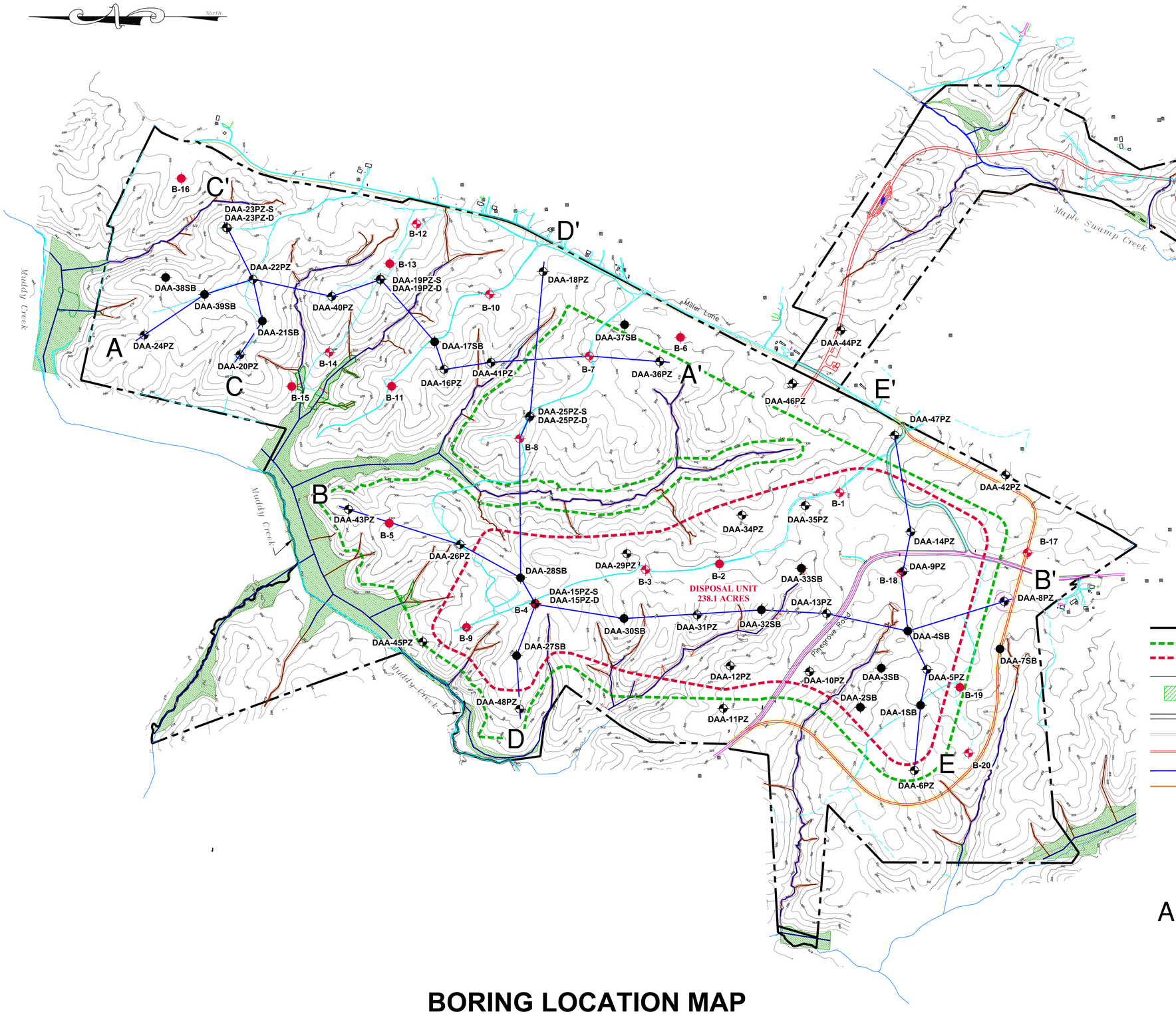
ATTACHMENT PTA-XII - LOCATION OF BORINGS AND BORING LOGS

In accordance with §9 VAC 20-81-460.E.2.a., a map showing boring locations, along with the corresponding DAA boring logs is presented herein. KBJW boring logs are contained in Appendix 2 of the Hydrogeologic Report.

Table 1 presented in this attachment provides completion details, groundwater and bedrock elevation data for both DAA and KBJW borings and piezometers.



NOTES:

1. THIS MAPPING PROJECT, L18–10560, WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF, ROBERT H. TUCK OF TUCK MAPPING SOLUTIONS, INC. FROM AN ACTUAL AIRBORNE SURVEY MADE UNDER MY SUPERVISION; THAT THE IMAGERY AND/OR ORIGINAL DATA WAS OBTAINED ON 05–02–18; AND THAT THIS PLAT, MAP, OR DIGITAL GEOSPATIAL DATA INCLUDING METADATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.
2. PARCEL LINES SHOWN HEREON ARE PER BOUNDARY SURVEYS BY HIGHMARK ENGINEERING DATED MAY 24, 2018, MARCH 4 2019 AND PER BOUNDARY SURVEY BY DRAPER ADEN ASSOCIATES DATED MARCH 29, 2019.
3. WETLANDS INFORMATION PROVIDED BY A SURVEY PERFORMED BY KOONTZ BRYANT JOHNSON WILLIAMS GROUP, DATED AUGUST 22, 2018, REVISED MAY 10, 2019.
4. CONTOUR INTERVALS ARE 10 FEET.

LEGEND:

- PROPERTY BOUNDARY/FACILITY BOUNDARY (1177.6 ACRES)
- WASTE MANAGEMENT BOUNDARY (438.1 ACRES)
- DISPOSAL UNIT BOUNDARY (238.1 ACRES)
- 330 EXISTING GROUND SURFACE CONTOURS
- DELINEATED WETLANDS
- EXISTING ROAD
- TRAIL
- APPROXIMATE LOCATION OF PROPOSED ROAD
- R3/R4 STREAMS
- EPH EPHEMERAL CHANNEL
- PIEZOMETER – COMPLETED BY DRAPER ADEN ASSOCIATES IN 2019
- SOIL BORING – COMPLETED BY DRAPER ADEN ASSOCIATES IN 2019
- PIEZOMETER – COMPLETED BY KOONTZ BRYANT JOHNSON WILLIAMS GROUP IN 2017
- SOIL BORING – COMPLETED BY KOONTZ BRYANT JOHNSON WILLIAMS GROUP IN 2017
- A - A' LOCATIONS OF CROSS SECTIONS. (SEE PTA ATTACHMENT CROSS 1 & PTA ATTACHMENT CROSS 2

BORING LOCATION MAP

SCALE: AS NOTED

GRAPHIC SCALE

500 0 250 500 1000

(IN FEET)
1 inch = 500 ft.

COMMONWEALTH OF VIRGINIA
KENNETH E. BANNISTER
No. 2801001751
12-09-2019
REGISTERED PROFESSIONAL ENGINEER

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GREEN RIDGE
RECYCLING AND DISPOSAL FACILITY

BORING LOCATION MAP

GREEN RIDGE RECYCLING AND DISPOSAL FACILITY
CUMBERLAND COUNTY, VIRGINIA

REVISIONS

DESIGNED BY:	DC
DRAWN BY:	DLD/DJF
CHECKED BY:	KEB
SCALE:	1" = 500'
DATE:	12-09-2019
PROJECT NUMBER:	18020117-030102

PTA ATTACHMENT XII
FIGURE: BOR

Z:\2018\18020100\18020117\18020117-030102\CAD\10560_Cumberland\BORING_MAP.MOD | 11-13-2019.dwg December 4, 2019 11:52:52 AM

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BORING/WELL LOG

Boring/Well ID: **DAA-1sb**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726364.55	Sampling Method:	Split Spoon
Start Date:	02/21/19	Easting:	11590010.10	Well Material:	NA
Completion Date:	02/21/19	Ground Elevation:	348.25	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	31.5'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand **(MH)**				Logged Cuttings from 0-6'
		5				343.25	
7	3 4 3 3		Red fine SAND, some Silt, trace Clay **(SM)**				Loose
8	4 4 4 5						Loose
	Shelby Tube	10	Light Brown fine SAND, little Silt, trace white quartzite gravel **(SM)**			338.25	
13	7 4 9 11						Loose
26	7 12 14 16 11 9	15	Gray fine to medium SAND, some Silt, coarse white quartzite sand lenses **(SM)**			333.25	Medium Dense
	Shelby Tube						
>50	15 32 50/2"	20	Brown to gray medium SAND, some Silt, *SAPROLITE* **(SM)**			328.25	Dense
>50	24 50/6"		**Auger Refusal at 21.5'**				Very Dense
Rock Core		25	Biotite Gneiss Rock Core Run 1: 21.5 to 26.5 feet Recovery: 34.5/60 inches = 57% RQD: 19/34.5 inches = 55%			323.25	
		30	Biotite Gneiss Rock Core Run 1: 26.5 to 31.5 feet Recovery: 47/60 inches = 78% RQD: 10.5/41 inches = 25%			318.25	

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BORING/WELL LOG

Boring/Well ID: **DAA-2sb**

Project:	**Green Ridge Recycling**	Boring/Well Area:	**West Area**	Drilling Rig Type:	**Track Rig CME 45**
Project #:	**18020117-030201**	Logged By:	**D. Coakley**	Drilling Method:	**3.25" Hollow Stem Auger**
Location:	**Cumberland County, VA**	Northing:	**3726996.95**	Sampling Method:	**Split Spoon**
Start Date:	**02/25/19**	Easting:	**11589988.63**	Well Material:	**NA**
Completion Date:	**02/25/19**	Ground Elevation:	**355.61**	Screen Size:	**NA**
Contractor:	**Blue Ridge Drilling**	Total Depth:	**51.5'**	Filter Pack:	**NA**
Driller:	**James Jones**	TOC Elevation:	**NA**	Seal:	**Bentonite Pellets/Hydrated**

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red SILT, some fine SAND, llittle Clay **(MH)**				Logged Cuttings from 0-6'
		5				350.61	
5	2 3 2 4						Loose
5	3 2 3 4		Brown fine SAND, some Silt, micaceous, Dry **(SM)**				
		10				345.61	
6	3 3 5 3						Loose
7	3 4 3 3						
9	4 5 6 3	15				340.61	Loose
6	3 6 5 5		Red to brown fine SAND, little Silt, trace Clay, micaceous **(SM)**				
12	7 11 7 9						Medium Dense
		20				335.61	
20	11 13 8 11						
21	10 10 8 9						Medium Dense
24	15 12 7 11	25				330.61	
23	12 8 6 10		Light Tan to gray very fine SAND, some Silt, bands of biotite, micaceous, dry **(SM)**				Medium Dense
21	11 11 12 10						
		30				325.61	
21	11 21 8 9						Medium Dense
24	15 28 13 14						

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BORING/WELL LOG

Boring/Well ID: **DAA-2sb**

Project:	**Green Ridge Recycling**	Boring/Well Area:	**West Area**	Drilling Rig Type:	**Track Rig CME 45**
Project #:	**18020117-030201**	Logged By:	**D. Coakley**	Drilling Method:	**3.25" Hollow Stem Auger**
Location:	**Cumberland County, VA**	Northing:	**3726996.95**	Sampling Method:	**Split Spoon**
Start Date:	**02/25/19**	Easting:	**11589988.63**	Well Material:	**NA**
Completion Date:	**02/25/19**	Ground Elevation:	**355.61**	Screen Size:	**NA**
Contractor:	**Blue Ridge Drilling**	Total Depth:	**51.5'**	Filter Pack:	**NA**
Driller:	**James Jones**	TOC Elevation:	**NA**	Seal:	**Bentonite Pellets/Hydrated**

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
36	16 28 6 13 23		Light Tan very fine SAND, some Silt, bands of biotite, micaceous, dry **(SM)**				Dense
>50	50/6" 35 50/4"						
		40	Light Tan to white fine SAND, little Silt, *SAPROLITE* **(SM)**			315.61	
>50	21 33 50/6"						Very Dense
		45				310.61	
>50	28 50/3"		Brown to gray fine SAND, some Silt, trace white quartzite gravel, *SAPROLITE* **(SM)**				Very Dense
		50	**Auger Refusal at 51.5'**			305.61	
		55				300.61	
		60				295.61	
		65				290.61	

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BORING/WELL LOG

Boring/Well ID: **DAA-3sb**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726777.44	Sampling Method:	Split Spoon
Start Date:	02/25/19	Easting:	11590399.87	Well Material:	NA
Completion Date:	02/25/19	Ground Elevation:	348.39	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	60'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
							Logged Cuttings from 0-6'
		5				343.39	
15	3 6 9 12						Stiff
2	3 6 8 9	10				338.39	
3	3 6 9 3						Medium Stiff
4	3 5 6 3						
5	3 5 6 2	15	Reddish brown SILT, some Clay, little fine Sand, iron bands, damp, **(MH)**			333.39	Medium Stiff
6	2 3 4 6						
7	3 3 5 wh						Medium Stiff
		20				328.39	
8	3 4 4 3						
9	3 3 4 wh						Medium Stiff
10	3 3 3 wh	25				323.39	
11	3 3 3 wh						Medium Stiff
12	12 3 4 wh						
		30				318.39	
13	1 4 5						Soft

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BORING/WELL LOG

Boring/Well ID: **DAA-3sb**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726777.44	Sampling Method:	Split Spoon
Start Date:	02/25/19	Easting:	11590399.87	Well Material:	NA
Completion Date:	02/25/19	Ground Elevation:	348.39	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	60'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
14	3 3 8 10						Stiff
		40				308.39	
15	wh 3 4 5						Medium Stiff
		45				303.39	
16	4 7 9 8						Stiff
			Brown SILT, some Clay, little very fine Sand, wet (MH)				
		50				298.39	
17	3 3 4 7						Medium Stiff
		55				293.39	
18	5 6 8 10						Medium Stiff
			No Auger Refusal, Drilling depth terminated at 60'				
		60				288.39	
19	4 7 9 13						Medium Stiff
		65				283.39	

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BORING/WELL LOG

Boring/Well ID: **DAA-4sb**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726498.37	Sampling Method:	Split Spoon
Start Date:	02/26/19	Easting:	11590790.11	Well Material:	NA
Completion Date:	02/26/19	Ground Elevation:	347.44	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	39'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
							Logged Cuttings from 0-6'
			Brown CLAY and Silt, wet **(MH)**				
		5				342.44	
7	6 3 4		No Recovery; Loose mud				
6	3 3 4		No Recovery; Loose mud				
	wh	10				337.44	
9	6 3 3		Light Tan fine SAND, some Silt, trace Clay **(SM)**				Loose
9	3 5 4						Loose
5	wh 2 3	15				332.44	Loose
5	3 wh 2		Brown fine SAND and Silt, some Clay **(SM)**				Loose
2	3 wh wh 2						Very Loose
	3	20				327.44	
8	2 3 5		Brown fine SAND, some Silt, little Clay, micaceous, biotite bands **(SM)**				Loose
7	7 wh 2 5						Loose
10	4 3 4 6	25				322.44	Loose
9	8 wh 3 6						Loose
16	9 5 7 9						Medium Dense
	12 wh	30	Brown fine SAND, some Silt, little Clay, biotite bands, white quartzite coarse sand lenses **(SM)**			317.44	
12	5 7 10						Medium Dense
27	4 10 17						Medium Dense
	26 8 9						

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BORING/WELL LOG

Boring/Well ID: **DAA-4sb**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726498.37	Sampling Method:	Split Spoon
Start Date:	02/26/19	Easting:	11590790.11	Well Material:	NA
Completion Date:	02/26/19	Ground Elevation:	347.44	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	39'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
>50	22 50/6"		Brown fine SAND, little Silt, little Clay, biotite bands, white quartzite coarse Sand lenses, *SAPROLITE* **(SM)**				Very Dense
>50	50/4"		**Auger Refusal at 39'**				Very Dense
		40				307.44	
		45				302.44	
		50				297.44	
		55				292.44	
		60				287.44	
		65				282.44	

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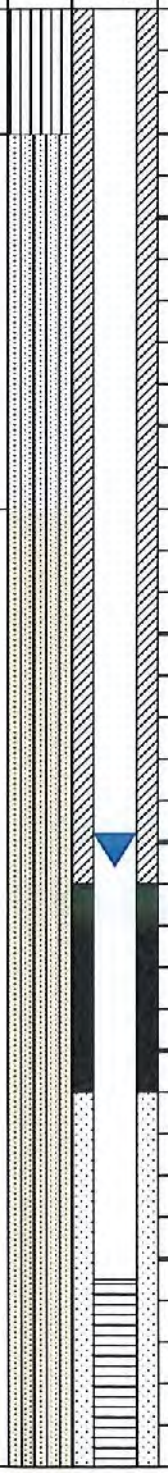
BORING/WELL LOG

Boring/Well ID: **DAA-5pz**

Project:	**Green Ridge Recycling**	Boring/Well Area:	**West Area**	Drilling Rig Type:	**Track Rig CME 45**
Project #:	**18020117-030201**	Logged By:	**D. Coakley**	Drilling Method:	**4.25" Hollow Stem Auger**
Location:	**Cumberland County, VA**	Northing:	**3726297.92**	Sampling Method:	**Split Spoon**
Start Date:	**02/26/19**	Easting:	**11590385.49**	Well Material:	**2" Schedule 40 PVC**
Completion Date:	**02/26/19**	Ground Elevation:	**356.49**	Screen Size:	**0.10 Slot**
Contractor:	**Blue Ridge Drilling**	Total Depth:	**35.5**	Filter Pack:	**#2 Sand**
Driller:	**James Jones**	TOC Elevation:	**356.50**	Seal:	**Bentonite Pellets/Hydrated**

