ftn Associates Ltd.
water resources / environmental consultants

ENTERGY WHITE BLUFF PLANT
LANDFILL CELLS 1 – 4

DEMONSTRATION OF COMPLIANCE WITH EPA CCR RULE SITING CRITERIA §257.64, UNSTABLE AREAS

PREPARED IN COMPLIANCE WITH THE EPA FINAL RULE FOR THE DISPOSAL OF COAL COMBUSTION RESIDUALS TITLE 40 CODE OF FEDERAL REGULATIONS PART 257

OCTOBER 17, 2018

ENTERGY WHITE BLUFF PLANT
LANDFILL CELLS 1 – 4

DEMONSTRATION OF COMPLIANCE WITH EPA CCR RULE SITING CRITERIA §257.64, UNSTABLE AREAS

Prepared for

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Prepared by

FTN Associates, Ltd.
3 Innwood Circle, Suite 220
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FTN No. R07920-1873-001

October 17, 2018

PROFESSIONAL ENGINEER'S CERTIFICATION

With this certification, I certify that I, as a Professional Engineer in the State of Arkansas, am a qualified professional engineer as defined in §257.53 of Title 40 Code of Federal Regulations (40 CFR) Part 257, that this report has been prepared under my direction in accordance with generally accepted good engineering practices, that the findings are accurate to the best of my knowledge, and that the CCR unit that is subject to this certification meets the location restriction requirements under §257.64 of 40 CFR Part 257.

Dana L. Derrington, Arkansas PE #16372

10/17/2018
Date

TABLE OF CONTENTS

LIST OF APPENDICES

1.0 INTRODUCTION

Entergy Arkansas, Inc. (Entergy), operates the White Bluff plant located approximately 2.5 miles southeast of Redfield, Arkansas. The plant utilizes four landfill disposal cells, Cells 1 through 4, hereafter also referred to as the landfill, for the disposal of coal combustion residuals (CCRs) generated from the combustion of coal at the plant. Pursuant to §257.64 of Title 40 Code of Federal Regulations (40 CFR) Part 257, existing CCR landfills must not be located in an unstable area. An unstable area is defined by §257.53 as a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity, including structural components of some or all of the CCR unit that are responsible for preventing releases from such unit. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and karst terrains. This report presents the findings of an evaluation of Cells 1 through 4 in support of the location restriction requirements of §257.64.

2.0 SITE DESCRIPTION

Per the CCR rule, an existing CCR unit is defined as a unit that "receives CCR both before and after October 19, 2015 or for which construction commenced prior to October 14, 2015." Cells 1 through 3 received CCR before and after October 19, 2015, and no lateral expansions occurred after October 19, 2015. Construction of Cell 4 commenced prior to October 1, 2015. Thus, the Cells 1 through 4 are an existing landfill as defined by the CCR rule.

The combined area of Cells 1 through 4 is approximately 31 acres with a maximum elevation of 408 ft North American Vertical Datum of 1988 (NAVD88) as of the date of the last survey, which was completed in November 2017. Natural topography surrounding the landfill is gently to steeply sloping terrain, with ground surface elevations ranging from approximately 390 to 300 ft NAVD88, as shown on Figures 1 and 2 (Appendix A).

3.0 UNSTABLE AREA EVALUATION

Pursuant to §257.64(b), the owner or operator must consider all of the following factors, at a minimum, when determining whether an area is unstable:

1. Onsite or local soil conditions that may result in significant differential settling;
2. Onsite or local geologic or geomorphologic features; and
3. Onsite or local human-made features or events (both surface and subsurface).

FTN Associates, Ltd. (FTN) performed a review of site-specific boring logs, geotechnical data, US Geological Survey (USGS) publications, and a settlement analysis prepared by FTN (FTN 2018). Findings from this review are discussed below within the context of the factors listed in §257.64(b).

3.1 Review of Onsite or Local Soil Conditions

Several subsurface investigations have been performed in the vicinity of the landfill. Available soil boring logs and geotechnical data (Appendix B) show that onsite soils are comprised of low- to high-plasticity clays, low- to high plasticity silts, and clayey to silty fine-grained sands. A review of the subsurface data included in Appendix B shows that no organic soils, which are prone to settlement due to their high compressibility, were encountered in any of the borings. There were also no apparent lateral changes in the underlying lithology that would indicate a notable change in the compressibility of foundation soils, as can be seen from the soil boring logs. These factors, coupled with a review of the landfill settlement analysis (FTN 2018), indicate that significant differential settling is unlikely.

3.2 Review of Onsite or Local Geologic or Geomorphologic Features

Surficial deposits in the vicinity of the landfill are generally comprised of Tertiary-age deposits belonging to the Jackson Group, as shown by the geological map included as Figure 3. The Jackson Group is reportedly up to 300 ft thick in Arkansas and is classified as a regional confining unit comprised mostly of unconsolidated clays (Kresse et al. 2014; Petersen, Broom,

and Bush 1985). A review of the area topography (Figures 1 and 2) and the geological map show no evidence of karst features or areas susceptible to mass movement (i.e., landslides) in the vicinity of the landfill.

3.3 Review of Onsite or Local Human-Made Features or Events (Both Surface and Subsurface)

The landfill is situated within an erosional ravine, the former axis of which slopes toward the east-southeast. A remnant of the former stream that carved the ravine still remains and carries stormwater that collects within the limits of the ravine to the plant's surge pond located to the southwest of the landfill. The surge pond is regulated by the plant's Arkansas Department of Environmental Quality (ADEQ) National Pollutant Discharge Elimination System (NPDES) permit. Due to the sloping terrain east of Cells 1 through 4, surface water runoff can cause rill erosion in areas with poorly established vegetation. However, these areas are repaired as needed by Entergy and do not affect the stability of the landfill.

Cells 1 through 4 were constructed on top of prior CCR disposal. The CCR placed in and under Cells 1 through 4 is almost exclusively comprised of ash from the combustion of low-sulfur subbituminous coal, which is sourced primarily from the Powder River Basin in Wyoming and Montana. Ash produced from the combustion of subbituminous coal or lignite is designated as Class C fly ash, which contains lime and other chemical compounds that give it self-cementing properties (Mine Safety and Health Administration [MSHA] 2009, Electric Power Research Institute, Inc. [EPRI] 1995). This, coupled with a review of the settlement evaluation performed by FTN (2018), indicates that the foundation of Cells 1 through 4 is stable with respect to settlement.

As described in Section 3.2, the underlying lithology belongs to the Jackson Group and is classified as a regional confining unit. Groundwater in the Jackson Group is limited to thin, interbedded sandy units. Due to the high clay content of the formation, groundwater yield from the sandy units is insufficient in both quantity and quality for domestic, public, or industrial use (Kresse et al. 2014). As such, land subsidence due to groundwater removal is considered unlikely.

4.0 CONCLUSIONS

Based on a review of the available documentation in this report, Cells 1 through 4 at the Entergy White Bluff plant are not located in an unstable area and therefore meet the location restriction requirements of §257.64.

5.0 REFERENCES

D'Appolonia Engineering. 2009. *Engineer and Design Manual, Coal Refuse Disposal Facilities, 2nd ed.* Pittsburgh, PA: US Department of Labor, Mine Safety and Health Administration. Revised August 2010. 869 pp.

EPRI [Electric Power Research Institute, Inc.]. 1995. See GAI Consultants, Inc. 1995.

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FTN [FTN Associates, Ltd.]. 2018. *Entergy White Bluff Plant, Foundation Settlement Evaluation, Landfill Cells 1 – 4*. Little Rock, AR: FTN Associates, Ltd.

Kresse, T.M., P.D. Hays, K.R. Merriman, J.A. Gillip, D.T. Fugitt, J.L. Spellman, A.M. Nottmeier, D.A. Westerman, J.M. Blackstock, and J.L. Battreal. 2014. *Aquifers of Arkansas—Protection, Management, and Hydrologic and Geochemical Characteristics of Groundwater Resources in Arkansas* [USGS Scientific Investigations Report 2014-5149]. Prepared in cooperation with the Arkansas Natural Resources Commission. Reston, VA: US Geological Survey. 334 pp. doi: http://dx.doi.org/10.3133/sir20145149.

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Petersen, J.C., M.E. Broom, and W.V. Bush. 1985. *Geohydrologic Units of the Gulf Coastal Plain in Arkansas* [USGS Water-Resources Investigations Report 85-4116]. Prepared in cooperation with the Arkansas Department of Pollution Control and Ecology and the Arkansas Geological Survey. Denver, CO: US Geological Survey, Western Distribution Branch, Open-File Services Collection. 24 pp.

Stoeser, D.B., G.N. Green, L.C. Morath, W.D. Heran, A.B. Wilson, D.W. Moore, and B.S. Van Gosen. 2005. "The State of Arkansas." In *Preliminary Integrated Geologic Map Databases for the United States Central states: Montana, Wyoming, Colorado, New Mexico, Kansas, Oklahoma, Texas, Missouri, Arkansas, and Louisiana* [USGS Open-File Report 2005-1351]. Denver, CO: US Geological Survey. Available online at http://pubs.usgs.gov/of/2005/1351/.

USGS [US Geological Survey]. 2017. "USGS US Topo 7.5-Minute Map for Redfield, AR 2017." Rolla, MO and Denver, CO: National Geospatial Technical Operations Center, US Geological Survey. Available online at https://www.sciencebase.gov/catalog/item/59647cabe4b0d1f9f059f935.

APPENDIX A

Figures

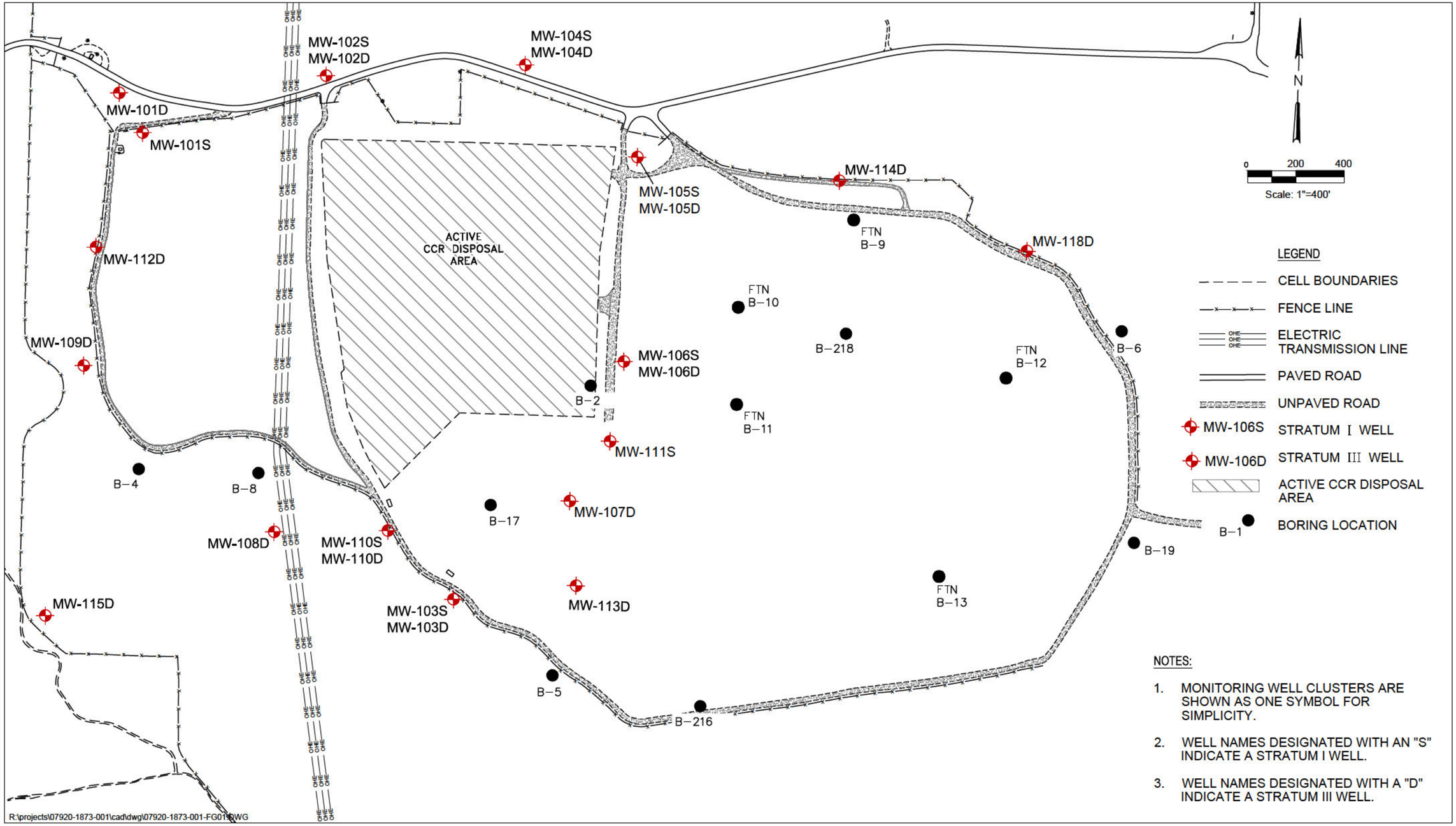


Figure 1. Site map, Entergy White Bluff landfill.

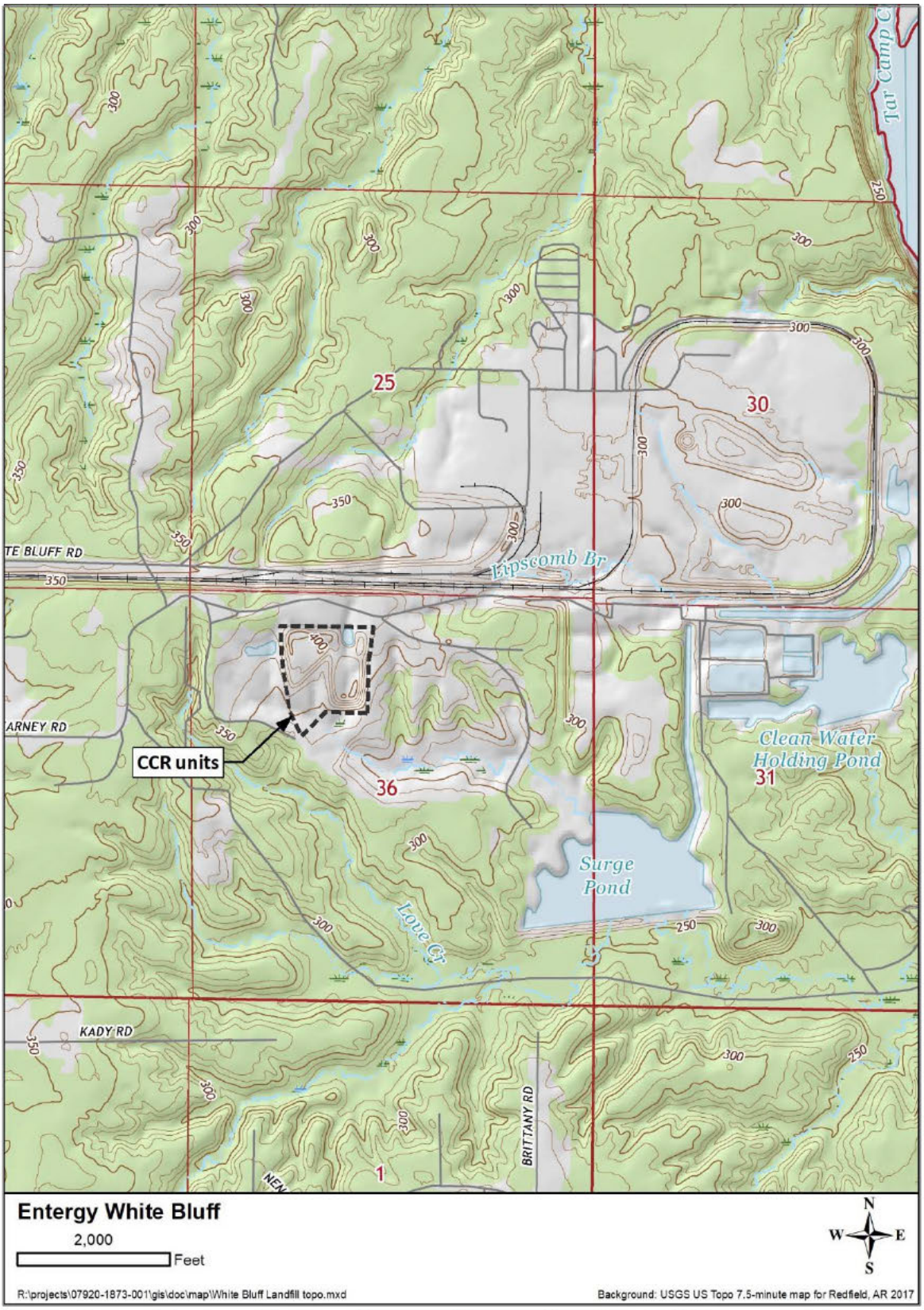


Figure 2. Topographic map of surrounding area based on USGS topographic quadrangle Redfield, AR (2017).

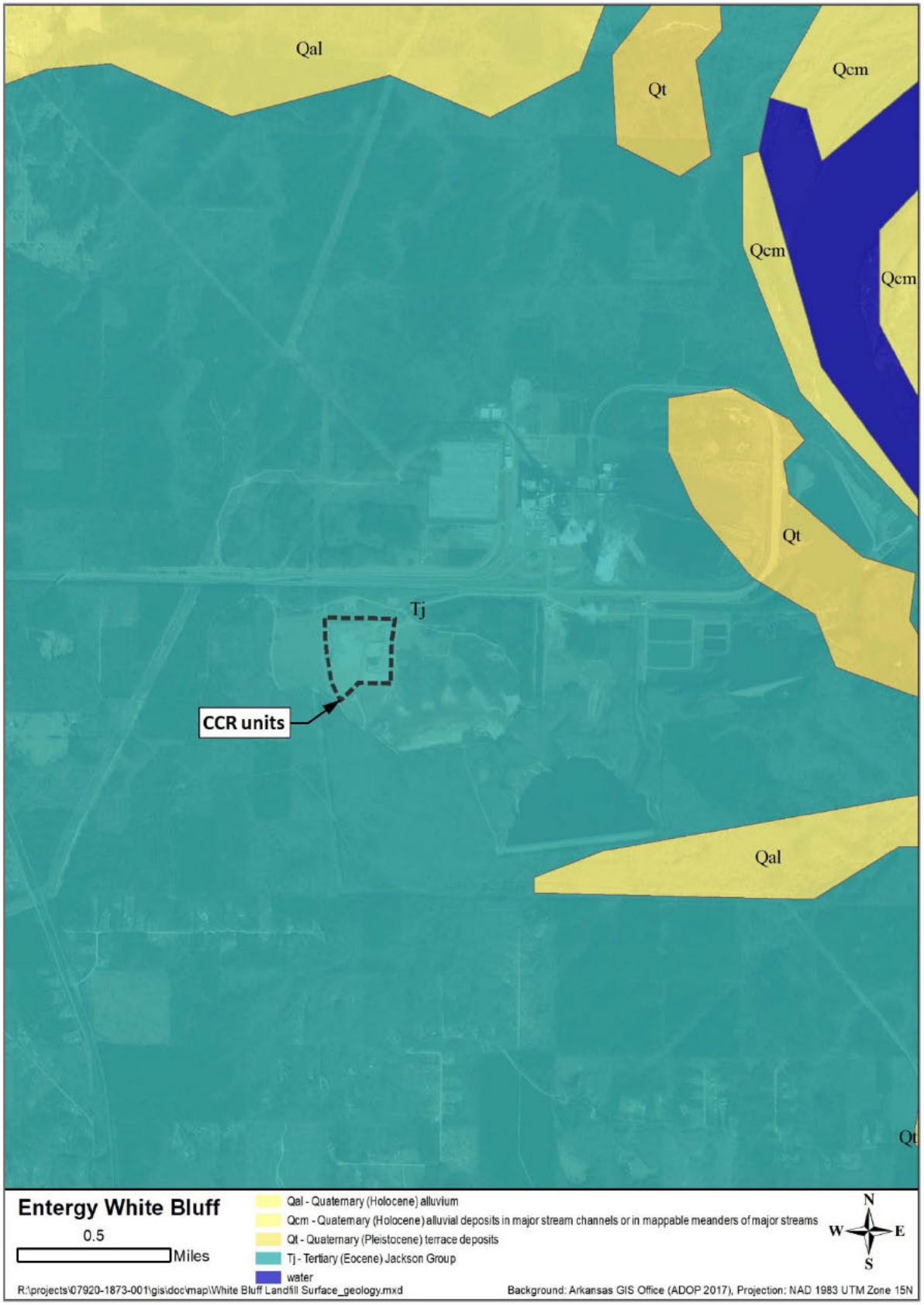


Figure 3. Surface geology of surrounding area based on Stoeser et al. 2005.

APPENDIX B

Soil Boring Logs and Geotechnical Data

Well Construction Diagrams and Soil Boring Logs

LOG OF BORING NO. 217

ASH POND
AP&L WHITE BLUFF PLANT
REDFIELD, ARKANSAS

TYPE: Wash

LOCATION: See Plate 1

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT — WATER CONTENT, % — LIQUID LIMIT (10 20 30 40 50 60 70)	-NO.200 %
			SURF. EL: 279.2				
			Soft brown sandy silt with roots				
5			Stiff light brown fine sandy clay with roots -light gray with organic matter and tan stains below 4 ft		101	$K=2.38\times10^{-6}$ cm/sec	
10			-fine gravel and coarse sand with clay from 8 to 11 ft -gray silty clay layer at 14 ft				
15			Gray clayey fine sand				
20							
25			Very stiff greenish gray silty clay with organic matter -silt partings and pockets to 38 ft				
30							
35			-fine sand pockets below 38 ft				
40							
45			Very stiff gray fine sandy clay with organic matter				
50							

COMPLETION DEPTH: 50 ft
DATE: 6-4-74

DEPTH TO WATER IN BORING: Ground level
DATE: 6-4-74

PLATE

LOG OF BORING NO. 216

ASH POND

AP&L WHITE BLUFF PLANT

REDFIELD, ARKANSAS

TYPE: Wash

LOCATION: See Plate 1

SURF. EL: 324.3

DEPTH, FT	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT — WATER CONTENT, % — LIQUID LIMIT (10 20 30 40 50 60 70)	- NO. 200 %
	Loose tan and light gray sandy silt				
5	Stiff gray and tan fine sandy clay	11			86
10	Stiff tan silty clay with fine sand pockets -ferrous partings -yellow seams below 10 ft -very stiff and blocky below 10 ft				
20	Very stiff tan and brown clay with silt partings -few ferrous partings				
30					
35	Very stiff grayish green clay -become sandy with fine sand pocket and organic specks below 37 ft				
40					
45					
50					

COMPLETION DEPTH: 50 ft DATE: 7/24/74

DEPTH TO WATER IN BORING: 17 ft DATE: 8/27/74

GRUBBS CONSULTING ENGINEERS

PLATE 3

LOG OF BORING NO. 218

ASH POND
AP&L WHITE BLUFF PLANT
REDFIELD, ARKANSAS

TYPE: Wash

LOCATION: See Plate 1

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT — WATER CONTENT, % — LIQUID LIMIT (10 20 30 40 50 60 70)	- NO. 200 %
			SURF. EL: 339.0				
			Stiff light brown sandy silt with organic matter				
5			Very stiff brown and light gray fine sandy clay -stiff with organic matter below 6 ft				
10			Medium dense light brown clayey fine sand with organic matter -tan stains from 11 to 22 ft				
15						K=5.92x10^{-6} cm/sec	36
20			-brown silty clay partings from 19 to 22 ft -silt layer from 22 to 23 ft				
25			Very stiff dark gray silty clay -organic matter below 28 ft				
30							
35			-fine sand and silt pockets below 38 ft				
40							
45							
50							

COMPLETION DEPTH: 50 ft
DATE: 6-4-74

DEPTH TO WATER IN BORING: Caved at 10.5 ft
DATE: 7-5-74

PLATE

LOG OF BORING NO. 215

ASH POND
AP&L WHITE BLUFF PLANT
REDFIELD, ARKANSAS

TYPE: Wash

LOCATION: See Plate 1

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT
			SURF. EL: 308.9		
			Loose tan fine sandy silt with organic material	7	
			-tan & gray sandy clay 3-5 ft	16	
5			Very stiff red and tan silty clay -blocky and slickened to 28 ft -tan below 8.5 ft		
10					
15			-redish tan partings below 13.5 ft		
20			-yellow silt pockets below 18.5 ft -yellow partings below 23.5 ft		
25					
30			-silty below 28.5 ft		
35			-occasional tan silt pockets below 33.5 ft		
40			Very stiff gray fine sandy clay		

Note Scale Change

COHESION, TON/SQ FT
0.2 0.4 0.6 0.8 1.0 1.2 1.4

PLASTIC LIMIT — WATER CONTENT, % — LIQUID LIMIT
10 20 30 40 50 60 70

-NO. 200 %

COMPLETION DEPTH: 40 ft
DATE: 8-16-74

DEPTH TO WATER IN BORING: 20 ft

DATE: 8-17-74

GRUBBS CONSULTING ENGINEERS

PLATE 2

LOG OF BORING NO. 1

ARKANSAS POWER AND LIGHT COMPANY
WHITE BLUFF

TYPE: Auger to 2 ft - Wash

LOCATION: See Plate 1

SURF. EL: 375 ±

NOTE SCALE CHANGE

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT — WATER CONTENT, % — LIQUID LIMIT (10 20 30 40 50 60 70)	% - NO. 200
			Loose gray fine sandy silt with organic matter to 1 ft	ML			
5			Stiff tan with light gray and reddish tan fine sandy clay with light gray clay pockets	CL	107	NON-PLASTIC	21
			Medium dense tan with reddish tan and light gray silty sand	SM		K = 1.7 x 10^{-5} cm/sec at 4.5 to 5 ft	
10			Laminated very stiff light gray clay and silty fine sand with tan ferrous stains	CL/SM	88	K = 6.2 x 10^{-7} cm/sec at 9.5 to 10 ft	56
15			Very stiff dark gray silty clay with light gray silt partings and some lignitic seams	CL			
20			-with light gray silty fine sand partings below 15 ft				
25			-with more silty fine sand below 20 ft -predominantly silty fine sand from 22 to 24 ft				
30							

COMPLETION DEPTH: 24.5 ft
DATE: 6/4/79

DEPTH TO WATER IN BORING:

DATE:

LOG OF BORING NO. 2

ARKANSAS POWER AND LIGHT COMPANY
WHITE BLUFF

TYPE: Auger to 2 ft - Wash LOCATION: See Plate 1

SURF. EL: 345 ±

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT — WATER CONTENT, % — LIQUID LIMIT (10 20 30 40 50 60 70)	% - NO. 200
			Loose light gray and tan fine sandy silt with organic matter to 0.5 ft		ML		
5			Very stiff light gray fine sandy clay with tan ferrous stains		CL		
10			Very stiff light brown and light gray silty clay with light gray silt partings and yellowish tan ferrous stains	88	CL	$k = 1.3 \times 10^{-7}$ cm/sec at 9.5 to 10 ft	77
15			Medium dense to dense brown silty fine sand with lignite seams and pockets		SM		
20			Dense gray silty fine sand with tan ferrous stains		SM		
25			Laminated very stiff dark gray silty clay, light gray silt and light gray silty fine sand		CL / ML / SM		
30							
35							

NOTE SCALE CHANGE

35 ft
6/4/79

LOG OF BORING NO. 3

ARKANSAS POWER AND LIGHT COMPANY
WHITE BLUFF

TYPE: Auger to 2 ft - Wash LOCATION: See Plate 1

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TONS/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT — WATER CONTENT, % — LIQUID LIMIT (10 20 30 40 50 60 70)	% NO. 200
			SURF. EL: 377 ±				
			Soft tan sandy clay with some organic matter to 0.5 ft		CL		
5			Stiff light gray and reddish tan silty clay with some fine sand		CL		
10			Laminated medium dense light gray fine sandy silt and gray silty clay	85	ML CL	$K = 8.8 \times 10^{-9}$ cm/sec at 9.5 to 10 ft	74
15			Very stiff dark gray silty clay with light gray silt partings -with light gray fine sand partings and seams and a trace of lignite below 15 ft		CL		
20							
25							
30							

NOTE SCALE CHANGE

30 ft
5/5/79

LOG OF BORING NO. 4

ARKANSAS POWER AND LIGHT COMPANY
WHITE BLUFF

TYPE: Auger to 2 ft - Wash

LOCATION: See Plate 1

SURF. EL: 357 ±

NOTE SCALE CHANGE

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4)	PLASTIC LIMIT / WATER CONTENT, % / LIQUID LIMIT (10 20 30 40 50 60 70)	NO. 200, %
			Loose tan fine sandy silt with organic matter and gravel		ML SM			
			Firm tan silty clay					
5			Laminated stiff light gray silty clay and silty fine sand		99 CL SM	K = 6.2 x 10^{-8} cm/sec at 4.5 to 5 ft		66
10								
15			Very stiff dark gray silty clay with light gray silt partings		CL			
20			Dense light brown and tan silty fine sand with organic matter -occasional brown clay partings and seams below 20 ft		SM 88	NON-PLASTIC		46
25								
30			Laminated very stiff gray silty clay and light gray fine sandy silt with some lignitic seams		CL ML			
35								

35 ft

LOG OF BORING NO. 5

ARKANSAS POWER AND LIGHT COMPANY
WHITE BLUFF

TYPE: Auger to 2 ft - Wash LOCATION: See Place 1

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL (SURF. EL: 333 ±)	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT — WATER CONTENT, % — LIQUID LIMIT (10 20 30 40 50 60 70)	% NO. 200
			Loose to medium dense tan fine sandy silt with some organic matter		ML		
5			Very stiff gray and tan silty clay with some fine sand and a trace of embedded gravel		CL		
10			Very stiff light brown and light gray silty clay with light gray and yellowish tan silt partings and seams -with ferrous seams below 10 ft -dark brown with dark gray silty clay with light gray silt partings	82	CL	$K = 5.4 \times 10^{-7}$ cm/sec at 9.5 to 10 ft	98
15							
20							
25							
30			Very stiff dark gray silty clay with light gray silt partings		CL		
35				84		$K = 4.1 \times 10^{-9}$ cm/sec. at 34.5 to 35 ft	96
40							

NOTE SCALE CHANGE

40 ft

LOG OF BORING NO. 6

ARKANSAS POWER AND LIGHT COMPANY
WHITE BLUFF

TYPE: Auger to 2 ft - Wash LOCATION: See Plate 1

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 1.0 1.2 1.4) / PLASTIC LIMIT — WATER CONTENT, % — LIQUID LIMIT (10 20 30 40 50 60 70)	- NO. 200, %
			SURF. EL: 316 ±				
			Loose to medium dense fine sandy silt with some organic matter				
			Very stiff light gray and tan silty clay with some fine sand and a trace of fine gravel		105		57
						K = 6.1 x 10^{-8} cm/sec at 4.5 to 5 ft	
5							
			Very stiff light brown silty clay with light gray, yellowish tan and tan fine sandy silt partings and seams				
10							
15							
20							
25							
30							
35			Laminated very stiff dark gray silty clay and gray silty fine sand				
40							

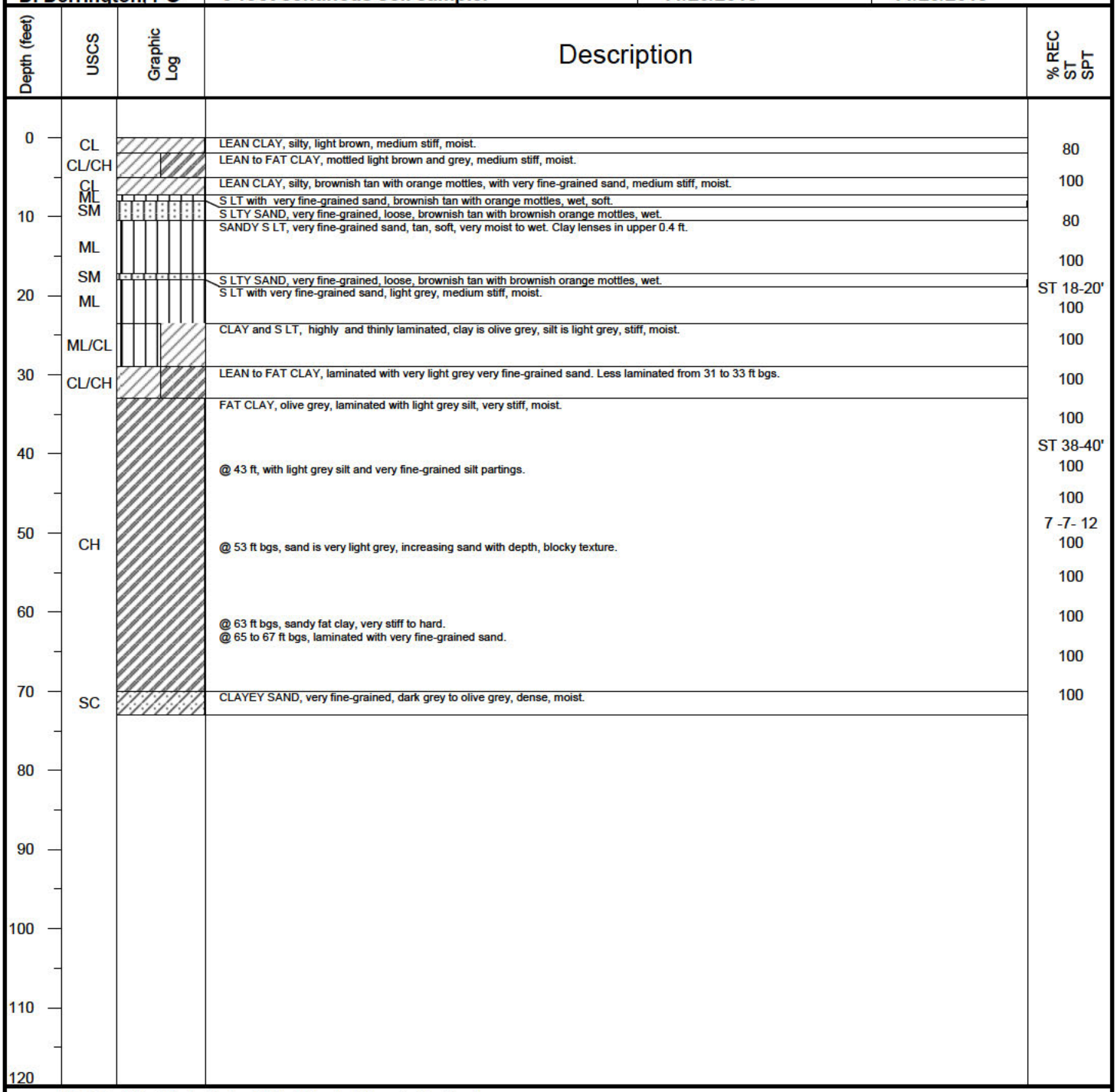
NOTE SCALE CHANGE

DEPTH OF BORING: 40 ft
DATE: 6/5/79

DEPTH TO WATER IN BORE HOLE:

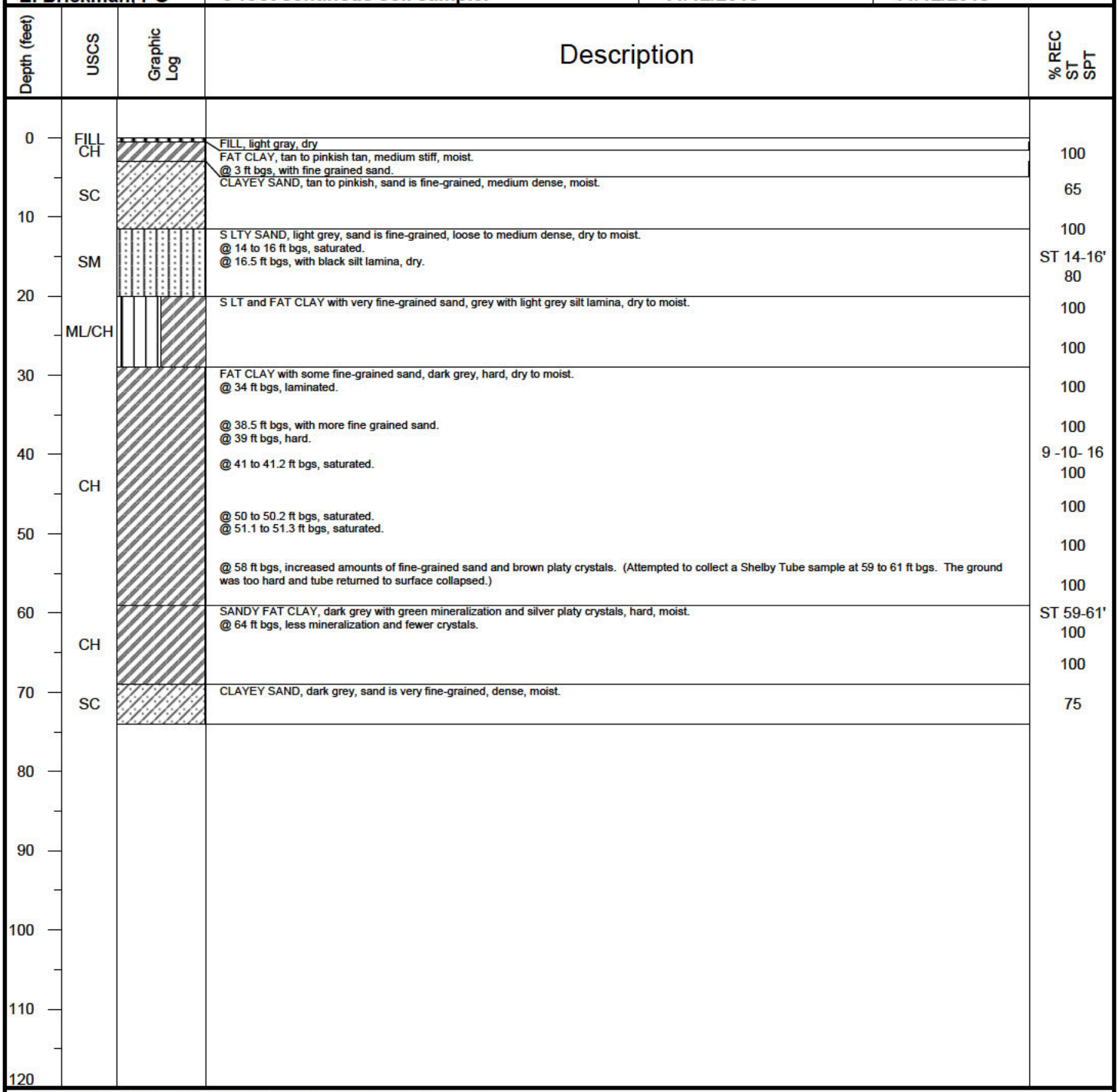
DATE:

FTN Associates Ltd. water resources / environmental consultants	PROJECT: **Entergy White Bluff Class 3N Landfill - GHI**	BORING ID: **FTN-B9**	
	LOCATION: **Jefferson Co., Arkansas**	WELL ID: **n/a**	
	DRILLING CONTRACTOR: **Tri-State Testing Services**	NORTH: (Site Coordinates) **-761.80**	EAST: (Site Coordinates) **-871.85**
	DRILLING EQUIPMENT: **CME 750x (SN: 299708)**	GROUND ELEVATION: (ft NGVD) **345.3**	TOC ELEVATION: (ft NGVD) **n/a**
FTN Project # R06040-0143-001	DRILLING METHOD: **8.25" Hollow Stem Auger (HSA)**	TOTAL DEPTH of BORING: **73 ft bgs**	DEPTH TO WATER from TOC: **n/a**
LOGGED BY: **D. Derrington, PG**	SAMPLING METHOD: **5-foot continous soil sampler**	DATE STARTED: **11/20/2013**	DATE COMPLETED: **11/20/2013**



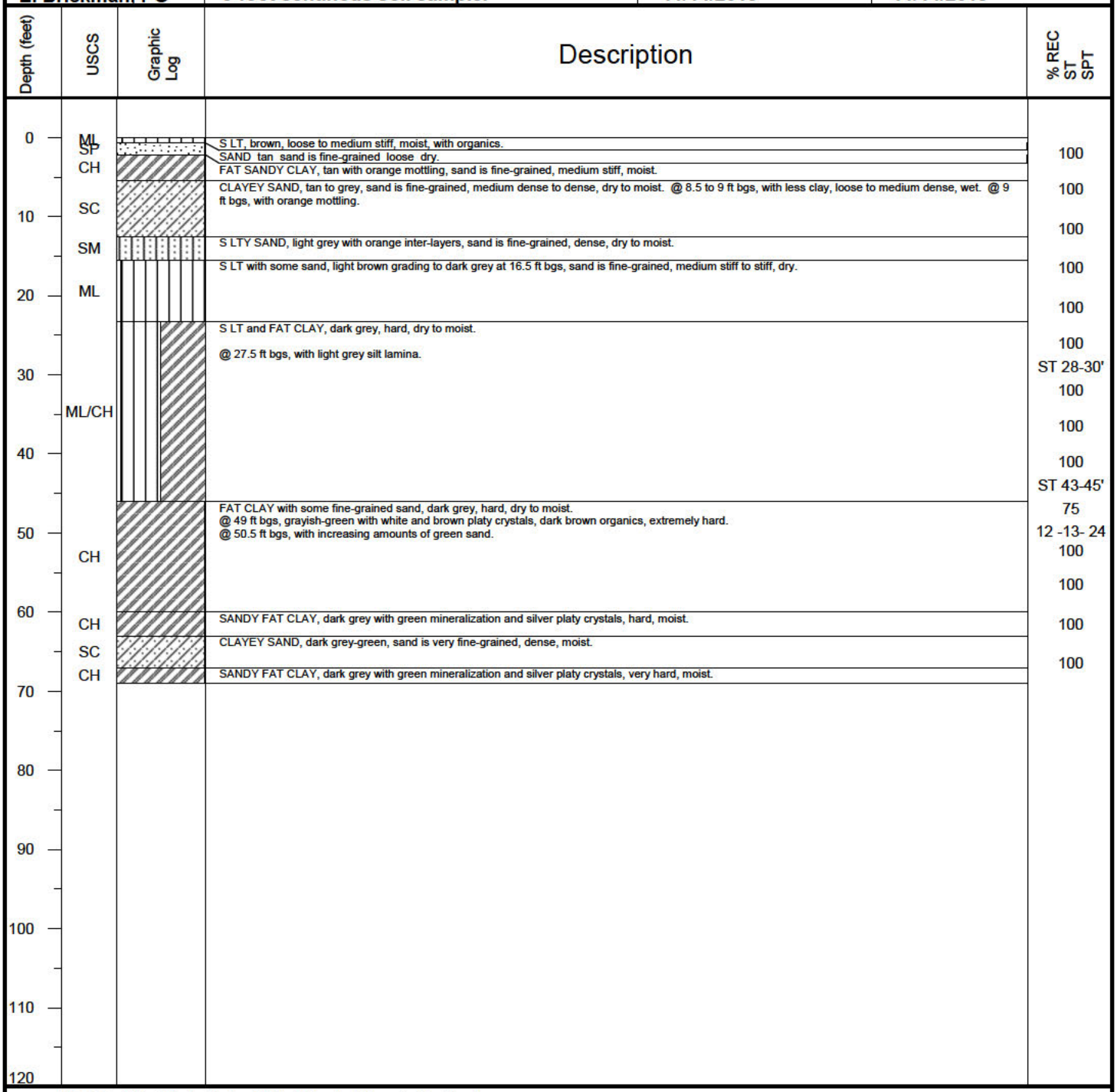
NOTES: ST - She by Tube. SPT - Standard Penetration Test
Horizontal and vertical data based on survey conducted by Harmon Surveying, February 2014 (referenced to site coordinate system)
Boring backfilled with bentonite pellets.

ftn Associates Ltd. water resources / environmental consultants	PROJECT: **Entergy White Bluff Class 3N Landfill - GHI**	BORING ID: **FTN-B10**	
	LOCATION: **Jefferson Co., Arkansas**	WELL ID: **n/a**	
	DRILLING CONTRACTOR: **Tri-State Testing Services**	NORTH: (Site Coordinates) **-1137.59**	EAST: (Site Coordinates) **-1341.03**
	DRILLING EQUIPMENT: **CME 750x (SN: 299708)**	GROUND ELEVATION: (ft NGVD) **335.4**	TOC ELEVATION: (ft NGVD) **n/a**
FTN Project # R06040-0143-001	DRILLING METHOD: **8.25" Hollow Stem Auger (HSA)**	TOTAL DEPTH of BORING: **74 ft bgs**	DEPTH TO WATER from TOC: **n/a**
LOGGED BY: **E. Brickman, PG**	SAMPLING METHOD: **5-foot continous soil sampler**	DATE STARTED: **11/12/2013**	DATE COMPLETED: **11/12/2013**



NOTES: ST - She by Tube. SPT - Standard Penetration Test
Horizontal and vertical data based on survey conducted by Harmon Surveying, February 2014 (referenced to site coordinate system)
Boring backfilled with bentonite pellets.

ftn Associates Ltd. water resources / environmental consultants	PROJECT: **Entergy White Bluff Class 3N Landfill - GHI**	BORING ID: **FTN-B11**	
	LOCATION: **Jefferson Co., Arkansas**	WELL ID: **n/a**	
	DRILLING CONTRACTOR: **Tri-State Testing Services**	NORTH: (Site Coordinates) **-1538.12**	EAST: (Site Coordinates) **-1329.87**
	DRILLING EQUIPMENT: **CME 750x (SN: 299708)**	GROUND ELEVATION: (ft NGVD) **330.1**	TOC ELEVATION: (ft NGVD) **n/a**
FTN Project # R06040-0143-001	DRILLING METHOD: **8.25" Hollow Stem Auger (HSA)**	TOTAL DEPTH of BORING: **69 ft bgs**	DEPTH TO WATER from TOC: **n/a**
LOGGED BY: **E. Brickman, PG**	SAMPLING METHOD: **5-foot continous soil sampler**	DATE STARTED: **11/14/2013**	DATE COMPLETED: **11/14/2013**



NOTES: ST - She by Tube. SPT - Standard Penetration Test
Horizontal and vertical data based on survey conducted by Harmon Surveying, February 2014 (referenced to site coordinate system)
Boring backfilled with bentonite pellets.

	PROJECT: **Entergy White Bluff Class 3N Landfill - GHI**	BORING ID: **FTN-B12**	
	LOCATION: **Jefferson Co., Arkansas**	WELL ID: **n/a**	
	DRILLING CONTRACTOR: **Tri-State Testing Services**	NORTH: (Site Coordinates) **-1397.60**	EAST: (Site Coordinates) **-220.72**
	DRILLING EQUIPMENT: **CME 750x (SN: 299708)**	GROUND ELEVATION: (ft NGVD) **298.7**	TOC ELEVATION: (ft NGVD) **n/a**
FTN Project # R06040-0143-001	DRILLING METHOD: **8.25" Hollow Stem Auger (HSA)**	TOTAL DEPTH of BORING: **43 ft bgs**	DEPTH TO WATER from TOC: **n/a**
LOGGED BY: **E. Brickman, PG**	SAMPLING METHOD: **5-foot continous soil sampler**	DATE STARTED: **11/11/2013**	DATE COMPLETED: **11/11/2013**

Depth (feet)	USCS	Graphic Log	Description	% REC ST SPT
0	FILL		FILL, light gray, dry	
	OL		LEAN CLAY with organics black to dark brown stiff to very stiff dry.	100
			FAT CLAY, orange to dark red, blocky texture, medium stiff, moist.	
			@ 3 ft bgs, gray with 10% orange to yellow mottling.	100
			@ 6 to 6.2 ft bgs, with iron oxidation.	
			@ 7.5 to 8 ft bgs, with orange iron oxidation, minor amount of fine sand, loose.	ST 8-10'
10	CH		@ 9 to 13 ft bgs, light brown grading to dark brown with yellow and orange oxidation seams.	
			@ 13 to 18 ft bgs, dark brown to black to green with some green and white crystals, stiff, moist, with minor amounts of sand.	100
			@ 18 to 19.5 ft bgs, abundant green and white crystals.	
			@ 19 ft bgs, black, with organics.	100
20				5 -8- 8
				100
			FAT CLAYEY SAND, dark grey with green tint, sand is very fine-grained, medium dense, moist to wet.	100
			@ 30.5 ft bgs, black organics.	
30	SC		@ 32 ft bgs, wet.	100
			@ 33 ft bgs, saturated.	
				70
40	CH		FAT CLAY, dark grey laminated with light grey, stiff to hard, dry.	85
50				
60				
70				
80				
90				
100				
110				
120				

NOTES: ST - She by Tube. SPT - Standard Penetration Test
Horizontal and vertical data based on survey conducted by Harmon Surveying, February 2014 (referenced to site coordinate system)
Boring backfilled with bentonite pellets.

ftn Associates Ltd. water resources / environmental consultants	PROJECT: **Entergy White Bluff Class 3N Landfill - GHI**	BORING ID: **FTN-B13**	
	LOCATION: **Jefferson Co., Arkansas**	WELL ID: **n/a**	
	DRILLING CONTRACTOR: **Tri-State Testing Services**	NORTH: (Site Coordinates) **-2228.01**	EAST: (Site Coordinates) **-473.70**
	DRILLING EQUIPMENT: **CME 750x (SN: 299708)**	GROUND ELEVATION: (ft NGVD) **283.7**	TOC ELEVATION: (ft NGVD) **n/a**
FTN Project # R06040-0143-001	DRILLING METHOD: **8.25" Hollow Stem Auger (HSA)**	TOTAL DEPTH of BORING: **29 ft bgs**	DEPTH TO WATER from TOC: **n/a**
LOGGED BY: **E. Brickman, PG**	SAMPLING METHOD: **5-foot continous soil sampler**	DATE STARTED: **11/13/2013**	DATE COMPLETED: **11/13/2013**

Depth (feet)	USCS	Graphic Log	Description	% REC ST SPT
0	FILL		FILL, tan with black particles, stiff to hard, dry to moist.	80
10	CH		FAT CLAY, grey with 10% orange mottles, stiff, moist. @ 3.7 ft bgs, with fine-grained sand. @ 6 ft bgs, black grading to dark grey. @ 8.7 ft bgs, medium stiff, with organics and roots. @ 9 ft bgs, grey with orange mottles, with fine-grained sand, wet to saturated, with abundant roots. @ 13 ft bgs, medium stiff to stiff, moist to wet, with fine to course angular and rounded river gravel, less amounts of sand. @ 17.5 ft bgs, grey with orange and red mottling/oxidation, with fine-grained sand, stiff to hard, moist.	50 100 ST 11-13' 3 -6- 5 100
20	SC		CLAYEY SAND, dark grey, sand is fine-grained, medium dense, wet to saturated.	100
30	CH		FAT CLAY, dark grey, laminated, stiff to hard, moist.	ST 24-26' 70
40				
50				
60				
70				
80				
90				
100				
110				
120				

NOTES: ST - She by Tube. SPT - Standard Penetration Test
Horizontal and vertical data based on survey conducted by Harmon Surveying, February 2014 (referenced to site coordinate system)
Boring backfilled with bentonite pellets.

	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-101S**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-101S**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1949570.7 ft**	EASTING: **1265633.0 ft**
	DRILLING EQUIPMENT: **CME 750x**	GROUND SURFACE ELEV.: **383.6 ft**	TOC ELEVATION: **385.76 ft**
	DRILLING METHOD: **8.25" Hollow Stem Auger**	TOTAL DEPTH: **49.1 ft below TOC**	DEPTH TO WATER: (10/3/2015) **36.82 ft below TOC**
LOGGED BY: **RSH**	SAMPLING METHOD: **Auger Cuttings**	DATE STARTED: **7/28/2015**	DATE COMPLETED: **7/28/2015**

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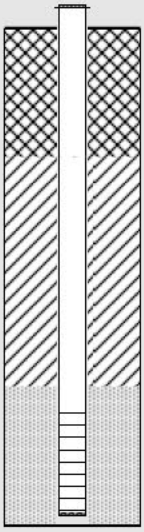
Depth (feet)	% REC	USCS	Description
0	100	CL	TOP SOIL
	100	CH	SANDY FAT CLAY, reddish brown. Increased sand content with depth.
		SM	SILTY SAND, tan.
10	100		SILT and CLAY, with sand, olive grey.
	100	ML/CL	
20	100		@ 20 ft bgs, carbonaceous/lignitic material.
	100		CLAYEY SANDY SILT, dark brown, moist.
30	100	ML	
	100		
	100	CL	LEAN SILTY CLAY, dark brown, moist.
40	100		SILTY SAND, very fine-grained, very moist to moist.
	100	SM	
50	100		
60			
70			
80			
90			
100			
110			
120			

Well Construction



Above ground completion including 2X2 ft concrete pad, four pipe bollards, and locking outer steel casing

38.7 ft of 2 in dia., Sch. 40 PVC solid riser including 2.2 ft of stickup

Cement/bentonite grout from 0 ft bgs to 12.9 ft bgs

Bentonite pellet seal from 12.9 ft bgs to 36 ft bgs

Silica size 10/20 filter pack from 36 ft bgs to 50 ft bgs

10 ft of 2 in dia., 0.010 in slot, Sch. 40 PVC screen from 36.5 to 46.5 ft bgs

0.35 ft, 2 in dia., Sch. 40 PVC end cap

50 ft BOH

NOTES: Horizontal and vertical data are based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-102S**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-102S**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1949808.0 ft**	EASTING: **1266397.3 ft**
	DRILLING EQUIPMENT: **CME 750x**	GROUND SURFACE ELEV.: **378.6 ft**	TOC ELEVATION: **381.17 ft**
	DRILLING METHOD: **8.25" Hollow Stem Auger**	TOTAL DEPTH: **52.6 ft below TOC**	DEPTH TO WATER: (10/3/2015) **32.94 ft below TOC**
LOGGED BY: **DLD/RSH**	SAMPLING METHOD: **Auger Cuttings**	DATE STARTED: **7/27/2015**	DATE COMPLETED: **7/27/2015**

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Depth (feet)	% REC	USCS	Graphic Log	Description
0		CL		TOP SOIL
		ML		S LT with very fine-grained sand, grey and yellowish orange, soft, moist.
		CH		FAT CLAY with very fine-grained sand, grey, blocky, very stiff, moist.
		SP		POORLY GRADED SAND with silt, very fine-grained, yellowish orange and grey, dense, dry to moist. @ 7 to 8 ft bgs, laminated with fat clay, sand is moist.
10		CL		LEAN CLAY, with silt laminations and very fine-grained sand, tan, stiff, moist. @ 10 ft, color changes to greenish grey.
		SM		S LTY SAND, very fine-grained, olive grey, medium dense, moist. @ 16 to 16.8, carbonaceous and fossiliferous material. @ 18 to 25 ft bgs, occasional clay laminations.
20		ML		CLAYEY SILT, olive grey to grey, highly and thinly laminated with grey silt and very-fine grained sand, medium stiff, moist. @ 27 to 28 ft, brownish grey. Occasional carbonaceous material.
30		SM		S LTY SAND, very fine-grained, olive grey, medium dense, moist. @ 28 to 30 ft bgs, greyish brown with carbonaceous material. @ 30 to 31 ft bgs, laminated with fat clay. @ 33 to 38 ft bgs, medium dense to dense, very moist to wet.
40				@ 40 to 40.5 ft bgs, saturated. @ 42 to 42.5 ft bgs, saturated.
50				@ 48 to 50 ft bgs, very moist to wet.
60				Soil descriptions are based on observations from continous soil sampling using a 5-ft split barrel sampler during the borehole advancement for FTN PZ-2 on 11-18-2013 and located 7 ft from MW-2S. Auger cuttings were used to verify that MW-2S was advanced in similar soils logged for FTN PZ-2.
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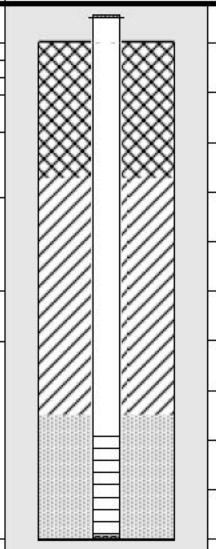
80				
90				
100				
110				
120				

Well Construction



Above ground completion including 2X2 ft concrete pad, four pipe bollards, and locking outer steel casing

42.2 ft of 2 in dia., Sch. 40 PVC solid riser, including 2.6 ft of stickup

Cement/bentonite grout from 0 ft bgs to 13.6 ft bgs

Bentonite pellet seal from 13.6 ft bgs to 37.5 ft bgs

Silica size 10/20 filter pack from 37.5 ft bgs to 50 ft bgs

10 ft of 2 in dia., 0.010 in slot, Sch. 40 PVC screen from 39.6 to 49.6 ft bgs

0.35 ft, 2 in dia., Sch. 40 PVC end cap

50 ft BOH

NOTES: Horizontal and vertical data are based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)
Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-103S**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-103S**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1947644.1 ft**	EASTING: **1266927.3 ft**
	DRILLING EQUIPMENT: **CME 750x**	GROUND SURFACE ELEV.: **336.7 ft**	TOC ELEVATION: **339.34 ft**
	DRILLING METHOD: **8.25" Hollow Stem Auger**	TOTAL DEPTH: **23.2 ft below TOC**	DEPTH TO WATER: (10/3/2015) **20.13 ft below TOC**
LOGGED BY: **DLD/RSH**	SAMPLING METHOD: **Auger Cuttings**	DATE STARTED: **7/29/2015**	DATE COMPLETED: **7/29/2015**

Depth (feet)	% REC	USCS	Graphic Log	Description
0		CH SC		TOP SOIL FAT CLAY, with very fine-grained sand, reddish to orangish brown, very stiff to hard dry to moist.
10		SM		CLAYEY SAND, very fine-grained, becoming silty with depth, light grey and orange, dense, dry. SILTY SAND, very fine-grained, light grey, medium dense to dense, very dry. @ 8 to 10 ft bgs, oxidation staining. @ 15 to 18 ft bgs, laminated with hard fat clay, color changed to light brownish tan.
20		ML/CL		SILT and LEAN CLAY, laminated, with very fine grained sand, dry to moist. Clay is platy.
30				
40				Soil descriptions are based on observations from continous soil sampling using a 5-ft split barrel sampler during the bore hole advancement for FTN PZ-3 on 11-7-2013 and located 19 ft from MW-3S. Auger cuttings were used to verify that MW-3S was advanced in similar soils logged for FTN PZ-3.
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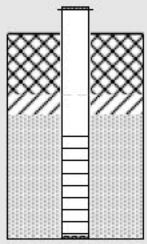


Well Construction

Above ground completion including 2X2 ft concrete pad, four pipe bollards, and locking outer steel casing

12.8 ft of 2 in dia., Sch. 40 PVC solid riser, including 2.6 ft of stickup

Cement/bentonite grout from 0 ft bgs to 6 ft bgs

Bentonite pellet seal from 6 ft bgs to 8 ft bgs

Silica size 10/20 filter pack from 8 ft bgs to 20 ft bgs

10 ft of 2 in dia., 0.010 in slot, Sch. 40 PVC screen from 10.2 to 20.2 ft bgs

0.35 ft, 2 in dia., Sch. 40 PVC end cap

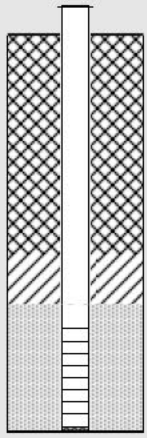
20 ft BOH

NOTES: Horizontal and vertical data are based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-104S**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-104S**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1949852.1 ft**	EASTING: **1267212.6 ft**
	DRILLING EQUIPMENT: **CME 750x**	GROUND SURFACE ELEV.: **374.2 ft**	TOC ELEVATION: **377.08 ft**
	DRILLING METHOD: **8.25" Hollow Stem Auger**	TOTAL DEPTH: **42.8 ft below TOC**	DEPTH TO WATER: (10/3/2015) **30.66 ft below TOC**
LOGGED BY: **DLD/RSH**	SAMPLING METHOD: **Auger Cuttings**	DATE STARTED: **7/28/2015**	DATE COMPLETED: **7/28/2015**

Depth (feet)	% REC	USCS	Graphic Log	Description
0		CL		TOPSOIL
				LEAN CLAY, silty, with very fine-grained sand, light brown with iron oxide staining, very stiff, dry.
		ML		SANDY SILT, light grey, sand is very fine-grained, stiff, dry. @ 6 ft, with organic matter.
10		CL		SANDY CLAY with trace subrounded gravel (up to 1 inch), sand is fine-grained, light grey, stiff, moist.
		CH		FAT CLAY, light grey with brown mottles, some organic matter, stiff, moist.
		SM		S LTY SAND, fine-grained, light grey, dense. @ 19 to 20.1 ft, saturated.
20		CL/ML		CLAY and S LT laminations, with very fine-grained sand, laminations are hard, clay and silt are light grey to 22 6 ft, then color changes to light brown. @ 23 ft, color changes to light grey with carbonaceous material.
				S LTY SAND, fine-grained,with clay laminations, light brown, dense, moist. @ 26 ft, color changes to light grey, minor amounts of clay laminations, dense, moist. @ 29 to 30.2 ft, with clay laminations. @ 29 to 34 ft, very moist to saturated.
30		SM		@ 34 to 39 ft, minor clay laminations.
40				
50				Soil descriptions are based on observations from continous soil sampling using a 5-ft split barrel sampler during the bore hole advancement for MW-4D on 7-13-2015 and located 13 ft from MW-4S. Auger cuttings were used to verify that MW-4S was advanced in similar soils logged for MW-4D.
60				
70				
80				
90				
100				
110				
120				



Well Construction

Above ground completion including 2X2 ft concrete pad, four pipe bollards, and locking outer steel casing

32.4 ft of 2 in dia., Sch. 40 PVC solid riser, including 2.9 ft of stickup

Cement/bentonite grout from 0 ft bgs to 22 ft bgs

Bentonite pellet seal from 22 ft bgs to 27 ft bgs

Silica size 10/20 filter pack from 27 ft bgs to 39.5 ft bgs

10 ft of 2 in dia., 0.010 in slot, Sch. 40 PVC screen form 29.5 to 39.5 ft bgs

0.35 ft, 2 in dia., Sch. 40 PVC end cap

40 ft BOH

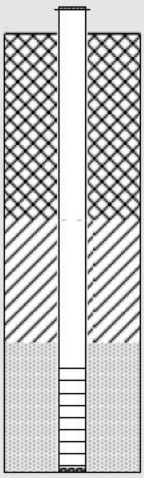
NOTES: Horizontal and vertical data are based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

ftn Associates Ltd. water resources / environmental consultants	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-105S**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-105S**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1949475.6 ft**	EASTING: **1267683.6 ft**
	DRILLING EQUIPMENT: **CME 750x**	GROUND SURFACE ELEV.: **367.9 ft**	TOC ELEVATION: **370.54 ft**
	DRILLING METHOD: **8.25" Hollow Stem Auger**	TOTAL DEPTH: **46.6 ft below TOC**	DEPTH TO WATER: (10/3/15) **27.22 ft below TOC**
LOGGED BY: **DLD/RSH**	SAMPLING METHOD: **Auger Cuttings**	DATE STARTED: **7/29/2015**	DATE COMPLETED: **7/29/2015**

Depth (feet)	% REC	USCS	Graphic Log	Description
0		ML		TOPSOIL
				SANDY SILT, sand is very fine-grained, yellowish orange, stiff, dry.
		CL		LEAN CLAY, silty, with very fine-grained sand.
10		CH		FAT CLAY, dark grey, hard, laminated with silt and very fine-grained sand. @ 11.7 ft color changes to brown. @ 12.7 ft clay is lean to fat.
		SM		S LTY SAND, very fine-grained, tan, medium dense, moist.
20		CH/ML		FAT CLAY and S LT, clay is dark grey, hard, highly laminated with silt and very fine-grained sand, moist.
		SC		SANDY FAT CLAY, sand is very fine-grained, dark brown, laminated, stiff, moist.
30				S LTY SAND, very fine-grained, light grey, moist. @ 28 ft, ,saturated. @ 33 ft, moist. @ 35 ft, laminated with minor thin clay laminations.
		SM		@ 38 ft, saturated.
40				
50				Soil descriptions are based on observations from continous soil sampling using a 5-ft split barrel samplers during the bore hole advancement for MW-5D on 7-15-2015 and located 13 ft from MW-5S. Auger cuttings were used to verify that MW-5S was advanced in similar soils logged for MW-5D.
60				
70				
80				
90				
100				
110				
120				

Well Construction



- Above ground completion including 2X2 ft concrete pad, four pipe bollards, and locking outer steel casing
- 36.2 ft of 2 in dia., Sch. 40 PVC solid riser, including 2.6 ft of stickup
- ▼ Cement/bentonite grout from 0 ft bgs to 18.6 ft bgs
- Bentonite pellet seal from 18.6 ft bgs to 31 ft bgs
- Silica size 10/20 filter pack from 31 ft bgs to 43 ft bgs
- 10 ft of 2 in dia., 0.010 in slot, Sch. 40 PVC screen from 33.6 to 43.6
- 0.35 ft, 2 in dia., Sch. 40 PVC end cap
- 44 ft BOH

NOTES: Horizontal and vertical data are based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-106S**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-106S**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1948626.6 ft**	EASTING: **1267626.8 ft**
	DRILLING EQUIPMENT: **CME 750x**	GROUND SURFACE ELEV.: **338.3 ft**	TOC ELEVATION: **341.03 ft**
	DRILLING METHOD: **8.25" Hollow Stem Auger**	TOTAL DEPTH: **26.0 ft below TOC**	DEPTH TO WATER: (10/3/15) **14.26 ft below TOC**
LOGGED BY: **DLD/RSH**	SAMPLING METHOD: **Auger Cuttings**	DATE STARTED: **7/29/2015**	DATE COMPLETED: **7/29/2015**

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Depth (feet)	% REC	USCS	Graphic Log	Description	Well Construction
0		FILL		Road base	Above ground completion including 2X2 ft concrete pad, four protective pipe bollards, and locking steel casing.
		CH		SANDY CLAY, light grey with orange mottles, sand is fine-grained, stiff, moist.	
		ML		SANDY SILT, light grey with orange mottles, sand is very fine-grained, soft, very moist to wet. @ 8-9 ft, decreasing silt content, saturated.	15.6 ft of 2 in dia., Sch. 40 PVC solid riser, including 2.7 ft of stick up
10				S LTY SAND, very fine-grained, light grey with orange mottles, medium dense, very moist to saturated, with some light grey clay laminations. @14ft poor recovery likely saturated. @21ft increased clay content , dark grey	Cement/bentonite grout from 0 ft bgs to 7 ft bgs
		SM			Bentonite pellet seal from 7 ft bgs to 11.1 ft bgs
20					Silica size 10/20 filter pack from 11.1 ft bgs to 23 ft bgs
					10 ft of 2 in dia., 0.010 in slot, Sch. 40 PVC screen from 12.9 to 22.9 ft bgs
30					0.35 ft, 2 in dia., Sch. 40 PVC end cap
					23 ft BOH
40					
50				Soil descriptions are based on observations from continous soil sampling using a 5-ft split barrel samplers during the bore hole advancement for MW-6D on 7-17-2015 and located 10 ft from MW-6S. Auger cuttings were used to verify that MW-6S was advanced in similar soils logged for MW-6D.	
60					
70					
80					
90					
100					
110					
120					

NOTES: Horizontal and vertical data are based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

ftn Associates Ltd. water resources / environmental consultants	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-108S**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-108S**	
	DRILLING CONTRACTOR: **Walker-Hill Environmental, Inc.**	NORTHING: **1948275.2**	EASTING: **1265967.1**
	DRILLING EQUIPMENT: **Geoprobe 8150LS**	GROUND ELEVATION: **349.1 ft**	TOC ELEVATION: **351.95 ft**
FTN Project # R07920-1516-001	DRILLING METHOD: **Sonic with 4x6 core and case**	TOTAL WELL DEPTH: **23.0 ft below TOC**	DEPTH TO WATER: (4/3/2017) **6.48 ft below TOC**
LOGGED BY: **AJP/DLD**	SAMPLING METHOD: **Continuous with 10 ft 4 in diameter core barrel**	DATE STARTED: **2/9/2017**	DATE COMPLETED: **2/13/2017**

Depth (feet)	USCS	Description	% REC
0	CL	S LTY CLAY, yellowish orange to light brown, with rounded gravel (~ 1 in), soft to medium stiff, moist.	
	CH	FAT CLAY, tan with red iron oxide staining, with rounded gravel (~ 2 in), very stiff.	35
10	SM	S LTY SAND, very fine-grained, tan, soft to medium stiff, dry to moist.	
		@ 10 ft, with increased silt content, tan with orange mottles, very moist.	100
20		@ 19 ft, with few clay lenses.	
	ML	S LT, greenish gray, with some thin clay lenses, medium stiff to soft, moist.	
	ML/CL	S LT and CLAY, laminated, light gray to olive gray, stiff, dry.	100
30	CH/ML	FAT CLAY, greenish gray, laminated with light gray silt, stiff, dry.	
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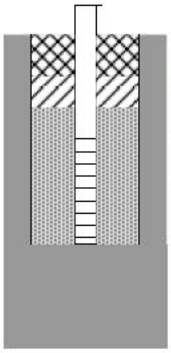
100			
110			
120			

Well Construction



- Above ground completion includes 2x2 ft concrete pad, four pipe bollards, and locking outer aluminum casing.
- 12.8 ft of 2 in Sch. 40 PVC including 2.8 ft of stickup (vented below cap)
- Cement/bentonite grout from 0 to 4 ft bgs
- Bentonite seal from 4 to 7 ft. bgs
- Silica size 20/40 filter pack from 7 to 20.2 ft bgs
- 10 ft of 2 in dia. 0.010 in slot, Sch 40 PVC
- 0.18 ft 2 in dia. Sch 40 PVC end cap
- Drilling terminated at 30 ft bgs

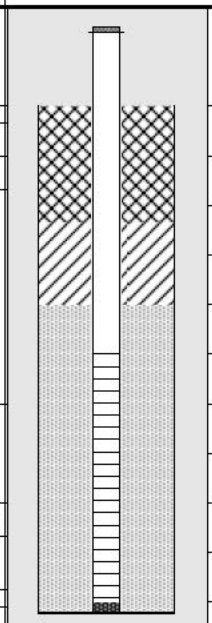
NOTES: Horizontal and vertical data are based on the Harmon Surveying report dated March 26, 2017 (AR State Plane NAD83 South and NAVD88).

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

ftn Associates Ltd. water resources / environmental consultants	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-110S**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-110S**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1947932.5 ft**	EASTING: **1266637.4 ft**
	DRILLING EQUIPMENT: **CME 550x**	GROUND SURFACE ELEV.: **334.3 ft**	TOC ELEVATION: **337.36 ft**
	DRILLING METHOD: **Hollow Stem Auger 8.25" O.D.**	TOTAL DEPTH: **23.5 ft below TOC**	DEPTH TO WATER: (1/27/2016) **10.15 ft below TOC**
LOGGED BY: **RSH**	SAMPLING METHOD: **5-foot continuous split barrel sampler**	DATE STARTED: **1/11/2016**	DATE COMPLETED: **1/12/2016**

Depth (feet)	% REC	USCS	Graphic Log	Description
0		FILL		Non CCR roadbase.
	70	ML		SILT, light brown, soft, very moist, with rootlets.
		CH		SANDY FAT CLAY, fine-grained sand, light grey with orange mottling, soft, moist.
4	70			SILTY SAND with minor clay content, very fine-grained, light grey, medium dense to loose, moist.
8		SM		@7-12 ft bgs, with occasional light brown sandy clay laminations, tan, moist to very moist.
	91			
12				CLAYEY SILTY SAND, very fine-grained, light grey with orange mottling and light brown fat clay laminations, medium dense, moist to very moist.
	100	SM		
16		CH		SANDY FAT CLAY with silt laminations, very fine-grained sand, olive grey, stiff, moist.
	100	ML		SILT with sand and clay laminations, fine-grained sand, light grey, stiff, moist, increasing clay content with depth.
20		CH		FAT CLAY with thin silt laminations, olive grey, very stiff, moist.
24				
28				
32				
36				
40				
44				

Well Construction



- Above ground completion including 2x2 ft concrete pad, four pipe bollards, and locking outer steel casing
- 13.1 ft of 2 in dia., Sch. 40 PVC solid riser, including 3.1 ft of stickup
- Cement/bentonite grout from 0 ft bgs to 4.7 ft bgs
- Bentonite pellet seal from 4.7 ft bgs to 8 ft bgs
- Silica size 10/20 filter pack from 8 ft bgs to 20.4 ft bgs
- 10 ft of 2 in dia., 0.010 in slot, Sch. 40 PVC screen
- 0.35 ft, 2 in dia., Sch. 40 PVC end cap
- 20.4 ft bgs BOH

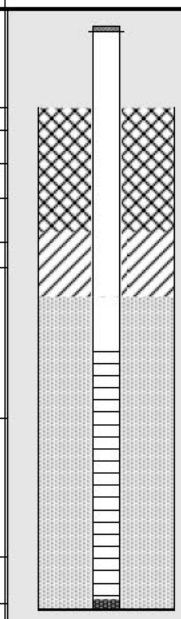
NOTES: Horizontal and vertical data on based on survey conducted by Harmon Surveying, February 2016 (AR State Plane NAD83 and NAVD88).

