	Depth to Water	19.3 ft
		Date/Time	10/23/18 12:38
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)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	Automatic	Weight	140
Drop	30	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	C. Kocka	Approved By	L. Price

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. %
0.0	751.5		Top of Hole						
			Placed crushed run and rip rap stone, no sample collected, [FILL]		SS01	0.0 - 1.5	0.0 - 1.5		N/A
					SS02	1.5 - 3.0	1.5 - 3.0		N/A
3.0	748.5		SP, Placed sand fill, fine to coarse grained, [FILL]		SS03	3.0 - 4.5	3.0 - 4.5	1.0	12-4-6
4.3	747.2		LEAN CLAY, CL, 10YR 4/4 (dark yellowish brown), firm to stiff, moist, [CCR] With bottom ash from 4.3' to 4.6' Soft, with organics, fragmented shale and siltstone from 4.5' to 4.6'		SS04	4.5 - 6.0	4.5 - 6.0	1.2	2-1-4
6.0	745.5		LEAN CLAY, CL, 10YR 4/6 (dark yellowish brown), firm to stiff, moist Fragments of weathered siltstone and shale from 6.0' to 7.5'		SS05	6.0 - 7.5	6.0 - 7.5	0.8	5-5-8
7.5	744.0		LEAN CLAY, CL, 10YR 4/1 (dark gray), firm to stiff, moist Fragments of limestone from 7.5' to 9.0' Stiff with fragments of limestone and siltstone from 9.0' to 10.5'		SS06	7.5 - 9.0	7.5 - 9.0	0.6	5-3-6
					SS07	9.0 - 10.5	9.0 - 10.5	1.0	3-10-13
			Very stiff to hard with highly weathered shale from 10.5' to 12.0'		SS08	10.5 - 12.0	10.5 - 12.0	1.1	9-11-39
12.0	739.5		WELL GRADED SAND, SW, 10YR 4/1 (dark gray), medium dense, wet, angular to subangular, with fragments of wood, shale, and limestone		SS09	12.0 - 13.5	12.0 - 13.5	0.6	15-11-13
13.5	738.0								

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-105**
Client: Tennessee Valley Authority
Boring Location: 574,807.16 N; 2,408,437.15 E NAD83
Project Number: 175668043
Surface Elevation: 751.5 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. %
14			LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), stiff to very stiff, wet, interbedded weathered limestone, shale, and siltstone *(Continued)*		SS10	13.5 - 15.0	13.5 - 15.0	1.3	16-11-19
15			Fragments of wood from 13.5' to 13.8'						
16			Stiff to medium stiff from 15.0' to 16.5'		SS11	15.0 - 16.5	15.0 - 16.5	1.2	13-7-5
	16.5	735.0							
17			Limestone Shale, moderately hard, highly weathered, wet, interbedded, clayey		SS12	16.5 - 18.0	16.5 - 18.0	0.5	6-7-7
18	18.0	733.5							
19			LEAN CLAY, CL, 10YR 4/2 (dark grayish brown), soft, wet, with highly weathered shale fragments and wood pieces from 18.0' to 19.5'		SS13	18.0 - 19.5	18.0 - 19.5	0.7	3-3-4
20			Soft to medium stiff with highly weathered shale fragments from 19.5' to 21.0'		SS14	19.5 - 21.0	19.5 - 21.0	0.5	3-8-6
21	21.0	730.5							
22			Limestone Shale, moderately hard, weathered, wet, interbedded		SS15	21.0 - 22.5	21.0 - 22.5	0.4	3-5-8
23			Soft with some clay from 22.5' to 24.0'		SS16	22.5 - 24.0	22.5 - 24.0	0.8	2-4-4
24			Highly weathered and soft from 24.0' to 26.7'		SS17	24.0 - 25.5	24.0 - 25.5	0.7	3-1-2
25									
26					SS18	25.5 - 27.0	25.5 - 27.0	1.3	1-1-1
	26.7	724.8							
	27.0	724.5	SILTY FAT CLAY, CH, 10YR 4/2 (dark grayish brown), soft, wet, trace very fine sand						
27					SS19	27.0 - 28.5	27.0 - 28.5	1.2	WH-WH-3
28	28.5	723.0	FAT CLAY, CH, 10YR 4/2 (dark grayish brown), very soft, wet, with trace organics						
29			FAT CLAY, CH, 10YR 5/4 (yellowish brown), very soft, wet		SS20	28.5 - 30.0	28.5 - 30.0	1.4	WH-WH-2
30			With some very fine sand from 28.5' to 30.0'						
			Soft from 30.0' to 31.5'						
31	31.0	720.5			SS21	30.0 - 31.5	30.0 - 31.5	1.5	2-2-1
	31.5	720.0	CLAYEY SAND, SC, 10YR 5/4 (yellowish brown) and 10YR 5/1 (gray), fine, very loose, wet						
32			POORLY GRADED SAND, SP, 10YR 5/4 (yellowish brown), fine to medium, very loose to loose, wet		SS22	31.5 - 33.0	31.5 - 33.0	1.4	WH-3-5

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 10/6/20

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-105**
Client Tennessee Valley Authority
Boring Location 574,807.16 N; 2,408,437.15 E NAD83
Project Number 175668043
Surface Elevation 751.5 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. %
33			POORLY GRADED SAND, SP, 10YR 5/4 (yellowish brown), fine to medium, very loose to loose, wet *(Continued)*						
34			Shale fragments from 33.4' to 33.9'		SS23	33.0 - 34.5	33.0 - 34.5	1.5	1-3-4
35			Trace manganese from 34.6' to 34.8'		SS24	34.5 - 36.0	34.5 - 36.0	1.4	7-5-4
36	36.0	715.5	No Refusal / Bottom of Hole at 36.0 Ft.						

Boring abandoned backfilled with grout due to presence of CCR material, relocate boring ~5' south and advance 4-1/4 HSA and 8-1/4 HSA to 12' and set 10-inch PVC casing backfilled with grout. The boring was then advanced to depth through the casing using 6"x8" roto-sonic drilling methods. The boring was advance to a final depth of 45' bgs to facilitate the installation of monitoring well KIF-105.

As-drilled location not surveyed. Horizontal coordinates based on proposed boring location and vertical coordinates based on 2017 LIDAR surfaces.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-105b**
Client	Tennessee Valley Authority	Boring Location	574,819.38 N; 2,408,462.83 E NAD83
Project Number	175668043	Surface Elevation	753.0 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	10/23/18
		Completed	10/31/18
Project Location	Harriman, Tennessee	Depth to Water	N/A
		Date/Time	N/A
Inspector	B. Evans	Logger	B. Evans
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Stantec / M&W Drilling	Drill Rig Type and ID	CME 850XR #853/Geoprobe 8150LS Sonic
Overburden Drilling and Sampling Tools (Type and Size)	4-1/4" & 8-1/4" HSA to 12'; 6"x8" Sonic to depth		
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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	E. Smith	Approved By	C. Kocka

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. %
0.0	753.0		Top of Hole					
			Boring offset due to CCR encountered in KIF-105. Overburden not sampled. See KIF-105 boring log for overburden sampling to 36.0' bgs.					

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 10/8/20

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-105b**
Client Tennessee Valley Authority
Boring Location 574,819.38 N; 2,408,462.83 E NAD83
Project Number 175668043
Surface Elevation 753.0 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. %
40 41 42 43 44 45	45.0	708.0	Boring offset due to CCR encountered in KIF-105. Overburden not sampled. See KIF-105 boring log for overburden sampling to 36.0' bgs. *(Continued)*					

No Refusal /
Bottom of Hole at 45.0 Ft.