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red fine SAND and Silt, some Clay **(ML)**		Logged Cuttings from 0-7'
		5		351.49	
31	6 12 19 50/6"		Light Tan to Red fine SAND, little Silt, trace gravel, Micaceous **(SM)**		Dense
	Shelby Tube	10		346.49	
>50	65/4"				Very Dense
>50	25 50/6"	15		341.49	Very Dense
>50	65/4"	20		336.49	
			Light Tan fine to med SAND, little Silt, Micaceous, Damp, *SAPROLITE* **(SM)**		
>50	50/2"	25		331.49	Very Dense
>50	50/1"	30		326.49	Very Dense
			Auger Refusal at 35.5'		

Geol | Well Log



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BORING/WELL LOG

Boring/Well ID: **DAA-6pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726430.01	Sampling Method:	Split Spoon
Start Date:	02/26/19	Easting:	11589325.34	Well Material:	2" Schedule 40 PVC
Completion Date:	02/26/19	Ground Elevation:	332.92	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	23.5'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	335.19	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red SAND, some Silt, some Clay **(ML)**				Logged Cuttings from 0-6'
			Light brown fine SAND, some Silt, trace Clay, Micaceous **(SM)**				
		5				327.92	
	2						Loose
7	3 4 6						Loose
8	4 4 4						
	5 4	10	Light brown fine SAND, some Silt, trace Clay, biotite bands, Micaceous **(SM)**			322.92	Medium Dense
15	5 10 20						Very Dense
>50	31 50/6"		Very light tan fine SAND, little Silt, Micaceous **(SM)**				
		15				317.92	
	10						Dense
30	14 16 26						
	10		Light brown fine SAND, some Silt, trace Clay, iron and biotite bands, Micaceous, *SAPROLITE* **(SM)**				Very Dense
>50	24 50/6"						
		20				312.92	
>50	50/6"						Very Dense
			Auger Refusal at 23.5'				
		25				307.92	
		30				302.92	

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BORING/WELL LOG

Boring/Well ID: **DAA-7sb**

Project:	**Green Ridge Recycling**	Boring/Well Area:	**West Area**	Drilling Rig Type:	**Track Rig CME 45**
Project #:	**18020117-030201**	Logged By:	**D. Coakley**	Drilling Method:	**3.25" Hollow Stem Auger**
Location:	**Cumberland County, VA**	Northing:	**3725536.82**	Sampling Method:	**Split Spoon**
Start Date:	**02/27/19**	Easting:	**11590630.30**	Well Material:	**NA**
Completion Date:	**02/27/19**	Ground Elevation:	**352.90**	Screen Size:	**NA**
Contractor:	**Blue Ridge Drilling**	Total Depth:	**63.5'**	Filter Pack:	**NA**
Driller:	**James Jones**	TOC Elevation:	**NA**	Seal:	**Bentonite Pellets/Hydrated**

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Brown SILT, some Clay, trace Sand **(SM)**				Logged Cuttings from 0-5'
		5				347.90	
15	4 6 9 7						Medium Dense
		10				342.90	
19	9 11 8 9		Green to gray fine SAND, little Silt, trace Clay, mottling **(SM)**				Medium Dense
21	7 11 10 12						
19	8 9 10	15				337.90	Medium Dense
24	14 5 9 15						
66	27 17 36 30						Very Dense
	31	20				332.90	
28	6 13 15 32		Light tan to brown SAND, some Silt, biotite mica bands, mottled **(SM)**				
>50	50/4"						
>50	50/2"	25				327.90	Very Dense
		30	Tan fine SAND, some Silt, white quartzite gravel and biotite mica lenses, mottled **(SM)**			322.90	
>50	17 50/6"						Very Dense

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BORING/WELL LOG

Boring/Well ID: **DAA-7sb**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3725536.82	Sampling Method:	Split Spoon
Start Date:	02/27/19	Easting:	11590630.30	Well Material:	NA
Completion Date:	02/27/19	Ground Elevation:	352.90	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	63.5'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
>50	26 38 50/5+		Tan fine SAND, some Silt, white quartzite gravel and biotite mica lenses, mottled **(SM)**				Very Dense
		40				312.90	
>50	33 50/3"						Very Dense
		45				307.90	
16	4 7 9 13						Medium Dense
			Red brown SILT, some fine Sand, little Clay, mottled **(SM)**				
		50				302.90	
23	6 9 14 24						Medium Dense
		55				297.90	
26	5 11 14 19						Medium Dense
		60				292.90	
18	8 9 9 23		Red SILT, some Clay, little Sand **(SM)**				Medium Dense
			Auger Refusal at 63.5'				
		65				287.90	

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BORING/WELL LOG

Boring/Well ID: **DAA-8pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726549.74	Sampling Method:	Split Spoon
Start Date:	02/27/19	Easting:	11591416.33	Well Material:	2" Schedule 40 PVC
Completion Date:	02/27/19	Ground Elevation:	364.19	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	36.0	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	365.46	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand **(ML)**		Logged Cuttings from 0-6'
		5		359.19	
4	2 2 2 3		Red/Brown fine to med SAND and Silt, trace Clay, micaceous, Damp **(SM)**		Medium Stiff
2	wh 2 2 3	10		354.19	
	Shelby Tube				
4	wh 2 2 4		Brown to gray fine to med SAND, little Silt, micaceous, iron and biotite bands, Wet **(SM)**		Medium Stiff
		15		349.19	
	Shelby Tube				
10	2 4 6 8				Stiff
		20		344.19	Medium Dense
12	4 6 6 11				
	Shelby Tube				
32	13 14 18 20	25		339.19	Dense
>50	11 37 50/4"		Light Gray to dark brown fine SAND, some Silt, white quartz gravel lenses *SAPROLITE* **(SM)**		Very Dense
>50	23 32 50/5"	30		334.19	Very Dense

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BORING/WELL LOG

Boring/Well ID: **DAA-8pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726549.74	Sampling Method:	Split Spoon
Start Date:	02/27/19	Easting:	11591416.33	Well Material:	2" Schedule 40 PVC
Completion Date:	02/27/19	Ground Elevation:	364.19	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	36.0	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	365.46	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
>50	50/4"		**Auger Refusal at 36'**				Very Dense
		40				324.19	
		45				319.19	
		50				314.19	
		55				309.19	
		60				304.19	
		65				299.19	

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BORING/WELL LOG

Boring/Well ID: **DAA-9pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3725486.86	Sampling Method:	Split Spoon
Start Date:	02/28/19	Easting:	11591101.07	Well Material:	2" Schedule 40 PVC
Completion Date:	02/28/19	Ground Elevation:	365.25	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	25'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	365.68	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand **(ML)**		Logged Cuttings from 0-6'
		5		360.25	
	2 3 5 4		Red/brown fine SAND and Silt, trace Clay, micaceous **(SM)**		
8					Loose
	2 3 2 4				
5					Loose
		10		355.25	
	2 2 3 3				Loose
5			Red/Brown fine SAND, little Silt, micaceous, white quartz lenses **(SM)**		Loose
	2 3 2 3				
5					Loose
		15		350.25	
	4 3 4 5				Medium Dense
9					
	4 5 6 6				Medium Dense
12					
	7 6 9 8	20		345.25	Medium Dense
17					
>50	4 50/4"		Brown fine SAND, some Silt, white quartz sand lenses, *SAPROLITE* **(SM)**		Very Dense
			Auger Refusal at 25'		
		25		340.25	
		30		335.25	

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BORING/WELL LOG

Boring/Well ID: **DAA-10pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726549.74	Sampling Method:	Split Spoon
Start Date:	02/28/19	Easting:	11591416.33	Well Material:	2" Schedule 40 PVC
Completion Date:	02/28/19	Ground Elevation:	339.45	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	31'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	341.55	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Gray/Green SILT, little fine Sand, little Clay **(MH)**		Logged Cuttings from 0-6'
		5	Red/Brown SILT, little fine Sand, little Clay **(MH)**	334.45	
49	18 16 33 49				Very Dense
49	12 18 31 50/5"	10	Light Brown fine SAND, some Silt, gray/white quartz sand lenses **(SM)**	329.45	Very Dense
>50	25 40 50/5"	15		324.45	Very Dense
>50	33 50/5"		Light brown SILT and fine Sand, dry, *SAPROLITE* **(SM)**		
		20		319.45	Very Dense
24	13 13 11 18		Dark brown fine SAND, little Silt, gray quartz sand lenses; *SAPROLITE* **(SM)**		
>50	29 50/2"	25		314.45	
>50	50/5"	30	**Auger Refusal at 31'**	309.45	

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BORING/WELL LOG

Boring/Well ID: **DAA-11pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3728437.13	Sampling Method:	Split Spoon
Start Date:	02/28/19	Easting:	11589977.41	Well Material:	2" Schedule 40 PVC
Completion Date:	02/28/19	Ground Elevation:	335.07	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	23'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	336.30	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand **(ML)**				Logged Cuttings from 0-6'
			Red SILT, little fine Sand, dry, weathered, *SAPROLITE* **(SM)**				
		5				330.07	
>50	24 50/3"						Medium Dense
>50	50/3"						Medium Dense
		10				325.07	
>50	50/3"	15				320.07	Dense
>50	50/5"	20	Light brown fine SAND, trace Silt, white quartz sand lenses, *SAPROLITE*, **(SM)**			315.07	Very Dense
			Auger Refusal at 23'				
		25				310.07	
		30				305.07	

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BORING/WELL LOG

Boring/Well ID: **DAA-12pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3728364.31	Sampling Method:	Split Spoon
Start Date:	03/04/19	Easting:	11590423.89	Well Material:	2" Schedule 40 PVC
Completion Date:	03/04/19	Ground Elevation:	330.07	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	25.5'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	331.20	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red/Brown fine SAND, some Silt **(SM)**		Logged Cuttings from 0-6'
		5		325.07	
12	4 5 7		Red/Brown fine to med SAND, some Silt, trace gravel **(SM)**		
15	6 5 7 8		Light Tan fine SAND, some Silt, micacious, **(SM)**		
16	7 4 7 9	10	Light Tan fine SAND, some Silt, micacious, white quartz sand lenses **(SM)**	320.07	
21	8 6 8 13				
25	14 9 10 15	15		315.07	
24	14 9 12 12				
24	15 7 8 16				
>50	43 14 50/3"	20	Gray fine SAND, little Silt, white quartz sand lenses, iron and biotite bands, *SAPROLITE* **(SM)**	310.07	Very Dense
>50	50/4"	25	**Auger Refusal at 25.5'**	305.07	
		30		300.07	

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BORING/WELL LOG

Boring/Well ID: **DAA-13pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3727352.27	Sampling Method:	Split Spoon
Start Date:	03/04/19	Easting:	11590973.86	Well Material:	2" Schedule 40 PVC
Completion Date:	03/04/19	Ground Elevation:	357.96	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	34'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	359.36	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red SILT, some Clay **(MH)**		Logged Cuttings from 0-6'
		5		352.96	
12	4 5 7 6		Red SILT, little Clay, trace fine Sand, micaceous, **(MH)**		Medium Dense
10	3 4 6 8	10	Red fine SAND, little Silt, trace Clay, micaceous, **(SM)**	347.96	Medium Dense
9	3 4 5 6				Medium Dense
12	4 5 7 6				Medium Dense
9	3 3 6 6	15		342.96	Medium Dense
10	4 5 5 6		Tan to Brown fine SAND, little Silt, trace Clay, micaceous, **(SM)**		Medium Dense
14	3 6 8 8	20		337.96	Medium Dense
16	6 7 9 9				Medium Dense
19	5 10 9 8				
17	4 7 10 13	25		332.96	Medium Dense
22	8 10 12 8				Very Dense
39	9 17 22 16	30	Red/Brown fine SAND, some Silt, iron and biotite bands, micaceous **(SM)**	327.96	Very Dense
41	14 22 19 29				Very Dense
>50	8 50/4"		Gray fine SAND and Silt; *SAPROLITE*, **(SM)**		
			Auger Refusal at 34'		

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BORING/WELL LOG

Boring/Well ID: **DAA-14pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726467.15	Sampling Method:	Split Spoon
Start Date:	03/05/19	Easting:	11591831.94	Well Material:	2" Schedule 40 PVC
Completion Date:	03/05/19	Ground Elevation:	380.13	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	42'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	381.44	Seal:	Bentonite Pellets/Hydrated

Samp ID	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
					Logged Cuttings from 0-6'
		5		375.13	
15	3 6 9 12		Red SILT, some Clay, trace fine Sand (ML)		Stiff
14	4 5 9 10				Stiff
		10		370.13	
15	3 6 9 10				Stiff
8	3 4 4 6				Medium Stiff
8	3 3 5 6	15		365.13	Medium Stiff
7	3 4 3 4		Red SILT and fine Sand, trace Clay, white quartzite gravel lenses, **(SM)**		Loose
8	3 4 4 6				Loose
		20		360.13	
9	3 4 5 5				Loose
9	2 4 5 5				Loose
11	4 5 6 8	25		355.13	Medium Dense
7	3 3 4 7				Loose
10	4 4 6 12				Loose
		30		350.13	
18	5 7 11 11		Lite tan fine SAND, little Silt, biotite bands, white quartzite sand lenses, micaceous **(SM)**		Medium Dense
13	4 6 7 8				Medium Dense
	5 7				

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BORING/WELL LOG

Boring/Well ID: **DAA-14pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726467.15	Sampling Method:	Split Spoon
Start Date:	03/05/19	Easting:	11591831.94	Well Material:	2" Schedule 40 PVC
Completion Date:	03/05/19	Ground Elevation:	380.13	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	42'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	381.44	Seal:	Bentonite Pellets/Hydrated

Samp ID	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
28	10 12 6		Lite tan fine SAND, little Silt, biotite bands, white quartzite sand lenses, micaceous **(SM)**				Medium Dense
14	11 12 8 6						Medium Dense
>50	16 32 50/6" 23 45 50/4"	40	Lite tan fine SAND, little Silt, biotite bands, white quartzite sand lenses, micaceous, *SAPROLITE*, **(SM)**			340.13	Very Dense
			Auger Refusal at 42'				
		45				335.13	
		50				330.13	
		55				325.13	
		60				320.13	
		65				315.13	

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BORING/WELL LOG

Boring/Well ID: **DAA-15pz-s**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3730413.59	Sampling Method:	Split Spoon
Start Date:	03/05/19	Easting:	11591080.07	Well Material:	2" Schedule 40 PVC
Completion Date:	03/05/19	Ground Elevation:	329.98	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	34'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	331.15	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
		5				324.98	
	Shelby Tube						
		10				319.98	
		15	Soil sampling and classification data available on well log for paired Deep well DAA-15pz-d			314.98	
	Shelby Tube						
		20				309.98	
		25				304.98	
		30				299.98	
			Auger Refusal at 34'				

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BORING/WELL LOG

Boring/Well ID: **DAA-15pz-d**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3730411.63	Sampling Method:	Split Spoon
Start Date:	03/05/19	Easting:	11591070.98	Well Material:	2" Schedule 40 PVC
Completion Date:	03/05/19	Ground Elevation:	329.71	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	39'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	331.34	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Brown fine SAND, some Silt **(SM)**		Logged Cuttings from 0-6'
		5		324.71	
66	22 28 38 50/5"		Very light Tan fine SAND, trace Silt, iron bands, *SAPROLITE* **(SM)**		Very Dense
>50	28 47 50/5"	10	Very light Tan fine SAND, trace Silt, white quartz gravel lenses, *SAPROLITE* **(SM)**	319.71	Very Dense
64	12 18 46 50/5"	15		314.71	Very Dense
>50	40 50/5"	20		309.71	Very Dense
>50	50/3"	25		304.71	Very Dense
			Auger Refusal at 29'		
Rock Core		30	Biotite Gneiss Rock Core Run 1: 29 to 34 feet Recovery: 59/60 inches = 98% RQD: 12/59 inches = 25%	299.71	

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BORING/WELL LOG

Boring/Well ID: **DAA-15pz-d**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3730411.63	Sampling Method:	Split Spoon
Start Date:	03/05/19	Easting:	11591070.98	Well Material:	2" Schedule 40 PVC
Completion Date:	03/05/19	Ground Elevation:	329.71	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	39'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	331.34	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
Rock Core			Biotite Gneiss Rock Core Run 2: 34 to 39 feet Recovery: 56.5/60 inches = 94% RDQ: 14/56.5 inches = 25%				
		40				289.71	
		45				284.71	
		50				279.71	
		55				274.71	
		60				269.71	
		65				264.71	

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BORING/WELL LOG

Boring/Well ID: **DAA-16pz**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3731369.62	Sampling Method:	Split Spoon
Start Date:	03/06/19	Easting:	11593538.41	Well Material:	2" Schedule 40 PVC
Completion Date:	03/06/19	Ground Elevation:	323.02	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	26'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	324.60	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Dark brown SILT, some Clay, trace fine Sand **(MH)**		Logged Cuttings from 0-6'
		5	Brown fine SAND, some Silt, trace Clay **(SM)**	318.02	
61	13 26 35				Very Dense
>50	50/5" 21 37 50/3"				Very Dense
>50	41 50/3"	10		313.02	Very Dense
>50	50/6"				Very Dense
		15	Light Tan fine SAND with lenses of Gray/Green Silt, mottling, *SAPROLITE* **(SM)**	308.02	
>50	50/4"	20		303.02	Very Dense
>50	50/3"	25	**Auger Refusal at 26'**	298.02	
		30		293.02	