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-111S**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-111S**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1948298.5 ft**	EASTING: **1267563.9 ft**
	DRILLING EQUIPMENT: **CME 550x**	GROUND SURFACE ELEV.: **333.4 ft**	TOC ELEVATION: **336.53 ft S**
	DRILLING METHOD: **Hollow Stem Auger 8.25" O.D.**	TOTAL DEPTH: **23.4 ft below TOC**	DEPTH TO WATER: (1/27/2016) **13.41 ft below TOC**
LOGGED BY: **RSH**	SAMPLING METHOD: **5-foot continuous split barrel sampler**	DATE STARTED: **1/12/2016**	DATE COMPLETED: **1/12/2016**

Depth (feet)	% REC	USCS	Graphic Log	Description
0	100	FILL		Non CCR roadbase.
		CH		FAT CLAY with sand, fine-grained sand, light grey with orange mottling, soft, moist.
		GC		CLAYEY GRAVEL, fine- to coarse-grained (<30mm), subrounded, light grey fat clay, moist.
4	100	CL		SANDY LEAN CLAY with trace gravel, very fine-grained sand, light grey with iron oxide staining , stiff, moist, increasing sand content with depth.
		ML		SANDY SILT, fine-grained sand, light brown, soft, moist.
8	100	SM		SILTY SAND, very-fine grained, yellowish orange to light grey, loose, moist. @7.8 ft bgs silty clay lense (0 2 ft), light grey, moist. @11.4-12.5 ft bgs saturated interval on top of light brown lignitic lamina, increasing silt content with depth.
12	100	ML		SILT with sand, fine-grained sand, light grey with ferrous staining along laminations, soft, moist to very moist. @15 9 ft bgs with silty clay laminations, light brown. @16.4-16.6 ft bgs light brown, occassional light brown lignitic laminations, saturated.
16	100	CH		FAT CLAY with thin silt laminations, grey to olive grey, stiff, moist.
20				
24				
28				
32				
36				
40				
44				

Well Construction



- Above ground completion including 2x2 ft concrete pad, four pipe bollards, and locking outer steel casing
- 13.0 ft of 2 in dia., Sch. 40 PVC solid riser, including 3.1 ft of stickup
- Cement/bentonite grout from 0 ft bgs to 5 ft bgs
- Bentonite pellet seal from 5 ft bgs to 7 6 ft bgs
- Silica size 10/20 filter pack from 7.6 ft bgs to 20.3 ft bgs
- 10 ft of 2 in dia., 0.010 in slot, Sch. 40 PVC screen
- 0.35 ft, 2 in dia., Sch. 40 PVC end cap
- 20.3 ft bgs BOH

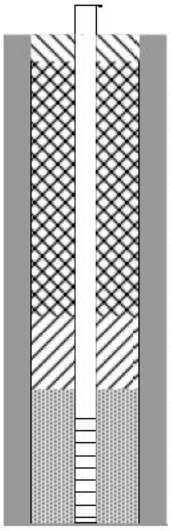
NOTES: Horizontal and vertical data on based on survey conducted by Harmon Surveying, February 2016 (AR State Plane NAD83 and NAVD88).
Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

ftn Associates Ltd. water resources / environmental consultants	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-112S**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-112S**	
	DRILLING CONTRACTOR: **Walker-Hill Environmental, Inc.**	NORTHING: **1949103.2**	EASTING: **1265439.6**
	DRILLING EQUIPMENT: **Geoprobe 8150LS**	GROUND ELEVATION: **375.4 ft**	TOC ELEVATION: **378.2 ft**
FTN Project # R07920-1516-001	DRILLING METHOD: **Sonic with 4x6 core and case**	TOTAL WELL DEPTH: **49.8 ft below TOC**	DEPTH TO WATER: (4/3/2017) **29.27 ft below TOC**
LOGGED BY: **AJP**	SAMPLING METHOD: **Continuous with 10 ft 4 in diameter core barrel**	DATE STARTED: **2/21/2017**	DATE COMPLETED: **2/22/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC
0	FILL		F LL, consisting of nepheline syenite gravel.	
	ML/CL		S LT, brownish tan, rootlets, soft, moist.	
	CH		LEAN CLAY, light brown with rootlets and rounded gravel (~ 1 in), medium stiff, moist.	55
	ML		FAT CLAY, gray with reddish-brown mottles, very stiff, moist.	
10			S LT, light gray to tan with orange mottles, laminated with clayey silt and sandy silt, very stiff, dry to moist.	
	CH		FAT SANDY CLAY, light gray to olive gray, sand is very fine-grained, very stiff, moist. @ 12.5 to 13.5 ft, with organic matter. @ 13 5 ft, with dark brown sandy lenses and greenish gray silt lenses, very stiff, moist.	100
	SM		S LTY SAND, very fine-grained, light to dark brown, with iron oxide staining, few thin clay lenses, loose to medium dense, moist.	
20	CH/ML		FAT CLAY and SANDY S LT, olive gray fat clay laminated with greenish grey sandy silt. Clay layers are very stiff, silty sand layers are medium dense.	
	SM		S LTY SAND, very fine-grained, with some clay, dark brown with dark brown organic matter, medium stiff, moist.	100
	CH		FAT CLAY, olive gray transitioning to greenish gray with depth some sandy lenses, with dark brown organic matter/old roots, very dense, moist.	
30			S LTY SAND, very fine-grained, tan to brown with some iron oxide staining, dense, moist.	
	SM		@ 35 ft, olive gray to light gray, with small amounts of organic matter.	80
40			@ 39 ft, with some clay laminations.	
	ML		S LT, with very fine-grained sand, light grey, decreasing sand with depth, soft to stiff, moist.	100
50				
60				
70				
80				
90				
100				
110				
120				

Soils descriptions are based on the soil log for MW-12D, located 12 ft from MW-12S. Soils were continuously sampled and logged at MW-12D using a 4-in core barrel. Samples from MW-12S were visually observed to verify that MW-12S was advanced in similar soils logged for MW-12D.

Well Construction



Above ground completion includes 2x2 ft concrete pad, four pipe bollards, and locking outer aluminum casing.

39.6 ft of 2 in Sch. 40 PVC including 2.8 ft of stickup (vented below cap)

Concrete cement from 0 to 2.5 ft bgs

Cement/bentonite grout from 2.5 to 27 ft bgs

Bentonite seal from 27 to 34 ft bgs

Silica size 20/40 filter pack from 34 to 47 ft bgs

10 ft of 2 in dia. 0.010 in slot, Sch 40 PVC

0.18 ft 2 in dia. Sch 40 PVC end cap

Drilling terminated at 47 ft bgs

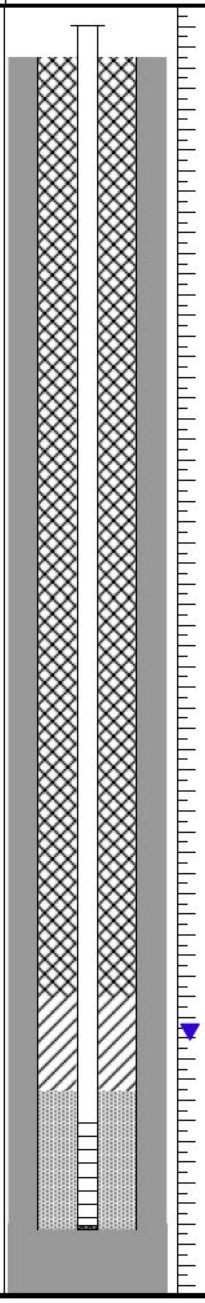
NOTES: Horizontal and vertical data are based on the Harmon Surveying report dated March 26, 2017 (AR State Plane NAD83 South and NAVD88).

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

FTN Associates Ltd. water resources / environmental consultants	PROJECT: **Supplemental GHI**	BORING ID: **MW-101D**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-101D**	
	DRILLING CONTRACTOR: **Tri-State Testing Services**	NORTHING **1949735.5 ft**	EASTING **1265536.4 ft**
	DRILLING EQUIPMENT: **CME 750x (SN: 299708)**	GROUND ELEVATION: **384.3 ft**	TOC ELEVATION: **387.06 ft**
FTN Project # R06040-0143-001	DRILLING METHOD: **8.25" Hollow Stem Auger (HSA)**	TOTAL DEPTH from TOC: **114.2 ft**	DEPTH TO WATER from TOC: **97.29 (2/12/2014)**
LOGGED BY: **DLD**	SAMPLING METHOD: **5-foot continous soil sampler**	DATE STARTED: **11/19/2013**	DATE COMPLETED: **11/20/2013**

Depth (feet)	USCS	Description	% REC ST SPT
0	FILL	TOP SOIL	
	SC	SANDY (FAT) CLAY, very fine-grained sand, reddish brown and grey, very stiff, moist.	100
	SM	CLAYEY SAND, very fine-grained, reddish brown and orange mottled, medium dense, moist.	80
10		S LTY SAND, very fine-grained, grey with orange mottles, medium dense to loose, moist. Decreasing sand with depth.	80
	ML	S LT with very fine-grained sand, light grey with orange mottles, medium stiff to soft, moist. Occasional lenses of tan to pinkish tan, very hard clay. @ 8.5 to 9 ft bgs, saturated. @13 ft bgs, CLAYEY S LT with very fine grained sand, greenish grey, very hard, moist. Decreasing clay content with depth.	100
20			100
	SC	@ 21 to 21.8 ft bgs, carbonaceous/lignitic material.	
	ML	CLAYEY SAND, very fine-grained, greenish grey, laminated with carbonaceous/lignitic material, very hard, moist.	100
		SANDY SILT, greenish grey, sand is very fine-grained, medium stiff to stiff, moist.	
30	SM	S LTY SAND, very fine-grained, greenish grey, soft to medium stiff, moist. Occasional lenses of clay and carbonaceous material.	100
	ML	SANDY SILT, greenish grey, sand is very fine-grained, medium stiff to soft, moist. @ 33 8 to 34 5 ft bgs, carbonaceous/lignitic material, very hard. @ 34.5 to 38 ft bgs, highly laminated with very hard brownish grey sandy silty clay, silt, and carbonaceous/lignitic material.	100
40	SM	@ 38 to 40 ft bgs, brownish grey platy hard clay laminated with silt and very fine-grained sand.	100
		S LTY SAND, very fine-grained, greenish grey, dense, very moist to moist.	
	ML	SANDY SILT, greenish grey, very fine-grained sand, soft, very moist. Occasional lenses of clay.	100
50	ML/CL	S LT to LEAN CLAY, olive grey, with very fine-grained light grey sand, soft, very moist.	100
	CL/CH	LEAN to FAT CLAY, olive grey, platy, very stiff to hard, with very fine-grained light grey sand, slightly moist. @ 56 to 58 ft bgs, texture is more massive.	100
60	SC	CLAYEY SAND, very fine-grained, olive grey, dense, moist.	100
	CL/CH	LEAN to FAT CLAY, olive grey, highly laminated with very light grey silt, very stiff, moist.	
	ML	S LT, olive grey, with clay lenses, moist.	100
70		FAT CLAY, olive grey with occasional silt laminations, very stiff, moist. @ 68 to 70 ft bgs, clay is laminated with silt. @ 70 ft bgs, clay has blocky texture. @ 73 to 80 ft bgs, clay is laminated with silt.	100
			100
80	CH	@ 80 ft, clay has blocky texture.	100
		@ 87 ft bgs, with very light grey, very fine-grained sand.	100
90			100
		@ 95.6 ft bgs, sand fat clay.	100
100	SC	CLAYEY SAND, very fine-grained, dark grey, dense, moist. @ 98.5 to 101 5 ft bgs, laminated with fat clay.	100
	CH	FAT SANDY CLAY, sand is very fine-grained, dark grey, very stiff, moist.	
	SC/ SM	CLAYEY to SILTY SAND, sand is very fine-grained, dark grey, moist. Decreasing clay content with depth.	70
110	SM/SP	S LTY SAND to POORLY GRADED SAND, very fine-grained, dark grey, saturated.	50
	CH	FAT CLAY, dark grey, highly laminated with light grey silt, very stiff, moist.	
120			

Well Construction



- Above ground wellhead completion including 2x2 ft concrete pad, four pipe bollards, and locking outer steel casing
- 103.8 ft of 2-inch dia., Sch. 40 PVC solid riser including 2.8 ft of stick up (vented below cap)
- Cement/Bentonite grout from 0 ft to 97.0 ft bgs
- Bentonite pellet seal from 97.0 ft bgs to 100.1 ft bgs
- Sillica size 10/20 filter pack from 100.1 ft bgs to 113 ft bgs
- 10.0 ft of 2-inch dia., 0.010-inch slotted Sch. 40 PVC screen
- 0.35 ft, 2-inch dia., Sch. 40 PVC end cap
- Drilling terminated at 113 ft bgs

NOTES: Revised well construction detail based on survey after the addition of the above ground wellhead completion during July 2015.
Horizontal and vertical data based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)
ST - Shelby Tube. SPT - Standard Penetration Test

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

PROJECT: **Supplemental GHI**	BORING ID: **MW-102D**		
LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-102D**		
DRILLING CONTRACTOR: **Tri-State Testing Services**	NORTHING **1949805.8 ft**	EASTING **1266390.6 ft**	
DRILLING EQUIPMENT: **CME 750x (SN: 299708)**	GROUND ELEVATION: **378.7 ft**	TOC ELEVATION: **381.40 ft**	
DRILLING METHOD: **8.25" Hollow Stem Auger (HSA)**	TOTAL DEPTH from TOC: **112.0 ft**	DEPTH TO WATER from TOC: **91.61 (5/8/2014)**	
LOGGED BY: **DLD/MHR**	SAMPLING METHOD: **5-foot continous soil sampler**	DATE STARTED: **4/25/2014**	DATE COMPLETED: **4/25/2014**

FTN Associates Ltd. water resources / environmental consultants

FTN Project # R06040-0143-001

Depth (feet)	USCS	Description	% REC ST SPT
0	FILL	TOP SOIL	100
	ML	S LT with very fine-grained sand, grey and yellowish orange, soft, moist.	100
	CH	FAT CLAY with very fine-grained sand grey blocky very stiff moist.	
	SP	POORLY GRADED SAND with silt, very fine-grained, yellowish orange and grey, dense, dry to moist. @ 7 to 8 ft bgs, laminated with fat clay and sand is moist.	
10	CL	LEAN CLAY, with silt laminations and very fine-grained sand, tan, stiff, moist. @ 10 ft bgs, color changed to greenish grey.	100
		S LTY SAND, very fine-grained, olive grey, medium dense, moist. @ 16 to 16.8 ft bgs, carbonaceous and fossiliferous material. @ 18 to 25 ft bgs, occasional clay laminations.	100
20	SM		100
	ML	CLAYEY SILT, olive grey to grey, highly and thinly laminated with grey silt and very-fine grained sand, medium stiff, moist. @ 27 to 28 ft, brownish grey. Occasional carbonaceous material.	100
30		S LTY SAND, very fine grained, olive grey, medium dense, moist. @ 28 to 30 ft bgs, grayish brown with carbonaceous material. @ 30 to 31 ft bgs, laminated with fat clay. @ 33 to 38 ft bgs, medium dense to dense, very moist to wet.	100
	SM		100
40		@ 40 to 40.5 ft bgs, saturated. @ 42 to 42.5 ft bgs, saturated.	100
		@ 48 to 50 ft bgs, very moist to wet.	100
50	SM/ML	S LTY SAND to SILT, olive grey, very thinly laminated with light grey silt and lean clay, sand is very fine grained, stiff, moist.	100
	CL/CH	LEAN to FAT SANDY CLAY, sand is very fine-grained, olive grey, platy, very stiff dry to moist.	100
	CH	FAT CLAY, with very fine-grained sand, olive grey, platy to blocky texture, decreasing sand content with depth, very stiff, dry to moist. @ 62 to 63 ft bgs, highly and thinly laminated with light grey silt and/or fine-grained sand.	100
60	ML/CL	LEAN CLAY and SILT, highly laminated, silt is very light grey, clay is dark grey to olive grey, very stiff, moist.	100
	CL/CH	LEAN to FAT CLAY, more plastic with depth, with light grey silt laminations, very stiff, moist.	100
70		FAT CLAY, olive grey to dark grey, blocky texture, very stiff to moist. @ 73 ft bgs, with very fine-grained sand.	
		@ 78 ft bgs, sand content increases with depth.	100
80	CH		100
			100
90		CLAYEY SAND, very fine-grained, dark grey, dense, moist. @ 94 to 95 ft bgs, laminated with fat clay.	
	SC		100
	SC/SM	CLAYEY SAND to S LTY SAND, very fine-grained, dark grey, dense, moist.	
100		S LTY SAND, very fine-grained, dark grey, dense, moist. Silt content decreasing with depth.	100
	SM		100
110			
120			

Well Construction

- Above ground wellhead completion including 2x2 ft concrete pad, four pipe bollards, and locking outer steel casing
- 101.6 ft of 2-inch dia., Sch. 40 PVC solid riser including 2.7 ft of stick up (vented below cap)
- Cement/Bentonite grout from 0 ft to 86.0 ft bgs
- Bentonite pellet seal from 86.0 ft bgs to 93.0 ft bgs
- Sillica size 10/20 filter pack from 93.0 ft bgs to 108 ft bgs
- 10.0 ft of 2-inch dia., 0.010-inch slotted Sch. 40 PVC screen
- 0.35 ft, 2-inch dia., Sch. 40 PVC end cap
- Drilling terminated at 108 ft bgs

NOTES: Revised well construction detail based on survey after the addition of the above ground wellhead completion during July 2015.
Horizontal and vertical data based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)
ST - Shelby Tube. SPT - Standard Penetration Test

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

ftn Associates Ltd. water resources / environmental consultants	PROJECT: **Supplemental GHI**	BORING ID: **MW-103D**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-103D**	
	DRILLING CONTRACTOR: **Tri-State Testing Services**	NORTHING **1947629.7 ft**	EASTING **1266915.2 ft**
	DRILLING EQUIPMENT: **CME 750x (SN: 299708)**	GROUND ELEVATION: **335.0 ft**	TOC ELEVATION: **339.18 ft**
FTN Project # R06040-0143-001	DRILLING METHOD: **8.25" Hollow Stem Auger (HSA)**	TOTAL DEPTH from TOC: **84.6 ft**	DEPTH TO WATER from TOC: **38.55 (2/12/2014)**
LOGGED BY: **DLD**	SAMPLING METHOD: **5-foot continous soil sampler**	DATE STARTED: **11/7/2013**	DATE COMPLETED: **11/7/2013**

Depth (feet)	USCS	Description	% REC ST SPT
0	FILL	TOP SOIL	
	CH	FAT CLAY, with very fine-grained sand, reddish to orangish brown, very stiff to hard, dry to moist.	100
	SC	CLAYEY SAND, very fine-grained, becoming silty with depth, light grey and orange, dense, dry.	100
10	SM	S LTY SAND, very fine-grained, light grey, medium dense to dense, very dry. @ 8 to 10 ft bgs, oxidation staining. @18 to 18 ft bgs, laminated with hard fat clay, color changed to light brownish tan.	80
			80
20	ML/CL	S LT and LEAN CLAY, laminated, with very fine-grained sand, dry to slightly moist. Clay is platy. Upper 0 5 inches (Shelby tube slag) was saturated.	ST 18-20'
		FAT CLAY, with silt and very fine-grained sand, platy, very stiff, dry to slightly moist.	100
			100
30		@ 28 ft bgs, laminated with very light grey silt.	100
		@ 35 ft bgs, occasional light grey silt and/or very fine-grained sand laminations.	ST 33-35'
		@ 38 ft bgs, with very fine-grained sand.	100
40			100
	CH		100
50			6 -8- 11
			100
			100
60		@ 63 ft bgs, sandy fat clay, dark grey, sand is very fine-grained, medium stiff, very moist.	100
			100
	SC	CLAYEY SAND, very fine-grained, dark grey, dense, very moist. @ 68 to 68.5 ft bgs, saturated.	
70	CH	SANDY (FAT) CLAY, very fine-grained sand, dark grey, very stiff, moist.	80
		CLAYEY SAND, very fine-grained, dark grey, dense, moist to very moist.	100
	SC		
80			100
	CH	FAT CLAY, dark grey, laminated with very light grey silt, some very fine-grained sand, very stiff, moist.	
90			
100			
110			
120			

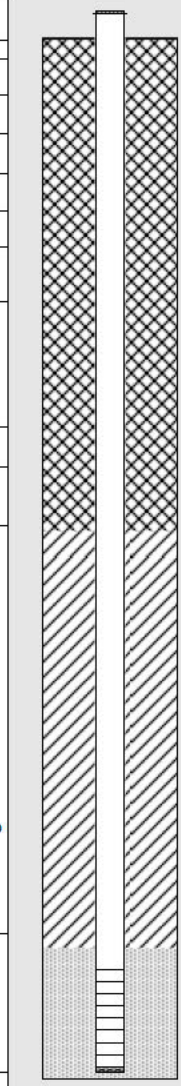
Well Construction

- Above ground wellhead completion including 2x2 ft concrete pad, four pipe bollards, and locking outer steel casing
- 69.2 ft of 2-inch dia., Sch. 40 PVC solid riser including 4.2 ft of stick up (vented below cap)
- Cement/Bentonite grout from 0 ft to 62.3 ft bgs
- Bentonite pellet seal (slow release) from 62.3 ft bgs to 65.0 ft bgs
- Sillica size 10/20 filter pack from 65.0 ft bgs to 84 ft bgs
- 15.0 ft of 2-inch dia., 0.010-inch slotted Sch. 40 PVC screen
- 0.35 ft, 2-inch dia., Sch. 40 PVC end cap
  Drilling terminated at 84 ft bgs

NOTES: Revised well construction detail based on survey after the addition of the above ground wellhead completion during July 2015.
Horizontal and vertical data based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)
ST - Shelby Tube. SPT - Standard Penetration Test
Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-104D**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-104D**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1949850.4 ft**	EASTING: **1267225.4 ft**
	DRILLING EQUIPMENT: **CME 750x**	GROUND SURFACE ELEV.: **374.1 ft**	TOC ELEVATION: **376.76 ft**
	DRILLING METHOD: **8.25" Hollow Stem Auger**	TOTAL DEPTH: **106.7 ft below TOC**	DEPTH TO WATER: (10/3/2015) **87.12 ft below TOC**
LOGGED BY: **DLD/RSH**	SAMPLING METHOD: **5-foot continous split barrel**	DATE STARTED: **7/13/2015**	DATE COMPLETED: **7/14/2015**

Depth (feet)	% REC	USCS	Description
0	100	CL	TOPSOIL
			LEAN CLAY, silty, with very fine-grained sand, light brown with iron oxide staining, very stiff, dry.
	74	ML	SANDY SILT, light grey, sand is very fine-grained, stiff, dry. @ 6 ft , with organic matter.
10	100	CL	SANDY CLAY with trace subrounded gravel (up to 1 inch), sand is fine-grained, light grey, stiff, moist.
		CH	FAT CLAY, light grey with brown mottles, some organic matter, stiff, moist.
	100	SM	SILTY SAND, fine-grained, light grey, dense. @19 to 20.1 ft, saturated.
20	100	CL/ML	CLAY and SILT laminations, with very fine-grained sand, laminations are hard, clay and silt are light grey to 22 6 ft, then color changes to light brown. @ 23 ft, color changes to light grey with carbonaceous material.
	100		SILTY SAND, fine-grained, with clay laminations, light brown, dense, moist. @ 26 ft, color changes to light grey, minor amounts of clay laminations, dense, moist.
30	100	SM	@ 29 to 30 2 ft, with clay laminations. @ 29 to 34 ft, very moist to saturated. @ 34 to 39 ft minor clay laminations.
	100		
40	100	SM/ML	SILTY SAND, decreasing sand content with depth, sand is very fine-grained.
	100	ML/CL	SILTY CLAY to CLAYEY SILT, laminated with very fine-grained sand partings, light grey. @ 43 to 44 ft, saturated. @ 44 ft, silt and clay laminations, light grey, moist to dry, clay is hard, platy. Silt is stiff.
50	100		FAT CLAY, olive grey, with light grey silt and very fine-grained sand partings, clay is blocky to platy, hard, dry to moist. @54 ft, blocky texture, very stiff, minor amounts of light grey very fine-grained sand and/or silt partings.
	100		
60	100		@ 61.5 to 62.5 ft, increased silt partings.
	88		@ 64 to 67 ft, clay is platy to blocky textured, then homogeneous.
70	100	CH	
	100		
80	n/a		@ 79 ft, plugged augers due to swelling clays. Soils logged by cuttings to 104 ft.
	n/a		
90	n/a		@ 90 ft drillers noted lithology change
	n/a	SC/SM	CLAYEY TO S LTY SAND. Assumed based on driller's description and auger cuttings.
100	n/a		
110			
120			



Well Construction

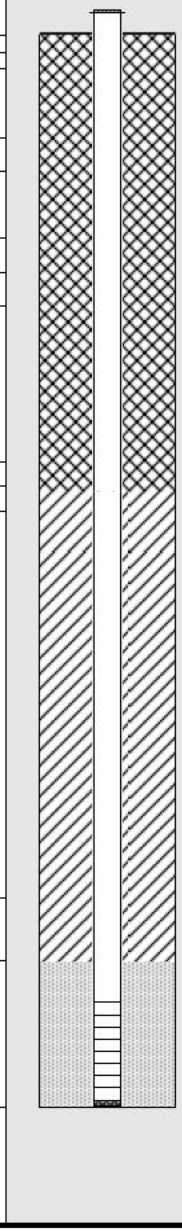
- Above ground completion including 2X2 ft concrete pad, four pipe bollards, and locking outer steel casing
- 96.3 ft of 2 in dia., Sch. 80 PVC solid riser, including 2.7 ft of stickup
- Cement/bentonite grout from 0 ft bgs to 49.5 ft bgs
- Bentonite pellet seal from 49.5 ft bgs to 91.5 ft bgs
- Silica size 10/20 filter pack from 91.5 ft bgs to 104 ft bgs
- 10 ft of 2 in dia., 0.010 in slot, Sch. 80 PVC screen from 93.6 ft bgs to 103.6 ft bgs
- 0.35 ft, 2 in dia., Sch. 80 PVC end cap
- 104 ft BOH

NOTES: Horizontal and vertical data are based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-105D**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-105D**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1949463.1 ft**	EASTING: **1267683.2 ft**
	DRILLING EQUIPMENT: **CME 750x**	GROUND SURFACE ELEV.: **367.8 ft**	TOC ELEVATION: **370.04 ft**
	DRILLING METHOD: **8.25" Hollow Stem Auger**	TOTAL DEPTH: **110.2 ft below TOC**	DEPTH TO WATER: (10/3/2015) **80.43 ft below TOC**
LOGGED BY: **DLD/RSH**	SAMPLING METHOD: **5-foot continous split barrel**	DATE STARTED: **7/15/2015**	DATE COMPLETED: **7/16/2015**

Depth (feet)	% REC	USCS	Description
0	100	ML	TOPSOIL
			SANDY SILT, sand is very fine-grained, yellowish orange, stiff, dry.
	100	CL	LEAN CLAY, silty, with very fine-grained sand, yellowish orange, stiff, dry to moist. @ 3 ft, increased silt content, soft, moist. @ 4 5 ft, color changes to tan, clay is silty, hard, laminated with very fine-grained sand. @ 5.5 ft, clay color changes to pinkish tan
10	100	CH	FAT CLAY, dark grey, hard, laminated with silt and very fine-grained sand. @ 11.7 ft, color changes to brown. @ 12.7 ft, clay is lean to fat.
	100	SM	S LTY SAND, very fine-grained, tan, medium dense, moist. @ 15 5 ft, lens of fat clay, brown, soft, moist (0.2 ft thick). @ 15.7 ft, lens of hard silty clay, dark grey, (0 3 ft thick). @ 16 ft, saturated. @ 17 ft, sand is laminated with very stiff to hard tan fat clay.
20	100	CH/ML	FAT CLAY and S LT, clay is dark grey, hard, highly laminated with silt and very fine-grained sand, moist.
	100	SC	SANDY FAT CLAY, sand is very fine-grained, dark brown, laminated, stiff, moist.
30	100		S LTY SAND, very fine-grained, light grey, moist. @ 28 ft, saturated.
	100	SM	@ 33 ft, moist.
			@ 35 ft, laminated with minor thin clay laminations.
40	100		@ 38 ft, saturated.
	100	ML	CLAYEY SILT, light grey, medium stiff, moist.
		CL	LEAN CLAY, light grey, laminated with light grey silt, stiff, moist.
50	100		FAT CLAY, dark grey, laminated with silt. @ 49.5 ft, clay is blocky, stiff, moist, minor amounts of very fine-grained sand and silt partings.
	100		
60	n/a		@ 58 ft, plugged augers to 93 ft due to swelling clays. Soils logged by cuttings to 93 ft.
	n/a	CH	
70	n/a		
	n/a		
80	n/a		
	n/a		Drillers noted lithology change at 87 ft.
90	n/a	SC	CLAYEY SAND, olive grey, decreasing clay with depth, dense, moist.
	100		S LTY SAND, very fine-grained, olive grey, dense, saturated.
100	100	SM	
	100		@ 105 to 107 ft, with clay laminations.
110			
120			



Above ground completion including 2X2 ft concrete pad, four pipe bollards, and locking outer steel casing

99.8 ft of 2 in dia., Sch. 80 PVC solid riser, including 2.3 ft of stickup

Cement/bentonite grout from 0 ft bgs to 46 ft bgs

Bentonite pellet seal from 46 ft bgs to 93.4 ft bgs

Silica size 10/20 filter pack from 93.4 ft bgs to 107 ft bgs

10 ft of 2 in dia., 0.010 in slot, Sch. 80 PVC screen from 97.5 ft bgs to 107.5 ft bgs

0.35 ft, 2 in dia., Sch. 80 PVC end cap

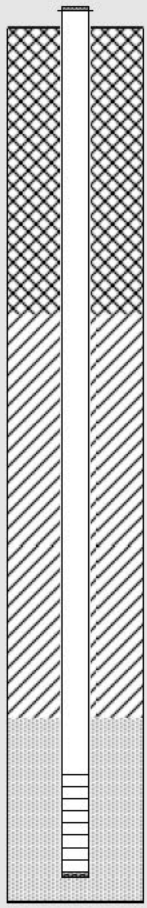
108 ft BOH

NOTES: Horizontal and vertical data are based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

ftn Associates Ltd. water resources / environmental consultants	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-106D**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-106D**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1948617.2 ft**	EASTING: **1267628.3 ft**
	DRILLING EQUIPMENT: **CME 750x**	GROUND SURFACE ELEV.: **337.8 ft**	TOC ELEVATION: **339.39 ft**
	DRILLING METHOD: **8.25" Hollow Stem Auger**	TOTAL DEPTH: **87.1 ft below TOC**	DEPTH TO WATER: (10/3/2015) **40.94 ft below TOC**
LOGGED BY: **DLD/RSH**	SAMPLING METHOD: **5-foot continous split barrel**	DATE STARTED: **7/17/2015**	DATE COMPLETED: **7/17/2015**

Depth (feet)	% REC	USCS	Graphic Log	Description
0	66	CH		Non-CCR road base SANDY CLAY, light grey with orange mottles, sand is fine-grained, stiff, moist.
	100	ML		SANDY SILT, light grey with orange mottles, sand is very fine-grained, soft, very moist to wet. @ 8 ft, decreasing silt content.
10	100			S LTY SAND, very fine-grained, light grey with orange mottles, medium dense, very moist to wet, with some light grey clay laminations.
	100	SM		
20	100			
	100			SANDY SILT, olive grey, stiff, very moist. Sand is very fine-grained.
		ML		@ 27 to 28 ft, with some clay laminations.
30	100			FAT CLAY, dark grey, laminated with silt, moist.
	100			@ 33 ft, blocky texture, very stiff, moist, with some light grey very fine-grained sand partings.
40	n/a			@ 38 to 68 ft, plugged augers due to swelling clays. Logged soils by cuttings to 68 ft.
	n/a			
50	n/a	CH		
	n/a			
60	n/a			
	n/a			
70	100	SC		@ 68 ft, FAT CLAY, dark grey, laminated, blocky, moist. CLAYEY SAND, very fine-grained, dark grey, very dense. Clay content decreasing with depth.
	100	SC/CH		CLAYEY SAND to SANDY FAT CLAY, dark grey, sand is very fine-grained, very dense/stiff, clay content decreases with depth, saturated.
80	100	SC		CLAYEY SAND, dark grey, clay content decreasing with depth, sand is very fine-grained, very dense, saturated.
	100	CH/ML		FAT CLAY and S LT, clay is dark grey, very stiff, moist, laminated with light grey silt and very fine-grained sand.
90				
100				
110				
120				



Above ground completion including 2X2 ft concrete pad, four pipe bollards, and locking outer steel casing

76.7 ft of 2 in dia., Sch. 80 PVC solid riser, including 1.6 ft of stickup

Cement/bentonite grout from 0 ft bgs to 28.8ft bgs

Bentonite pellet seal from 28.8 ft bgs to 69.4 ft bgs

Silica size 10/20 filter pack from 69.4 ft bgs to 88.0 ft bgs

10 ft of 2 in dia., 0.010 in slot, Sch. 80 PVC screen from 75.1 ft bgs to 85.1 ft bgs

0.35 ft, 2 in dia., Sch. 80 PVC end cap

88 ft BOH

NOTES: Horizontal and vertical data are based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)
Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-107D**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-107D**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1948044.1 ft**	EASTING: **1267403.4 ft**
	DRILLING EQUIPMENT: **CME 750x**	GROUND SURFACE ELEV.: **319.4 ft**	TOC ELEVATION: **322.26 ft**
	DRILLING METHOD: **8.25" Hollow Stem Auger**	TOTAL DEPTH: **68.6 ft below TOC**	DEPTH TO WATER: (10/3/2015) **19.38 ft below TOC**
LOGGED BY: **DLD/RSH**	SAMPLING METHOD: **5-foot continous split barrel**	DATE STARTED: **7/20/2015**	DATE COMPLETED: **7/20/2015**

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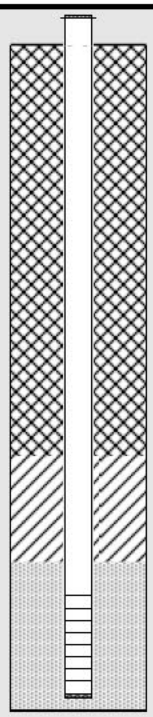
Depth (feet)	% REC	USCS	Graphic Log	Description
0	76	CL CH		Nob-CCR road base SANDY S LTY CLAY, yellowish orange to light brown, sand is very fine-grained soft moist.
	90	CL		FAT CLAY, yellowish orange to light brown, some very fine-grained sand, medium stiff, moist.
10	90			LEAN CLAY, silty, tan, with hard clay laminations, silty clay was soft, moist. FAT CLAY, tan with iron oxide staining, blocky, very stiff to hard.
	100			@ 15 5 ft, color changes to olive grey with light grey silt laminations, stiff, moist.
20	100			@ 18 to 23 ft, SAA, very stiff.
	n/a			@ 23 ft, plugged augers due to swelling clays. Logged soils by cuttings to 43 ft.
30	n/a	CH		
	n/a			
40	n/a			@ 43 ft, fat clay, olive grey, very stiff, moist.
	100			
50	100			
	100	SC		CLAYEY SAND, very fine-grained, olive grey, very dense, very moist to saturated. @ 58 ft, clay content begins to decrease with depth.
60	100	SM		S LTY SAND, very fine-grained, olive grey, very dense, very moist to saturated.
	100	SM/SC CH		S LTY SAND TO CLAYEY SAND, olive grey, clay content increasing with depth saturated. FAT CLAY, greenish grey, finely laminated with clayey sand.
70				
80				
90				
100				
110				
120				



Well Construction

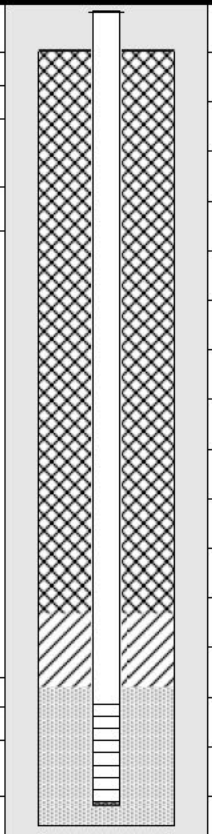
- Above ground completion including 2X2 concrete pad, four pipe bollards, and locking outer steel casing
- 58.3 ft of 2 in dia., Sch. 80 PVC solid riser, including 2.9 ft of stickup
- Cement/bentonite grout from 0 ft bgs to 41.3 ft bgs
- Bentonite pellet seal from 41.3 ft bgs to 52 ft bgs
- Silica size 10/20 filter pack from 52 ft bgs to 67.0 ft bgs
- 10 ft of 2 in dia., 0.010 in slot, Sch. 80 PVC screen from 55.4 to 65.4 ft bgs
- 0.35 ft, 2 in dia., Sch. 80 PVC end cap
- 67.0 ft BOH

NOTES: Horizontal and vertical data are based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)
Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

ftn Associates Ltd. water resources / environmental consultants	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-108D**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-108D**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1947916.6 ft**	EASTING: **1266178.4 ft**
	DRILLING EQUIPMENT: **CME 750x**	GROUND SURFACE ELEV.: **337.6 ft**	TOC ELEVATION: **341.61 ft**
	DRILLING METHOD: **8.25" Hollow Stem Auger**	TOTAL DEPTH: **80.1 ft below TOC**	DEPTH TO WATER: (10/3/2015) **47.70 ft below TOC**
LOGGED BY: **DLD/RSH**	SAMPLING METHOD: **5-foot continous split barrel**	DATE STARTED: **7/23/2015**	DATE COMPLETED: **7/23/2015**

Depth (feet)	% REC	USCS	Description
0	100	ML	SANDY S LT, dark brown with organic matter, sand is very fine-grained, color changes to orangish tan at 0 5 ft, very dry, soft.
	100	CH	FAT CLAY with sand and silt, yellowish orange becoming light grey with orange mottles with depth very stiff dry.
10	100	ML	SANDY S LT, tan with orange mottles, decreasing sand content with depth, moist to very moist with depth. @ 5 ft, SILT with very fine-grained sand, tan with orange mottles, stiff to very stiff, very moist. @ 10.7 ft, SAA, with light brown silty clay lenses.
	100	CL/ML	CLAY and S LT laminations, with very fine-grained sand, laminations are hard, sand and silt are light grey, stiff, dry to moist.
20	100		FAT CLAY with very fine-grained sand, olive grey, slight blocky texture, very stiff, moist. @ 18 ft, SAA with fine fine-grained sand and silt partings. @ 23 ft, plugged augers due to swelling clays. Soils logged by cuttings to 53 ft.
	n/a		
30	n/a		
	n/a		
40	n/a	CH	
	n/a		
50	n/a		@ 53 ft, SAA olive grey with very fine-grained sand, dry to moist.
	100		
60	100		@ 62 ft, sandy fat clay.
	100	SC	CLAYEY SAND, very fine-grained, olive grey, very dense, moist.
	100	CH	SANDY FAT CLAY, sand is very fine-grained, olive grey, laminated with light grey very fine-grained sand very stiff moist.
70	100	SC	CLAYEY SAND, very fine-grained, olive grey, dense, moist.
	100		@ 75.5 ft, minor carbonaceous material.
80			
90			
100			
110			
120			

Well Construction



Above ground completion including 2X2 concrete pad, four pipe bollards, and locking outer steel casing

69.7 ft of 2 in dia., Sch. 80 PVC solid riser, including 4.0 ft of stickup

Cement/bentonite grout from 0 ft bgs to 56.6 ft bgs

Bentonite pellet seal from 56.6 ft bgs to 64 ft bgs

Silica size 10/20 filter pack from 64 ft bgs to 78 ft bgs

10 ft of 2 in dia., 0.010 in slot, Sch. 80 PVC screen from 65.7 to 75.7 ft bgs

0.35 ft, 2 in dia., Sch. 80 PVC end cap

78 ft BOH

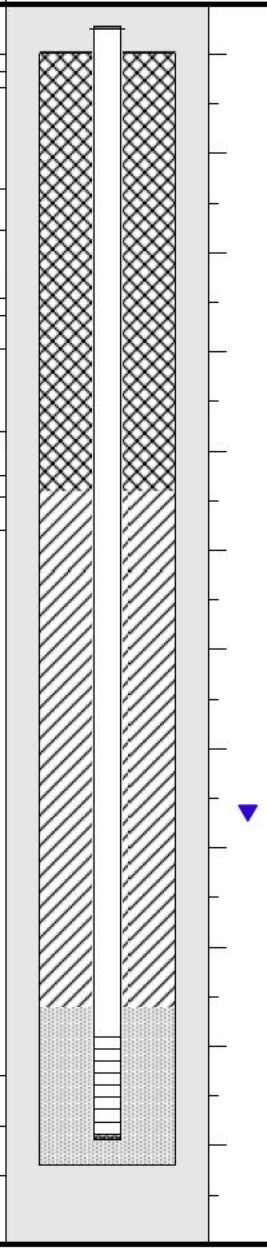
NOTES: Horizontal and vertical data are based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-109D**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-109D**	
	DRILLING CONTRACTOR: **McCray Drilling, LLC**	NORTHING: **1948605.7 ft**	EASTING: **1265389.0 ft**
	DRILLING EQUIPMENT: **CME 750x**	GROUND SURFACE ELEV.: **368.7 ft**	TOC ELEVATION: **371.31 ft**
	DRILLING METHOD: **8.25" Hollow Stem Auger**	TOTAL DEPTH: **112.0 ft below TOC**	DEPTH TO WATER: (10/3/2015) **80.12 ft below TOC**
LOGGED BY: **DLD/RSH**	SAMPLING METHOD: **5-foot continous split barrel**	DATE STARTED: **7/21/2015**	DATE COMPLETED: **7/21/2015**

Depth (feet)	% REC	USCS	Description
0	66	SM	Non-CCR road base.
			SANDY SILT, light brown to tan, soft, dry.
	100	CH	FAT CLAY, light grey with reddish orange mottles, stiff, moist. @ 5 ft, SAA, laminated with light grey to tan silt, some laminations are hard. Clay color changes to light grey with orange mottling, moist to dry. @ 8 ft, SAA, color changes to light brown. @ 9.9 ft, a ~3 inch layer of peat-like organic matter. @ 10.1 color changes to brown. @ 10 6 ft, color changes to olive grey. @ 12.7 ft, a 3 inch lens of silt with fine-grained sand, tan to light brown, soft, dry to moist.
10	100		
	80	SM	S LTY SAND, very fine-grained, tan with orange and brown mottling, moist.
20	100	CH/ML	FAT CLAY and S LT, fat clay is thinly laminated with silt and very fine-grained sand, clay is olive grey, medium stiff, moist. @ 18 ft, SAA, clay laminations are stiff to hard. @ 21.7 ft, SAA, clay has some very fine-grained sand, is laminated with organic matter.
	80	SM	S LTY SAND, very fine-grained, medium dense, light grey, moist.
		CH	FAT CLAY and S LT, fat clay is olive grey and thinly laminated with light grey silt and very fine-grained sand. Clay is stiff to medium stiff, moist.
30	90	SM	S LTY SAND, fine-grained, dense to medium dense, light grey, some clay laminations. @ 33 ft, SAA, saturated to 34.5 ft, then wet to very moist.
	90		
40	100	SM/ML	S LTY SAND to SANDY SILT, medium dense/medium stiff, light grey, saturated from 38 to 40 ft, then very moist to wet. Sand content decreases with depth.
		ML	SANDY SILT, light grey, medium stiff, very moist to wet.
	100	CH/ML	FAT CLAY and S LT, clay is olive grey, very stiff, and laminated with silt, light grey to greenish grey, soft, moist.
50	100		FAT CLAY, olive grey, laminated with light grey very fine-grained sand. Clay is blocky, stiff. @ 53 ft, plugged augers due to swelling clays. Soils logged by cuttings to 88 ft.
	n/a		
60	n/a		
	n/a		
70	n/a		
	n/a	CH	
80	n/a		
	100		@ 88 ft, SAA, fat clay, olive grey, blocky, with some very fine-grained sand, very stiff, moist.
90	100		@ 89.5 ft, sandy fat clay, olive grey, sand is very fine-grained, very stiff, moist.
	100		
100	100		
	100	SC	CLAYEY SAND, very fine-grained, very dense, olive grey, very moist to wet. Clay content decreases with depth.
110		CH	SANDY FAT CLAY, olive grey, stiff, moist. @ 110 ft, clay is laminated with light grey silt. Clay is light grey, olive grey, and greenish grey. @ 110 ft, silt laminations are more prominent.
120			

Well Construction



Above ground completion including 2X2 ft concrete pad, four pipe bollards, and locking outer steel casing

101.6 ft of 2 in dia., Sch. 80 PVC solid riser, including 2.6 ft of stickup

Cement/bentonite grout from 0 ft bgs to 44.1 ft bgs

Bentonite pellet seal from 44.1 ft bgs to 96 ft bgs

Silica size 10/20 filter pack from 96 ft bgs to 112 ft bgs

10 ft of 2 in dia., 0.010 in slot, Sch. 80 PVC screen from 99.0 to 109.0 ft bgs

0.35 ft, 2 in dia., Sch. 80 PVC end cap

112 ft BOH

NOTES: Horizontal and vertical data are based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

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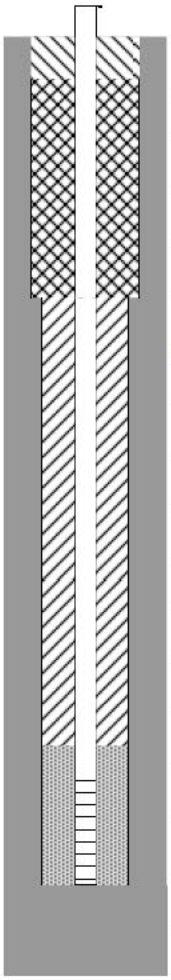
FTN Project # R07920-1516-001

PROJECT: **Monitoring Well Installations**		BORING ID: **MW-110D**	
LOCATION: **Entergy White Bluff Landfill**		WELL ID: **MW-110D**	
DRILLING CONTRACTOR: **Walker-Hill Environmental, Inc.**		NORTHING: **1947917.7**	EASTING: **1266655.5**
DRILLING EQUIPMENT: **Geoprobe 8150LS**		GROUND ELEVATION: **335.3 ft**	TOC ELEVATION: **338.26 ft**
DRILLING METHOD: **Sonic with 4x6 core and case ***		TOTAL WELL DEPTH: **84.4 ft below TOC**	DEPTH TO WATER: (4/3/2017) **33.24 ft below TOC**
LOGGED BY: **AJP**	SAMPLING METHOD: **Continuous with 10 ft 4 in diameter core barrel**	DATE STARTED: **2/22/2017**	DATE COMPLETED: **2/23/2017**

Depth (feet)	USCS	Description	% REC
0	FILL	F LL, consisting of nepheline syenite gravel.	
	ML	SANDY CLAYEY S LT, orangish gray, less clay with depth, medium dense, dry to moist.	80
10	SM	S LTY SAND, yellowish orange transitioning to tan with depth, orange mottles, medium dense to loose, moist.	
			100
20	ML	SANDY CLAYEY S LT, light gray sandy silt with olive gray lenses of clay that increase with depth, medium stiff, moist. @ 20 ft, dark olive clay lenses interbedded with silt, very stiff, moist.	
		FAT CLAY, olive gray, with laminations of silt and very fine-grained sand, sand content decreases with depth, hard to very stiff, dry to somewhat moist.	100
30			
		@ 35 to 40 ft, sand content increases with depth, hard to very stiff, dry to somewhat moist.	100
40	CH	@ 40 ft, color changes from olive gray to dark olive.	
			100
50		@ 48 ft, color changes to dark olive gray.	
			100
60		@ 57 to 60 ft. transitions to FAT SANDY CLAY, hard to very stiff, dry to somewhat moist.	
		CLAYEY SAND to SILTY SAND, light gray to olive gray, dense, moist.	100
	SC/SM	@ 69 ft, very dark gray.	
70	CL	LEAN SANDY CLAY, gray to olive gray, fine-grained, varved, moist.	
	SC/SM	CLAYEY SAND to SILTY SAND, very dark gray to olive gray, laminated clayey sand and silty sand, fine-grained, dense to medium dense, wet.	100
80		@ 80 to 81 ft, clay lenses thicken with depth.	
	CH	FAT CLAY, olive gray clay with thin lenses of light gray fine-grained sand and silt, hard to very stiff, moist to somewhat dry.	100
90			
100			
110			
120			

Well Construction



- 0: Above ground completion includes 3x3 ft concrete pad, four pipe bollards, and locking outer steel casing.
- 0–10: 74.3 ft of 4 in Sch. 40 PVC including 3.0 ft of stickup (vented below cap)
- 0–20: Concrete cement from 0 to 4 ft bgs
- 20: Cement/bentonite grout from 4 to 25 ft bgs
- 30: ▼
- 50: Bentonite seal from 25 to 68 ft bgs
- 70: Silica size 20/40 filter pack from 68 to 81.4 ft bgs
- 70–80: 10 ft of 4 in dia. 0.010 in slot, Sch 40 PVC
- 80: 0.1 ft 4 in dia. Sch 40 PVC end cap
- 90: Drilling terminated at 90 ft bgs

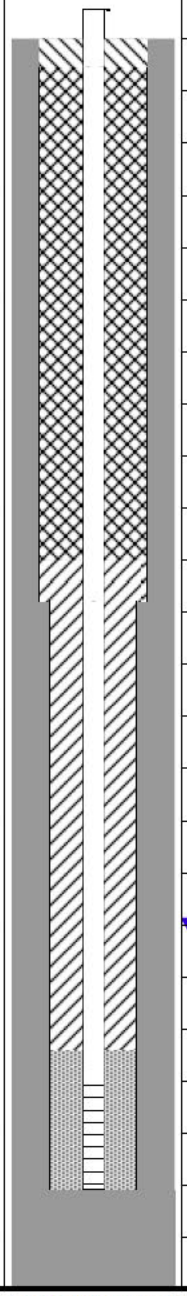
NOTES: Horizontal and vertical data are based on the Harmon Surveying report dated March 26, 2017 (AR State Plane NAD83 South and NAVD88).
* 10 in temporary outer casing was drilled to 25 ft bgs

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

ftn Associates Ltd. water resources / environmental consultants	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-112D**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-112D**	
	DRILLING CONTRACTOR: **Walker-Hill Environmental, Inc.**	NORTHING: **1949090.5**	EASTING: **1265440.9**
	DRILLING EQUIPMENT: **Geoprobe 8150LS**	GROUND ELEVATION: **375.5 ft**	TOC ELEVATION: **378.29 ft**
FTN Project # R07920-1516-001	DRILLING METHOD: **Sonic with 4x6 core and case ***	TOTAL WELL DEPTH: **113.3 ft below TOC**	DEPTH TO WATER: (4/3/2017) **87.93 ft below TOC**
LOGGED BY: **AJP/DLD**	SAMPLING METHOD: **Continuous with 10 ft 4 in diameter core barrel**	DATE STARTED: **2/12/2017**	DATE COMPLETED: **2/21/2017**

Depth (feet)	USCS	Description	% REC
0	FILL	F LL, consisting of nepheline syenite gravel.	
	ML/CL	S LT, brownish tan, rootlets, soft, moist.	
	CH	LEAN CLAY, light brown with rootlets and rounded gravel (~ 1 in), medium stiff, moist.	65
	ML	FAT CLAY, gray with reddish-brown mottles, very stiff, moist.	
10		S LT, light gray to tan with orange mottles, laminated with clayey silt and sandy silt, very stiff, dry to moist.	
	CH	FAT SANDY CLAY, light gray to olive gray, sand is very fine-grained, very stiff, moist. @ 12.5 to 13.5 ft, with organic matter. @ 13 5 ft, with dark brown sandy lenses and greenish gray silt lenses, very stiff, moist.	100
	SM	S LTY SAND, very fine-grained, light to dark brown, with iron oxide staining, few thin clay lenses, loose to medium dense, moist.	
20	CH/ML	FAT CLAY and SANDY S LT, olive gray fat clay laminated with greenish grey sandy silt. Clay layers are very stiff, silty sand layers are medium dense.	
	SM	S LTY SAND, very fine-grained, with some clay, dark brown with dark brown organic matter, medium stiff, moist.	100
	CH	FAT CLAY, olive gray transitioning to greenish gray with depth some sandy lenses, with dark brown organic matter/old roots, very dense, moist.	
30		S LTY SAND, very fine-grained, tan to brown with some iron oxide staining, dense, moist.	
	SM	@ 35 ft, olive gray to light gray, with small amounts of organic matter.	100
40		@ 39 ft, with some clay laminations.	
	ML	S LT, with very fine-grained sand, light grey, decreasing sand with depth, soft to stiff, moist.	100
50	CH/ML	@ 48 to 50 ft. increasing clay content medium stiff moist. FAT CLAY and S LT, olive gray fat clay with laminations of light gray sandy silt, medium stiff, moist.	
		FAT CLAY, olive gray with light gray silt lenses that decrease with depth, very stiff to hard, dry to somewhat moist.	100
60		@ 60 to 60.5 ft, blocky texture, organic matter.	
			100
70	CH	@ 70 ft, silt lenses thicken but become sparse, very stiff to hard, dry to somewhat moist.	
			100
80		@ 80 ft, homogeneous texture with no silt lenses.	
			100
90			
	SC	CLAYEY SAND, fine-grained, dark grey to olive gray, poorly graded, moist.	100
100	CH/CL	FAT CLAY to LEAN CLAY, olive gray with light gray silt lenses that thicken and decrease in frequency with depth, very stiff to hard, dry to somewhat moist.	
	SC/SM	CLAYEY SAND to SILTY SAND, fine-grained, very dark gray to olive gray, decreasing clay with depth, medium dense, moist to wet.	100
110	SM	S LTY SAND, light gray and poorly graded, very loose, moist to wet.	
	CH	FAT CLAY, olive gray with light gray silt lenses that decrease with depth, very stiff to hard, dry to somewhat moist.	100
120			

Well Construction



- Above ground completion includes 3x3 ft concrete pad, four pipe bollards, and locking outer aluminum casing.
- 103.2 ft of 4 in Sch. 40 PVC including 2.8 ft of stickup (vented below cap)
- Concrete cement from 0 to 2.7 ft bgs
- Cement/benontite grout from 2.7 to 50 ft bgs
- Bentonite seal from 50 to 97 ft bgs
- Silica size 20/40 filter pack from 97 to 111ft bgs
- 10 ft of 4 in dia. 0.010 in. slot, Sch 40 PVC.
- 0.1 ft 4 in dia. Sch 40 PVC end cap
- Drilling terminated at 120 ft bgs

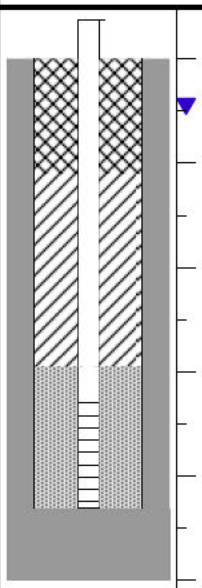
NOTES: Horizontal and vertical data are based on the Harmon Surveying report dated March 26, 2017 (AR State Plane NAD83 South and NAVD88).
* 10 in temporary outer casing was drilled to 54 ft bgs

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-113D**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-113D**	
	DRILLING CONTRACTOR: **Walker-Hill Environmental, Inc.**	NORTHING: **1947692.9**	EASTING: **1267429.5**
	DRILLING EQUIPMENT: **Geoprobe 8150LS**	GROUND ELEVATION: **301.7 ft**	TOC ELEVATION: **305.46 ft**
FTN Project # R07920-1516-001	DRILLING METHOD: **Sonic with 4x6 core and case**	TOTAL WELL DEPTH: **46.9 ft below TOC**	DEPTH TO WATER: (4/3/2017) **8.36 ft below TOC**
LOGGED BY: **AJP**	SAMPLING METHOD: **Continuous with 10 ft 4 in diameter core barrel**	DATE STARTED: **2/23/2017**	DATE COMPLETED: **2/24/2017**

Depth (feet)	USCS	Description	% REC
0	FILL	F LL, consisting of nepheline syenite gravel.	
		FAT CLAY, oxidized orange, laminated with light gray clayey fine-grained sandy silt, silt content increases with depth, rootlets, soft, very moist. @ 2.7 ft, SANDY CLAY, yellowish orange with lenses of fine-grained sandy silt that are light gray with bright orange mottling, very soft, moist.	70
10	CH	@ 15 ft, with fine-grained sand, tan with bright orange limonite stained silts and fine-grained sand, some subrounded to rounded fine-grained gravel to 17 ft, medium stiff, moist. @ 17 ft, color changes to very dark gray.	100
20		@ 22ft, dark olive gray with very little sand or silt, very hard, dry.	100
30	SC	CLAYEY SAND, dark olive gray with lenses of dark gray-green sand and light gray sand, dense, moist.	100
40	SM	S LTY SAND, fine-grained, olive gray with thin layers of clayey sand, loose to medium dense.	
	SC/SM	CLAYEY SAND to SILTY SAND, dark olive gray with lenses of dark gray-green sand and light gray sand, with organic matter and dark gray-green clay layers that increasing with depth, dense, moist.	100
	CH	FAT CLAY with sand, olive gray with lenses of light grey fine-grained sand and silt clay thickness increases with depth very stiff moist.	
50			
60			
70			
80			
90			
100			
110			
120			

Well Construction



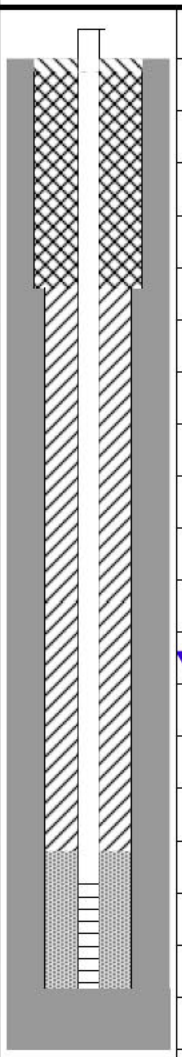
- 0: Above ground completion includes 3x3 ft concrete pad, four pipe bollards, and locking outer aluminum casing.
- 0–10: 36.8 ft of 4 in Sch 40 PVC including 3.8 ft of stickup (vented below cap)
- 0–11: Cement/benonite grout from 0 to 11 ft bgs
- 11–20: Bentonite seal from 11 to 29.5 ft bgs
- 29.5–43.5: Silica size 20/40 filter pack from 29.5 to 43.5 ft bgs
- 30–40: 10 ft of 4 in dia. 0.010 in slot, Sch 40 PVC
- 40–50: 0.1 ft 4 in dia. Sch 40 PVC end cap
- 50: Drilling terminated at 50 ft bgs

NOTES: Horizontal and vertical data are based on the Harmon Surveying report dated March 26, 2017 (AR State Plane NAD83 South and NAVD88).

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

ftn Associates Ltd. water resources / environmental consultants	PROJECT: **Monitoring Well Installations**	BORING ID: **MW-114D**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **MW-114D**	
	DRILLING CONTRACTOR: **Walker-Hill Environmental, Inc.**	NORTHING: **1949371**	EASTING: **1268520.5**
	DRILLING EQUIPMENT: **Geoprobe 8150LS**	GROUND ELEVATION: **347.3 ft**	TOC ELEVATION: **350.22 ft**
FTN Project # R07920-1516-001	DRILLING METHOD: **Sonic with 4x6 core and case ***	TOTAL WELL DEPTH: **92.2 ft below TOC**	DEPTH TO WATER: (4/3/2017) **60.55 ft below TOC**
LOGGED BY: **AJP/DLD**	SAMPLING METHOD: **Continuous with 10 ft 4 in diameter core barrel**	DATE STARTED: **2/8/2017**	DATE COMPLETED: **2/13/2017**

Depth (feet)	USCS	Description	% REC
0	FILL	F LL, consisting of nepheline syenite gravel.	30
10	SM	S LTY SAND, very fine-grained, brownish tan, with clay lenses, moist. @ 10 ft, with orange iron oxide stains.	100
20	ML	S LT, with very fine grained sand, tan with orange oxide stains, very moist to wet.	
		FAT CLAY, dark gray, medium stiff to soft, moist, some silt in the upper 1 5 ft. @ 21 5 ft, with thin laminations of gray silt, very stiff, moist.	100
30		@ 32 ft, very few to no silt laminations, very stiff, moist.	100
40		@ 40 ft, homogeneous texture.	100
50	CH		100
60			100
70		@ 68 5 ft, with very fine-grained sand. @ 70 ft, SANDY FAT CLAY, sand content increases with depth.	100
80	SM	S LTY SAND, very fine-grained, dark gray to dark olive gray, dense, very moist. @ 80 ft, silt content decreases with depth.	100
	SP-SM	POORLY GRADED SAND with SILT, fine-grained, dark gray, medium dense, very moist.	100
90	CH	FAT CLAY, dark gray, with some thin laminations of gray silt, very stiff, moist.	100
100			
110			
120			



Well Construction

- Above ground completion includes 3x3 ft concrete pad, four pipe bollards, and locking outer aluminum casing.
- 82.1 ft of 4 in Sch 40 PVC including 2.9 ft of stickup (vented below cap)
- Concrete cement from 0 to 1.2 ft bgs
- Cement/bentonite grout from 1.2 to 22 ft bgs
- Bentonite seal from 22 to 76 ft bgs
- Silica size 20/40 filter pack from 76 to 90 ft bgs
- 10 ft of 4 in dia. 0.010 in. slot, Sch 40 PVC
- 0.1 ft 4 in dia. Sch 40 PVC end cap
- Drilling terminated at 95 ft bgs

NOTES: Horizontal and vertical data are based on the Harmon Surveying report dated March 26, 2017 (AR State Plane NAD83 South and NAVD88).
* 10 in temporary outer casing was drilled to 22 ft bgs

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

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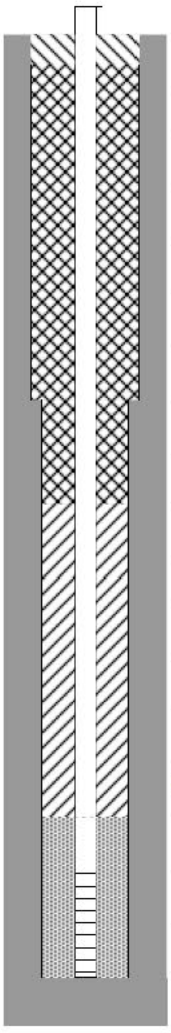
water resources / environmental consultants

FTN Project # R07920-1516-001

PROJECT: **Monitoring Well Installations**		BORING ID: **MW-115D**	
LOCATION: **Entergy White Bluff Landfill**		WELL ID: **MW-115D**	
DRILLING CONTRACTOR: **Walker-Hill Environmental, Inc.**		NORTHING: **1947569.4**	EASTING: **1265229.9**
DRILLING EQUIPMENT: **Geoprobe 8150LS**		GROUND ELEVATION: **358.5 ft**	TOC ELEVATION: **361.27 ft**
DRILLING METHOD: **Sonic with 4x6 core and case ***		TOTAL WELL DEPTH: **93.3 ft below TOC**	DEPTH TO WATER: (4/3/2017) **74.70 ft below TOC**
LOGGED BY: **AJP/DLD**	SAMPLING METHOD: **Continuous with 10 ft 4 in diameter core barrel**	DATE STARTED: **2/10/2017**	DATE COMPLETED: **2/13/2017**

Depth (feet)	USCS	Description	% REC
0	FILL	F LL, consisting of nepheline syenite gravel.	
	CL	LEAN CLAY, tan, highly and thinly laminated with light tan silt and very fine-grained sand, hard, dry.	46
10		S LTY SAND, very fine-grained, tan with orange mottles, some clay laminations in the upper first foot, soft, dry.	
	SM		40
20		S LT with fine-grained sand, light gray, highly laminated with clay with lenses of sandy silt (~ 6 in), stiff to soft, moist.	
	ML		100
30		FAT CLAY, olive gray, thinly laminated with light gray very fine-grained sand and silt, very stiff, dry.	
			86
40		@ 40 to 45 ft, decreasing laminations.	
		@ 45 to 50 ft, increased laminations of light gray very fine-grained sand and silt, very stiff, dry.	90
50	CH	@ 50 ft, no laminations.	
			100
60			
			100
70		@ 69 ft, FAT SANDY CLAY, olive gray, very stiff, dry.	
	SM/SC	S LTY SAND to CLAYEY SAND, fine-grained, dark gray to olive gray, very dense, moist.	100
80	CL/CH	LEAN SANDY CLAY to FAT SANDY CLAY, olive gray, very stiff, dry,	100
	SC	CLAYEY SAND, fine-grained, olive gray, very dense, moist.	
90	CH	FAT CLAY, highly laminated with light gray fine-grained sand and silt, very stiff, dry.	100
100			
110			
120			

Well Construction



Above ground completion includes 3x3 ft concrete pad, four pipe bollards, and locking outer aluminum casing.

83.2 ft of 4 in Sch 40 PVC including 2.7 ft stickup (vented below cap)

Concrete cement from 0 to 2.8 ft bgs

Cement/bentonite grout from 2.8 to 45 ft bgs

Bentonite seal from 45 to 75 ft bgs

Silica size 20/40 filter pack from 75 to 90 ft bgs

10 ft of 4 in dia. 0.010 in slot, Sch 40 PVC

0.1 ft 4 in dia. Sch 40 PVC end cap

Drilling terminated at 95 ft bgs

NOTES: Horizontal and vertical data are based on the Harmon Surveying report dated March 26, 2017 (AR State Plane NAD83 South and NAVD88).
* 10 in temporary outer casing was drilled to 35 ft bgs

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

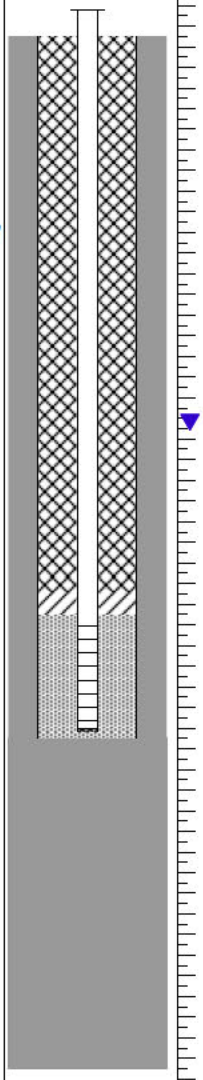
PROJECT: **Supplemental GHI**		BORING ID: **MW-118D**	
LOCATION: **Entergy White Bluff Landfill**		WELL ID: **MW-118D**	
DRILLING CONTRACTOR: **Tri-State Testing Services**		NORTHING **1949079.9 ft**	EASTING **1269297.5 ft**
DRILLING EQUIPMENT: **CME 750x (SN: 299708)**		GROUND ELEVATION: **326.2 ft**	TOC ELEVATION: **330.07 ft**
DRILLING METHOD: **8.25" Hollow Stem Auger (HSA)**		TOTAL DEPTH from TOC: **71.4 ft**	DEPTH TO WATER from TOC: **39.73 (2/12/2014)**
SAMPLING METHOD: **5-foot continous soil sampler**		DATE STARTED: **11/4/2013**	DATE COMPLETED: **11/5/2013**

FTN Associates Ltd. water resources / environmental consultants

FTN Project # R06040-0143-001

LOGGED BY: **DLD**

Depth (feet)	USCS	Description	% REC ST SPT
0	CL	LEAN CLAY, very silty, yellowish orange, stiff, dry. @ 1 5 ft bgs, color changes to very light grey with orange mottles. @ 3 ft bgs, orangish brown mottles.	100
		FAT CLAY, tan with orangish brown and reddish brown mottles, blocky texture, hard, dry.	100
10		@ 6 ft bgs, color changes to yellowish orange. @ 7 ft bgs, color changes to grayish tan to medium grey. Blocky texture, very stiff to hard, dry. @ 10 ft bgs, with orange mottles, blocky texture, very stiff to hard. @ 13 ft bgs, color changes to tan to dark tan, with silt partings.	ST 8-10' 100 100
20	CH	@ 20 ft bgs, color changes to dark tan to dark pinkish tan, blocky texture, very stiff, moist. @ 23 ft color is dark pinkish tan to reddish tan. @ 26 ft bgs, color changes to very dark grey. @ 28 ft bgs, with some very fine-grained sand partings, sand is dark grey, blocky texture, very stiff, moist.	ST 18-20' 100 100
30			100 100
40		@ 38 to 42 ft bgs, increased sand content. @ 43 to 45 ft bgs, laminated.	100 100 100
50	SC	CLAYEY SAND, dark grey, sand is very fine-grained, medium dense, moist to very moist. @ 53 ft bgs, wet and less clay.	6 -8- 11 100 100
60	SP	POORLY GRADED SAND, very fine-grained, with some silt and clay, dark grey, wet.	100 100
	CH	FAT CLAY, dark grey laminated with very light grey silt and very fine-grained sand, stiff, moist.	100
70			
80			
90			
100			
110			
120			



Well Construction

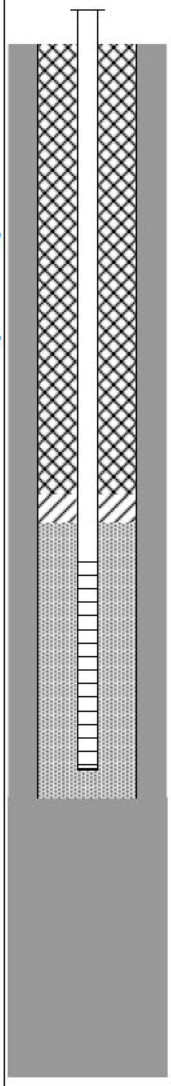
- Above ground wellhead completion including 2x2 ft concrete pad, four pipe bollards, and locking outer steel casing
- 61.0 ft of 2-inch dia., Sch. 40 PVC solid riser including 3.9 ft of stick up (vented below cap)
- Cement/Bentonite grout from 0 ft to 53.9 ft bgs
- Bentonite pellet seal (slow release) from 53.9 ft bgs to 56.0 ft bgs
- Sillica size 10/20 filter pack from 56.0 ft bgs to 68 ft bgs
- 10.0 ft of 2-inch dia., 0.010-inch slotted Sch. 40 PVC screen
- 0.35 ft, 2-inch dia., Sch. 40 PVC end cap
- Drilling terminated at 68 ft bgs

NOTES: Revised well construction detail based on survey after the addition of the above ground wellhead completion during July 2015.
Horizontal and vertical data based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)
ST - Shelby Tube. SPT - Standard Penetration Test

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

FTN Associates Ltd. water resources / environmental consultants	PROJECT: **Supplemental GHI**	BORING ID: **PZ-5**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **PZ-5**	
	DRILLING CONTRACTOR: **Tri-State Testing Services**	NORTHING **1947135.1 ft**	EASTING **1268229.8 ft**
	DRILLING EQUIPMENT: **CME 750x (SN: 299708)**	GROUND ELEVATION: **319.1 ft**	TOC ELEVATION: **322.81 ft**
FTN Project # R06040-0143-001	DRILLING METHOD: **8.25" Hollow Stem Auger (HSA)**	TOTAL DEPTH from TOC: **74.0 ft**	DEPTH TO WATER from TOC: **43.95 (2/12/2014)**
LOGGED BY: **DLD**	SAMPLING METHOD: **5-foot continous soil sampler**	DATE STARTED: **11/6/2013**	DATE COMPLETED: **11/6/2013**

Depth (feet)	USCS	Description	% REC ST SPT
0	CL	LEAN CLAY, very silty with some very fine-grained sand, light grey with orange mottles, medium stiff, dry. @ 1 5 ft bgs, color changes to very light grey with orange mottles.	100
	CL/CH	LEAN to FAT CLAY, more plastic with depth, silty with very-fine-grained sand, light grey to grey with orange mottles, very stiff, dry.	100
10	GC	@ 8 ft bgs clay is less plastic. CLAYEY GRAVEL, with coarse-grains sand, sand and fines are oxidized, gravel is up to 2-inches, sub-rounded, various colors. Dry to moist.	100
		FAT CLAY, tan becoming pinkish tan with depth, blocky texture, with some silt partings. very stiff to hard. @ 13 ft bgs, laminated with very light grey silt, clay has blocky texture, very stiff, moist.	100
20		@ 20 ft bgs, blocky texture with very few silt partings.	ST 18-20' 100
		@ 23 to 24 ft bgs, laminated, few silt partings, partings are oxidized.	80
30	CH	@ 30 to 30.5 ft bgs, with organic matter. @ 30.5 ft bgs, color changes to greenish grey to dark grey. @ 32.5 ft bgs, color changes to dark grey, very stiff, moist.	ST 28-30' 100
		@ 37 to 38 ft bgs, color changes to dark brownish grey. @ 38 ft bgs, color changes to dark grey, blocky texture, stiff, moist.	90
40		@ 40 ft bgs, with very fine-grained sand, very stiff to hard. @ 43 ft bgs, with few light grey silt partings.	100
		@ 49 ft bgs, SANDY (FAT) CLAY, sand is very fine-grained, dark grey, very stiff, moist.	100
50	SC	CLAYEY SAND, very fine-grained, dark grey, medium dense, moist.	100
	CH	FAT CLAY, with very fine-grained sand, dark grey, stiff to hard, moist.	100
60		CLAYEY SAND, very fine-grained, dark grey, medium dense, moist. @ 63 to 68 ft bgs, highly laminated with light grey silt, and greenish grey fat clay.	80
	SC		100
70	CH	FAT CLAY, dark grey, highly laminated with light grey silt, very stiff, moist.	100
80			
90			
100			
110			
120			



Above ground wellhead completion including 2x2 ft concrete pad, four pipe bollards, and locking outer steel casing

53.6 ft of 2-inch dia., Sch. 40 PVC solid riser including 3.7 ft of stick up (vented below cap)

Cement/Bentonite grout from 0 ft to 43.6 ft bgs

Bentonite pellet seal (slow release) from 43.6 ft bgs to 46.3 ft bgs

Sillica size 10/20 filter pack from 46.3 ft bgs to 73 ft bgs

20.0 ft of 2-inch dia., 0.010-inch slotted Sch. 40 PVC screen

0.35 ft, 2-inch dia., Sch. 40 PVC end cap
Drilling terminated at 73 ft bgs

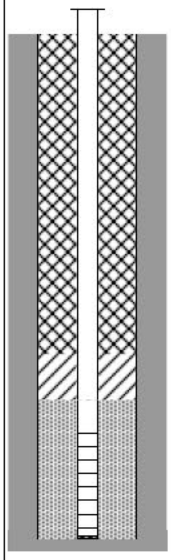
NOTES: Revised well construction detail based on survey after the addition of the above ground wellhead completion during July 2015.
Horizontal and vertical data based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)
ST - Shelby Tube. SPT - Standard Penetration Test

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

FTN Associates Ltd. water resources / environmental consultants	PROJECT: **Supplemental GHI**	BORING ID: **PZ-7**	
	LOCATION: **Entergy White Bluff Landfill**	WELL ID: **PZ-7**	
	DRILLING CONTRACTOR: **Tri-State Testing Services**	NORTHING **1948088.1 ft**	EASTING **1269806.2 ft**
	DRILLING EQUIPMENT: **CME 750x (SN: 299708)**	GROUND ELEVATION: **300.5 ft**	TOC ELEVATION: **304.10 ft**
FTN Project # R06040-0143-001	DRILLING METHOD: **8.25" Hollow Stem Auger (HSA)**	TOTAL DEPTH from TOC: **51.2 ft**	DEPTH TO WATER from TOC: **25.35 (2/12/2014)**
LOGGED BY: **DLD**	SAMPLING METHOD: **5-foot continous soil sampler**	DATE STARTED: **11/5/2013**	DATE COMPLETED: **11/5/2013**

Depth (feet)	USCS	Description	% REC ST SPT
0	FILL	FILL - TOP SOIL	
		FAT CLAY, tan with orange mottles, blocky texture, very stiff, dry.	100
		@ 3 ft bgs, with some silt, color changes to dark pinkish tan with orange mottles, blocky texture, very stiff to hard, dry.	100
10		@ 8 to 12 ft bgs, with very fine-grained sand. (Attempted to collect Shelby tube sample at 13 to 15 ft bgs, sampler broke off in bore hole due to very stiff clays. Poor recovery to depth of borehole due to interference of the broken tube).	100
	CH		50
20			60
		@ 22 ft bgs, color changed to dark grey, very stiff, moist.	15 -8- 7
		@ 24.5 ft bgs, with very fine-grained sand.	70
		@ 28 ft bgs, SANDY (FAT) CLAY, sand is very dark grey, dark grey, medium stiff, very moist.	65
30			
		CLAYEY SAND, dark grey, sand is very fine-grained, medium dense, saturated.	65
40	SC		20
			20
50			
60			
70			
80			
90			
100			
110			
120			

Well Construction



- Above ground wellhead completion including 2x2 ft concrete pad, four pipe bollards, and locking outer steel casing
- 40.8 ft of 2-inch dia., Sch. 40 PVC solid riser including 3.6 ft of stick up (vented below cap)
- Cement/Bentonite grout from 0 ft to 31.0 ft bgs
- Bentonite pellet seal (slow release) from 31.0 ft bgs to 35.4 ft bgs
- Sillica size 10/20 filter pack from 35.4 ft bgs to 48 ft bgs
- 10.0 ft of 2-inch dia., 0.010-inch slotted Sch. 40 PVC screen
- 0.35 ft, 2-inch dia., Sch. 40 PVC end cap
- Drilling terminated at 48 ft bgs

NOTES: Revised well construction detail based on survey after the addition of the above ground wellhead completion during July 2015.
Horizontal and vertical data based on survey conducted by Harmon Surveying, September 2015 (AR State Plane NAD83 and NAVD88)
ST - Shelby Tube. SPT - Standard Penetration Test

Borehole and/or well IDs were updated to reflect the nomenclature used for EPA CCR Rule network.