Monitoring Well KIF-105 installed in boring. Refer to KIF-105b Well Installation Detail dated 10/30/18.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-106**
Client	Tennessee Valley Authority	Boring Location	574,427.76 N; 2,408,031.06 E NAD83
Project Number	175668043	Surface Elevation	748.6 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	10/18/18
Completed	10/22/18		
Project Location	Harriman, Tennessee	Depth to Water	25.3 ft
Date/Time	10/18/18 15:00		
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)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	Automatic	Weight	140
Drop	30	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	C. Kocka	Approved By	L. Price

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. %
0.0	748.6		Top of Hole						
			Placed crush and run and riprap stone, no sample collected, [FILL]		SS01	0.0 - 1.5	0.0 - 1.5		N/A
					SS02	1.5 - 3.0	1.5 - 3.0		N/A
3.0	745.6		Placed sand auger cuttings, no sample collected, [FILL]		SS03	3.0 - 4.5	3.0 - 4.5	0.0	5-5-2
4.5	744.1		LEAN CLAY, CL, 5YR 4/6 (yellowish red), soft, moist, with fragments of siltstone		SS04	4.5 - 6.0	4.5 - 6.0	0.8	1-1-2
			Color change to 10YR 5/6 (yellowish brown) at 6.0'		SS05	6.0 - 7.5	6.0 - 7.5	0.6	1-1-1
			Color change to 5YR 4/6 (yellowish red) at 7.5'		SS06	7.5 - 9.0	7.5 - 9.0	0.3	1-WH-WH
9.0	739.6		Bottom ash at 8.9', [CCR]						
9.7	738.9		SANDY LEAN CLAY, CL, 10YR 5/6 (yellowish brown) and 10YR 4/2 (dark grayish brown), soft, wet, with fragments of shale and trace bottom ash, [CCR]		SS07	9.0 - 10.5	9.0 - 10.5	1.5	1-1-1
			LEAN CLAY, CL, 5YR 4/6 (yellowish red), soft, moist, with abundant chert fragments Color change to 10YR 4/2 (dark grayish brown), stiff, wet, with fragments of limestone and chert at 10.5'		SS08	10.5 - 12.0	10.5 - 12.0	1.0	2-10-14
			Color change to 5YR 4/2 (dark reddish gray), firm to stiff, with fragments of shale at 12.0'		SS09	12.0 - 13.5	12.0 - 13.5	1.1	5-5-5
			Color change to 10YR 3/1 (very dark gray), hard, with weathered interbedded shale and siltstone at 13.5'						

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-106**
Client Tennessee Valley Authority
Boring Location 574,427.76 N; 2,408,031.06 E NAD83
Project Number 175668043
Surface Elevation 748.6 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. %
			LEAN CLAY, CL, 5YR 4/6 (yellowish red), soft, moist, with abundant chert fragments *(Continued)*		SS10	13.5 - 15.0	13.5 - 15.0	0.7	22-49-27
			Stiff, moist, with highly weathered shale at 15.0'		SS11	15.0 - 16.5	15.0 - 16.5	0.6	11-11-12
16.5	732.1		No recovery		SS12	16.5 - 18.0	16.5 - 18.0	0.0	11-12-15
					SS13	18.0 - 19.5	18.0 - 19.5	0.0	12-11-9
19.5	729.1		LEAN CLAY, CL, 10YR 3/1 (very dark gray), soft, moist Weathered shale from 19.5' to 19.9' Soft, red brown weathered siltstone from 19.9' to 21.0'		SS14	19.5 - 21.0	19.5 - 21.0	1.0	2-4-4
			Color change to 10YR 4/3 (brown), with fragments of limestone and shale at 21.0'		SS15	21.0 - 22.5	21.0 - 22.5	0.8	3-5-3
			Firm to stiff, wet, with fragments of siltstone, shale, and limestone from 22.5' to 25.5'		SS16	22.5 - 24.0	22.5 - 24.0	0.6	6-13-5
			Soft at 24.0'		SS17	24.0 - 25.5	24.0 - 25.5	0.3	3-2-3
			Fragments of siltstone and shale from 25.5' to 28.5'		SS18	25.5 - 27.0	25.5 - 27.0	0.2	1-1-WH
					SS19	27.0 - 28.5	27.0 - 28.5	0.7	WH-2-2
28.5	720.1		No recovery		SS20	28.5 - 30.0	28.5 - 30.0	0.0	1-3-4
30.0	718.6		LEAN CLAY, CL, 10YR 4/3 (brown), soft, wet Fragments of siltstone, shale, and limestone from 30.0' to 31.5'		SS21	30.0 - 31.5	30.0 - 31.5	0.6	1-3-1
			Fragments of siltstone and shale from 31.5' to 36.0'		SS22	31.5 - 33.0	31.5 - 33.0	1.1	1-3-3

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-106**
Client Tennessee Valley Authority
Boring Location 574,427.76 N; 2,408,031.06 E NAD83
Project Number 175668043
Surface Elevation 748.6 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. %
33			LEAN CLAY, CL, 10YR 4/3 (brown), soft, wet *(Continued)*		SS23	33.0 - 34.5	33.0 - 34.5	0.4	WH-WH-WH
34									
35					SS24	34.5 - 36.0	34.5 - 36.0	0.7	WH-1-1
36	36.0	712.6							

No Refusal /
Bottom of Hole at 36.0 Ft.

Boring abandoned backfilled with grout due to presence of CCR material, relocate boring ~5' north and advance 4-1/4 HSA, and 8-1/4 HSA to 15' and set 10-inch PVC casing backfilled with grout. The boring was then advanced to depth using 6"x8" roto-sonic drilling methods. The boring was advanced to 40' bgs to facilitate the installation of the monitoring well.

As-drilled location not surveyed. Horizontal coordinates based on proposed boring location and vertical coordinates based on 2017 LIDAR surfaces.

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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-106b**
Client	Tennessee Valley Authority	Boring Location	574,439.09 N; 2,408,024.18 E NAD83
Project Number	175668043	Surface Elevation	757.6 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	10/22/18
Completed	11/1/18		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	B. Evans	Logger	B. Evans
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Stantec / M&W Drilling	Drill Rig Type and ID	CME 850XR #853/Geoprobe 8150LS Sonic
Overburden Drilling and Sampling Tools (Type and Size)	4-1/4" & 8-1/4" HSA to 15'; 6"x8" Sonic to depth		
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 (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	E. Smith	Approved By	C. Kocka

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. %
0.0	757.6		Top of Hole					
			Boring offset due to CCR encountered in KIF-106. Overburden not sampled. See KIF-106 boring log for overburden sampling to 36.0' bgs.					

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-106b**
Client Tennessee Valley Authority
Boring Location 574,439.09 N; 2,408,024.18 E NAD83
Project Number 175668043
Surface Elevation 757.6 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. %
35 36 37 38 39 40	40.0	717.6	Boring offset due to CCR encountered in KIF-106. Overburden not sampled. See KIF-106 boring log for overburden sampling to 36.0' bgs. *(Continued)*					

No Refusal /
Bottom of Hole at 40.0 Ft.

Monitoring Well KIF-106 installed in boring. Refer to KIF-106 Well Installation Detail dated 10/31/18.

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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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TB01**
Client	Tennessee Valley Authority	Boring Location	575,777.94 N; 2,406,720.24 E NAD83
Project Number	175668043	Surface Elevation	776.0 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	7/10/19
Completed	7/10/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	C. Sexton	Logger	C. Sexton
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" PVC 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	C. Kocka	Approved By	L. Price

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. %
0.0	776.0		Top of Hole						
0			CLAYEY SILT WITH GRAVEL, ML, 10YR 5/3 (brown) and 10GY 6/1 (greenish gray), low to medium plasticity, loose, dry, iron oxide staining		DP01	0.0 - 5.0	0.0 - 5.0	4.6	N/A
4.0	772.0		SILTY FAT CLAY SOME GRAVEL, CL, 5Y 5/2 (olive gray), medium to high plasticity, soft, moist, iron oxide staining						
6.4	769.6		SILTY FAT CLAY WITH GRAVEL, CH, 10GY 5/1 (greenish gray), very soft to very firm, moist to wet, iron oxide staining Wet from 6.8' to 7.1' Organic material from 8.2' to 8.5'		DP02	5.0 - 10.0	5.0 - 10.0	4.7	N/A
8.6	767.4		SILT, ML, 2.5Y 6/1 (gray), coarse, loose to very dense, dry, fissured, Weathered shale Bright green mineralization at 8.8', very fine						
10.0	766.0		Bedrock Refusal / Bottom of Hole at 10.0 Ft. Top of Rock = 10.0 Ft. Top of Rock Elevation = 766.0 Ft.						

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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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TB02**
Client	Tennessee Valley Authority	Boring Location	575,751.95 N; 2,406,699.77 E NAD83
Project Number	175668043	Surface Elevation	778.2 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	7/10/19
		Completed	7/10/19
Project Location	Harriman, Tennessee	Depth to Water	N/A
		Date/Time	N/A
Inspector	C. Sexton	Logger	C. Sexton
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" PVC 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	C. Kocka	Approved By	L. Price

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. %
0.0	778.2		Top of Hole						
0			CLAYEY SILT WITH GRAVEL, ML, 10YR 5/3 (brown) and 10GY 6/1 (greenish gray), low to medium plasticity, loose, dry, iron oxide staining						
1									
2									
2.6	775.6				DP01	0.0 - 5.0	0.0 - 5.0	4.7	N/A
3			SILTY FAT CLAY SOME GRAVEL, CL, 5Y 5/2 (olive gray), medium to high plasticity, soft, moist, iron oxide staining						
4									
4.8	773.4								
5			SILT, ML, 2.5Y 6/1 (gray), coarse, loose to very dense, dry, fissured, weathered shale						
6									
7					DP02	5.0 - 8.8	5.0 - 8.8	3.8	N/A
8									
8.8	769.4								

Bedrock Refusal /
Bottom of Hole at 8.8 Ft.