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BORING/WELL LOG

Boring/Well ID: **DAA-17sb**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3731469.53	Sampling Method:	Split Spoon
Start Date:	03/06/19	Easting:	11593827.25	Well Material:	NA
Completion Date:	03/06/19	Ground Elevation:	332.69	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	22.5'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red to brown SILT and Clay **(MH)**				Logged Cuttings from 0-6'
		5				327.69	
24	7 8 16		Light Tan very fine SAND, some Silt, dry **(SM)**				Medium Dense
23	15 9 11 12						Medium Dense
	16	10				322.69	
28	8 12 16 19		Green to gray fine SAND, little Silt, dry **(SM)**				Medium Dense
40	11 16 24 24						Medium Dense
59	12 22 37 50/5"	15	Light Tan very fine SAND, some Silt, dry, *SAPROLITE* **(SM)**			317.69	Very Dense
			Red to brown fine SAND, some SILT, biotite bands, *SAPROLITE* **(SM)**				
		20				312.69	
76	19 39 37 41						Very Dense
			Auger Refusal at 22.5'				
		25				307.69	
		30				302.69	

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BORING/WELL LOG

Boring/Well ID: **DAA-18pz**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3730329.89	Sampling Method:	Split Spoon
Start Date:	03/07/19	Easting:	11594565.79	Well Material:	2" Schedule 40 PVC
Completion Date:	03/07/19	Ground Elevation:	342.12	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	27'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	343.46	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red SILT and Clay, trace fine Sand **(MH)**		Logged Cuttings from 0-6'
		5	Brown fine SAND, some Silt, trace Clay, white quartz gravel lenses **(SM)**	337.12	
4	3 2 2 1				Loose
4	2 2 2 2				Loose
		10	Red/Brown fine SAND, little Silt, biotite and iron bands, micacious **(SM)**	332.12	
6	3 3 4 3				Loose
9	4 5 4				Medium Dense
	Shelby Tube	15		327.12	
23	17 11 12 16 7		Brown fine SAND, some Silt, trace Clay, white quartz gravel lenses **(SM)**		Medium Dense
25	11 14 17 8	20		322.12	Dense
53	18 35 50				Very Dense
			Brown/Gray very fine SAND and Silt, white quartz sand lenses, *SAPROLITE* **(SM)**		
>50	18 50/2"	25	**Auger Refusal at 27'**	317.12	Very Dense
		30		312.12	

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BORING/WELL LOG

Boring/Well ID: **DAA-19pz-s**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3732042.79	Sampling Method:	Split Spoon
Start Date:	03/07/19	Easting:	11594480.40	Well Material:	2" Schedule 40 PVC
Completion Date:	03/07/19	Ground Elevation:	325.34	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	21.5'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	325.94	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand **(MH)**		Logged Cuttings from 0-6'
		5		320.34	
14	7 6 8		Brown/Gray/Green fine SAND, little Silt, trace Clay, Mottled **(SM)**		Medium Dense
34	12 8 10 24				Dense
>50	42 16 45 50/4"	10		315.34	Very Dense
			Light Tan very fine SAND, little Silt, loose, dry, *SAPROLITE* **(SM)**		
>50	50/4"	15		310.34	Very Dense
>50	50/2"	20		305.34	Very Dense
			Auger Refusal at 21.5'		
		25		300.34	Very Dense
		30		295.34	

Geol

Well Log

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BORING/WELL LOG

Boring/Well ID: **DAA-19pz-d**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3732039.94	Sampling Method:	Split Spoon
Start Date:	03/11/19	Easting:	11594488.33	Well Material:	2" Schedule 40 PVC
Completion Date:	03/11/19	Ground Elevation:	325.18	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	33'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	327.09	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
		5				320.18	
		10	Soil sampling and classification data available on well log for paired Shallow well DAA-19pz-s			315.18	
		15				310.18	
		20				305.18	
			Auger Refusal at 23'				
Rock Core		25	Biotite Gneiss Rock Core Run 1: 23 to 28 feet Recovery: 58.5/60 inches = 97% RQD: 23/58 inches = 39%			300.18	
		30	Biotite Gneiss Rock Core Run 2: 28 to 33 feet Recovery: 57.5/60 inches = 96% RDQ: 37/57.5 inches = 65%			295.18	Sand caved into core hole from 29 to 33'

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BORING/WELL LOG

Boring/Well ID: **DAA-20pz**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3732042.79	Sampling Method:	Split Spoon
Start Date:	03/11/19	Easting:	11594480.40	Well Material:	2" Schedule 40 PVC
Completion Date:	03/11/19	Ground Elevation:	312.39	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	34'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	313.62	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand (MH)		Logged Cuttings from 0-6'
		5	Red very fine SAND, some Silt, trace Clay (SM)	307.39	
30	7 13 17				Dense
35	18 10 18 17				Dense
	26 14	10		302.39	
47	19 28 23		Gray/Green very fine SAND, little Silt, white quartz course sand lenses (SM)		Vey Dense
52	9 20 32 42				Very Dense
39	16 18 21 26	15		297.39	Very Dense
>50	18 40 50/5"				Very Dense
>50	37 50/6"		Light Tan very fine SAND, little Silt, white quartz course sand lenses, loose, dry *SAPROLITE* (SM)		Very Dense
>50	50/6"	20		292.39	Very Dense
>50	20 34 50/4"	25	Red/Brown fine SAND, some Silt, loose, dry, *SAPROLITE* (SM)	287.39	Very Dense
>50	50/1"	30		282.39	
			Auger Refusal at 34		

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BORING/WELL LOG

Boring/Well ID: **DAA-21sb**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3733279.40	Sampling Method:	Split Spoon
Start Date:	03/12/19	Easting:	11594045.62	Well Material:	NA
Completion Date:	03/12/19	Ground Elevation:	315.47	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	47'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red Brown SILT and Clay **(MH)**				
							Logged Cuttings from 0-6'
			Red fine SAND, some Silt, little Clay with gray medium sand lenses **(SM)**				
		5				310.47	
22	6 9 13						Medium Dense
29	18 13 17 12						Medium Dense
	16	10	Brown fine SAND, some Silt, trace Clay **(SM)**			305.47	
23	6 11 12						Medium Dense
28	19 7 12 16						Medium Dense
	25		Gray to white fine SAND, little Silt **(SM)**				
57	13 22 35	15				300.47	Very Dense
>50	50/6" 41 50/4"						Very Dense
		20				295.47	
>50	32 50/2"						Very Dense
		25	Light brown fine SAND and Silt, *SAPROLITE* **(SM)**			290.47	
		30				285.47	
>50	25 50/5"						Very Dense

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BORING/WELL LOG

Boring/Well ID: **DAA-21sb**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3733279.40	Sampling Method:	Split Spoon
Start Date:	03/12/19	Easting:	11594045.62	Well Material:	NA
Completion Date:	03/12/19	Ground Elevation:	315.47	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	47'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
>50	45 50/4"		Light brown fine SAND and Silt, trace white quartzite gravel, *SAPROLITE* **(SM)**				Very Dense
>50	50/5"	40	Gray fine SAND, little Silt, dry, *SAPROLITE* **(SM)**			275.47	Very Dense
>50	50/2"	45	Gray fine SAND, little Silt, dry, *SAPROLITE* **(SM)** **Auger Refusal at 47'**			270.47	Very Dense
		50				265.47	
		55				260.47	
		60				255.47	
		65				250.47	

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BORING/WELL LOG

Boring/Well ID: **DAA-22pz**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3733377.87	Sampling Method:	Split Spoon
Start Date:	03/12/19	Easting:	11594485.30	Well Material:	2" Schedule 40 PVC
Completion Date:	03/12/19	Ground Elevation:	323.33	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	55'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	324.70	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand, elastic **(MH)**		Logged Cuttings from 0-6'
		5	Tan SILT, some fine Sand, trace Clay, moist **(SM)**	318.33	
6	2 3 3				Medium Stiff
5	4 2 2 3				Loose
	4	10		313.33	
5	2 3 2		Reddish brown fine SAND, little Silt, micaceous, loose **(SM)**		Loose
7	4 3 3				Loose
6	4 3 2 3	15		308.33	Loose
6	3 3 3				Loose
11	6 5 5 6		Gray/Green fine SAND, some Silt, micaceous, white quartz sand lenses, loose **(SM)**		Medium Dense
12	7 5 6 6	20		303.33	Medium Dense
>50	8 7 30 50/5"				Very Dense
>50	50/6"	25		298.33	Very Dense
			Brown fine SAND, some Silt, trace white quartz gravel, micaceous, *SAPROLITE* **(SM)**		
>50	18 39 50/4"	30		293.33	Very Dense

Geol | Well Log

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BORING/WELL LOG

Boring/Well ID: **DAA-22pz**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3733377.87	Sampling Method:	Split Spoon
Start Date:	03/12/19	Easting:	11594485.30	Well Material:	2" Schedule 40 PVC
Completion Date:	03/12/19	Ground Elevation:	323.33	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	55'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	324.70	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
>50	39 50/6"						Very Dense
>50	50/3"	40				283.33	
		45	Brown fine SAND, little Silt, trace white quartz gravel, micaceous, *SAPROLITE* **(SM)**			278.33	
>50	50/1"	50				273.33	No Sample Recovery
		55	No Auger Refusal, boring depth terminated at 55'			268.33	
		60				263.33	
		65				258.33	

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BORING/WELL LOG

Boring/Well ID: **DAA-23pz-s**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3733647.76	Sampling Method:	Split Spoon
Start Date:	03/13/19	Easting:	11595024.84	Well Material:	2" Schedule 40 PVC
Completion Date:	03/13/19	Ground Elevation:	318.63	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	33'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	320.61	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red SILT and Clay, little fine Sand **(ML)**		Logged Cuttings from 0-6'
		5		313.63	
6	2 3 3		Red fine SAND, some Silt, trace Clay, white Quartz sand lenses, black biotite bands **(SM)**		Loose
5	2 2 2 3 2	10		308.63	Loose
	Shelby Tube				
5	3 2 3 3		Reddish brown fine SAND, some Silt, trace Clay, micaceous **(SM)**		Loose
5	3 2 3 5	15	Dark gray fine SAND, little Silt **(SM)**	303.63	Loose
	Shelby Tube				
20	3 5 15 18		Red fine SAND, some Silt, trace Clay **(SM)**		Medium Dense
47	12 20 27 35	20	White fine SAND, trace Silt **(SM)**	298.63	Dense
	Shelby Tube				
30	8 10 20 31	25		293.63	Medium Dense
>50	24 29 50/6"		White fine SAND, trace Silt **(SM)**		Very Dense
23	15 12 11 15	30	Gray fine SAND, little Silt, trace Clay, micaceous, *SAPROLITE* **(SM)**	288.63	Medium Dense
	Shelby Tube				
>50	41 50/3"		**Auger Refusal at 33'**		

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BORING/WELL LOG

Boring/Well ID: **DAA-23pz-d**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3733658.36	Sampling Method:	Split Spoon
Start Date:	03/12/19	Easting:	11595026.15	Well Material:	2" Schedule 40 PVC
Completion Date:	03/13/19	Ground Elevation:	317.94	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	47'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	318.67	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
		5				312.94	
		10				307.94	
			Soil sampling and classification data available on well log for paired Shallow well DAA-23pz-s				
		15				302.94	
		20				297.94	
		25				292.94	
		30				287.94	

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BORING/WELL LOG

Boring/Well ID: **DAA-23pz-d**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3733658.36	Sampling Method:	Split Spoon
Start Date:	03/12/19	Easting:	11595026.15	Well Material:	2" Schedule 40 PVC
Completion Date:	03/13/19	Ground Elevation:	317.94	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	47'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	318.67	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
Rock Core			**Auger Refusal at 37"**				
		40	Bitotite Gneiss Rock Core Run 1: 37 to 42 feet Recovery: 54.5/60 inches = 90% RQD: 32.5/60 inches = 54%			277.94	
		45	Biotite Gneiss Rock Core Run 1: 42 to 47 feet Recovery: 58/60 inches = 96% RQD: 50.5/58 inches = 87%			272.94	
		50				267.94	
		55				262.94	
		60				257.94	
		65				252.94	

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BORING/WELL LOG

Boring/Well ID: **DAA-24pz**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3734520.89	Sampling Method:	Split Spoon
Start Date:	03/13/19	Easting:	11593898.96	Well Material:	2" Schedule 40 PVC
Completion Date:	03/13/19	Ground Elevation:	289.87	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	23'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	291.19	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand **(ML)**		Logged Cuttings from 0-6'
		5		284.87	
5	2 2 3 3 3		Red fine SAND, some Silt, trace Clay, white quartz sand lenses, micaceous **(SM)**		Loose
8	3 5 6 5 5	10	Tan fine SAND, some Silt **(SM)**	279.87	Loose
10	5 4 4 4 6				Loose
8	7 6 5 8 8		Red fine SAND, some Silt, trace Clay, white quartz sand lenses, micaceous **(SM)**		Loose
11		15	Tan fine SAND, some Silt **(SM)**	274.87	Medium Dense
25	8 17 50/3" 50/3"		Red fine SAND, some Silt, trace Clay, white quartz sand lenses, micaceous **(SM)**		Medium Dense
>50			Tan fine SAND, some Silt, micaceous, *SAPROLITE* **(SM)**		Dense
		20		269.87	
			Auger Refusal at 23'		
		25		264.87	
		30		259.87	

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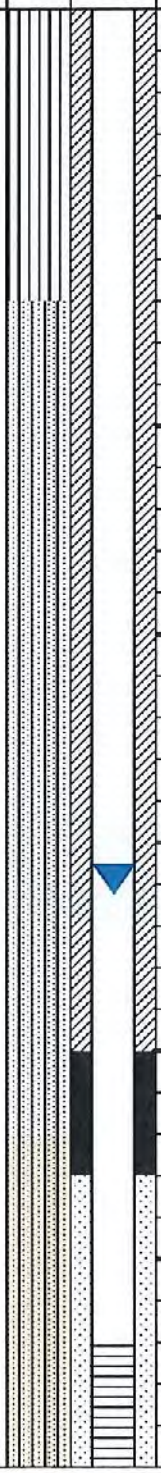
BORING/WELL LOG

Boring/Well ID: **DAA-25pz-s**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3733647.76	Sampling Method:	Split Spoon
Start Date:	03/14/19	Easting:	11595024.84	Well Material:	2" Schedule 40 PVC
Completion Date:	03/14/19	Ground Elevation:	326.38	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	37'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	328.45	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
		5				321.38	
		10				316.38	
			Soil sampling and classification data available on well log for paired Deep well DAA-25pz-d				
	Shelby Tube	15				311.38	
	Shelby Tube	20				306.38	
		25				301.38	
		30				296.38	



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BORING/WELL LOG

Boring/Well ID: **DAA-25pz-s**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3733647.76	Sampling Method:	Split Spoon
Start Date:	03/14/19	Easting:	11595024.84	Well Material:	2" Schedule 40 PVC
Completion Date:	03/14/19	Ground Elevation:	326.38	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	37'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	328.45	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Auger Refusal at 37"				
		40				286.38	
		45				281.38	
		50				276.38	
		55				271.38	
		60				266.38	
		65				261.38	

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BORING/WELL LOG

Boring/Well ID: **DAA-25pz-d**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3730467.21	Sampling Method:	Split Spoon
Start Date:	03/14/19	Easting:	11593049.11	Well Material:	2" Schedule 40 PVC
Completion Date:	03/14/19	Ground Elevation:	326.58	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	47'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	327.70	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand **(MH)**		Logged Cuttings from 0-6'
		5		321.58	
6	2 2 4		Red/Brown SILT and Sand, trace Clay, micaceous **(SM)**		Loose
5	4 2 2 3				
	4 2	10		316.58	Loose
4	2 2 4				Loose
5	3 2 3				Loose
9	3 3 6	15		311.58	
11	5 4 5		Brown fine SAND, some Silt, trace Clay, micaceous **(SM)**		Loose
12	6 8 6 7				Medium Dense
	5 6	20		306.58	Medium Dense
15	5 6 9				Medium Dense
45	14 11 16 29				
>50	50/5" 25 50/6"	25	Brown med to fine SAND, some Silt, trace Clay, gray and white quartz coarse sand lenses, micaceous, *SAPROLITE* **(SM)**	301.58	Very Dense
>50	50/3"	30	Gray med to fine SAND, some Silt, trace gravel, micaceous, *SAPROLITE* **(SM)**	296.58	Very Dense

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BORING/WELL LOG

Boring/Well ID: **DAA-25pz-d**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3730467.21	Sampling Method:	Split Spoon
Start Date:	03/14/19	Easting:	11593049.11	Well Material:	2" Schedule 40 PVC
Completion Date:	03/14/19	Ground Elevation:	326.58	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	47'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	327.70	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
>50	50/5"		**Auger Refusal at 37"**				
Rock Core		40	Biotite Gneiss Rock Core Run 1: 37 to 42 feet Recovery: 58/60 inches = 96% RQD: 41/58 inches = 70%			286.58	
		45	Biotite Gneiss Rock Core Run 1: 42 to 47 feet Recovery: 58.5/60 inches = 97% RQD: 33.5/58.5 inches = 57%			281.58	
		50				276.58	
		55				271.58	
		60				266.58	
		65				261.58	