Geotechnical Data

ENTERGY WHITE BLUFF PLANT WELL ID NUMBER KEY.

EPA CCR Well ID on Site Map	Well ID on Geotechnical Data Test Forms[a]
MW-101S	MW-1S
MW-101D	MW-1D
MW-102S/MW-102D[b]	MW-2S/MW-2D
MW-103S/MW-103D[b]	MW-3S/MW-3D
MW-104S/MW-104D[b]	MW-4S/MW-4D
MW-105S/MW-105D[b]	MW-5S/MW-5D
MW-106S/MW-106D[b]	MW-6S/MW-6D
MW-107D	MW-7D
MW-108D	MW-8D
MW-109D	MW-9D
MW-110S/MW-110D[b]	MW-10S/MW-10D
MW-111S	MW-11S
MW-112D	MW-12D
MW-113D	MW-13D
MW-114D	MW-14D
MW-115D	MW-15D
MW-118D	PZ-8

Notes:

a. Geotechnical soil samples were collected and tested using well IDs associated with the landfill's ADEQ solid waste permit (Permit No. 0199-S3N-R3).

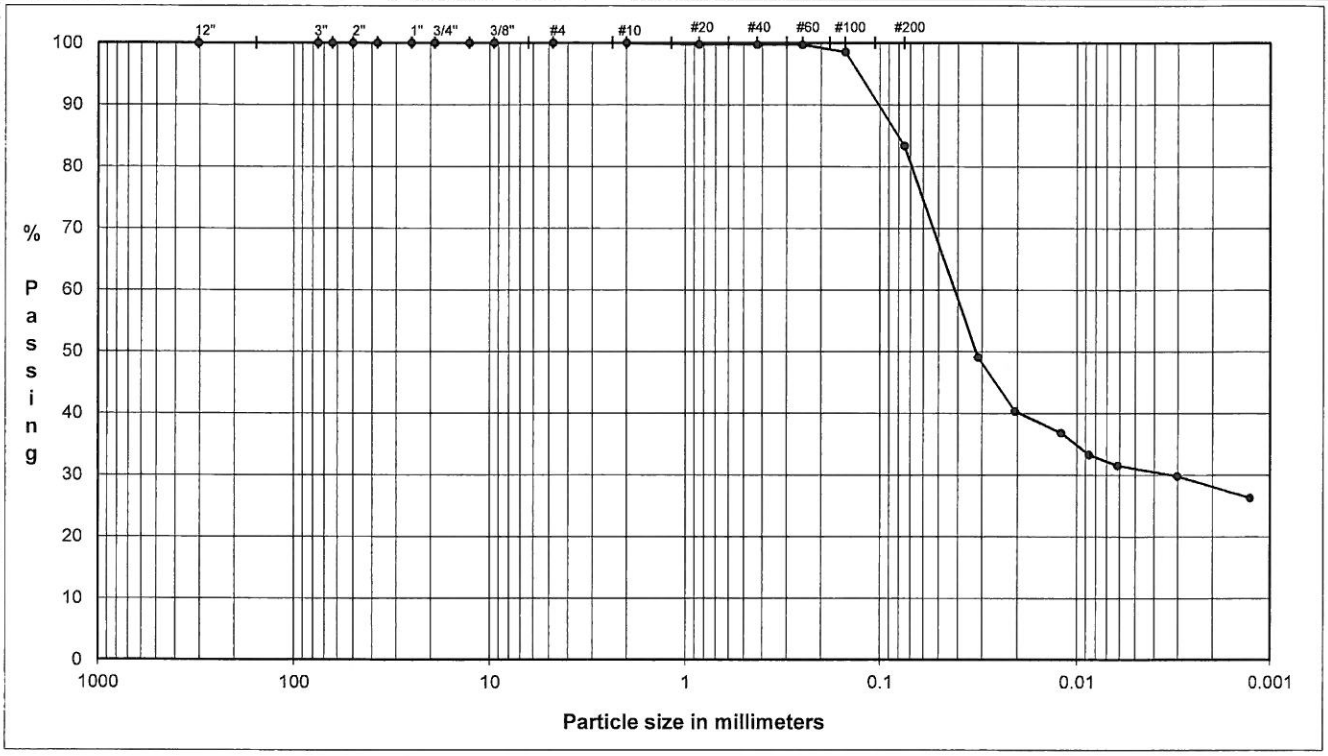
b. Well cluster consisting of two closely spaced wells with different depths. Due to scale, these are represented as one well on the site map.

DECEMBER 2013 1303118

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-9** Depth: **5.0-7.0'**
TYPE: **Bag**



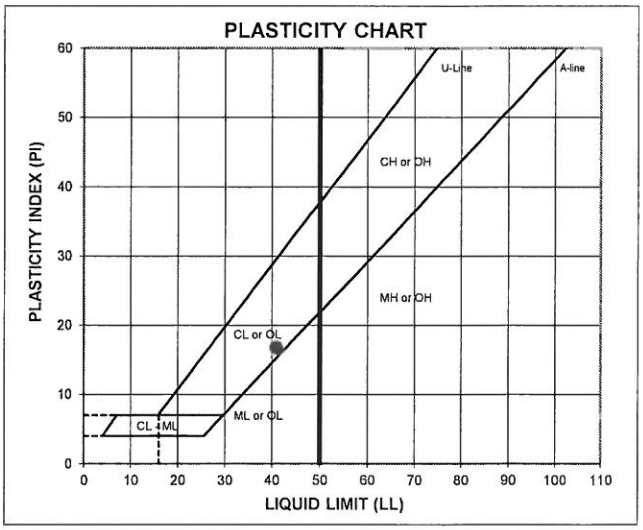
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**100.0**	Coarse Sand	**0.0**
#20	0.85	**99.8**		
#40	0.43	**99.8**	Medium Sand	**0.2**
#60	0.25	**99.7**		
#100	0.15	**98.6**		
#200	0.075	**83.4**	Fine Sand	**16.4**

Hydrometer Analysis

(mm)	%Finer		
0.031	**49.1**		
0.021	**40.3**		
0.012	**36.8**	Fines	
0.0087	**33.3**	Silt or Clay	**83.4**
0.0062	**31.6**		
0.0030	**29.8**		
0.0013	**26.3**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
27.6	41	24	17	0.23

LL (oven-dried) / 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy SILTY CLAY, fine to medium; yellow and pale brown.

USCS: CL

TECH	AM/TJ
DATE	12/30/13
CHECK	CDM
REVIEW	MW.4
APPROVE	

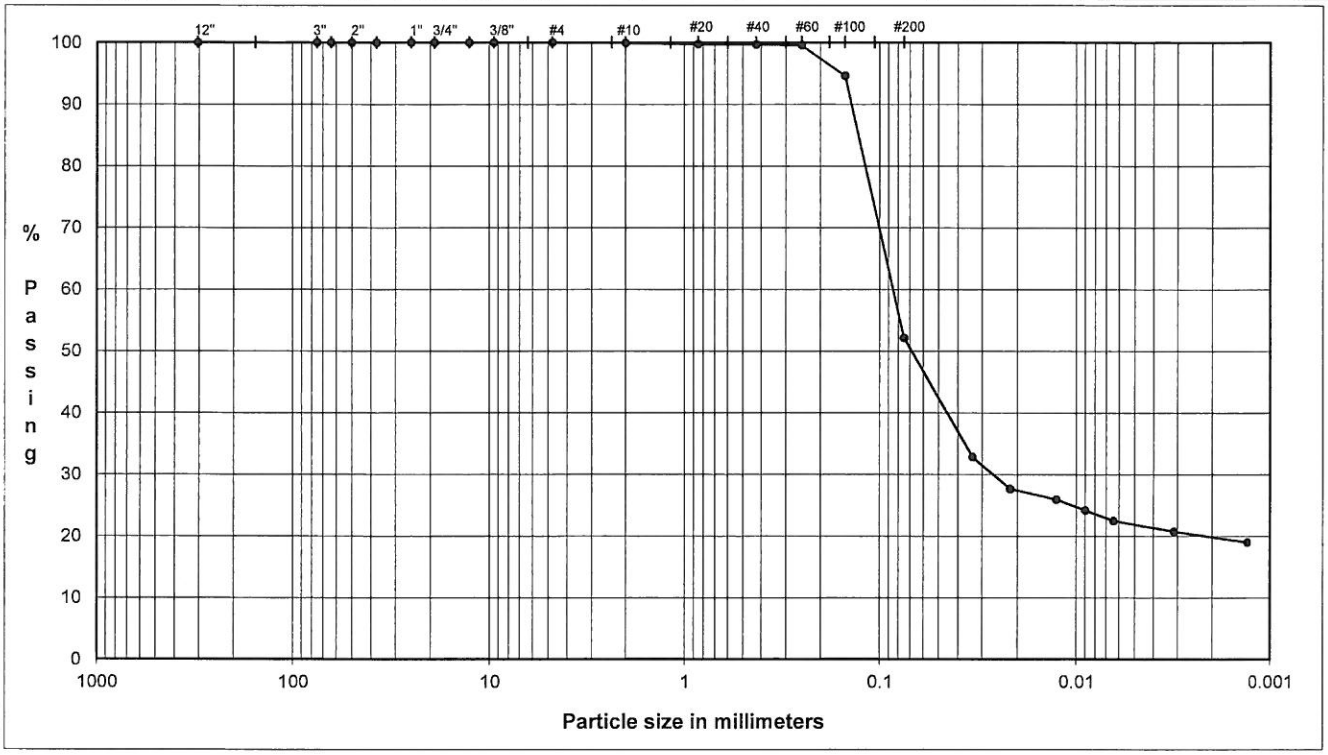
Golder Associates Inc.

DECEMBER 2013 1303118

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-9** Depth: **13.0-18.0'**
TYPE: **Bulk**



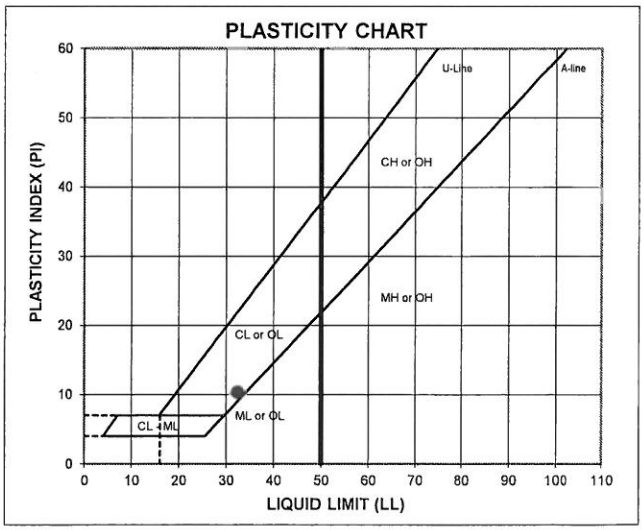
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**99.9**	Coarse Sand	**0.1**
#20	0.85	**99.8**		
#40	0.43	**99.7**	Medium Sand	**0.3**
#60	0.25	**99.6**		
#100	0.15	**94.6**		
#200	0.075	**52.2**	Fine Sand	**47.5**

Hydrometer Analysis

(mm)	%Finer		
0.034	**32.8**		
0.022	**27.7**		
0.013	**25.9**	Fines	
0.0090	**24.2**	Silt or Clay	**52.2**
0.0064	**22.5**		
0.0031	**20.7**		
0.0013	**19.0**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
30.3	**32**	**22**	**10**	**0.77**

LL (oven-dried) / 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SILTY CLAY and fine to coarse SAND; yellowish brown.

USCS: CL

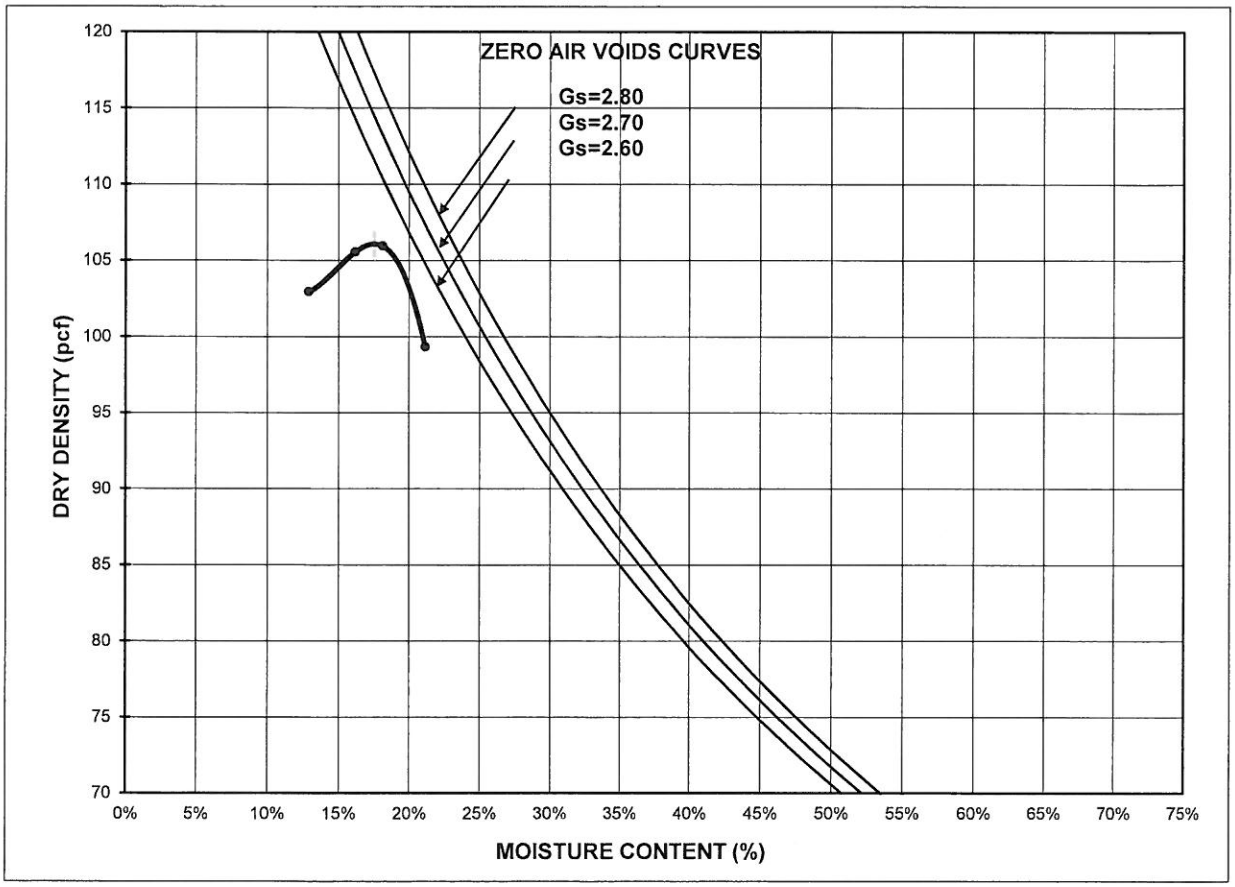
TECH SJ/AM
DATE 12/27/13
CHECK
REVIEW
APPROVE

Golder Associates Inc.

MOISTURE / DRY DENSITY CURVE
ASTM D 698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
PROJECT NUMBER: **1303118**
SAMPLE ID: **FTN B-9** - DEPTH: **13.0-18.0'** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	102.9	12.9%
2	105.5	16.2%
3	105.9	18.1%
4	99.3	21.1%

Maximum Dry Density (pcf)	106.0
Optimum Moisture (%)	17.5
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	30.3%
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	

DESCRIPTION SILTY CLAY and fine to coarse SAND; yellowish brown.

USCS CL

CHECK aem
REVIEW [illegible]
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF LF/AR		Board #	3	COMMENTS: The sample was remolded to 95.5% of the Maximum Dry Density and OPTM + 2.8% (using ASTM D 698).
PROJECT NUMBER	1303118		Flow Pump	1	
SAMPLE ID	FTN B-9	13.0-18.0'	Flow Pump Speed	7	
SAMPLE TYPE	Bulk		Technician	TW	

Sample Data, Initial				Sample Data, Final	
Height, inches	2.994	B-Value, f	0.98	Height, inches	3.017
Diameter, inches	2.790	Cell Pres.	90.0	Diameter, inches	2.798
Area, cm^2	39.44	Bot. Pres.	80.0	Area, cm^2	39.67
Volume, cm^3	299.95	Top Pres.	80.0	Volume, cm^3	303.99
Mass, g	585.14	Tot. B.P.	80.0	Mass, g	598.49
Moisture Content, %	20.3	Head, max.	104.10	Moisture Content, %	23.01
Dry Density, pcf	101.2	Head, min.	104.10	Dry Density, pcf	99.87
Spec. Gravity(assumed)	2.700	Max. Grad.	13.58	Volume Solids, cm^3	180.20
Volume Solids, cm^3	180.20	Min. Grad.	13.58	Volume Voids, cm^3	123.79
Volume Voids, cm^3	119.75			Void Ratio	0.69
Void Ratio	0.66			Saturation, %	90.4%
Saturation, %	82.3%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	585.14	606.45
Wt Soil & Tare, f	g	486.55	494.56
Wt Tare	g	0.00	8.21
Wt Moisture Lost	g	98.59	111.89
Wt Dry Soil	g	486.55	486.35
Water Content	%	20.26%	23.01%

Flow Pump Rate: 2.35E-04 cm^3/sec

USCS: CL

DESCRIPTION: SILTY CLAY and fine to coarse SAND; yellowish brown.

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
01/03/14	41642	9	45	21.3	0	0	0	0	1.48	104.10	13.58	4.2E-07
01/03/14	41642	9	50	21.3	5	5	300	300	1.48	104.10	13.58	4.2E-07
01/03/14	41642	9	55	21.3	5	10	300	600	1.48	104.10	13.58	4.2E-07
01/03/14	41642	10	0	21.3	5	15	300	900	1.48	104.10	13.58	4.2E-07 *
01/03/14	41642	10	5	21.3	5	20	300	1200	1.48	104.10	13.58	4.2E-07 *
01/03/14	41642	10	10	21.3	5	25	300	1500	1.48	104.10	13.58	4.2E-07 *
01/03/14	41642	10	15	21.3	5	30	300	1800	1.48	104.10	13.58	4.2E-07 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

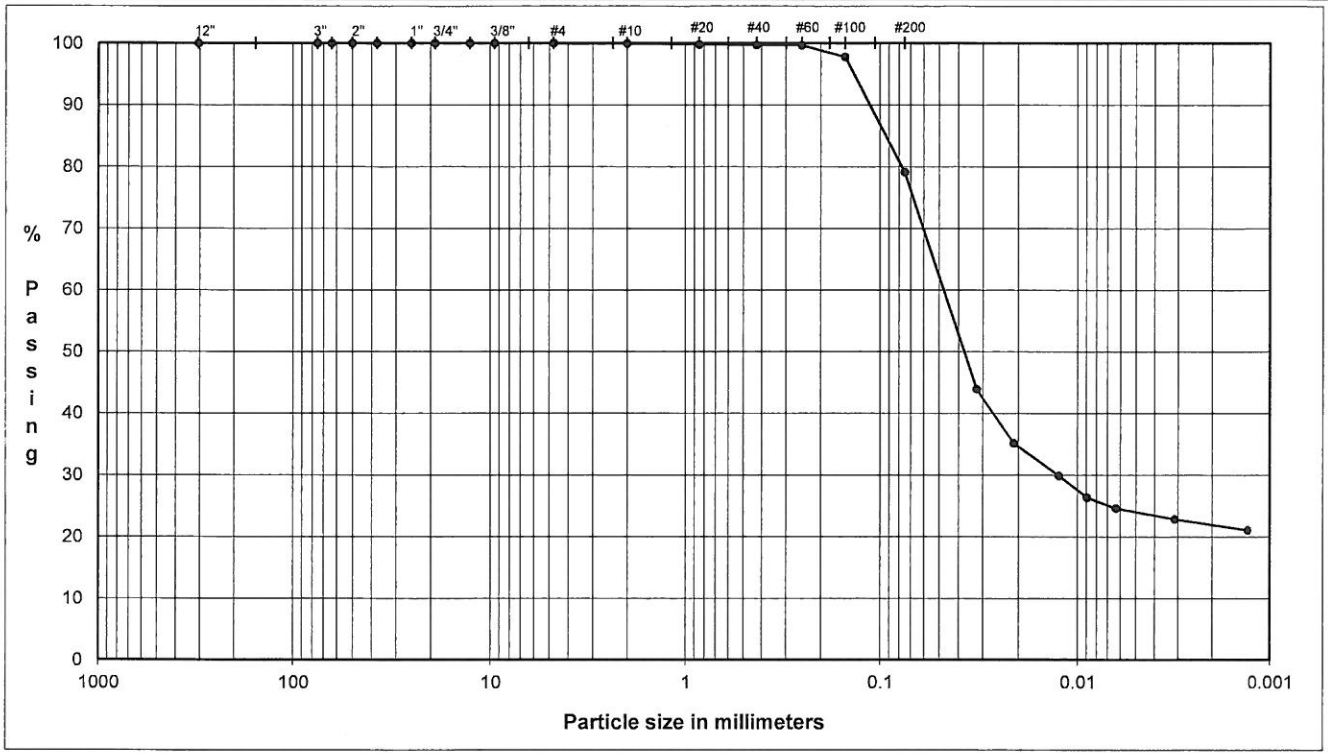
PERMEABILITY REPORTED AS ** 4.2E-07 cm/sec **

DATE	1/3/14
CHECK	alm
REVIEW	[illegible]
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-9** Depth: **23.0-28.0'**
TYPE: **Bulk**



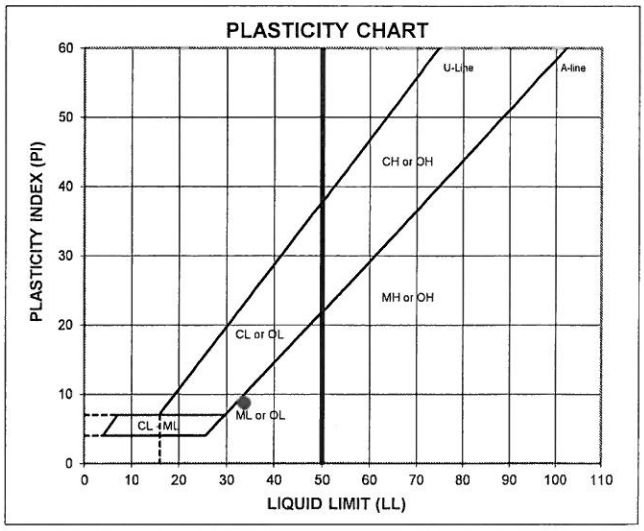
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**100.0**	Coarse Sand	**0.0**
#20	0.85	**99.8**		
#40	0.43	**99.7**	Medium Sand	**0.2**
#60	0.25	**99.7**		
#100	0.15	**97.8**		
#200	0.075	**79.1**	Fine Sand	**20.6**

Hydrometer Analysis

(mm)	%Finer		
0.032	**43.9**		
0.021	**35.1**		
0.012	**29.9**	Fines	
0.0090	**26.4**	Silt or Clay	**79.1**
0.0064	**24.6**		
0.0031	**22.8**		
0.0013	**21.1**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
33.7	**34**	**25**	**9**	**0.99**

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy CLAYEY SILT, fine to medium; grayish brown.

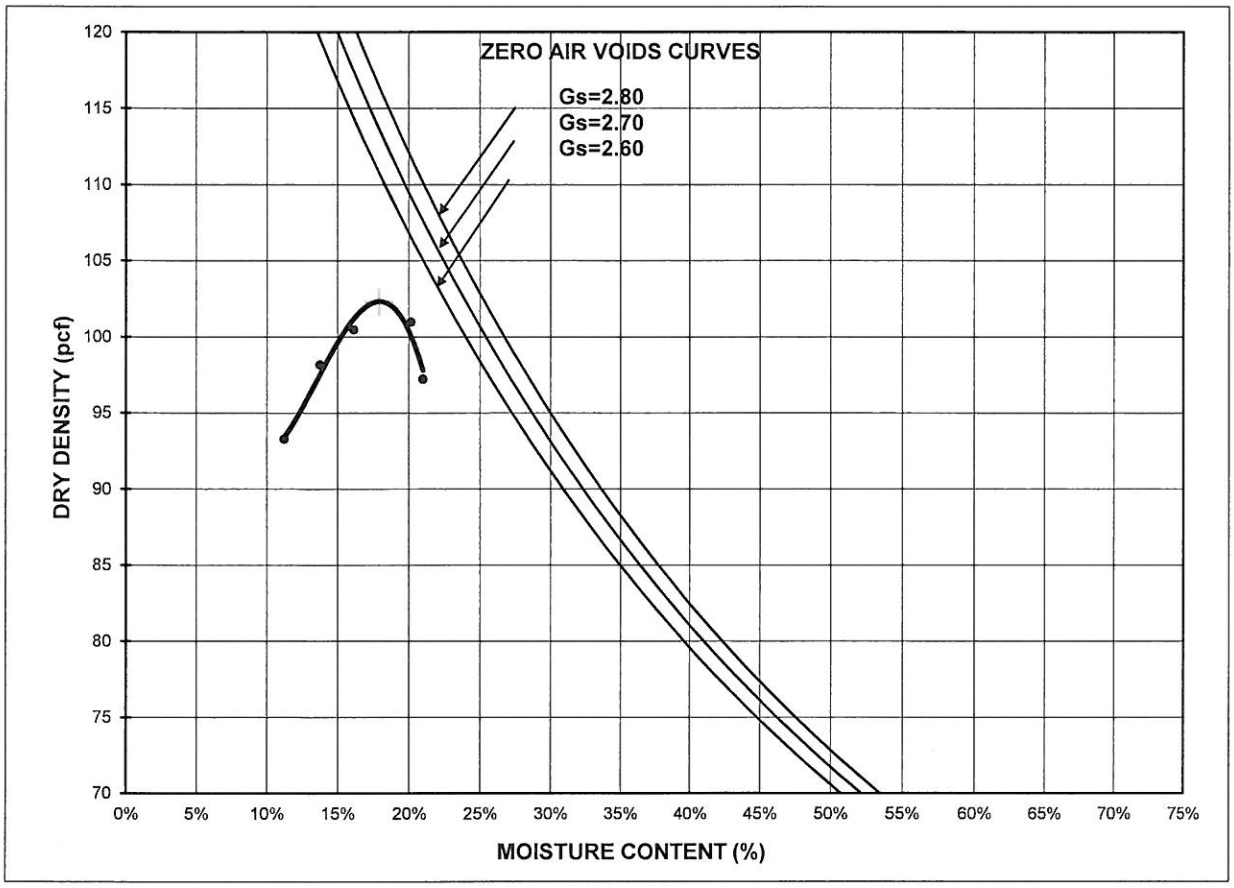
USCS: ML

TECH	SJ/AM
DATE	12/27/13
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D 698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
PROJECT NUMBER: **1303118**
SAMPLE ID: **FTN B-9** - DEPTH: **23.0-28.0'** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	93.3	11.2%
2	98.1	13.8%
3	100.5	16.1%
4	101.0	20.1%
5	97.2	21.0%

Maximum Dry Density (pcf)	**102.3**
Optimum Moisture (%)	**17.9**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**33.7%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	

DESCRIPTION sandy CLAYEY SILT, fine to medium; grayish brown.

USCS ML

CHECK QWM
REVIEW MWG
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF LF/AR		Board #	5	COMMENTS: The sample was remolded to 95.0% of the Maximum Dry Density and OPTM + 3.3% (using ASTM D 698).
PROJECT NUMBER	1303118		Flow Pump	1	
SAMPLE ID	FTN B-9	23.0-28.0'	Flow Pump Speed	5	
SAMPLE TYPE	Bulk		Technician	TW	

Sample Data, Initial				Sample Data, Final	
Height, inches	2.988	B-Value, f	1.00	Height, inches	3.010
Diameter, inches	2.790	Cell Pres.	90.0	Diameter, inches	2.801
Area, cm²	39.44	Bot. Pres.	80.0	Area, cm²	39.75
Volume, cm³	299.35	Top Pres.	80.0	Volume, cm³	303.94
Mass, g	564.75	Tot. B.P.	80.0	Mass, g	584.40
Moisture Content, %	21.2	Head, max.	76.67	Moisture Content, %	25.38
Dry Density, pcf	97.2	Head, min.	76.67	Dry Density, pcf	95.70
Spec. Gravity(assumed)	2.700	Max. Grad.	10.03	Volume Solids, cm³	172.64
Volume Solids, cm³	172.64	Min. Grad.	10.03	Volume Voids, cm³	131.30
Volume Voids, cm³	126.72			Void Ratio	0.76
Void Ratio	0.73			Saturation, %	90.1%
Saturation, %	77.8%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	564.75	592.42
Wt Soil & Tare, f	g	466.12	474.19
Wt Tare	g	0.00	8.29
Wt Moisture Lost	g	98.63	118.23
Wt Dry Soil	g	466.12	465.90
Water Content	%	21.16%	25.38%

Flow Pump Rate: 1.26E-03 cm³/sec

USCS: ML

DESCRIPTION: sandy CLAYEY SILT, fine to medium; grayish brown.

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
01/03/14	41642	11	50	21.3	0	0	0	0	1.09	76.67	10.03	3.1E-06
01/03/14	41642	11	55	21.3	5	5	300	300	1.09	76.67	10.03	3.1E-06
01/03/14	41642	12	0	21.3	5	10	300	600	1.09	76.67	10.03	3.1E-06
01/03/14	41642	12	5	21.3	5	15	300	900	1.09	76.67	10.03	3.1E-06 *
01/03/14	41642	12	10	21.3	5	20	300	1200	1.09	76.67	10.03	3.1E-06 *
01/03/14	41642	12	15	21.3	5	25	300	1500	1.09	76.67	10.03	3.1E-06 *
01/03/14	41642	12	20	21.3	5	30	300	1800	1.09	76.67	10.03	3.1E-06 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

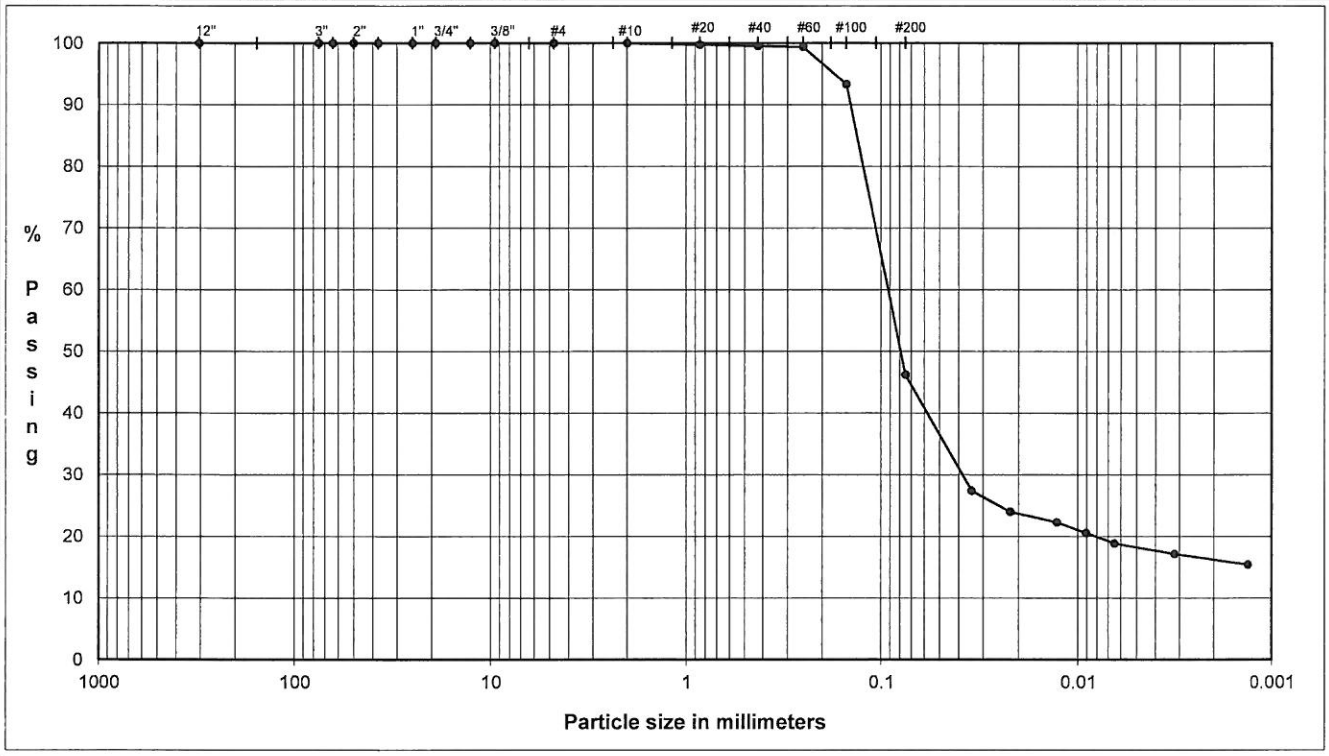
PERMEABILITY REPORTED AS ** 3.1E-06 cm/sec **

DATE	1/3/14
CHECK	DEM
REVIEW	MM
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-10** Depth: **3.0-8.0'**
TYPE: **Bulk**



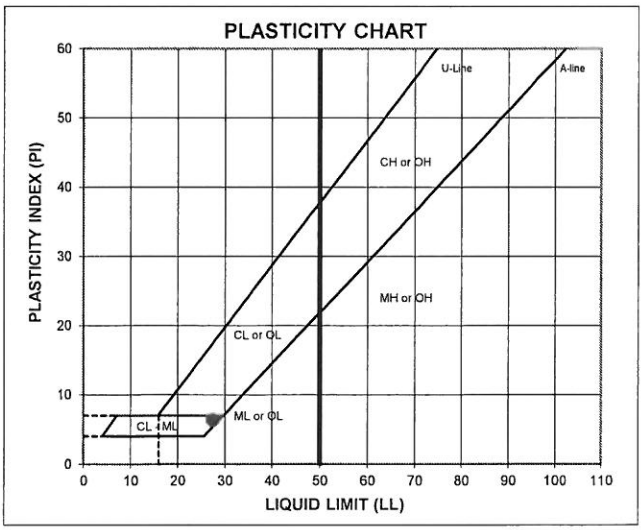
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.8		
#40	0.43	99.6	Medium Sand	0.4
#60	0.25	99.4		
#100	0.15	93.3		
#200	0.075	46.2	Fine Sand	53.3

Hydrometer Analysis

(mm)	%Finer		
0.034	27.4		
0.022	24.0		
0.013	22.3	Fines	
0.0091	20.5	Silt or Clay	46.2
0.0065	18.8		
0.0032	17.1		
0.0013	15.4		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
27.3	27	21	6	0.97

LL (oven-dried) / <0.75 = ORGANIC (OL/OH)

DESCRIPTION: CLAYEY SAND to SILTY SAND, fine to medium; brown.

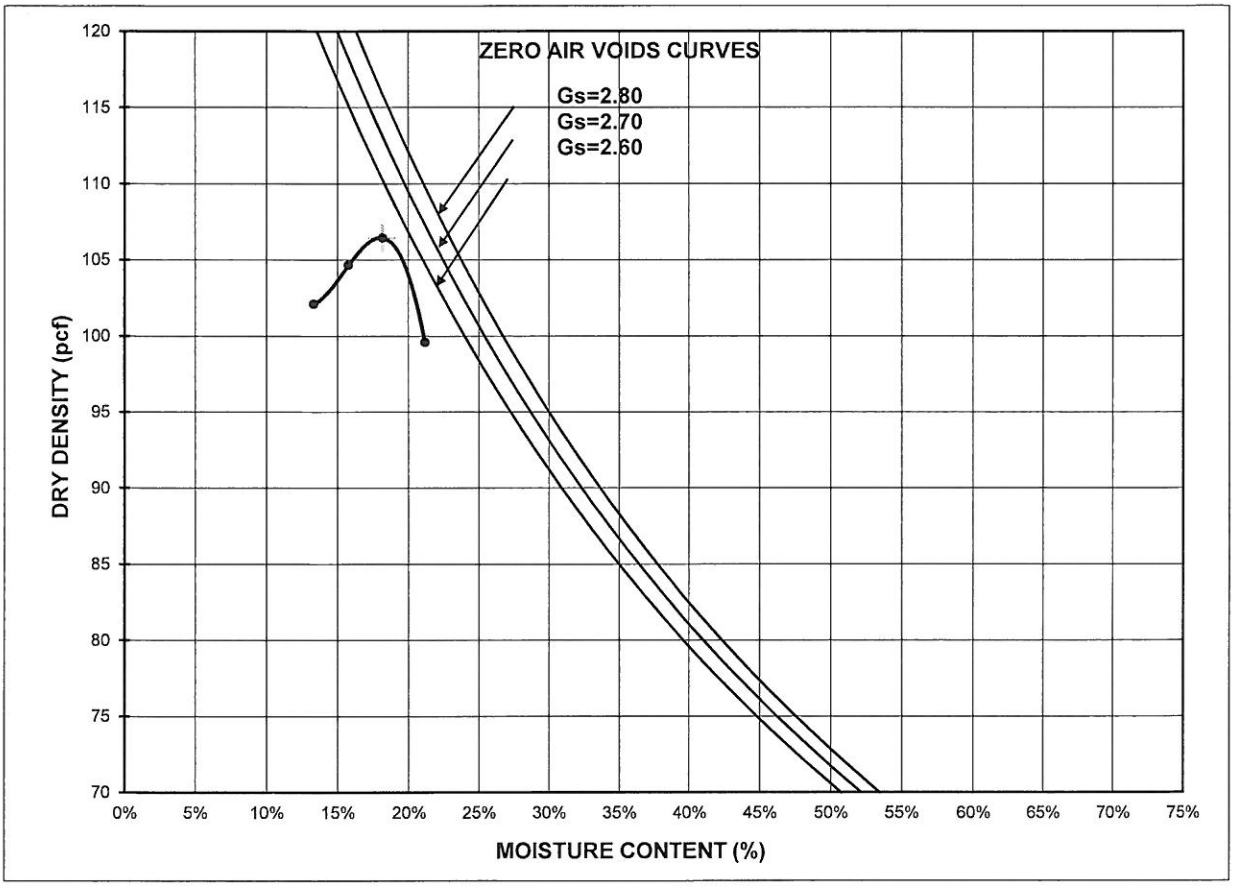
USCS: SC-SM

TECH	SJ/AM
DATE	12/27/13
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D 698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
PROJECT NUMBER: **1303118**
SAMPLE ID: **FTN B-10** - DEPTH: **3.0-8.0'** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	102.1	13.3%
2	104.6	15.8%
3	106.4	18.2%
4	99.6	21.1%

Maximum Dry Density (pcf)	**106.4**
Optimum Moisture (%)	**18.2**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**27.3%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	

DESCRIPTION CLAYEY SAND to SILTY SAND, fine to medium; brown.

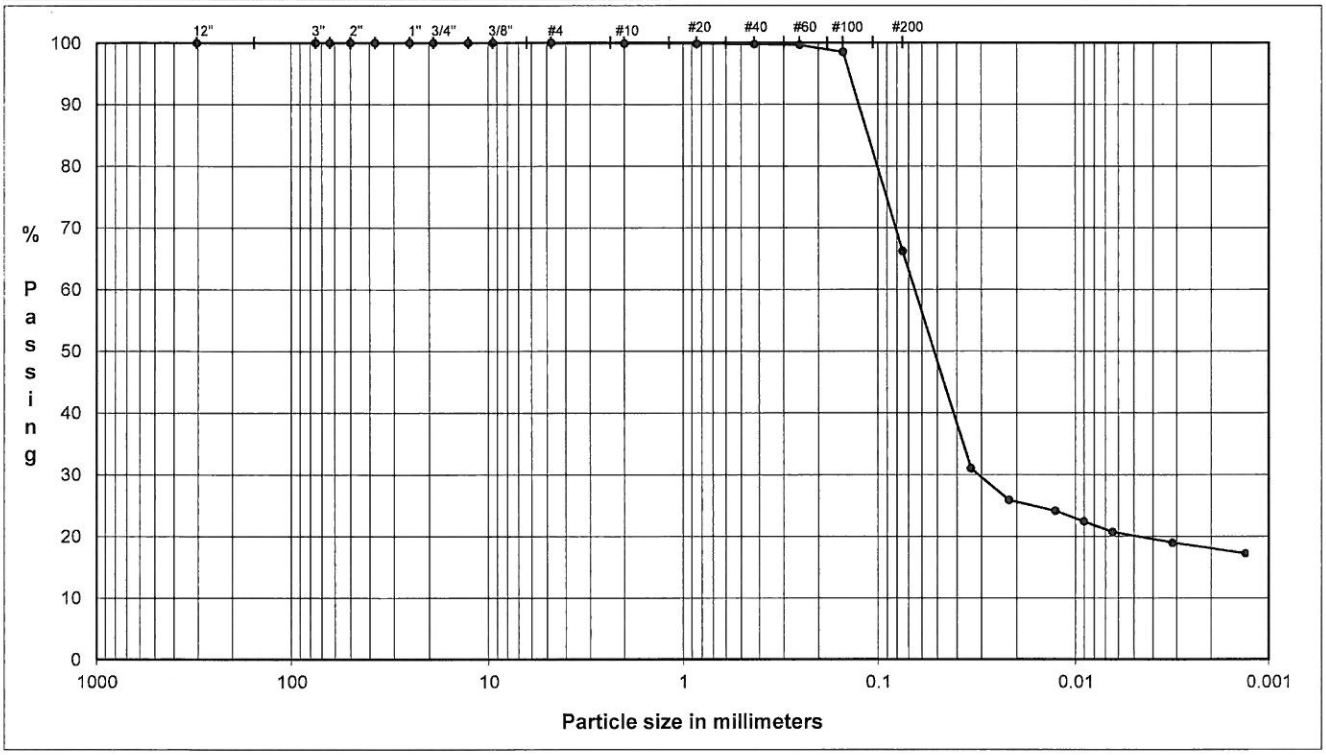
USCS SC-SM

CHECK aem
REVIEW AWG
APPROVE

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-10** Depth: **13.0-18.0'**
TYPE: **Bulk**



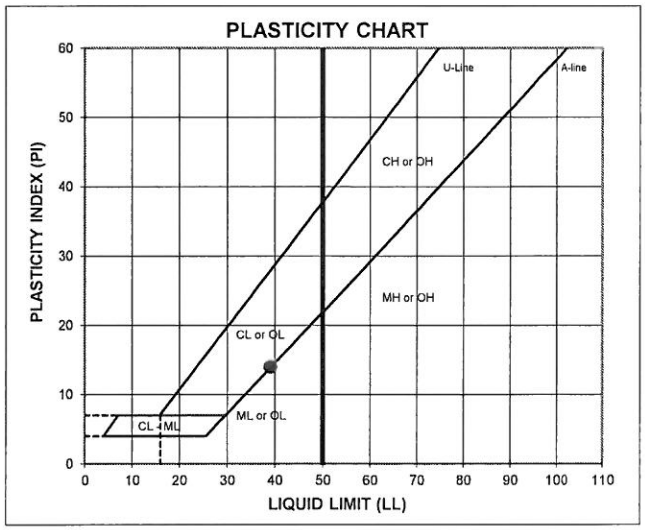
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**99.9**	Coarse Sand	**0.1**
#20	0.85	**99.9**		
#40	0.43	**99.8**	Medium Sand	**0.1**
#60	0.25	**99.7**		
#100	0.15	**98.5**		
#200	0.075	**66.3**	Fine Sand	**33.5**

Hydrometer Analysis

(mm)	%Finer		
0.034	**31.0**		
0.022	**25.9**		
0.013	**24.1**	Fines	
0.0091	**22.4**	Silt or Clay	**66.3**
0.0064	**20.7**		
0.0032	**19.0**		
0.0013	**17.2**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
31.5	**39**	**25**	**14**	**0.43**

LL (oven-dried) / 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy SILTY CLAY, fine to coarse; gray.

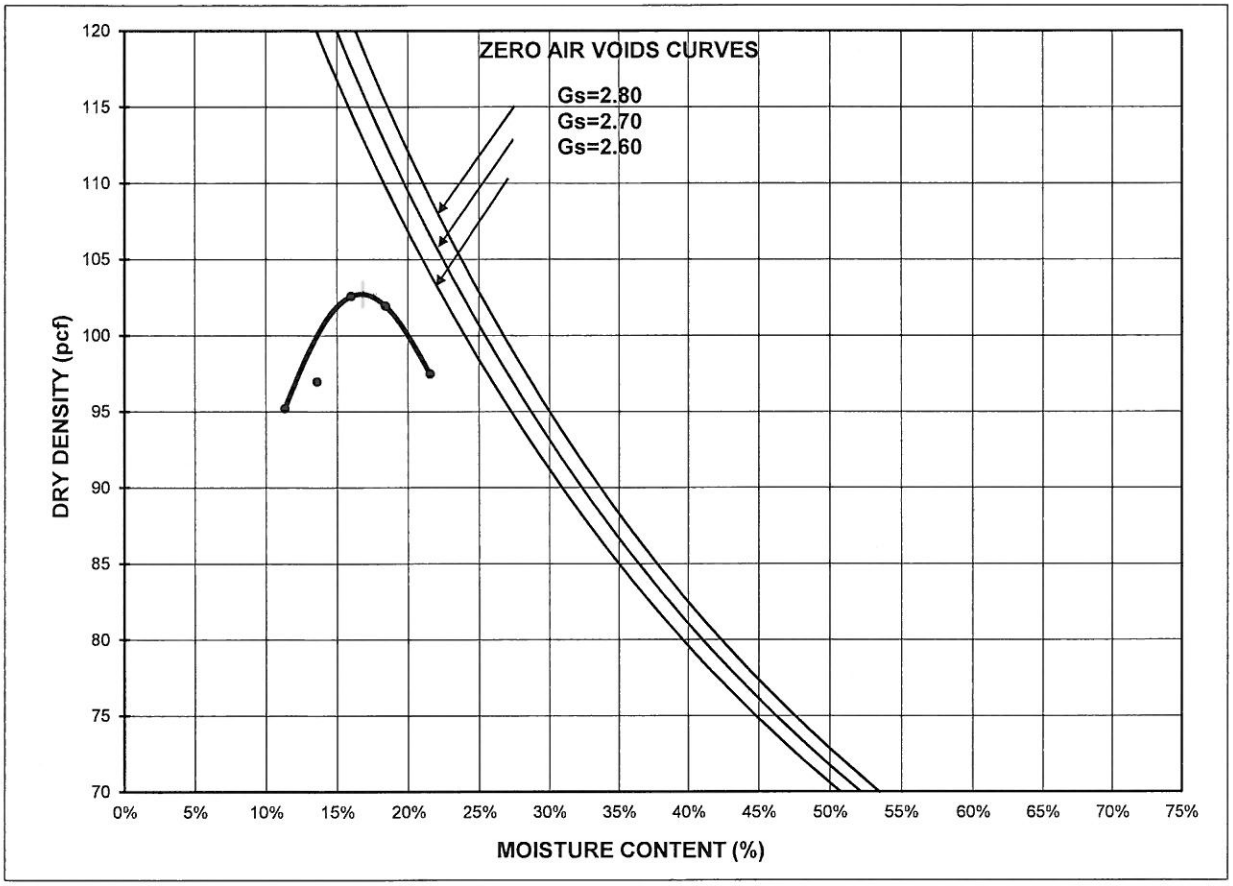
USCS: CL

TECH	TJ/AM
DATE	12/27/13
CHECK	aem
REVIEW	AWY
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D 698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
PROJECT NUMBER: **1303118**
SAMPLE ID: **FTN B-10** - DEPTH: **13.0-18.0'** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	95.2	11.3%
2	96.9	13.6%
3	102.6	16.0%
4	101.9	18.4%
5	97.5	21.5%

Maximum Dry Density (pcf)	**102.7**
Optimum Moisture (%)	**16.8**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**31.5%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	

DESCRIPTION sandy SILTY CLAY, fine to coarse; gray.

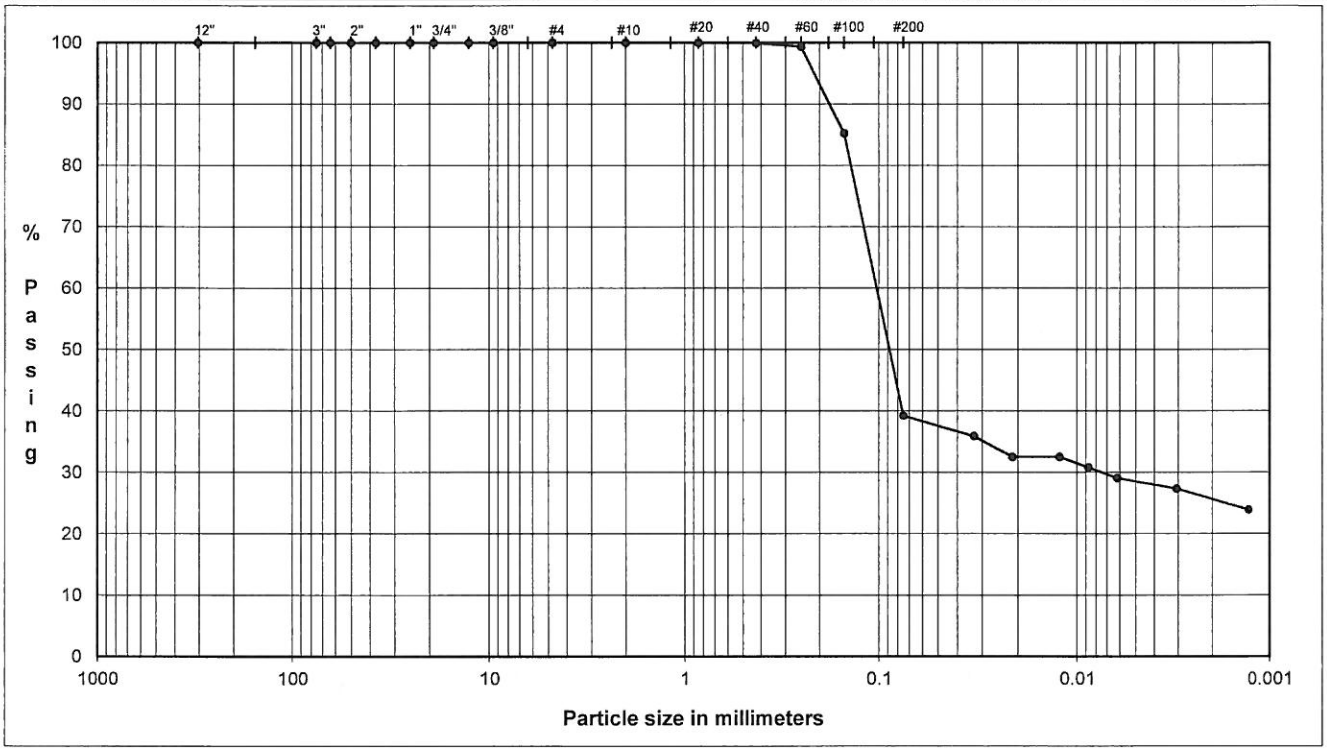
USCS CL

CHECK aem
REVIEW [illegible]
APPROVE

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-10** Depth: **69.0-74.0'**
TYPE: **Bag**



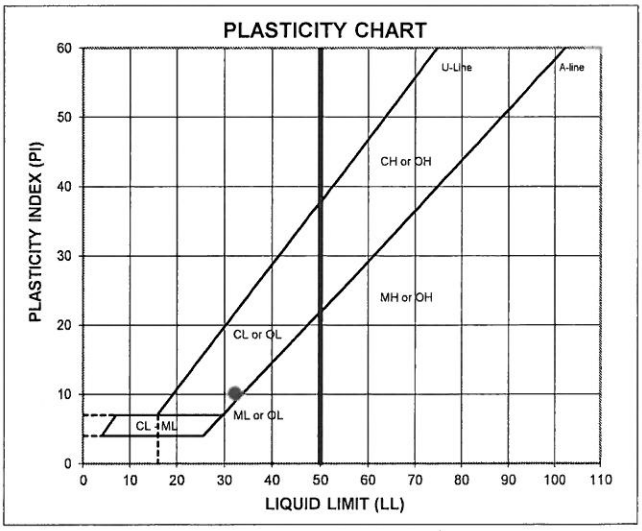
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**99.9**	Medium Sand	**0.1**
#60	0.25	**99.3**		
#100	0.15	**85.2**		
#200	0.075	**39.2**	Fine Sand	**60.7**

Hydrometer Analysis

(mm)	%Finer		
0.033	**35.9**		
0.021	**32.5**		
0.012	**32.5**	Fines	
0.0087	**30.8**	Silt or Clay	**39.2**
0.0062	**29.1**		
0.0031	**27.4**		
0.0013	**23.9**		



ATTERBERG LIMITS
Method -B (Dry preparation)

M_c	LL	PL	PI	LI
22.1	**32**	**22**	**10**	**0.04**

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SAND and SILTY CLAY, fine to medium; dark gray.

USCS: SC

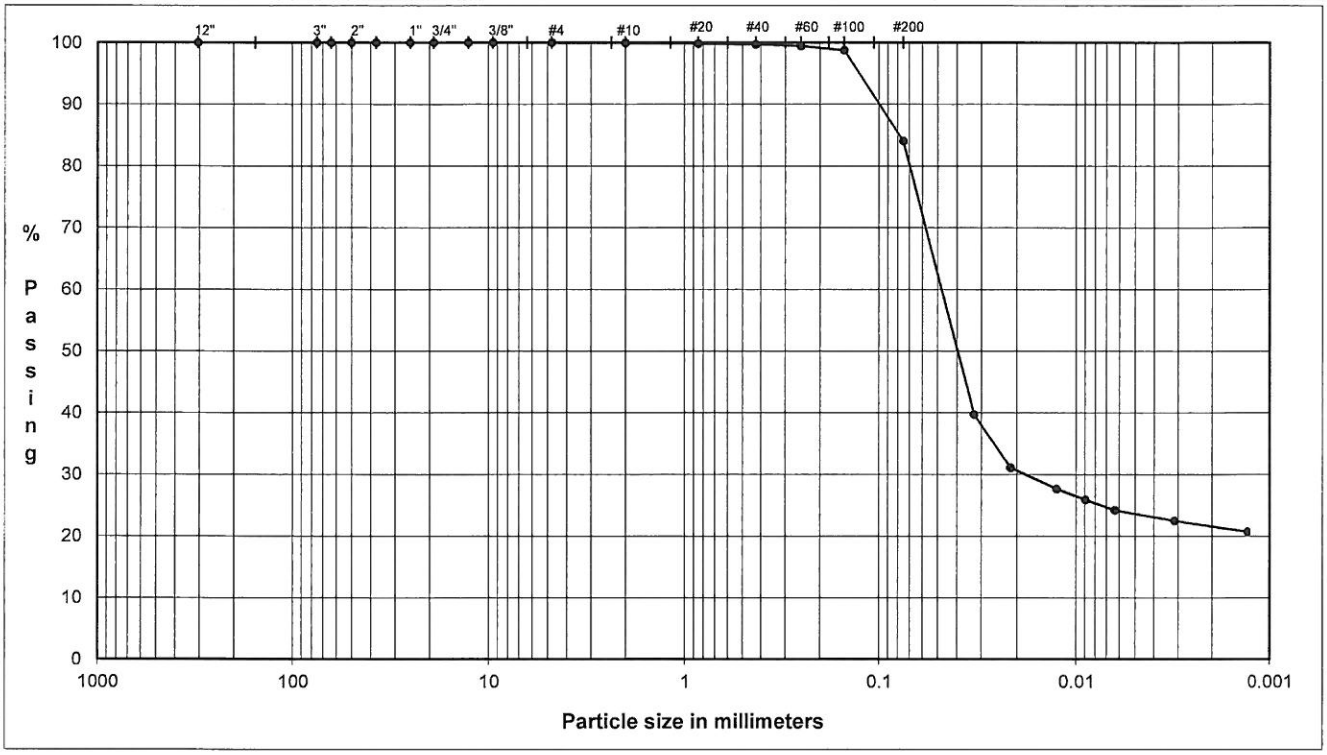
TECH	TJ/AM
DATE	12/30/13
CHECK	aem
REVIEW	
APPROVE	

DECEMBER 2013 1303118

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: FTN/ENTERGY WHITE BLUFF LF/AR
SAMPLE ID: FTN B-11 Depth: 13.0-18.0'
TYPE: Bulk



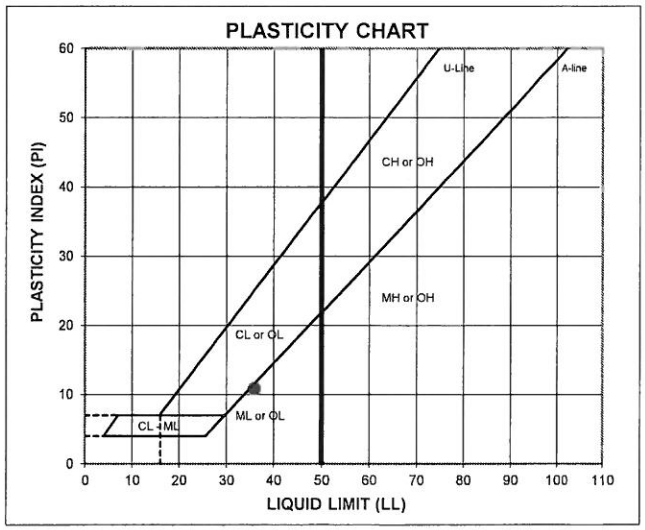
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.9		
#40	0.43	99.7	Medium Sand	0.2
#60	0.25	99.5		
#100	0.15	98.8		
#200	0.075	84.1	Fine Sand	15.7

Hydrometer Analysis

(mm)	%Finer		
0.033	39.7		
0.021	31.1		
0.013	27.6	Fines	
0.0090	25.9	Silt or Clay	84.1
0.0064	24.2		
0.0031	22.5		
0.0013	20.7		



ATTERBERG LIMITS
Method -B (Dry preparation)

M_c	LL	PL	PI	LI
30.0	36	25	11	0.47

LL (oven-dried) / 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy CLAYEY SILT, fine to medium; yellowish brown.

USCS: ML

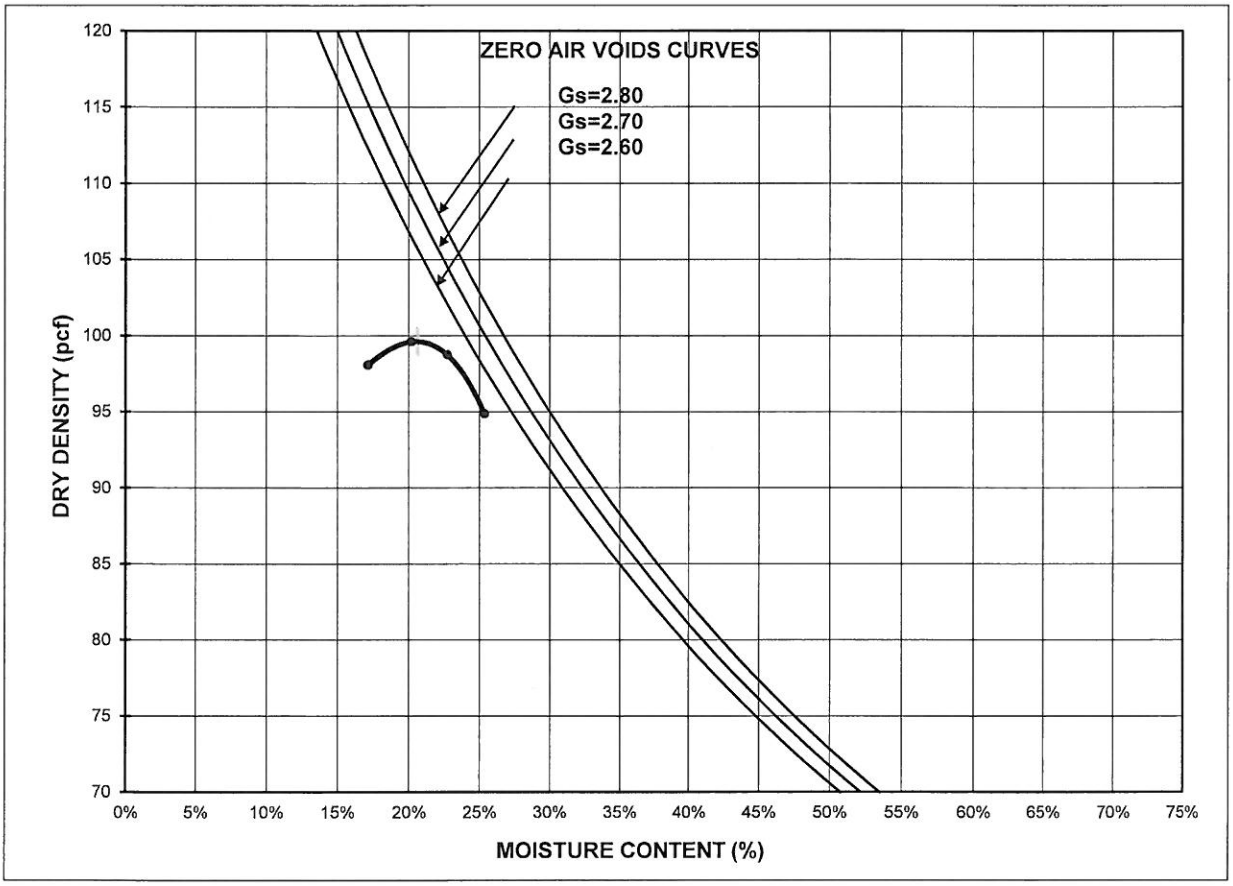
TECH	SJ/AM/TJ
DATE	12/30/13
CHECK	QCM
REVIEW	AWM
APPROVE	

Golder Associates Inc.

MOISTURE / DRY DENSITY CURVE
ASTM D 698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
PROJECT NUMBER: **1303118**
SAMPLE ID: **FTN B-11** - DEPTH: **13.0-18.0'** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	98.1	17.1%
2	99.6	20.2%
3	98.7	22.7%
4	94.9	25.4%

Maximum Dry Density (pcf)	**99.6**
Optimum Moisture (%)	**20.6**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**30.0%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	

DESCRIPTION sandy CLAYEY SILT, fine to medium; yellowish brown.

USCS ML

CHECK acm
REVIEW MWH
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF LF/AR		Board #	4	COMMENTS: The sample was remolded to 95.3% of the Maximum Dry Density and OPTM + 2.9% (using ASTM D 698).
PROJECT NUMBER	1303118		Flow Pump	1	
SAMPLE ID	FTN B-11	13.0-18.0'	Flow Pump Speed	7	
SAMPLE TYPE	Bulk		Technician	TW	

Sample Data, Initial				Sample Data, Final	
Height, inches	2.989	B-Value, f	1.00	Height, inches	3.011
Diameter, inches	2.790	Cell Pres.	90.0	Diameter, inches	2.777
Area, cm^2	39.44	Bot. Pres.	80.0	Area, cm^2	39.08
Volume, cm^3	299.45	Top Pres.	80.0	Volume, cm^3	298.85
Mass, g	562.33	Tot. B.P.	80.0	Mass, g	576.47
Moisture Content, %	23.5	Head, max.	98.48	Moisture Content, %	26.63
Dry Density, pcf	94.9	Head, min.	98.48	Dry Density, pcf	95.05
Spec. Gravity(assumed)	2.700	Max. Grad.	12.88	Volume Solids, cm^3	168.61
Volume Solids, cm^3	168.61	Min. Grad.	12.88	Volume Voids, cm^3	130.24
Volume Voids, cm^3	130.84			Void Ratio	0.77
Void Ratio	0.78			Saturation, %	93.1%
Saturation, %	81.8%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	562.33	584.72
Wt Soil & Tare, f	g	455.24	463.53
Wt Tare	g	0.00	8.46
Wt Moisture Lost	g	107.09	121.19
Wt Dry Soil	g	455.24	455.07
Water Content	%	23.52%	26.63%

DESCRIPTION: sandy CLAYEY SILT, fine to medium; yellowish brown.

Flow Pump Rate: 2.35E-04 cm^3/sec USCS: ML

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
01/03/14	41642	11	0	21.3	0	0	0	0	1.40	98.48	12.88	4.5E-07
01/03/14	41642	11	5	21.3	5	5	300	300	1.40	98.48	12.88	4.5E-07
01/03/14	41642	11	10	21.3	5	10	300	600	1.40	98.48	12.88	4.5E-07
01/03/14	41642	11	15	21.3	5	15	300	900	1.40	98.48	12.88	4.5E-07 *
01/03/14	41642	11	20	21.3	5	20	300	1200	1.40	98.48	12.88	4.5E-07 *
01/03/14	41642	11	25	21.3	5	25	300	1500	1.40	98.48	12.88	4.5E-07 *
01/03/14	41642	11	30	21.3	5	30	300	1800	1.40	98.48	12.88	4.5E-07 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 4.5E-07 cm/sec **

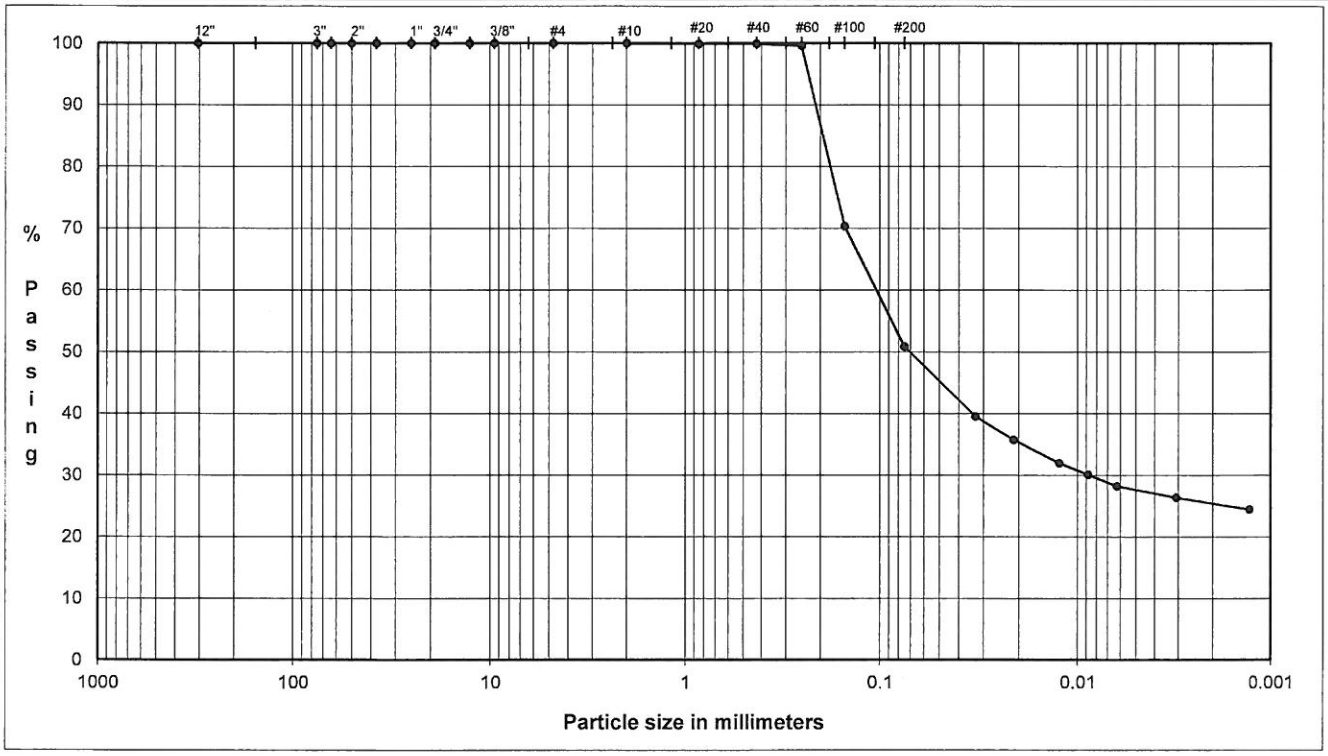
DATE	1/3/14
CHECK	alm
REVIEW	[illegible]
APPROVE	

DECEMBER 2013 1303118

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN PZ-8** Depth: **63.0-66.0'**
TYPE: **Bag**



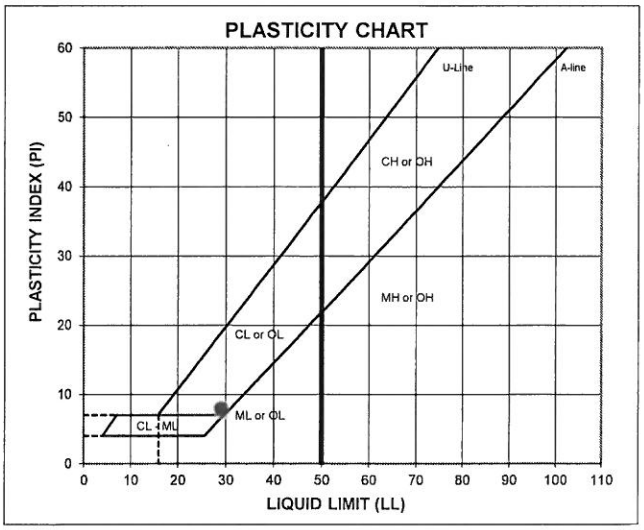
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**100.0**	Coarse Sand	**0.0**
#20	0.85	**99.9**		
#40	0.43	**99.9**	Medium Sand	**0.1**
#60	0.25	**99.6**		
#100	0.15	**70.3**		
#200	0.075	**50.9**	Fine Sand	**49.0**

Hydrometer Analysis

(mm)	%Finer		
0.033	**39.5**		
0.021	**35.7**		
0.012	**32.0**	Fines	
0.0088	**30.1**	Silt or Clay	**50.9**
0.0063	**28.2**		
0.0031	**26.3**		
0.0013	**24.5**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
28.7	**29**	**21**	**8**	**0.95**

LL (oven-dried) / <0.75 = ORGANIC (OL/OH)

DESCRIPTION: SILTY CLAY and fine to medium SAND; dark gray.

USCS: CL

TECH	AM/TJ
DATE	12/30/13
CHECK	AEM
REVIEW	TWH
APPROVE	

Golder Associates Inc.

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF LF/AR		Board #	3	COMMENTS: The sample was remolded to 95.0% of the Maximum Dry Density and OPTM + 2.8% (using ASTM D 698).
PROJECT NUMBER	1303118		Flow Pump	1	
SAMPLE ID	FTN B-10	3.0-8.0'	Flow Pump Speed	9	
SAMPLE TYPE	Bulk		Technician	SDM	

Sample Data, Initial			
Height, inches	3.007	B-Value, f	0.98
Diameter, inches	2.790	Cell Pres.	90.0
Area, cm²	39.44	Bot. Pres.	80.0
Volume, cm³	301.25	Top Pres.	80.0
Mass, g	590.50	Tot. B.P.	80.0
Moisture Content, %	21.0	Head, max.	141.38
Dry Density, pcf	101.1	Head, min.	141.38
Spec. Gravity(assumed)	2.700	Max. Grad.	18.60
Volume Solids, cm³	180.69	Min. Grad.	18.60
Volume Voids, cm³	120.56		
Void Ratio	0.67		
Saturation, %	85.1%		

Sample Data, Final	
Height, inches	2.992
Diameter, inches	2.771
Area, cm²	38.91
Volume, cm³	295.68
Mass, g	599.01
Moisture Content, %	22.78
Dry Density, pcf	102.96
Volume Solids, cm³	180.69
Volume Voids, cm³	114.99
Void Ratio	0.64
Saturation, %	96.7%

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	590.50	606.97
Wt Soil & Tare, f	g	487.87	495.89
Wt Tare	g	0.00	8.31
Wt Moisture Lost	g	102.63	111.08
Wt Dry Soil	g	487.87	487.58
Water Content	%	21.04%	22.78%

DESCRIPTION: CLAYEY SAND to SILTY SAND, fine to medium; brown.