Top of Rock = 8.8 Ft.
Top of Rock Elevation = 769.4 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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TB03**
Client	Tennessee Valley Authority	Boring Location	575,905.47 N; 2,406,816.38 E NAD83
Project Number	175668043	Surface Elevation	769.5 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	7/10/19
Completed	7/10/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	C. Sexton	Logger	C. Sexton
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" PVC 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	C. Kocka	Approved By	L. Price

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. %
0.0	769.5		Top of Hole						
0.3	769.2		Rock fill						
0			SILT, ML, 2.5Y 6/1 (gray), coarse, loose to very dense, dry, fissured, weathered shale		DP01	0.0 - 3.5	0.0 - 3.5	2.6	N/A
1									
2									
3									
3.5	766.0								

Bedrock Refusal /
Bottom of Hole at 3.5 Ft.

Top of Rock = 3.5 Ft.
Top of Rock Elevation = 766.0 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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TB04**
Client	Tennessee Valley Authority	Boring Location	575,682.22 N; 2,406,649.55 E NAD83
Project Number	175668043	Surface Elevation	781.3 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	7/10/19
Completed	7/10/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	C. Sexton	Logger	C. Sexton
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" PVC 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	C. Kocka	Approved By	L. Price

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. %
0.0	781.3		Top of Hole						
1.4	779.9		CLAYEY SILT WITH GRAVEL, ML, 10YR 5/3 (brown) and 10GY 6/1 (greenish gray), low to medium plasticity, loose, dry, iron oxide staining						
			SILT, ML, 2.5Y 6/1 (gray), coarse, loose to very dense, dry, fissured, weathered shale		DP01	0.0 - 4.0	0.0 - 4.0	3.7	N/A
4.0	777.3								

Bedrock Refusal /
Bottom of Hole at 4.0 Ft.

Top of Rock = 4.0 Ft.
Top of Rock Elevation = 777.3 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

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TB05**
Client	Tennessee Valley Authority	Boring Location	575,663.31 N; 2,406,722.56 E NAD83
Project Number	175668043	Surface Elevation	773.6 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	7/10/19
Completed	7/10/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	C. Sexton	Logger	C. Sexton
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" PVC 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	C. Kocka	Approved By	L. Price

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. %
0.0	773.6		Top of Hole						
0			CLAYEY SILT WITH GRAVEL, ML, 10YR 5/3 (brown) and 10GY 6/1 (greenish gray), low to medium plasticity, loose to dense, dry to moist, iron oxide staining		DP01	0.0 - 5.0	0.0 - 5.0	4.5	N/A
3.0	770.6		SILT, ML, 2.5Y 6/1 (gray), coarse, loose to very dense, dry, fissured, weathered shale						
5.0	768.6		Bedrock Refusal / Bottom of Hole at 5.0 Ft.						

Top of Rock = 5.0 Ft.
Top of Rock Elevation = 768.6 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

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 2/9/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TB05a**
Client	Tennessee Valley Authority	Boring Location	575,645.11 N; 2,406,721.76 E NAD83
Project Number	175668043	Surface Elevation	774.1 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	7/10/19
Completed	7/10/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	C. Sexton	Logger	C. Sexton
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" PVC 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	C. Kocka	Approved By	L. Price

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. %
0.0	774.1		Top of Hole						
0			CLAYEY SILT WITH GRAVEL, ML, 10YR 5/3 (brown) and 10GY 6/1 (greenish gray), low to medium plasticity, loose, dry, iron oxide staining						
1									
2									
2.7	771.4				DP01	0.0 - 5.0	0.0 - 5.0	4.5	N/A
3			SILTY FAT CLAY SOME GRAVEL, CL, 5Y 5/2 (olive gray), medium to high plasticity, soft, moist, iron oxide staining						
3.8	770.3								
4			SILT, ML, 2.5Y 6/1 (gray), coarse, loose to very dense, dry, fissured, weathered shale						
5.0	769.1								
5			Bedrock Refusal / Bottom of Hole at 5.0 Ft.						

Top of Rock = 5.0 Ft.
Top of Rock Elevation = 769.1 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

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 2/9/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TB06**
Client	Tennessee Valley Authority	Boring Location	576,039.98 N; 2,406,841.56 E NAD83
Project Number	175668043	Surface Elevation	769.2 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	7/10/19
Completed	7/10/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	C. Sexton	Logger	C. Sexton
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" PVC 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	C. Kocka	Approved By	L. Price

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. %
0.0	769.2		Top of Hole						
0.3	768.9		Rock fill and soil						
			SILT, ML, 2.5Y 6/1 (gray) to N 8/ (white), coarse, loose to very dense, dry, fissured, Weathered shale		DP01	0.0 - 3.5	0.0 - 3.5	2.5	N/A
3.5	765.7		Bedrock Refusal / Bottom of Hole at 3.5 Ft.						

Top of Rock = 3.5 Ft.
Top of Rock Elevation = 765.7 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

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 2/9/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TB07**
Client	Tennessee Valley Authority	Boring Location	576,191.33 N; 2,406,888.79 E NAD83
Project Number	175668043	Surface Elevation	768.6 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	7/10/19
Completed	7/10/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	C. Sexton	Logger	C. Sexton
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" PVC 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	C. Kocka	Approved By	L. Price

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. %
0.0	768.6		Top of Hole						
1.2	767.4		Asphalt and soil						
3.0	765.6		SILT, ML, 2.5Y 6/1 (gray), coarse, loose to very dense, dry, fissured, weathered shale		DP01	0.0 - 3.0	0.0 - 3.0	2.4	N/A

Bedrock Refusal /
Bottom of Hole at 3.0 Ft.

Top of Rock = 3.0 Ft.
Top of Rock Elevation = 765.6 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

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 2/9/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-TB08**
Client	Tennessee Valley Authority	Boring Location	576,336.38 N; 2,406,930.54 E NAD83
Project Number	175668043	Surface Elevation	767.9 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	7/10/19
Completed	7/10/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	C. Sexton	Logger	C. Sexton
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" PVC 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	C. Kocka	Approved By	L. Price

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. %
0.0	767.9		Top of Hole						
1.2	766.7		Rock fill and asphalt						
			SILT, ML, 2.5Y 6/1 (gray), coarse, loose to very dense, dry, fissured, weathered shale		DP01	0.0 - 4.0	0.0 - 4.0	3.0	N/A
4.0	763.9								

Bedrock Refusal /
Bottom of Hole at 4.0 Ft.

Top of Rock = 4.0 Ft.
Top of Rock Elevation = 763.9 Ft.

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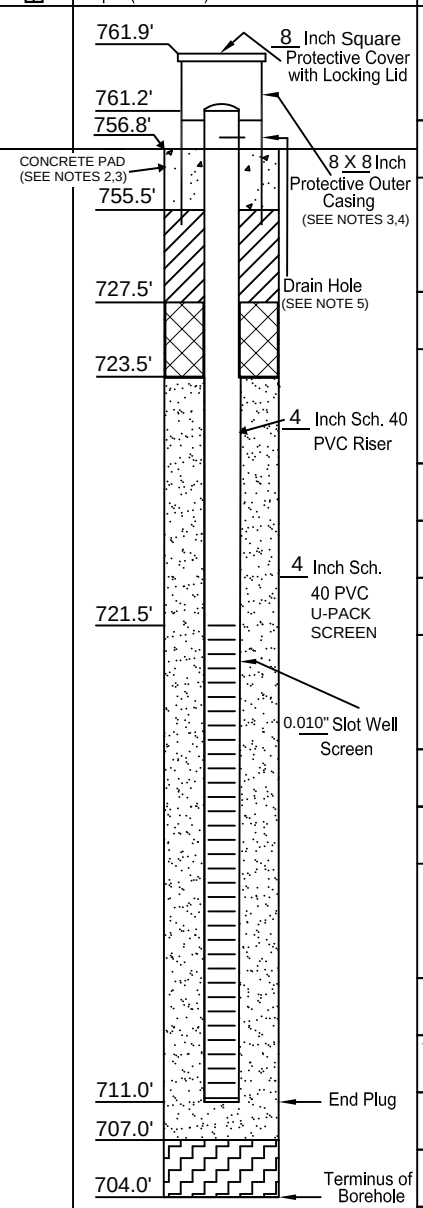
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