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BORING/WELL LOG

Boring/Well ID: **DAA-26pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3731202.27	Sampling Method:	Split Spoon
Start Date:	03/27/19	Easting:	11591698.15	Well Material:	2" Schedule 40 PVC
Completion Date:	03/27/19	Ground Elevation:	304.20	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	48'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	305.08	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
5	3 2 3		Red SILT, some Clay **(MH)**				Soft
7	3 4 3		Reddish brown SILT, some Clay, elastic **(MH)**				Medium Stiff
11	4 5 3	5				299.20	Medium Stiff
12	4 7 8		Light brown SILT and Clay, elastic **(MH)**				Stiff
16	3 5 7						Stiff
18	10 4 6	10	Light brown SILT, some Clay, little fine Sand mottling, elastic **(MH)**			294.20	Very Stiff
17	10 12 4						Very Stiff
20	8 10 12	15				289.20	Very Stiff
11	5 7 10						Stiff
9	9 4 7						Medium Stiff
6	13 10 4	20				284.20	Medium Stiff
4	5 6 9						Soft
4	3 4 5	25	Light brown SILT, some Clay, trace fine Sand, mottling, elastic **(MH)**			279.20	Soft
9	8 wh 3						Medium Stiff
13	wh 3 4						Stiff
6	wh 2 2	30				274.20	Medium Stiff
17	4 wh 2						Stiff
	2 4 wh						
	2 2 3						
	wh 6 3						
	13 wh 7						
	6 8 wh						
	2 4 6						
	3 7 10						
	23 3 8		Light brown fine SAND, some Silt, trace Clay, **(SM)**				

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BORING/WELL LOG

Boring/Well ID: **DAA-26pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3731202.27	Sampling Method:	Split Spoon
Start Date:	03/27/19	Easting:	11591698.15	Well Material:	2" Schedule 40 PVC
Completion Date:	03/27/19	Ground Elevation:	304.20	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	48'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	305.08	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
	14 15 6						
15	6 9 15						Medium Dense
17	4 7 10						Medium Dense
	16 5	40	Light brown fine SAND, some Silt, little Sand, trace Clay, **(SM)**			264.20	
18	8 10 15						Medium Dense
30	7 12 18						Dense
57	25 12 25 32	45				259.20	Very Dense
>50	42 50/2		Light brown fine fine SAND, little Silt, *SAPROLITE* **(SM)**				
			Auger Refusal at 48'				
		50				254.20	
		55				249.20	
		60				244.20	
		65				239.20	

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BORING/WELL LOG

Boring/Well ID: **DAA-27sb**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3730609.14	Sampling Method:	Split Spoon
Start Date:	03/27/19	Easting:	11590530.73	Well Material:	NA
Completion Date:	03/27/19	Ground Elevation:	331.70	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	21.5'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Brown SILT, some Clay, trace fine Sand **(MH)**				
32	6 12 20		Brown to dark gray fine SAND, some Silt, trace Clay **(SM)**				Medium Dense
>50	60/4" 50/6"	5				326.70	
>50	24 50/3"						Very Dense
48	24 25 23						Very Dense
59	39 18 22 37	10				321.70	Very Dense
	50/4" 50/3"		Light Tan very fine SAND, little Silt, trace white quartzite gravel, dry, *SAPROLITE* **(SM)**				
30	14 12 8	15				316.70	Medium Dense
>50	7 14 11 50/4"						Very Dense
>50	50/5"						
>50	50/3"	20				311.70	
			Auger Refusal at 21.5'				
		25				306.70	
		30				301.70	

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BORING/WELL LOG

Boring/Well ID: **DAA-28sb**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3730566.92	Sampling Method:	Split Spoon
Start Date:	03/28/19	Easting:	11591349.73	Well Material:	NA
Completion Date:	03/28/19	Ground Elevation:	320.28	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	44'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
6	2 2 4		Red to brown SAND, some Silt, little Clay **(SM)**				Medium Stiff
12	7 3 6 6	5				315.28	Stiff
13	10 6 6 7						Stiff
44	10 5 14 30						Dense
23	23 7 12 11	10	Light Tan very fine SAND and Silt, **(SM)**			310.28	Medium Dense
>50	28 7 42 50/6"						Very Dense
79	27 42 37	15				305.28	Very Dense
55	28 11 24 31						Very Dense
>50	21 18 50/0"		Brown to red fine SAND, some Silt, trace Clay, white quartzite sand lenses, micaceous, *SAPROLITE,* **(SM)**				Very Dense
65	20 24 41	20				300.28	Very Dense
>50	38 36 50/5"						Very Dense
>50	29 50/4"	25				295.28	Very Dense
>50	28 50/6"						Very Dense
>50	50/6"						
61	28 25 36	30	Red fine SAND, some Silt, iron and biotite bands, *SAPROLITE,* **(SM)**			290.28	Very Dense
>50	50/6" 50/5"						
	50/6"						

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BORING/WELL LOG

Boring/Well ID: **DAA-28sb**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3730566.92	Sampling Method:	Split Spoon
Start Date:	03/28/19	Easting:	11591349.73	Well Material:	NA
Completion Date:	03/28/19	Ground Elevation:	320.28	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	44'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
>50	26 50/3"	40	Red fine SAND, some Silt, iron and biotite bands, white quartzite gravel lenses, *SAPROLITE*, Wet **(SM)**			280.28	Very Dense
			Auger Refusal at 44'				
		45				275.28	
		50				270.28	
		55				265.28	
		60				260.28	
		65				255.28	

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BORING/WELL LOG

Boring/Well ID: **DAA-29pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3729450.80	Sampling Method:	Split Spoon
Start Date:	03/28/19	Easting:	11591602.94	Well Material:	2" Schedule 40 PVC
Completion Date:	03/28/19	Ground Elevation:	347.84	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	34.5'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	349.41	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
7	2 3 4 7		Brown fine SAND, some Clay, little Silt **(SC)**		Medium Stiff
10	2 4 6	5		342.84	Loose
17	9 4 6 11				Medium Dense
30	18 6 12 18				Medium Dense
31	25 4 12 19	10		337.84	Dense
41	23 11 23 18		Brown fine SAND, some Silt, little Clay, trace gravel **(SM)**		Dense
45	27 7 14 31	15		332.84	Dense
59	28 19 32 27				Very Dense
>50	31 10 22 50/6"				Very Dense
>50	15 32 50/4"	20		327.84	Very Dense
>50	13 31 50/5"		Light Tan very fine SAND, some Silt, trace gravel, *SAPROLITE* **(SM)**		Very Dense
67	15 27 40 50/6"	25		322.84	Very Dense
>50	26 36 50/4"		Red/Brown fine SAND, some Silt, little Clay *SAPROLITE* **(SM)**		Very Dense
>50	20 29 50/4"				Very Dense
>50	50/5"	30	Dark Gray fine SAND, little Silt, *SAPROLITE* **(SM)**	317.84	

Auger Refusal at 34.5'

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BORING/WELL LOG

Boring/Well ID: **DAA-30sb**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3729480.24	Sampling Method:	Split Spoon
Start Date:	03/28/19	Easting:	11590921.73	Well Material:	NA
Completion Date:	03/28/19	Ground Elevation:	339.93	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	31'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red SILT, little Clay, trace fine Sand **(ML)**				
>50	50/5"						Very Dense
>50	50/2"	5				334.93	Very Dense
>50	50/3"						Very Dense
>50	15 30 50/3"						Very Dense
>50	50/6"	10	Light Tan fine SAND and Silt, trace white quartzite gravel, *SAPROLITE* **(SM)**			329.93	
>50	50/3"						Very Dense
>50	41 50/4"	15				324.93	Very Dense
>50	50/5"	20				319.93	Very Dense
>50	44 50/4"	25	Dark gray fine SAND and Silt, *SAPROLITE* **(SM)**			314.93	Very Dense
>50	50/3"	30	**Auger Refusal at 31'**			309.93	Very Dense

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BORING/WELL LOG

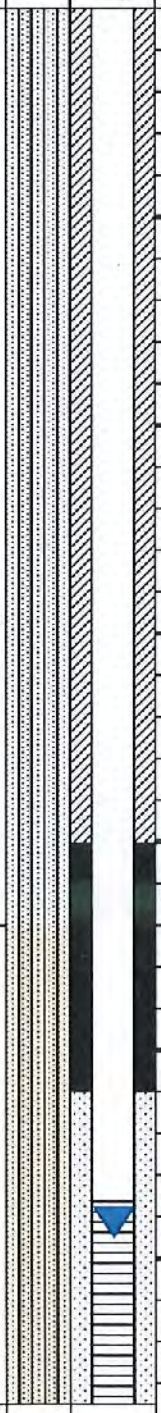
Boring/Well ID: **DAA-31pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3729450.80	Sampling Method:	Split Spoon
Start Date:	03/29/19	Easting:	11591602.94	Well Material:	2" Schedule 40 PVC
Completion Date:	03/29/19	Ground Elevation:	348.57	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	33.5'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	349.92	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red SILT, some Sand, trace fine Sand **(SM)**		
>50	25 32 50/6"				Very Dense
59	15 27 32 50/6"	5		343.57	Very Dense
54	14 19 35 25		Light Tan fine SAND, some Silt **(SM)**		Very Dense
37	9 17 20 34				Dense
>50	19 29 50/6"	10		338.57	Very Dense
57	20 31 26 21				Very Dense
22	8 9 13 12	15	Tan fine SAND, some Silt, trace Clay, biotite and iron bands, white quartz sand lenses **(SM)**	333.57	Medium Dense
42	12 15 27 36				Dense
34	10 18 16 20				Dense
49	18 31 18 27	20		328.57	Very Dense
>50	50/6"				
>50	50/1"	25		323.57	Very Dense
>50	50/2"		Brown Silt, some SAND, micaceous, *SAPROLITE*, **(SM)**		Very Dense
		30		318.57	
			Auger Refusal at 33.5'		

Geol

Well Log



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BORING/WELL LOG

Boring/Well ID: **DAA-32sb**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3728036.55	Sampling Method:	Split Spoon
Start Date:	03/29/19	Easting:	11591011.48	Well Material:	NA
Completion Date:	03/29/19	Ground Elevation:	349.82	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	31'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
22	6 7 15 29		Red SILT and Clay, trace fine Sand **(ML)**				Very Stiff
>50	14 22 50/5"	5				344.82	
>50	50/4"						Very Dense
>50	50/3"		Tan very fine SAND and Silt, dry, *SAPROLITE,* **(SM)**				Very Dense
>50	50/4"	10				339.82	Very Dense
>50	50/3"						Very Dense
>50	50/4"						Very Dense
		15				334.82	
>50	50/3"		Gray SILT, some fine Sand, *SAPROLITE* **(SM)**				Very Dense
>50	50/2"						Very Dense
>50	50/2"	20				329.82	Very Dense
>50	50/4"	25	Light Tan SILT, some fine Sand, *SAPROLITE,* **(SM)**			324.82	Very Dense
>50	50/1"	30	**Auger Refusal at 31'**			319.82	Very Dense

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BORING/WELL LOG

Boring/Well ID: **DAA-33sb**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3727617.39	Sampling Method:	Split Spoon
Start Date:	04/02/19	Easting:	11591448.65	Well Material:	NA
Completion Date:	04/02/19	Ground Elevation:	348.20	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	17'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
7	4 3 4 5		Red fine SAND, little Silt, little Clay, micaceous **(SM)**				Medium Stiff
6	3 2 4 4	5				343.20	Medium Stiff
6	2 3 3 5						Loose
9	3 4 5 7						Loose
10	2 4 6 9	10	Gray fine SAND, some Clay, little Silt **(SM)**			338.20	Loose
30	5 12 18 50/5"						Medium Dense
>50	50/6"	15	Brown fine SAND, some Silt, dry, *SAPROLITE,* **(SM)**			333.20	
>50	50/0"		**Auger Refusal at 17'**				Very Dense
		20				328.20	
		25				323.20	
		30				318.20	

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BORING/WELL LOG

Boring/Well ID: **DAA-34pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3728241.05	Sampling Method:	Split Spoon
Start Date:	04/02/19	Easting:	11592007.95	Well Material:	2" Schedule 40 PVC
Completion Date:	04/02/19	Ground Elevation:	354.70	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	39.5'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	355.38	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand **(ML)**		
8	3 3 5 7				Loose
7	2 3 4 5	5	Red SILT, some Clay, little Sand, micaceous **(ML)**	349.70	Loose
9	2 3 6 5				Loose
9	2 3 6 5				Loose
7	2 3 4 4	10		344.70	Loose
8	3 3 5 5				Loose
7	3 4 3 4	15		339.70	Loose
9	5 5 4 5		Brown to Red SILT, some fine Sand, trace Clay, micaceous, white quartz sand lenses **(SM)**		Loose
10	5 5 5 6				Loose
13	3 5 8 7	20		334.70	Medium Dense
14	4 7 7 10				Medium Dense
	Shelby Tube	25		329.70	
>50	22 34 50/5"				Very Dense
>50	32 50/6"				Very Dense
>50	50/5"	30	Brown very fine SAND, some Silt, micaceous, *SAPROLITE* **(SM)**	324.70	
>50	50/2"				Very Dense

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BORING/WELL LOG

Boring/Well ID: **DAA-34pz**

Project:	**Green Ridge Recycling**	Boring/Well Area:	**West Area**	Drilling Rig Type:	**Track Rig CME 45**
Project #:	**18020117-030201**	Logged By:	**D. Coakley**	Drilling Method:	**4.25" Hollow Stem Auger**
Location:	**Cumberland County, VA**	Northing:	**3728241.05**	Sampling Method:	**Split Spoon**
Start Date:	**04/02/19**	Easting:	**11592007.95**	Well Material:	**2" Schedule 40 PVC**
Completion Date:	**04/02/19**	Ground Elevation:	**354.70**	Screen Size:	**0.10 Slot**
Contractor:	**Blue Ridge Drilling**	Total Depth:	**39.5'**	Filter Pack:	**#2 Sand**
Driller:	**James Jones**	TOC Elevation:	**355.38**	Seal:	**Bentonite Pellets/Hydrated**

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
	50/5"		Brown very fine SAND, some Silt, micaceous, *SAPROLITE* **(SM)**				
			Auger Refusal at 39.5'				
		40				314.70	
		45				309.70	
		50				304.70	
		55				299.70	
		60				294.70	
		65				289.70	

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BORING/WELL LOG

Boring/Well ID: **DAA-35pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3727576.32	Sampling Method:	Split Spoon
Start Date:	04/03/19	Easting:	11592108.08	Well Material:	2" Schedule 40 PVC
Completion Date:	04/03/19	Ground Elevation:	365.58	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	38'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	367.36	Seal:	Bentonite Pellets/Hydrated

Samp ID	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
7	1 3 4		Red CLAY, little Silt **(ML)**		Loose
7	5 3 3 4	5		360.58	Loose
5	5 2 2 3				Loose
4	3 1 2 2		Red SILT, some Clay, little fine Sand, micaceous **(SM)**		Loose
5	3 2 2 3	10		355.58	Loose
	3 Shelby Tube				
5	2 3 2	15		350.58	Loose
8	4 3 4 4				Loose
7	4 3 3 4				Loose
10	5 3 5 5	20	Light brown to tan fine SAND, some Silt, trace Clay, white quartz gravel lenses, micaceous **(SM)**	345.58	Loose
13	8 5 6 7				Medium Dense
	7 Shelby Tube	25		340.58	
47	8 19 28				Dense
43	15 8 20 23				Dense
43	23 8 18 25	30	Gray to Light brown fine SAND, some Silt, trace gravel, micaceous, **(SM)**	335.58	Dense
	40				

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BORING/WELL LOG

Boring/Well ID: **DAA-35pz**

Project:	**Green Ridge Recycling**	Boring/Well Area:	**West Area**	Drilling Rig Type:	**Track Rig CME 45**
Project #:	**18020117-030201**	Logged By:	**D. Coakley**	Drilling Method:	**4.25" Hollow Stem Auger**
Location:	**Cumberland County, VA**	Northing:	**3727576.32**	Sampling Method:	**Split Spoon**
Start Date:	**04/03/19**	Easting:	**11592108.08**	Well Material:	**2" Schedule 40 PVC**
Completion Date:	**04/03/19**	Ground Elevation:	**365.58**	Screen Size:	**0.10 Slot**
Contractor:	**Blue Ridge Drilling**	Total Depth:	**38'**	Filter Pack:	**#2 Sand**
Driller:	**James Jones**	TOC Elevation:	**367.36**	Seal:	**Bentonite Pellets/Hydrated**

Samp ID	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
>50	35 50/6"		Light Tan very fine SAND, little Silt, micaceous, *SAPROLITE* **(SM)** **Auger Refusal at 38'**				Very Dense
		40				325.58	
		45				320.58	
		50				315.58	
		55				310.58	
		60				305.58	
		65				300.58	

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BORING/WELL LOG

Boring/Well ID: **DAA-36pz**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3729104.75	Sampling Method:	Split Spoon
Start Date:	04/03/19	Easting:	11593620.95	Well Material:	2" Schedule 40 PVC
Completion Date:	04/03/19	Ground Elevation:	340.15	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	45'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	340.83	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Red/brown SILT, little Clay, trace fine Sand **(ML)**		
7	4 3 4 6		Red to Tan SILT, little Sand, trace Clay **(SM)**		Loose
5	2 2 3 3	5		335.15	Loose
5	2 2 3 4				Loose
7	4 3 4 4		Tan SAND and Silt, trace Clay **(SM)**		Loose
4	2 1 3 3	10	Tan/Red/Gray SAND, some Silt, little Clay, mottling; moist **(SM)**	330.15	Loose
6	2 3 3 5		Red SILT, little Clay, gray sand lenses; moist; **(SM)**		Loose
9	3 3 6 7	15		325.15	Loose
15	4 6 9 9		Tan SILT, some fine Sand, little Clay **(SM)**		Medium Dense
17	6 9 8 10				Medium Dense
18	5 7 11 14	20		320.15	Medium Dense
20	7 10 10 22				Medium Dense
32	15 15 17 28	25		315.15	Dense
23	10 11 12 17		Tan to brown fine SAND and Silt, trace Clay **(SM)**		Medium Dense
21	8 10 11 16	30		310.15	Medium Dense