Flow Pump Rate: 4.48E-05 cm³/sec

USCS: SC-SM

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
01/08/14	41647	8	50	20.1	0	0	0	0	2.01	141.38	18.60	6.2E-08
01/08/14	41647	8	55	20.1	5	5	300	300	2.01	141.38	18.60	6.2E-08
01/08/14	41647	9	0	20.1	5	10	300	600	2.01	141.38	18.60	6.2E-08
01/08/14	41647	9	5	20.1	5	15	300	900	2.01	141.38	18.60	6.2E-08 *
01/08/14	41647	9	10	20.1	5	20	300	1200	2.01	141.38	18.60	6.2E-08 *
01/08/14	41647	9	15	20.1	5	25	300	1500	2.01	141.38	18.60	6.2E-08 *
01/08/14	41647	9	20	20.1	5	30	300	1800	2.01	141.38	18.60	6.2E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 6.2E-08 cm/sec **

DATE	1/8/14
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF LF/AR		Board #	2	COMMENTS: The sample was remolded to 95.5% of the Maximum Dry Density and OPTM + 2.6% (using ASTM D 698).
PROJECT NUMBER	1303118		Flow Pump	1	
SAMPLE ID	FTN B-10	13.0-18.0'	Flow Pump Speed	5	
SAMPLE TYPE	Bulk		Technician	SDM	

Sample Data, Initial				Sample Data, Final	
Height, inches	2.996	B-Value, f	0.97	Height, inches	3.003
Diameter, inches	2.790	Cell Pres.	90.0	Diameter, inches	2.792
Area, cm^2	39.44	Bot. Pres.	80.0	Area, cm^2	39.50
Volume, cm^3	300.15	Top Pres.	80.0	Volume, cm^3	301.28
Mass, g	562.96	Tot. B.P.	80.0	Mass, g	593.51
Moisture Content, %	19.4	Head, max.	85.81	Moisture Content, %	25.93
Dry Density, pcf	98.0	Head, min.	85.81	Dry Density, pcf	97.62
Spec. Gravity(assumed)	2.700	Max. Grad.	11.25	Volume Solids, cm^3	174.56
Volume Solids, cm^3	174.56	Min. Grad.	11.25	Volume Voids, cm^3	126.72
Volume Voids, cm^3	125.59			Void Ratio	0.73
Void Ratio	0.72			Saturation, %	96.4%
Saturation, %	73.0%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	562.96	601.41
Wt Soil & Tare, f	g	471.32	479.28
Wt Tare	g	0.00	8.20
Wt Moisture Lost	g	91.64	122.13
Wt Dry Soil	g	471.32	471.08
Water Content	%	19.44%	25.93%

DESCRIPTION: sandy SILTY CLAY, fine to coarse; gray.

Flow Pump Rate: 1.26E-03 cm^3/sec

USCS: CL

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
01/08/14	41647	8	5	19.3	0	0	0	0	1.22	85.81	11.25	2.9E-06
01/08/14	41647	8	10	19.3	5	5	300	300	1.22	85.81	11.25	2.9E-06
01/08/14	41647	8	15	19.3	5	10	300	600	1.22	85.81	11.25	2.9E-06
01/08/14	41647	8	20	19.3	5	15	300	900	1.22	85.81	11.25	2.9E-06 *
01/08/14	41647	8	25	19.3	5	20	300	1200	1.22	85.81	11.25	2.9E-06 *
01/08/14	41647	8	30	19.3	5	25	300	1500	1.22	85.81	11.25	2.9E-06 *
01/08/14	41647	8	35	19.3	5	30	300	1800	1.22	85.81	11.25	2.9E-06 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

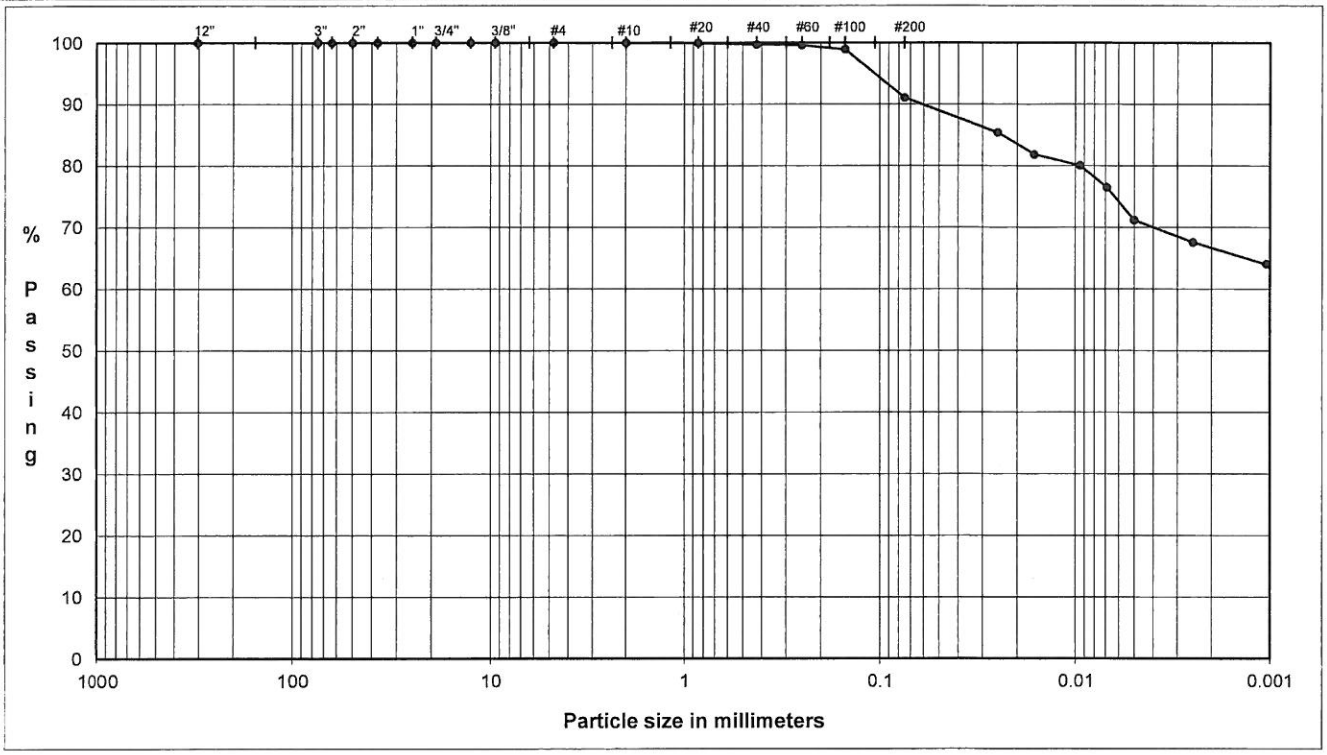
PERMEABILITY REPORTED AS ** 2.9E-06 cm/sec **

DATE	1/8/14
CHECK	
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-11** Depth: **43.0-45.0'**
TYPE: **UD**



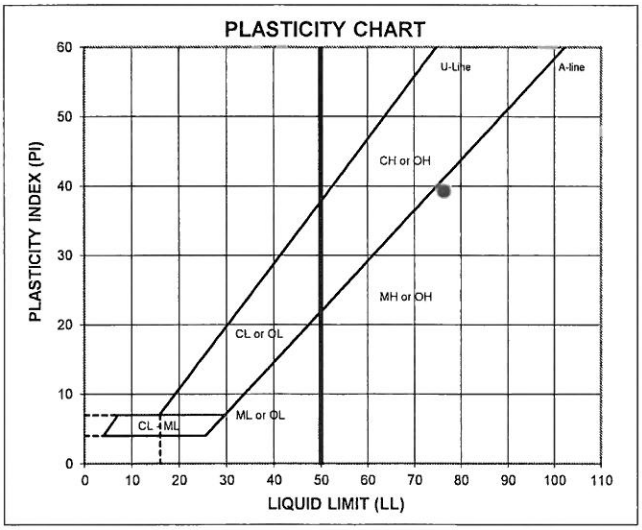
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**99.7**	Medium Sand	**0.3**
#60	0.25	**99.6**		
#100	0.15	**98.9**		
#200	0.075	**91.1**	Fine Sand	**8.6**

Hydrometer Analysis

(mm)	%Finer		
0.025	**85.4**		
0.016	**81.8**		
0.009	**80.1**	Fines	
0.0069	**76.5**	Silt or Clay	**91.1**
0.0050	**71.2**		
0.0025	**67.6**		
0.0010	**64.1**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
35.3	**76**	**37**	**39**	**-0.05**

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: CLAYEY SILT, some fine to medium sand; gray.

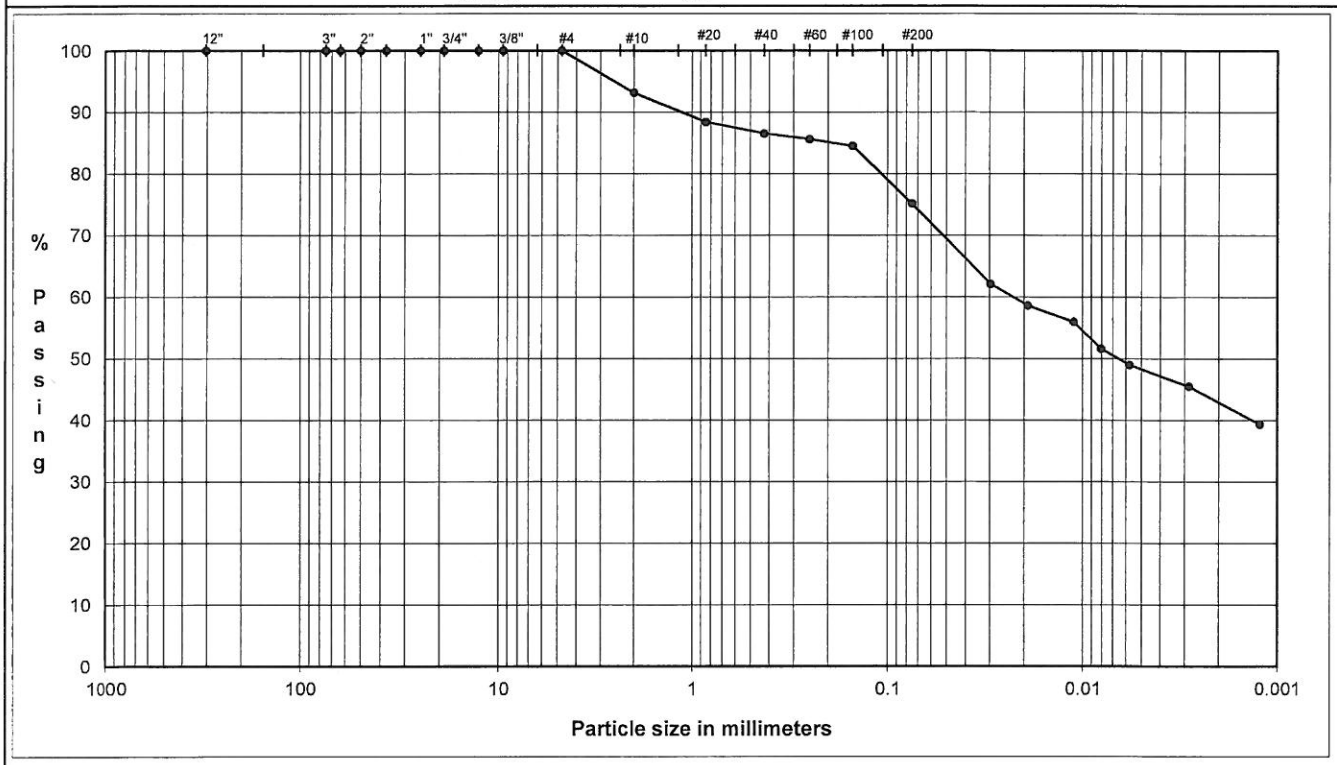
USCS: MH

TECH	TJ/BW
DATE	1/7/14
CHECK	DA
REVIEW	TWM
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-12** Depth: **8.0-10.0'**
TYPE: **UD**



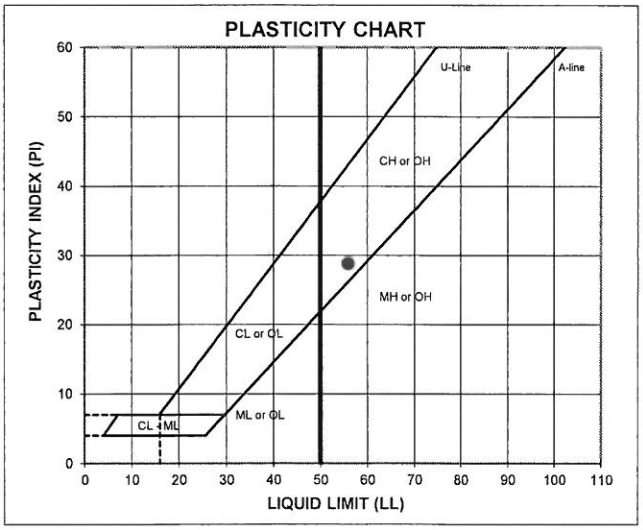
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**93.2**	Coarse Sand	**6.8**
#20	0.85	**88.4**		
#40	0.43	**86.6**	Medium Sand	**6.6**
#60	0.25	**85.6**		
#100	0.15	**84.5**		
#200	0.075	**75.1**	Fine Sand	**11.4**

Hydrometer Analysis

(mm)	%Finer		
0.030	**62.1**		
0.019	**58.6**		
0.011	**56.0**	Fines	
0.0081	**51.6**	Silt or Clay	**75.1**
0.0057	**49.0**		
0.0029	**45.5**		
0.0012	**39.4**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
36.5	**56**	**27**	**29**	**0.32**

LL (oven-dried) / LL (not dried) < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy CLAY, fine to coarse; olive brown.

USCS: CH

TECH	SJ/TW/AM
DATE	1/10/14
CHECK	DA
REVIEW	[illegible]
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF LF/AR		Board #	8	COMMENTS
PROJECT NUMBER	1303118		Flow Pump	1	
SAMPLE ID	FTN B-12	8.0-10.0'	Flow Pump Speed	5	
SAMPLE TYPE	UD		Technician	TW	

Sample Data, Initial				Sample Data, Final	
Height, inches	2.935	B-Value, f	0.99	Height, inches	2.946
Diameter, inches	2.827	Cell Pres.	85.0	Diameter, inches	2.847
Area, cm^2	40.50	Bot. Pres.	80.0	Area, cm^2	41.07
Volume, cm^3	301.89	Top Pres.	80.0	Volume, cm^3	307.33
Mass, g	543.01	Tot. B.P.	80.0	Mass, g	558.56
Moisture Content, %	36.5	Head, max.	111.84	Moisture Content, %	40.39
Dry Density, pcf	82.2	Head, min.	111.84	Dry Density, pcf	80.78
Spec. Gravity	2.699	Max. Grad.	14.95	Volume Solids, cm^3	147.41
Volume Solids, cm^3	147.41	Min. Grad.	14.95	Volume Voids, cm^3	159.92
Volume Voids, cm^3	154.48			Void Ratio	1.08
Void Ratio	1.05			Saturation, %	100.0%
Saturation, %	94.0%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	543.01	566.44
Wt Soil & Tare, f	g	397.85	405.92
Wt Tare	g	0.00	8.53
Wt Moisture Lost	g	145.16	160.52
Wt Dry Soil	g	397.85	397.39
Water Content	%	36.49%	40.39%

DESCRIPTION: sandy CLAY, fine to coarse; olive brown.

Flow Pump Rate: 1.26E-03 cm^3/sec

USCS: CH

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (^{0}C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
01/03/14	41642	15	0	21.4	0	0	0	0	1.59	111.84	14.95	2.0E-06
01/03/14	41642	15	5	21.4	5	5	300	300	1.59	111.84	14.95	2.0E-06
01/03/14	41642	15	10	21.4	5	10	300	600	1.59	111.84	14.95	2.0E-06
01/03/14	41642	15	15	21.4	5	15	300	900	1.59	111.84	14.95	2.0E-06 *
01/03/14	41642	15	20	21.4	5	20	300	1200	1.59	111.84	14.95	2.0E-06 *
01/03/14	41642	15	25	21.4	5	25	300	1500	1.59	111.84	14.95	2.0E-06 *
01/03/14	41642	15	30	21.4	5	30	300	1800	1.59	111.84	14.95	2.0E-06 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

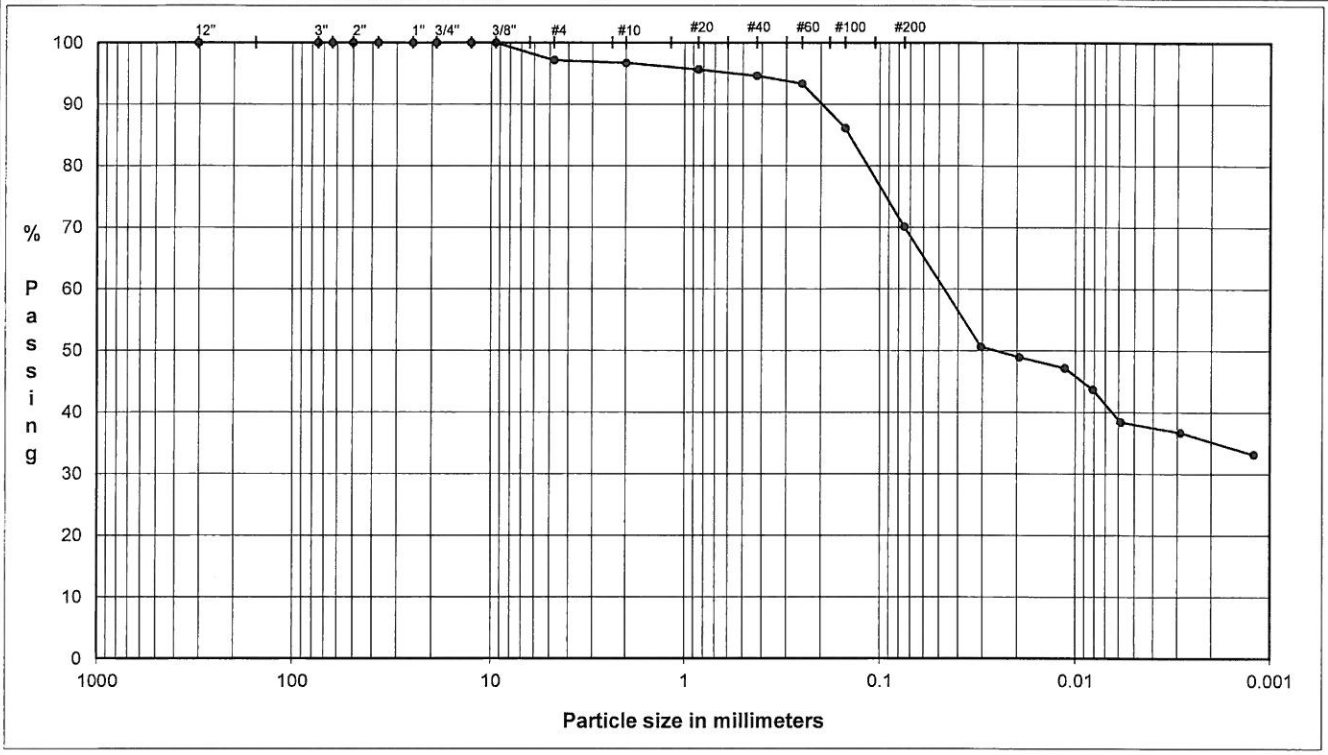
PERMEABILITY REPORTED AS ** 2.0E-06 cm/sec **

DATE	1/3/14
CHECK	DA
REVIEW	RWM
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-13** Depth: **11.0-13.0'**
TYPE: **UD**



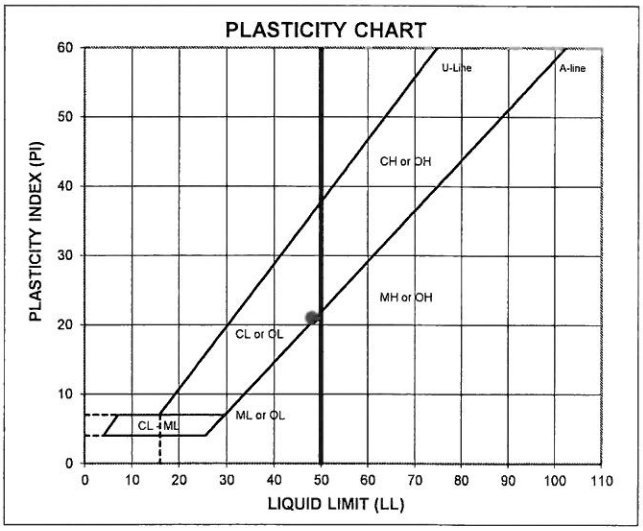
COBBLES	Coarse GRAVEL	Fine GRAVEL	Coarse SAND	Medium SAND	Fine SAND	Silt or Clay FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**97.2**	Fine Gravel	**2.8**
#10	2.00	**96.7**	Coarse Sand	**0.5**
#20	0.85	**95.7**		
#40	0.43	**94.6**	Medium Sand	**2.1**
#60	0.25	**93.4**		
#100	0.15	**86.1**		
#200	0.075	**70.1**	Fine Sand	**24.5**

Hydrometer Analysis

(mm)	%Finer		
0.031	**50.7**		
0.019	**48.9**		
0.011	**47.2**	Fines	
0.0081	**43.7**	Silt or Clay	**70.1**
0.0059	**38.4**		
0.0029	**36.7**		
0.0012	**33.2**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
24.7	**48**	**27**	**21**	**-0.10**

LL (oven-dried) / 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy SILTY CLAY, fine to coarse, trace fine gravel; yellowish brown.

USCS: CL

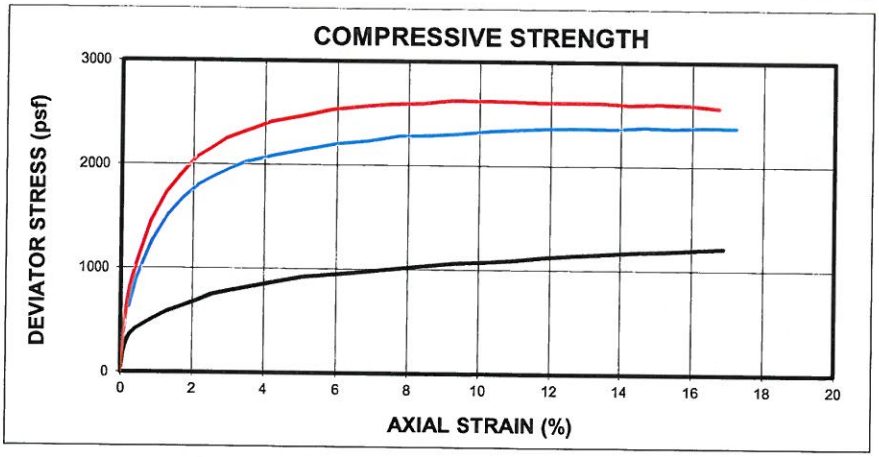
TECH	BW/AM/TJ
DATE	1/7/14
CHECK	JA
REVIEW	TJM
APPROVE	

JANUARY 2014

1303118

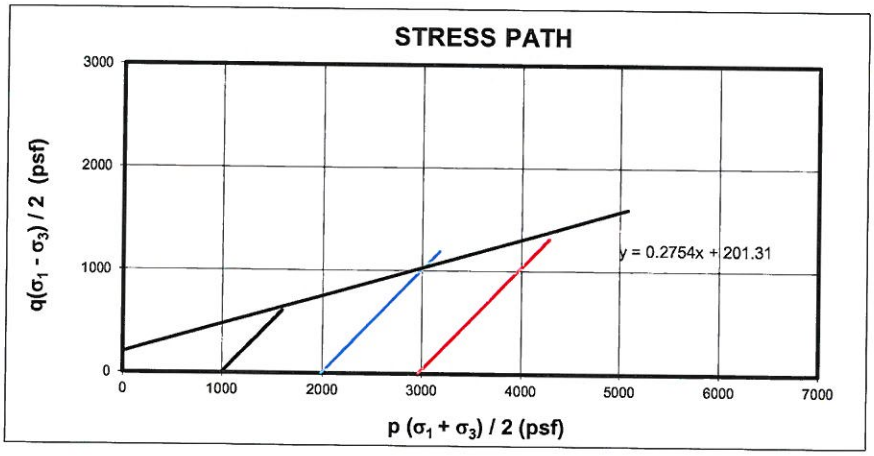
UNCONSOLIDATED / UNDRAINED COMPRESSIVE STRENGTH OF SOILS
ASTM D 2850

PROJECT NAME: FTN/ENTERGY WHITE BLUFF LF/AR
PROJECT NUMBER: 1303118
SAMPLE ID: FTN B-13 - **Depth:** 11.0-13.0' **Sample Type:** UD



Specimen	Confining Pressure (psf)	Dry Density (pcf)	Moisture Content (%)
1	994	96.0	26.8
2	1987	98.9	24.1
3	2966	102.3	23.1
	AVERAGE	**99.1**	**24.7**

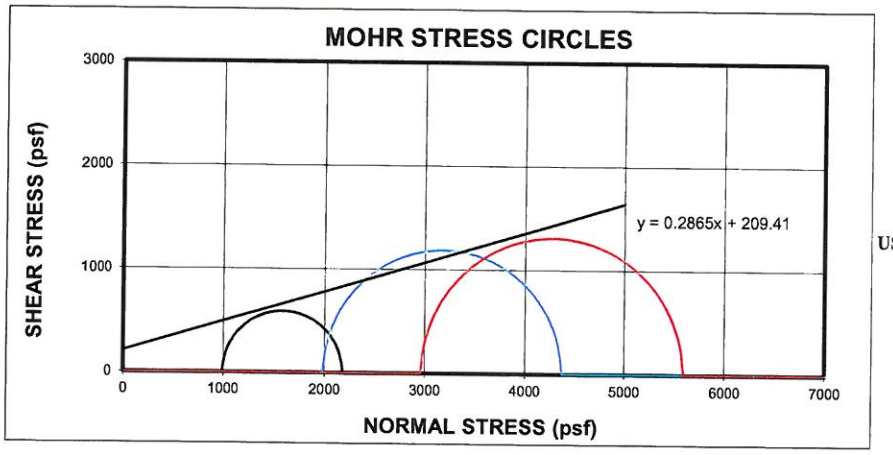
Specimen	Normal Stress @ Failure (psf)	Axial Strain @ Failure (%)	Rate of Axial Strain (in/min.)
1	2176	15.2	0.06
2	4366	14.6	0.06
3	5592	9.2	0.06



FAILURE PICTURE

STRESS PATH RESULTS			
α	=	15.4	°
a	=	201.3	psf

MOHR STRESS RESULTS			
ϕ	=	16.0	°
c	=	209.4	psf



USCS

Soil Description

sandy SILTY CLAY, fine to coarse, trace fine gravel; yellowish brown.

CL

Comments

-

TECH	SDM
DATE	1/7/14
CHECK	JB
REVIEW	BWM
APPROVE	

JANUARY 2014

1303118

UNCONSOLIDATED / UNDRAINED COMPRESSIVE STRENGTH OF SOILS
ASTM D 2850

PROJECT NAME: FTN/ENTERGY WHITE BLUFF LF/AR

PROJECT NUMBER: 1303118

SAMPLE ID: FTN B-13 - DEPTH: 11.0-13.0' SAMPLE TYPE UD

SPECIMEN 1

MACHINE SPEED	0.06	in/min
STRAIN RATE	1.01	%/min
CONFINING PRES.	6.9	psi

INITIAL SAMPLE DATA

HEIGHT	5.918	in	15.027	cm
DIAMETER	2.868	in	7.285	cm
AREA	6.46	in^2	41.68	cm^2
VOLUME	38.23	in^3	626.50	cm^3
WEIGHT	1222.25	g		
% MOISTURE	26.82			
SPECIFIC GRAVITY	2.691			
WET DENSITY	121.79	pcf		
DRY DENSITY, calc	96.03	pcf		
VOLUME OF SOLIDS	358.15	cm^3		
VOLUME OF VOIDS	268.35	cm^3		
VOID RATIO	0.75			
% SATURATION	96.32			

CORRECTED SAMPLE DATA

HEIGHT	5.916	in
DIAMETER	2.868	in
AREA	6.46	in^2
VOLUME	38.23	in^3

WATER CONTENT

WT SOIL & TARE, WET	1401.08	g
WT SOIL & TARE, DRY	1143.46	g
WT TARE	182.83	g
WT MOISTURE	257.62	g
WT DRY SOIL	960.63	g
% MOISTURE	26.82	

TIME (min)	ACCUMULATED DEFLECT (inch)	AXIAL LOAD (lbs)	e % STRAIN (in/in)	CORRECTED AREA (in^2)	DEVIATOR STRESS (psf)	(σ_1) devstr+cp (psf)	$\frac{(\sigma_1 + \sigma_3)}{2}$ (p)	$\frac{(\sigma_1 - \sigma_3)}{2}$ (q)
0.0	0.000	1.5	0.0	6.46	0.00	993.60	993.60	0.00
0.1	0.003	9.3	0.1	6.47	173.72	1167.32	1080.46	86.86
0.1	0.006	13.2	0.1	6.47	260.44	1254.04	1123.82	130.22
0.1	0.009	14.8	0.2	6.47	295.91	1289.51	1141.56	147.96
0.2	0.012	16.7	0.2	6.48	338.01	1331.61	1162.61	169.01
0.3	0.015	18.0	0.3	6.48	366.73	1360.33	1176.97	183.37
0.4	0.025	20.4	0.4	6.49	419.36	1412.96	1203.28	209.68
0.8	0.050	24.2	0.8	6.52	501.54	1495.14	1244.37	250.77
1.3	0.075	27.9	1.3	6.55	580.81	1574.41	1284.00	290.40
1.7	0.100	30.5	1.7	6.57	635.28	1628.88	1311.24	317.64
2.1	0.125	33.1	2.1	6.60	689.26	1682.86	1338.23	344.63
2.5	0.150	36.1	2.5	6.63	751.44	1745.04	1369.32	375.72
2.9	0.175	37.6	3.0	6.66	780.62	1774.22	1383.91	390.31
3.3	0.200	39.1	3.4	6.69	809.51	1803.11	1398.36	404.76
4.2	0.250	42.1	4.2	6.75	866.46	1860.06	1426.83	433.23
5.0	0.300	45.1	5.1	6.81	922.28	1915.88	1454.74	461.14
5.8	0.350	46.7	5.9	6.87	947.61	1941.21	1467.41	473.81
6.7	0.400	48.4	6.8	6.93	974.42	1968.02	1480.81	487.21
7.5	0.450	50.2	7.6	6.99	1002.65	1996.25	1494.93	501.33
8.3	0.500	52.1	8.4	7.06	1032.24	2025.84	1509.72	516.12
9.2	0.550	54.0	9.3	7.12	1061.12	2054.72	1524.16	530.56
10.0	0.600	55.1	10.1	7.19	1073.26	2066.86	1530.23	536.63
10.8	0.650	56.6	11.0	7.26	1092.92	2086.52	1540.06	546.46
11.7	0.700	58.6	11.8	7.33	1121.84	2115.44	1554.52	560.92
12.5	0.750	60.1	12.7	7.40	1140.28	2133.88	1563.74	570.14
13.3	0.800	61.5	13.5	7.47	1156.23	2149.83	1571.71	578.11
14.2	0.850	63.0	14.4	7.55	1173.56	2167.16	1580.38	586.78
15.0	0.900	64.1	15.2	7.62	1182.76	2176.36	1584.98	591.38
15.8	0.950	65.6	16.1	7.70	1199.04	2192.64	1593.12	599.52
16.7	1.000	67.1	16.9	7.78	1214.74	2208.34	1600.97	607.37

Time to Failure	15.0
Deflection @ Failure	0.900
% Strain @ Failure	15.2

*NORMAL STRESS @ FAILURE 2176.36 psf

Failure based on the maximum deviator stress or 15% axial strain, whichever occurs first.

TECH	SDM
DATE	1/7/14
CHECK	DA
REVIEW	MWM
APPROVE	

JANUARY 2014

1303118

UNCONSOLIDATED / UNDRAINED COMPRESSIVE STRENGTH OF SOILS
ASTM D 2850

PROJECT NAME: FTN/ENTERGY WHITE BLUFF LF/AR

PROJECT NUMBER: 1303118

SAMPLE ID: FTN B-13 - DEPTH: 11.0-13.0' SAMPLE TYPE UD

SPECIMEN 2

MACHINE SPEED	0.06	in/min
STRAIN RATE	1.03	%/min
CONFINING PRES.	13.8	psi

INITIAL SAMPLE DATA

HEIGHT	5.803	in	14.729	cm
DIAMETER	2.878	in	7.310	cm
AREA	6.51	in^2	41.97	cm^2
VOLUME	37.75	in^3	618.62	cm^3
WEIGHT		1216.57	g	
% MOISTURE		24.08		
SPECIFIC GRAVITY		2.691		
WET DENSITY		122.77	pcf	
DRY DENSITY, calc		98.94	pcf	
VOLUME OF SOLIDS		364.35	cm^3	
VOLUME OF VOIDS		254.27	cm^3	
VOID RATIO		0.70		
% SATURATION		92.86		

CORRECTED SAMPLE DATA

HEIGHT	5.799	in
DIAMETER	2.879	in
AREA	6.51	in^2
VOLUME	37.75	in^3

WATER CONTENT

WT SOIL & TARE, WET	1321.79	g
WT SOIL & TARE, DRY	1086.37	g
WT TARE	108.79	g
WT MOISTURE	235.42	g
WT DRY SOIL	977.58	g
% MOISTURE	24.08	

TIME (min)	ACCUMULATED DEFLECT (inch)	AXIAL LOAD (lbs)	e % STRAIN (in/in)	CORRECTED AREA (in^2)	DEVIATOR STRESS (psf)	(σ_1) devstr+cp (psf)	$\frac{(\sigma_1 + \sigma_3)}{2}$ (p)	$\frac{(\sigma_1 - \sigma_3)}{2}$ (q)
0.0	0.000	1.1	0.0	6.51	0.00	1987.20	1987.20	0.00
0.1	0.003	17.5	0.1	6.51	362.59	2349.79	2168.49	181.29
0.1	0.006	21.2	0.1	6.52	444.16	2431.36	2209.28	222.08
0.2	0.009	29.5	0.2	6.52	627.24	2614.44	2300.82	313.62
0.2	0.012	29.3	0.2	6.52	622.50	2609.70	2298.45	311.25
0.3	0.015	32.4	0.3	6.53	690.58	2677.78	2332.49	345.29
0.4	0.025	42.4	0.4	6.54	909.63	2896.83	2442.02	454.82
0.8	0.050	58.5	0.9	6.57	1258.77	3245.97	2616.58	629.38
1.3	0.075	70.4	1.3	6.60	1513.13	3500.33	2743.76	756.56
1.7	0.100	78.3	1.7	6.62	1678.26	3665.46	2826.33	839.13
2.1	0.125	84.6	2.2	6.65	1807.26	3794.46	2890.83	903.63
2.5	0.150	88.7	2.6	6.68	1887.65	3874.85	2931.03	943.83
2.9	0.175	92.4	3.0	6.71	1958.68	3945.88	2966.54	979.34
3.3	0.200	95.8	3.4	6.74	2022.60	4009.80	2998.50	1011.30
4.2	0.250	99.9	4.3	6.80	2091.34	4078.54	3032.87	1045.67
5.0	0.300	103.6	5.2	6.86	2150.12	4137.32	3062.26	1075.06
5.8	0.350	107.3	6.0	6.93	2207.49	4194.69	3090.95	1103.75
6.7	0.400	109.6	6.9	6.99	2234.62	4221.82	3104.51	1117.31
7.5	0.450	112.9	7.8	7.06	2281.28	4268.48	3127.84	1140.64
8.3	0.500	114.4	8.6	7.12	2290.29	4277.49	3132.35	1145.15
9.2	0.550	116.3	9.5	7.19	2306.74	4293.94	3140.57	1153.37
10.0	0.600	118.9	10.3	7.26	2336.35	4323.55	3155.38	1168.18
10.8	0.650	120.8	11.2	7.33	2351.22	4338.42	3162.81	1175.61
11.7	0.700	122.6	12.1	7.40	2363.42	4350.62	3168.91	1181.71
12.5	0.750	123.9	12.9	7.48	2365.30	4352.50	3169.85	1182.65
13.3	0.800	124.9	13.8	7.55	2360.97	4348.17	3167.68	1180.48
14.2	0.850	127.1	14.6	7.63	2378.91	4366.11	3176.65	1189.45
15.0	0.900	127.9	15.5	7.70	2369.85	4357.05	3172.12	1184.92
15.8	0.950	129.7	16.4	7.78	2378.98	4366.18	3176.69	1189.49
16.7	1.000	130.8	17.2	7.87	2374.61	4361.81	3174.50	1187.30

Time to Failure	14.2
Deflection @ Failure	0.850
% Strain @ Failure	14.6

*NORMAL STRESS @ FAILURE 4366.11 psf

Failure based on the maximum deviator stress or 15% axial strain, whichever occurs first.

TECH	SDM
DATE	1/7/14
CHECK	DA
REVIEW	MM
APPROVE	

JANUARY 2014

1303118

UNCONSOLIDATED / UNDRAINED COMPRESSIVE STRENGTH OF SOILS
ASTM D 2850

PROJECT NAME: FTN/ENTERGY WHITE BLUFF LF/AR

PROJECT NUMBER: 1303118

SAMPLE ID: FTN B-13 - DEPTH: 11.0-13.0' SAMPLE TYPE UD

SPECIMEN 3

MACHINE SPEED	0.06	in/min
STRAIN RATE	1.01	%/min
CONFINING PRES.	20.6	psi

INITIAL SAMPLE DATA

HEIGHT	5.971	in	15.161	cm
DIAMETER	2.876	in	7.305	cm
AREA	6.50	in^2	41.91	cm^2
VOLUME	38.79	in^3	635.65	cm^3
WEIGHT	1282.83	g		
% MOISTURE	23.14			
SPECIFIC GRAVITY	2.691			
WET DENSITY	125.99	pcf		
DRY DENSITY, calc	102.31	pcf		
VOLUME OF SOLIDS	387.12	cm^3		
VOLUME OF VOIDS	248.53	cm^3		
VOID RATIO	0.64			
% SATURATION	97.01			

CORRECTED SAMPLE DATA

HEIGHT	5.969	in
DIAMETER	2.876	in
AREA	6.50	in^2
VOLUME	38.79	in^3

WATER CONTENT

WT SOIL & TARE, WET	1477.70	g
WT SOIL & TARE, DRY	1237.35	g
WT TARE	198.81	g
WT MOISTURE	240.35	g
WT DRY SOIL	1038.54	g
% MOISTURE	23.14	

TIME (min)	ACCUMULATED DEFLECT (inch)	AXIAL LOAD (lbs)	e % STRAIN (in/in)	CORRECTED AREA (in^2)	DEVIATOR STRESS (psf)	(σ_1) devstr+cp (psf)	$\frac{(\sigma_1+\sigma_3)}{2}$ (p)	$\frac{(\sigma_1-\sigma_3)}{2}$ (q)
0.0	0.000	1.1	0.0	6.50	0.00	2966.40	2966.40	0.00
0.1	0.003	12.7	0.1	6.50	256.91	3223.31	3094.86	128.46
0.1	0.006	22.3	0.1	6.51	469.30	3435.70	3201.05	234.65
0.2	0.009	29.1	0.2	6.51	619.52	3585.92	3276.16	309.76
0.2	0.012	34.2	0.2	6.51	731.99	3698.39	3332.39	365.99
0.3	0.015	38.3	0.3	6.51	822.24	3788.64	3377.52	411.12
0.4	0.025	48.0	0.4	6.53	1034.90	4001.30	3483.85	517.45
0.8	0.050	67.2	0.8	6.55	1452.44	4418.84	3692.62	726.22
1.3	0.075	80.1	1.3	6.58	1728.57	4694.97	3830.68	864.28
1.7	0.100	88.7	1.7	6.61	1908.62	4875.02	3920.71	954.31
2.1	0.125	96.5	2.1	6.64	2069.71	5036.11	4001.25	1034.85
2.5	0.150	101.0	2.5	6.67	2158.07	5124.47	4045.43	1079.03
2.9	0.175	105.8	2.9	6.69	2252.05	5218.45	4092.42	1126.02
3.3	0.200	108.8	3.3	6.72	2306.58	5272.98	4119.69	1153.29
4.2	0.250	114.8	4.2	6.78	2413.99	5380.39	4173.39	1206.99
5.0	0.300	118.5	5.0	6.84	2470.76	5437.16	4201.78	1235.38
5.8	0.350	122.6	5.9	6.90	2534.50	5500.90	4233.65	1267.25
6.7	0.400	125.2	6.7	6.97	2565.71	5532.11	4249.25	1282.85
7.5	0.450	127.5	7.5	7.03	2589.81	5556.21	4261.30	1294.90
8.3	0.500	129.0	8.4	7.09	2596.81	5563.21	4264.80	1298.40
9.2	0.550	131.6	9.2	7.16	2625.38	5591.78	4279.09	1312.69
10.0	0.600	132.7	10.0	7.22	2623.09	5589.49	4277.95	1311.55
10.8	0.650	133.8	10.9	7.29	2620.39	5586.79	4276.60	1310.20
11.7	0.700	134.6	11.7	7.36	2611.42	5577.82	4272.11	1305.71
12.5	0.750	135.8	12.6	7.43	2609.90	5576.30	4271.35	1304.95
13.3	0.800	137.2	13.4	7.50	2611.77	5578.17	4272.29	1305.89
14.2	0.850	137.6	14.2	7.58	2594.12	5560.52	4263.46	1297.06
15.0	0.900	139.4	15.1	7.65	2602.66	5569.06	4267.73	1301.33
15.8	0.950	140.2	15.9	7.73	2591.91	5558.31	4262.35	1295.95
16.7	1.000	140.2	16.7	7.81	2566.10	5532.50	4249.45	1283.05

Time to Failure	9.2
Deflection @ Failure	0.550
% Strain @ Failure	9.2

*NORMAL STRESS @ FAILURE 5591.78 psf

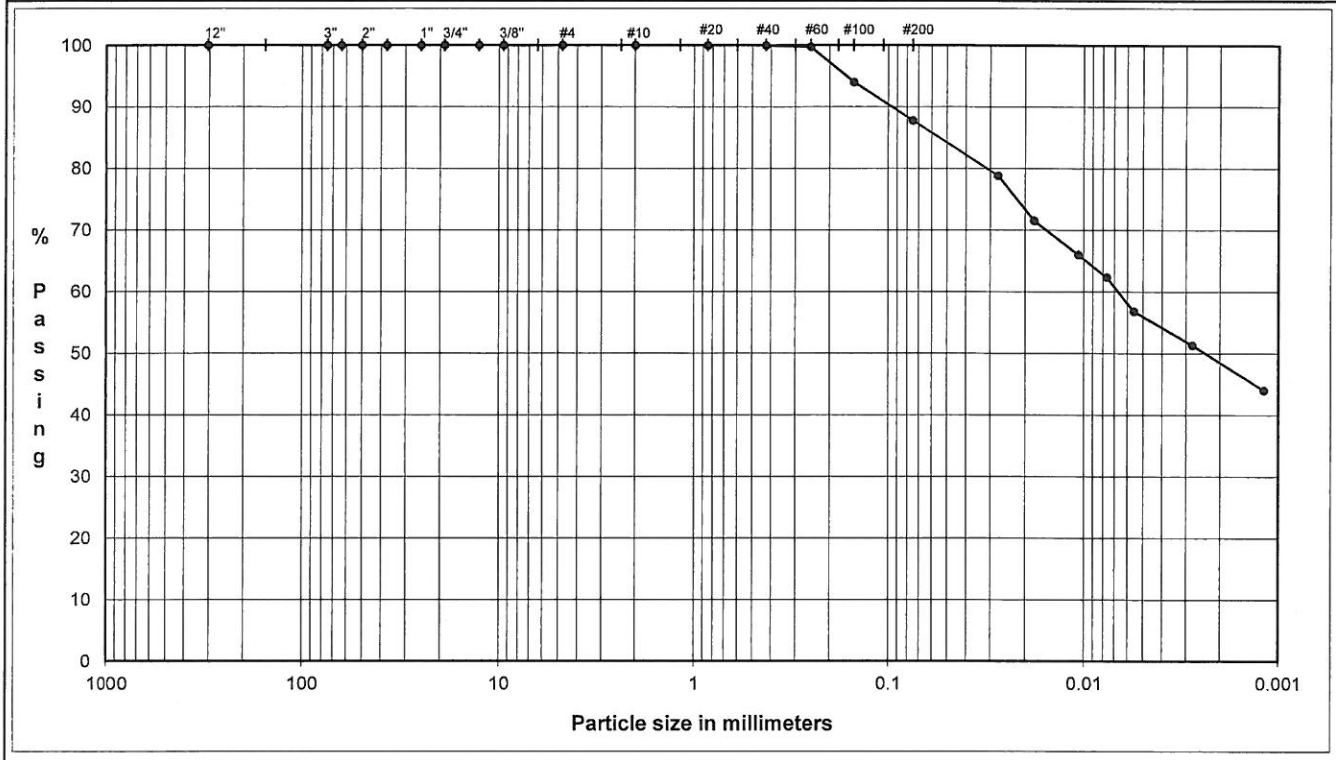
Failure based on the maximum deviator stress or 15% axial strain, whichever occurs first.

TECH	SDM
DATE	1/7/14
CHECK	DR
REVIEW	FWM
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-13** Depth: **24.0-26.0'**
TYPE: **UD**



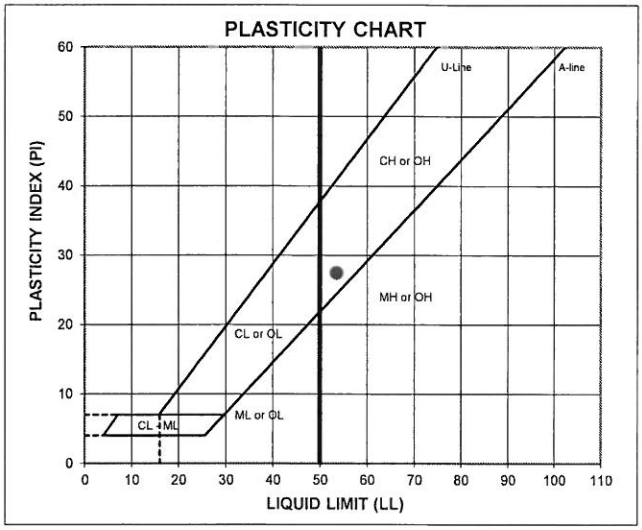
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**100.0**	Medium Sand	**0.0**
#60	0.25	**99.7**		
#100	0.15	**94.0**		
#200	0.075	**87.8**	Fine Sand	**12.2**

Hydrometer Analysis

(mm)	%Finer		
0.027	**78.8**		
0.018	**71.5**		
0.011	**66.0**	Fines	
0.0077	**62.3**	Silt or Clay	**87.8**
0.0056	**56.8**		
0.0028	**51.3**		
0.0012	**44.0**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
28.8	**53**	**26**	**27**	**0.10**

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy CLAY, fine; dark olive brown.

USCS: CH

TECH	TJ/BW
DATE	1/3/14
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF LF/AR		Board #	7	COMMENTS
PROJECT NUMBER	1303118		Flow Pump	1	
SAMPLE ID	FTN B-13	24.0-26.0'	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	TW	

Sample Data, Initial				Sample Data, Final	
Height, inches	2.917	B-Value, f	0.99	Height, inches	2.880
Diameter, inches	2.854	Cell Pres.	97.0	Diameter, inches	2.865
Area, cm²	41.27	Bot. Pres.	80.0	Area, cm²	41.59
Volume, cm³	305.80	Top Pres.	80.0	Volume, cm³	304.25
Mass, g	584.22	Tot. B.P.	80.0	Mass, g	586.53
Moisture Content, %	28.8	Head, max.	94.96	Moisture Content, %	29.35
Dry Density, pcf	92.5	Head, min.	94.96	Dry Density, pcf	93.00
Spec. Gravity(assumed)	2.700	Max. Grad.	12.98	Volume Solids, cm³	167.94
Volume Solids, cm³	167.94	Min. Grad.	12.98	Volume Voids, cm³	136.31
Volume Voids, cm³	137.86			Void Ratio	0.81
Void Ratio	0.82			Saturation, %	97.6%
Saturation, %	94.9%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	584.22	594.53
Wt Soil & Tare, f	g	453.43	461.50
Wt Tare	g	0.00	8.29
Wt Moisture Lost	g	130.79	133.03
Wt Dry Soil	g	453.43	453.21
Water Content	%	28.84%	29.35%

DESCRIPTION: sandy CLAY, fine; dark olive brown.

Flow Pump Rate: 2.07E-05 cm³/sec

USCS: CH

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
01/03/14	41642	14	20	21.3	0	0	0	0	1.35	94.96	12.98	3.7E-08
01/03/14	41642	14	25	21.3	5	5	300	300	1.35	94.96	12.98	3.7E-08
01/03/14	41642	14	30	21.3	5	10	300	600	1.35	94.96	12.98	3.7E-08
01/03/14	41642	14	35	21.3	5	15	300	900	1.35	94.96	12.98	3.7E-08 *
01/03/14	41642	14	40	21.3	5	20	300	1200	1.35	94.96	12.98	3.7E-08 *
01/03/14	41642	14	45	21.3	5	25	300	1500	1.35	94.96	12.98	3.7E-08 *
01/03/14	41642	14	50	21.3	5	30	300	1800	1.35	94.96	12.98	3.7E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

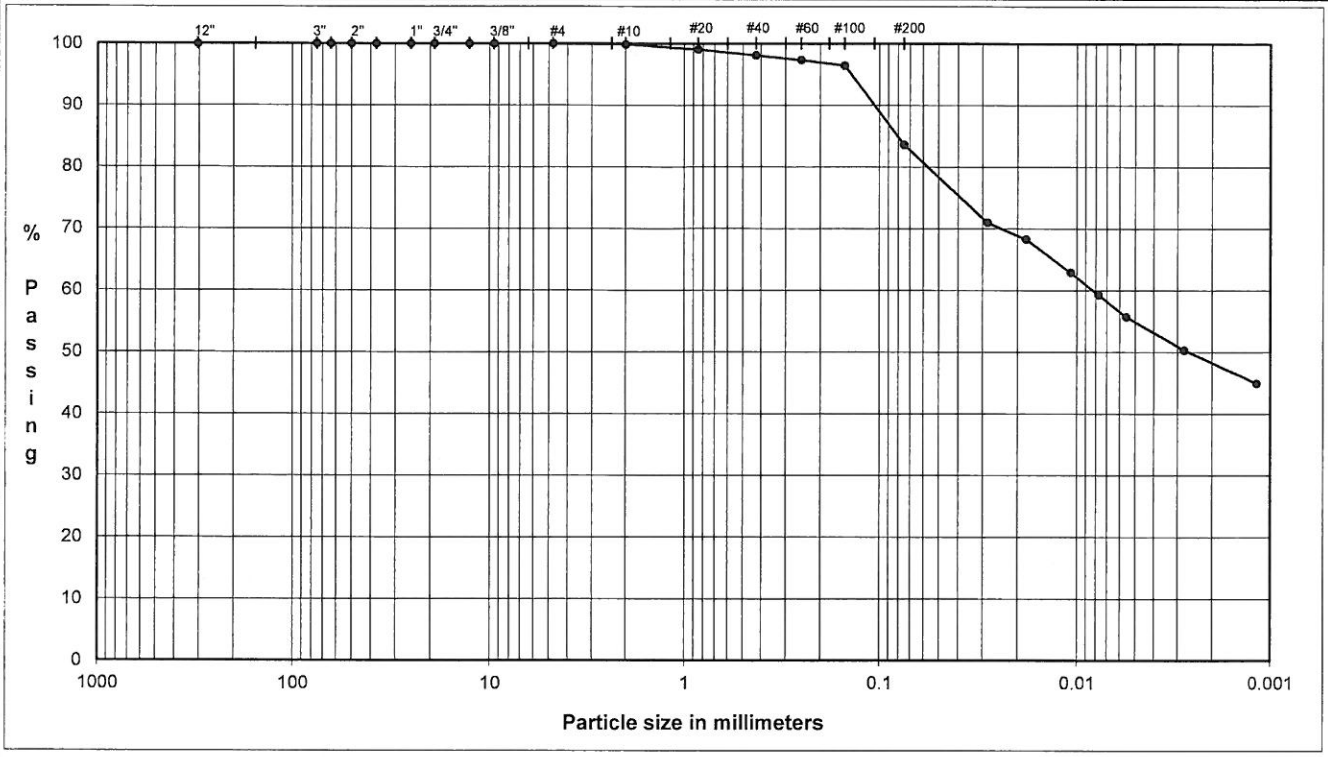
PERMEABILITY REPORTED AS ** 3.7E-08 cm/sec **

DATE	1/3/14
CHECK	DA
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN PZ-8** Depth: **8.0-10.0'**
TYPE: **UD**



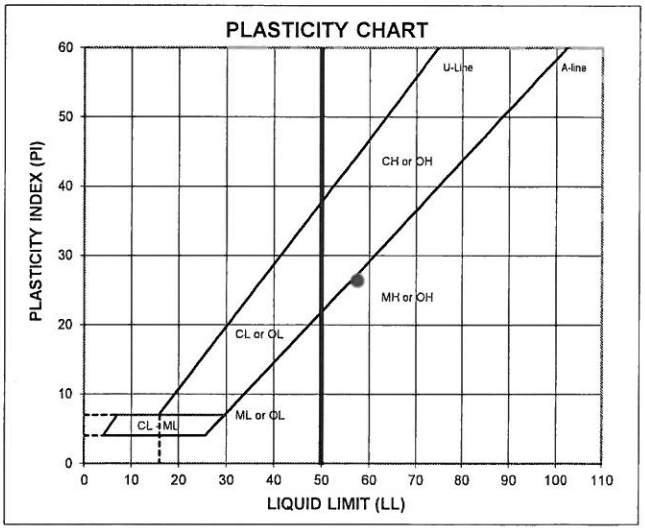
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**99.9**	Coarse Sand	**0.1**
#20	0.85	**99.1**		
#40	0.43	**98.1**	Medium Sand	**1.8**
#60	0.25	**97.4**		
#100	0.15	**96.5**		
#200	0.075	**83.6**	Fine Sand	**14.5**

Hydrometer Analysis

(mm)	%Finer		
0.028	**71.0**		
0.018	**68.3**		
0.011	**62.9**	Fines	
0.0077	**59.3**	Silt or Clay	**83.6**
0.0056	**55.7**		
0.0028	**50.3**		
0.0012	**44.9**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
26.1	**57**	**31**	**26**	**-0.20**

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy CLAYEY SILT, fine to coarse; yellowish brown.

USCS: MH

TECH	BW/AM/TJ
DATE	1/6/14
CHECK	DR
REVIEW	TJM
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF LF/AR		Board #	2	COMMENTS
PROJECT NUMBER	1303118		Flow Pump	1	
SAMPLE ID	FTN PZ-8	8.0-10.0'	Flow Pump Speed	5	
SAMPLE TYPE	UD		Technician	SDM	

Sample Data, Initial				Sample Data, Final	
Height, inches	2.924	B-Value, f	1.00	Height, inches	2.963
Diameter, inches	2.846	Cell Pres.	85.0	Diameter, inches	2.868
Area, cm²	41.04	Bot. Pres.	80.0	Area, cm²	41.68
Volume, cm³	304.82	Top Pres.	80.0	Volume, cm³	313.68
Mass, g	545.81	Tot. B.P.	80.0	Mass, g	584.32
Moisture Content, %	26.1	Head, max.	84.41	Moisture Content, %	35.00
Dry Density, pcf	88.6	Head, min.	84.41	Dry Density, pcf	86.10
Spec. Gravity(assumed)	2.700	Max. Grad.	11.22	Volume Solids, cm³	160.31
Volume Solids, cm³	160.31	Min. Grad.	11.22	Volume Voids, cm³	153.37
Volume Voids, cm³	144.51			Void Ratio	0.96
Void Ratio	0.90			Saturation, %	98.8%
Saturation, %	78.2%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	545.81	592.42
Wt Soil & Tare, f	g	432.82	441.02
Wt Tare	g	0.00	8.47
Wt Moisture Lost	g	112.99	151.40
Wt Dry Soil	g	432.82	432.55
Water Content	%	26.10%	35.00%

DESCRIPTION: sandy CLAYEY SILT, fine to coarse; yellowish brown.

Flow Pump Rate: 1.26E-03 cm³/sec

USCS: MH

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
01/07/14	41646	10	30	20.1	0	0	0	0	1.20	84.41	11.22	2.7E-06
01/07/14	41646	10	35	20.1	5	5	300	300	1.20	84.41	11.22	2.7E-06
01/07/14	41646	10	40	20.1	5	10	300	600	1.20	84.41	11.22	2.7E-06
01/07/14	41646	10	45	20.1	5	15	300	900	1.20	84.41	11.22	2.7E-06 *
01/07/14	41646	10	50	20.1	5	20	300	1200	1.20	84.41	11.22	2.7E-06 *
01/07/14	41646	10	55	20.1	5	25	300	1500	1.20	84.41	11.22	2.7E-06 *
01/07/14	41646	11	0	20.1	5	30	300	1800	1.20	84.41	11.22	2.7E-06 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 2.7E-06 cm/sec **

DATE	1/7/14
CHECK	DW
REVIEW	[illegible]
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF LF/AR		Board #	2	COMMENTS: The sample was remolded to 95.0% of the Maximum Dry Density and OPTM + 3.1% (using ASTM D 698).
PROJECT NUMBER	1303118		Flow Pump	1	
SAMPLE ID	FTN B-10	3.0-8.0'	Flow Pump Speed	6	
SAMPLE TYPE	Bulk		Technician	SDM	

Sample Data, Initial				Sample Data, Final	
Height, inches	3.000	B-Value, f	0.99	Height, inches	3.002
Diameter, inches	2.790	Cell Pres.	90.0	Diameter, inches	2.782
Area, cm²	39.44	Bot. Pres.	80.0	Area, cm²	39.22
Volume, cm³	300.55	Top Pres.	80.0	Volume, cm³	299.03
Mass, g	589.86	Tot. B.P.	80.0	Mass, g	599.35
Moisture Content, %	21.3	Head, max.	99.18	Moisture Content, %	23.22
Dry Density, pcf	101.0	Head, min.	99.18	Dry Density, pcf	101.50
Spec. Gravity(assumed)	2.700	Max. Grad.	13.01	Volume Solids, cm³	180.15
Volume Solids, cm³	180.15	Min. Grad.	13.01	Volume Voids, cm³	118.88
Volume Voids, cm³	120.40			Void Ratio	0.66
Void Ratio	0.67			Saturation, %	95.0%
Saturation, %	85.9%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	589.86	607.34
Wt Soil & Tare, f	g	486.41	494.50
Wt Tare	g	0.00	8.51
Wt Moisture Lost	g	103.45	112.84
Wt Dry Soil	g	486.41	485.99
Water Content	%	21.27%	23.22%

Flow Pump Rate: 5.07E-04 cm³/sec

USCS: SC-SM

DESCRIPTION: CLAYEY SAND to SILTY SAND, fine to medium; brown.

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
01/22/14	41661	8	20	19.5	0	0	0	0	1.41	99.18	13.01	1.0E-06
01/22/14	41661	8	25	19.5	5	5	300	300	1.41	99.18	13.01	1.0E-06
01/22/14	41661	8	30	19.5	5	10	300	600	1.41	99.18	13.01	1.0E-06
01/22/14	41661	8	35	19.5	5	15	300	900	1.41	99.18	13.01	1.0E-06 *
01/22/14	41661	8	40	19.5	5	20	300	1200	1.41	99.18	13.01	1.0E-06 *
01/22/14	41661	8	45	19.5	5	25	300	1500	1.41	99.18	13.01	1.0E-06 *
01/22/14	41661	8	50	19.5	5	30	300	1800	1.41	99.18	13.01	1.0E-06 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 1.0E-06 cm/sec **

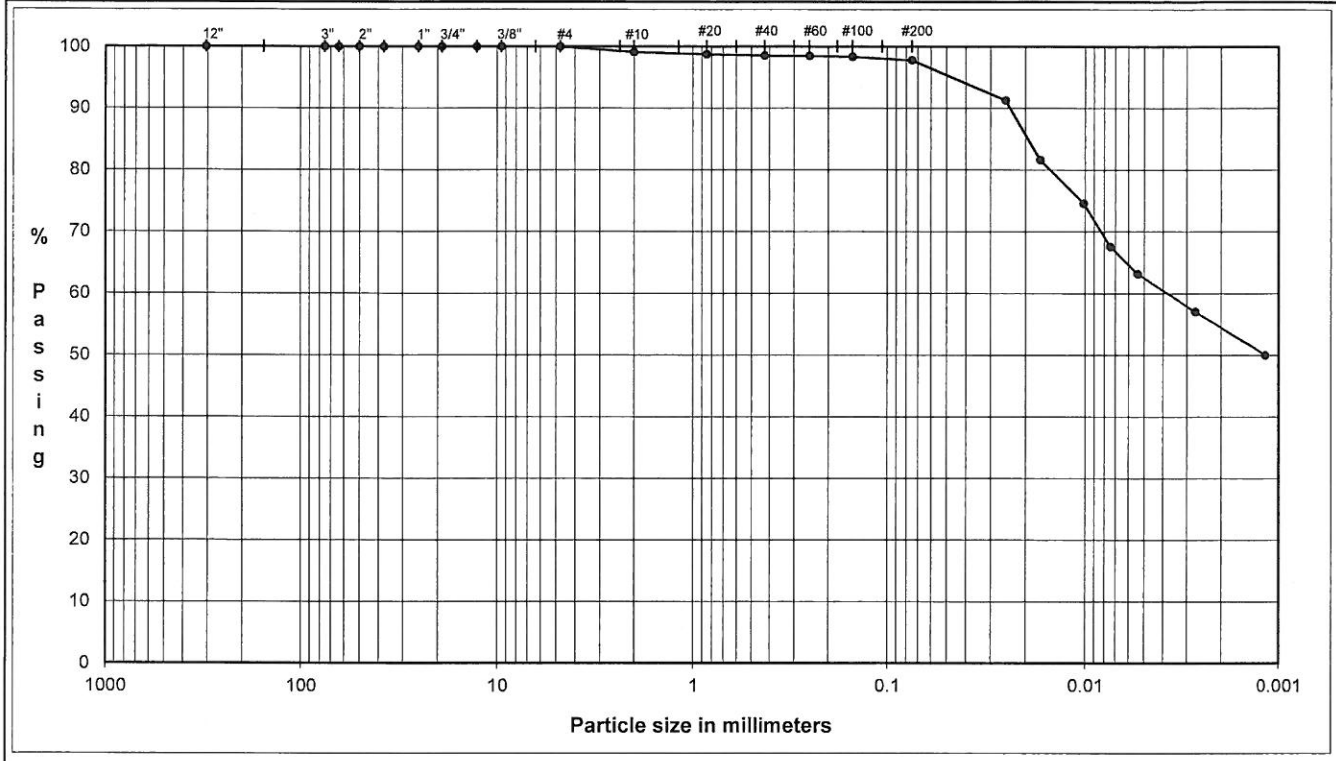
DATE	1/22/14
CHECK	
REVIEW	
APPROVE	

JANUARY 2014 1303118

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-9** Depth: **38.0-40.0**
TYPE: **UD**



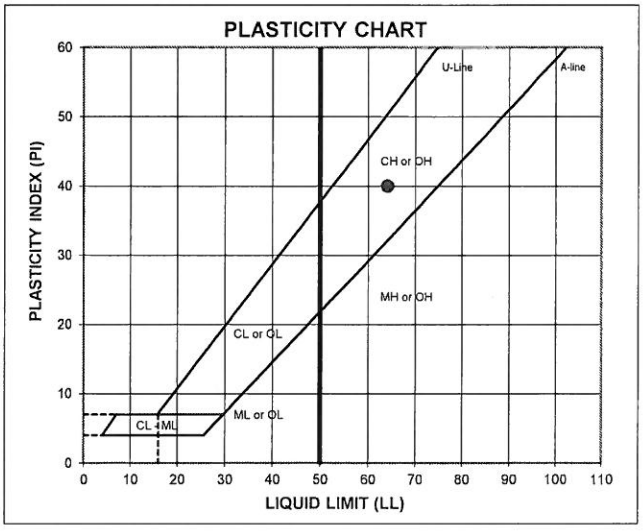
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**99.1**	Coarse Sand	**0.9**
#20	0.85	**98.8**		
#40	0.43	**98.6**	Medium Sand	**0.5**
#60	0.25	**98.5**		
#100	0.15	**98.4**		
#200	0.075	**97.8**	Fine Sand	**0.8**

Hydrometer Analysis

(mm)	%Finer		
0.025	**91.3**		
0.017	**81.6**		
0.010	**74.6**	Fines	
0.0075	**67.6**	Silt or Clay	**97.8**
0.0054	**63.2**		
0.0027	**57.1**		
0.0012	**50.0**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
34.4	64	24	40	0.27

LL (oven-dried) / 0.75 = ORGANIC (OL/OH)

DESCRIPTION: CLAY, trace fine to coarse sand; gray.

USCS: CH

TECH	FT/TW/SJ/AM
DATE	1/10/14
CHECK	
REVIEW	
APPROVE	

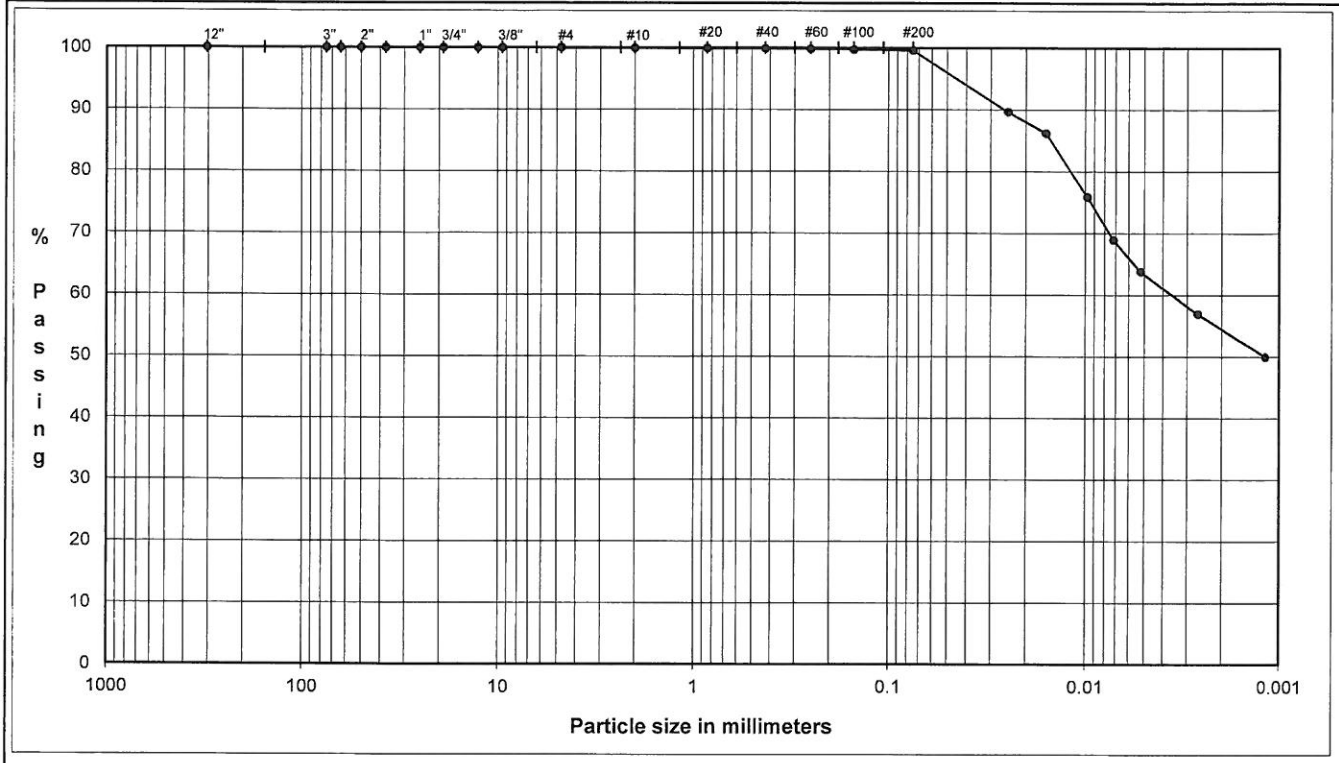
Golder Associates Inc.

JANUARY 2014 1303118

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-11** Depth: **28.0-30.0'**
TYPE: **UD**



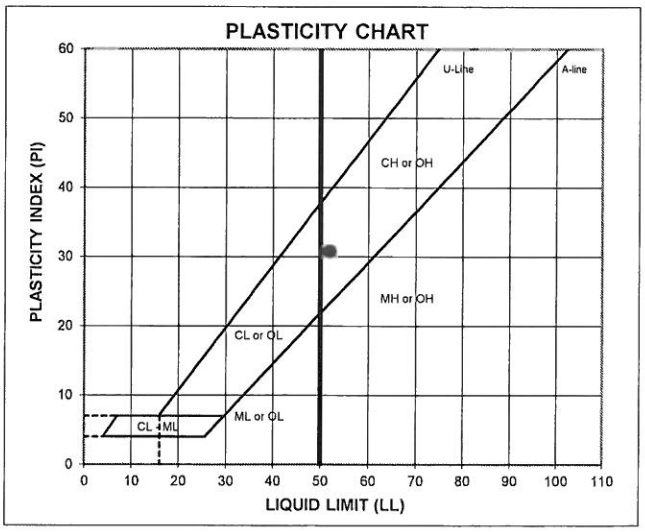
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**100.0**	Coarse Sand	**0.0**
#20	0.85	**99.9**		
#40	0.43	**99.9**	Medium Sand	**0.1**
#60	0.25	**99.8**		
#100	0.15	**99.8**		
#200	0.075	**99.6**	Fine Sand	**0.3**

Hydrometer Analysis

(mm)	%Finer		
0.025	**89.7**		
0.016	**86.2**		
0.010	**75.9**	Fines	
0.0072	**69.0**	Silt or Clay	**99.6**
0.0052	**63.8**		
0.0027	**56.9**		
0.0012	**50.0**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
35.8	**52**	**21**	**31**	**0.47**

LL (oven-dried) / LL (not dried) < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: CLAY, trace fine to medium sand; gray.

USCS: CH

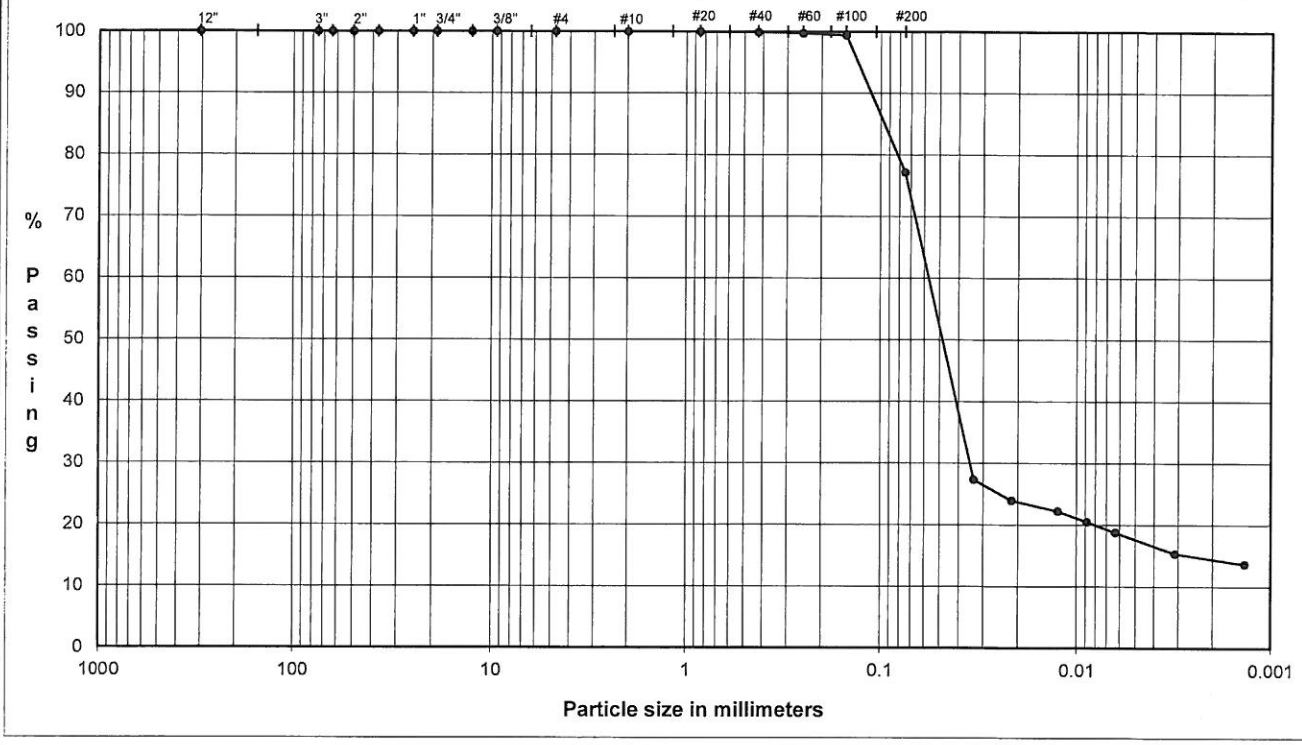
TECH	SJ/TJ/FT
DATE	1/9/14
CHECK	
REVIEW	
APPROVE	

Golder Associates Inc.