MONITORING WELL INSTALLATION FIELD LOG

FACILITY NAME: **KINGSTON FOSSIL PLANT**	FACILITY ID:	WELL NO.: **MW-22C**
ENGINEER: S&ME / N.PETERSON	DRILLING METHOD: SONIC	LOCATION/COORDINATES: N: 577060.67 E: 2411240.29 (TN STATE PLANE)
WEATHER: CLOUDY	DRILLING COMPANY: CASCADE	DATE/TIME
TEMPERATURE: 55° F	DRILL RIG: SONIC / DRILLER: T. TAYLOR	STARTED: 11/7/17 / COMPLETED: 1/30/18 (SEE NOTE 1)

LITHOLOGIC DESCRIPTION	ELEVATION/ DEPTH	PID (ppm)	BLOWS/ft.
	755.5/0.0		
CRUSHED STONE	752.5/3.0		
CLAY, DARK REDDISH BROWN, MOIST (FILL)	747.5/8.0		
CLAY, DARK GREY AND DARK REDDISH BROWN, MOIST, SOME BOTTOM ASH AND FLY ASH (FILL)	745.5/10.0		
CLAY, YELLOWISH BROWN, MOIST (ALLUVIUM)	738.0/17.5		
SAND, LIGHT OLIVE BROWN, WET (ALLUVIUM)	736.0/19.5		
CLAY, YELLOWISH BROWN, MOIST (ALLUVIUM)	729.5/26.0		
CLAYEY SAND, YELLOWISH BROWN, WET (ALLUVIUM)	725.5/30.0		
SAND, YELLOWISH BROWN, WET (ALLUVIUM)	719.5/36.0		
SAND WITH COBBLE, YELLOWISH BROWN, WET (ALLUVIUM)	707.0/48.5		
WEATHERED SHALE	704.0/51.5		
BOTTOM OF BORING / NO REFUSAL			

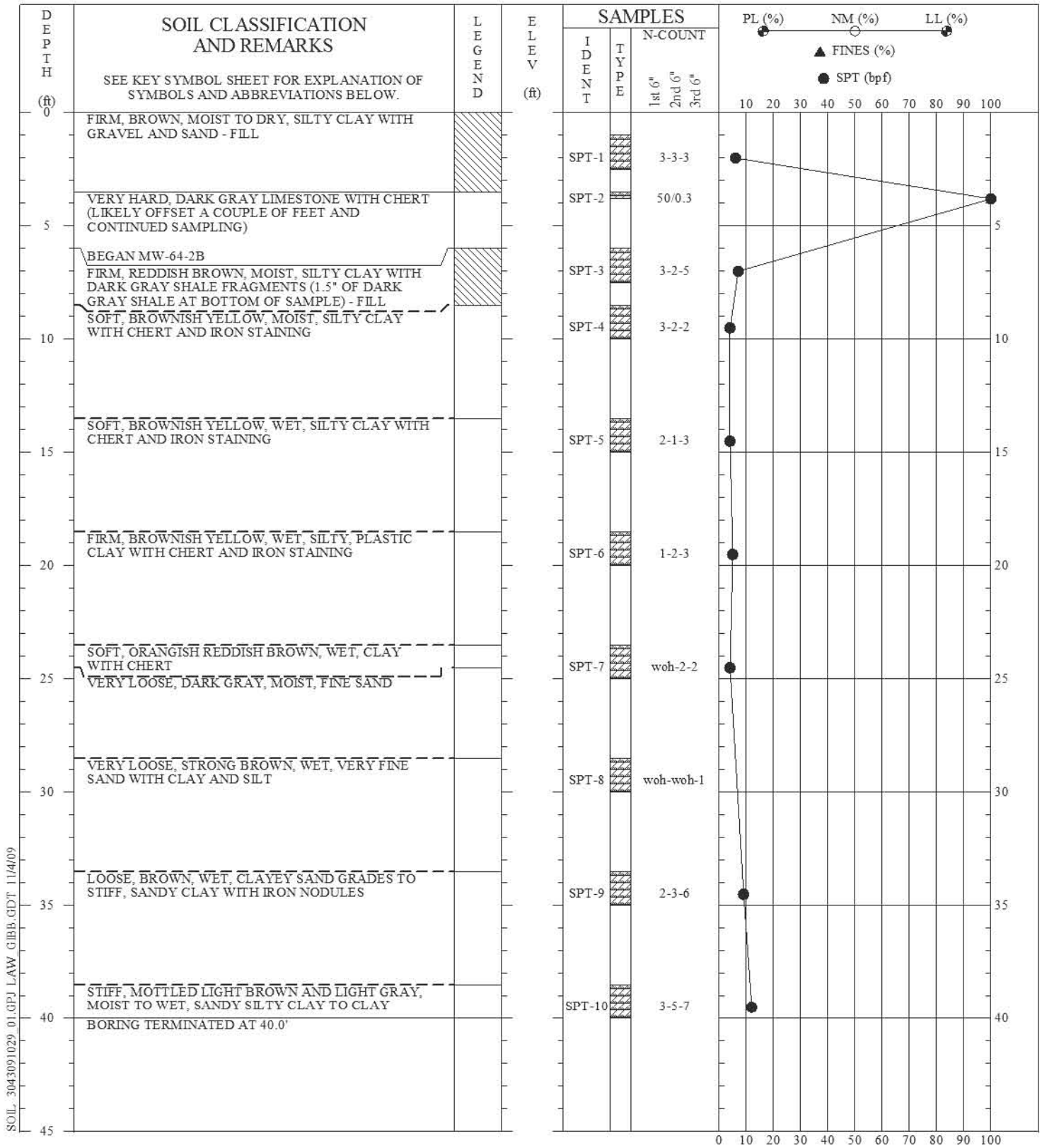


MATERIALS INVENTORY	
BENTONITE SEAL:	TOP: 28.0 FT BGS / BOTTOM: 32.0 FT BGS
FILTER PACK GRAINSIZE:	GLOBAL #7 (20-40 MESH)
FILTER PACK :	TOP: 32.0 FT BGS / BOTTOM: 48.5 FT BGS
GROUT QUANTITY:	69 US GALLONS
GROUT :	TOP: 2.0 FT BGS / BOTTOM: 28.0 FT BGS
GROUT TYPE:	HIGH SOLIDS (30%) BENTONITE
SCREEN TYPE:	SCH. 40 PVC
WELL SCREEN:	in. 4" X 5" U-PACK / l.f. 10.0 FT
SLOT SIZE:	0.010 INCHES
WELL CASING:	Inches in Diameter 4 INCHES / l.f. 39.7 FT
CASING TYPE:	SCH. 40 PVC
TOP OF CASING (AGS):	5.7 FT
BOREHOLE (IN. DIAMETER):	10 INCHES (0'-15'); 9 INCHES (15'-51.5')
BOTTOM OF BOREHOLE (FT BGS):	51.5 FT
TOP OF CASING ELEVATION (FT ABOVE MSL):	N/A

NOTES:
1. COMPLETION DATE INCLUDES INSTALLATION OF THE CONCRETE PAD, PROTECTIVE BOLLARDS, AND WELL DEVELOPMENT
2. 4'X4'X12" THICK CONCRETE PAD WITH 4 BOLLARDS SET 2' BGS IN CONCRETE
3. PRECAST CONCRETE PAD INSTALLED, WITH PROTECTIVE COVER BOLTED TO THE TOP OF THE PAD.
4. ANNULUS BETWEEN PVC CASING AND PROTECTIVE COVER BACKFILLED WITH PEA GRAVEL
5. DRAIN HOLE INSTALLED ON TWO SIDES OF PROTECTIVE COVER

CAVE IN (SLOUGH) | COARSE SAND | FINE FILTER SAND | BENTONITE GROUT | CEMENT PAD | BENTONITE SEAL (PELLETS)

TVA



SOIL_3043091029_01.GPJ LAW_GIBB.GDT 11/4/09

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER. NO GROUND WATER ENCOUNTERED AT TIME OF EXPLORATION.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Tri-State
Logged By: N.S.
Checked By: J.M.