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BORING/WELL LOG

Boring/Well ID: **DAA-36pz**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3729104.75	Sampling Method:	Split Spoon
Start Date:	04/03/19	Easting:	11593620.95	Well Material:	2" Schedule 40 PVC
Completion Date:	04/03/19	Ground Elevation:	340.15	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	45'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	340.83	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
30	7 13 17 24						Dense
		40	Brown fine SAND, little Silt, white/pink quartzite gravel lenses, *SAPROLITE* **(SM)**			300.15	
57	22 28 29 50/6"						Very Dense
		45	**Auger Refusal at 45"**			295.15	
		50				290.15	
		55				285.15	
		60				280.15	
		65				275.15	

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BORING/WELL LOG

Boring/Well ID: **DAA-37sb**

Project:	**Green Ridge Recycling**	Boring/Well Area:	**East Area**	Drilling Rig Type:	**Track Rig CME 45**
Project #:	**18020117-030201**	Logged By:	**D. Coakley**	Drilling Method:	**3.25" Hollow Stem Auger**
Location:	**Cumberland County, VA**	Northing:	**3729474.02**	Sampling Method:	**Split Spoon**
Start Date:	**04/04/19**	Easting:	**11594007.15**	Well Material:	**NA**
Completion Date:	**04/04/19**	Ground Elevation:	**357.48**	Screen Size:	**NA**
Contractor:	**Blue Ridge Drilling**	Total Depth:	**47.5'**	Filter Pack:	**NA**
Driller:	**James Jones**	TOC Elevation:	**NA**	Seal:	**Bentonite Pellets/Hydrated**

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red SILT and Clay **(ML)**				
14	3 6 8 10						Medium Dense
10	3 5 5 7	5	Red SILT and fine Sand, trace Clay, micaceous, dry **(SM)**			352.48	Loose
8	3 3 5 5						Loose
10	5 5 5 3	10				347.48	Loose
6	2 3 3 3						Loose
6	3 2 4 4	15				342.48	Loose
7	3 4 3 6						Loose
13	5 5 8 9						Medium Dense
14	4 7 7 9	20	Light tan to brown SILT, some fine Sand, micaceous, white quartzite gravel lenses, **(SM)**			337.48	Medium Dense
	Shelby Tube						
17	7 8 9 12	25				332.48	Medium Dense
26	10 12 14 14						Medium Dense
35	5 13 22 42						Dense
>50	20 30 50/6"	30				327.48	Very Dense
64	20 25 39 50/5"						Very Dense
	14 50/5"		Gray fine SAND, little Silt, dry, micaceous, *SAPROLITE* **(SM)**				

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BORING/WELL LOG

Boring/Well ID: **DAA-37sb**

Project:	**Green Ridge Recycling**	Boring/Well Area:	**East Area**	Drilling Rig Type:	**Track Rig CME 45**
Project #:	**18020117-030201**	Logged By:	**D. Coakley**	Drilling Method:	**3.25" Hollow Stem Auger**
Location:	**Cumberland County, VA**	Northing:	**3729474.02**	Sampling Method:	**Split Spoon**
Start Date:	**04/04/19**	Easting:	**11594007.15**	Well Material:	**NA**
Completion Date:	**04/04/19**	Ground Elevation:	**357.48**	Screen Size:	**NA**
Contractor:	**Blue Ridge Drilling**	Total Depth:	**47.5'**	Filter Pack:	**NA**
Driller:	**James Jones**	TOC Elevation:	**NA**	Seal:	**Bentonite Pellets/Hydrated**

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
>50	40 60/4"						Very Dense
		40				317.48	
>50	40 50/3"		Gray fine SAND, little Silt, dry, micaceous, *SAPROLITE* **(SM)**				Very Dense
		45				312.48	
>50	45 50/2"						Very Dense
			Auger Refusal at 47.5'				
		50				307.48	
		55				302.48	
		60				297.48	
		65				292.48	

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BORING/WELL LOG

Boring/Well ID: **DAA-38sb**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3734294.95	Sampling Method:	Split Spoon
Start Date:	04/04/19	Easting:	11594503.05	Well Material:	NA
Completion Date:	04/04/19	Ground Elevation:	307.43	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	19.5'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red SILT and Clay **(ML)**				
9	3 3 6						Loose
8	9 3 4 4	5	Red SILT and fine Sand, micaceous **(SM)**			302.43	Loose
6	6 3 3 3						Loose
15	5 5 5 10						Medium Dense
13	11 5 6 7	10				297.43	Medium Dense
18	8 5 7 11		Very light Tan fine SAND and Silt, micaceous, dry, **(SM)**				Medium Dense
	9						
	Shelby Tube	15				292.43	
12	7 5 7 10						Medium Dense
>50	6 50/6"		**Auger Refusal at 19.5'**				Very Dense
		20				287.43	
		25				282.43	
		30				277.43	

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BORING/WELL LOG

Boring/Well ID: **DAA-39sb**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	3.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3733886.43	Sampling Method:	Split Spoon
Start Date:	04/04/19	Easting:	11594325.67	Well Material:	NA
Completion Date:	04/04/19	Ground Elevation:	315.21	Screen Size:	NA
Contractor:	Blue Ridge Drilling	Total Depth:	25.5'	Filter Pack:	NA
Driller:	James Jones	TOC Elevation:	NA	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
>50	50/4"		Tan very fine SAND and Silt, *SAPROLITE* **(SM)**				Very Dense
>50	50/4"						Very Dense
		5				310.21	
>50	50/3"						Very Dense
>50	11 17 50/5"						Very Dense
		10				305.21	
43	14 21 22 23		Tan fine SAND, little Silt, white quartzite gravel lenses, *SAPROLITE* **(SM)**				Dense
69	15 35 34 30						Very Dense
31	10 13 18 27	15				300.21	Dense
>50	24 31 50/5"						Very Dense
43	19 21 22 22						Dense
		20				295.21	
56	17 23 33 39		Brown to gray fine SAND, little Silt, dry, *SAPROLITE*, **(SM)**				Very Dense
69	18 31 38 50/5"						Very Dense
>50	27 50/3"	25	**Auger Refusal at 25.5'**			290.21	Very Dense
		30				285.21	

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BORING/WELL LOG

Boring/Well ID: **DAA-40pz**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3732549.57	Sampling Method:	Split Spoon
Start Date:	04/05/19	Easting:	11594305.23	Well Material:	2" Schedule 40 PVC
Completion Date:	04/05/19	Ground Elevation:	325.93	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	29'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	327.50	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red SILT and Clay **(MH)**				
		5				320.93	
			Red SILT, some fine Sand, little Clay **(MH)**				
		10				315.93	
		15	Brown fine SAND, some Silt **(SM)**			310.93	**NOTE:** Pouring rain, split spoons not collected due to safety concerns; Logged Cuttings and collected grab samples
		20				305.93	
			Brown fine SAND, some Silt, micaceous **(SM)**				
		25				300.93	
			Auger Refusal at 29'				
		30				295.93	

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BORING/WELL LOG

Boring/Well ID: **DAA-41pz**

Project:	Green Ridge Recycling	Boring/Well Area:	East Area	Drilling Rig Type:	Track Rig CME 45
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	4.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3730877.23	Sampling Method:	Split Spoon
Start Date:	04/08/19	Easting:	11593612.69	Well Material:	2" Schedule 40 PVC
Completion Date:	04/08/19	Ground Elevation:	306.52	Screen Size:	0.10 Slot
Contractor:	Blue Ridge Drilling	Total Depth:	22.5'	Filter Pack:	#2 Sand
Driller:	James Jones	TOC Elevation:	307.99	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	ELEV.	Remarks
			Brown fine SAND, some Silt **(SM)**		
>50	18 38 50/6"				Very Dense
>50	43 50/4"	5	Light Tan fine SAND, some Silt, trace white quartz gravel, *SAPROLITE* **(SM)**	301.52	Very Dense
>50	50/5"				
>50	50/3"				
>50	50/5"	10		296.52	
			Dark Brown fine SAND, little Silt, trace white quartz gravel, *SAPROLITE* **(SM)**		
>50	50/4"	15		291.52	
>50	50/2"	20		286.52	
			Auger Refusal at 22.5'		
		25		281.52	
		30		276.52	

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BORING/WELL LOG

Boring/Well ID: **DAA-42pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Geoprobe 7822DT
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	2.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3729104.75	Sampling Method:	Logged Cuttings
Start Date:	05/20/19	Easting:	11593620.95	Well Material:	1" Schedule 40 PVC
Completion Date:	05/20/19	Ground Elevation:	363.99	Screen Size:	0.10 Slot
Contractor:	Jetco Inc.	Total Depth:	48'	Filter Pack:	#2 Sand
Driller:	Rory Ricks	TOC Elevation:	366.57	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand **(ML)**				
		5				358.99	
		10				353.99	
		15				348.99	
			Red to brown SILT, little fine Sand, trace gravel **(SM)**				1" Piezometer installed for additional groundwater and bedrock (auger refusal) control data; drill cuttings logged; no samples collected
		20				343.99	
		25				338.99	
		30				333.99	
			Light gray fine SAND, some Silt, trace white quartz gravel **(SM)**				

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BORING/WELL LOG

Boring/Well ID: **DAA-42pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Geoprobe 7822DT
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	2.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3729104.75	Sampling Method:	Logged Cuttings
Start Date:	05/20/19	Easting:	11593620.95	Well Material:	1" Schedule 40 PVC
Completion Date:	05/20/19	Ground Elevation:	363.99	Screen Size:	0.10 Slot
Contractor:	Jetco Inc.	Total Depth:	48'	Filter Pack:	#2 Sand
Driller:	Rory Ricks	TOC Elevation:	366.57	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Light gray fine SAND, some Silt, trace white quartz gravel **(SM)**				
		40				323.99	Auger bit chattering noted, Increase in drilling down pressure required to advance depth;
			Dark Gray very fine SAND, some Silt, micaceous, wet *SAPROLITE* **(SM)**				
		45				318.99	
			Auger Refusal at 48"				
		50				313.99	
		55				308.99	
		60				303.99	
		65				298.99	

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BORING/WELL LOG

Boring/Well ID: **DAA-43pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Geoprobe 7822DT
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	2.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3732375.27	Sampling Method:	Logged Cuttings
Start Date:	05/20/19	Easting:	11592068.47	Well Material:	1" Schedule 40 PVC
Completion Date:	05/20/19	Ground Elevation:	309.00	Screen Size:	0.10 Slot
Contractor:	Jetco Inc.	Total Depth:	15'	Filter Pack:	#2 Sand
Driller:	Rory Ricks	TOC Elevation:	309.32	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Light brown SILT, little fine Sand, dry **(SM)**				1" Piezometer installed for additional groundwater and bedrock (auger refusal) control data; drill cuttings logged; no samples collected
		5	Light Tan to gray fine SAND, some Silt, micaceous, dry **(SM)**			304.00	
		10	Brown to gray very fine SAND and Silt, micaceous, dry, *SAPROLITE* **(SM)**			299.00	Auger bit chattering noted, Increase in drilling down pressure required to advance depth;
		15	**Auger Refusal at 15'**			294.00	
		20				289.00	
		25				284.00	
		30				279.00	

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BORING/WELL LOG

Boring/Well ID: **DAA-44pz**

Project:	**Green Ridge Recycling**	Boring/Well Area:	**West Area**	Drilling Rig Type:	**Geoprobe 7822DT**
Project #:	**18020117-030201**	Logged By:	**D. Coakley**	Drilling Method:	**2.25" Hollow Stem Auger**
Location:	**Cumberland County, VA**	Northing:	**3727203.10**	Sampling Method:	**Logged Cuttings**
Start Date:	**05/20/19**	Easting:	**11593948.53**	Well Material:	**1" Schedule 40 PVC**
Completion Date:	**05/20/19**	Ground Elevation:	**379.96**	Screen Size:	**0.10 Slot**
Contractor:	**Jetco Inc.**	Total Depth:	**45'**	Filter Pack:	**#2 Sand**
Driller:	**Rory Ricks**	TOC Elevation:	**382.98**	Seal:	**Bentonite Pellets/Hydrated**

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red to brown SILT and Clay, trace fine Sand, micaceous **(ML)**				
		5	Red SILT, trace white quartz gravel, **(SM)**			374.96	
			Dark brown SILT, trace fine Sand, micaceous, **(SM)**				
		10				369.96	
							1" Piezometer installed for additional groundwater and bedrock (auger refusal) control data; drill cuttings logged; no samples collected
		15	Light Gray SILT, trace quartz gravel, micaceous, **(SM)**			364.96	
		20				359.96	
		25				354.96	
							Auger bit chattering noted, Increase in drilling down pressure required to advance depth;
		30	Gray fine SAND, some Silt, trace white quartz gravel, micaceous, *SAPROLITE* **(SM)**			349.96	

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BORING/WELL LOG

Boring/Well ID: **DAA-44pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Geoprobe 7822DT
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	2.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3727203.10	Sampling Method:	Logged Cuttings
Start Date:	05/20/19	Easting:	11593948.53	Well Material:	1" Schedule 40 PVC
Completion Date:	05/20/19	Ground Elevation:	379.96	Screen Size:	0.10 Slot
Contractor:	Jetco Inc.	Total Depth:	45'	Filter Pack:	#2 Sand
Driller:	Rory Ricks	TOC Elevation:	382.98	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
		40	Gray fine SAND, some Silt, trace white quartz gravel, micaceous, *SAPROLITE* **(SM)**			339.96	
		45	**Auger Refusal at 45"**			334.96	
		50				329.96	
		55				324.96	
		60				319.96	
		65				314.96	

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BORING/WELL LOG

Boring/Well ID: **DAA-45pz**

Project:	**Green Ridge Recycling**	Boring/Well Area:	**West Area**	Drilling Rig Type:	**Geoprobe 7822DT**
Project #:	**18020117-030201**	Logged By:	**D. Coakley**	Drilling Method:	**2.25" Hollow Stem Auger**
Location:	**Cumberland County, VA**	Northing:	**3731594.25**	Sampling Method:	**Logged Cuttings**
Start Date:	**05/20/19**	Easting:	**11590676.39**	Well Material:	**1" Schedule 40 PVC**
Completion Date:	**05/20/19**	Ground Elevation:	**269.06**	Screen Size:	**0.10 Slot**
Contractor:	**Jetco Inc.**	Total Depth:	**8'**	Filter Pack:	**#2 Sand**
Driller:	**Rory Ricks**	TOC Elevation:	**271.24**	Seal:	**Bentonite Pellets/Hydrated**

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand **(ML)**				1" Piezometer installed for additional groundwater and bedrock (auger refusal) control data; drill cuttings logged; no samples collected
		5	Light Tan to gray fine SAND, some Silt, micaceous, dry **(SM)**			264.06	
			Auger Refusal at 8'				
		10				259.06	
		15				254.06	
		20				249.06	
		25				244.06	
		30				239.06	

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BORING/WELL LOG

Boring/Well ID: **DAA-46pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Geoprobe 7822DT
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	2.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3727762.31	Sampling Method:	Logged Cuttings
Start Date:	05/20/19	Easting:	11593398.57	Well Material:	1" Schedule 40 PVC
Completion Date:	05/20/19	Ground Elevation:	360.77	Screen Size:	0.10 Slot
Contractor:	Jetco Inc.	Total Depth:	35'	Filter Pack:	#2 Sand
Driller:	Rory Ricks	TOC Elevation:	364.16	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red SILT, some Clay, trace fine Sand **(ML)**				
		5	Red to brown SILT, some fine Sand, trace Clay, micaceous, **(SM)**			355.77	
		10				350.77	
			Brown fine SAND, some Silt, trace white quartz gravel, micaceous, **(SM)**				
		15				345.77	1" Piezometer installed for additional groundwater and bedrock (auger refusal) control data; drill cuttings logged; no samples collected
		20				340.77	
			Light Gray SILT and fine Sand, micaceous, **(SM)**				
		25				335.77	
		30	Dark Gray very fine SAND, little Silt, micaceous, **(SM)**			330.77	
			Auger Refusal at 35'				

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BORING/WELL LOG

Boring/Well ID: **DAA-47pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Geoprobe 7822DT
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	2.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726637.56	Sampling Method:	Logged Cuttings
Start Date:	05/21/19	Easting:	11592845.76	Well Material:	1" Schedule 40 PVC
Completion Date:	05/21/19	Ground Elevation:	359.19	Screen Size:	0.10 Slot
Contractor:	Jetco Inc.	Total Depth:	54'	Filter Pack:	#2 Sand
Driller:	Rory Ricks	TOC Elevation:	360.91	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
			Red to brown SILT, some Clay, trace fine Sand **(ML)**				
		5	Red to brown SILT, little fine Sand, trace gravel **(SM)**			354.19	
		10	Very light Tan to white fine SAND, little Silt **(SM)**			349.19	
		15	Light brown very fine SAND, trace gravel, micaceous **(SM)**			344.19	1" Piezometer installed for additional groundwater and bedrock (auger refusal) control data; drill cuttings logged; no samples collected
		20				339.19	
		25				334.19	
		30	Light gray fine SAND, trace Silt, trace white quartz gravel **(SM)**			329.19	