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN B-10** Depth: **14.0-16.0'**
TYPE: **UD**



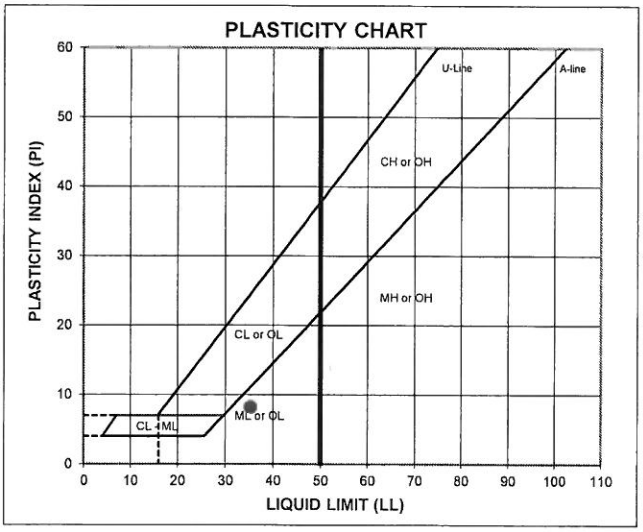
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**99.9**	Medium Sand	**0.1**
#60	0.25	**99.8**		
#100	0.15	**99.5**		
#200	0.075	**77.2**	Fine Sand	**22.7**

Hydrometer Analysis

(mm)	%Finer		
0.034	**27.3**		
0.021	**23.9**		
0.012	**22.2**	Fines	
0.0089	**20.5**	Silt or Clay	**77.2**
0.0063	**18.8**		
0.0031	**15.4**		
0.0014	**13.7**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
27.8	**35**	**27**	**8**	**0.08**

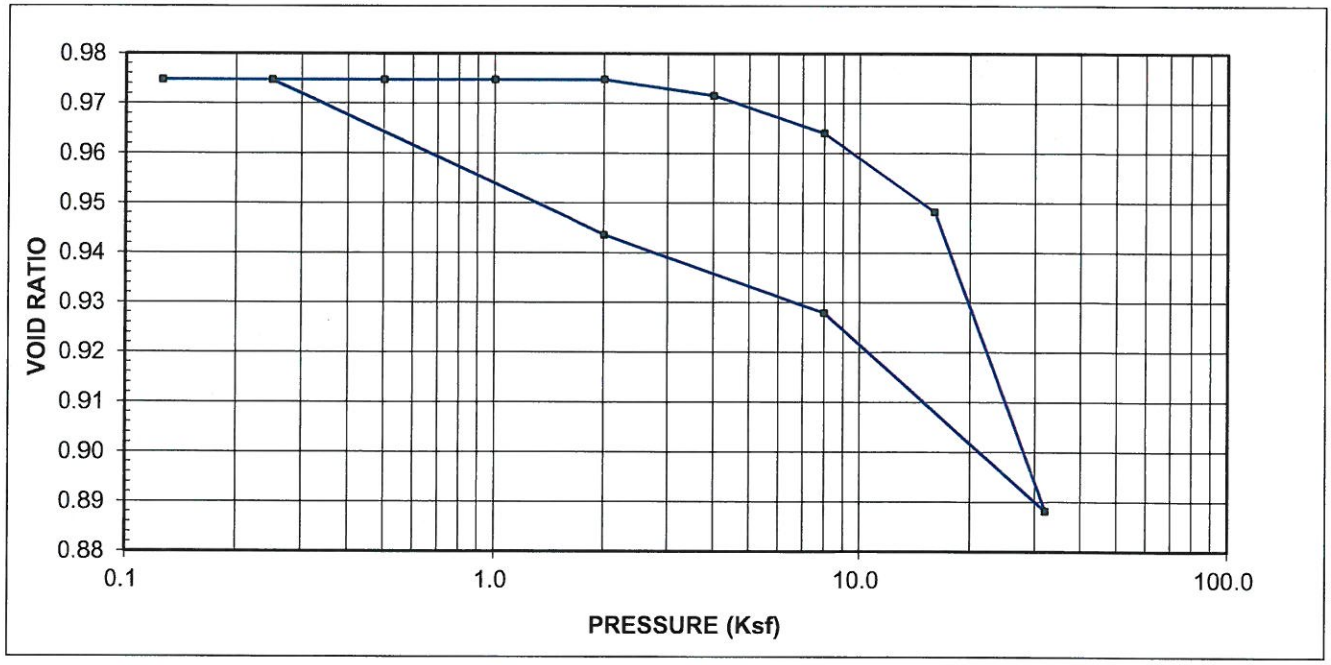
LL (oven-dried) / 0.75 = ORGANIC (OL/OH)

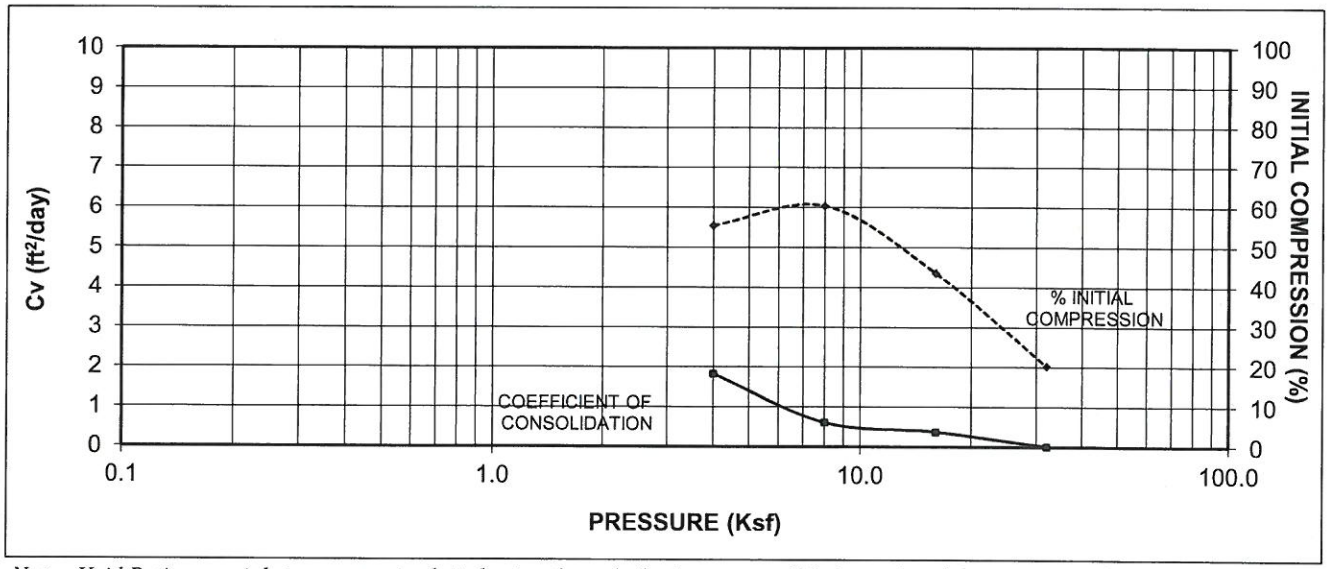
DESCRIPTION: sandy CLAYEY SILT, fine to medium; gray.

USCS: ML

TECH	FT/SJ/TJ
DATE	1/9/14
CHECK	DA
REVIEW	
APPROVE	

ONE - DIMENSIONAL CONSOLIDATION
ASTM D 2435 Method A





Note: Void Ratio vs. axial stress curve is plotted using the end of primary consolidation, using the square root of time method.

SAMPLE ID	FTN B-11
SAMPLE TYPE	UD
SAMPLE DEPTH	43.0 - 45.0'

LL	76
PL	37
PI	39
Gs	2.73

	Initial	Final
Dry Unit Weight (pcf)	86.2	86.2
Wet Unit Weight (pcf)	116.5	118.2
Moisture Content	35.1%	37.1%
Void Ratio	0.975	0.975
Degree of Saturation	98%	100%

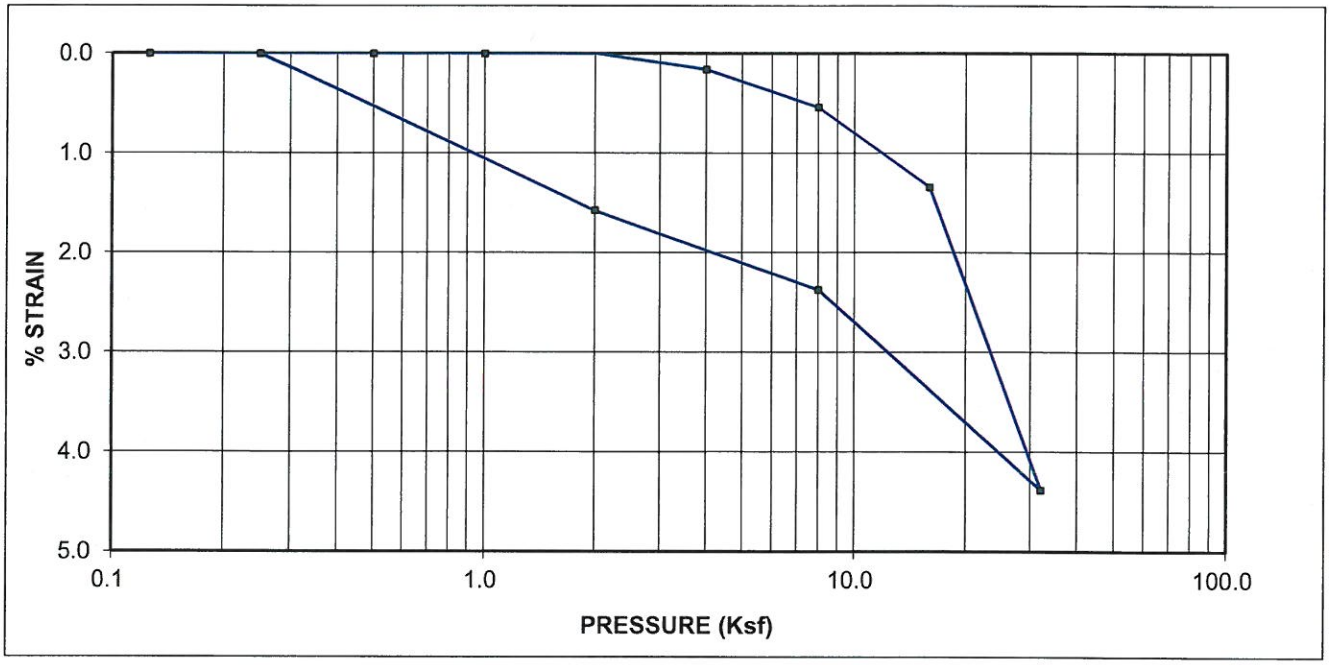
DESCRIPTION: CLAYEY SILT, some fine to medium sand; gray.

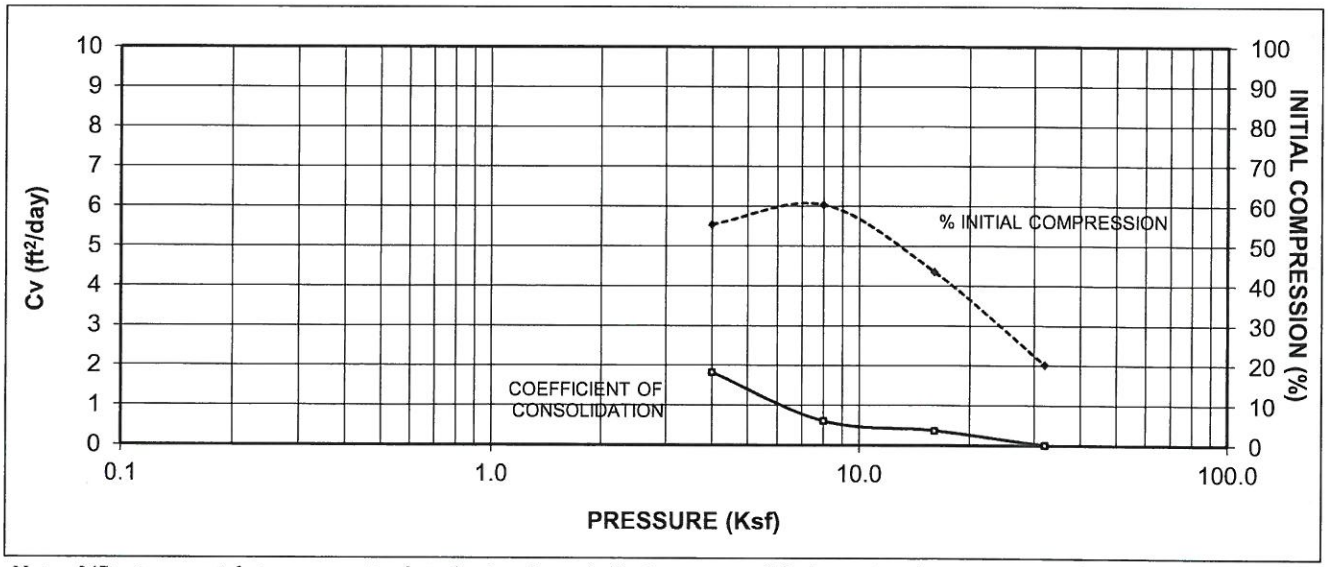
USCS: MH

FTN/ENTERGY WHITE BLUFF LF/AR
1303118

TECH	PWM/TW
START DATE	1/7/14
CHECK	
REVIEW	
APPROVE	

ONE - DIMENSIONAL CONSOLIDATION
ASTM D 2435 Method A





Note: %Strain vs. axial stress curve is plotted using the end of primary consolidation, using the square root of time method.

SAMPLE ID	FTN B-11
SAMPLE TYPE	UD
SAMPLE DEPTH	43.0 - 45.0'

LL	76
PL	37
PI	39
Gs	2.73

	Initial	Final
Dry Unit Weight (pcf)	86.2	86.2
Wet Unit Weight (pcf)	116.5	118.2
Moisture Content	35.1%	37.1%
Void Ratio	0.975	0.975
Degree of Saturation	98%	100%

DESCRIPTION: CLAYEY SILT, some fine to medium sand; gray.

USCS: MH

FTN/ENTERGY WHITE BLUFF LF/AR
1303118

TECH	PWM/TW
START DATE	1/7/14
CHECK	TWN
REVIEW	NLC
APPROVE	

ONE-DIMENSIONAL CONSOLIDATION
ASTM D 2435 Method A

PROJECT NAME	FTN/ENTERGY WHITE BLUFF LF/AR
PROJECT NUMBER	1303118
SAMPLE ID	FTN B-11
SAMPLE DEPTH	43.0 - 45.0'
SAMPLE TYPE	UD

DESCRIPTION: CLAYEY SILT, some fine to medium sand; gray.

CLASSIFICATION: MH

CONSOLIDOMETER #: 1

ASTM D 2435 Method: A

	LL	PL	PI	Gs
	76	37	39	2.729

Sample Data	Trimmings	Before Test	After Test
Tare plus wet soil, g	181.63	185.14	186.81
Tare plus dry soil, g	147.69	156.37	156.37
Tare, g	51.57	74.36	74.36
Water, g	33.94	28.77	30.44
Dry soil, g	96.12	82.01	82.01
Water Content	35.3%	35.1%	37.1%

Diameter (in)	2.490
Height of sample (in)	0.744
Area of sample (in^2)	4.870
Volume of sample (in^3)	3.623
Water Content	35.1%
Sample Wt (wet, g)	110.78
Sample Wt (dry, g)	82.01
Water Wt (g)	28.77

Sample Data	Initial	Final
Total Height (in)	0.744	0.744
Height of solids (in)	0.377	0.377
Height of voids (in)	0.367	0.367
Height of water (in)	0.361	0.382
Void ratio	0.975	0.975
Degree of saturation	98.2%	100.0%
Dry unit wt (pcf)	86.2	86.2
Wet unit wt (pcf)	116.5	118.2

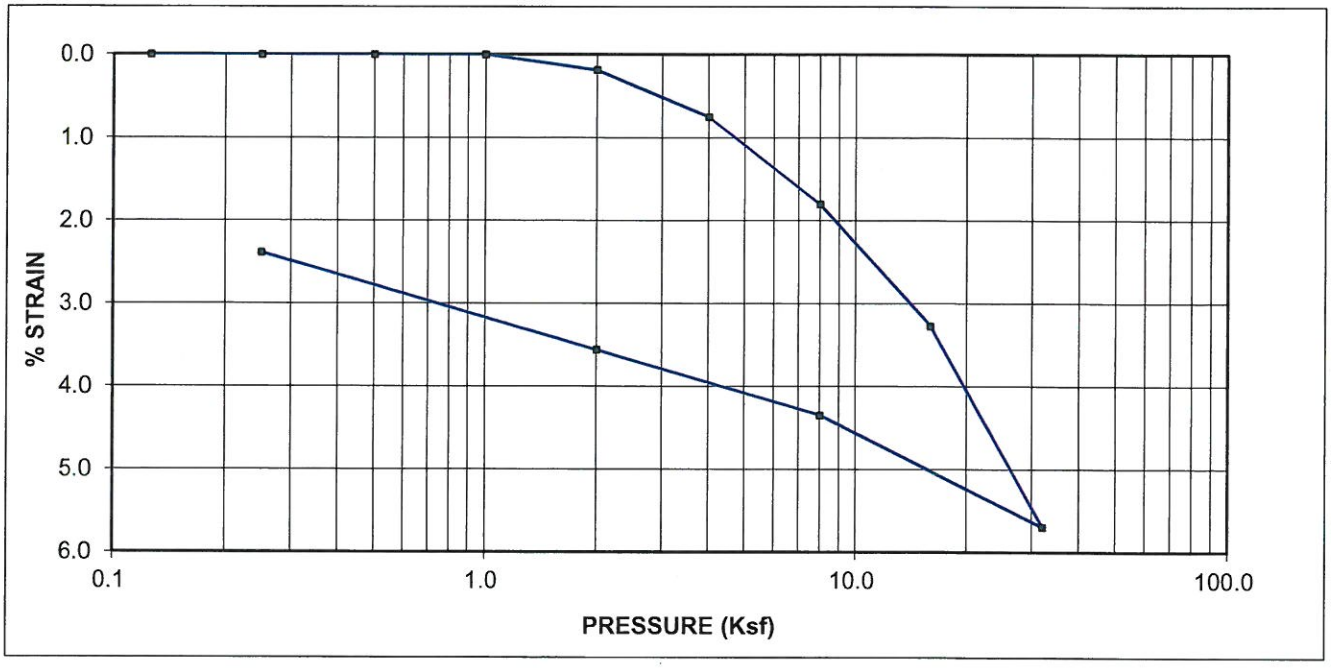
PRESSURE (ksf)	H100 DIAL READING	MACHINE / STONE CORR.	DIAL CHANGE (in)	FITTING TIME (sec) t90	SAMPLE HEIGHT (in)	HEIGHT OF VOIDS Hv	VOID RATIO e	CHANGE IN HEIGHT (accum)	STRAIN %	LENGTH OF DRAINAGE PATH (DOUBLE DRAINAGE) H (in)	LENGTH OF DRAINAGE PATH (DOUBLE DRAINAGE) H^2 (cm^2)	PERCENT INITIAL COMPRESSION	COEFFICIENT OF CONSOLIDATION (ft^2/day)
0.125	0.0000	0.0000	0.0000		0.744	0.3672	0.9748	0.0000	0.0	0.372	0.893		
0.126	0.0000	0.0000	0.0000		0.744	0.3672	0.9748	0.0000	0.0	0.372	0.893		
0.250	0.0000	0.0000	0.0000		0.744	0.3672	0.9748	0.0000	0.0	0.372	0.893		
0.500	0.0000	0.0000	0.0000		0.744	0.3672	0.9748	0.0000	0.0	0.372	0.893		
1.000	0.0000	0.0000	0.0000		0.744	0.3672	0.9748	0.0000	0.0	0.372	0.893		
2.000	0.0017	0.0017	0.0000		0.744	0.3673	0.9748	0.0000	0.0	0.372	0.893		
4.000	0.0046	0.0034	0.0012	38	0.743	0.3661	0.9716	0.0012	0.2	0.372	0.891	55.4	1.83
8.000	0.0091	0.0050	0.0040	114	0.740	0.3632	0.9641	0.0040	0.5	0.371	0.887	60.4	0.61
16.000	0.0169	0.0069	0.0100	184	0.734	0.3573	0.9482	0.0100	1.3	0.368	0.876	43.6	0.38
32.000	0.0416	0.0090	0.0326	4646	0.711	0.3346	0.8882	0.0326	4.4	0.361	0.842	20.3	0.01
8.000	0.0227	0.0050	0.0177		0.726	0.3496	0.9279	0.0177	2.4	0.359	0.834		
2.000	0.0150	0.0033	0.0117		0.732	0.3555	0.9436	0.0117	1.6	0.365	0.858		
0.250	0.0000	0.0000	0.0000		0.744	0.3672	0.9748	0.0000	0.0	0.369	0.879		

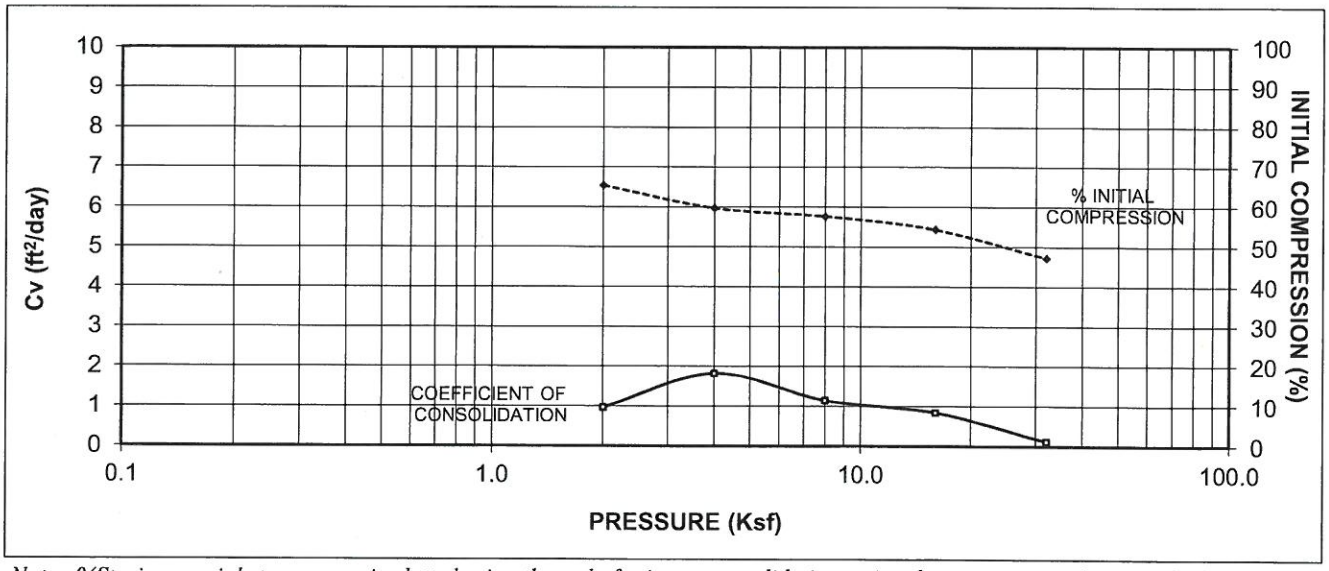
FINAL DIAL READING = 0.0000 Test terminated, due to sample swelling.

Note:
- Specimen was trimmed into consolidation ring
- Specimen was run **inundated**.
- Specimen required **2 ksf** of pressure to hold **swelling** down.
- Load increments were allowed to stay on samples for at least **24 hours.**
- **%Strain and Void Ratio** versus **axial stress** curves are plotted using the end of primary consolidation, using the **square root of time method.**
- Final saturation high (104%), adjusted to 100%

TECH	PWM/TW
START DATE	1/7/14
CHECK	PWM
REVIEW	WCS
APPROVE	

ONE - DIMENSIONAL CONSOLIDATION
ASTM D 2435 Method A





Note: %Strain vs. axial stress curve is plotted using the end of primary consolidation, using the square root of time method.

SAMPLE ID	FTN B-12
SAMPLE TYPE	UD
SAMPLE DEPTH	8.0 - 10.0'

LL	56
PL	27
PI	29
Gs	2.70

	Initial	Final
Dry Unit Weight (pcf)	85.1	87.2
Wet Unit Weight (pcf)	113.4	118.3
Moisture Content	33.1%	35.6%
Void Ratio	0.978	0.931
Degree of Saturation	91%	100%

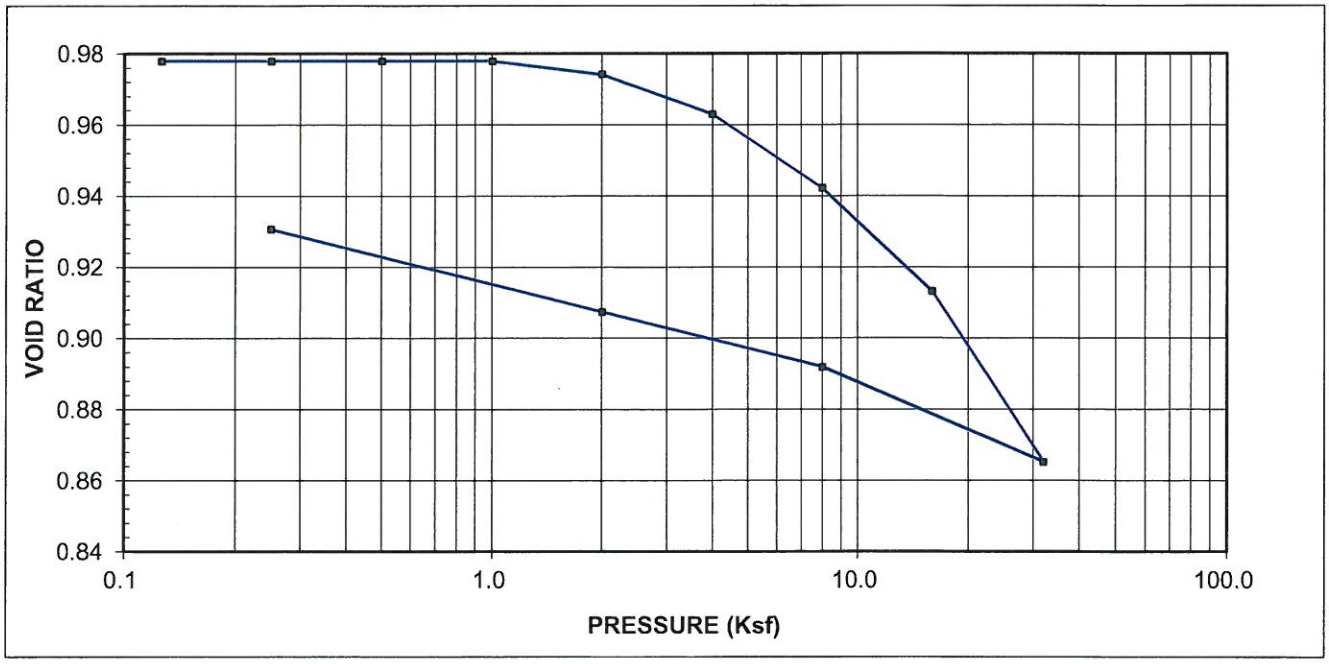
DESCRIPTION: sandy CLAY, fine to coarse; olive brown.

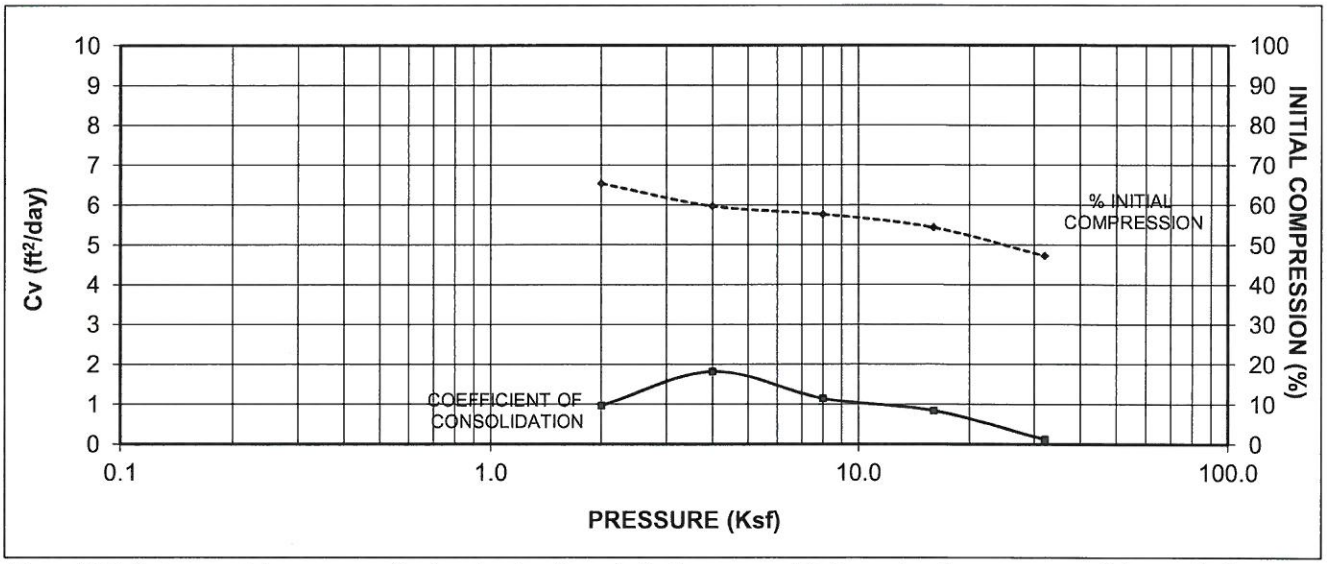
USCS: CH

FTN/ENTERGY WHITE BLUFF LF/AR
1303118

TECH	PWM/TW
START DATE	1/7/14
CHECK	JWM
REVIEW	WES
APPROVE	

ONE - DIMENSIONAL CONSOLIDATION
ASTM D 2435 Method A





Note: Void Ratio vs. axial stress curve is plotted using the end of primary consolidation, using the square root of time method.

SAMPLE ID	FTN B-12
SAMPLE TYPE	UD
SAMPLE DEPTH	8.0 - 10.0'

LL	56
PL	27
PI	29
Gs	2.70

	Initial	Final
Dry Unit Weight (pcf)	85.1	87.2
Wet Unit Weight (pcf)	113.4	118.3
Moisture Content	33.1%	35.6%
Void Ratio	0.978	0.931
Degree of Saturation	91%	100%

DESCRIPTION: sandy CLAY, fine to coarse; olive brown.

USCS: CH

FTN/ENTERGY WHITE BLUFF LF/AR
1303118

TECH	PWM/TW
START DATE	1/7/14
CHECK	
REVIEW	
APPROVE	

ONE-DIMENSIONAL CONSOLIDATION
ASTM D 2435 Method A

PROJECT NAME	FTN/ENTERGY WHITE BLUFF LF/AR
PROJECT NUMBER	1303118
SAMPLE ID	FTN B-12
SAMPLE DEPTH	8.0 - 10.0'
SAMPLE TYPE	UD

DESCRIPTION: sandy CLAY, fine to coarse; olive brown.

CLASSIFICATION: CH

CONSOLIDOMETER #: 2

ASTM D 2435 Method: A

	LL	PL	PI	Gs
	56	27	29	2.699

Sample Data	Trimmings	Before Test	After Test
Tare plus wet soil, g	219.62	184.01	186.03
Tare plus dry soil, g	180.83	157.02	157.02
Tare, g	52.08	75.54	75.54
Water, g	38.79	26.99	29.01
Dry soil, g	128.75	81.48	81.48
Water Content	30.1%	33.1%	35.6%

Diameter (in)	2.496
Height of sample (in)	0.745
Area of sample (in^2)	4.893
Volume of sample (in^3)	3.645
Water Content	33.1%
Sample Wt (wet, g)	108.47
Sample Wt (dry, g)	81.48
Water Wt (g)	26.99

Sample Data	Initial	Final
Total Height (in)	0.745	0.727
Height of solids (in)	0.377	0.377
Height of voids (in)	0.368	0.351
Height of water (in)	0.337	0.362
Void ratio	0.978	0.931
Degree of saturation	91.4%	100.0%
Dry unit wt (pcf)	85.1	87.2
Wet unit wt (pcf)	113.4	118.3

PRESSURE (ksf)	H100 DIAL READING	MACHINE / STONE CORR.	DIAL CHANGE (in)	FITTING TIME (sec) t90	SAMPLE HEIGHT (in)	HEIGHT OF VOIDS Hv	VOID RATIO e	CHANGE IN HEIGHT (accum)	STRAIN %	LENGTH OF DRAINAGE PATH (DOUBLE DRAINAGE) H (in)	LENGTH OF DRAINAGE PATH (DOUBLE DRAINAGE) H^2 (cm^2)	PERCENT INITIAL COMPRESSION	COEFFICIENT OF CONSOLIDATION (ft^2/day)
0.125	0.0000	0.0000	0.0000		0.745	0.3683	0.9779	0.0000	0.0	0.373	0.895		
0.126	0.0000	0.0000	0.0000		0.745	0.3683	0.9779	0.0000	0.0	0.372	0.895		
0.250	0.0000	0.0000	0.0000		0.745	0.3683	0.9779	0.0000	0.0	0.372	0.895		
0.500	0.0000	0.0000	0.0000		0.745	0.3683	0.9779	0.0000	0.0	0.372	0.895		
1.000	0.0000	0.0000	0.0000		0.745	0.3683	0.9779	0.0000	0.0	0.372	0.895		
2.000	0.0034	0.0020	0.0014	73	0.744	0.3669	0.9742	0.0014	0.2	0.372	0.894	65.4	0.97
4.000	0.0087	0.0031	0.0056	38	0.739	0.3627	0.9630	0.0056	0.8	0.371	0.887	59.7	1.82
8.000	0.0179	0.0045	0.0134	60	0.732	0.3549	0.9422	0.0134	1.8	0.368	0.872	57.7	1.15
16.000	0.0305	0.0061	0.0244	79	0.721	0.3440	0.9132	0.0244	3.3	0.363	0.850	54.3	0.84
32.000	0.0509	0.0085	0.0424	512	0.703	0.3259	0.8652	0.0424	5.7	0.356	0.817	47.3	0.13
8.000	0.0384	0.0060	0.0324		0.713	0.3360	0.8919	0.0324	4.3	0.354	0.808		
2.000	0.0285	0.0020	0.0265		0.718	0.3418	0.9075	0.0265	3.6	0.358	0.826		
0.250	0.0178	0.0000	0.0178		0.727	0.3506	0.9307	0.0178	2.4	0.361	0.843		

FINAL DIAL READING = 0.0178

Note:
Specimen was trimmed into consolidation ring
Specimen was run **inundated**.
Specimen required 1 **ksf** of pressure to hold **swelling** down.
Load increments were allowed to stay on samples for at least **24 hours**.
%Strain and Void Ratio versus **axial stress** curves are plotted using the **end of primary consolidation**, using the **square root of time method**.
Final saturation high (103%), adjusted to 100%

TECH	PWM/TW
START DATE	1/7/14
CHECK	
REVIEW	NCS
APPROVE	

JANUARY 2014

1303118

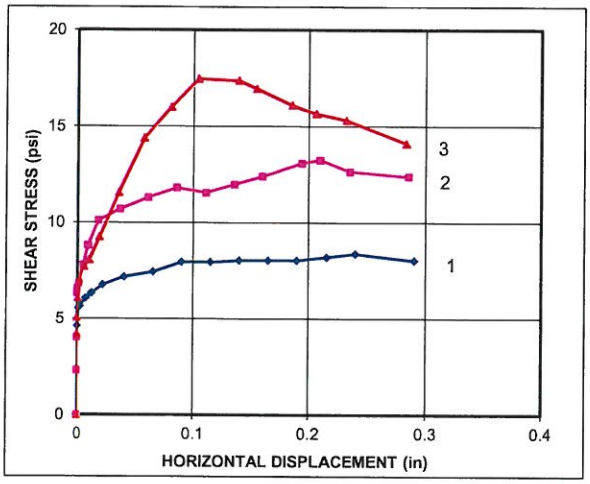
DIRECT SHEAR

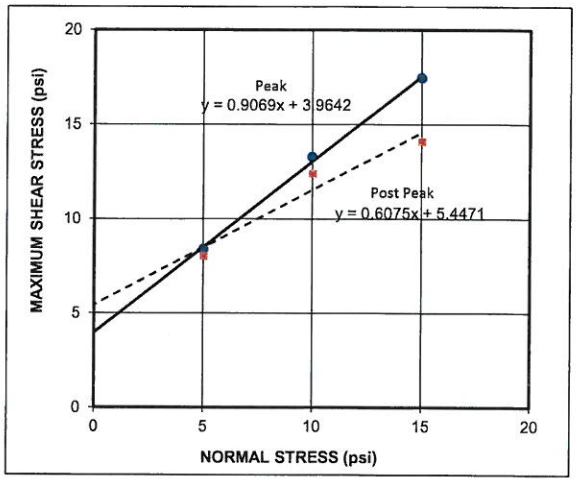
ASTM D 3080

PROJECT NAME: FTN/ENTERGY WHITE BLUFF LF/AR

PROJECT NUMBER: 1303118

SAMPLE ID: FTN B-10 - **DEPTH:** 14.0-16.0'





Peak		
ϕ =	42.2	°
C=	4.0	psi

Post Peak		
ϕ =	31.3	°
C=	5.4	psi

SPECIMEN 1	
Normal Stress (psi)	5
t50 (minutes)	0.19
SPEED mm/min	0.036
Sample Diameter (in)	2.50
Moisture Content (%)	27.8
Wet Density (pcf)	118.8
Dry Density (pcf)	93.0
Void Ratio	0.813
Saturation (%)	92

HORIZONTAL DISPLACEMENT (in)	SHEAR STRESS (psi)
0.000	0.0
0.000	2.0
0.000	3.7
0.001	4.6
0.001	5.6
0.003	5.6
0.008	6.1
0.013	6.3
0.022	6.8
0.042	7.2
0.066	7.4
0.091	8.0
0.116	8.0
0.141	8.0
0.166	8.0
0.191	8.0
0.215	8.2
0.240	8.4
0.291	8.0

8.4 Max Shear Stress

SPECIMEN 2	
Normal Stress (psi)	10
t50 (minutes)	0.12
SPEED mm/min	0.036
Sample Diameter (in)	2.50
Moisture Content (%)	27.8
Wet Density (pcf)	117.9
Dry Density (pcf)	92.3
Void Ratio	0.826
Saturation (%)	91

HORIZONTAL DISPLACEMENT (in)	SHEAR STRESS (psi)
0.000	0.0
0.000	2.3
0.000	4.0
0.000	6.3
0.000	6.6
0.002	6.8
0.006	7.8
0.010	8.8
0.018	10.1
0.038	10.7
0.062	11.3
0.086	11.8
0.112	11.6
0.136	12.0
0.161	12.4
0.195	13.1
0.210	13.3
0.235	12.7
0.286	12.4

13.3 Max Shear Stress

SPECIMEN 3	
Normal Stress (psi)	15
t50 (minutes)	0.11
SPEED mm/min	0.036
Sample Diameter (in)	2.50
Moisture Content (%)	27.8
Wet Density (pcf)	116.8
Dry Density (pcf)	91.4
Void Ratio	0.844
Saturation (%)	89

HORIZONTAL DISPLACEMENT (in)	SHEAR STRESS (psi)
0.000	0.0
0.000	1.9
0.000	4.2
0.000	5.0
0.001	6.1
0.002	7.0
0.006	7.7
0.011	8.0
0.019	9.2
0.037	11.6
0.058	14.4
0.081	16.0
0.105	17.5
0.140	17.4
0.155	16.9
0.186	16.1
0.207	15.7
0.232	15.3
0.284	14.1

17.5 Max Shear Stress

REMARKS Test was run inundated.

DESCRIPTION sandy CLAYEY SILT, fine to medium; gray.

USCS ML

TECH	TW
DATE	1/10/14
CHECK	MWM
REVIEW	NGS
APROVE	

Golder Associates Inc.

ONE-DIMENSIONAL CONSOLIDATION
ASTM D 2435 Method A

PROJECT NAME	FTN/ENTERGY WHITE BLUFF LF/AR
PROJECT NUMBER	1303118
SAMPLE ID	FTN B-9
SAMPLE DEPTH	38.0-40.0'
SAMPLE TYPE	UD

DESCRIPTION: CLAY, trace fine to coarse sand; gray.

CLASSIFICATION: CH

CONSOLIDOMETER #: 1

ASTM D 2435 Method: A

	LL	PL	PI	Gs
	64	24	40	2.712

Sample Data	Trimmings	Before Test	After Test
Tare plus wet soil, g	216.50	186.22	187.75
Tare plus dry soil, g	174.24	158.12	158.12
Tare, g	51.53	76.05	76.05
Water, g	42.26	28.10	29.63
Dry soil, g	122.71	82.07	82.07
Water Content	34.4%	34.2%	36.1%

Diameter (in)	2.498
Height of sample (in)	0.747
Area of sample (in^2)	4.901
Volume of sample (in^3)	3.661
Water Content	34.2%
Sample Wt (wet, g)	110.17
Sample Wt (dry, g)	82.07
Water Wt (g)	28.1

Sample Data	Initial	Final
Total Height (in)	0.747	0.740
Height of solids (in)	0.377	0.377
Height of voids (in)	0.370	0.363
Height of water (in)	0.350	0.369
Void ratio	0.982	0.962
Degree of saturation	94.6%	100.0%
Dry unit wt (pcf)	85.4	86.3
Wet unit wt (pcf)	114.6	117.4

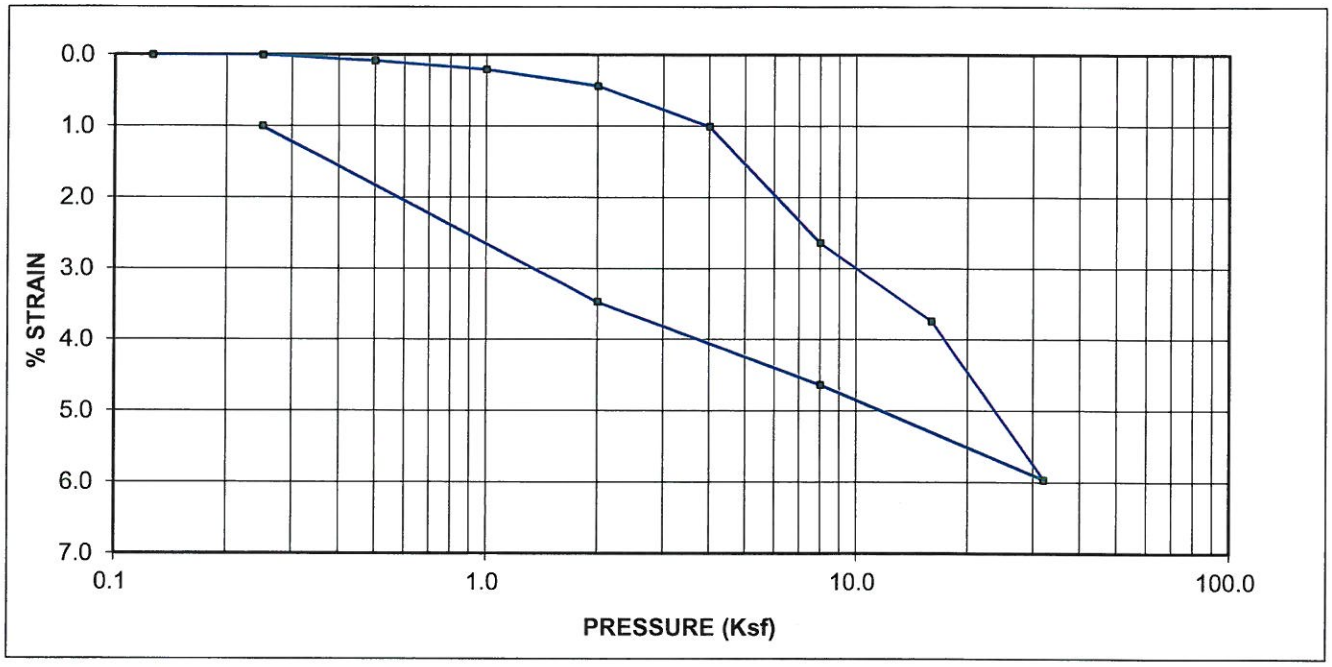
PRESSURE (ksf)	H100 DIAL READING	MACHINE / STONE CORR.	DIAL CHANGE (in)	FITTING TIME (sec) t90	SAMPLE HEIGHT (in)	HEIGHT OF VOIDS Hv	VOID RATIO e	CHANGE IN HEIGHT (accum)	STRAIN %	LENGTH OF DRAINAGE PATH (DOUBLE DRAINAGE) H (in)	LENGTH OF DRAINAGE PATH (DOUBLE DRAINAGE) H^2 (cm^2)	PERCENT INITIAL COMPRESSION	COEFFICIENT OF CONSOLIDATION (ft^2/day)
0.125	0.0000	0.0000	0.0000		0.747	0.3700	0.9816	0.0000	0.0	0.374	0.900		
0.126	0.0000	0.0000	0.0000		0.747	0.3700	0.9816	0.0000	0.0	0.374	0.900		
0.250	0.0000	0.0000	0.0000		0.747	0.3700	0.9816	0.0000	0.0	0.374	0.900		
0.500	0.0012	0.0006	0.0006		0.746	0.3694	0.9799	0.0006	0.1	0.373	0.899		
1.000	0.0027	0.0011	0.0015		0.745	0.3685	0.9775	0.0015	0.2	0.373	0.897		
2.000	0.0054	0.0021	0.0033		0.744	0.3668	0.9730	0.0033	0.4	0.372	0.894		
4.000	0.0109	0.0034	0.0075		0.740	0.3625	0.9617	0.0075	1.0	0.371	0.887		
8.000	0.0247	0.0050	0.0197	265	0.727	0.3503	0.9293	0.0197	2.6	0.367	0.868	34.9	0.26
16.000	0.0349	0.0069	0.0279	470	0.719	0.3421	0.9075	0.0279	3.7	0.362	0.844	27.4	0.14
32.000	0.0535	0.0090	0.0445	1411	0.702	0.3255	0.8634	0.0445	6.0	0.355	0.815	31.1	0.05
8.000	0.0406	0.0060	0.0346		0.712	0.3354	0.8898	0.0346	4.6	0.354	0.807		
2.000	0.0279	0.0020	0.0259		0.721	0.3441	0.9129	0.0259	3.5	0.358	0.829		
0.250	0.0075	0.0000	0.0075		0.740	0.3626	0.9618	0.0075	1.0	0.365	0.860		

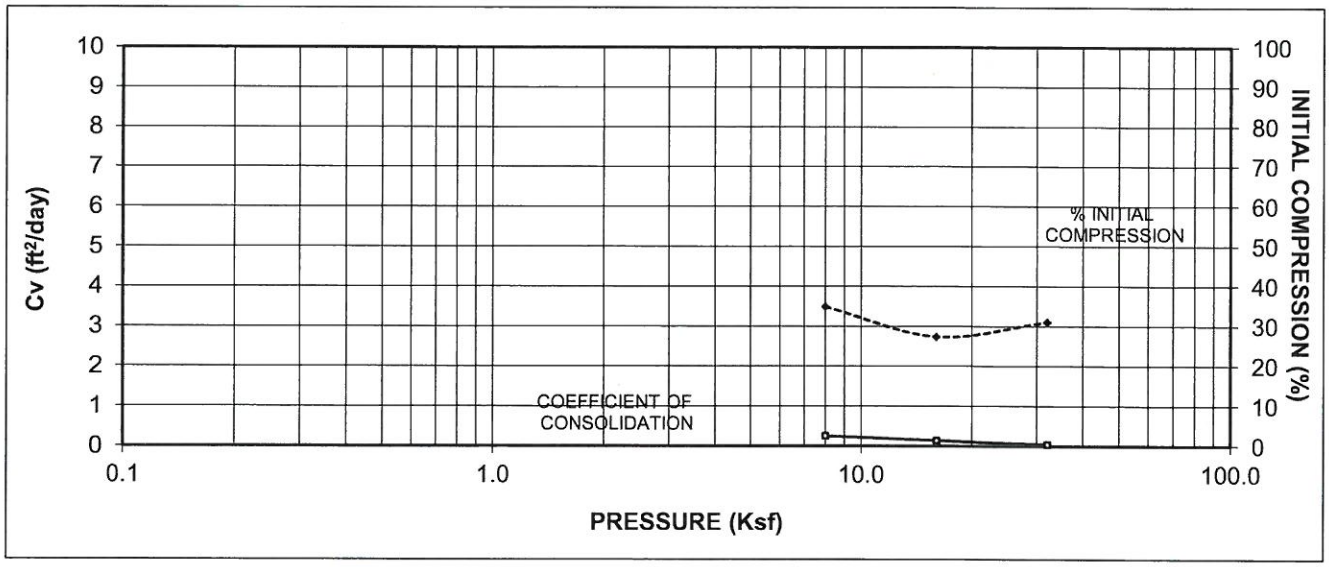
FINAL DIAL READING = 0.0075

Note:
Specimen was trimmed into consolidation ring
Specimen was run **inundated**.
Specimen required **4 ksf** of pressure to hold **swelling** down.
Load increments were allowed to stay on samples for at least **24 hours**.
%Strain and **Void Ratio** versus axial stress **curves** are plotted using the **end of primary consolidation**, using the **square root of time method**.
Final saturation high (102%), adjusted to **100%**

TECH	SDM/TW
START DATE	1/22/14
CHECK	PWN
REVIEW	WRS
APPROVE	

ONE - DIMENSIONAL CONSOLIDATION
ASTM D 2435 Method A





Note: %Strain vs. axial stress curve is plotted using the end of primary consolidation, using the square root of time method.

SAMPLE ID	FTN B-9
SAMPLE TYPE	UD
SAMPLE DEPTH	38.0-40.0'

LL	64
PL	24
PI	40
Gs	2.71

	Initial	Final
Dry Unit Weight (pcf)	85.4	86.3
Wet Unit Weight (pcf)	114.6	117.4
Moisture Content	34.2%	36.1%
Void Ratio	0.982	0.962
Degree of Saturation	95%	100%

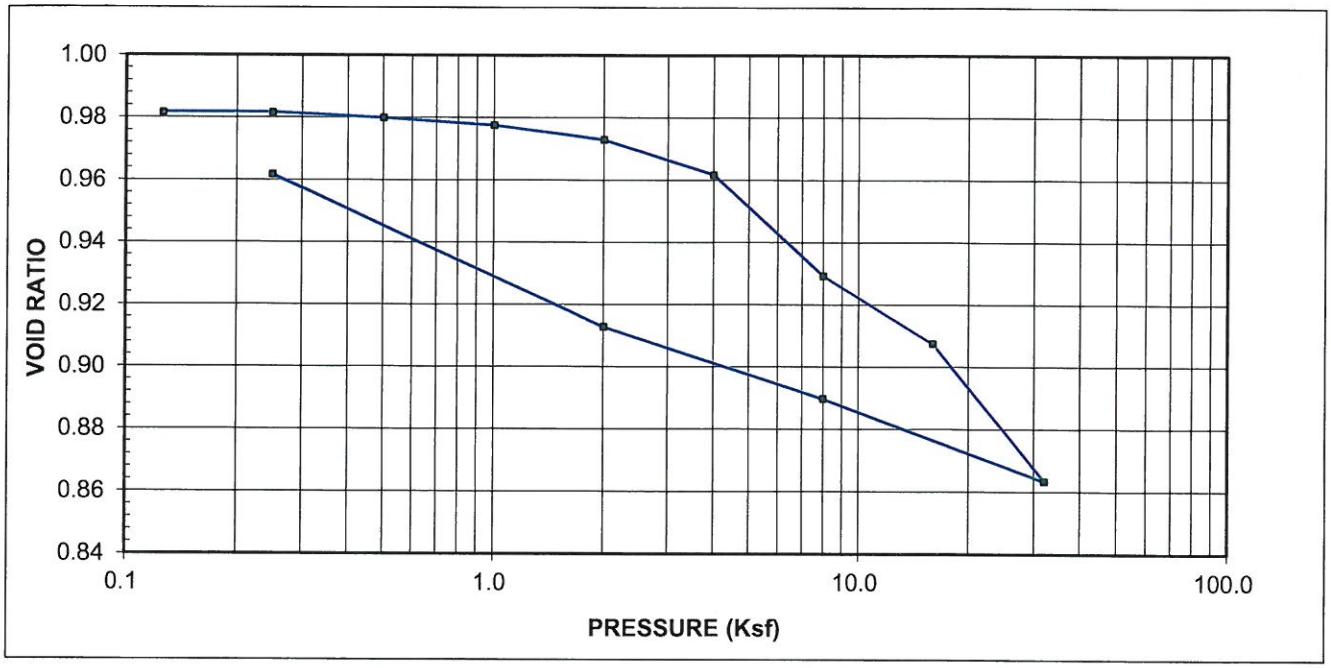
DESCRIPTION: CLAY, trace fine to coarse sand; gray.

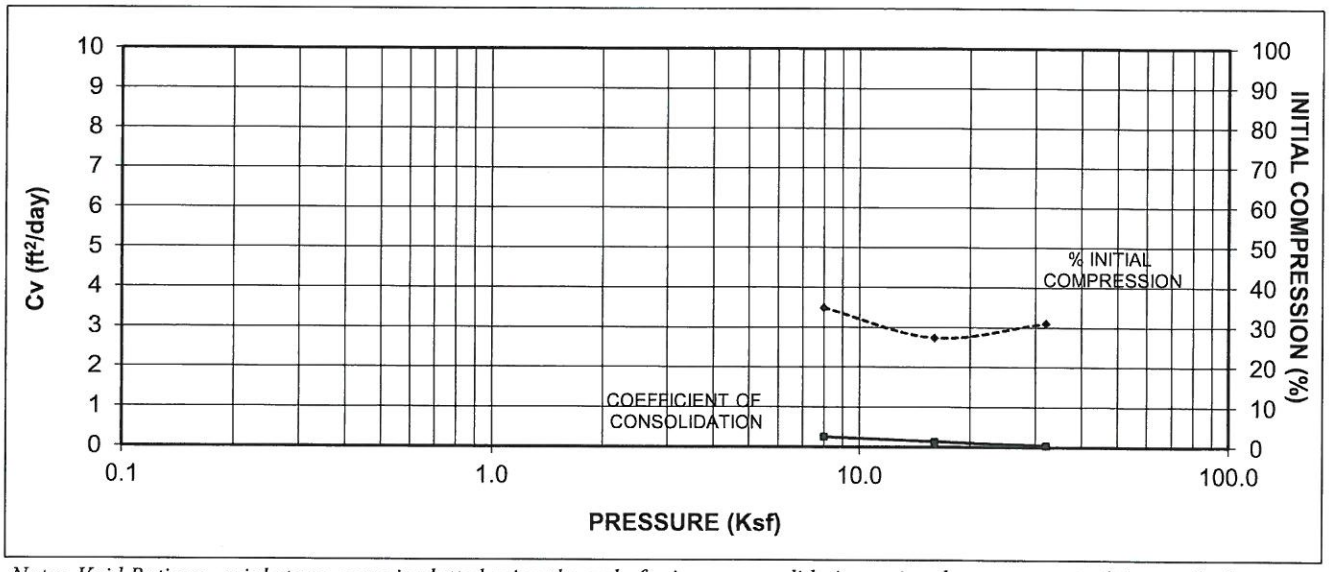
USCS: CH

FTN/ENTERGY WHITE BLUFF LF/AR
1303118

TECH	SDM/TW
START DATE	1/22/14
CHECK	AWM
REVIEW	4/16
APPROVE	

ONE - DIMENSIONAL CONSOLIDATION
ASTM D 2435 Method A





Note: Void Ratio vs. axial stress curve is plotted using the end of primary consolidation, using the square root of time method.

SAMPLE ID	FTN B-9
SAMPLE TYPE	UD
SAMPLE DEPTH	38.0-40.0'

LL	64
PL	24
PI	40
Gs	2.71

	Initial	Final
Dry Unit Weight (pcf)	85.4	86.3
Wet Unit Weight (pcf)	114.6	117.4
Moisture Content	34.2%	36.1%
Void Ratio	0.982	0.962
Degree of Saturation	95%	100%

DESCRIPTION: CLAY, trace fine to coarse sand; gray.

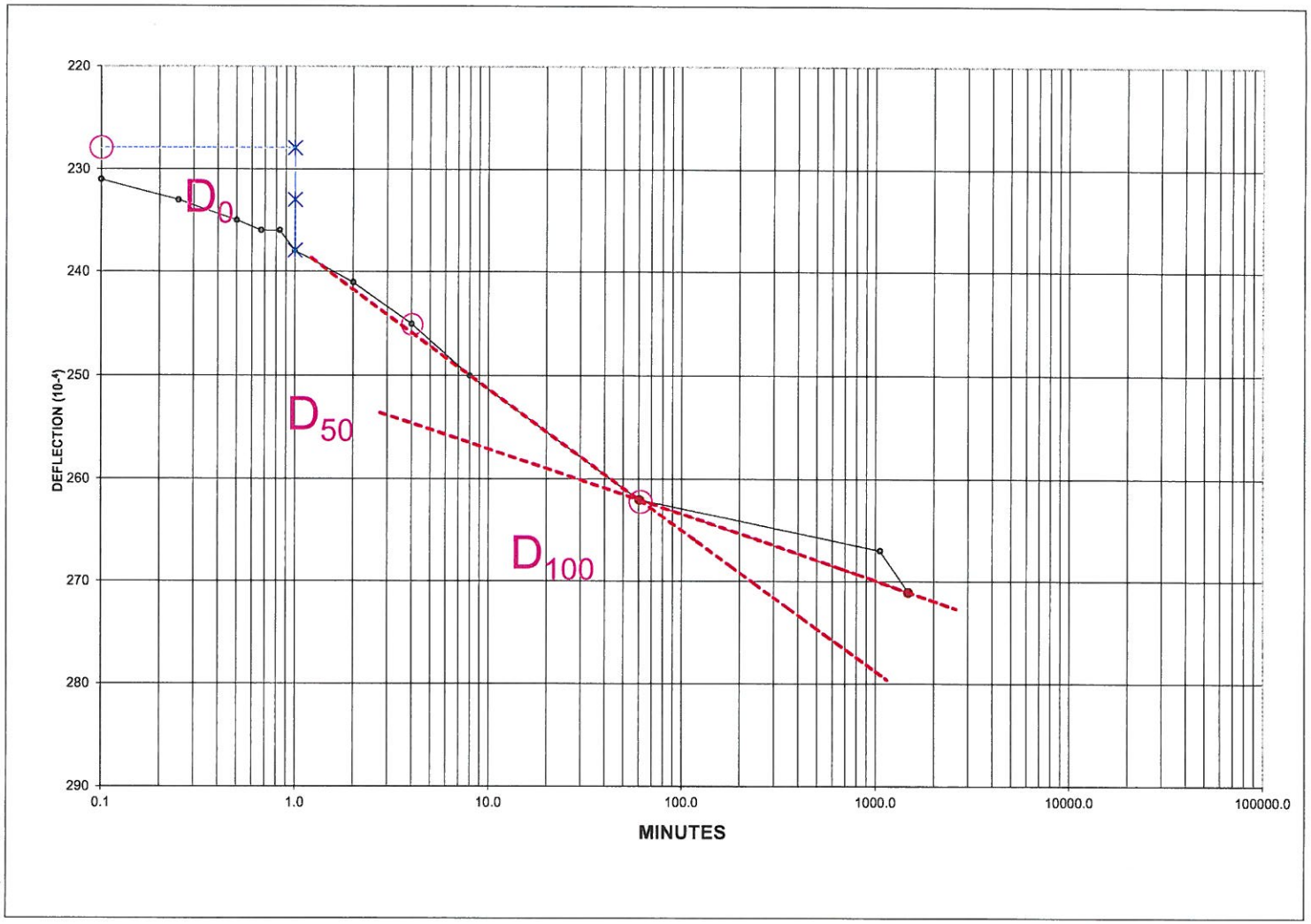
USCS: CH

FTN/ENTERGY WHITE BLUFF LF/AR
1303118

TECH	SDM/TW
START DATE	1/22/14
CHECK	TWN
REVIEW	WBS
APPROVE	

WORKSHEET FOR CONSOLIDATION TEST

CLOCK TIME	ELAPSED TIME MIN.	DIAL READING
	0.1	218
	0.1	231
	0.25	233
	0.5	235
	0.67	236
	0.83	236
	1	238
	2	241
	4	245
	8	250
	60	262
	1054	267
	1473	271



8.000 KSF

INITIAL READING =	0.0218	inches
D0 =	0.0228	inches
D50 =	0.0245	inches
D100 =	0.0262	inches

T50 =	4.0	minutes

Sample Initial Height	0.7470	in.
H_{D50}	0.7225	

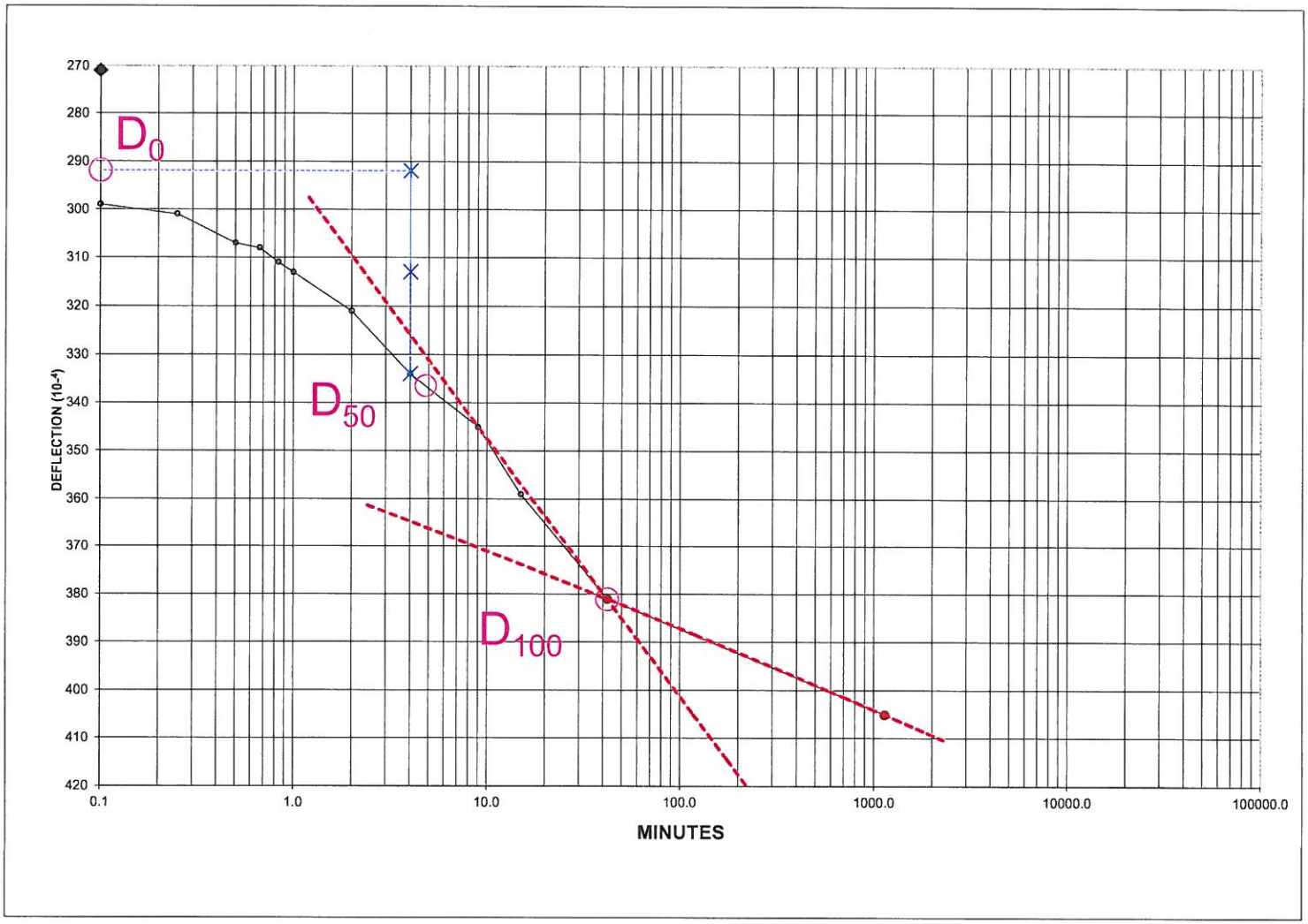
cv	0.064	ft2/day

CONSOLIDATION TEST

TEST NUMBER		TEST BY SDM/TW PWM	PROJECT NO. 130-3118
INCREMENTAL LOAD		CHECKED BY	BOREHOLE NO. FTN-B-9
APPLIED LOAD	4 TSF	DATE Start 1/22/14	SAMPLE NO -
		MACHINE NO. 1	SAMPLE DEPTH 38.0-40.0'

WORKSHEET FOR CONSOLIDATION TEST

CLOCK TIME	ELAPSED TIME MIN.	DIAL READING
	0.1	271
	0.1	299
	0.25	301
	0.5	307
	0.67	308
	0.83	311
	1	313
	2	321
	4	334
	9	345
	15	359
	42	381
	1138	405



16.000 KSF

INITIAL READING =	0.0271	inches
D0 =	0.0292	inches
D50 =	0.0337	inches
D100 =	0.0381	inches

T50 =	4.8	minutes

Sample Initial Height	0.7470	in.
H_{D50}	0.7134	

cv	0.052	ft2/day

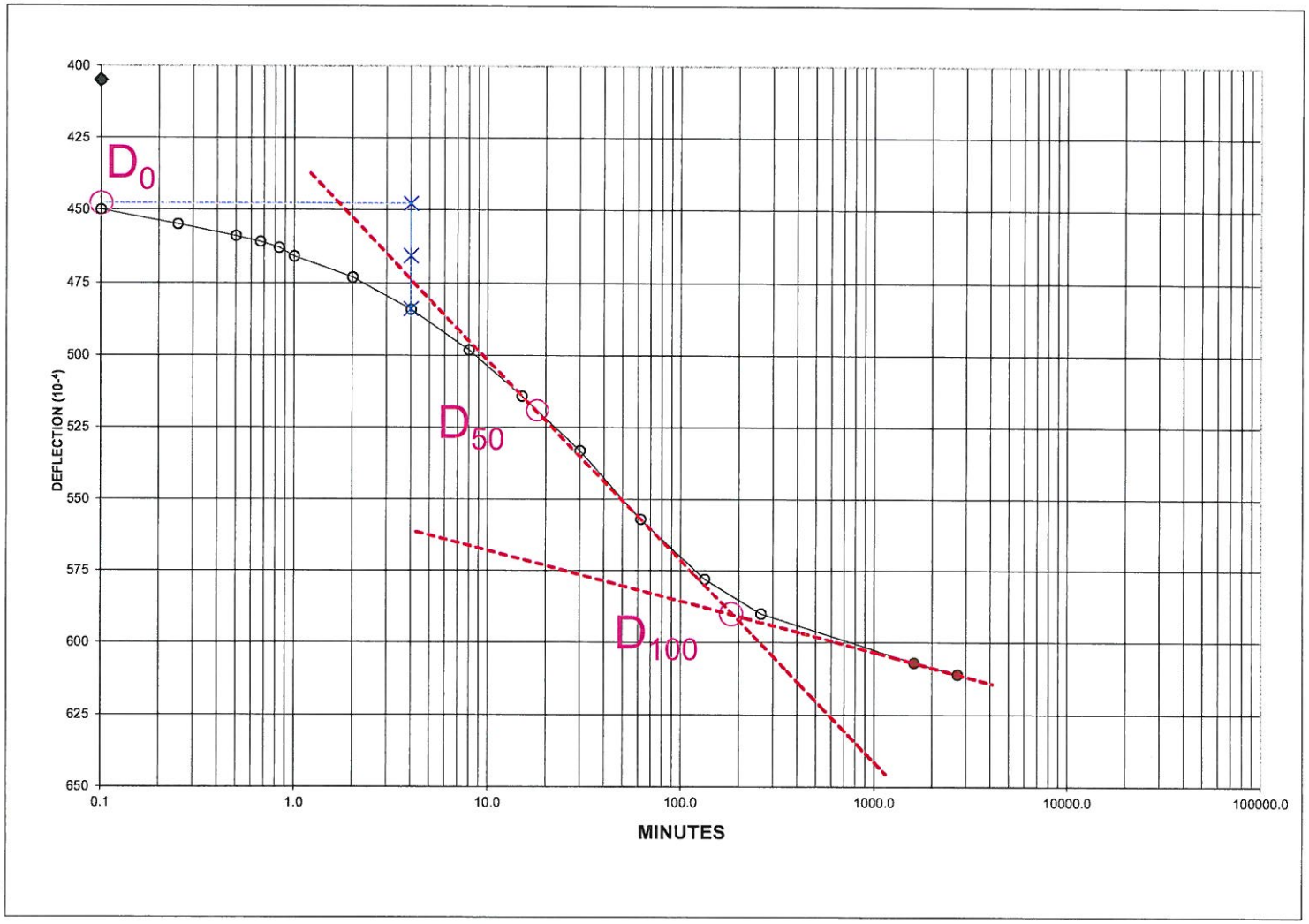
CONSOLIDATION TEST

TEST NUMBER		TEST BY	SDM/TW PWM
INCREMENTAL LOAD		CHECKED BY	
APPLIED LOAD	8 TSF	DATE	Start 1/22/14
		MACHINE NO.	1

PROJECT NO.	130-3118
BOREHOLE NO.	FTN-B-9
SAMPLE NO	-
SAMPLE DEPTH	38.0-40.0'

WORKSHEET FOR CONSOLIDATION TEST

CLOCK TIME	ELAPSED TIME MIN.	DIAL READING
	0.1	405
	0.1	450
	0.25	455
	0.5	459
	0.67	461
	0.83	463
	1	466
	2	473
	4	484
	8	498
	15	514
	30	533
	62	557
	133	578
	259	590
	1604	607
	2698	611



32.000 KSF

INITIAL READING =	0.0405	inches
D0 =	0.0448	inches
D50 =	0.0519	inches
D100 =	0.0590	inches

T50 =	18.0	minutes

Sample Initial Height	0.7470	in.
H_{D50}	0.6951	

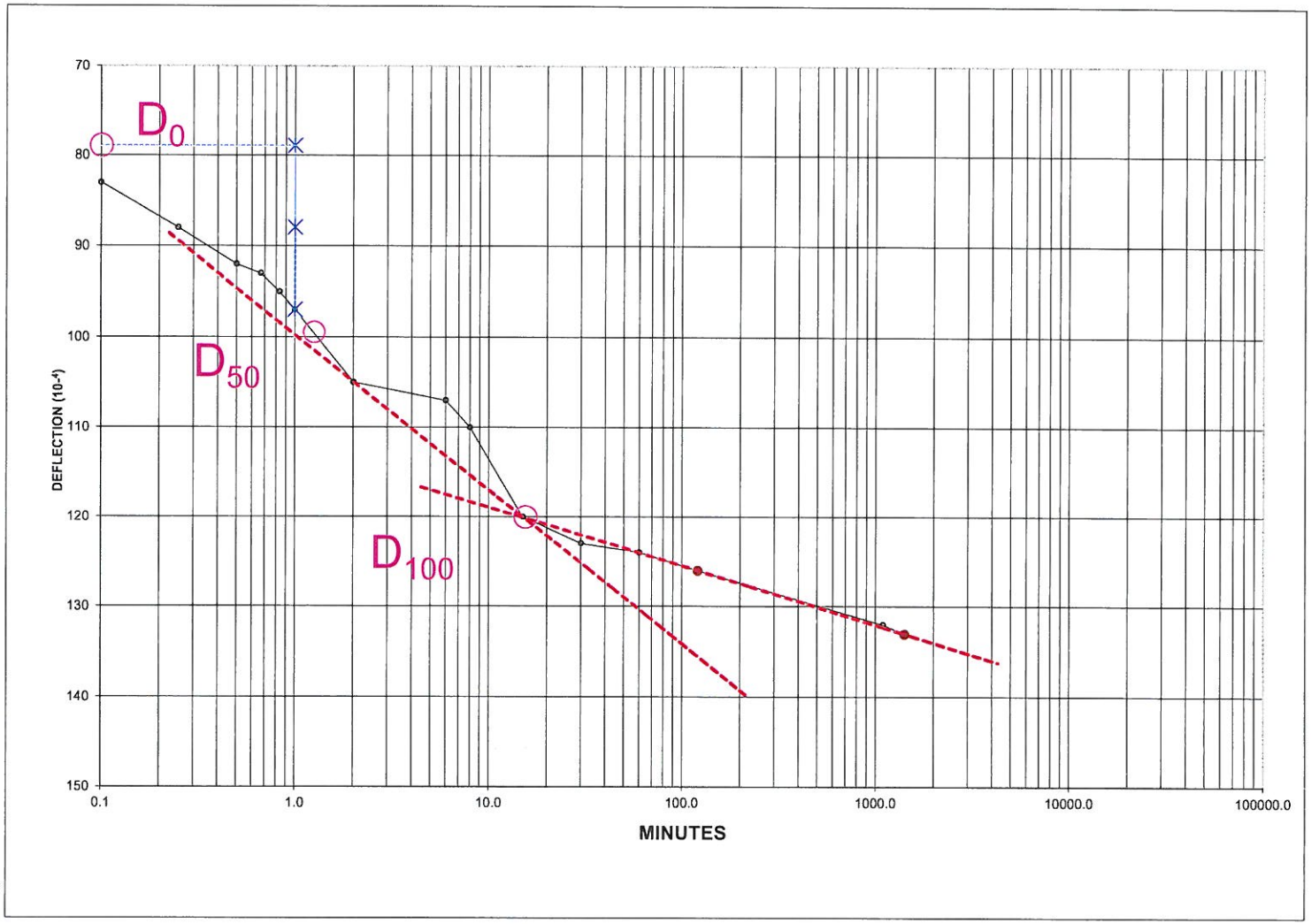
cv	0.013	ft2/day

CONSOLIDATION TEST

TEST NUMBER		TEST BY SDM/TW PWM	PROJECT NO. 130-3118
INCREMENTAL LOAD		CHECKED BY	BOREHOLE NO. FTN-P-9
APPLIED LOAD	16 TSF	DATE Start 1/22/14	SAMPLE NO -
		MACHINE NO. 2	SAMPLE DEPTH 38.0-40.0'

WORKSHEET FOR CONSOLIDATION TEST

CLOCK TIME	ELAPSED TIME MIN.	DIAL READING
	0	57
	0.1	83
	0.25	88
	0.5	92
	0.67	93
	0.83	95
	1	97
	2	105
	6	107
	8	110
	15	120
	30	123
	60	124
	120	126
	1093	132
	1407	133



4.000 KSF

INITIAL READING =	0.0057	inches
D0 =	0.0079	inches
D50 =	0.0100	inches
D100 =	0.0120	inches

T50 =	1.3	minutes

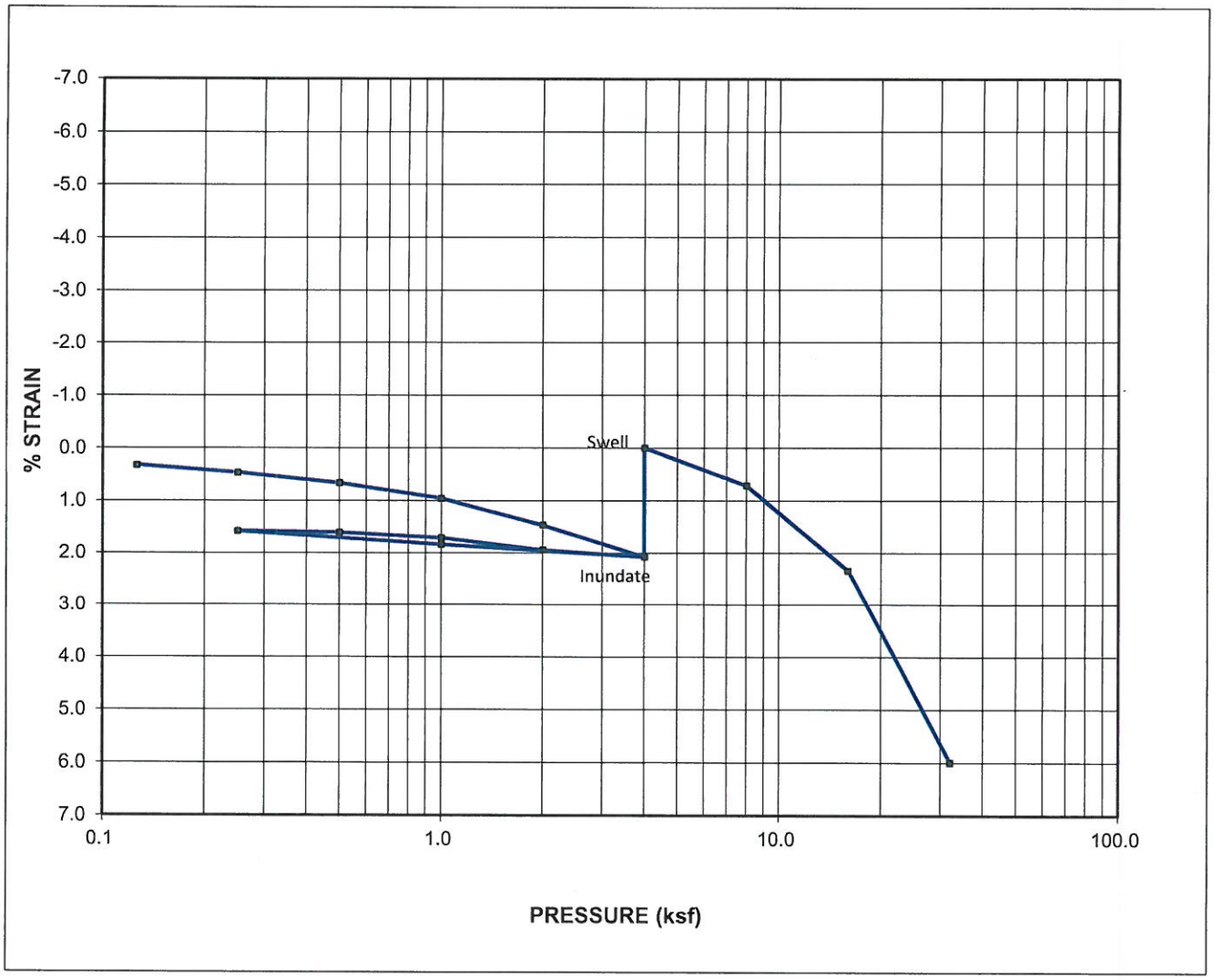
Sample Initial Height	0.7470	in.
H_{D50}	0.7371	

cv	0.214	ft2/day

CONSOLIDATION TEST

TEST NUMBER		TEST BY SDM/TW PWM	PROJECT NO. 130-3118
INCREMENTAL LOAD		CHECKED BY	BOREHOLE NO. FTN-B-9
APPLIED LOAD	2 TSF	DATE Start 1/22/14	SAMPLE NO -
		MACHINE NO. 1	SAMPLE DEPTH 38.0-40.0'

ONE - DIMENSIONAL SWELL OR COLLAPSE OF COHESIVE SOILS
ASTM D 4546 Method B & C



%Free Swell	2.1% @ 4.0 Ksf
% Collapse	

SAMPLE ID	FTN B-9
SAMPLE TYPE	UD
SAMPLE DEPTH	38.0 - 40.0'

LL	64
PL	24
PI	40
Gs	2.71

	Initial	Final
Dry Unit Weight (pcf)	87.9	89.2
Wet Unit Weight (pcf)	117.9	122.2
Moisture Content	34.1%	36.9%
Void Ratio	0.926	0.896
Degree of Saturation	100%	100%

DESCRIPTION: CLAY, trace fine to coarse sand; gray.