SOIL TEST BORING RECORD

PROJECT: TVA KIF MW-6AR Installation

DRILLED: September 2, 2009 **BORING NO.:** MW-6AR

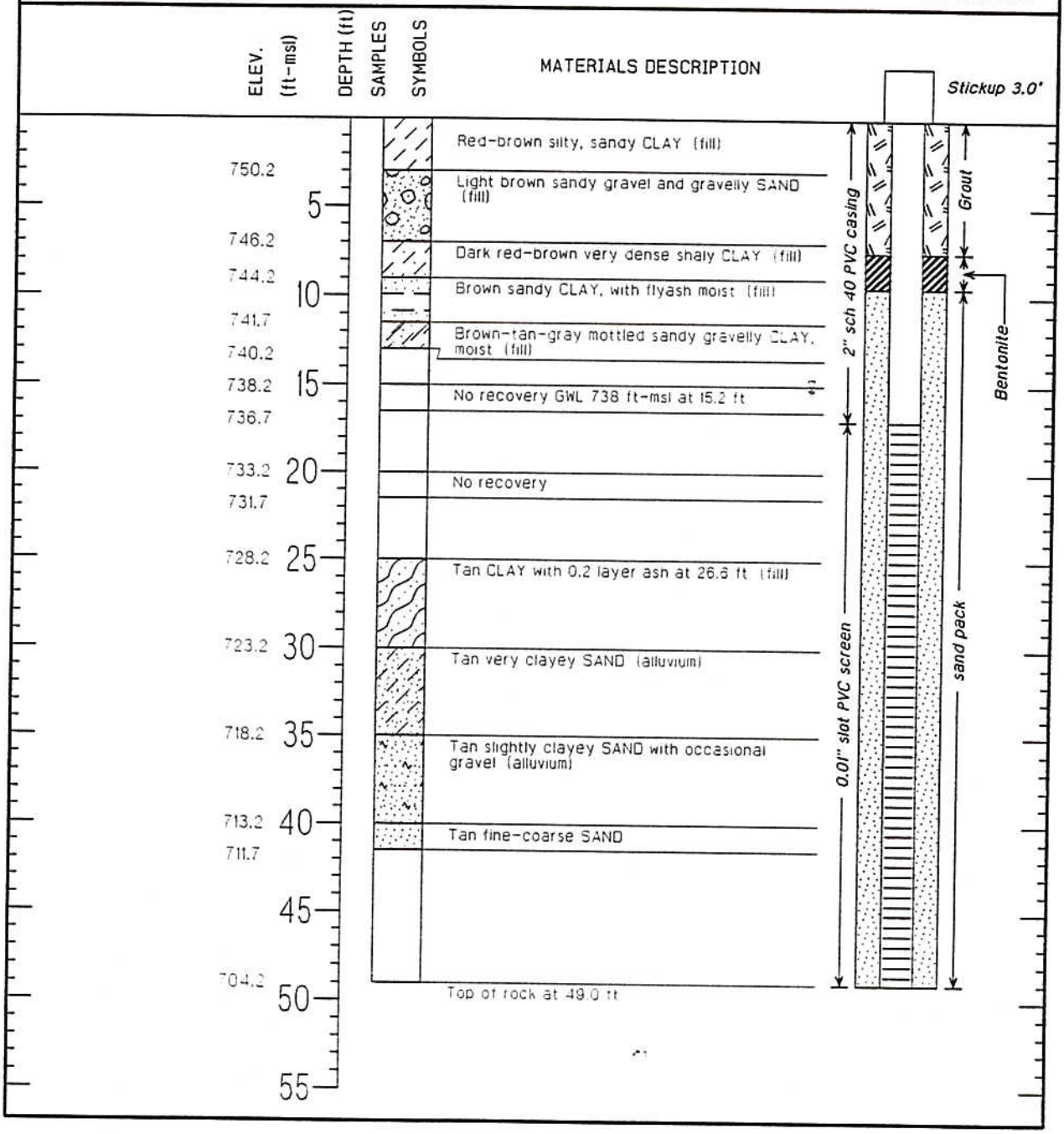
PROJ. NO.: 3043-09-1029-01 **PAGE** 1 **OF** 1

MACTEC

Tennessee Valley Authority

MONITORING WELL KIF-22

WELL CONSTRUCTION DETAIL



PROJECT Kingston Fossil Plant

LOCATION Kingston, TN

DRILL RIG Hollow Stem Auger

LOGGER/ENGINEER Jim Overton

WATER LEVEL (INITIAL) 15.2 ft

EAST 2442754.9

DRILLING COMPANY TVA Field Engineering

DATE DRILLED 07/10/02

SURFACE ELEVATION 753.2 ft-msl

T.O.C. ELEVATION 756.2 ft-msl

WATER LEVEL (24-HOUR) ft

NORTH 555694.2

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-22B**

DATE DRILLED: **7/31/14**	ELEVATION: **Not Recorded**	NOTES: **Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.**
DRILLING METHOD: **6-5/8" H.S.A / PQ3**	BORING DEPTH: **79 feet**	
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **15 feet**	
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
		Crushed Stone Aggregate (2-inch diameter minus)									
		No. 10 Screenings Aggregate									
5		**FAT CLAY (CH)** - With black nodules; dark red; slightly moist - FILL					2	22	11	9	33
		LEAN CLAY (CL) - With tan weathered shale fragments, red fat clay, and trace bottom ash; orange and tan; slightly moist; firm to hard - FILL					5	9	10	11	19
10							0	1	4	13	5
		BOTTOM ASH - With some fine sand and sandy lean clay intervals; slightly moist to wet; very loose to loose - FILL									

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

NOTES:

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3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

S&ME

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-22B**

DATE DRILLED: **7/31/14**	ELEVATION: **Not Recorded**
DRILLING METHOD: **6-5/8" H.S.A / PQ3**	BORING DEPTH: **79 feet**
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **15 feet**
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**

NOTES: **Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
15		**BOTTOM ASH** - With some fine sand and sandy lean clay intervals; slightly moist to wet; very loose to loose - FILL *(continued)*	▽				1	5	4	5	9
							4	4	5	5	9
							3	3	4	3	7
20							3	1	1	0	2
							0	0	2	2	2
							3	4	0	1	4

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

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S&ME

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-22B**

DATE DRILLED: **7/31/14**	ELEVATION: **Not Recorded**
DRILLING METHOD: **6-5/8" H.S.A / PQ3**	BORING DEPTH: **79 feet**
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **15 feet**
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**

NOTES: **Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
		BOTTOM ASH - With some fine sand and sandy lean clay intervals; slightly moist to wet; very loose to loose - FILL *(continued)*					0	0	1	3	1
							1	3	3	3	6
30		**LEAN CLAY WITH SAND (CL)** - Tan and brown; very moist to wet; very soft to firm - ALLUVIUM					0	0	1	2	1
							0	1	0	0	1
							0	1	1	1	2
35		**SILTY SAND (SM)** - Orange brown; wet; very loose - ALLUVIUM					0	1	1	2	2

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

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S&ME

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-22B**

DATE DRILLED: **7/31/14**	ELEVATION: **Not Recorded**
DRILLING METHOD: **6-5/8" H.S.A / PQ3**	BORING DEPTH: **79 feet**
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **15 feet**
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**

NOTES: **Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
							1	1	0	0	1
40							1	1	3	4	4
							0	1	1	1	2
		POORLY GRADED SAND (SP) - With occasional gravel; orange brown and tan; wet; very loose to very dense - ALLUVIUM					1	2	3	3	5
45							1	3	5	7	8
						>>	14	34	50/4"		50/4"

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

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S&ME

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-22B**

DATE DRILLED: **7/31/14**	ELEVATION: **Not Recorded**	NOTES: **Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.**
DRILLING METHOD: **6-5/8" H.S.A / PQ3**	BORING DEPTH: **79 feet**	
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **15 feet**	
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
		WEATHERED SILTSTONE / SHALE - Tan, brown, to gray; slightly moist; very hard - RESIDUUM *(continued)*				>>	8	27	39	16	66
						>>	10	50/3"			50/3"
55		Began PQ3 coring at a depth of 54.2 feet. **Run No. 1** (54.2' to 56.4') Siltstone - Dark gray; fine grained; friable; near vertical bedding; soft; highly fractured.			1 REC 73% RQD 0%						
		Run No. 2 (56.4' to 58.4') Siltstone - With interbedded limestone from 58.0 to 58.4 feet; dark gray; fine grained; friable; slightly weathered; bedding is at an apparent dip of 45 degrees; siltstone is soft to medium hard; limestone is hard.			2 REC 90% RQD 0%						
60		**Run No. 3** (58.4' to 61.1') Siltstone with interbedded Limestone - Greenish gray and gray; fine grained; medium hard; slightly weathered; moderately weathered seams at 58.7, 58.9, and 59.3 feet; calcite-healed features throughout; bedding is at an apparent dip of 45 degrees.			3 REC 100% RQD 0%						
					4 REC						