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BORING/WELL LOG

Boring/Well ID: **DAA-47pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Geoprobe 7822DT
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	2.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3726637.56	Sampling Method:	Logged Cuttings
Start Date:	05/21/19	Easting:	11592845.76	Well Material:	1" Schedule 40 PVC
Completion Date:	05/21/19	Ground Elevation:	359.19	Screen Size:	0.10 Slot
Contractor:	Jetco Inc.	Total Depth:	54'	Filter Pack:	#2 Sand
Driller:	Rory Ricks	TOC Elevation:	360.91	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
		40	Gray very fine SAND, little Silt, micaceous, wet *SAPROLITE* **(SM)**			319.19	
		45				314.19	
		50	Dark Gray very fine SAND, little Silt, micaceous, wet *SAPROLITE* **(SM)**			309.19	Auger bit chattering noted, Increase in drilling down pressure required to advance depth;
			Auger Refusal at 54"				
		55				304.19	
		60				299.19	
		65				294.19	

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BORING/WELL LOG

Boring/Well ID: **DAA-48pz**

Project:	Green Ridge Recycling	Boring/Well Area:	West Area	Drilling Rig Type:	Geoprobe 7822DT
Project #:	18020117-030201	Logged By:	D. Coakley	Drilling Method:	2.25" Hollow Stem Auger
Location:	Cumberland County, VA	Northing:	3730575.48	Sampling Method:	Logged Cuttings from 0-6
Start Date:	05/21/19	Easting:	11589971.32	Well Material:	1" Schedule 40 PVC
Completion Date:	05/21/19	Ground Elevation:	315.50	Screen Size:	0.10 Slot
Contractor:	Jetco Inc.	Total Depth:	18'	Filter Pack:	#2 Sand
Driller:	Rory Ricks	TOC Elevation:	317.84	Seal:	Bentonite Pellets/Hydrated

N Value	Blow Counts	Depth	Description (USCS)	Geol	Well Log	ELEV.	Remarks
		5	Red SILT, some Clay, trace fine Sand **(ML)**			310.50	1" Piezometer installed for additional groundwater and bedrock (auger refusal) control data; drill cuttings logged; no samples collected
		10				305.50	
		15	Very light Tan fine SAND, trace Silt, white quartz gravel lenses, *SAPROLITE* **(SM)**			300.50	Auger bit chattering noted, Increase in drilling down pressure required to advance depth;
			Auger Refusal at 18'				
		20				295.50	
		25				290.50	
		30				285.50	

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TABLE 1

Boring Log Completion Details

Groundwater and Bedrock Elevation Data

Green Ridge Recycling and Disposal Facility

Cumberland, VA

Boring ID	Completion Date	Auger Refusal Depth (ft bgs)	Rock Core Depth (ft bgs)	Current Status	Depth to Groundwater (feet below top of casing)			Elevation Data (feet above mean sea level)								
								Top of Casing	Top of Screen	Bottom of Screen	Ground Surface	Groundwater			Proposed Base Grade	Bedrock
					04/11/19	05/31/19	10/29/19					04/11/19	05/31/19	10/29/19		
B-1	11/30/17	51	-	1" Piezometer	37.06	36.14	36.65	375.59	339.63	323.63	374.63	338.53	339.45	338.94	344.65	323.63
B-2	11/30/17	32	32 to 42	Sealed Boring	-	-	-	-	-	-	358.28	-	-	-	na	326.28
B-3	12/01/17	25.5	25.5 to 35.5	1" Piezometer	19.90	19.40	20.06	348.89	312.33	322.33	347.83	328.99	329.49	328.83	322.88	322.33
B-4	12/01/17	25.5	-	Sealed Boring	-	-	-	-	-	-	329.63	-	-	-	na	304.13
B-5	12/04/17	10	-	Sealed Boring	-	-	-	-	-	-	315.00	-	-	-	299.16	305.00
B-6	12/12/17	40	40 to 50	Sealed Boring	-	-	-	-	-	-	355.46	-	-	-	na	315.46
B-7	12/05/17	55	-	1" Piezometer	31.78	30.53	31.84	353.71	312.33	297.33	352.33	321.93	323.18	321.87	328.18	297.33
B-8	12/04/17	36	-	1" Piezometer	36.15	35.15	35.20	331.21	304.26	294.26	330.26	295.06	296.06	296.01	315.69	294.26
B-9	12/01/17	21	-	Sealed Boring	-	-	-	-	-	-	310.55	-	-	-	281.26	289.55
B-10	12/05/17	47	-	1" Piezometer	29.72	29.19	30.10	342.16	309.19	294.19	341.19	312.44	312.97	312.06	317.97	294.19
B-11	12/05/17	40	-	Sealed Boring	-	-	-	-	-	-	320.32	-	-	-	281.07	280.32
B-12	12/06/17	40	-	1" Piezometer	10.82	13.08	19.55	337.01	315.89	295.89	335.89	326.19	323.93	317.46	na	295.89
B-13	12/07/17	25	-	Sealed Boring	-	-	-	-	-	-	332.58	-	-	-	316.19	307.58
B-14	12/07/17	42.5	-	1" Piezometer	30.34	31.16	33.87	291.89	258.00	248.00	290.50	261.55	260.73	258.02	265.73	248.00
B-15	12/08/17	11	-	Sealed Boring	-	-	-	-	-	-	265.88	-	-	-	na	254.88
B-16	12/08/17	30	-	Sealed Boring	-	-	-	-	-	-	320.00	-	-	-	na	290.00
B-17	11/12/17	47	-	1" Piezometer	31.38	30.15	30.99	383.46	354.37	334.37	381.37	352.08	353.31	352.47	na	334.37
B-18	12/14/17	30	30 to 40	1" Piezometer	13.81	13.94	16.60	366.17	350.42	325.42	365.42	352.36	352.23	349.57	348.09	335.42
B-19	12/13/17	46.5	-	Sealed Boring	-	-	-	-	-	-	363.66	-	-	-	na	317.16
B-20	12/15/17	38	38 to 48	1" Piezometer	34.65	34.05	34.90	349.61	316.15	301.15	349.15	314.96	315.56	314.71	na	311.15
DAA-1sb	02/21/19	21.5	21.5 to 31.5	Sealed Boring	-	-	-	-	-	-	348.25	-	-	-	332.22	326.75
DAA-2sb	02/25/19	51.5	-	Sealed Boring	-	-	-	-	-	-	355.61	-	-	-	325.04	304.11
DAA-3sb	02/25/19	> 62	-	Sealed Boring	-	-	-	-	-	-	348.39	-	-	-	333.64	< 286.39
DAA-4sb	02/26/19	39	-	Sealed Boring	-	-	-	-	-	-	347.44	-	-	-	343.78	308.44
DAA-5pz	02/26/19	35.5	-	2" Piezometer	20.32	19.56	21.25	356.50	325.99	320.99	356.49	336.18	336.94	335.25	339.68	320.99
DAA-6pz	02/26/19	23.5	-	2" Piezometer	18.25	18.13	21.20	335.19	314.42	309.42	332.92	316.94	317.06	313.99	324.63	309.42
DAA-7sb	02/27/19	63.5	-	Sealed Boring	-	-	-	-	-	-	352.90	-	-	-	na	289.40
DAA-8pz	02/27/19	36	-	2" Piezometer	8.47	9.59	13.55	365.46	338.19	328.19	364.19	356.99	355.87	351.91	na	328.19
DAA-9pz	02/28/19	25	-	2" Piezometer	19.89	19.71	21.70	365.68	350.25	340.25	365.25	345.79	345.97	343.98	348.58	340.25
DAA-10pz	02/28/19	31	-	2" Piezometer	22.95	22.66	24.60	341.55	313.45	308.45	339.45	318.60	318.89	Dry	323.52	308.45
DAA-11pz	02/28/19	23	-	2" Piezometer	dry	23.75	dry	336.30	317.07	312.07	335.07	Dry	312.55	Dry	na	312.07
DAA-12pz	03/04/19	25.5	-	2" Piezometer	22.34	22.35	26.00	331.20	309.57	304.57	330.07	308.86	308.85	305.20	315.95	304.57
DAA-13pz	03/04/19	34	-	2" Piezometer	24.82	24.66	27.05	359.36	328.96	323.96	357.96	334.54	334.70	332.31	331.44	323.96
DAA-14pz	03/05/19	42	-	2" Piezometer	36.79	35.75	35.30	381.44	343.13	338.13	380.13	344.65	345.69	346.14	349.97	338.13
DAA-15pz-s	03/05/19	34	-	2" Piezometer	24.53	24.08	25.20	331.15	300.98	295.98	329.98	306.62	307.07	305.95	302.47	295.98
DAA-15pz-d	03/05/19	29	29 to 39	2" Piezometer	24.72	24.25	25.30	331.34	300.71	290.71	329.71	306.62	307.09	306.04	na	300.71
DAA-16pz	03/06/19	26	-	2" Piezometer	21.68	27.57	dry	324.60	302.02	297.02	323.02	302.92	297.03	Dry	301.63	297.02
DAA-17sb	03/06/19	22.5	-	Sealed Boring	-	-	-	-	-	-	332.69	-	-	-	305.85	310.19
DAA-18pz	03/07/19	27	-	2" Piezometer	17.68	18.26	21.83	343.46	320.12	315.12	342.12	325.78	325.20	321.63	na	315.12
DAA-19pz-s	03/07/19	21.5	-	2" Piezometer	17.00	17.68	20.40	325.94	308.84	303.84	325.34	308.94	308.26	305.54	313.26	303.84
DAA-19pz-d	03/11/19	23	23 to 33	2" Piezometer	18.17	18.80	22.20	327.09	306.18	296.18	325.18	308.92	308.29	304.89	na	302.18
DAA-20pz	03/11/19	34	-	2" Piezometer	dry	dry	dry	313.62	283.39	278.39	312.39	Dry	Dry	Dry	277.63	278.39
DAA-21sb	03/12/19	47	-	Sealed Boring	-	-	-	-	-	-	315.47	-	-	-	285.97	268.47

GREEN RIDGE
RECYCLING AND DISPOSAL FACILITY

Draper Aden Associates
Engineering • Surveying • Environmental Services

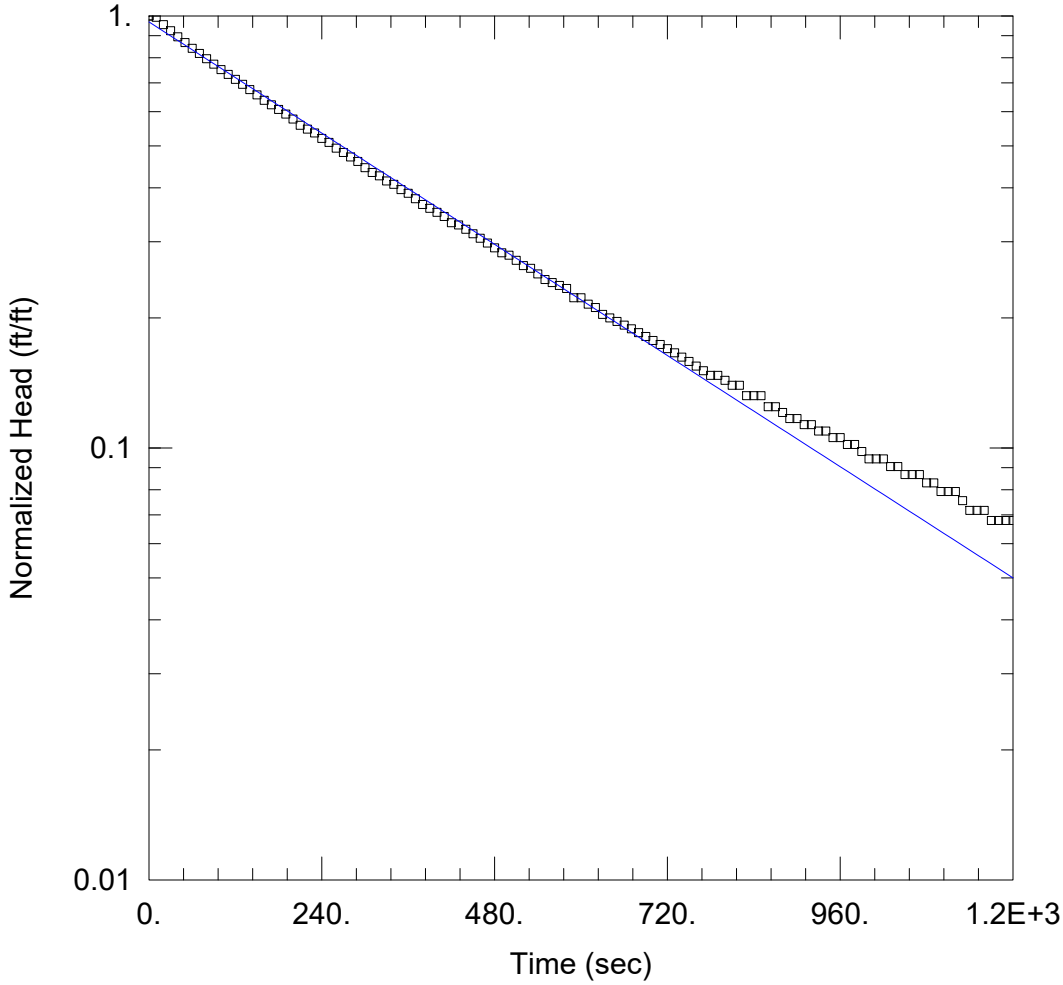
TABLE 1
Boring Log Completion Details
Groundwater and Bedrock Elevation Data
Green Ridge Recycling and Disposal Facility
Cumberland, VA

Boring ID	Completion Date	Auger Refusal Depth (ft bgs)	Rock Core Depth (ft bgs)	Current Status	Depth to Groundwater (feet below top of casing)			Elevation Data (feet above mean sea level)								
								Top of Casing	Top of Screen	Bottom of Screen	Ground Surface	Groundwater			Proposed Base Grade	Bedrock
					04/11/19	05/31/19	10/29/19					04/11/19	05/31/19	10/29/19		
DAA-22pz	03/12/19	> 55	-	2" Piezometer	37.55	35.86	35.48	324.70	278.33	268.33	323.33	287.15	288.84	289.22	293.84	< 268.33
DAA-23pz-s	03/13/19	33	-	2" Piezometer	28.59	26.34	29.20	320.61	290.63	285.63	318.63	292.02	294.27	291.41	315.56	285.63
DAA-23pz-d	03/13/19	37	37 to 47	2" Piezometer	27.98	26.26	23.82	318.67	280.94	270.94	317.94	290.69	292.41	294.85	na	280.94
DAA-24pz	03/13/19	23	-	2" Piezometer	22.33	20.27	20.40	291.19	271.87	266.87	289.87	268.86	270.92	270.79	275.92	266.87
DAA-25pz-s	03/14/19	37	-	2" Piezometer	23.55	23.55	26.00	328.45	294.38	289.38	326.38	304.90	304.90	302.45	310.75	289.38
DAA-25pz-d	03/14/19	37	37 to 47	2" Piezometer	21.88	21.95	25.05	327.70	289.58	279.58	326.58	305.82	305.75	302.65	na	289.58
DAA-26pz	03/27/19	48	-	2" Piezometer	28.76	28.07	28.86	305.08	261.20	256.20	304.20	276.32	277.01	276.22	284.60	256.20
DAA-27sb	03/27/19	21.5	-	Sealed Boring	-	-	-	-	-	-	331.70	-	-	-	295.20	310.20
DAA-28sb	03/28/19	44	-	Sealed Boring	-	-	-	-	-	-	320.28	-	-	-	299.64	276.28
DAA-29pz	03/28/19	34.5	-	2" Piezometer	20.91	20.63	25.60	349.41	318.34	313.34	347.84	328.50	328.78	323.81	322.08	313.34
DAA-30sb	03/28/19	31	-	Sealed Boring	-	-	-	-	-	-	339.93	-	-	-	313.35	308.93
DAA-31pz	03/29/19	33.5	-	2" Piezometer	31.64	31.04	32.20	349.92	320.07	315.07	348.57	318.28	318.88	317.72	319.98	315.07
DAA-32sb	03/29/19	31	-	Sealed Boring	-	-	-	-	-	-	349.82	-	-	-	325.35	318.82
DAA-33sb	04/02/19	17	-	Sealed Boring	-	-	-	-	-	-	348.20	-	-	-	333.81	331.20
DAA-34pz	04/02/19	39.5	-	2" Piezometer	27.65	25.91	26.75	355.38	320.20	315.20	354.70	327.73	329.47	328.63	334.17	315.20
DAA-35pz	04/03/19	38	-	2" Piezometer	31.58	30.95	32.00	367.36	332.58	327.58	365.58	335.78	336.41	335.36	340.90	327.58
DAA-36pz	04/03/19	45	-	2" Piezometer	10.25	10.64	14.04	340.83	300.15	295.15	340.15	330.58	330.19	326.79	335.19	295.15
DAA-37sb	04/04/19	47.5	-	Sealed Boring	-	-	-	-	-	-	357.48	-	-	-	355.32	309.98
DAA-38sb	04/04/19	19.5	-	Sealed Boring	-	-	-	-	-	-	307.43	-	-	-	292.53	287.93
DAA-39sb	04/04/19	25.5	-	Sealed Boring	-	-	-	-	-	-	315.21	-	-	-	284.97	289.71
DAA-40pz	04/05/19	29	-	2" Piezometer	25.94	26.83	dry	327.50	301.93	296.93	325.93	301.56	300.67	Dry	305.67	296.93
DAA-41pz	04/08/19	22.5	-	2" Piezometer	22.45	22.83	23.60	307.99	289.02	284.02	306.52	285.54	285.16	284.39	290.16	284.02
DAA-42pz	05/20/19	48	-	1" Piezometer	-	27.70	30.25	366.57	320.99	315.99	363.99		338.87	336.32	na	315.99
DAA-43pz	05/20/19	15	-	1" Piezometer	-	dry	dry	309.32	299.00	294.00	309.00		dry	dry	na	294.00
DAA-44pz	05/20/19	45	-	1" Piezometer	-	36.90	38.70	382.98	339.96	334.96	379.96		346.08	344.28	na	334.96
DAA-45pz	05/20/19	8	-	1" Piezometer	-	dry	dry	271.24	266.06	261.06	269.06		dry	dry	266.40	261.06
DAA-46pz	05/20/19	35	-	1" Piezometer	-	26.78	28.80	364.16	330.77	325.77	360.77		337.38	335.36	na	325.77
DAA-47pz	05/21/19	54	-	1" Piezometer	-	29.27	31.52	360.91	310.19	305.19	359.19		331.64	329.39	na	305.19
DAA-48pz	05/21/19	18	-	1" Piezometer	-	dry	dry	317.84	302.50	297.50	315.50		dry	dry	na	297.50

Not Applicable: Boring/Piezometer outside of the Limits of Disposal Area

ATTACHMENT PTA-XIII - LABORATORY AND FIELD DATA

As required by §9 VAC 20-81-460.E, laboratory analysis documentation and field data are herein provided as Attachment XIII. This includes slug test results and geotechnical laboratory analysis of soils.