USCS: CH

FTN/ENTERGY WHITE BLUFF LF/AR
1303118

TECH	TW/SDM
START DATE	2/5/14
CHECK	SDM
REVIEW	MWM
APPROVE	

ONE-DIMENSIONAL SWELL OR COLLAPSE OF COHESIVE SOILS
ASTM D 4546 Method B & C

PROJECT NAME	FTN/ENTERGY WHITE BLUFF LF/AR
PROJECT NUMBER	1303118
SAMPLE ID	FTN B-9
SAMPLE DEPTH	38.0 - 40.0'
SAMPLE TYPE	UD

DESCRIPTION	CLAY, trace fine to coarse sand; gray.
CLASSIFICATION	CH
CONSOLIDOMETER #	1
ASTM D 4546 Method	B & C

LL	64
PL	24
PI	40
Gs	2.712

Sample Data	Trimmings	Before Test	After Test
Tare plus wet soil, g	96.94	148.54	150.09
Tare plus dry soil, g	74.36	129.70	129.70
Tare, g	8.23	74.46	74.46
Water, g	22.58	18.84	20.39
Dry soil, g	66.13	55.24	55.24
Water Content	34.1%	34.1%	36.9%

Diameter (in)	2.502
Height of sample (in)	0.487
Area of sample (in^2)	4.917
Volume of sample (in^3)	2.394
Water Content	34.1%
Sample Wt (wet, g)	74.08
Sample Wt (dry, g)	55.24
Water Wt (g)	18.84

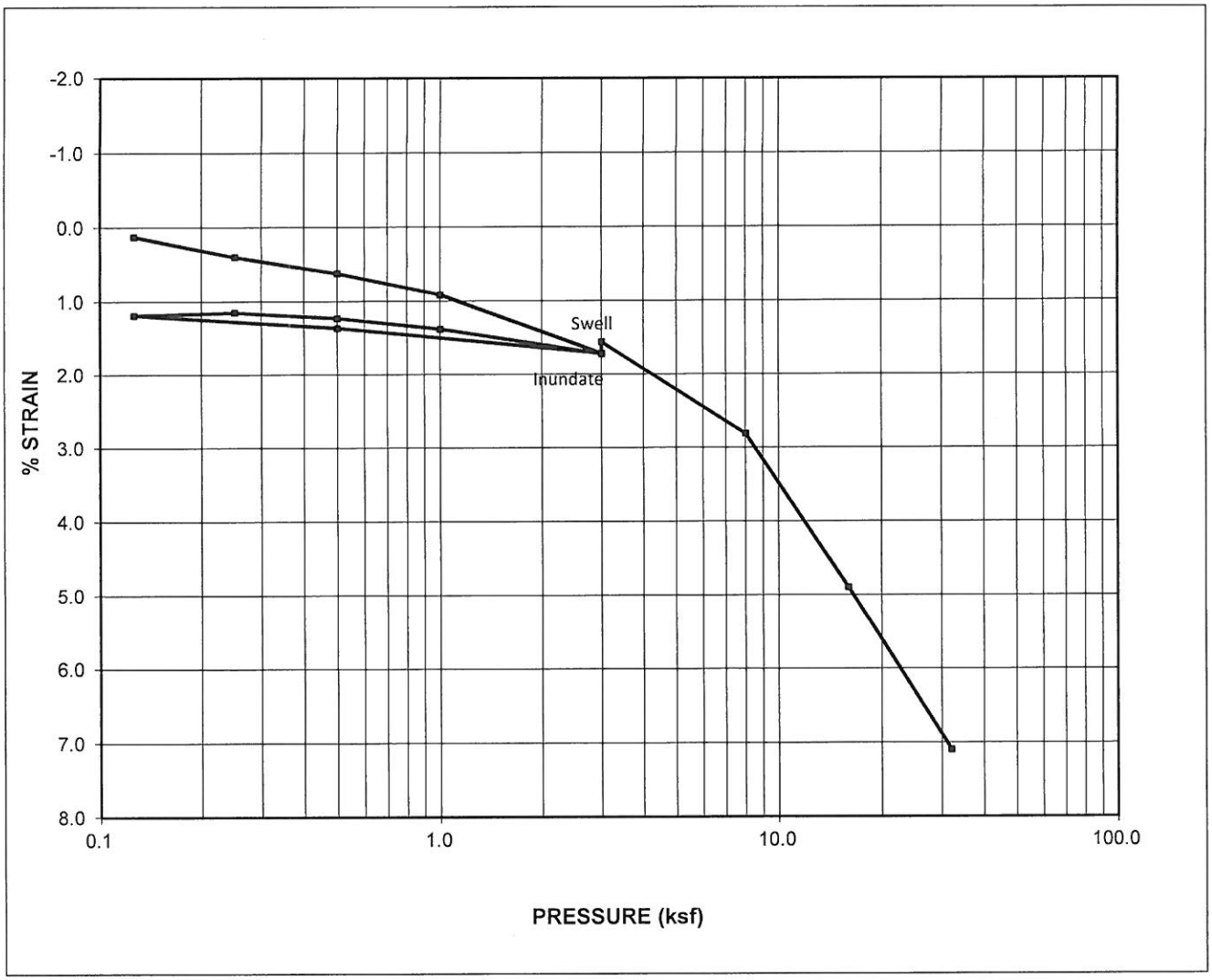
Sample Data	Initial	Final
Total Height (in)	0.487	0.480
Height of solids (in)	0.253	0.253
Height of voids (in)	0.234	0.227
Height of water (in)	0.234	0.253
Void ratio	0.926	0.896
Degree of saturation	99.9%	100.0%
Dry unit wt (pcf)	87.9	89.2
Wet unit wt (pcf)	117.9	122.2

PRESSURE (ksf)	H100 DIAL READING	DIAL CHANGE (in)	FITTING TIME (sec) t90	SAMPLE HEIGHT (in)	HEIGHT OF VOIDS Hv	VOID RATIO e	CHANGE IN HEIGHT (accum)	STRAIN %	LENGTH OF DRAINAGE PATH (DOUBLE DRAINAGE) H (in)	LENGTH OF DRAINAGE PATH (DOUBLE DRAINAGE) H^2 (cm^2)	PERCENT INITIAL COMPRESSION	COEFFICIENT OF CONSOLIDATION (ft^2/day)
0.125	0.0000	0.0000		0.487	0.2341	0.9255	0.0000	0.0				
0.126	0.0016	0.0016		0.485	0.2325	0.9193	0.0016	0.3				
0.250	0.0023	0.0023		0.485	0.2318	0.9165	0.0023	0.5				
0.500	0.0032	0.0032		0.484	0.2309	0.9128	0.0032	0.7				
1.000	0.0047	0.0047		0.482	0.2294	0.9071	0.0047	1.0				
2.000	0.0071	0.0071		0.480	0.2269	0.8973	0.0071	1.5				
4.000	0.0101	0.0101		0.477	0.2240	0.8856	0.0101	2.1				
1.000	0.0089	0.0089		0.478	0.2251	0.8901	0.0089	1.8				
0.250	0.0077	0.0077		0.479	0.2264	0.8952	0.0077	1.6				
0.500	0.0078	0.0078		0.479	0.2263	0.8946	0.0078	1.6				
1.000	0.0083	0.0083		0.479	0.2258	0.8926	0.0083	1.7				
2.000	0.0094	0.0094		0.478	0.2246	0.8882	0.0094	1.9				
4.000	0.0101	0.0101		0.477	0.2240	0.8856	0.0101	2.1				
4.000	0.0000	0.0000		0.487	0.2341	0.9255	0.0000	0.0				
8.000	0.0035	0.0035	558	0.484	0.2306	0.9118	0.0035	0.7	0.240	0.372	29.8	0.053
16.000	0.0114	0.0114	718	0.476	0.2227	0.8805	0.0114	2.3	0.240	0.371	35.4	0.041
32.000	0.0292	0.0292	4335	0.458	0.2049	0.8101	0.0292	6.0	0.233	0.351	21.8	0.006

Note: Specimen was trimmed into consolidation ring
Specimen **inundated at 4.0 ksf.**
Specimen was allowed to swell or collapse at 4.0 ksf
Load increment at 4.0 ksf was allowed to stay on specimen for **24 hours.**
%Strain versus axial stress **curve** is plotted using the **end of primary consolidation**, using the **square root of time method.**
Final saturation high (105%), adjusted to **100%**

TECH	TW/SDM
START DATE	2/5/14
CHECK	DA
REVIEW	AWL
APPROVE	

ONE - DIMENSIONAL SWELL OR COLLAPSE OF COHESIVE SOILS
ASTM D 4546 Method B & C



%Free Swell	0.1% @ 3.0 ksf
% Collapse	

SAMPLE ID	FTN B-11
SAMPLE TYPE	UD
SAMPLE DEPTH	28.0-30.0'

LL	52
PL	21
PI	31
Gs	2.71

	Initial	Final
Dry Unit Weight (pcf)	90.8	94.7
Wet Unit Weight (pcf)	116.2	123.5
Moisture Content	28.0%	30.5%
Void Ratio	0.862	0.786
Degree of Saturation	88%	100%

DESCRIPTION: CLAY, trace fine to medium sand; gray.

USCS: CH

FTN/ENTERGY WHITE BLUFF LF/AR
1303118

TECH	TW/PWM
START DATE	2/11/14
CHECK	DA
REVIEW	PWM
APPROVE	

ONE-DIMENSIONAL SWELL OR COLLAPSE OF COHESIVE SOILS
ASTM D 4546 Method B & C

PROJECT NAME	FTN/ENTERGY WHITE BLUFF LF/AR
PROJECT NUMBER	1303118
SAMPLE ID	FTN B-11
SAMPLE DEPTH	28.0-30.0'
SAMPLE TYPE	UD

DESCRIPTION: CLAY, trace fine to medium sand; gray.

CLASSIFICATION: CH

CONSOLIDOMETER #: 1

ASTM D 4546 Method: B & C

	LL	PL	PI	Gs
	52	21	31	2.710

Sample Data	Trimmings	Before Test	After Test
Tare plus wet soil, g	207.30	148.38	149.80
Tare plus dry soil, g	166.31	132.45	132.45
Tare, g	51.75	75.54	75.54
Water, g	40.99	15.93	17.35
Dry soil, g	114.56	56.91	56.91
Water Content	35.8%	28.0%	30.5%

Diameter (in)	2.496
Height of sample (in)	0.488
Area of sample (in^2)	4.893
Volume of sample (in^3)	2.388
Water Content	28.0%
Sample Wt (wet, g)	72.84
Sample Wt (dry, g)	56.91
Water Wt (g)	15.93

Sample Data	Initial	Final
Total Height (in)	0.488	0.468
Height of solids (in)	0.262	0.262
Height of voids (in)	0.226	0.206
Height of water (in)	0.199	0.216
Void ratio	0.862	0.786
Degree of saturation	88.0%	100.0%
Dry unit wt (pcf)	90.8	94.7
Wet unit wt (pcf)	116.2	123.5

PRESSURE (ksf)	H100 DIAL READING	DIAL CHANGE (in)	FITTING TIME (sec) t90	SAMPLE HEIGHT (in)	HEIGHT OF VOIDS Hv	VOID RATIO e	CHANGE IN HEIGHT (accum)	STRAIN %	LENGTH OF DRAINAGE PATH (DOUBLE DRAINAGE) H (in)	LENGTH OF DRAINAGE PATH (DOUBLE DRAINAGE) H^2 (cm^2)	PERCENT INITIAL COMPRESSION	COEFFICIENT OF CONSOLIDATION (ft^2/day)
0.125	0.0006	0.0000		0.488	0.2260	0.8625	0.0000	0.0				
0.126	0.0012	0.0006		0.487	0.2254	0.8602	0.0006	0.1				
0.250	0.0025	0.0019		0.486	0.2240	0.8551	0.0019	0.4				
0.500	0.0036	0.0030		0.485	0.2230	0.8510	0.0030	0.6				
1.000	0.0051	0.0045		0.484	0.2215	0.8455	0.0045	0.9				
3.000	0.0090	0.0084		0.480	0.2176	0.8306	0.0084	1.7				
0.500	0.0073	0.0067		0.481	0.2193	0.8371	0.0067	1.4				
0.126	0.0064	0.0058		0.482	0.2202	0.8404	0.0058	1.2				
0.250	0.0062	0.0056		0.482	0.2204	0.8411	0.0056	1.1				
0.500	0.0066	0.0060		0.482	0.2200	0.8396	0.0060	1.2				
1.000	0.0073	0.0067		0.481	0.2193	0.8368	0.0067	1.4				
3.000	0.0090	0.0084		0.480	0.2176	0.8304	0.0084	1.7				
3.000	0.0082	0.0076		0.480	0.2184	0.8335	0.0076	1.6				
8.000	0.0143	0.0137	86	0.474	0.2123	0.8101	0.0137	2.8	0.239	0.367	62.2	0.34
16.000	0.0245	0.0239	240	0.464	0.2021	0.7713	0.0239	4.9	0.235	0.355	53.5	0.12
32.000	0.0352	0.0346	94	0.453	0.1914	0.7303	0.0346	7.1	0.229	0.339	54.2	0.29

Note:
Specimen was trimmed into consolidation ring
Specimen **inundated at 3.0 ksf**.
Specimen was allowed to swell or collapse at 3.0 ksf
Load increment at 3.0 ksf was allowed to stay on specimen for **24 hours**.
%Strain versus axial stress **curve** is plotted using the **end of primary consolidation**, using the **square root of time method**.
Final saturation high (105%), adjusted to **100%**

TECH	TW/PWM
START DATE	2/11/14
CHECK	DA
REVIEW	PWM
APPROVE	

ONE-DIMENSIONAL CONSOLIDATION
ASTM D 2435 Method A

PROJECT NAME	FTN/ENTERGY WHITE BLUFF LF/AR
PROJECT NUMBER	1303118
SAMPLE ID	FTN B-9R
SAMPLE DEPTH	38.0-40.0'
SAMPLE TYPE	UD

DESCRIPTION: CLAY, trace fine to coarse sand; gray.

CLASSIFICATION: CH

LL	64
PL	24
PI	40
Gs	2.712

CONSOLIDOMETER #: 1

ASTM D 2435 Method: A

Sample Data	Trimmings	Before Test	After Test
Tare plus wet soil, g	143.69	187.84	189.13
Tare plus dry soil, g	110.02	159.67	159.67
Tare, g	8.27	74.46	74.46
Water, g	33.67	28.17	29.46
Dry soil, g	101.75	85.21	85.21
Water Content	33.1%	33.1%	34.6%

Diameter (in)	2.502
Height of sample (in)	0.747
Area of sample (in^2)	4.917
Volume of sample (in^3)	3.673
Water Content	33.1%
Sample Wt (wet, g)	113.38
Sample Wt (dry, g)	85.21
Water Wt (g)	28.17

Sample Data	Initial	Final
Total Height (in)	0.747	0.747
Height of solids (in)	0.390	0.390
Height of voids (in)	0.357	0.357
Height of water (in)	0.350	0.366
Void ratio	0.915	0.915
Degree of saturation	98.0%	100.0%
Dry unit wt (pcf)	88.4	88.4
Wet unit wt (pcf)	117.6	118.9

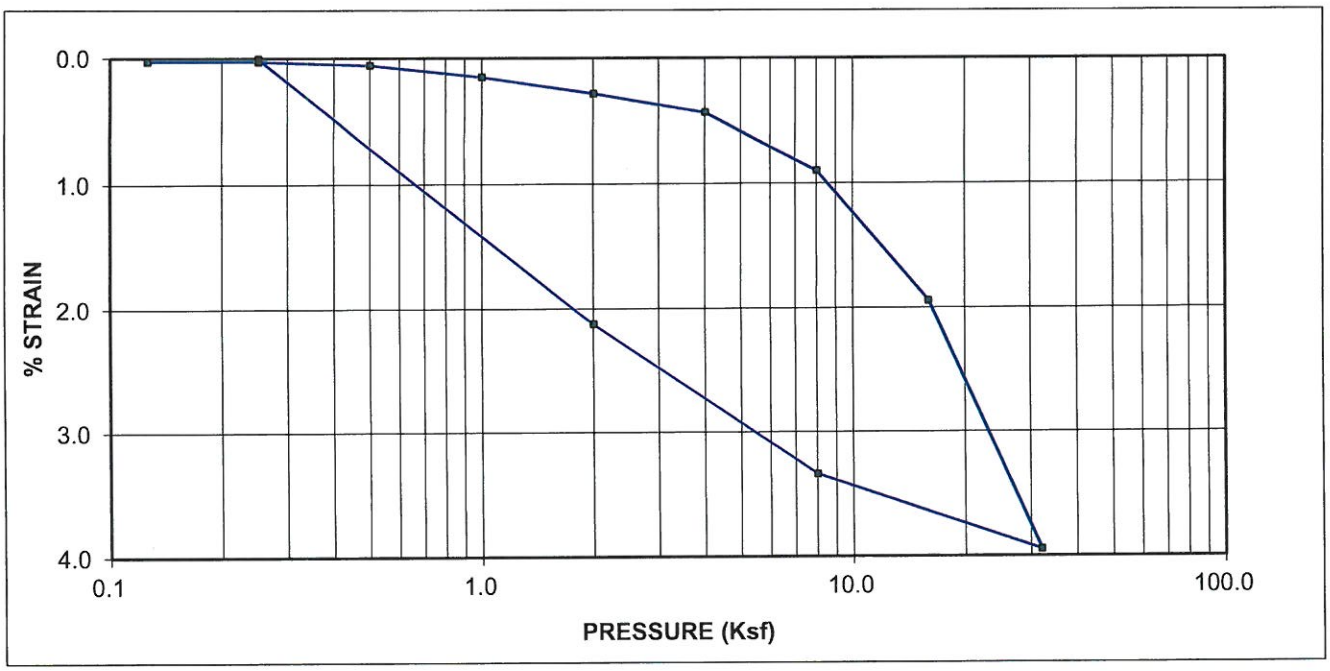
PRESSURE (ksf)	H100 DIAL READING	MACHINE / STONE CORR.	DIAL CHANGE (in)	FITTING TIME (sec) t90	SAMPLE HEIGHT (in)	HEIGHT OF VOIDS Hv	VOID RATIO e	CHANGE IN HEIGHT (accum)	STRAIN %	LENGTH OF DRAINAGE PATH (DOUBLE DRAINAGE) H (in)	LENGTH OF DRAINAGE PATH (DOUBLE DRAINAGE) H^2 (cm^2)	PERCENT INITIAL COMPRESSION	COEFFICIENT OF CONSOLIDATION (ft^2/day)
0.125	0.0005	0.0000	0.0000		0.747	0.3569	0.9147	0.0000	0.0	0.374	0.900		
0.126	0.0007	0.0000	0.0002		0.747	0.3567	0.9142	0.0002	0.0	0.373	0.900		
0.250	0.0007	0.0000	0.0002		0.747	0.3567	0.9142	0.0002	0.0	0.373	0.900		
0.500	0.0015	0.0006	0.0004		0.747	0.3564	0.9136	0.0004	0.1	0.373	0.899		
1.000	0.0028	0.0011	0.0011		0.746	0.3557	0.9118	0.0011	0.2	0.373	0.898		
2.000	0.0047	0.0021	0.0021		0.745	0.3548	0.9093	0.0021	0.3	0.373	0.896		
4.000	0.0072	0.0034	0.0032		0.744	0.3536	0.9064	0.0032	0.4	0.372	0.894		
8.000	0.0123	0.0050	0.0067	118	0.740	0.3501	0.8975	0.0067	0.9	0.371	0.888	54.2	0.595
16.000	0.0219	0.0069	0.0145	290	0.732	0.3424	0.8775	0.0145	1.9	0.368	0.875	42.0	0.237
32.000	0.0390	0.0090	0.0295	2693	0.718	0.3274	0.8392	0.0295	3.9	0.363	0.848	29.3	0.025
8.000	0.0314	0.0060	0.0249		0.722	0.3319	0.8508	0.0249	3.3	0.360	0.836		
2.000	0.0184	0.0020	0.0159		0.731	0.3410	0.8741	0.0159	2.1	0.363	0.852		
0.250	0.0005	0.0000	0.0000		0.747	0.3569	0.9147	0.0000	0.0	0.370	0.881		

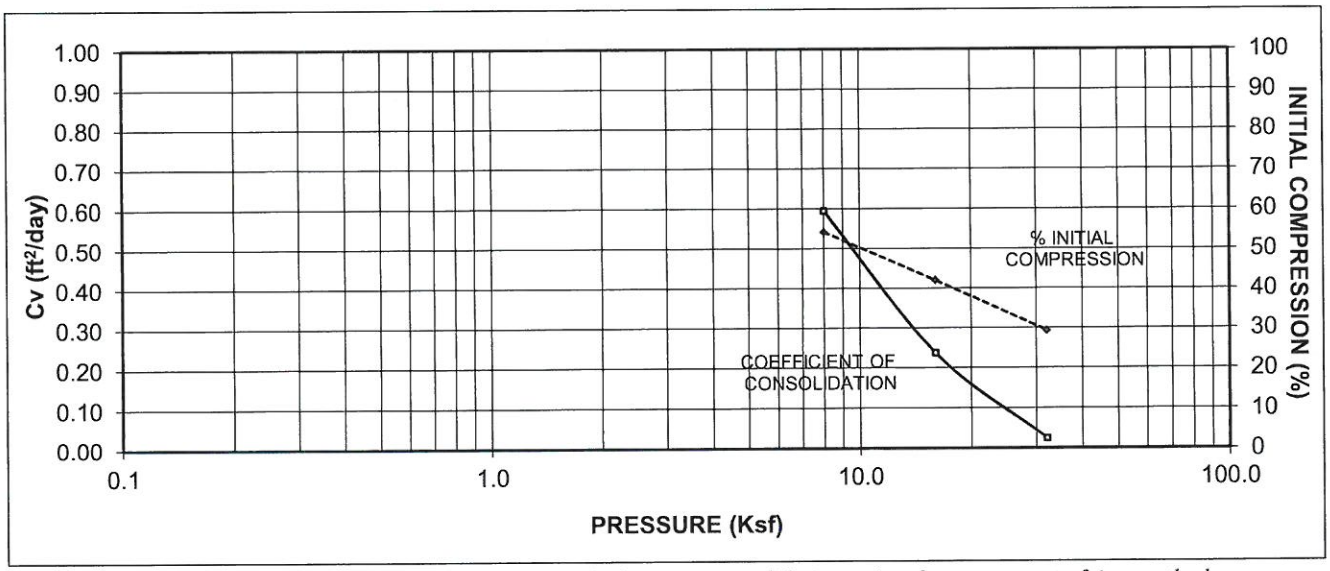
FINAL DIAL READING = 0.0000

Note:
Specimen was trimmed into consolidation ring
Specimen was run **inundated**.
Specimen required **4 ksf** of pressure to hold **swelling** down.
%Strain and **Void Ratio** versus axial stress **curves** are plotted using the **end of primary consolidation**, using the **square root of time method**.
Final saturation high (102%), adjusted to **100%**

TECH	TW
START DATE	2/14/14
CHECK	MWM
REVIEW	WRS
APPROVE	

ONE - DIMENSIONAL CONSOLIDATION
ASTM D 2435 Method A





Note: %Strain vs. axial stress curve is plotted using the end of primary consolidation, using the square root of time method.

SAMPLE ID	FTN B-9R
SAMPLE TYPE	UD
SAMPLE DEPTH	38.0-40.0'

LL	64
PL	24
PI	40
Gs	2.71

	Initial	Final
Dry Unit Weight (pcf)	88.4	88.4
Wet Unit Weight (pcf)	117.6	118.9
Moisture Content	33.1%	34.6%
Void Ratio	0.915	0.915
Degree of Saturation	98%	100%

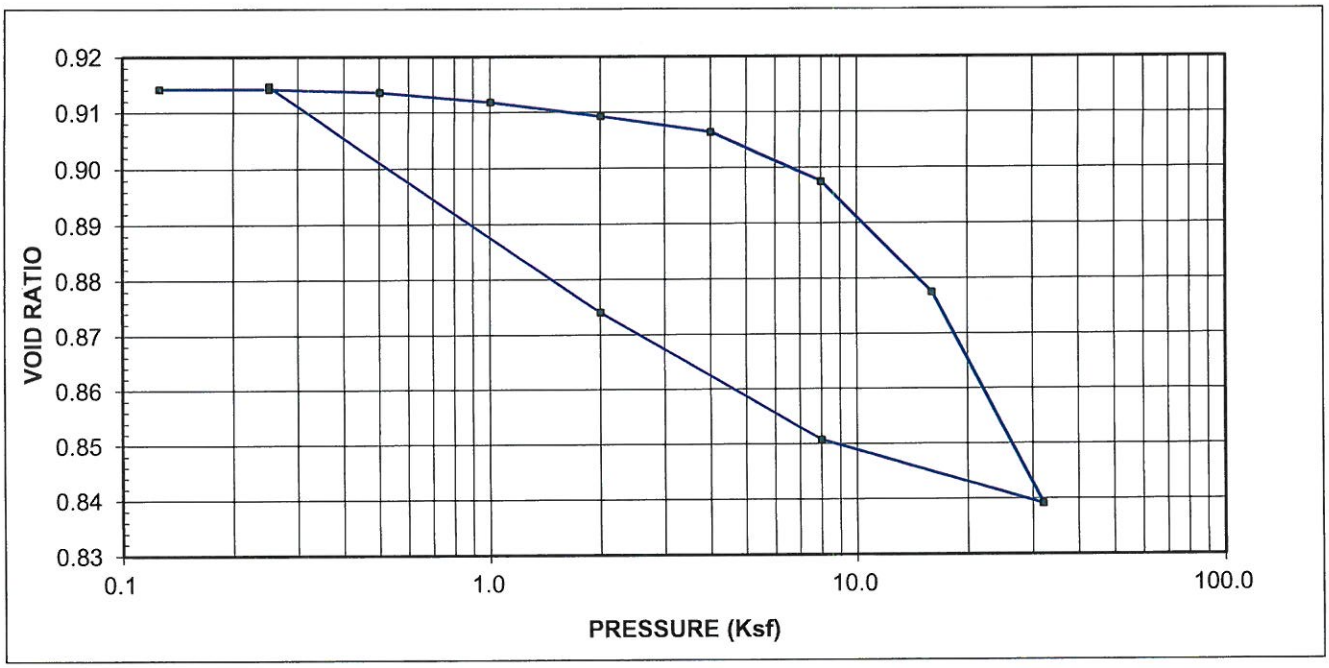
DESCRIPTION: CLAY, trace fine to coarse sand; gray.

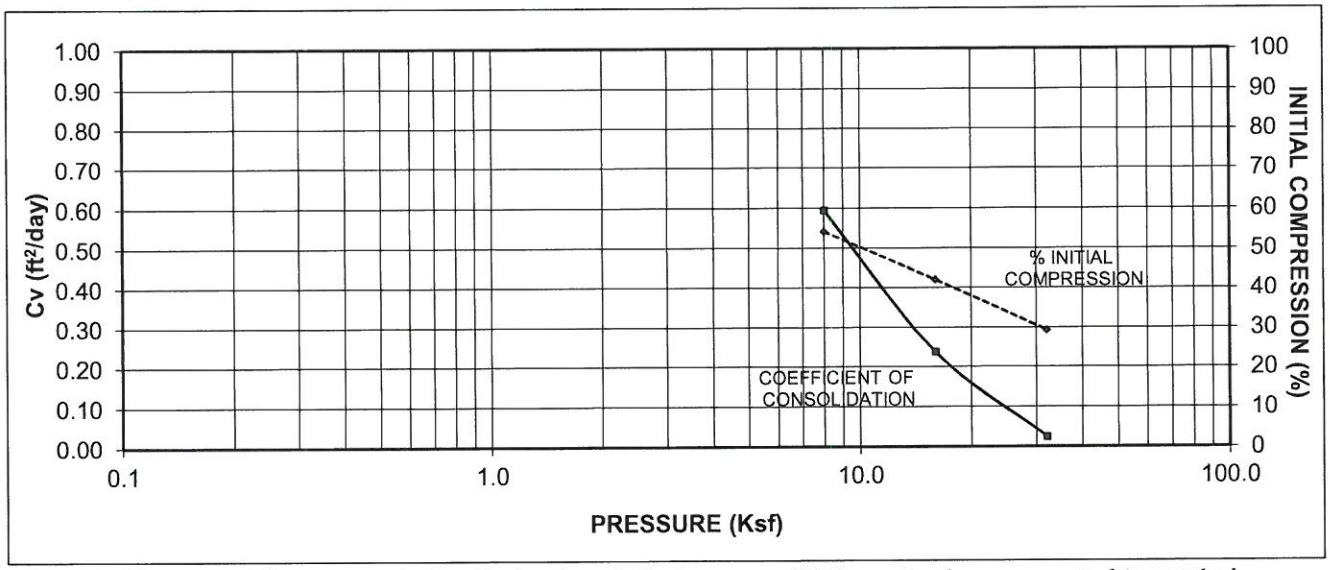
USCS: CH

FTN/ENTERGY WHITE BLUFF LF/AR
1303118

TECH	TW
START DATE	2/14/14
CHECK	CWM
REVIEW	WPS
APPROVE	

ONE - DIMENSIONAL CONSOLIDATION
ASTM D 2435 Method A





Note: Void Ratio vs. axial stress curve is plotted using the end of primary consolidation, using the square root of time method.

SAMPLE ID	FTN B-9R
SAMPLE TYPE	UD
SAMPLE DEPTH	38.0-40.0'

LL	64
PL	24
PI	40
Gs	2.71

	Initial	Final
Dry Unit Weight (pcf)	88.4	88.4
Wet Unit Weight (pcf)	117.6	118.9
Moisture Content	33.1%	34.6%
Void Ratio	0.915	0.915
Degree of Saturation	98%	100%

DESCRIPTION: CLAY, trace fine to coarse sand; gray.

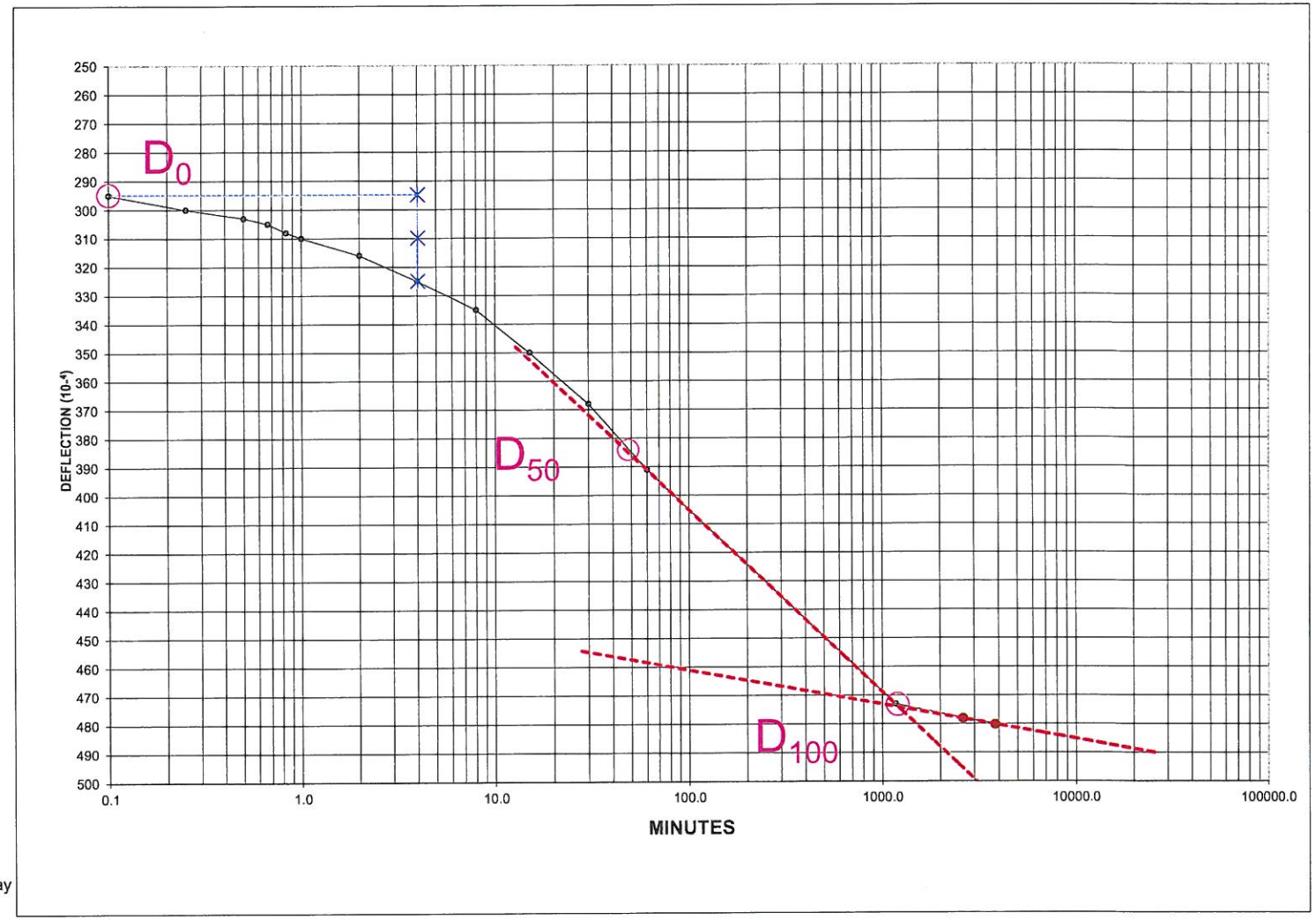
USCS: CH

FTN/ENTERGY WHITE BLUFF LF/AR
1303118

TECH	TW
START DATE	2/14/14
CHECK	RWG
REVIEW	WRS
APPROVE	

WORKSHEET FOR CONSOLIDATION TEST

CLOCK TIME	ELAPSED TIME MIN.	DIAL READING
	0	252
	0.1	295
	0.25	300
	0.5	303
	0.67	305
	0.83	308
	1	310
	2	316
	4	325
	8	335
	15	350
	30	368
	60	391
	1170	473
	2618	478
	3842	480



32.000 KSF

INITIAL READING =	0.0252	inches
D0 =	0.0295	inches
D50 =	0.0384	inches
D100 =	0.0473	inches

T50 =	48.0	minutes

Sample Initial Height	0.7470	in.
H_{D50}	0.7086	

cv	0.005	ft2/day

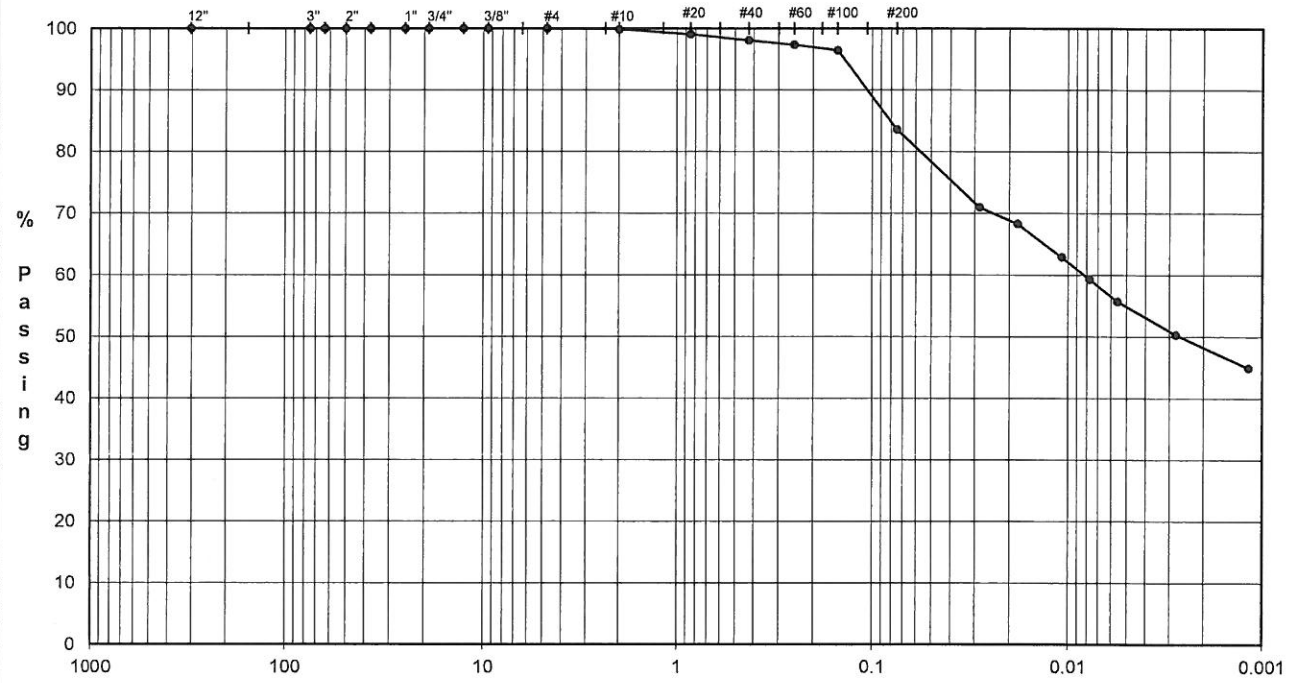
CONSOLIDATION TEST

TEST NUMBER	9	TEST BY PWM -	PROJECT NO. 1303118
INCREMENTAL LOAD		CHECKED BY	BOREHOLE NO. FTN B-9
APPLIED LOAD	16 TSF	DATE Start - 2/14/2014	SAMPLE NO -
		MACHINE NO. 1	SAMPLE DEPTH 38.0-40.0'

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF LF/AR**
SAMPLE ID: **FTN PZ-8** Depth: **8.0-10.0'**
TYPE: **UD**



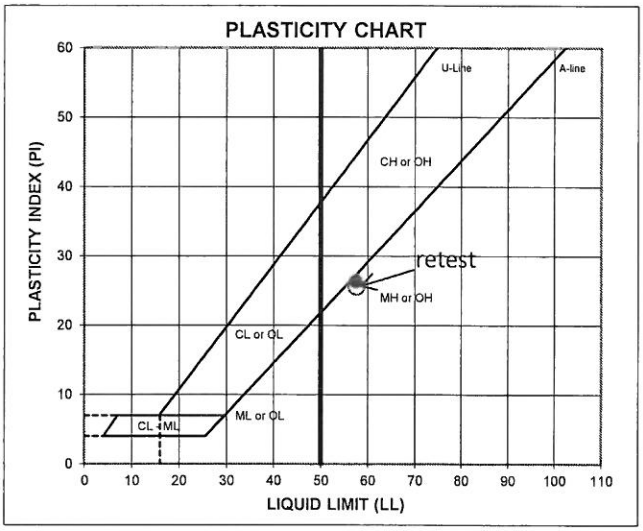
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**99.9**	Coarse Sand	**0.1**
#20	0.85	**99.1**		
#40	0.43	**98.1**	Medium Sand	**1.8**
#60	0.25	**97.4**		
#100	0.15	**96.5**		
#200	0.075	**83.6**	Fine Sand	**14.5**

Hydrometer Analysis

(mm)	%Finer		
0.028	**71.0**		
0.018	**68.3**		
0.011	**62.9**	Fines	
0.0077	**59.3**	Silt or Clay	**83.6**
0.0056	**55.7**		
0.0028	**50.3**		
0.0012	**44.9**		



ATTERBERG LIMITS
Method -B (Dry preparation)

	M_c	LL	PL	PI	LI
	26.1	**57**	**31**	**26**	**-0.20**
Retest	**26.1**	**58**	**32**	**26**	**-0.22**

LL (oven-dried) / 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy CLAYEY SILT, fine to coarse; yellowish brown.

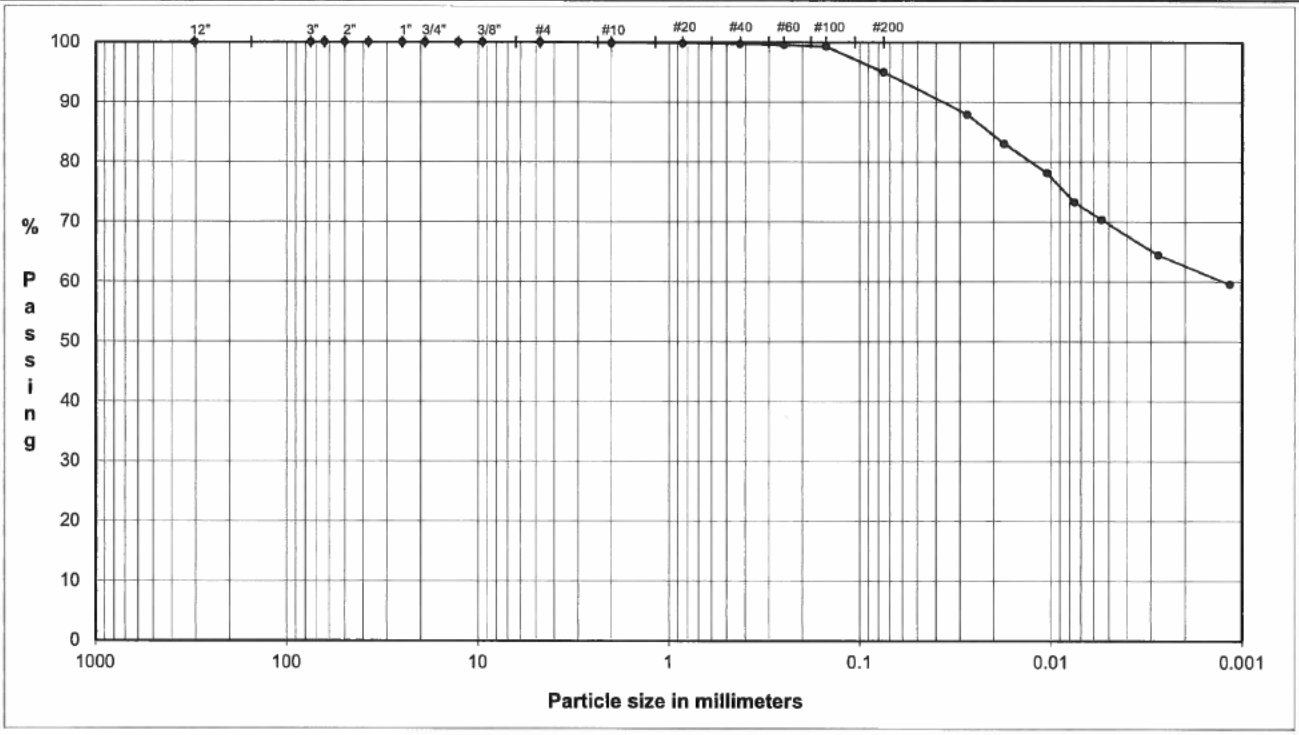
USCS: MH

TECH	BW/AM/TJ
DATE	1/6/14
CHECK	DA
REVIEW	TWH
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-10D** Depth: **40.0-42.0'**
TYPE: **UD**



COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

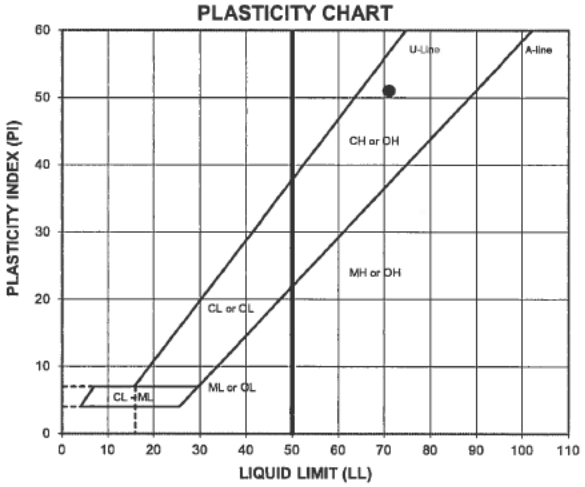
U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**99.9**	Coarse Sand	**0.1**
#20	0.85	**99.8**		
#40	0.43	**99.7**	Medium Sand	**0.2**
#60	0.25	**99.6**		
#100	0.15	**99.3**		
#200	0.075	**95.0**	Fine Sand	**4.7**

Hydrometer Analysis

(mm)	%Finer		
0.027	**87.9**		
0.018	**83.0**		
0.011	**78.2**	Fines	
0.0076	**73.3**	Silt or Clay	**95.0**
0.0055	**70.3**		
0.0027	**64.5**		
0.0012	**59.6**		

PLASTICITY CHART



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
40.4	**71**	**20**	**51**	**0.40**

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: CLAY, trace fine to coarse sand; dark olive.

USCS: CH

TECH	FT/WD
DATE	3/16/17
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF/AR		Board #	9	COMMENTS
PROJECT NUMBER	1776955		Flow Pump	2	
SAMPLE ID	MW-10D	40.0-42.0'	Flow Pump Speed	12	
SAMPLE TYPE	UD		Technician	SDM/PWM	

Sample Data, Initial				Sample Data, Final	
Height, inches	3.121	B-Value, f	1.00	Height, inches	3.107
Diameter, inches	2.830	Cell Pres.	113.0	Diameter, inches	2.841
Area, cm²	40.58	Bot. Pres.	80.0	Area, cm²	40.90
Volume, cm³	321.70	Top Pres.	80.0	Volume, cm³	322.76
Mass, g	578.02	Tot. B.P.	80.0	Mass, g	578.33
Moisture Content, %	40.43	Head, max.	183.59	Moisture Content, %	40.51
Dry Density, pcf	79.84	Head, min.	183.59	Dry Density, pcf	79.58
Spec. Gravity (assumed)	2.700	Max. Grad.	23.26	Volume Solids, cm³	152.45
Volume Solids, cm³	152.45	Min. Grad.	23.26	Volume Voids, cm³	170.31
Volume Voids, cm³	169.26			Void Ratio	1.12
Void Ratio	1.11			Saturation, %	97.9%
Saturation, %	98.3%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	578.02	586.62
Wt Soil & Tare, f	g	411.61	419.94
Wt Tare	g	0.00	8.44
Wt Moisture Lost	g	166.41	166.68
Wt Dry Soil	g	411.61	411.50
Water Content	%	40.43%	40.51%

Flow Pump Rate: 4.35E-06 cm³/sec

USCS: CH

DESCRIPTION: CLAY, trace fine to coarse sand; dark olive.

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
03/22/17	42816	15	30	20.0	0	0	0	0	2.61	183.59	23.26	4.6E-09
03/22/17	42816	15	35	20.0	5	5	300	300	2.61	183.59	23.26	4.6E-09
03/22/17	42816	15	40	20.0	5	10	300	600	2.61	183.59	23.26	4.6E-09
03/22/17	42816	15	45	20.0	5	15	300	900	2.61	183.59	23.26	4.6E-09 *
03/22/17	42816	15	50	20.0	5	20	300	1200	2.61	183.59	23.26	4.6E-09 *
03/22/17	42816	15	55	20.0	5	25	300	1500	2.61	183.59	23.26	4.6E-09 *
03/22/17	42816	16	0	20.0	5	30	300	1800	2.61	183.59	23.26	4.6E-09 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 4.6E-09 cm/sec **

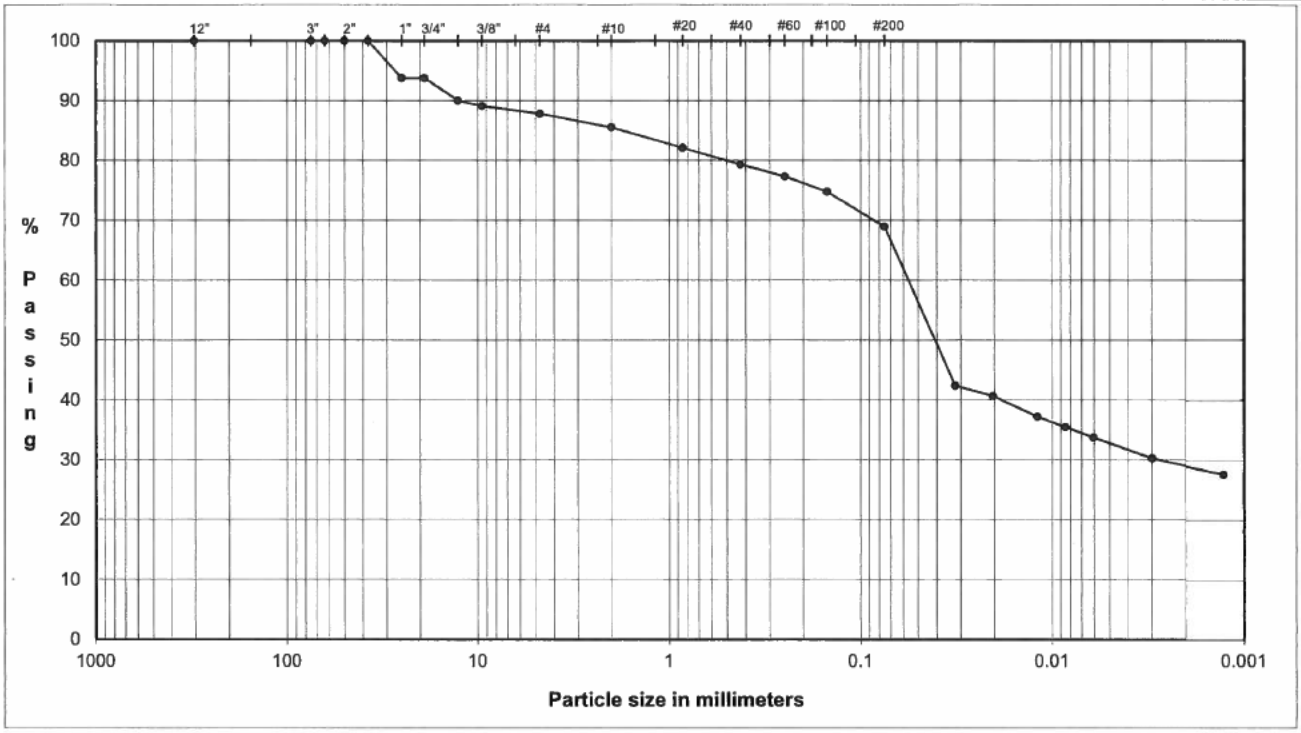
DATE	3/22/17
CHECK	
REVIEW	
APPROVE	

MARCH 2017 1776955

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-12D** Depth: **10.0-12.0'**
TYPE: **UD**



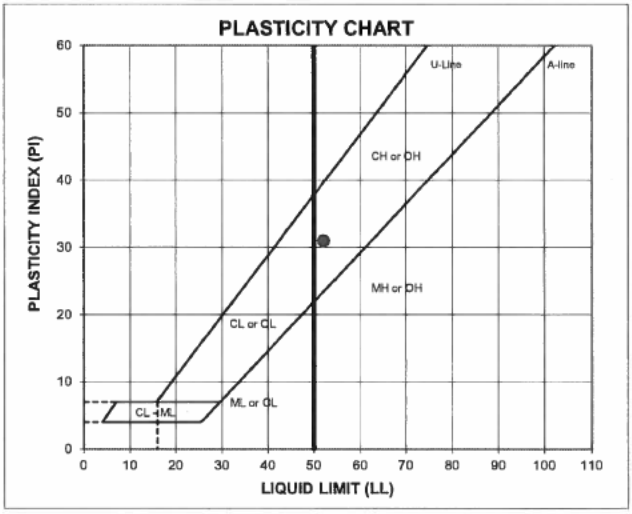
COBBLES	Coarse GRAVEL	Fine GRAVEL	Coarse SAND	Medium SAND	Fine SAND	Silt or Clay FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	93.8		
0.75"	19.0	93.8	Coarse Gravel	6.2
0.50"	12.7	90.0		
0.375"	9.5	89.1		
#4	4.8	87.8	Fine Gravel	6.0
#10	2.00	85.5	Coarse Sand	2.3
#20	0.85	82.1		
#40	0.43	79.3	Medium Sand	6.2
#60	0.25	77.3		
#100	0.15	74.8		
#200	0.075	69.0	Fine Sand	10.4

Hydrometer Analysis

(mm)	%Finer		
0.032	42.4		
0.020	40.7		
0.012	37.2	Fines	
0.0085	35.5	Silt or Clay	69.0
0.0061	33.7		
0.0030	30.3		
0.0013	27.7		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
29.2	52	21	31	0.26

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: gravelly sandy CLAY, fine to coarse gravel, fine to coarse sand; yellowish brown, red, and gray.

USCS: CH

TECH	JS/HH/WD
DATE	3/16/17
CHECK	
REVIEW	
APPROVE	

Golder Associates Inc.

FLEXIBLE WALL TRIAXIAL PERMEABILITY
ASTM D 5084
METHOD C, FALLING HEAD W/INCREASING TAIL WATER PRESSURE

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF/AR			**Using Pipettes Only**	YES	**COMMENTS**	
PROJECT NUMBER	1776955			**Using Pipettes & Burettes**	NO		
SAMPLE ID	MW-12D	10.0-12.0'	**BOARD#**	5	**TECH**	PWM/DA	
SAMPLE TYPE	UD		**CELL #**	5	**DATE**	3/19/17	

Sample Data, Initial

Height, inches	3.137
Diameter, inches	2.824
Area, cm^2	40.41
Volume, cm^3	321.98
Mass, g	619.08
Moisture Content, %	29.2
Dry Density, pcf	92.8
Spec. Gravity (assumed)	2.700
Volume Solids, cm^3	177.43
Volume Voids, cm^3	144.56
Void Ratio	0.81
Saturation	96.9%

B-Value,f	0.96	
Cell Pres.	59.0	psi
Bot. Pres.	52.0	psi
Top Pres.	50.0	psi
Head, cm	140.68	
Max. Grad.	20.66	
Min. Grad.	19.45	
Max. E.S.	9.00	
Min. E.S.	7.00	

Sample Data, Final

Height, inches	3.146
Diameter, inches	2.842
Area, cm^2	40.93
Volume, cm^3	327.04
Mass, g	623.46
Moisture Content %	30.15
Dry Density, pcf	91.40
Saturation	96.5%
Inflow Volume per (cc)	1.00
Outflow Volume per (cc)	1.00

Water Contents	**Initial**	**Final**
Wt soil&tare, i	619.08	631.61
Wt soil&tare, f	479.05	487.25
Wt Tare	0.00	8.37
Wt Moisture Lost	140.03	144.36
Wt Dry Soil	479.05	478.88
Water Content	29.23%	30.15%

DESCRIPTION gravelly sandy CLAY, fine to coarse gravel, fine to coarse sand; yellowish brown, red, and gray.

USCS CH

PERMEANT: Deaired Tap Water

TIME FUNCTION			READINGS			TIME IN MINUTES & SECONDS						VOLUME		PERMEABILITY	
DATE	HOUR	MIN	Inflow (cc)	Outflow (cc)	Temp.	dt (min)	dt (sec)	dt, acc (sec)	Head (cm)	(H1/H2) (inc.)	Gradient	Inflow (cc)	Outflow (cc)	@ 20 Degrees C (cm/sec)	
03/19/17	13	8	0.0	25.0	18.0	0.0	0.0	0	165.10		20.66	0.00	0.00	0.0	
03/19/17	13	26	1.6	23.6	18.0	18.0	1080	1080	162.17	1.02	20.30	1.60	1.40	1.7E-06	
03/19/17	14	16	5.2	20.3	18.0	50.0	3000	4080	155.45	1.04	19.45	3.60	3.30	1.5E-06	
03/20/17	9	2	0.0	25.0	18.7	1126.0	67560	71640	165.10	0.94	20.66	0.00	0.00	-	
03/20/17	9	12	0.8	24.2	18.7	10.0	600	72240	163.54	1.01	20.47	0.80	0.80	1.6E-06	*
03/20/17	9	31	2.1	22.9	18.7	19.0	1140	73380	161.00	1.02	20.15	1.30	1.30	1.4E-06	*
03/20/17	9	41	2.8	22.3	18.7	10.0	600	73980	159.74	1.01	19.99	0.70	0.60	1.3E-06	*
03/20/17	10	9	4.8	20.4	18.7	28.0	1680	75660	155.94	1.02	19.51	2.00	1.90	1.5E-06	*

Inflow Rate	0.000132
Outflow Rate	0.000123
Outflow/Inflow Ratio	0.93

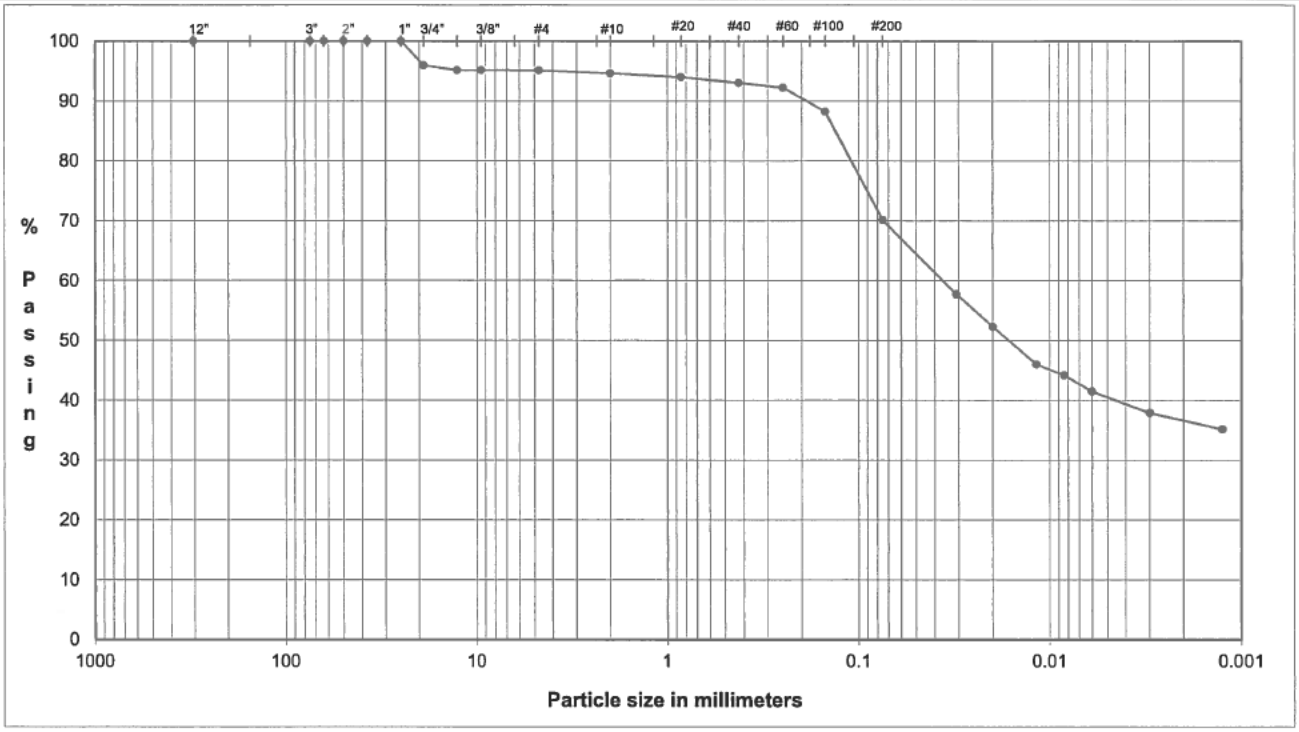
***PERMEABILITY REPORTED AS** 1.4E-06 cm/sec

DATE	3/19/17
CHECK	
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-13D** Depth: **20.0-22.0'**
TYPE: **UD**



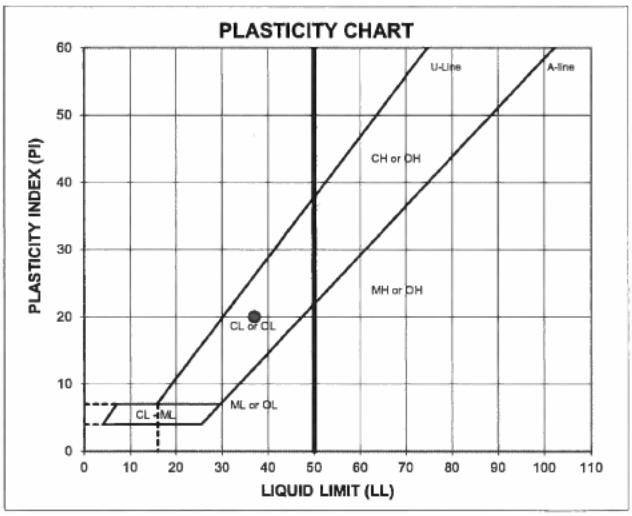
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	96.0	Coarse Gravel	4.0
0.50"	12.7	95.2		
0.375"	9.5	95.2		
#4	4.8	95.1	Fine Gravel	0.9
#10	2.00	94.6	Coarse Sand	0.5
#20	0.85	94.0		
#40	0.43	93.0	Medium Sand	1.6
#60	0.25	92.2		
#100	0.15	88.2		
#200	0.075	70.1	Fine Sand	22.9

Hydrometer Analysis

(mm)	%Finer		
0.031	57.7		
0.020	52.3		
0.012	46.0	Fines	
0.0084	44.2	Silt or Clay	70.1
0.0060	41.5		
0.0030	37.9		
0.0013	35.2		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
37.7	37	17	20	1.05

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy SILTY CLAY, fine to coarse, trace fine to coarse gravel; yellowish brown.

USCS: CL

TECH	JS/HH/WD
DATE	3/16/17
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF/AR		Board #	6	COMMENTS
PROJECT NUMBER	1776955		Flow Pump	2	
SAMPLE ID	MW-13D	20.0-22.0'	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	PWM	

Sample Data, Initial				Sample Data, Final	
Height, inches	3.106	B-Value, f	1.00	Height, inches	3.105
Diameter, inches	2.859	Cell Pres.	97.0	Diameter, inches	2.875
Area, cm²	41.42	Bot. Pres.	80.0	Area, cm²	41.88
Volume, cm³	326.75	Top Pres.	80.0	Volume, cm³	330.32
Mass, g	600.19	Tot. B.P.	80.0	Mass, g	600.91
Moisture Content, %	37.69	Head, max.	117.47	Moisture Content, %	37.86
Dry Density, pcf	83.24	Head, min.	117.47	Dry Density, pcf	82.34
Spec. Gravity (assumed)	2.700	Max. Grad.	14.89	Volume Solids, cm³	161.44
Volume Solids, cm³	161.44	Min. Grad.	14.89	Volume Voids, cm³	168.88
Volume Voids, cm³	165.31			Void Ratio	1.05
Void Ratio	1.02			Saturation, %	97.7%
Saturation, %	99.4%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	600.19	609.17
Wt Soil & Tare, f	g	435.89	444.20
Wt Tare	g	0.00	8.45
Wt Moisture Lost	g	164.30	164.97
Wt Dry Soil	g	435.89	435.75
Water Content	%	37.69%	37.86%

Flow Pump Rate: 2.25E-05 cm³/sec

USCS: CL

DESCRIPTION: sandy SILTY CLAY, fine to coarse, trace fine to coarse gravel; yellowish brown.

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
03/20/17	42814	14	30	19.6	0	0	0	0	1.67	117.47	14.89	3.6E-08
03/20/17	42814	14	35	19.6	5	5	300	300	1.67	117.47	14.89	3.6E-08
03/20/17	42814	14	40	19.6	5	10	300	600	1.67	117.47	14.89	3.6E-08
03/20/17	42814	14	45	19.6	5	15	300	900	1.67	117.47	14.89	3.6E-08 *
03/20/17	42814	14	50	19.6	5	20	300	1200	1.67	117.47	14.89	3.6E-08 *
03/20/17	42814	14	55	19.6	5	25	300	1500	1.67	117.47	14.89	3.6E-08 *
03/20/17	42814	15	0	19.6	5	30	300	1800	1.67	117.47	14.89	3.6E-08 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

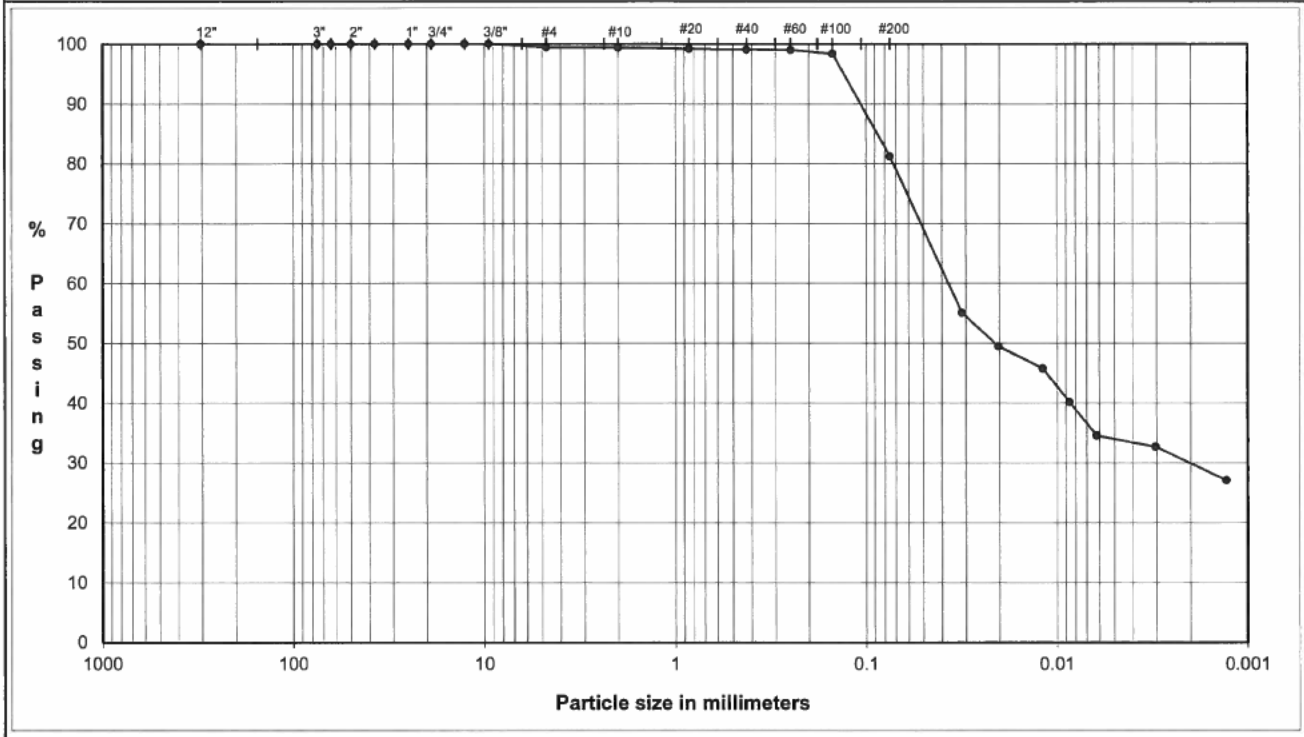
PERMEABILITY REPORTED AS ** 3.6E-08 cm/sec **

DATE	3/20/17
CHECK	
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-14D** Depth: **30.0-32.0'**
TYPE: **UD**



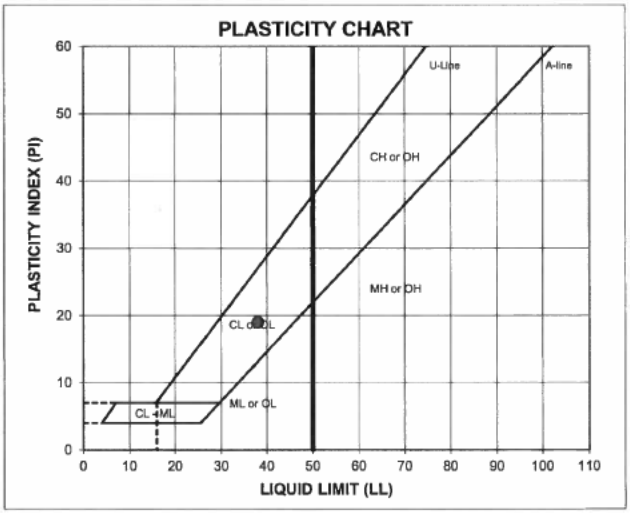
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**99.5**	Fine Gravel	**0.5**
#10	2.00	**99.4**	Coarse Sand	**0.1**
#20	0.85	**99.2**		
#40	0.43	**99.0**	Medium Sand	**0.4**
#60	0.25	**99.0**		
#100	0.15	**98.4**		
#200	0.075	**81.2**	Fine Sand	**17.8**

Hydrometer Analysis

(mm)	%Finer		
0.031	**55.1**		
0.020	**49.5**		
0.012	**45.8**	Fines	
0.0086	**40.2**	Silt or Clay	**81.2**
0.0062	**34.6**		
0.0031	**32.7**		
0.0013	**27.1**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
33.1	**38**	**19**	**19**	**0.78**

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy SILTY CLAY, fine to coarse, trace fine gravel; olive brown.

USCS: CL

TECH	WD/FT
DATE	3/22/17
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF/AR		Board #	11	COMMENTS
PROJECT NUMBER	1776955		Flow Pump	2	
SAMPLE ID	MW-14D	30.0-32.0'	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	SDM	

Sample Data, Initial				Sample Data, Final	
Height, inches	3.102	B-Value, f	0.99	Height, inches	3.090
Diameter, inches	2.847	Cell Pres.	105.0	Diameter, inches	2.860
Area, cm²	41.07	Bot. Pres.	80.0	Area, cm²	41.45
Volume, cm³	323.60	Top Pres.	80.0	Volume, cm³	325.30
Mass, g	610.19	Tot. B.P.	80.0	Mass, g	607.84
Moisture Content, %	33.12	Head, max.	180.07	Moisture Content, %	32.60
Dry Density, pcf	88.39	Head, min.	180.07	Dry Density, pcf	87.93
Spec. Gravity (assumed)	2.700	Max. Grad.	22.94	Volume Solids, cm³	169.77
Volume Solids, cm³	169.77	Min. Grad.	22.94	Volume Voids, cm³	155.52
Volume Voids, cm³	153.83			Void Ratio	0.92
Void Ratio	0.91			Saturation, %	96.1%
Saturation, %	98.7%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	610.19	616.23
Wt Soil & Tare, f	g	458.39	466.80
Wt Tare	g	0.00	8.48
Wt Moisture Lost	g	151.80	149.43
Wt Dry Soil	g	458.39	458.32
Water Content	%	33.12%	32.60%

DESCRIPTION: sandy SILTY CLAY, fine to coarse, trace fine gravel; olive brown.