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

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S&ME

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-22B**

DATE DRILLED: **7/31/14**	ELEVATION: **Not Recorded**	NOTES: **Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.**
DRILLING METHOD: **6-5/8" H.S.A / PQ3**	BORING DEPTH: **79 feet**	
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **15 feet**	
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
		Run No. 4 (61.1' to 63.8') Siltstone with interbedded Limestone - Greenish gray and gray; fine grained; medium hard; slightly weathered; calcite-healed features throughout; moderately to highly fractured; bedding is at an apparent dip of 35 degrees.			100% RQD 0%						
		Run No. 5 (63.8' to 66.4') From 63.8 to 64.7 feet - Siltstone with interbedded Limestone - Greenish gray and gray; fine grained; medium hard; slightly weathered; calcite-healed features throughout; moderately to highly fractured; bedding is at an apparent dip of 35 degrees. From 64.7 to 66.4 feet - Siltstone with interbedded Shale and Limestone- Dark gray; very fine grained; medium hard; slightly weathered; with calcite healed veins throughout; highly fractured; limestone interval observed from 65.9 to 66.2 feet.			5 REC 92% RQD 0%						
65		**Run No. 6** (66.4' to 68.2') From 66.4 to 66.9 feet - Limestone. From 66.9 to 68.2 feet Siltstone with interbedded Shale - Greenish gray and gray; fine grained; medium hard; slightly weathered; calcite-healed features throughout; moderately to highly fractured; bedding is at an apparent dip of 35 degrees.			6 REC 94% RQD 0%						
		Run No. 7 (68.2' to 70.4') Siltstone with interbedded Shale - Greenish gray and gray; fine grained; medium hard; slightly weathered; calcite-healed features throughout; moderately to highly fractured; bedding is at an apparent dip of 35 degrees.			7 REC 100% RQD 0%						
70		**Run No. 8** (70.4' to 70.9') Siltstone with interbedded Shale - Same lithology as previous run.			8 REC 100% RQD 0%						
		Run No. 9 (70.9' to 74.2') Siltstone with interbedded Shale - Same lithology as previous run.			9 REC 85% RQD 0%						
		Run No. 10 (74.2' to 76.4') Siltstone with interbedded Shale - Same lithology as previous run.									

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

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S&ME

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-22B**

DATE DRILLED: **7/31/14**	ELEVATION: **Not Recorded**	NOTES: **Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.**
DRILLING METHOD: **6-5/8" H.S.A / PQ3**	BORING DEPTH: **79 feet**	
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **15 feet**	
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
		Run No. 10 (74.2' to 76.4') Siltstone with interbedded Shale - Same lithology as previous run. *(continued)*			10 REC 114% RQD 18%						
		Run No. 11 (76.4' to 77.3') Siltstone with interbedded Shale - Same lithology as previous run.			11 REC 100% RQD 0%						
		Run No. 12 (77.3' to 79.0') Siltstone with interbedded Shale - Same lithology as previous run.			12 REC 82% RQD 0%						
		PQ3 Coring Terminated at 79.0 feet.									

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

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S&ME

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-27A**

DATE DRILLED: **7/22/14**	ELEVATION: **Not Recorded**
DRILLING METHOD: **CME 750, 4¼" H.S.A.**	BORING DEPTH: **44.2 feet**
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **17 feet**
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**

NOTES: **Soil descriptions based upon visual observation of obtained samples. A blowcount of (0) indicates that the split spoon advanced under the weight of the hammer.**

DEPTH (feet)	MATERIAL DESCRIPTION	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
5	Crushed Stone Aggregate (4-inch diameter minus)			10	6	5	4	11
10	**FAT CLAY (CH)** - Brown and reddish brown; slightly moist; firm to stiff - FILL			8	4	2	1	6
				4	5	5	5	10
15				3	3	2	3	5
				1	2	2	3	4
				1	1	2	2	3
20	**LEAN CLAY WITH SAND (CL)** - Orange brown with tan and brown mottling; moist to wet; very soft to firm - ALLUVIUM			0	1	2	3	3
				0	0	2	2	2
25				0	0	0	0	0
				0	1	1	2	2
30	**SILTY SAND (SM)** - With some clay lenses; orange brown; wet; very loose - ALLUVIUM			0	1	1	2	2
	POORLY GRADED SAND (SP) - Fined grained; orange brown, brown, and tan; wet; very loose to medium dense - ALLUVIUM			0	1	1	1	2
				0	2	1	3	3

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

NOTES:

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2. ***BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.***
3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

S&ME

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-27A**

DATE DRILLED: **7/22/14**	ELEVATION: **Not Recorded**
DRILLING METHOD: **CME 750, 4¼" H.S.A.**	BORING DEPTH: **44.2 feet**
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **17 feet**
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**

NOTES: **Soil descriptions based upon visual observation of obtained samples. A blowcount of (0) indicates that the split spoon advanced under the weight of the hammer.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
		POORLY GRADED SAND (SP) - Fined grained; orange brown, brown, and tan; wet; very loose to medium dense - ALLUVIUM *(continued)*					1	2	2	2	4
							1	1	1	2	2
40							1	2	10	20	12
		POORLY GRADED SAND WITH GRAVEL (SP) - Tan, brown, and orange brown, wet; medium dense - ALLUVIUM				>>	10	29	30	31	59
		WEATHERED SHALE / SILTSTONE - Brown, orange and gray; slightly moist; very hard - RESIDUUM				>>	50/5"				50/5"
		Auger Refusal at 44.2 feet									

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

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S&ME

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-27B**

DATE DRILLED: **7/17/14**	ELEVATION: **Not Recorded**	NOTES: **Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.**
DRILLING METHOD: **6-5/8" H.S.A / PQ3**	BORING DEPTH: **69 feet**	
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **21 feet**	
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
		Began HSA drilling. Soil descriptions based on soil cuttings return.									
		Crushed Stone Aggregate - FILL									
5											
		Lean clay to fat clay - FILL									
10											
15		Lean clay - ALLUVIUM									

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

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S&ME

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-27B**

DATE DRILLED: **7/17/14**	ELEVATION: **Not Recorded**	NOTES: **Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.**
DRILLING METHOD: **6-5/8" H.S.A / PQ3**	BORING DEPTH: **69 feet**	
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **21 feet**	
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
25		Lean clay - ALLUVIUM *(continued)*	▽								
30		Sandy lean clay to clayey sand - ALLUVIUM									
35		Sand with gravel and cobbles - ALLUVIUM Auger refusal at 39.5 feet									

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

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S&ME

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-27B**

DATE DRILLED: **7/17/14**	ELEVATION: **Not Recorded**	NOTES: **Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.**
DRILLING METHOD: **6-5/8" H.S.A / PQ3**	BORING DEPTH: **69 feet**	
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **21 feet**	
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
		Cobbles with sand from 39.5 to 40.9 feet- ALLUVIUM *(continued)*									
		Began PQ3 coring at a depth of 40.9 feet.									
45		**Run No. 1** (40.9' to 45.9') Shale with interbedded Siltstone and Limestone - Dark greenish gray; hard; near vertical bedding; with some interbedded calcite healed veins. Recovered core is highly fractured.			1 REC 24% RQD 0%						
50		**Run No. 2** (45.9' to 50.9') Shale with interbedded Siltstone and Limestone - Greenish gray and light gray; very fine to fine grained; thinly bedded; closely jointed with an apparent dip of 70 degrees; medium hard; with many calcite healed veins.			2 REC 46% RQD 0%						
55		**Run No. 3** (50.9' to 55.9') Shale with interbedded Siltstone and Limestone - Same lithology as above.			3 REC 30% RQD 0%						
		Run No. 4 (55.9' to 58.4') Shale with interbedded Siltstone and Limestone - Same lithology as above.			4 REC 108% RQD 0%						
					5 REC 100%						

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S&ME

PROJECT:	BORING LOG:
TVA KIF - Monitoring Well Installation **Kingston, TN** **S&ME Project No. 1431-11-121**	**KIF-27B**