WELL TEST ANALYSIS

Data Set: C:\Users\Bfitzwater\OneDrive - Draper Aden Associates\Desktop\PZ-5 (FHT).aqt
Date: 07/14/19 Time: 17:23:11

PROJECT INFORMATION

Company: Draper Aden Associates
Client: Green Ridge
Project: 18020117-030102
Location: Cumberland County
Test Well: PZ-5
Test Date: 6/03/19

AQUIFER DATA

Saturated Thickness: 16.94 ft
Anisotropy Ratio (Kz/Kr): 1.

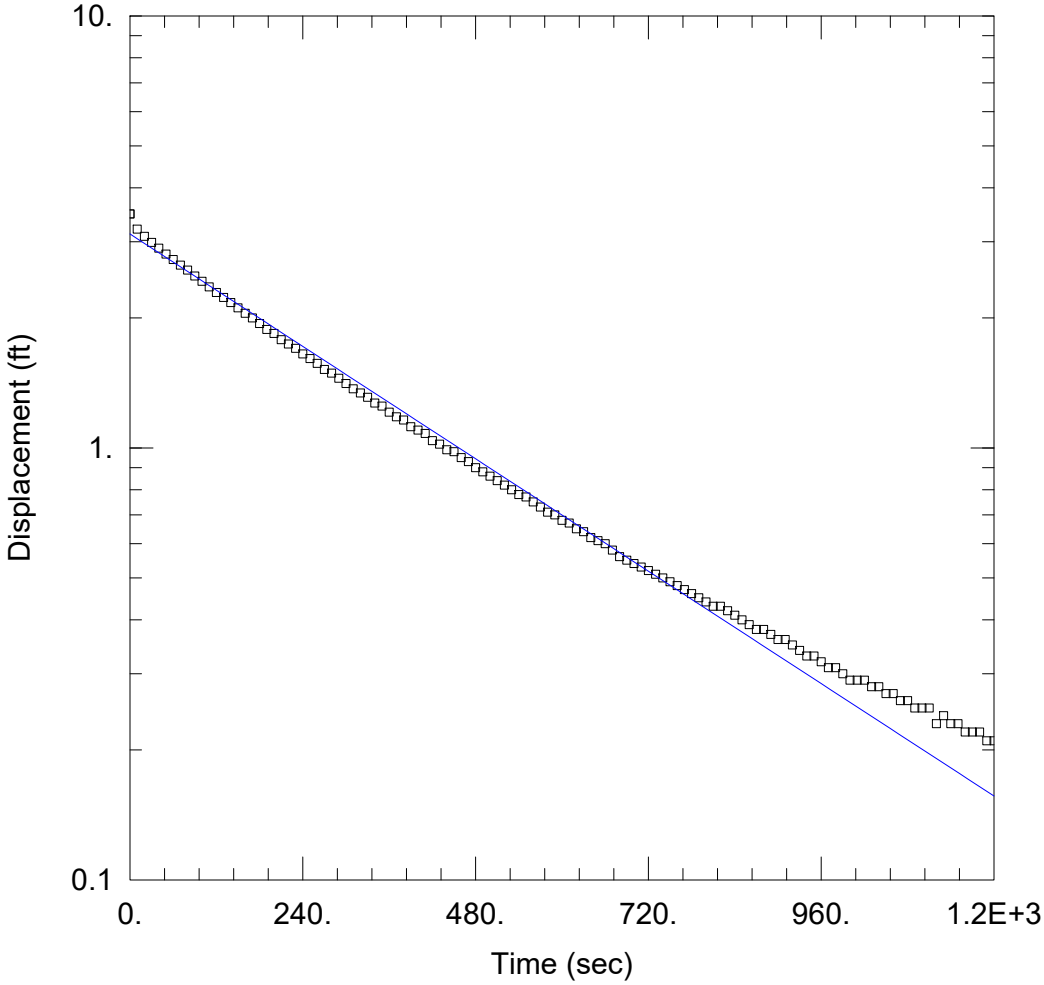
WELL DATA (PZ-5)

Initial Displacement: 2.65 ft
Static Water Column Height: 15.94 ft
Total Well Penetration Depth: 15.94 ft
Screen Length: 5. ft
Casing Radius: 0.083 ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.2907 ft/day
y0 = 2.566 ft



WELL TEST ANALYSIS

Data Set: C:\Users\Bfitzwater\OneDrive - Draper Aden Associates\Desktop\PZ-5 (RHT).aqt
Date: 07/14/19 Time: 17:30:26

PROJECT INFORMATION

Company: Draper Aden Associates
Client: Green Ridge
Project: 18020117-030102
Location: Cumberland County
Test Well: PZ-5
Test Date: 6/03/19

AQUIFER DATA

Saturated Thickness: 16.94 ft
Anisotropy Ratio (Kz/Kr): 1.

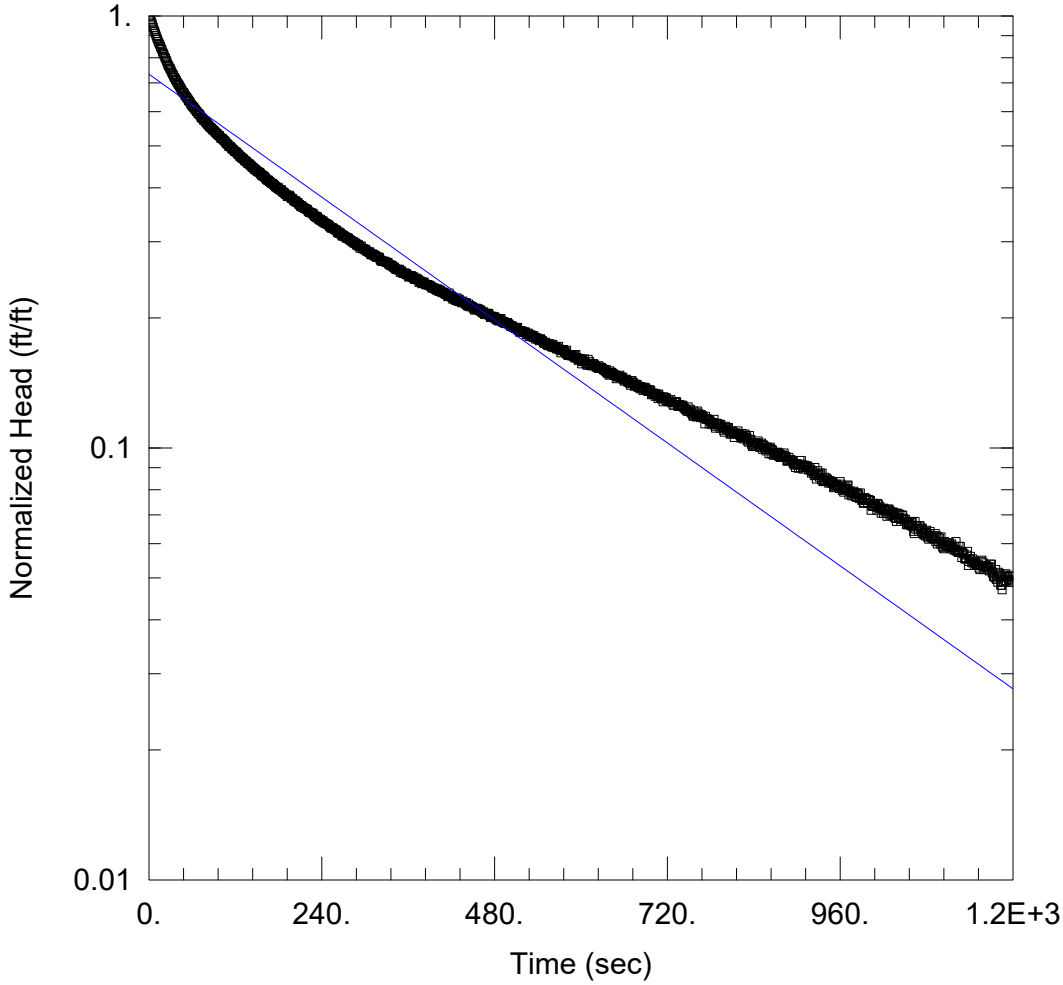
WELL DATA (PZ-5)

Initial Displacement: 3.48 ft
Total Well Penetration Depth: 15.94 ft
Casing Radius: 0.083 ft
Static Water Column Height: 15.94 ft
Screen Length: 5. ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.294 ft/day
y0 = 3.128 ft



FALLING HEAD TEST

Data Set: P:\2018\1802\0100\18020117\18020117-030102\WORK\Slug Test Data\PZ-8\PZ-8 FHT.aqt
Date: 07/15/19 Time: 08:55:09

PROJECT INFORMATION

Company: Draper Aden Associates
Client: Green Ridge
Project: 18020117-030102
Location: Cumberland County
Test Well: PZ-8
Test Date: 6/06/19

AQUIFER DATA

Saturated Thickness: 28.57 ft
Anisotropy Ratio (Kz/Kr): 1.

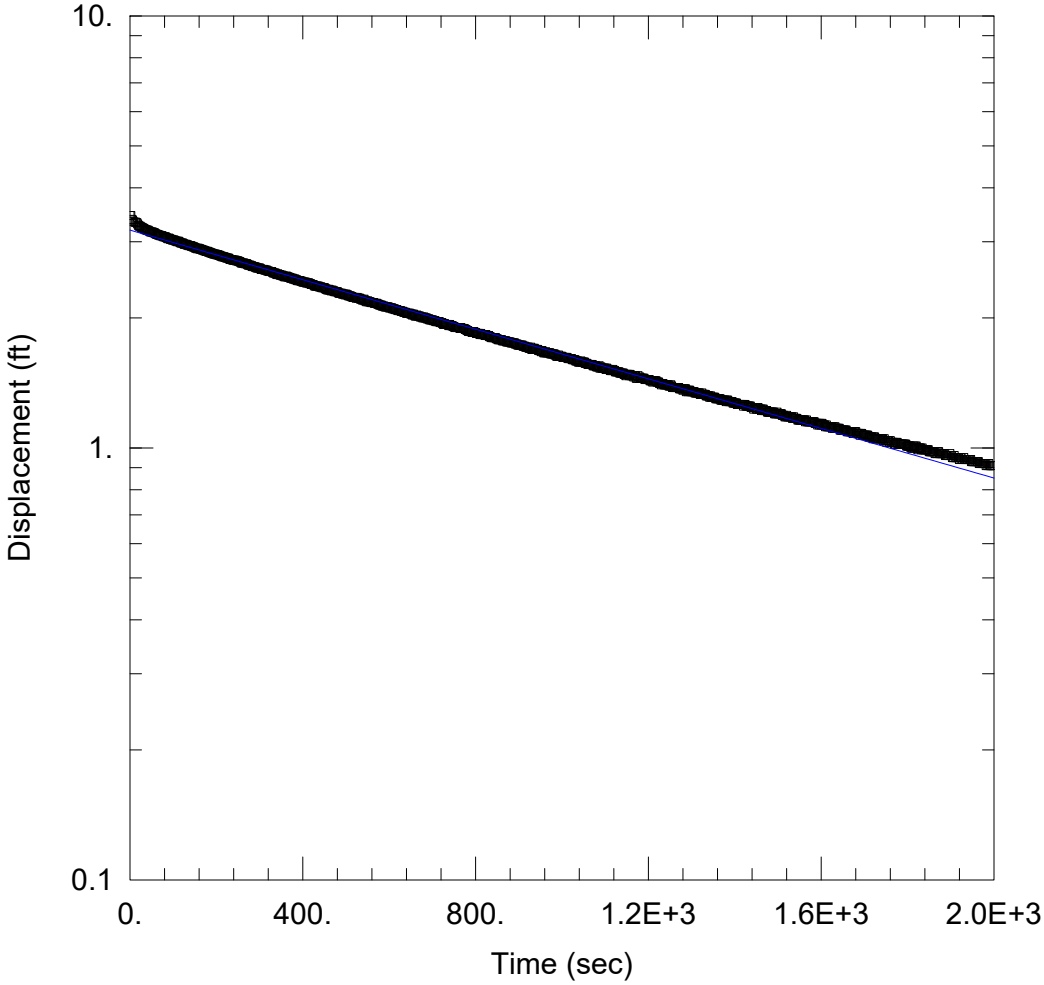
WELL DATA (PZ-8)

Initial Displacement: 2.62 ft
Total Well Penetration Depth: 27.57 ft
Casing Radius: 0.083 ft
Static Water Column Height: 27.57 ft
Screen Length: 10. ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.2052 ft/day
y0 = 1.92 ft



RISING HEAD TEST

Data Set: C:\...\PZ-8 RHT.aqt
Date: 07/14/19 Time: 15:43:14

PROJECT INFORMATION

Company: Draper Aden Associates
Client: Green Ridge
Project: 18020117-030102
Location: Cumberland County
Test Well: PZ-8
Test Date: 6/06/19

AQUIFER DATA

Saturated Thickness: 28.57 ft Anisotropy Ratio (Kz/Kr): 1.

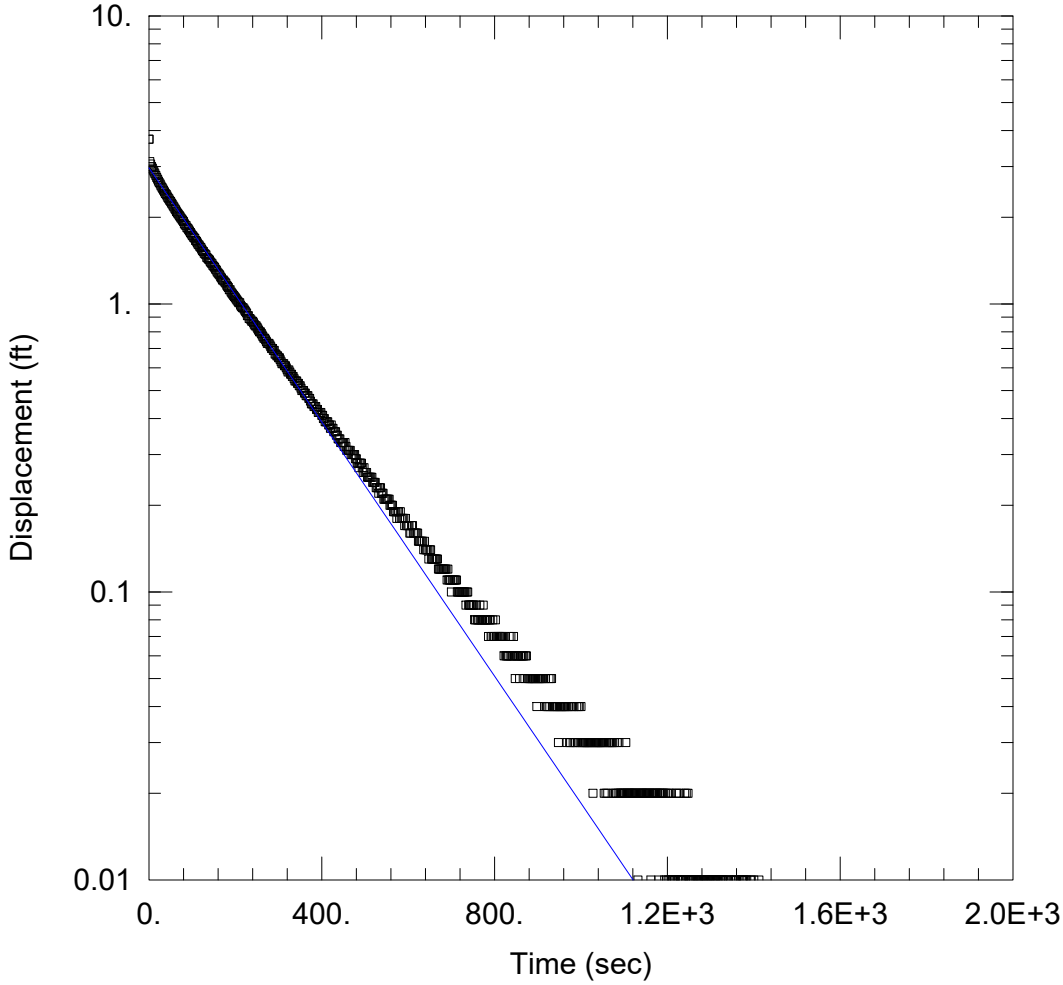
WELL DATA (PZ-8)

Initial Displacement: 3.45 ft Static Water Column Height: 27.57 ft
Total Well Penetration Depth: 27.57 ft Screen Length: 10. ft
Casing Radius: 0.083 ft Well Radius: 0.085 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.06899 ft/day y0 = 3.193 ft



FALLING HEAD TEST

Data Set: C:\...\PZ-22 FHT.aqt
Date: 07/14/19 Time: 15:56:40

PROJECT INFORMATION

Company: Draper Aden Associates
Client: Green Ridge
Project: 18020117-030102
Location: Cumberland County
Test Well: PZ-22
Test Date: 6/06/19

AQUIFER DATA

Saturated Thickness: 21.67 ft Anisotropy Ratio (Kz/Kr): 1.