Flow Pump Rate: 2.25E-05 cm³/sec USCS: CL

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
03/22/17	42816	15	15	19.6	0	0	0	0	2.56	180.07	22.94	2.4E-08
03/22/17	42816	15	20	19.6	5	5	300	300	2.56	180.07	22.94	2.4E-08
03/22/17	42816	15	25	19.6	5	10	300	600	2.56	180.07	22.94	2.4E-08
03/22/17	42816	15	30	19.6	5	15	300	900	2.56	180.07	22.94	2.4E-08 *
03/22/17	42816	15	35	19.6	5	20	300	1200	2.56	180.07	22.94	2.4E-08 *
03/22/17	42816	15	40	19.6	5	25	300	1500	2.56	180.07	22.94	2.4E-08 *
03/22/17	42816	15	45	19.6	5	30	300	1800	2.56	180.07	22.94	2.4E-08 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

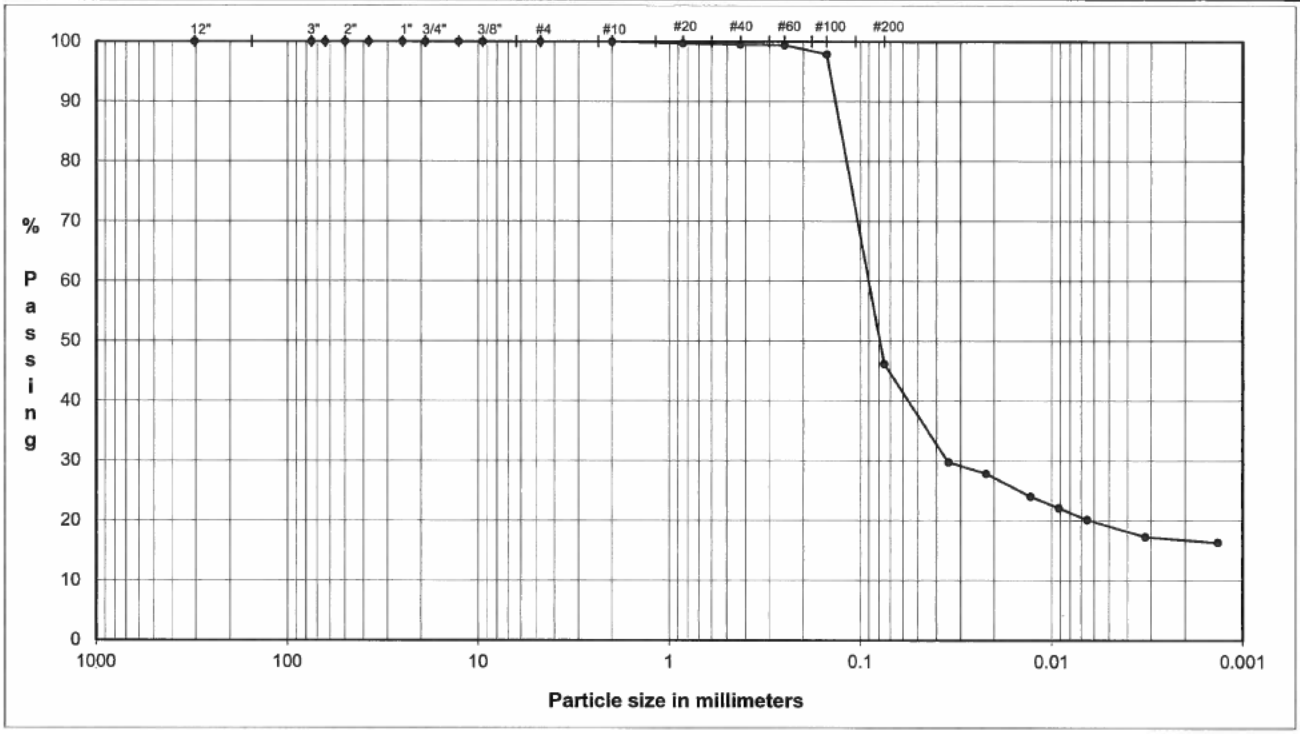
PERMEABILITY REPORTED AS ** 2.4E-08 cm/sec **

DATE	3/22/17
CHECK	
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-15D** Depth: **20.0-22.0'**
TYPE: **UD**



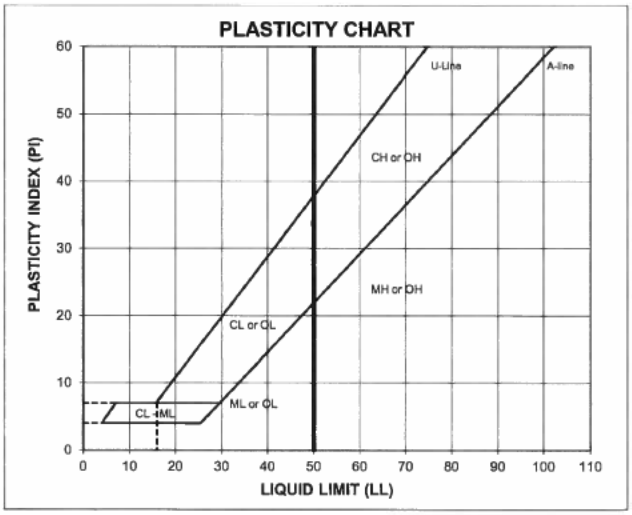
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	99.9	Coarse Sand	0.1
#20	0.85	99.7		
#40	0.43	99.5	Medium Sand	0.4
#60	0.25	99.3		
#100	0.15	97.8		
#200	0.075	46.2	Fine Sand	53.3

Hydrometer Analysis

(mm)	%Finer		
0.035	29.8		
0.022	27.9		
0.013	24.0	Fines	
0.0092	22.1	Silt or Clay	46.2
0.0065	20.2		
0.0032	17.3		
0.0013	16.3		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
28.1	NP	NP	NP	NP

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SAND and SILT, fine to coarse; yellowish brown and grayish brown.

USCS: SM

TECH	FT/WD
DATE	3/22/17
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL TRIAXIAL PERMEABILITY
ASTM D 5084
METHOD C, FALLING HEAD W/INCREASING TAIL WATER PRESSURE

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF/AR			**Using Pipettes Only**	YES	**COMMENTS**	
PROJECT NUMBER	1776955			**Using Pipettes & Burettes**	NO		
SAMPLE ID	MW-15D	20.0-22.0'	**BOARD#**	12	**TECH**	SDM/PWM	
SAMPLE TYPE	UD		**CELL #**	12	**DATE**	3/21/17	

Sample Data, Initial

Height, inches	3.096
Diameter, inches	2.836
Area, cm^2	40.75
Volume, cm^3	320.48
Mass, g	614.11
Moisture Content, %	28.1
Dry Density, pcf	93.3
Spec. Gravity (assumed)	2.700
Volume Solids, cm^3	177.49
Volume Voids, cm^3	142.99
Void Ratio	0.81
Saturation	94.3%

B-Value,f	0.98	
Cell Pres.	87.0	psi
Bot. Pres.	53.0	psi
Top Pres.	50.0	psi
Head, cm	211.02	
Max. Grad.	29.98	
Min. Grad.	28.40	
Max. E.S.	37.00	
Min. E.S.	34.00	

Sample Data, Final

Height, inches	3.092
Diameter, inches	2.820
Area, cm^2	40.30
Volume, cm^3	316.47
Mass, g	614.92
Moisture Content %	28.32
Dry Density, pcf	94.49
Saturation	97.6%
Inflow Volume per (cc)	1.00
Outflow Volume per (cc)	1.00

Water Contents	**Initial**	**Final**
Wt soil&tare, i	614.11	623.27
Wt soil&tare, f	479.23	487.61
Wt Tare	0.00	8.50
Wt Moisture Lost	134.88	135.66
Wt Dry Soil	479.23	479.11
Water Content	28.15%	28.32%

DESCRIPTION SAND and SILT, fine to coarse; yellowish brown and grayish brown.

USCS SM

PERMEANT: Deaired Tap Water

TIME FUNCTION			READINGS			TIME IN MINUTES & SECONDS						VOLUME		PERMEABILITY	
DATE	HOUR	MIN	Inflow (cc)	Outflow (cc)	Temp.	dt (min)	dt (sec)	dt, acc (sec)	Head (cm)	(H1/H2) (inc.)	Gradient	Inflow (cc)	Outflow (cc)	@ 20 Degrees C (cm/sec)	
03/21/17	14	45	0.0	25.0	19.7	0.0	0.0	0	235.44		29.98	0.00	0.00	0.0	
03/21/17	14	56	1.1	23.9	19.7	11.0	660	660	233.29	1.01	29.70	1.10	1.10	1.4E-06	
03/21/17	15	14	2.3	22.7	19.8	18.0	1080	1740	230.95	1.01	29.41	1.20	1.20	9.2E-07	
03/21/17	15	40	3.6	21.4	19.8	26.0	1560	3300	228.42	1.01	29.08	1.30	1.30	7.0E-07	
03/21/17	15	55	4.2	20.9	19.8	15.0	900	4200	227.30	1.00	28.94	0.60	0.55	5.4E-07	*
03/21/17	16	31	5.5	19.5	20.0	36.0	2160	6360	224.72	1.01	28.61	1.30	1.35	5.2E-07	*
03/21/17	16	41	6.0	19.2	20.0	10.0	600	6960	224.00	1.00	28.52	0.45	0.29	5.2E-07	*
03/21/17	16	55	6.4	18.7	20.0	14.0	840	7800	223.06	1.00	28.40	0.45	0.52	4.9E-07	*

Inflow Rate	0.000821
Outflow Rate	0.000808
Outflow/Inflow Ratio	0.98

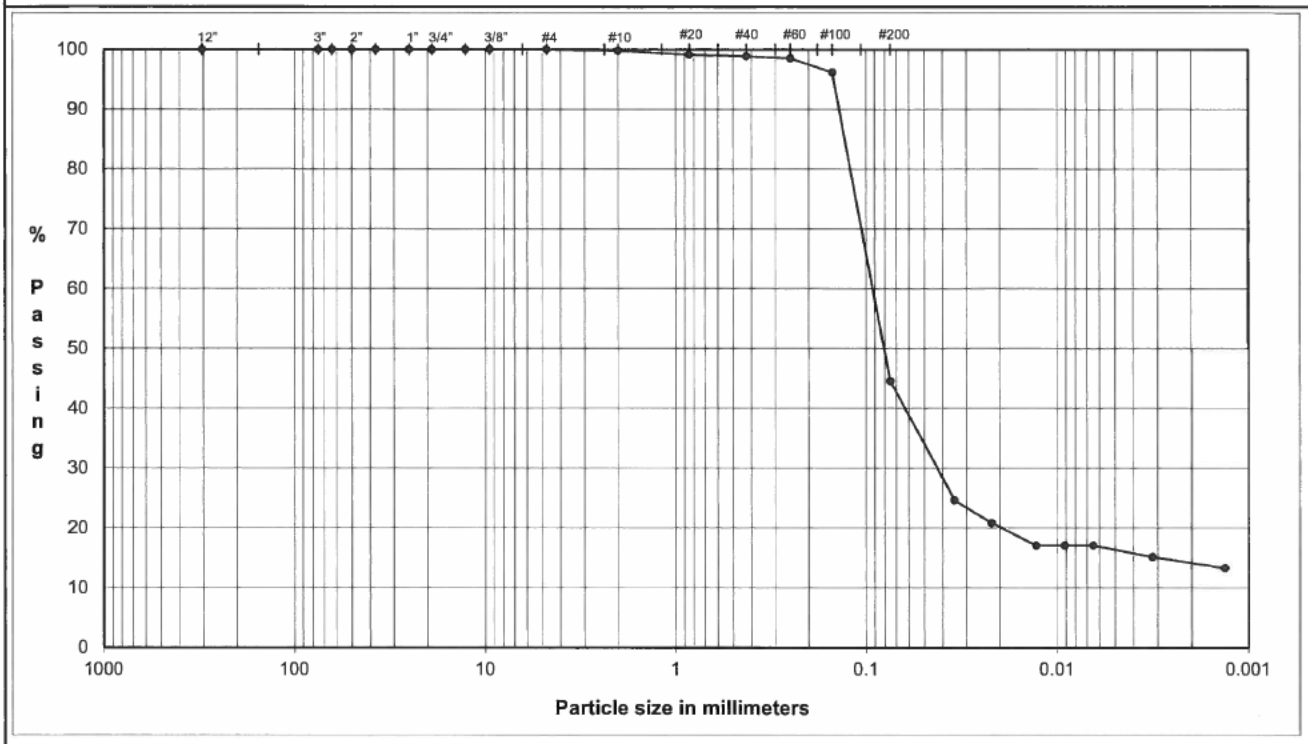
***PERMEABILITY REPORTED AS** 5.2E-07 cm/sec

DATE	3/21/17
CHECK	
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-10D** Depth: **10.0-12.0'**
TYPE: **UD**



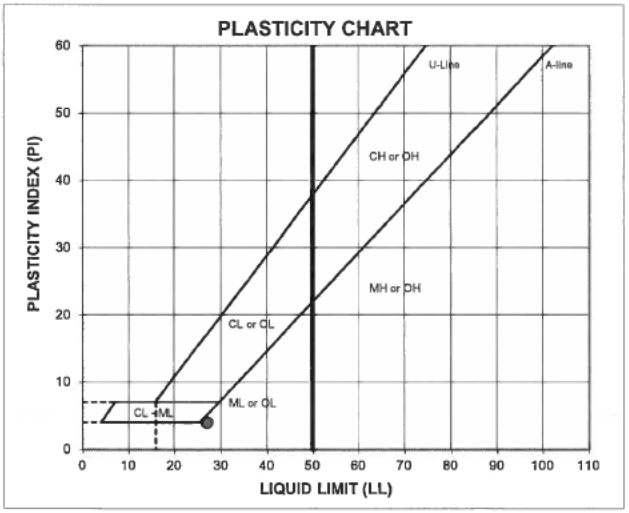
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	99.8	Coarse Sand	0.2
#20	0.85	99.1		
#40	0.43	98.9	Medium Sand	0.9
#60	0.25	98.5		
#100	0.15	96.2		
#200	0.075	44.5	Fine Sand	54.3

Hydrometer Analysis

(mm)	%Finer		
0.035	24.6		
0.022	20.8		
0.013	17.1	Fines	
0.0091	17.1	Silt or Clay	44.5
0.0065	17.1		
0.0032	15.2		
0.0013	13.3		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
17.4	27	23	4	-1.33

LL (oven-dried) / 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SAND and CLAYEY SILT, fine to coarse; light gray and yellow.

USCS: SM

TECH	JS/FT
DATE	3/29/17
CHECK	DA
REVIEW	MM
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF/AR		Board #	5	COMMENTS
PROJECT NUMBER	1776955		Flow Pump	2	
SAMPLE ID	MW-10D	10.0-12.0'	Flow Pump Speed	7	
SAMPLE TYPE	UD		Technician	SDM	

Sample Data, Initial				Sample Data, Final	
Height, inches	3.145	B-Value, f	0.99	Height, inches	3.058
Diameter, inches	2.793	Cell Pres.	89.0	Diameter, inches	2.802
Area, cm^2	39.53	Bot. Pres.	80.0	Area, cm^2	39.78
Volume, cm^3	315.76	Top Pres.	80.0	Volume, cm^3	309.00
Mass, g	674.00	Tot. B.P.	80.0	Mass, g	668.25
Moisture Content, %	17.41	Head, max.	139.98	Moisture Content, %	16.41
Dry Density, pcf	113.45	Head, min.	139.98	Dry Density, pcf	115.93
Spec. Gravity (assumed)	2.700	Max. Grad.	18.02	Volume Solids, cm^3	212.62
Volume Solids, cm^3	212.62	Min. Grad.	18.02	Volume Voids, cm^3	96.39
Volume Voids, cm^3	103.14			Void Ratio	0.45
Void Ratio	0.49			Saturation, %	97.7%
Saturation, %	96.9%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	674.00	675.90
Wt Soil & Tare, f	g	574.07	581.80
Wt Tare	g	0.00	8.23
Wt Moisture Lost	g	99.93	94.10
Wt Dry Soil	g	574.07	573.57
Water Content	%	17.41%	16.41%

DESCRIPTION: SAND and CLAYEY SILT, fine to coarse; light gray and yellow.

Flow Pump Rate: 2.38E-04 cm^3/sec USCS: SM

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
03/29/17	42823	13	30	20.4	0	0	0	0	1.99	139.98	18.02	3.3E-07	
03/29/17	42823	13	35	20.4	5	5	300	300	1.99	139.98	18.02	3.3E-07	
03/29/17	42823	13	40	20.4	5	10	300	600	1.99	139.98	18.02	3.3E-07	
03/29/17	42823	13	45	20.4	5	15	300	900	1.99	139.98	18.02	3.3E-07	*
03/29/17	42823	13	50	20.4	5	20	300	1200	1.99	139.98	18.02	3.3E-07	*
03/29/17	42823	13	55	20.4	5	25	300	1500	1.99	139.98	18.02	3.3E-07	*
03/29/17	42823	14	0	20.4	5	30	300	1800	1.99	139.98	18.02	3.3E-07	*

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

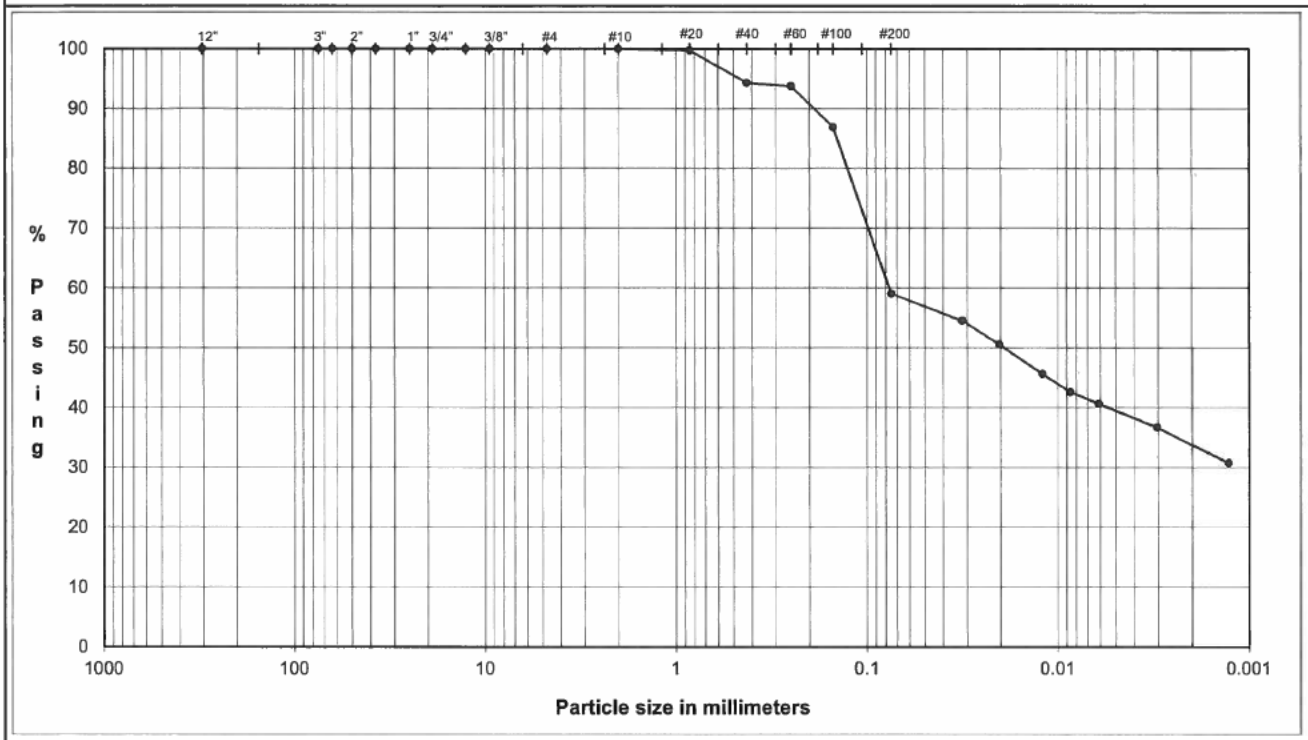
PERMEABILITY REPORTED AS ** 3.3E-07 cm/sec **

DATE	3/29/17
CHECK	DA
REVIEW	MWM
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-12D** Depth: **100.0-102.0'**
TYPE: **UD**



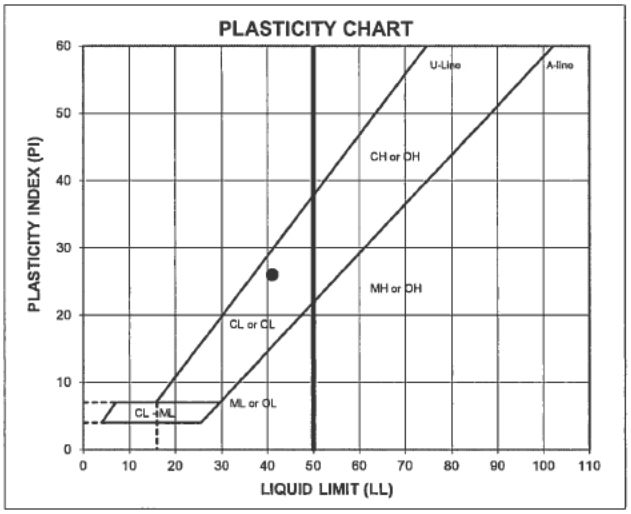
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.7		
#40	0.43	94.3	Medium Sand	5.7
#60	0.25	93.8		
#100	0.15	86.9		
#200	0.075	59.1	Fine Sand	35.2

Hydrometer Analysis

(mm)	%Finer		
0.032	54.5		
0.020	50.6		
0.012	45.6	Fines	
0.0086	42.6	Silt or Clay	59.1
0.0061	40.6		
0.0030	36.7		
0.0013	30.7		



ATTERBERG LIMITS
Method -B (Dry preparation)

M_c	LL	PL	PI	LI
26.1	41	15	26	0.43

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SILTY CLAY and SAND, fine to medium; olive gray.

USCS: CL

TECH	JS/HH
DATE	3/16/17
CHECK	DH
REVIEW	MWM
APPROVE	

FLEXIBLE WALL TRIAXIAL PERMEABILITY
ASTM D 5084
METHOD C, FALLING HEAD W/INCREASING TAIL WATER PRESSURE

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF/AR			**Using Pipettes Only**	YES	**COMMENTS**	
PROJECT NUMBER	1776955			**Using Pipettes & Burettes**	NO		
SAMPLE ID	MW-12D	100.0-102.0'	**BOARD#**	4	**TECH**	SDM/PWM	
SAMPLE TYPE	UD		**CELL #**	4	**DATE**	3/24/17	

Sample Data, Initial

Height, inches	3.087
Diameter, inches	2.826
Area, cm^2	40.47
Volume, cm^3	317.30
Mass, g	650.92
Moisture Content, %	26.1
Dry Density, pcf	101.5
Spec. Gravity (assumed)	2.700
Volume Solids, cm^3	191.13
Volume Voids, cm^3	126.17
Void Ratio	0.66
Saturation	100.0%

B-Value,f	0.97	
Cell Pres.	115.0	psi
Bot. Pres.	45.0	psi
Top Pres.	40.0	psi
Head, cm	351.70	
Max. Grad.	48.16	
Min. Grad.	47.46	
Max. E.S.	75.00	
Min. E.S.	70.00	

Sample Data, Final

Height, inches	3.075
Diameter, inches	2.825
Area, cm^2	40.44
Volume, cm^3	315.89
Mass, g	639.99
Moisture Content %	24.02
Dry Density, pcf	101.94
Saturation	99.3%
Inflow Volume per (cc)	1.00
Outflow Volume per (cc)	1.00

Water Contents	**Initial**	**Final**
Wt soil&tare, i	650.92	648.28
Wt soil&tare, f	516.05	524.37
Wt Tare	0.00	8.42
Wt Moisture Lost	134.87	123.91
Wt Dry Soil	516.05	515.95
Water Content	26.13%	24.02%

DESCRIPTION SILTY CLAY and SAND, fine to medium; olive gray.

USCS CL

PERMEANT: Deaired Tap Water

TIME FUNCTION			READINGS			TIME IN MINUTES & SECONDS						VOLUME		PERMEABILITY	
DATE	HOUR	MIN	Inflow (cc)	Outflow (cc)	Temp.	dt (min)	dt (sec)	dt, acc (sec)	Head (cm)	(H1/H2) (inc.)	Gradient	Inflow (cc)	Outflow (cc)	@ 20 Degrees C (cm/sec)	
03/24/17	8	50	0.0	25.0	18.9	0.0	0.0	0	376.12		48.16	0.00	0.00	0.0	
03/25/17	15	28	1.0	24.1	18.9	1838.0	110280	110280	374.27	1.00	47.92	1.00	0.90	4.5E-09	
03/26/17	14	58	1.6	23.5	18.6	1410.0	84600	194880	373.10	1.00	47.77	0.60	0.60	3.7E-09	
03/27/17	7	44	2.0	23.0	19.0	1006.0	60360	255240	372.22	1.00	47.66	0.40	0.50	3.9E-09	*
03/27/17	17	4	2.3	22.8	20.4	560.0	33600	288840	371.73	1.00	47.59	0.25	0.25	3.7E-09	*
03/28/17	7	45	2.7	22.4	19.2	881.0	52860	341700	371.00	1.00	47.50	0.40	0.35	3.7E-09	*
03/28/17	14	0	2.8	22.2	20.3	375.0	22500	364200	370.66	1.00	47.46	0.15	0.20	3.9E-09	*

Inflow Rate	0.0000077
Outflow Rate	0.0000077
Outflow/Inflow Ratio	1.00

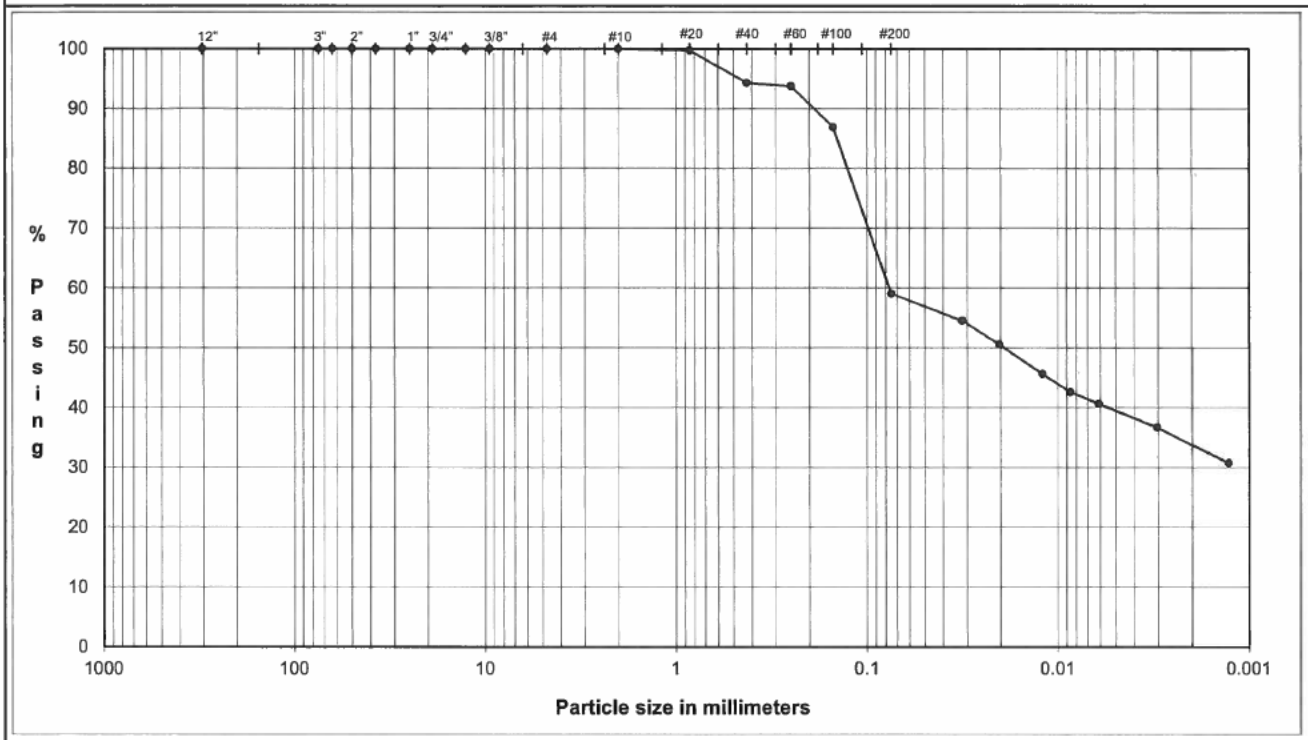
***PERMEABILITY REPORTED AS** 3.8E-09 cm/sec

DATE	3/24/17
CHECK	
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-12D** Depth: **100.0-102.0'**
TYPE: **UD**



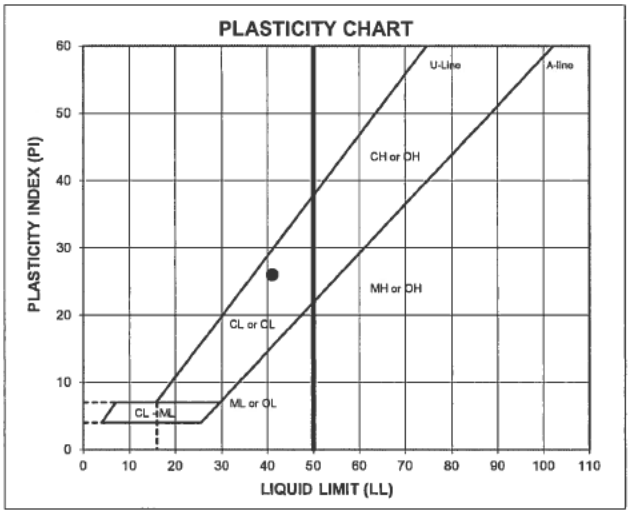
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.7		
#40	0.43	94.3	Medium Sand	5.7
#60	0.25	93.8		
#100	0.15	86.9		
#200	0.075	59.1	Fine Sand	35.2

Hydrometer Analysis

(mm)	%Finer		
0.032	54.5		
0.020	50.6		
0.012	45.6	Fines	
0.0086	42.6	Silt or Clay	59.1
0.0061	40.6		
0.0030	36.7		
0.0013	30.7		



ATTERBERG LIMITS
Method -B (Dry preparation)

M_c	LL	PL	PI	LI
26.1	41	15	26	0.43

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SILTY CLAY and SAND, fine to medium; olive gray.

USCS: CL

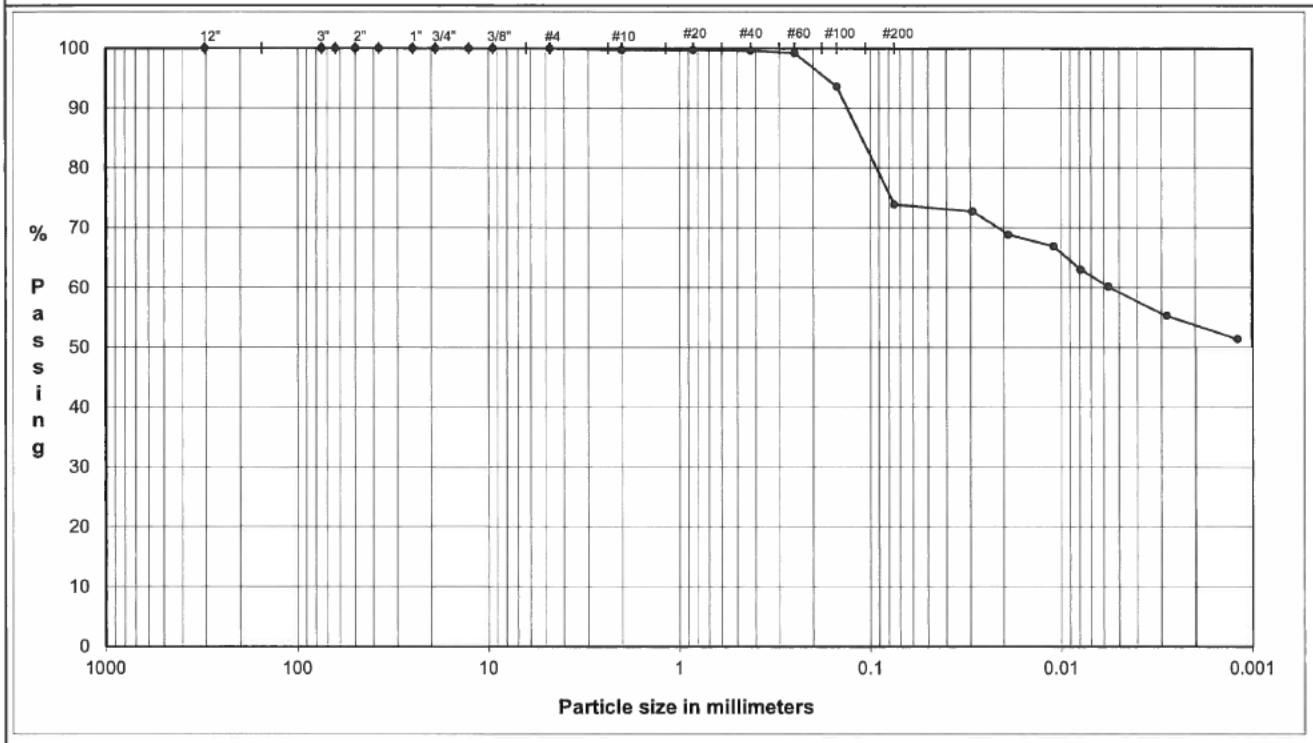
TECH	JS/HH
DATE	3/16/17
CHECK	DH
REVIEW	MWM
APPROVE	

MARCH 2017 1776955

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-14D** Depth: **70.0-72.0'**
TYPE: **UD**



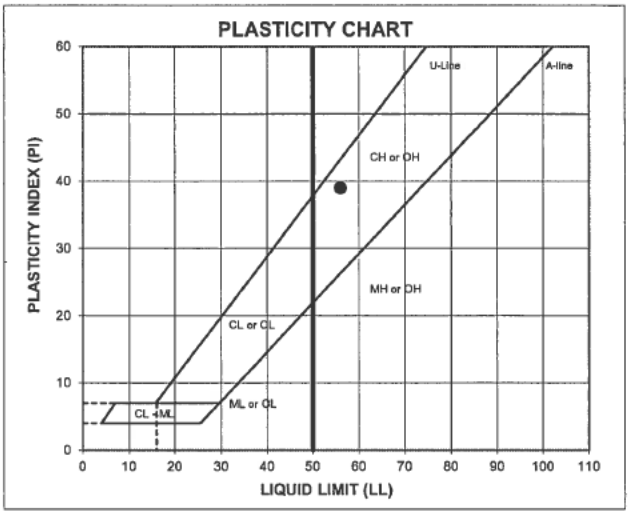
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**99.7**	Coarse Sand	**0.3**
#20	0.85	**99.7**		
#40	0.43	**99.6**	Medium Sand	**0.2**
#60	0.25	**99.2**		
#100	0.15	**93.6**		
#200	0.075	**73.9**	Fine Sand	**25.7**

Hydrometer Analysis

(mm)	%Finer		
0.029	**72.7**		
0.019	**68.9**		
0.011	**66.9**	Fines	
0.0079	**63.0**	Silt or Clay	**73.9**
0.0057	**60.1**		
0.0028	**55.3**		
0.0012	**51.4**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
28.1	**56**	**17**	**39**	**0.29**

LL (oven-dried) / LL (not dried) < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy CLAY, fine to coarse; dark olive gray.

USCS: CH

TECH	FT/WD
DATE	3/22/17
CHECK	DA
REVIEW	PWM
APPROVE	

FLEXIBLE WALL TRIAXIAL PERMEABILITY
ASTM D 5084
METHOD C, FALLING HEAD W/INCREASING TAIL WATER PRESSURE

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF/AR		**Using Pipettes Only**	YES	**COMMENTS**	
PROJECT NUMBER	1776955		**Using Pipettes & Burettes**	NO		
SAMPLE ID	MW-14D	70.0-72.0'	**BOARD#**	10	**TECH**	SDM/PWM
SAMPLE TYPE	UD		**CELL #**	10	**DATE**	3/22/17

Sample Data, Initial

Height, inches	3.109
Diameter, inches	2.835
Area, cm^2	40.73
Volume, cm^3	321.60
Mass, g	625.98
Moisture Content, %	28.1
Dry Density, pcf	94.8
Spec. Gravity (assumed)	2.700
Volume Solids, cm^3	180.95
Volume Voids, cm^3	140.65
Void Ratio	0.78
Saturation	97.7%

B-Value,f	0.98	
Cell Pres.	107.0	psi
Bot. Pres.	55.0	psi
Top Pres.	50.0	psi
Head, cm	351.70	
Max. Grad.	49.18	
Min. Grad.	48.54	
Max. E.S.	57.00	
Min. E.S.	52.00	

Sample Data, Final

Height, inches	3.011
Diameter, inches	2.808
Area, cm^2	39.95
Volume, cm^3	305.56
Mass, g	607.73
Moisture Content %	24.39
Dry Density, pcf	99.77
Saturation	95.6%
Inflow Volume per (cc)	1.00
Outflow Volume per (cc)	1.00

Water Contents	**Initial**	**Final**
Wt soil&tare, i	625.98	615.84
Wt soil&tare, f	488.57	496.73
Wt Tare	0.00	8.37
Wt Moisture Lost	137.41	119.11
Wt Dry Soil	488.57	488.36
Water Content	28.13%	24.39%

DESCRIPTION sandy CLAY, fine to coarse; dark olive gray.

USCS CH

PERMEANT: Deaired Tap Water

TIME FUNCTION			READINGS			TIME IN MINUTES & SECONDS						VOLUME		PERMEABILITY
DATE	HOUR	MIN	Inflow (cc)	Outflow (cc)	Temp.	dt (min)	dt (sec)	dt, acc (sec)	Head (cm)	(H1/H2) (inc.)	Gradient	Inflow (cc)	Outflow (cc)	@ 20 Degrees C (cm/sec)
03/22/17	9	14	0.0	25.0	18.6	0.0	0.0	0	376.12		49.18	0.00	0.00	0.0
03/23/17	7	42	0.3	24.2	18.7	1348.0	80880	80880	375.04	1.00	49.04	0.30	0.80	3.5E-09
03/23/17	16	57	0.4	24.0	20.3	555.0	33300	114180	374.75	1.00	49.00	0.10	0.20	2.2E-09
03/24/17	9	30	0.6	23.8	20.3	993.0	59580	173760	374.36	1.00	48.95	0.20	0.20	1.7E-09
03/25/17	15	29	1.2	23.3	18.9	1799.0	107940	281700	373.29	1.00	48.81	0.60	0.50	2.6E-09
03/26/17	15	0	1.5	22.9	18.6	1411.0	84660	366360	372.61	1.00	48.72	0.30	0.40	2.1E-09
03/27/17	7	45	1.8	22.5	19.0	1005.0	60300	426660	371.97	1.00	48.64	0.25	0.40	2.8E-09
03/27/17	17	5	2.0	22.3	20.4	560.0	33600	460260	371.58	1.00	48.59	0.20	0.20	3.0E-09
03/28/17	7	46	2.1	22.1	19.2	881.0	52860	513120	371.19	1.00	48.54	0.15	0.25	1.9E-09
03/28/17	9	0	0.0	25.0	19.3	74.0	4440	517560	376.12	0.99	49.18	0.00	0.00	-
03/29/17	8	39	0.4	24.6	19.7	1419.0	85140	602700	375.34	1.00	49.08	0.40	0.40	2.4E-09
03/29/17	16	47	0.5	24.5	20.9	488.0	29280	631980	375.14	1.00	49.05	0.10	0.10	1.7E-09
03/30/17	10	33	0.8	24.2	19.6	1066.0	63960	695940	374.56	1.00	48.98	0.30	0.30	2.4E-09 *
03/31/17	10	15	1.2	23.8	19.6	1422.0	85320	781260	373.78	1.00	48.87	0.40	0.40	2.4E-09 *
04/01/17	12	48	1.6	23.4	19.1	1593.0	95580	876840	373.00	1.00	48.77	0.40	0.40	2.1E-09 *
04/03/17	9	6	2.2	22.5	19.2	2658.0	159480	1036320	371.54	1.00	48.58	0.60	0.90	2.4E-09 *

Inflow Rate	0.0000042
Outflow Rate	0.0000048
Outflow/Inflow Ratio	1.14

***PERMEABILITY REPORTED AS** 2.3E-09 cm/sec

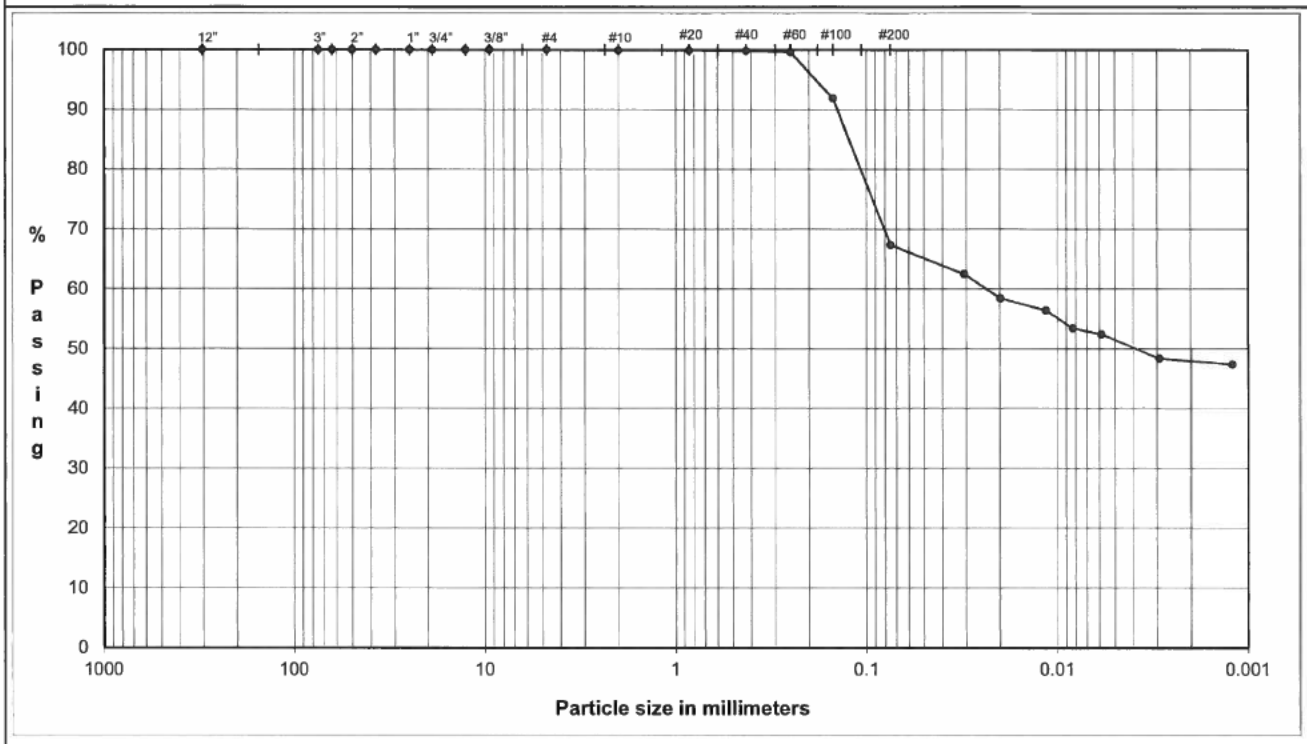
DATE	3/22/17
CHECK	DA
REVIEW	MM
APPROVE	

GOLDER ASSOCIATES INC.

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-15D** Depth: **80.0-82.0'**
TYPE: **UD**



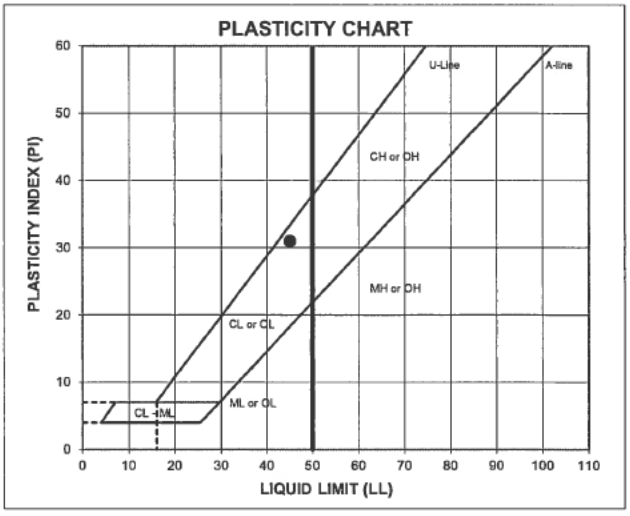
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	99.9	Coarse Sand	0.1
#20	0.85	99.9		
#40	0.43	99.8	Medium Sand	0.1
#60	0.25	99.6		
#100	0.15	91.8		
#200	0.075	67.3	Fine Sand	32.5

Hydrometer Analysis

(mm)	%Finer		
0.031	62.5		
0.020	58.4		
0.012	56.4	Fines	
0.0083	53.4	Silt or Clay	67.3
0.0059	52.4		
0.0029	48.4		
0.0012	47.4		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
27.8	45	14	31	0.44

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy SILTY CLAY, fine to coarse; olive gray.

USCS: CL

TECH	JS/FT
DATE	3/23/17
CHECK	DA
REVIEW	
APPROVE	

FLEXIBLE WALL TRIAXIAL PERMEABILITY
ASTM D 5084
METHOD C, FALLING HEAD W/INCREASING TAIL WATER PRESSURE

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF/AR			**Using Pipettes Only**	YES	**COMMENTS**	
PROJECT NUMBER	1776955			**Using Pipettes & Burettes**	NO		
SAMPLE ID	MW-15D	80.0-82.0'	**BOARD#**	15	**TECH**	SDM/PWM	
SAMPLE TYPE	UD		**CELL #**	15	**DATE**	3/26/17	

Sample Data, Initial

Height, inches	3.119
Diameter, inches	2.885
Area, cm^2	42.17
Volume, cm^3	334.12
Mass, g	636.80
Moisture Content, %	27.8
Dry Density, pcf	93.1
Spec. Gravity (assumed)	2.700
Volume Solids, cm^3	184.54
Volume Voids, cm^3	149.58
Void Ratio	0.81
Saturation	92.6%

B-Value,f	0.97	
Cell Pres.	105.0	psi
Bot. Pres.	45.0	psi
Top Pres.	40.0	psi
Head, cm	351.70	
Max. Grad.	48.23	
Min. Grad.	48.01	
Max. E.S.	65.00	
Min. E.S.	60.00	

Sample Data, Final

Height, inches	3.070
Diameter, inches	2.852
Area, cm^2	41.22
Volume, cm^3	321.39
Mass, g	625.66
Moisture Content %	25.57
Dry Density, pcf	96.74
Saturation	93.1%
Inflow Volume per (cc)	1.00
Outflow Volume per (cc)	1.00

Water Contents	**Initial**	**Final**
Wt soil&tare, i	636.80	633.87
Wt soil&tare, f	498.26	506.50
Wt Tare	0.00	8.37
Wt Moisture Lost	138.54	127.37
Wt Dry Soil	498.26	498.13
Water Content	27.81%	25.57%

DESCRIPTION sandy SILTY CLAY, fine to coarse; olive gray.

USCS CL

PERMEANT: Deaired Tap Water

TIME FUNCTION			READINGS			TIME IN MINUTES & SECONDS						VOLUME		PERMEABILITY	
DATE	HOUR	MIN	Inflow (cc)	Outflow (cc)	Temp.	dt (min)	dt (sec)	dt, acc (sec)	Head (cm)	(H1/H2) (inc.)	Gradient	Inflow (cc)	Outflow (cc)	@ 20 Degrees C (cm/sec)	
03/26/17	15	5	0.0	25.0	18.6	0.0	0.0	0	376.12		48.23	0.00	0.00	0.0	
03/27/17	7	45	0.1	24.9	19.0	1000.0	60000	60000	375.92	1.00	48.21	0.10	0.10	8.4E-10	
03/27/17	17	5	0.2	24.8	20.4	560.0	33600	93600	375.78	1.00	48.19	0.05	0.10	1.1E-09	
03/28/17	7	46	0.2	24.7	19.2	881.0	52860	146460	375.63	1.00	48.17	0.05	0.10	7.1E-10	
03/28/17	9	8	0.0	25.0	19.3	82.0	4920	151380	376.12	1.00	48.23	0.00	0.00	-	
03/29/17	8	40	0.1	24.9	19.7	1412.0	84720	236100	375.92	1.00	48.21	0.10	0.10	5.9E-10	*
03/30/17	10	32	0.4	24.8	19.6	1552.0	93120	329220	375.53	1.00	48.16	0.30	0.10	1.1E-09	*
03/31/17	10	15	0.5	24.7	19.6	1423.0	85380	414600	375.29	1.00	48.13	0.10	0.15	7.3E-10	*
04/03/17	9	5	1.0	24.2	19.2	4250.0	255000	669600	374.36	1.00	48.01	0.50	0.45	9.4E-10	*

Inflow Rate	0.0000019
Outflow Rate	0.0000015
Outflow/Inflow Ratio	0.80

***PERMEABILITY REPORTED AS** **8.3E-10** cm/sec

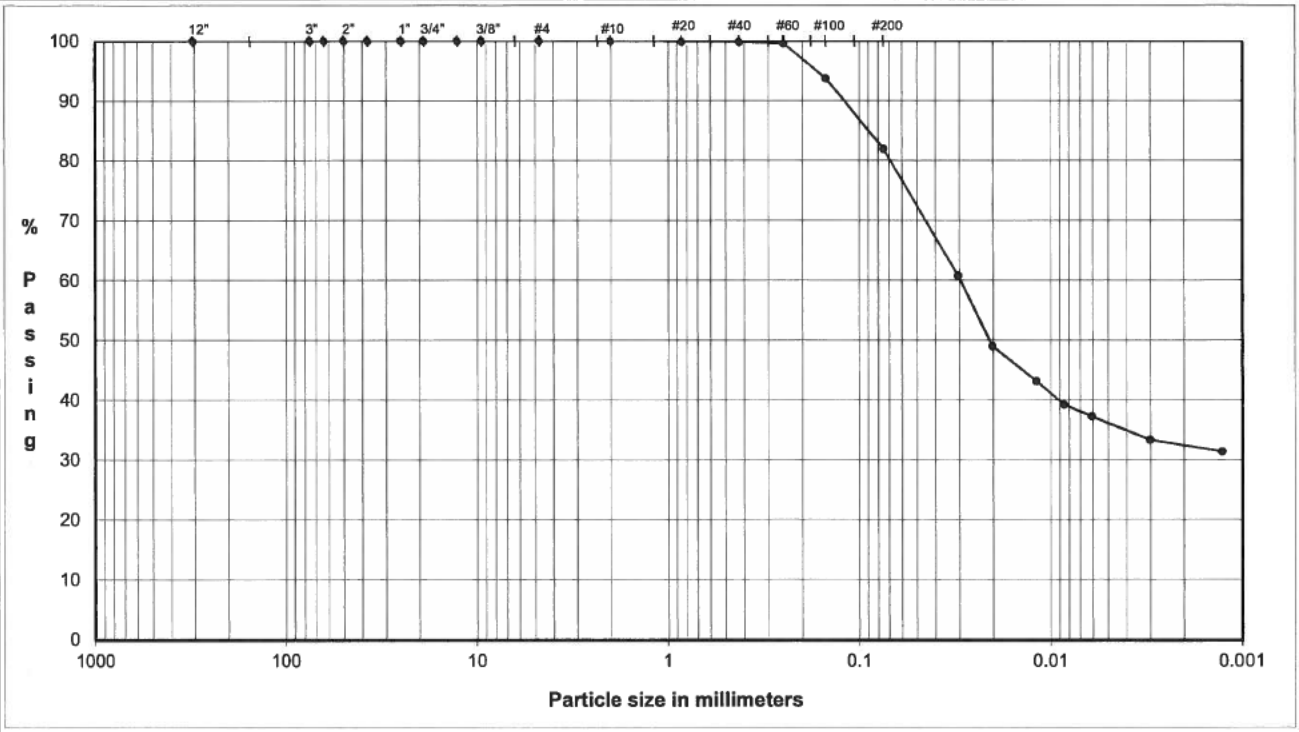
DATE	3/26/17
CHECK	DA
REVIEW	PWM
APPROVE	

GOLDER ASSOCIATES INC.

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-10D** Depth: **70.0-72.0'**
TYPE: **UD**



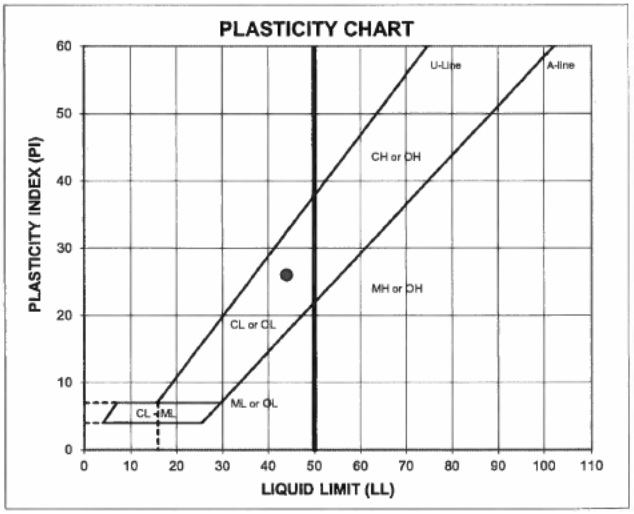
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	99.9	Coarse Sand	0.1
#20	0.85	99.9		
#40	0.43	99.8	Medium Sand	0.1
#60	0.25	99.5		
#100	0.15	93.7		
#200	0.075	81.9	Fine Sand	17.9

Hydrometer Analysis

(mm)	%Finer		
0.030	60.8		
0.020	49.0		
0.012	43.1	Fines	
0.0085	39.2	Silt or Clay	81.9
0.0061	37.2		
0.0030	33.3		
0.0013	31.4		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
32.4	44	18	26	0.56

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy SILTY CLAY, fine to coarse; gray, micaceous.

USCS: CL

TECH	FT/JS
DATE	3/30/17
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL TRIAXIAL PERMEABILITY
ASTM D 5084
METHOD C, FALLING HEAD W/INCREASING TAIL WATER PRESSURE

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF/AR		**Using Pipettes Only**	YES	**COMMENTS**	
PROJECT NUMBER	1776955		**Using Pipettes & Burettes**	NO		
SAMPLE ID	MW10D	70.0-72.0'	**BOARD#** 8	**TECH**	PWM	
SAMPLE TYPE	UD		**CELL #** 8	**DATE**	3/30/17	

Sample Data, Initial

Height, inches	3.116
Diameter, inches	2.829
Area, cm^2	40.55
Volume, cm^3	320.96
Mass, g	626.18
Moisture Content, %	32.4
Dry Density, pcf	92.0
Spec. Gravity (assumed)	2.700
Volume Solids, cm^3	175.23
Volume Voids, cm^3	145.73
Void Ratio	0.83
Saturation	100.0%

B-Value,f	0.99	
Cell Pres.	107.0	psi
Bot. Pres.	60.0	psi
Top Pres.	50.0	psi
Head, cm	703.40	
Max. Grad.	95.42	
Min. Grad.	95.16	
Max. E.S.	57.00	
Min. E.S.	47.00	

Sample Data, Final

Height, inches	3.003
Diameter, inches	2.829
Area, cm^2	40.55
Volume, cm^3	309.32
Mass, g	602.02
Moisture Content %	27.24
Dry Density, pcf	95.44
Saturation	96.1%
Inflow Volume per (cc)	1.00
Outflow Volume per (cc)	1.00

Water Contents	**Initial**	**Final**
Wt soil&tare, i	626.18	610.01
Wt soil&tare, f	473.12	481.17
Wt Tare	0.00	8.26
Wt Moisture Lost	153.06	128.84
Wt Dry Soil	473.12	472.91
Water Content	32.35%	27.24%

DESCRIPTION sandy SILTY CLAY, fine to coarse; gray, micaceous.

USCS CL

PERMEANT: Deaired Tap Water

TIME FUNCTION			READINGS			TIME IN MINUTES & SECONDS						VOLUME		PERMEABILITY
DATE	HOUR	MIN	Inflow (cc)	Outflow (cc)	Temp.	dt (min)	dt (sec)	dt, acc (sec)	Head (cm)	(H1/H2) (inc.)	Gradient	Inflow (cc)	Outflow (cc)	@ 20 Degrees C (cm/sec)
04/03/17	17	40	0.0	25.0	20.3	0.0	0.0	0	727.82		95.42	0.00	0.00	0.0
04/04/17	11	0	0.2	24.9	19.7	1040.0	62400	62400	727.53	1.00	95.38	0.20	0.10	6.1E-10
04/05/17	8	51	0.5	24.6	19.6	1311.0	78660	141060	726.94	1.00	95.30	0.30	0.30	9.7E-10
04/06/17	8	46	0.7	24.4	20.0	1435.0	86100	227160	726.55	1.00	95.25	0.20	0.20	5.9E-10
04/06/17	18	51	0.8	24.3	20.0	605.0	36300	263460	726.36	1.00	95.23	0.10	0.10	7.0E-10
04/07/17	8	33	0.9	24.1	19.2	822.0	49320	312780	726.06	1.00	95.19	0.10	0.20	7.9E-10
04/07/17	16	30	1.0	24.0	19.6	477.0	28620	341400	725.87	1.00	95.16	0.10	0.10	8.9E-10

Inflow Rate	0.0000029
Outflow Rate	0.0000029
Outflow/Inflow Ratio	1.00

***PERMEABILITY REPORTED AS** 7.4E-10 **cm/sec**

DATE	4/3/17
CHECK	
REVIEW	
APPROVE	

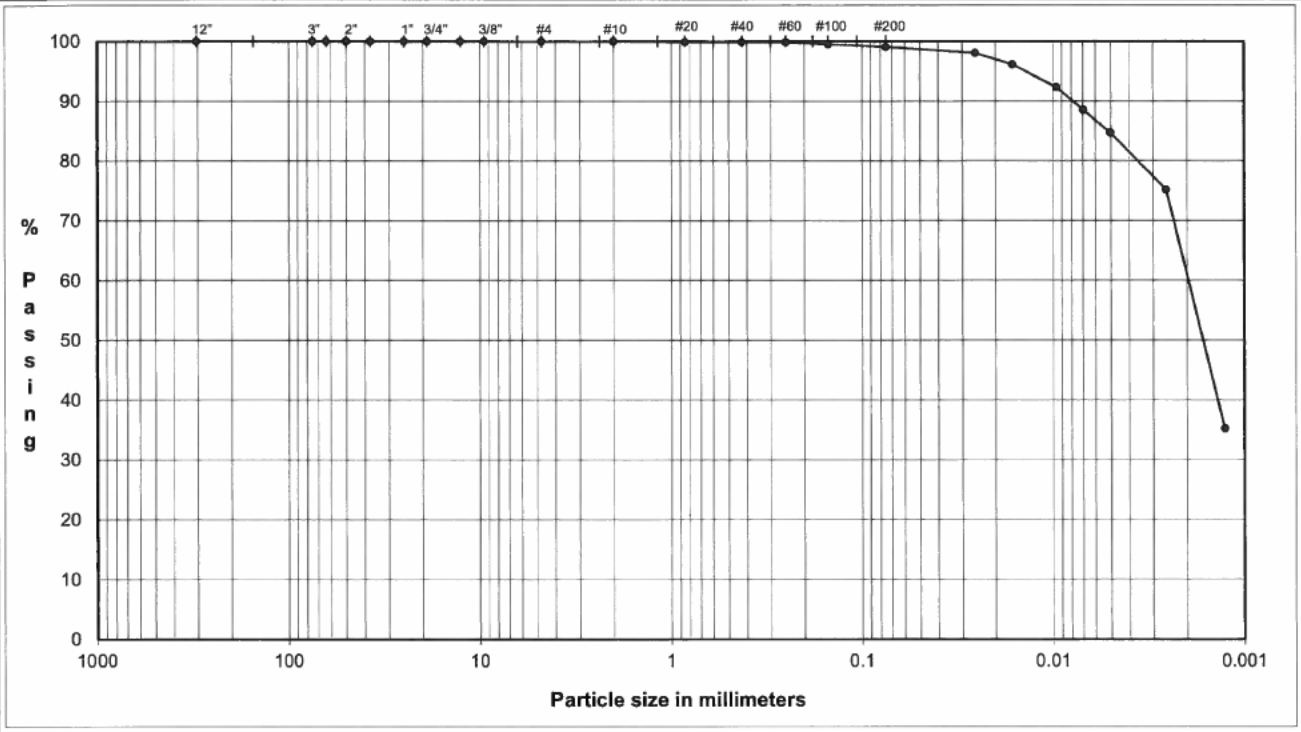
GOLDER ASSOCIATES INC.

MARCH 2017 1776955

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-10D** Depth: **48.0-49.0'**
TYPE: **Bag**



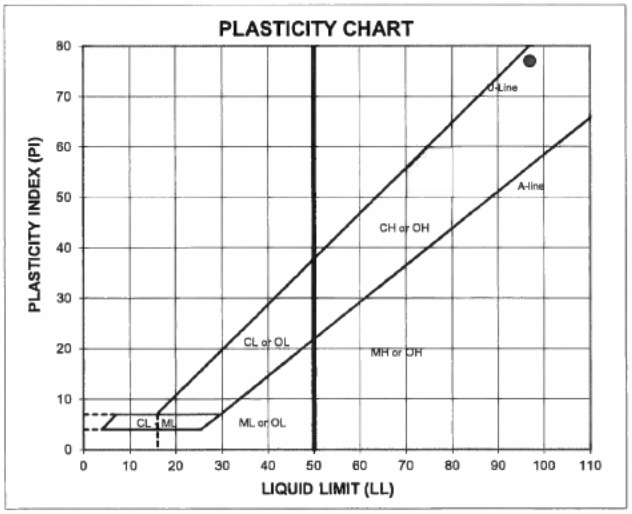
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**100.0**	Coarse Sand	**0.0**
#20	0.85	**99.9**		
#40	0.43	**99.8**	Medium Sand	**0.2**
#60	0.25	**99.8**		
#100	0.15	**99.5**		
#200	0.075	**99.1**	Fine Sand	**0.8**

Hydrometer Analysis

(mm)	%Finer		
0.026	**98.0**		
0.016	**96.1**		
0.010	**92.3**	Fines	
0.0070	**88.5**	Silt or Clay	**99.1**
0.0050	**84.7**		
0.0026	**75.2**		
0.0013	**35.2**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
33.7	**97**	**20**	**77**	**0.18**

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: CLAY, trace fine to medium sand; dark olive gray.

USCS: CH

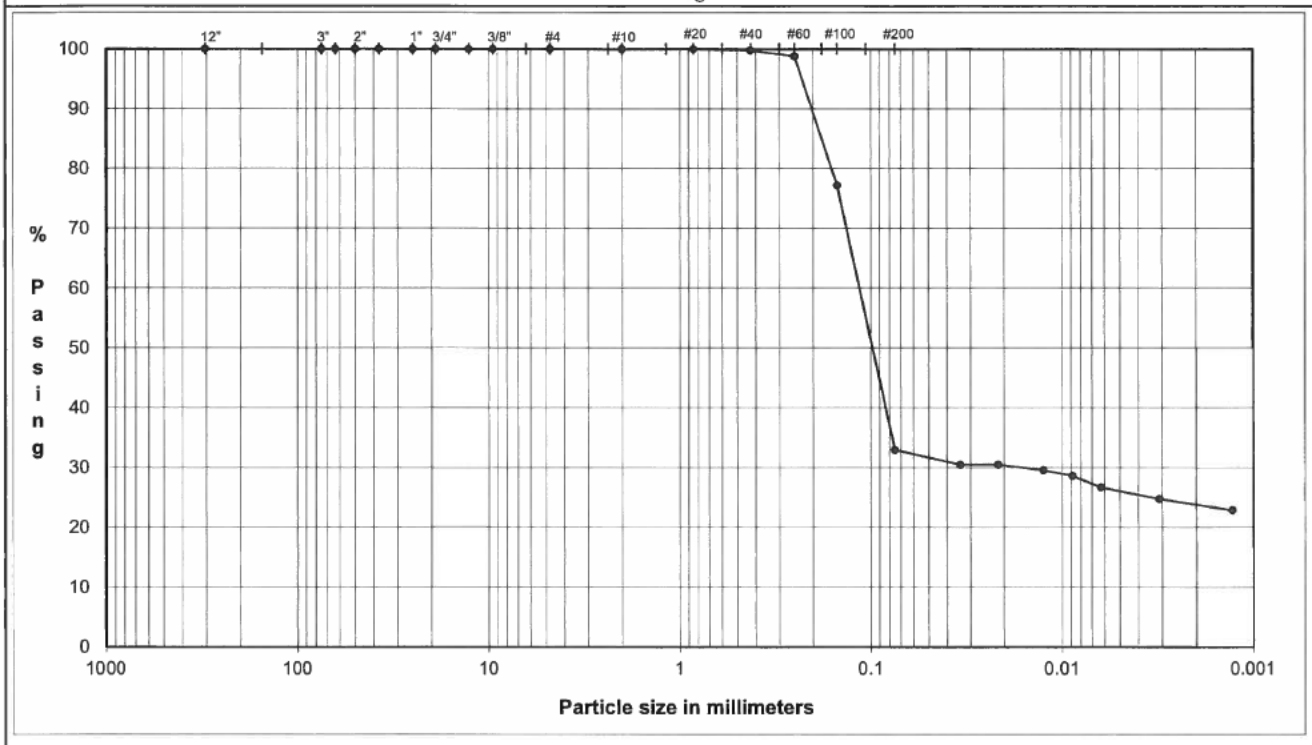
TECH	JS/WD
DATE	3/31/17
CHECK	
REVIEW	PWH
APPROVE	

Golder Associates Inc.

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-10D** Depth: **69.0-70.0'**
TYPE: **Bag**



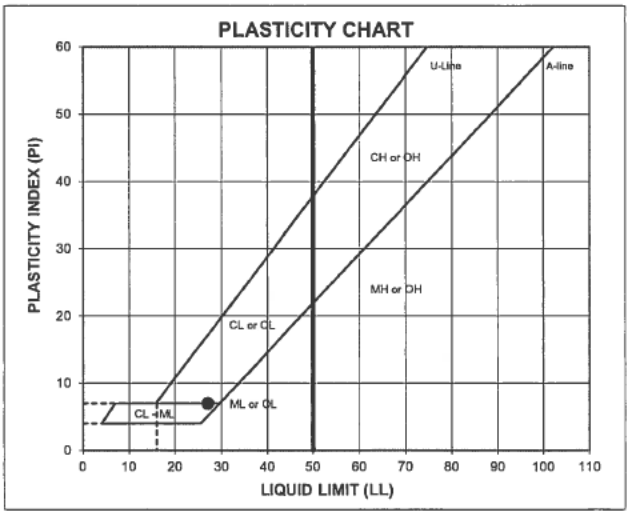
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.9		
#40	0.43	99.8	Medium Sand	0.2
#60	0.25	98.8		
#100	0.15	77.2		
#200	0.075	32.9	Fine Sand	66.8

Hydrometer Analysis

(mm)	%Finer		
0.034	30.5		
0.021	30.5		
0.013	29.5	Fines	
0.0088	28.6	Silt or Clay	32.9
0.0063	26.7		
0.0031	24.8		
0.0013	22.9		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
22.0	27	20	7	0.25

LL (oven-dried) / LL (not dried) < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: CLAYEY SAND to SILTY SAND, fine to medium; very dark gray.

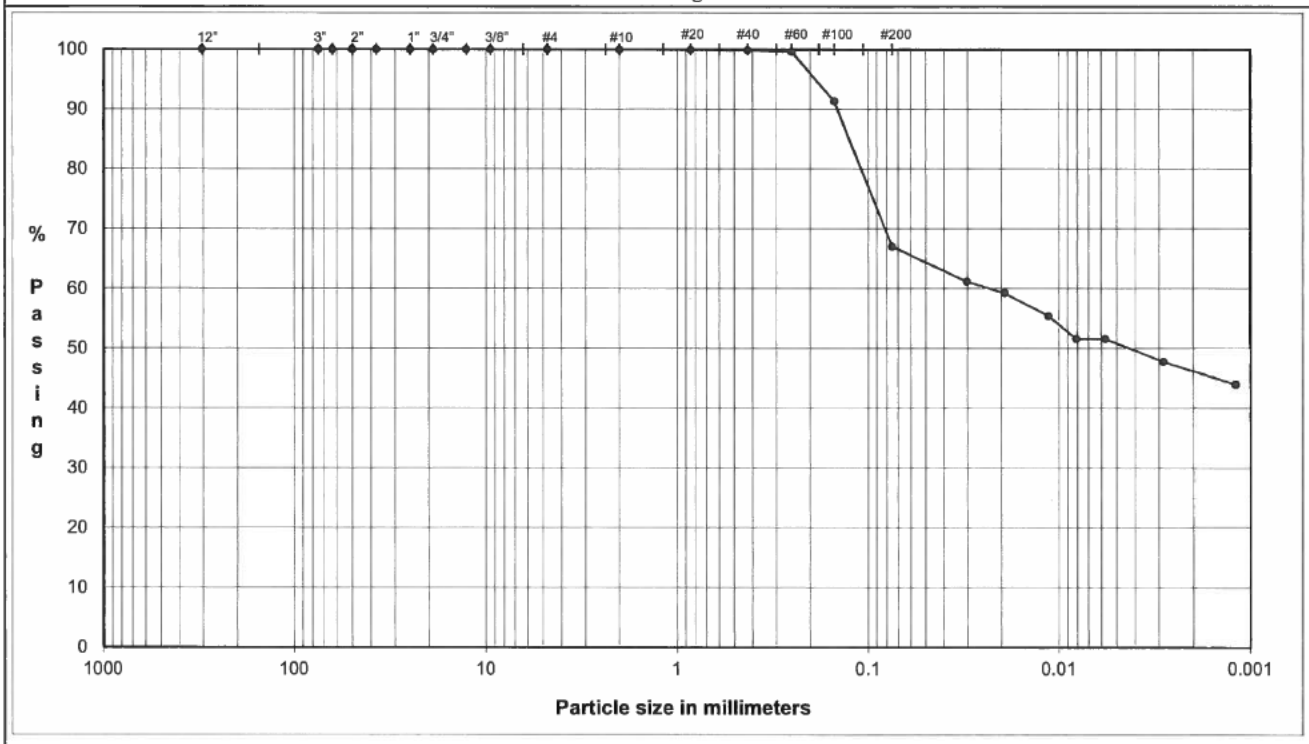
USCS: SC-SM

TECH	FT
DATE	3/30/17
CHECK	DA
REVIEW	TWM
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-10D** Depth: **72.0-74.0'**
TYPE: **Bag**



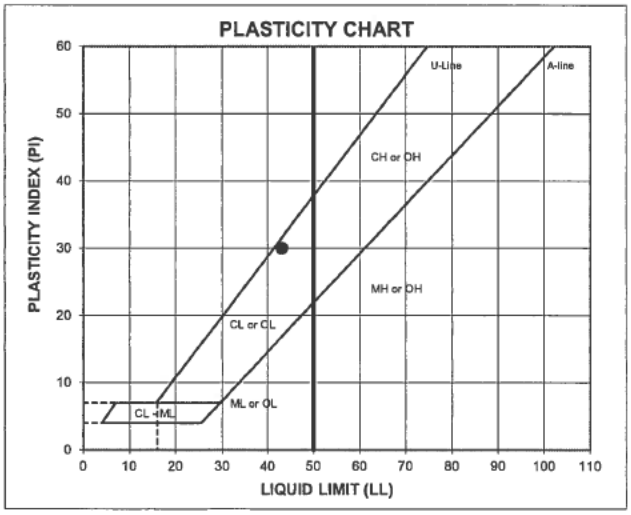
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.9		
#40	0.43	99.8	Medium Sand	0.1
#60	0.25	99.6		
#100	0.15	91.3		
#200	0.075	67.0	Fine Sand	32.8

Hydrometer Analysis

(mm)	%Finer		
0.030	61.1		
0.019	59.2		
0.011	55.4	Fines	
0.0081	51.6	Silt or Clay	67.0
0.0057	51.6		
0.0029	47.8		
0.0012	43.9		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
23.8	43	13	30	0.35

LL (oven-dried) / <0.75 – ORGANIC (OL/OH)

DESCRIPTION: sandy SILTY CLAY, fine to coarse; very dark gray.