DATE DRILLED: **7/17/14**	ELEVATION: **Not Recorded**	NOTES: **Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.**
DRILLING METHOD: **6-5/8" H.S.A / PQ3**	BORING DEPTH: **69 feet**	
LOGGED BY: **J. Feuge**	WATER LEVEL @ TOB: **21 feet**	
DRILLER: **H. Herd**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
		Run No. 5 (58.4' to 60.9') Shale with interbedded Siltstone and Limestone - Greenish gray and light gray; very fine to fine grained; thinly bedded; closely jointed with near vertical bedding; medium hard; with many calcite healed veins. Recovered core is fractured along bedding planes. *(continued)*			RQD 0%						
		Run No. 6 (60.9' to 63.4') Limestone and Siltstone with interbedded Shale - Greenish gray and gray; very fine to fine grained; thinly bedded; closely jointed; slightly weathered; with many calcite healed veins. Recovered core is highly fractured. Apparent dip of bedding varies from near vertical to horizontal (in the middle of the run; appoximately at 62.5 feet).			6 REC 72% RQD 0%						
65		**Run No. 7** (63.4' to 65.9') Limestone and Siltstone with interbedded Shale - Greenish gray and gray; very fine to fine grained; thinly bedded; closely jointed; slightly weathered; with many calcite healed veins. Recovered core is highly fractured. Apparent dip of bedding is near vertical.			7 REC 64% RQD 0%						
		Run No. 8 (65.9' to 69.0') Shale with interbedded Siltstone - Dark gray; slightly weathered; medium hard; thinly bedded; closely jointed; Recovered core is highly fractured. Bedding is at an apparent dip of about 60 degrees.			8 REC 42% RQD 0%						
		PQ3 Coring Terminated at 69.0 feet.									

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

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S&ME

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-109**
Client	Tennessee Valley Authority	Boring Location	575,305.85 N; 2,409,009.99 E NAD83
Project Number	175668053	Surface Elevation	757.6 ft
		Elevation Datum	NGVD29
Project Name	KIF CCR Rule	Date Started	12/1/20
		Completed	12/3/20
Project Location	Harriman, Tennessee	Depth to Water	13.3 ft
		Date/Time	12/10/20 10:26
Inspector	E. Smith II	Logger	E. Smith II
Depth to Water	13.3 ft	Date/Time	1/6/21 08:13
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Boart Longyear LS600
Overburden Drilling and Sampling Tools (Type and Size)	6" x 8" Rotosonic		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	8" x 12" Rotosonic	Overdrill Depth	27.0 ft
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	E. Smith II

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. %
0.0	757.6		Top of Hole						
1.0	756.6		Crushed stone, light gray gravel fill						
2.5	755.1		LEAN CLAY, CL, 5YR 3/4 (dark reddish brown), low to medium plasticity, soft to firm, moist, [FILL]						
4.0	753.6		POORLY GRADED SAND, SP, N 3/ (very dark gray), very fine to medium, loose to dense, dry to moist, [FILL]		RS01	0.0 - 7.0	0.0 - 7.0	7.0	N/A
6.0	751.6		SILT TRACE SAND, SM, N 3/ (very dark gray), very fine to fine, loose to medium dense, dry to moist, [CCR]						
10.5	747.1		SILTY POORLY GRADED SAND, SP-SM, 5Y 4/3 (olive), very fine to medium, medium dense, moist, [FILL]						
12.0	745.6		GRAVELLY LEAN CLAY TRACE SAND, CL, 10YR 6/8 (brownish yellow) with 2.5Y 5/1 (gray), non-plastic to low plasticity, firm, moist, [FILL]						
12.5	745.1		POORLY GRADED SAND WITH GRAVEL, SP, 5Y 2.5/1 (black), fine to medium, loose, moist, gap graded, [CCR]						
17.0	740.6		GRAVELLY FAT CLAY TRACE SAND, CH, 5YR 4/6 (yellowish red), very fine to fine, medium plasticity, firm, moist, gap graded, gravel size is coarse, [FILL]		RS02	7.0 - 23.0	7.0 - 23.0	16.0	N/A

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-109**
Client Tennessee Valley Authority
Boring Location 575,305.85 N; 2,409,009.99 E NAD83
Project Number 175668053
Surface Elevation 757.6 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			GC, 5Y 5/1 (gray) with 5YR 2.5/2 (dark reddish brown), very fine to medium, dense to very dense, moist, gap graded, gravel size is coarse to cobbles, limestone and weathered shale gravel, [FILL] *(Continued)*					
19								
20								
21								
22								
23	23.0	734.6						
23			SANDY FAT CLAY WITH GRAVEL, CH, 7.5YR 5/4 (brown), medium plasticity, soft to firm, moist to wet, gravel is limestone and weathered shale, [FILL] Wet at 24.5'		RS03	23.0 - 27.0	4.0	N/A
24								
25								
26	26.0	731.6						
26			CLAYEY SILT, ML, 5Y 5/1 (gray), non-plastic to low plasticity, very soft, wet, moderate organic odor, homogeneous, visible fine plant roots preserved					
27								
28	28.0	729.6						
28			CLAYEY POORLY GRADED SAND WITH CLAY, SC, 2.5Y 5/6 (light olive brown) with 10YR 5/1 (gray), very fine to fine, very dense to dense, moist to wet, slight organic odor, poorly graded, mottled	27.0/32.0-20201203	RS04aE	27.0 - 32.0		
29								
30								
31								
32								
33				32.0/36.0-20201203				
34					RS04bE	32.0 - 36.0		
35								
36	36.0	721.6						
36			CLAYEY POORLY GRADED SAND WITH CLAY TRACE CLAY, SP-SC, 5Y 5/2 (olive gray) with 5Y 5/4 (olive), very fine to fine, loose to very loose, wet, slight organic odor, slight mottling	36.0/40.0-20201203			20.0	N/A
37								
38					RS04cE	36.0 - 40.0		
39								
40	40.0	717.6						
40			CLAYEY POORLY GRADED SAND WITH CLAY, SC, 2.5Y 5/6 (light olive brown) with 10YR 5/1 (gray), very fine to fine, very dense to dense, moist to wet, slight organic odor, poorly graded, mottled	40.0/44.0-20201203				
41								
42					RS04dE	40.0 - 44.0		

23.0 - 27.0

27.0 - 47.0

TVA EIP BORING LOG 175668043_TVA_KIF_CCR-RULE.GPJ TDEC SUBSURF DT 20190530.GDT 11/1/21

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-109**
Client: Tennessee Valley Authority
Boring Location: 575,305.85 N; 2,409,009.99 E NAD83
Project Number: 175668053
Surface Elevation: 757.6 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. %
44.0	713.6							
			CLAYEY POORLY GRADED SAND, SP-SC, 5Y 4/1 (dark gray), very fine to fine, loose, wet, poorly graded	44.0/47.0-20201203	RS04eE	44.0 - 47.0		
47.0	710.6							
			POORLY GRADED SAND, SP, 10YR 6/8 (brownish yellow), fine to medium, very loose, wet, homogeneous	47.0/51.0-20201203	RS05aE	47.0 - 51.0		
51.0	706.6							
			Shale, pale olive and pale yellow brown, soft, thin bedded to very thin bedded, highly weathered to moderately weathered, moist to dry, iron oxide staining, argillaceous	51.0/55.0-20201203	RS05bE	51.0 - 55.0		
55.0	702.6							

47.0 - 55.0

8.0 N/A

No Refusal /
Bottom of Hole at 55.0 Ft.

Top of Rock = 51.0 Ft.
Top of Rock Elevation = 706.6 Ft.