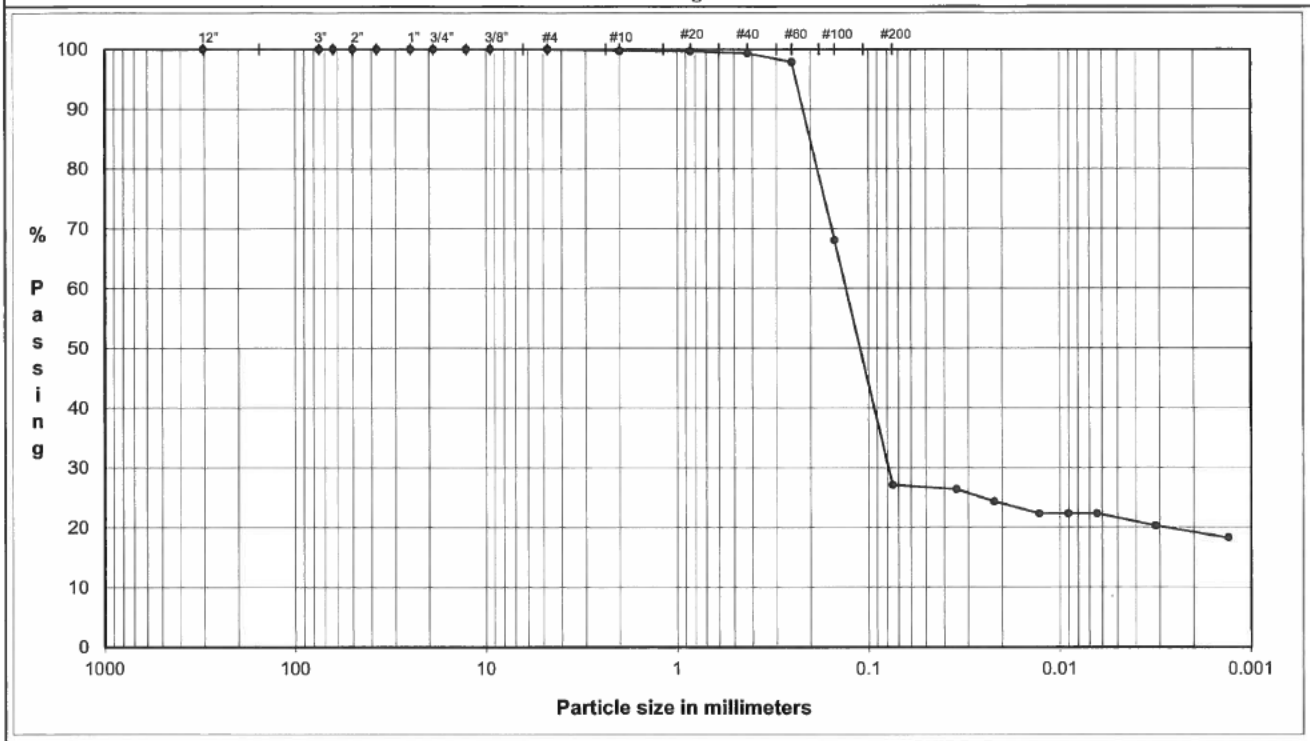
USCS: CL

TECH	FT/WD
DATE	3/30/17
CHECK	
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-10D** Depth: **78.0-79.0'**
TYPE: **Bag**



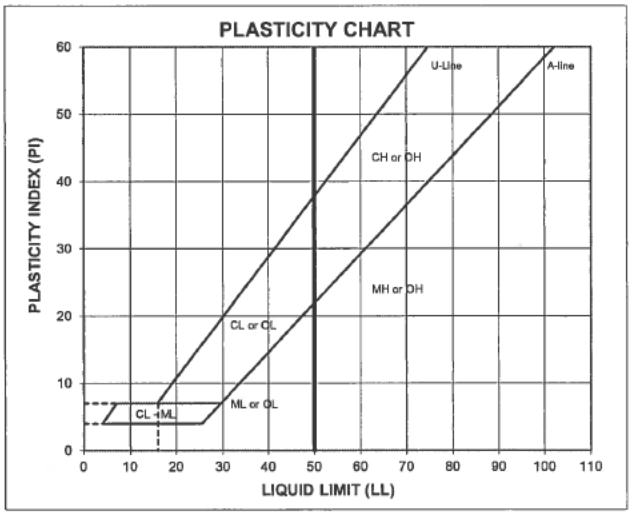
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	99.7	Coarse Sand	0.3
#20	0.85	99.6		
#40	0.43	99.3	Medium Sand	0.3
#60	0.25	97.8		
#100	0.15	68.0		
#200	0.075	27.1	Fine Sand	72.2

Hydrometer Analysis

(mm)	%Finer		
0.035	26.4		
0.022	24.4		
0.013	22.3	Fines	
0.0090	22.3	Silt or Clay	27.1
0.0064	22.3		
0.0032	20.3		
0.0013	18.3		



ATTERBERG LIMITS
Method -B (Dry preparation)

M_c	LL	PL	PI	LI
22.9	NP	NP	NP	NP

LL (oven-dried) / 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SILTY SAND, fine to coarse; very dark gray.

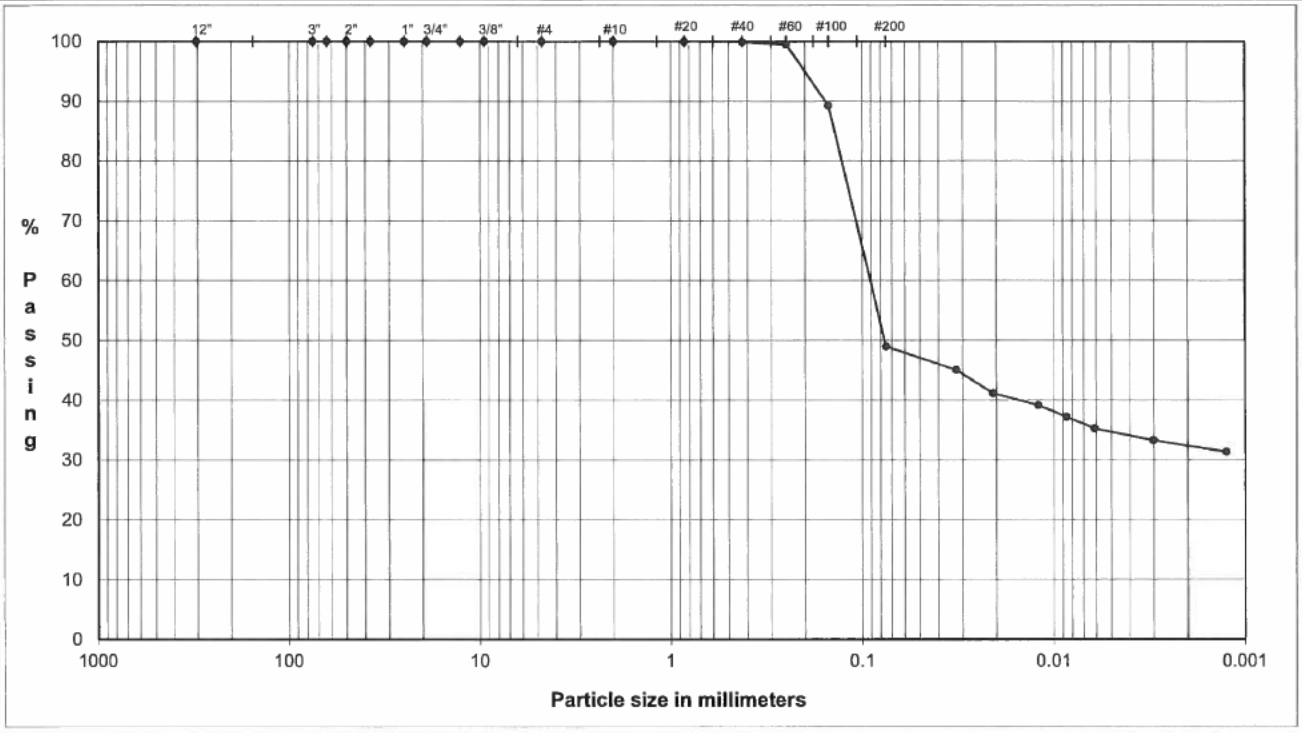
USCS: SM

TECH	FT/WD
DATE	3/30/17
CHECK	
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-12D** Depth: **92.0-97.0'**
TYPE: **Bag**



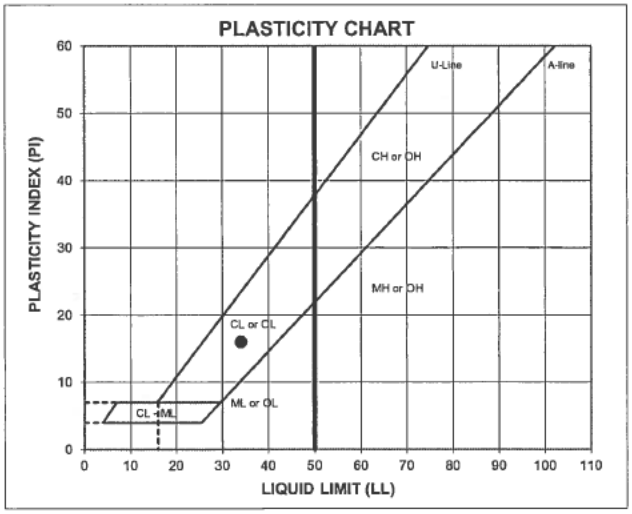
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.9		
#40	0.43	99.9	Medium Sand	0.1
#60	0.25	99.5		
#100	0.15	89.3		
#200	0.075	49.0	Fine Sand	50.9

Hydrometer Analysis

(mm)	%Finer		
0.032	45.0		
0.021	41.1		
0.012	39.2	Fines	
0.0086	37.2	Silt or Clay	49.0
0.0061	35.2		
0.0030	33.3		
0.0013	31.3		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
32.7	34	18	16	0.95

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SAND and SILTY CLAY, fine to medium; dark gray.

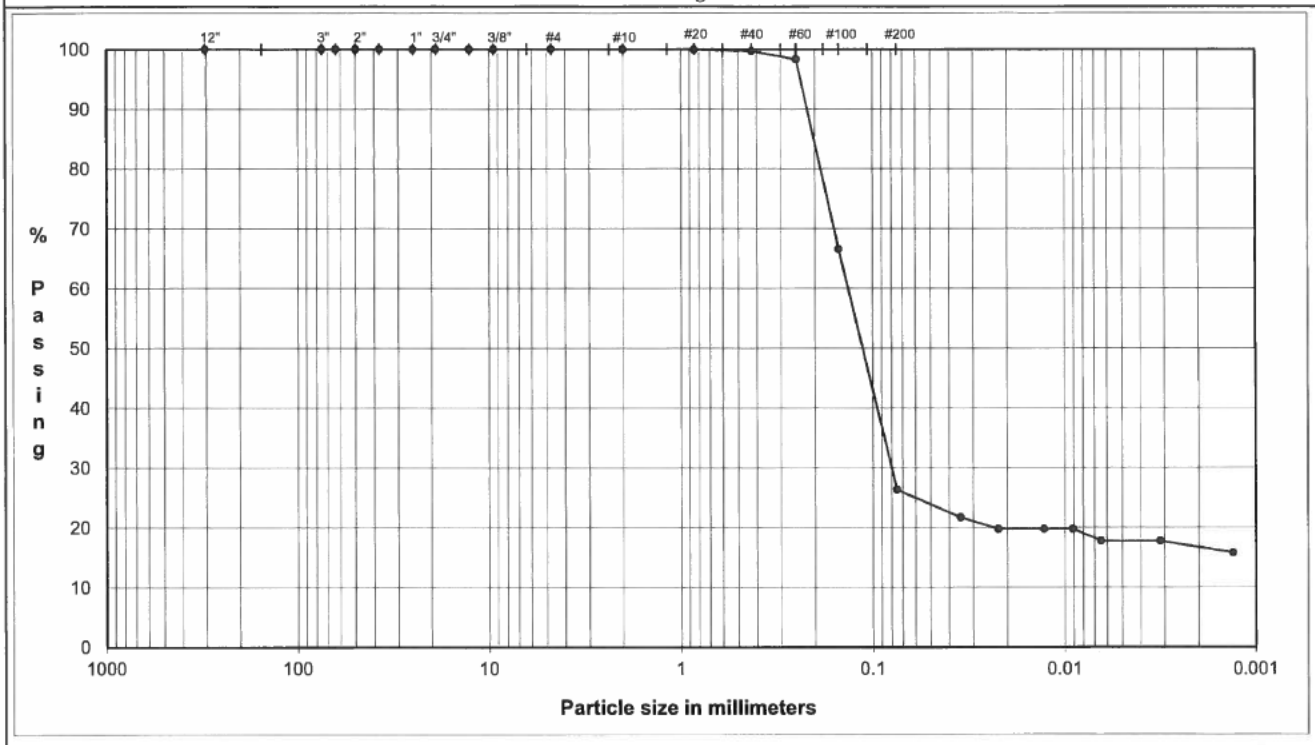
USCS: SC

TECH	FT
DATE	3/30/17
CHECK	
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-12D** Depth: **105.0-107.0'**
TYPE: **Bag**



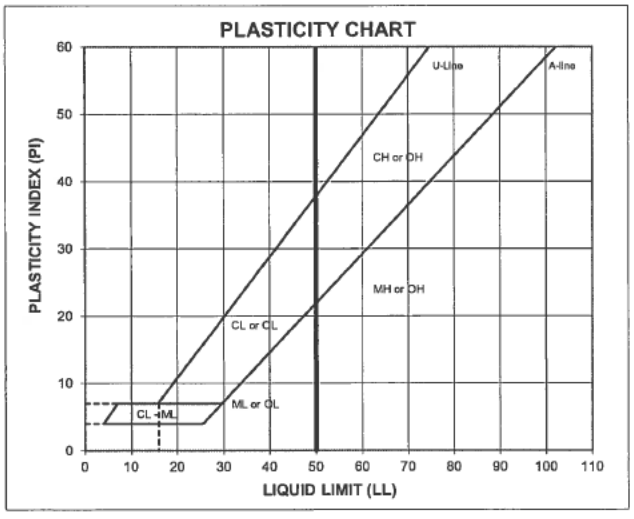
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.9		
#40	0.43	99.7	Medium Sand	0.3
#60	0.25	98.3		
#100	0.15	66.6		
#200	0.075	26.3	Fine Sand	73.4

Hydrometer Analysis

(mm)	%Finer		
0.035	21.7		
0.022	19.7		
0.013	19.7	Fines	
0.0091	19.7	Silt or Clay	26.3
0.0065	17.8		
0.0032	17.8		
0.0013	15.8		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
23.1	NP	NP	NP	NP

LL (oven-dried) / LL (not dried) < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SILTY SAND, fine to medium; very dark gray.

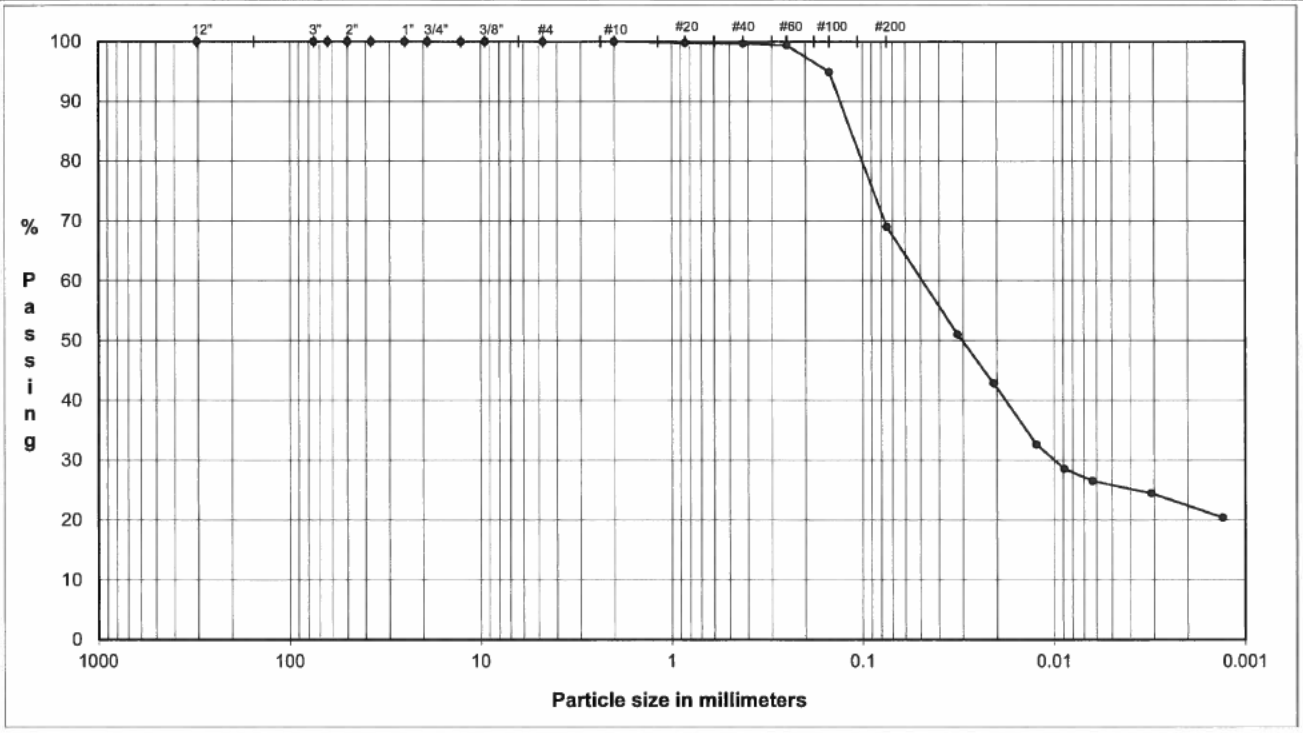
USCS: SM

TECH	FT/JS
DATE	3/30/17
CHECK	
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-13D** Depth: **6.0-7.0'**
TYPE: **Bag**



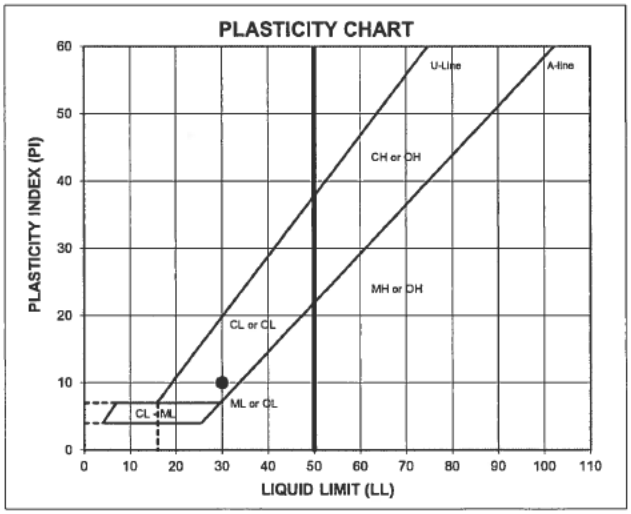
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.8		
#40	0.43	99.7	Medium Sand	0.3
#60	0.25	99.3		
#100	0.15	94.9		
#200	0.075	69.0	Fine Sand	30.7

Hydrometer Analysis

(mm)	%Finer		
0.032	51.0		
0.021	42.8		
0.012	32.6	Fines	
0.0089	28.6	Silt or Clay	69.0
0.0063	26.5		
0.0031	24.5		
0.0013	20.4		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
22.3	30	20	10	0.23

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy SILTY CLAY, fine to medium; light brownish yellow and light gray, micaceous.

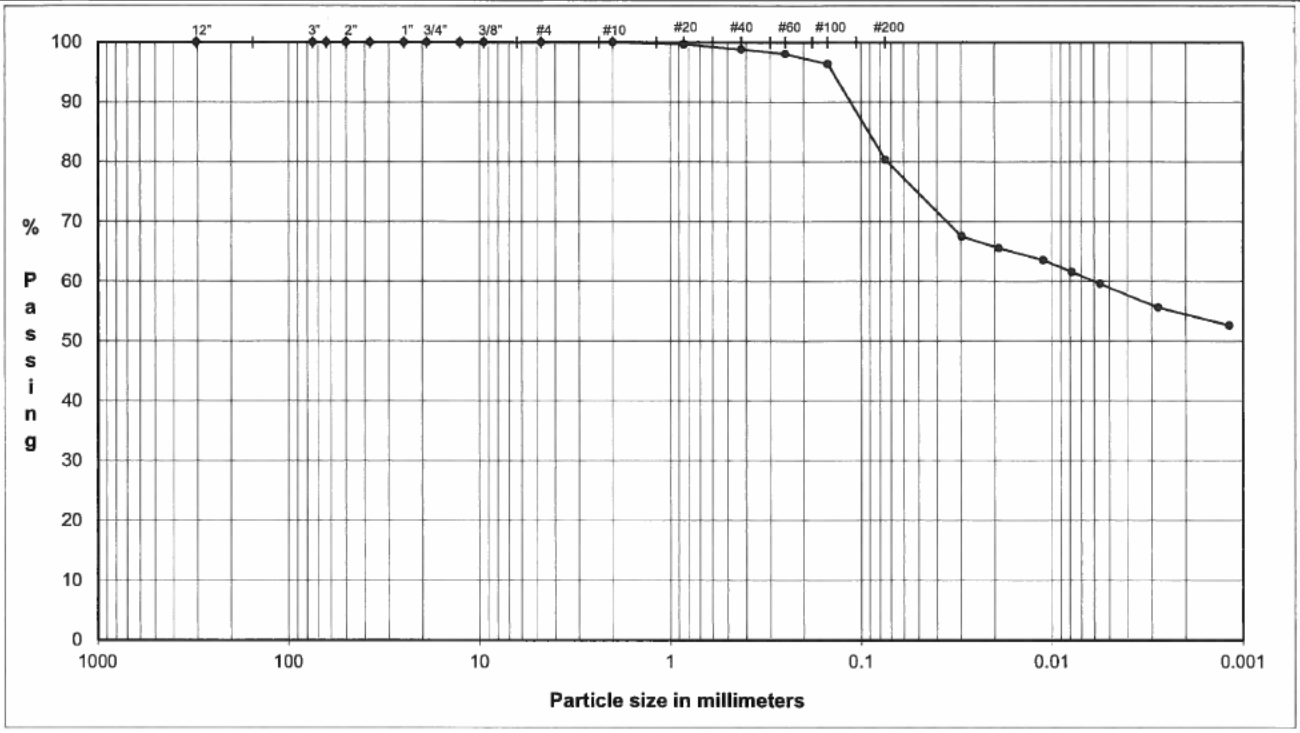
USCS: CL

TECH	FT/JS
DATE	3/30/17
CHECK	DA
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-13D** Depth: **16.0-17.0'**
TYPE: **Bag**



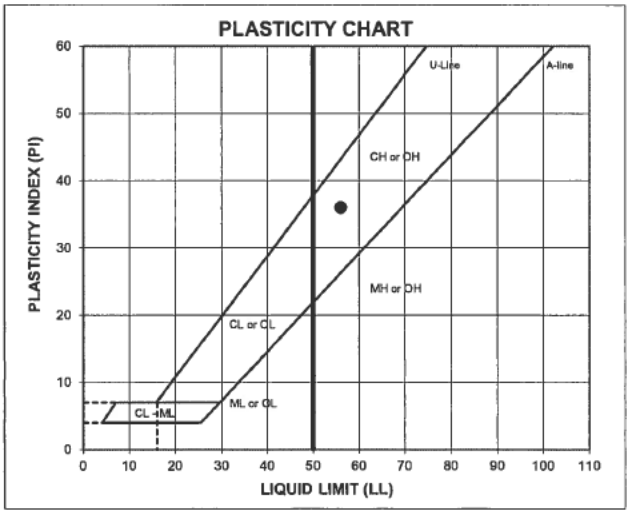
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.7		
#40	0.43	98.8	Medium Sand	1.2
#60	0.25	98.1		
#100	0.15	96.4		
#200	0.075	80.4	Fine Sand	18.5

Hydrometer Analysis

(mm)	%Finer		
0.030	67.5		
0.019	65.6		
0.011	63.6	Fines	
0.0079	61.6	Silt or Clay	80.4
0.0056	59.6		
0.0028	55.6		
0.0012	52.6		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_r	LL	PL	PI	LI
32.3	56	20	36	0.34

LL (oven-dried) / LL (oven-dried) < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: sandy CLAY, fine to medium; brownish yellow and light gray.

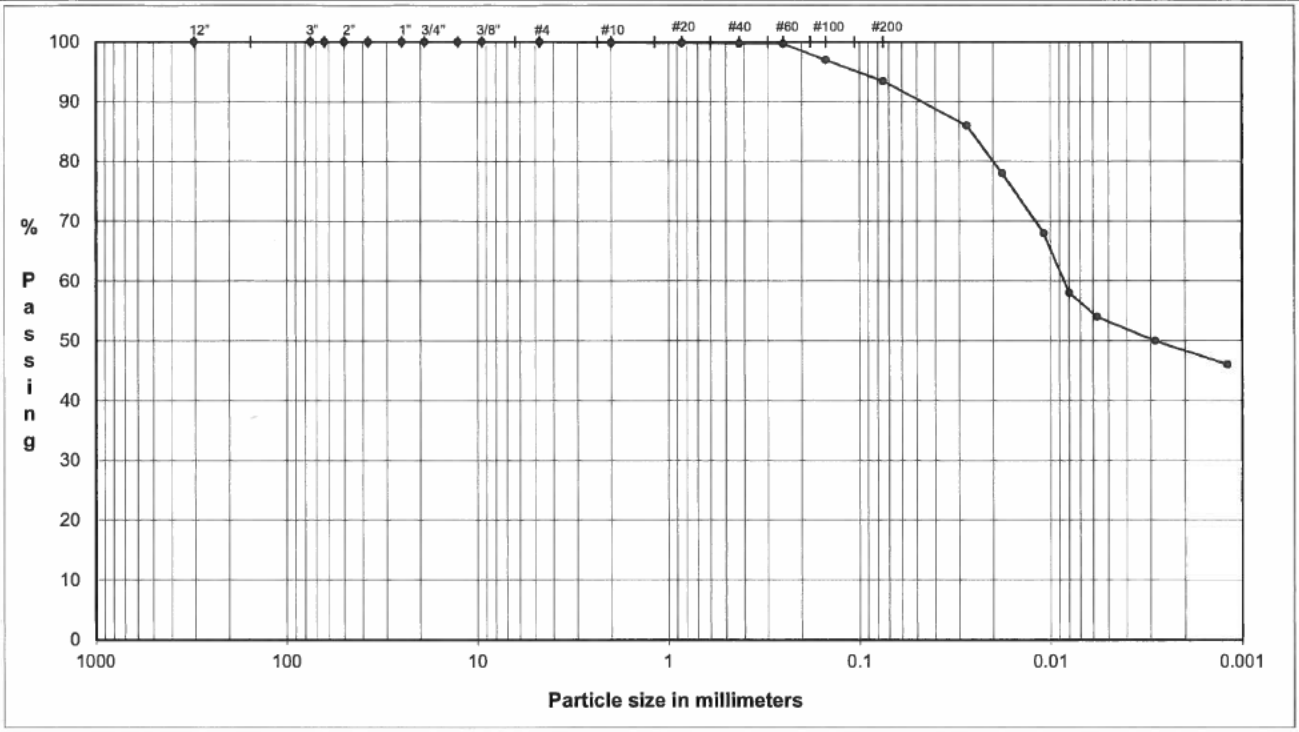
USCS: CH

TECH	FT
DATE	3/30/17
CHECK	
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-13D** Depth: **17.0-18.0'**
TYPE: **Bag**



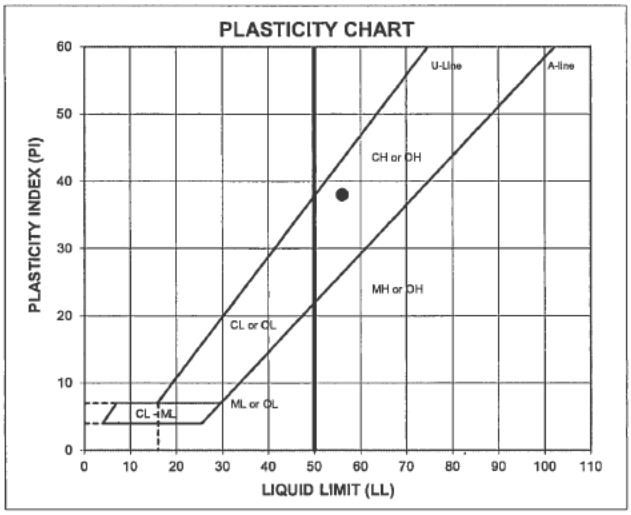
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	99.9	Coarse Sand	0.1
#20	0.85	99.8		
#40	0.43	99.7	Medium Sand	0.1
#60	0.25	99.7		
#100	0.15	96.9		
#200	0.075	93.4	Fine Sand	6.3

Hydrometer Analysis

(mm)	%Finer		
0.027	86.0		
0.018	78.0		
0.011	68.0	Fines	
0.0080	58.0	Silt or Clay	93.4
0.0057	54.0		
0.0029	50.0		
0.0012	46.0		



ATTERBERG LIMITS
Method -B (Dry preparation)

M_c	LL	PL	PI	LI
26.3	56	18	38	0.21

LL (oven-dried) / LL (oven-dried) < 0.75 – ORGANIC (OL/OH)

DESCRIPTION: CLAY, some fine to coarse sand; very dark gray.

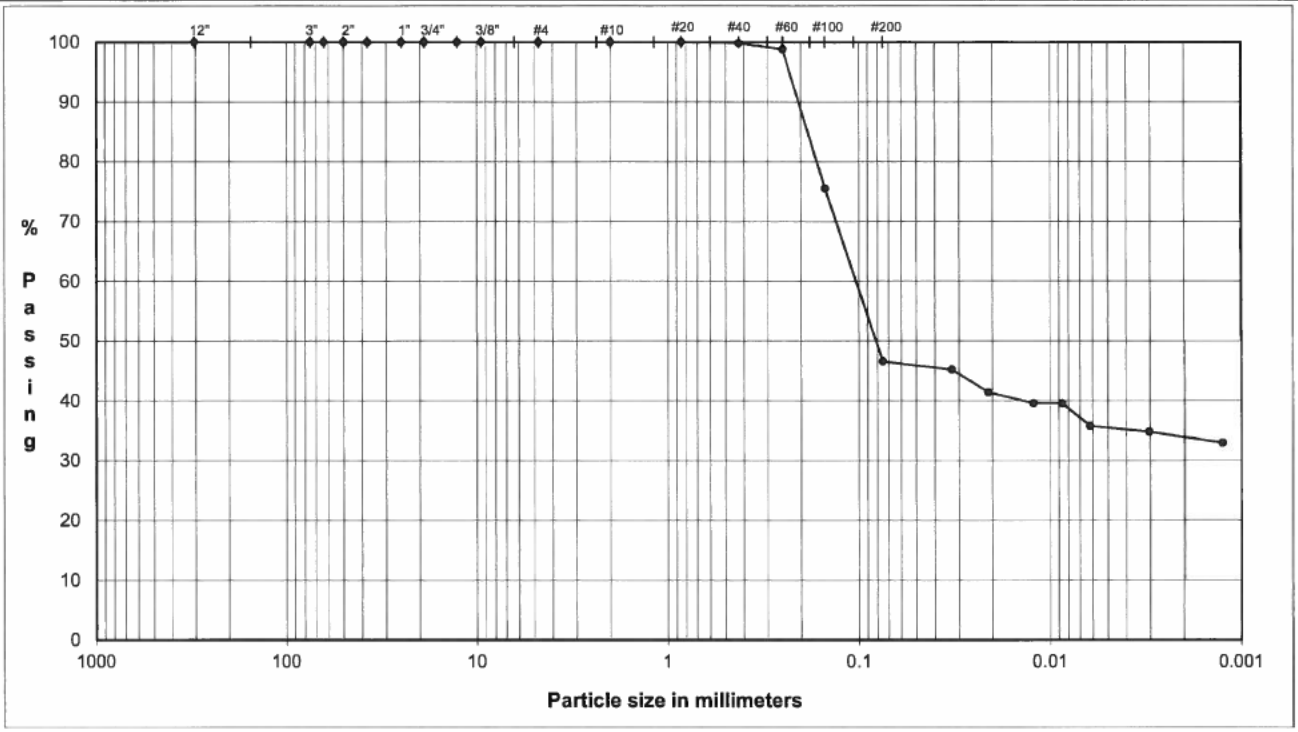
USCS: CH

TECH	FT
DATE	3/30/17
CHECK	DA
REVIEW	TWM
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-13D** Depth: **37.0-38.0'**
TYPE: **Bag**



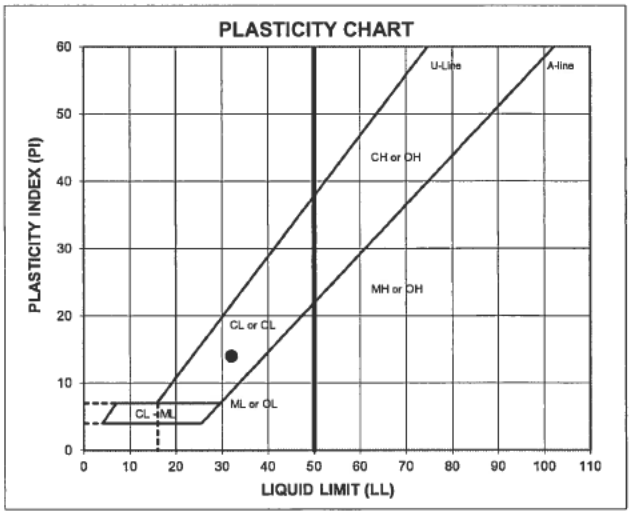
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	100.0		
#40	0.43	99.8	Medium Sand	0.2
#60	0.25	98.8		
#100	0.15	75.5		
#200	0.075	46.6	Fine Sand	53.2

Hydrometer Analysis

(mm)	%Finer		
0.033	45.2		
0.021	41.4		
0.012	39.5	Fines	
0.0086	39.5	Silt or Clay	46.6
0.0062	35.8		
0.0030	34.8		
0.0013	32.9		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
20.9	32	18	14	0.20

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SAND and SILTY CLAY, fine to medium; dark olive gray.

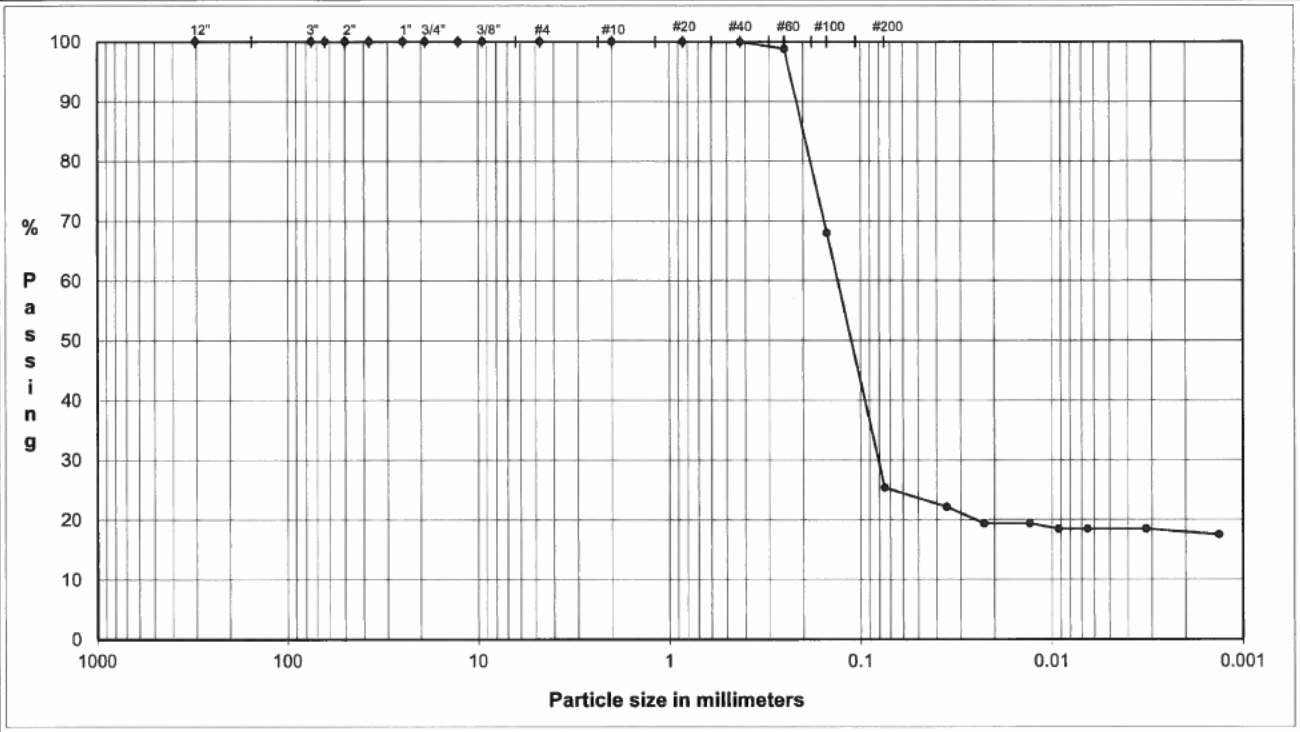
USCS: SC

TECH	JS/FT
DATE	3/31/17
CHECK	
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-13D** Depth: **40.0-41.0'**
TYPE: **Bag**



COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

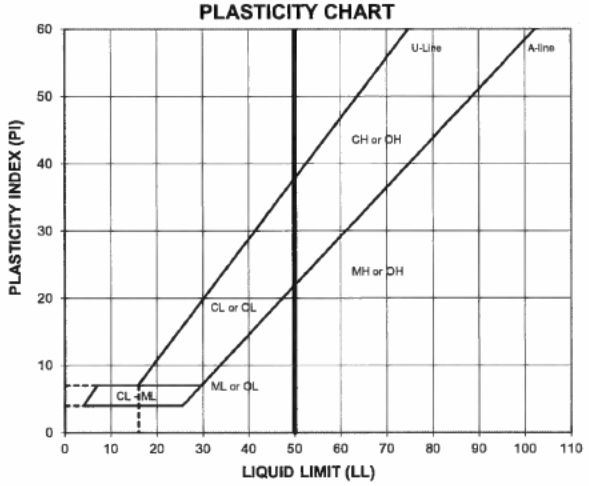
U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**100.0**	Coarse Sand	**0.0**
#20	0.85	**99.9**		
#40	0.43	**99.9**	Medium Sand	**0.1**
#60	0.25	**98.8**		
#100	0.15	**68.0**		
#200	0.075	**25.4**	Fine Sand	**74.5**

Hydrometer Analysis

(mm)	%Finer		
0.035	**22.1**		
0.023	**19.4**		
0.013	**19.4**	Fines	
0.0093	**18.5**	Silt or Clay	**25.4**
0.0065	**18.5**		
0.0032	**18.5**		
0.0013	**17.5**		

PLASTICITY CHART



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
23.4	**NP**	**NP**	**NP**	**NP**

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SILTY SAND, fine to coarse; very dark gray.

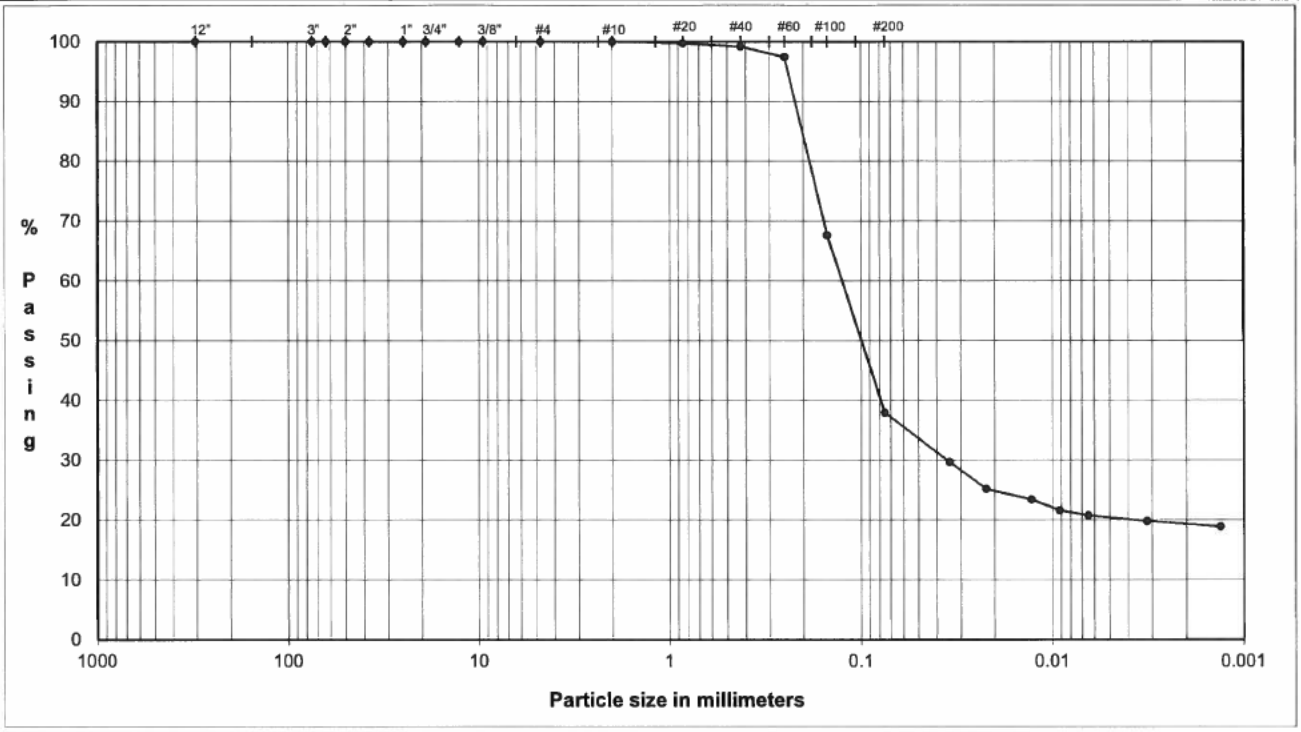
USCS: SM

TECH	JS/FT
DATE	3/31/17
CHECK	JA
REVIEW	MJ
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-13D** Depth: **43.0-45.0'**
TYPE: **Bag**



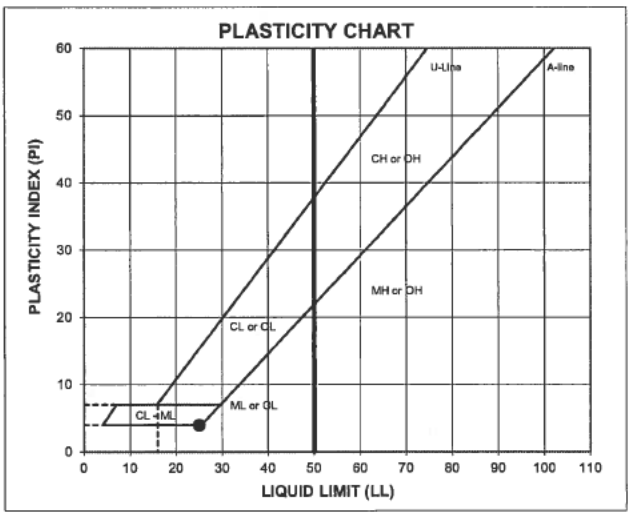
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.7		
#40	0.43	99.2	Medium Sand	0.8
#60	0.25	97.4		
#100	0.15	67.6		
#200	0.075	37.9	Fine Sand	61.2

Hydrometer Analysis

(mm)	%Finer		
0.034	29.7		
0.022	25.2		
0.013	23.4	Fines	
0.0092	21.6	Silt or Clay	37.9
0.0065	20.7		
0.0032	19.8		
0.0013	18.9		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
21.3	25	21	4	-0.05

LL (oven-dried) / <0.75 – ORGANIC (OL/OH)

DESCRIPTION: CLAYEY SAND to SILTY SAND, fine to medium; dark olive gray and black.

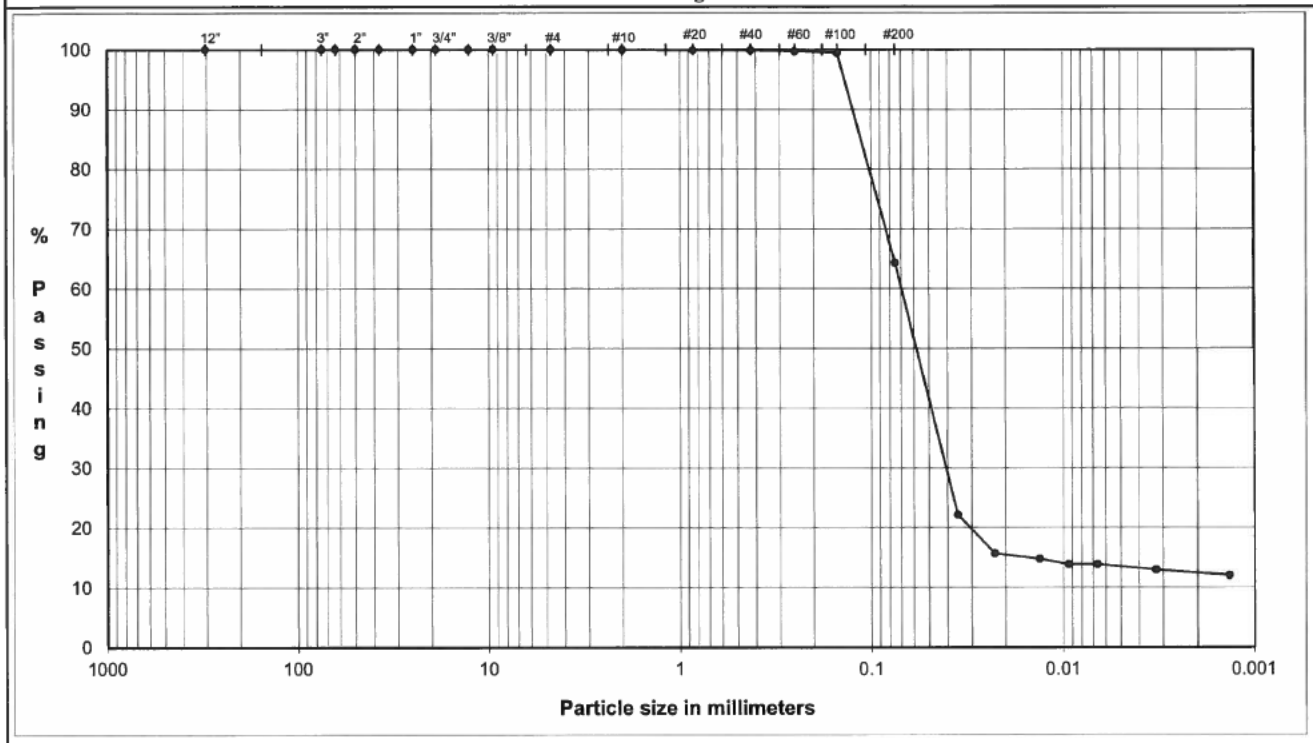
USCS: SC-SM

TECH	JS/FT
DATE	3/31/17
CHECK	DA
REVIEW	
APPROVE	

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-14D** Depth: **17.0-18.0'**
TYPE: **Bag**



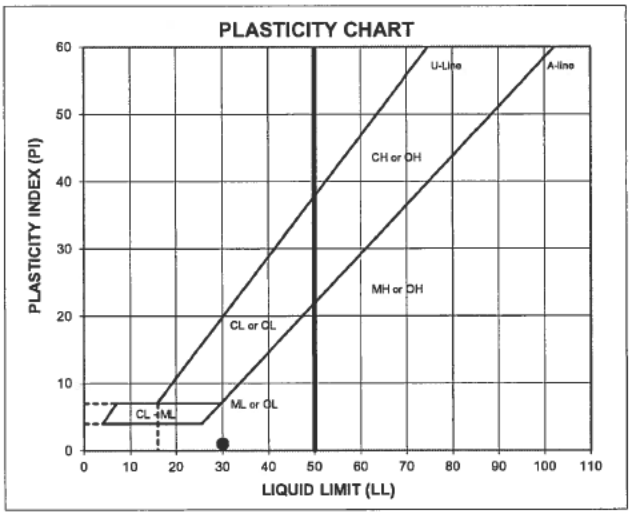
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	99.9	Coarse Sand	0.1
#20	0.85	99.9		
#40	0.43	99.8	Medium Sand	0.1
#60	0.25	99.7		
#100	0.15	99.4		
#200	0.075	64.3	Fine Sand	35.5

Hydrometer Analysis

(mm)	%Finer		
0.035	22.2		
0.023	15.7		
0.013	14.8	Fines	
0.0094	13.9	Silt or Clay	64.3
0.0066	13.9		
0.0033	12.9		
0.0014	12.0		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
30.1	30	29	1	1.44

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: CLAYEY SILT and SAND, fine to coarse; light olive brown.

USCS: ML

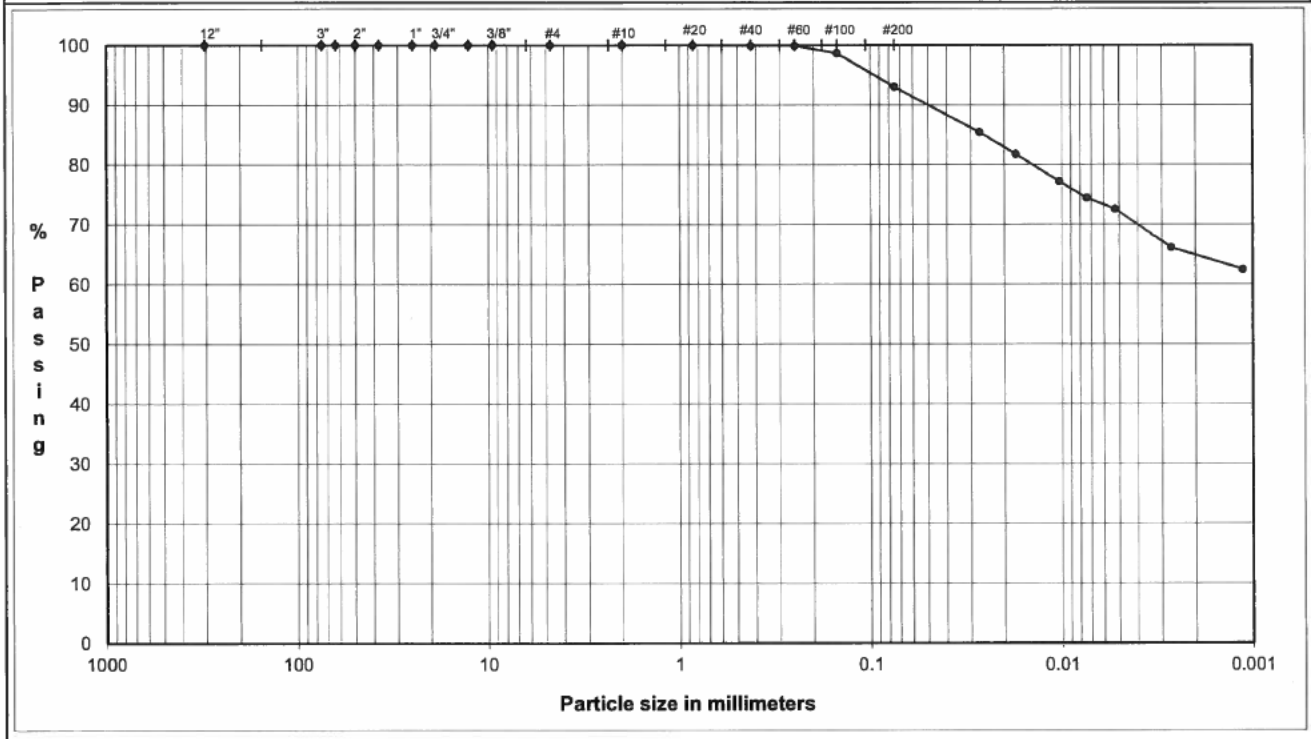
TECH	JS/FT
DATE	3/31/17
CHECK	JA
REVIEW	
APPROVE	

MARCH 2017 1776955

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-14D** Depth: **36.0-37.0'**
TYPE: **Bag**



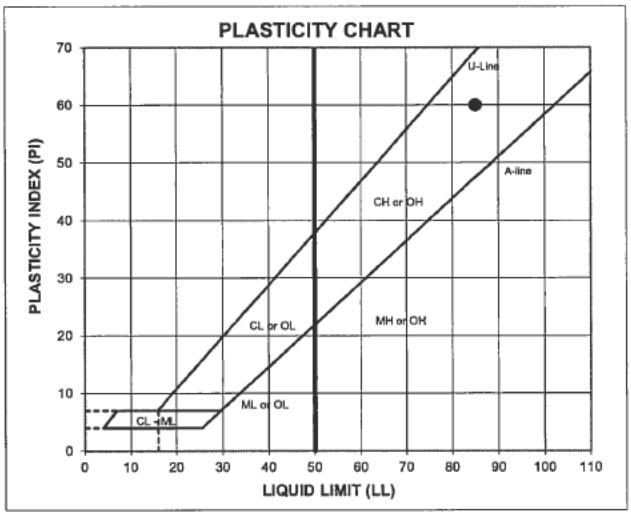
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	100.0		
#40	0.43	99.9	Medium Sand	0.1
#60	0.25	99.9		
#100	0.15	98.6		
#200	0.075	93.0	Fine Sand	6.9

Hydrometer Analysis

(mm)	%Finer		
0.027	85.4		
0.017	81.7		
0.010	77.1	Fines	
0.0074	74.4	Silt or Clay	93.0
0.0053	72.5		
0.0027	66.1		
0.0011	62.4		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
32.6	85	25	60	0.12

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: CLAY, some fine to medium sand, dark olive gray.

USCS: CH

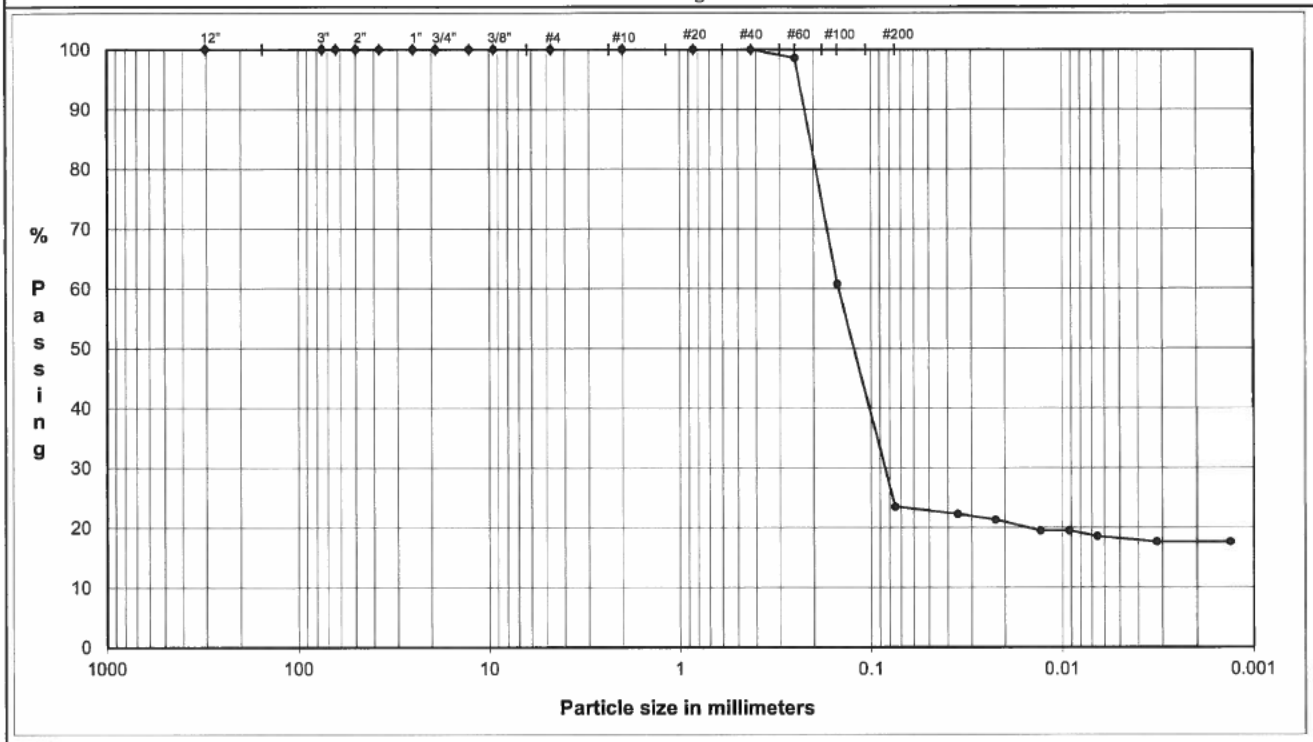
TECH	JS/FT
DATE	3/31/17
CHECK	
REVIEW	
APPROVE	

MARCH 2017 1776955

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-14D** Depth: **78.0-80.0'**
TYPE: **Bag**



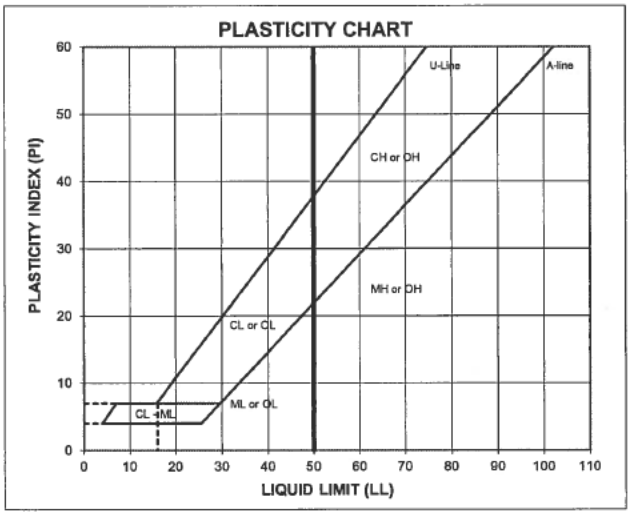
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.00	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**100.0**	Medium Sand	**0.0**
#60	0.25	**98.6**		
#100	0.15	**60.7**		
#200	0.075	**23.5**	Fine Sand	**76.5**

Hydrometer Analysis

(mm)	%Finer		
0.035	**22.2**		
0.022	**21.3**		
0.013	**19.5**	Fines	
0.0092	**19.5**	Silt or Clay	**23.5**
0.0065	**18.5**		
0.0032	**17.6**		
0.0013	**17.6**		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
24.2	**NP**	**NP**	**NP**	**NP**

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SILTY SAND, fine sand; dark olive gray.

USCS: SM

TECH	JS/WD
DATE	3/31/17
CHECK	
REVIEW	
APPROVE	

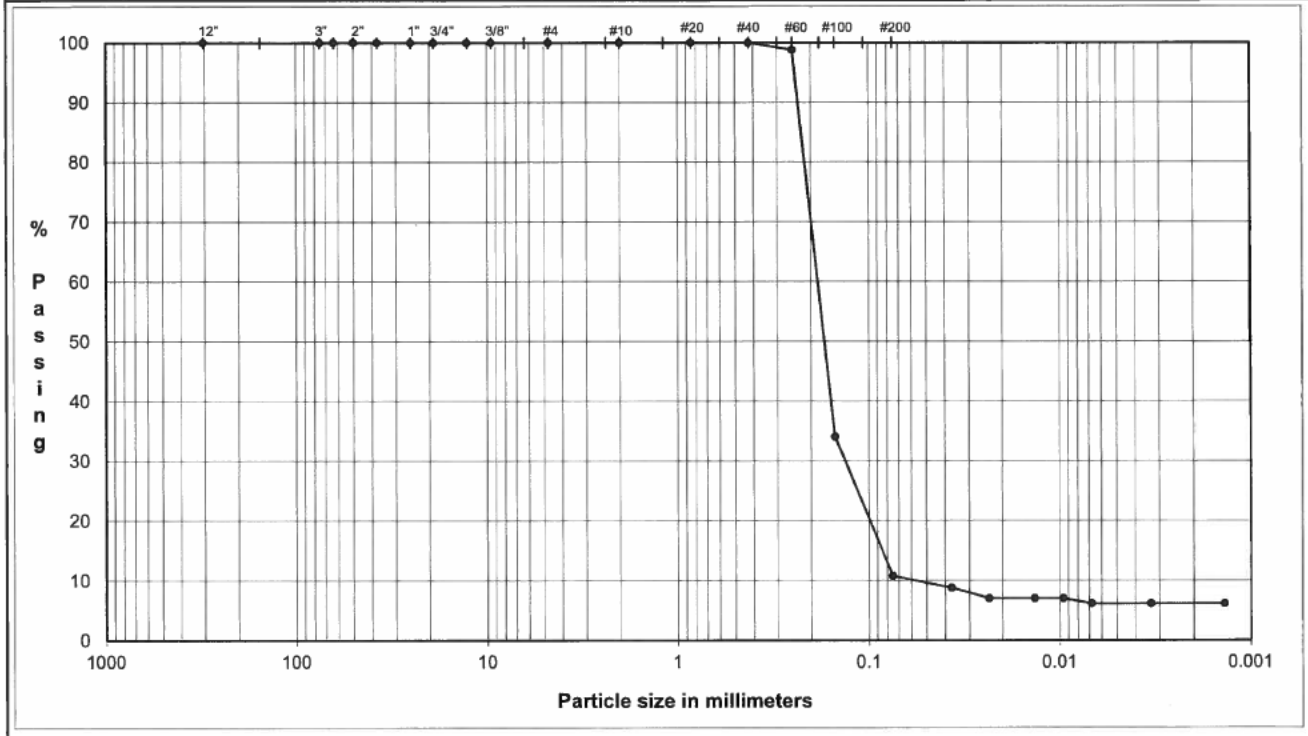
Golder Associates Inc.

MARCH 2017 1776955

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-14D** Depth: **85.0-90.0'**
TYPE: **Bag**



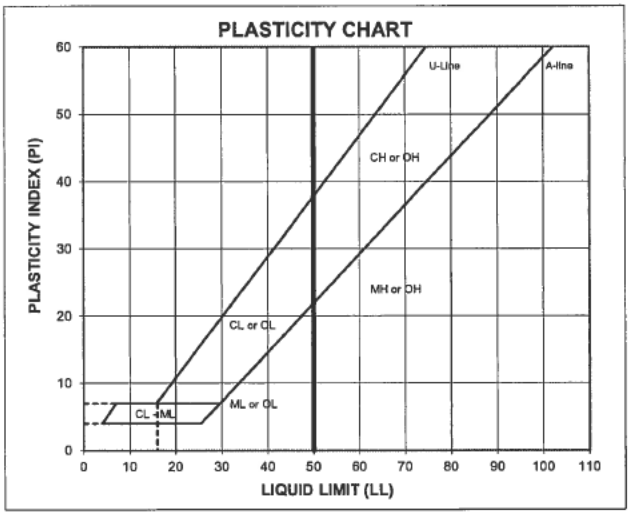
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	100.0		
#40	0.43	100.0	Medium Sand	0.0
#60	0.25	98.8		
#100	0.15	34.1		
#200	0.075	10.8	Fine Sand	89.2

Hydrometer Analysis

(mm)	%Finer		
0.037	8.8		
0.023	7.0		
0.014	7.0	Fines	
0.0096	7.0	Silt or Clay	10.8
0.0068	6.1		
0.0033	6.1		
0.0014	6.1		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
22.9	NP	NP	NP	NP

LL (oven-dried) / < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SAND, fine sand, some fines; gray.

USCS: SP-SM

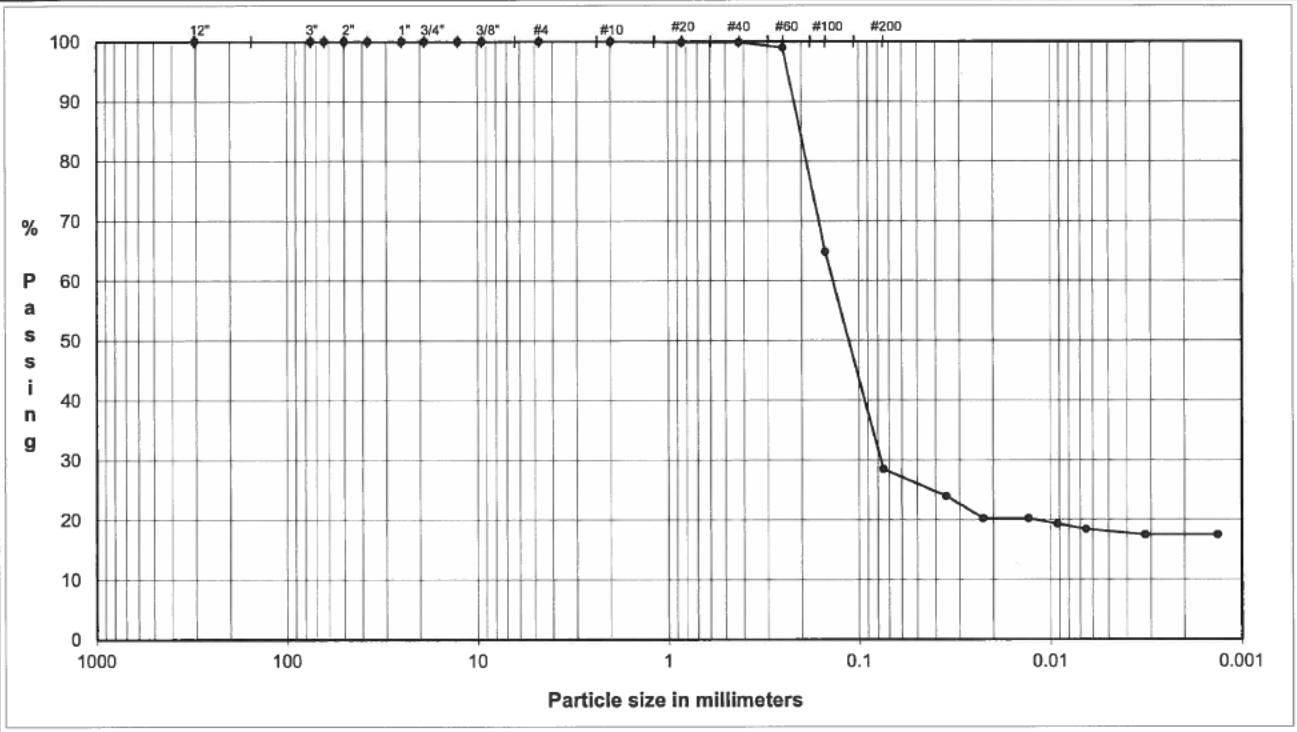
TECH	JS/FT
DATE	3/31/17
CHECK	DA
REVIEW	TWH
APPROVE	

MARCH 2017 1776955

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-15D** Depth: **75.0-80.0'**
TYPE: **Bag**



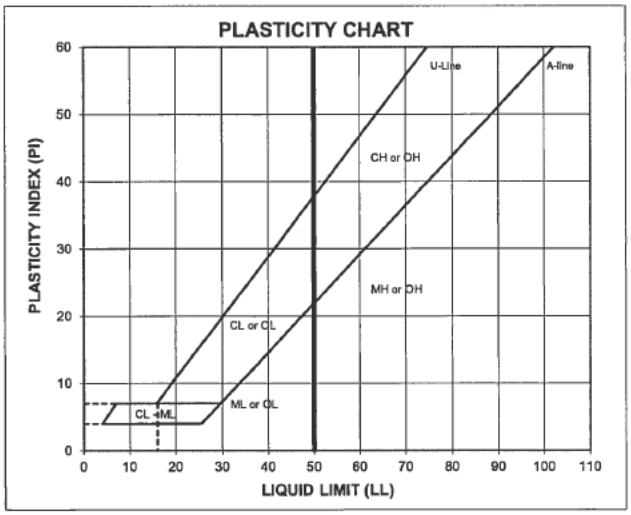
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.9		
#40	0.43	99.9	Medium Sand	0.1
#60	0.25	99.0		
#100	0.15	64.8		
#200	0.075	28.5	Fine Sand	71.4

Hydrometer Analysis

(mm)	%Finer		
0.035	23.9		
0.023	20.3		
0.013	20.3	Fines	
0.0092	19.3	Silt or Clay	28.5
0.0065	18.4		
0.0032	17.5		
0.0013	17.5		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
25.0	NP	NP	NP	NP

LL (oven-dried) / 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SILTY SAND, fine to medium; dark gray.

USCS: SM

TECH	JS/FT
DATE	3/31/17
CHECK	
REVIEW	
APPROVE	

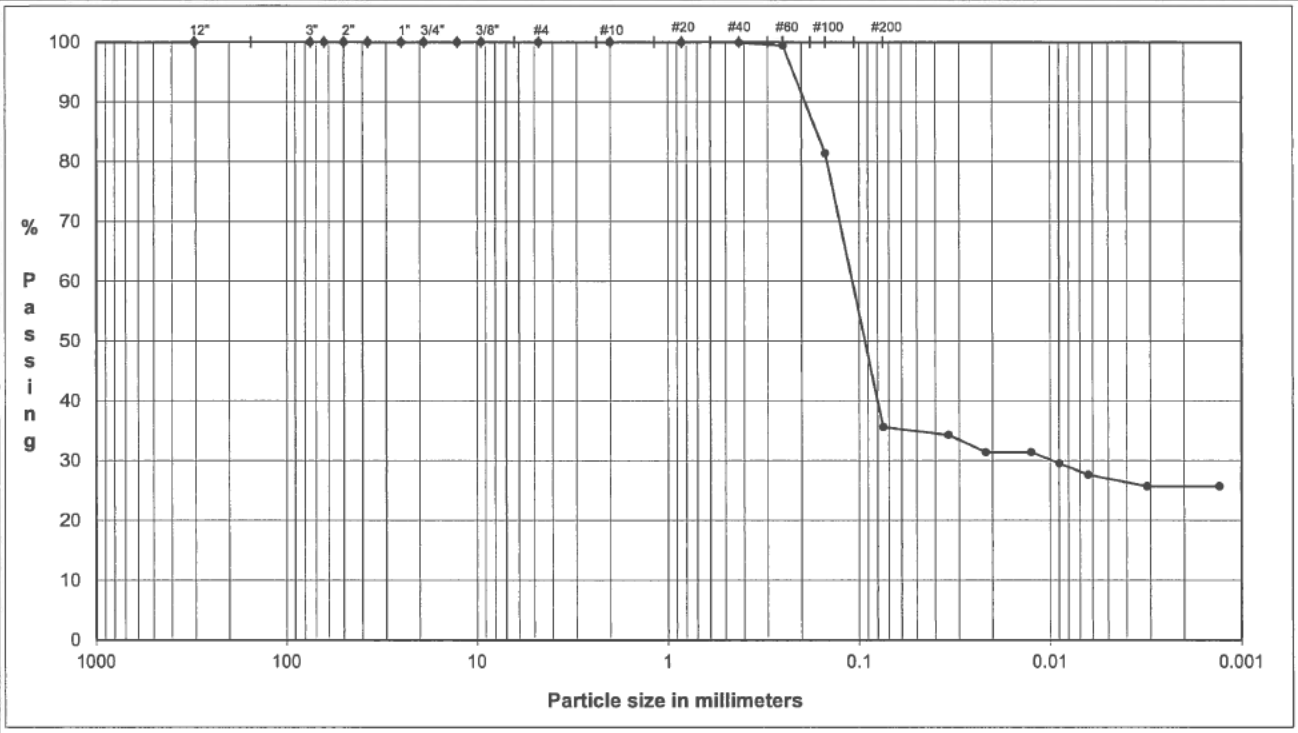
Golder Associates Inc.

MARCH 2017 1776955

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **FTN/ENTERGY WHITE BLUFF/AR**
SAMPLE ID: **MW-15D** Depth: **85.0-90.0'**
TYPE: **Bag**



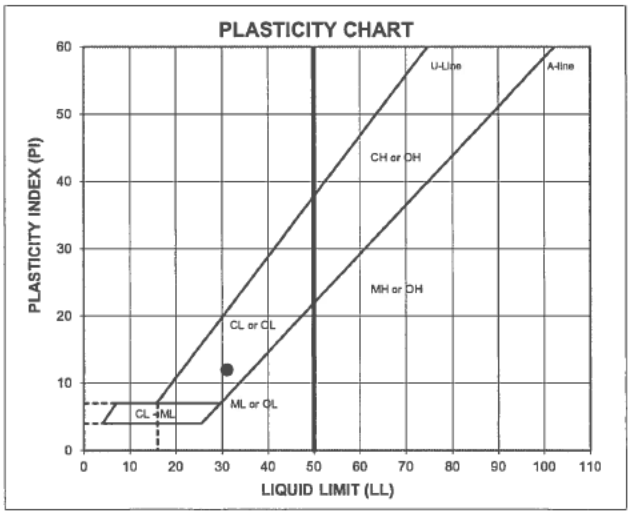
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.0
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.0
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.0
#10	2.00	100.0	Coarse Sand	0.0
#20	0.85	99.9		
#40	0.43	99.9	Medium Sand	0.1
#60	0.25	99.4		
#100	0.15	81.4		
#200	0.075	35.6	Fine Sand	64.3

Hydrometer Analysis

(mm)	%Finer		
0.034	34.3		
0.022	31.4		
0.013	31.4	Fines	
0.0090	29.5	Silt or Clay	35.6
0.0064	27.6		
0.0031	25.7		
0.0013	25.7		



ATTERBERG LIMITS

Method -B (Dry preparation)

M_c	LL	PL	PI	LI
21.1	31	19	12	0.19

LL (oven-dried) / 0.75 = ORGANIC (OL/OH)

DESCRIPTION: SAND and SILTY CLAY, fine to medium; olive gray.

USCS: SC

TECH	JS/WD
DATE	3/31/17
CHECK	DA
REVIEW	MW
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	FTN/ENTERGY WHITE BLUFF/AR		Board #	7	COMMENTS
PROJECT NUMBER	1776955		Flow Pump	2	
SAMPLE ID	MW-13D	30.0-32.0'	Flow Pump Speed	12	
SAMPLE TYPE	UD		Technician	DA/SDM	

Sample Data, Initial				Sample Data, Final	
Height, inches	3.112	B-Value, f	1.00	Height, inches	3.075
Diameter, inches	2.805	Cell Pres.	105.0	Diameter, inches	2.816
Area, cm²	39.87	Bot. Pres.	80.0	Area, cm²	40.18
Volume, cm³	315.13	Top Pres.	80.0	Volume, cm³	313.84
Mass, g	613.32	Tot. B.P.	80.0	Mass, g	602.52
Moisture Content, %	31.89	Head, max.	130.13	Moisture Content, %	29.57
Dry Density, pcf	92.08	Head, min.	130.13	Dry Density, pcf	92.46
Spec. Gravity (assumed)	2.700	Max. Grad.	16.66	Volume Solids, cm³	172.23
Volume Solids, cm³	172.23	Min. Grad.	16.66	Volume Voids, cm³	141.60
Volume Voids, cm³	142.90			Void Ratio	0.82
Void Ratio	0.83			Saturation, %	97.1%
Saturation, %	103.8%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	613.32	610.69
Wt Soil & Tare, f	g	465.03	473.23
Wt Tare	g	0.00	8.32
Wt Moisture Lost	g	148.29	137.46
Wt Dry Soil	g	465.03	464.91
Water Content	%	31.89%	29.57%

DESCRIPTION: sandy gravelly CLAY, fine to coarse; gray

Flow Pump Rate: 4.35E-06 cm³/sec

USCS: CH

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
04/10/17	42835	10	0	18.9	0	0	0	0	1.85	130.13	16.66	6.7E-09
04/10/17	42835	10	5	18.9	5	5	300	300	1.85	130.13	16.66	6.7E-09
04/10/17	42835	10	10	18.9	5	10	300	600	1.85	130.13	16.66	6.7E-09
04/10/17	42835	10	15	18.9	5	15	300	900	1.85	130.13	16.66	6.7E-09 *
04/10/17	42835	10	20	18.9	5	20	300	1200	1.85	130.13	16.66	6.7E-09 *
04/10/17	42835	10	25	18.9	5	25	300	1500	1.85	130.13	16.66	6.7E-09 *
04/10/17	42835	10	30	18.9	5	30	300	1800	1.85	130.13	16.66	6.7E-09 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 6.7E-09 cm/sec **

DATE	4/10/17
CHECK	
REVIEW	
APPROVE	