See well installation detail for KIF-109 dated 12/07/2020 for well installation 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

SUBSURFACE LOG

Project Number	175618806	Location	N 575,378.6, E 2,410,382.7 (NAD 83)
Project Name	KIF Soil Gas & Pore Water Wells	Boring No.	**VB-01a** Total Depth 21.5 ft
County	Roane County, TN	Surface Elevation	758.3 ft
Project Type	Well Installations	Date Started	6/19/18 Completed 6/19/18
Supervisor	Patrick Hoefle Driller Stantec	Depth to Water	16.0 ft Date/Time 6/19/18
Logged By	Patrick Hoefle	Depth to Water	N/A Date/Time N/A

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
758.3	0.0	Top of Hole							
		Auger through cover/fill, no sample							Well installed to 19.5 ft adjacent to boring
748.8	9.5								
		Ash, gray, dry to wet		SS-1	9.5 - 11.5	1.6	1-1-1	--	
				SS-2	11.5 - 13.5	1.9	1-1-1	--	
				SS-3	13.5 - 15.5	1.5	6-9-6	--	
				SS-4	15.5 - 17.5	0.0	1-2-3	--	
				SS-5	17.5 - 19.5	2.0	1-WOH-WOH	--	
737.3	21.0			SS-6	19.5 - 21.5	2.0	1-WOH-WOH	--	
736.8	21.5	Lean Clay, brown, moist, with little sand							WOH = Weight of Hammer
		No Refusal / Bottom of Hole							

SUBSURFACE LOG

Project Number	175618806	Location	N 575,378.6, E 2,410,382.7 (NAD 83)
Project Name	KIF Soil Gas & Pore Water Wells	Boring No.	**VB-01b** Total Depth 22.0 ft
County	Roane County, TN	Surface Elevation	758.3 ft
Project Type	Well Installations	Date Started	6/19/18 Completed 6/19/18
Supervisor	Patrick Hoefle Driller Stantec	Depth to Water	N/A Date/Time N/A
Logged By	Patrick Hoefle	Depth to Water	N/A Date/Time N/A

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
758.3	0.0	Top of Hole							
		Auger through cover/fill, no sample							Well installed to 19.5 ft
748.8	9.5			ST-1	8.0 - 10.0	1.4		--	
		Ash, gray, dry to wet							
				OS-2	12.0 - 14.5	2.1		--	
				OS-3	17.0 - 19.5	2.0		--	
737.3	21.0			ST-4	20.0 - 22.0	0.0		--	
736.3	22.0	Lean Clay, brown, moist, with little sand							
		No Refusal / Bottom of Hole							

STANTEC/FMSM_LEGACY_175618806_KIF.GPJ FMSM-GRAPHIC LOG.GDT 7/6/18

SUBSURFACE LOG

Project Number	175618806	Location	N 575,653.2, E 2,411,086.6 (NAD 83)
Project Name	KIF Soil Gas & Pore Water Wells	Boring No.	**VB-02a** Total Depth 30.5 ft
County	Roane County, TN	Surface Elevation	753.4 ft
Project Type	Well Installations	Date Started	6/14/18 Completed 6/14/18
Supervisor	Patrick Hoefle Driller Stantec	Depth to Water	11.5 ft Date/Time 6/14/18
Logged By	Patrick Hoefle	Depth to Water	N/A Date/Time N/A

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
753.4	0.0	Top of Hole							
		Auger through cover/fill, no sample							Well installed to 20.0 ft adjacent to boring
744.9	8.5								
743.9	9.5	Mix of red clay and ash fill		SS-1	8.5 - 10.5	2.0	7-9-9	--	
		Coal ash, gray, dry to wet		SS-2	10.5 - 12.5	1.8	6-7-4	--	
				SS-3	12.5 - 14.5	1.8	9-9-9	--	
				SS-4	14.5 - 16.5	0.7	1-WOH-WOH	--	
				SS-5	16.5 - 18.5	2.0	2-1-WOH	--	
				SS-6	18.5 - 20.5	1.3	1-WOH-WOH	--	
				SS-7	20.5 - 22.5	1.3	WOR-WOR-WOR	--	
				SS-8	22.5 - 24.5	2.0	WOH-WOH-WOH	--	
				SS-9	24.5 - 26.5	2.0	WOH-WOH-WOH	--	
725.6	27.8			SS-10	26.5 - 28.5	2.0	WOH-WOH-WOR-5-6	--	
		Clay, light brown		SS-11	28.5 - 30.5	2.0	WOH-WOH-WOH	--	
722.9	30.5								
		No Refusal / Bottom of Hole							WOH = Weight of Hammer WOR = Weight of Rod

STANTEC/FMSM_LEGACY 175618806_KIF.GPJ FMSM-GRAPHIC LOG.GDT 7/6/18

SUBSURFACE LOG

Project Number	175618806	Location	N 575,653.2, E 2,411,086.6 (NAD 83)
Project Name	KIF Soil Gas & Pore Water Wells	Boring No.	**VB-02b** Total Depth 28.5 ft
County	Roane County, TN	Surface Elevation	753.4 ft
Project Type	Well Installations	Date Started	6/14/18 Completed 6/14/18
Supervisor	Patrick Hoefle Driller Stantec	Depth to Water	N/A Date/Time N/A
Logged By	Patrick Hoefle	Depth to Water	N/A Date/Time N/A

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
753.4	0.0	Top of Hole							
		Auger through cover/fill, no sample							Well Installed to20 ft
744.9	8.5			ST-1	7.0 - 9.0	2.3		--	
743.9	9.5	Mix of red clay and ash fill							
		Coal ash, gray, dry to wet							
				OS-2	13.5 - 16.0	1.9		--	
				OS-3	18.5 - 21.0	2.5		--	
				OS-4	23.5 - 26.0	0.0		--	
725.6	27.8			ST-5	26.5 - 28.5	0.0		--	
724.9	28.5	Clay, light brown							
		No Refusal / Bottom of Hole							

STANTEC/FMSM_LEGACY 175618806_KIF.GPJ FMSM-GRAPHIC LOG.GDT 7/6/18

SUBSURFACE LOG

Project Number	175618806	Location	N 576,162.9, E 2,410,996.1 (NAD 83)
Project Name	KIF Soil Gas & Pore Water Wells	Boring No.	**VB-03a** Total Depth 33.0 ft
County	Roane County, TN	Surface Elevation	758.8 ft
Project Type	Well Installations	Date Started	6/12/18 Completed 6/12/18
Supervisor	Patrick Hoefle Driller Stantec	Depth to Water	20.0 ft Date/Time 6/12/18
Logged By	Patrick Hoefle	Depth to Water	N/A Date/Time N/A

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
758.8	0.0	Top of Hole							
		Auger through cover/fill, no sample							Well installed to 25.0 ft adjacent to boring
753.8	5.0								
		Cover, mix of red clay and gray ash, dry		SS-1	5.0 - 7.0	2.0	8-9-13	--	
				SS-2	7.0 - 9.0	1.7	7-13-15	--	
				SS-3	9.0 - 11.0	1.7	5-7-10	--	
				SS-4	11.0 - 13.0	2.0	5-7-7	--	
745.4	13.4								
		Ash, gray, dry to wet		SS-5	13.0 - 15.0	2.0	5-3-3	--	
				SS-6	15.0 - 17.0	1.6	2-3-4	--	
				SS-7	17.0 - 19.0	2.0	1-1-2	--	
				SS-8	19.0 - 21.0	0.7	1-1-1	--	
				SS-9	21.0 - 23.0	0.7		--	Pushed rods at EPRI's request
				SS-10	23.0 - 25.0	1.3	WOH-WOH-WOH	--	
				SS-11	25.0 - 27.0	1.6	WOH-WOH-WOH	--	
731.3	27.5								
730.2	28.6	Coal ash, gray and brown, possibly with clay/silt		SS-12	27.0 - 29.0	2.0	WOH-WOH-WOH	--	
728.0	30.8	Ash, gray, wet		SS-13	29.0 - 31.0	2.0	WOH-WOH-WOH	--	
725.8	33.0	Silt, light brown to tan, moist		SS-14	31.0 - 33.0	2.0	WOH-WOH-WOH	--	
		No Refusal / Bottom of Hole							WOH = Weight of Hammer

STANTEC/FMSM_LEGACY 175618806_KIF.GPJ FMSM-GRAPHIC LOG.GDT 7/6/18

7/6/18

SUBSURFACE LOG

Project Number	175618806	Location	N 576,162.9, E 2,410,996.1 (NAD 83)
Project Name	KIF Soil Gas & Pore Water Wells	Boring No.	**VB-03b** Total Depth 26.5 ft
County	Roane County, TN	Surface Elevation	758.8 ft
Project Type	Well Installations	Date Started	6/12/18 Completed 6/12/18
Supervisor	Patrick Hoefle Driller Stantec	Depth to Water	N/A Date/Time N/A
Logged By	Patrick Hoefle	Depth to Water	N/A Date/Time N/A

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
758.8	0.0	Top of Hole							
		Auger through cover/fill, no sample							Well installed to 25.0 ft
753.8	5.0								
		Cover, mix of red clay and gray ash, dry							
745.4	13.4								
		Ash, gray, dry to wet							
				OS-1	17.0 - 19.5	2.5		--	
				OS-2	20.0 - 22.5	0.0		--	
				OS-3	24.0 - 26.5	1.0		--	
732.3	26.5								
		No Refusal / Bottom of Hole							