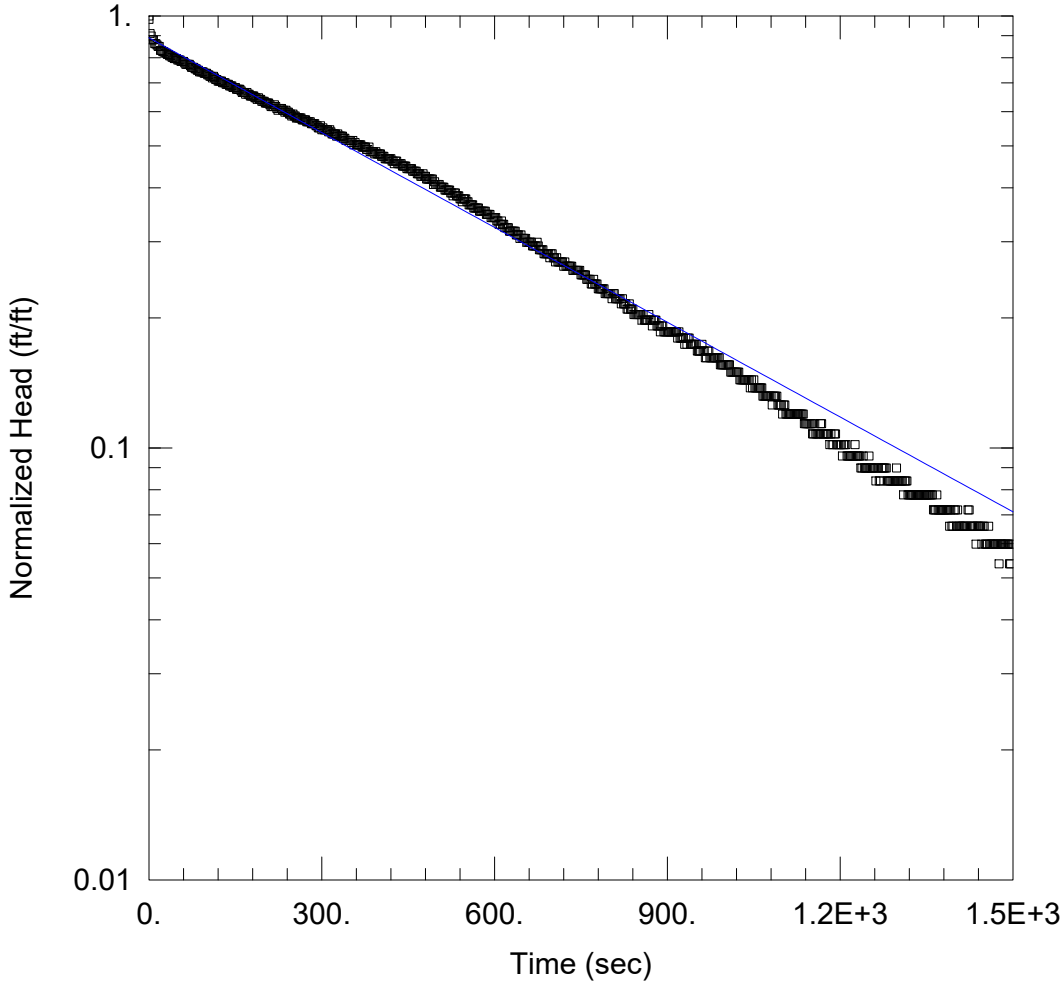
WELL DATA (PZ-22)

Initial Displacement: 3.73 ft Static Water Column Height: 20.67 ft
Total Well Penetration Depth: 20.67 ft Screen Length: 10. ft
Casing Radius: 0.083 ft Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.3637 ft/day y0 = 2.969 ft



RISING HEAD TEST

Data Set: C:\...\PZ-22 RHT.aqt
Date: 07/14/19 Time: 16:00:59

PROJECT INFORMATION

Company: Draper Aden Associates
Client: Green Ridge
Project: 18020117-030102
Location: Cumberland County
Test Well: PZ-22
Test Date: 6/06/19

AQUIFER DATA

Saturated Thickness: 21.67 ft Anisotropy Ratio (Kz/Kr): 1.

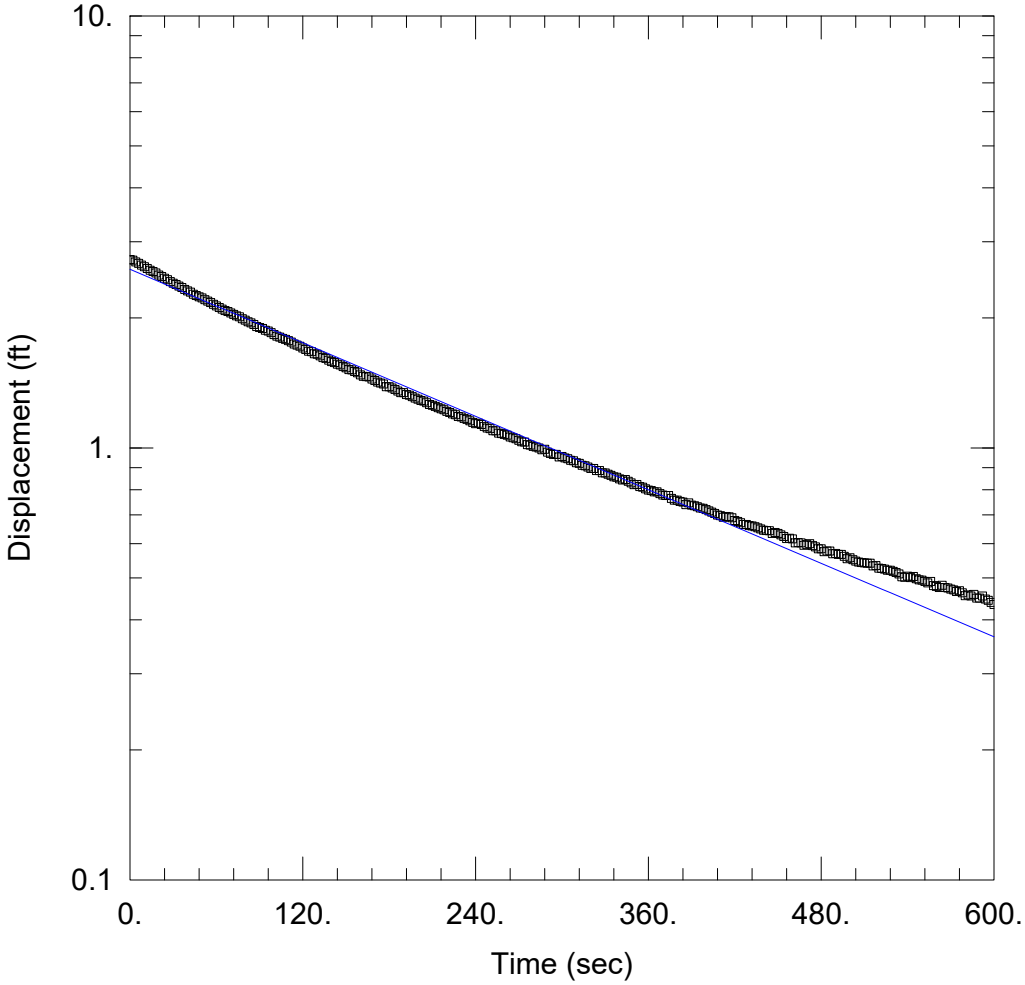
WELL DATA (PZ-22)

Initial Displacement: 1.67 ft Static Water Column Height: 20.67 ft
Total Well Penetration Depth: 20.67 ft Screen Length: 10. ft
Casing Radius: 0.083 ft Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.1206 ft/day y0 = 1.486 ft



FALLING HEAD TEST

Data Set: P:\...\PZ-25 (FHT).aqt
Date: 07/14/19 Time: 15:27:23

PROJECT INFORMATION

Company: Draper Aden Associates
Client: Green Ridge
Project: 18020117-030102
Location: Cumberland County
Test Well: PZ-25 (Shallow)
Test Date: 6/03/19

AQUIFER DATA

Saturated Thickness: 16.4 ft
Anisotropy Ratio (Kz/Kr): 1.

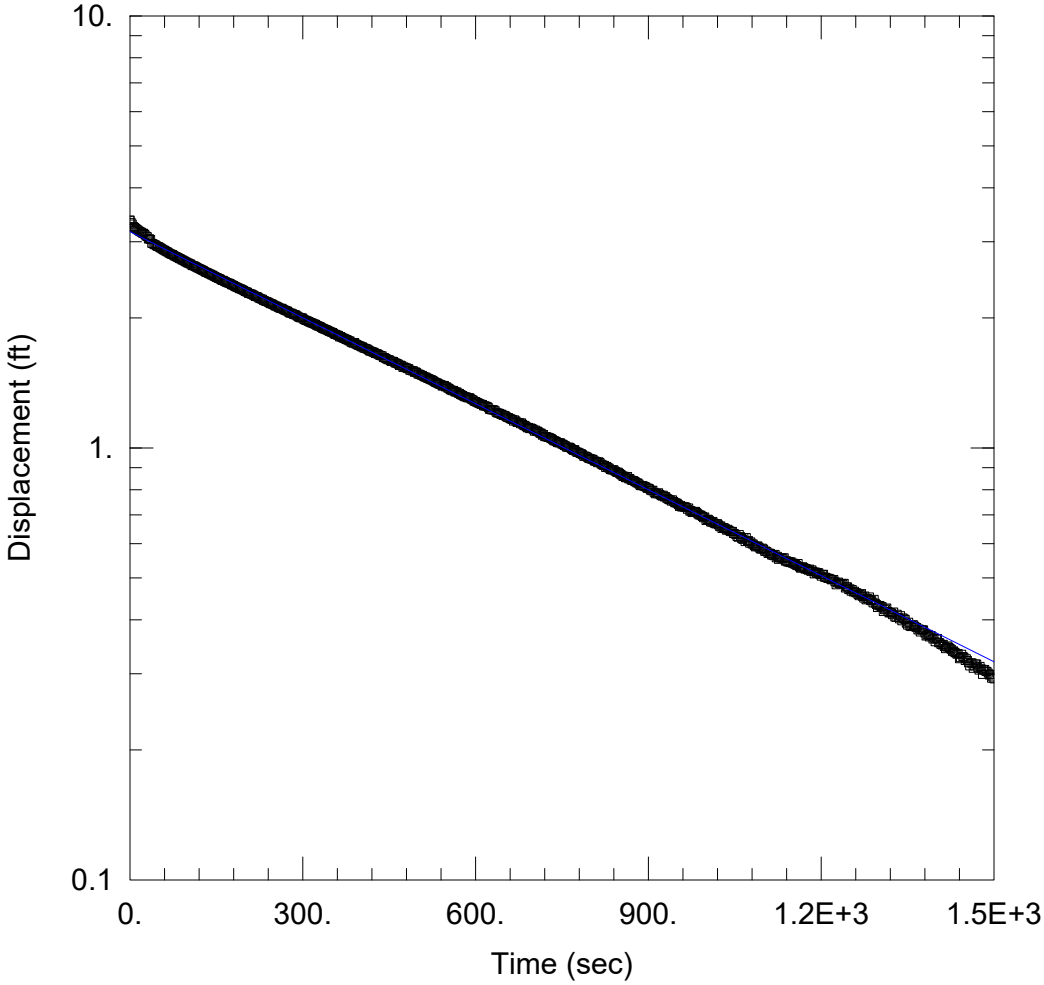
WELL DATA (PZ-25 (Shallow))

Initial Displacement: 2.73 ft
Total Well Penetration Depth: 15.4 ft
Casing Radius: 0.083 ft
Static Water Column Height: 15.4 ft
Screen Length: 5. ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.3823 ft/day
y0 = 2.592 ft



RISING HEAD TEST

Data Set: P:\...\PZ-25 (RHT).aqt
Date: 07/14/19 Time: 15:03:04

PROJECT INFORMATION

Company: Draper Aden Associates
Client: Green Ridge
Project: 18020117-030102
Location: Cumberland County
Test Well: PZ-25 (Shallow)
Test Date: 6/03/19

AQUIFER DATA

Saturated Thickness: 16.4 ft Anisotropy Ratio (Kz/Kr): 1.

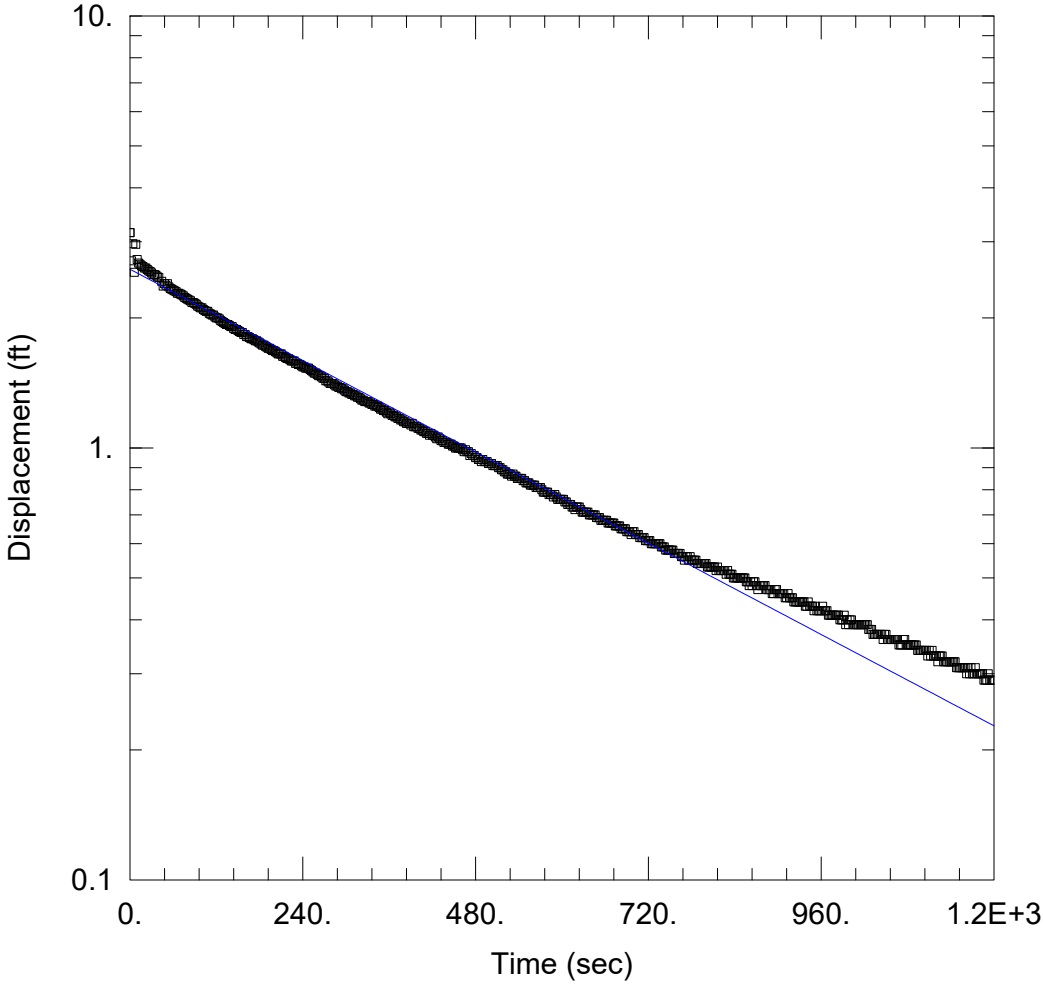
WELL DATA (PZ-25 (Shallow))

Initial Displacement: 3.37 ft Static Water Column Height: 15.4 ft
Total Well Penetration Depth: 15.4 ft Screen Length: 5. ft
Casing Radius: 0.083 ft Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.1789 ft/day y0 = 3.165 ft



FALLING HEAD TEST

Data Set: C:\...\Falling Head Test.aqt
Date: 07/14/19 Time: 16:40:12

PROJECT INFORMATION

Company: Draper Aden Associates
Client: Green Ridge
Project: 18020117-030102
Location: Cumberland County
Test Well: PZ-26
Test Date: 5/16/19

AQUIFER DATA

Saturated Thickness: 21.67 ft Anisotropy Ratio (Kz/Kr): 1.

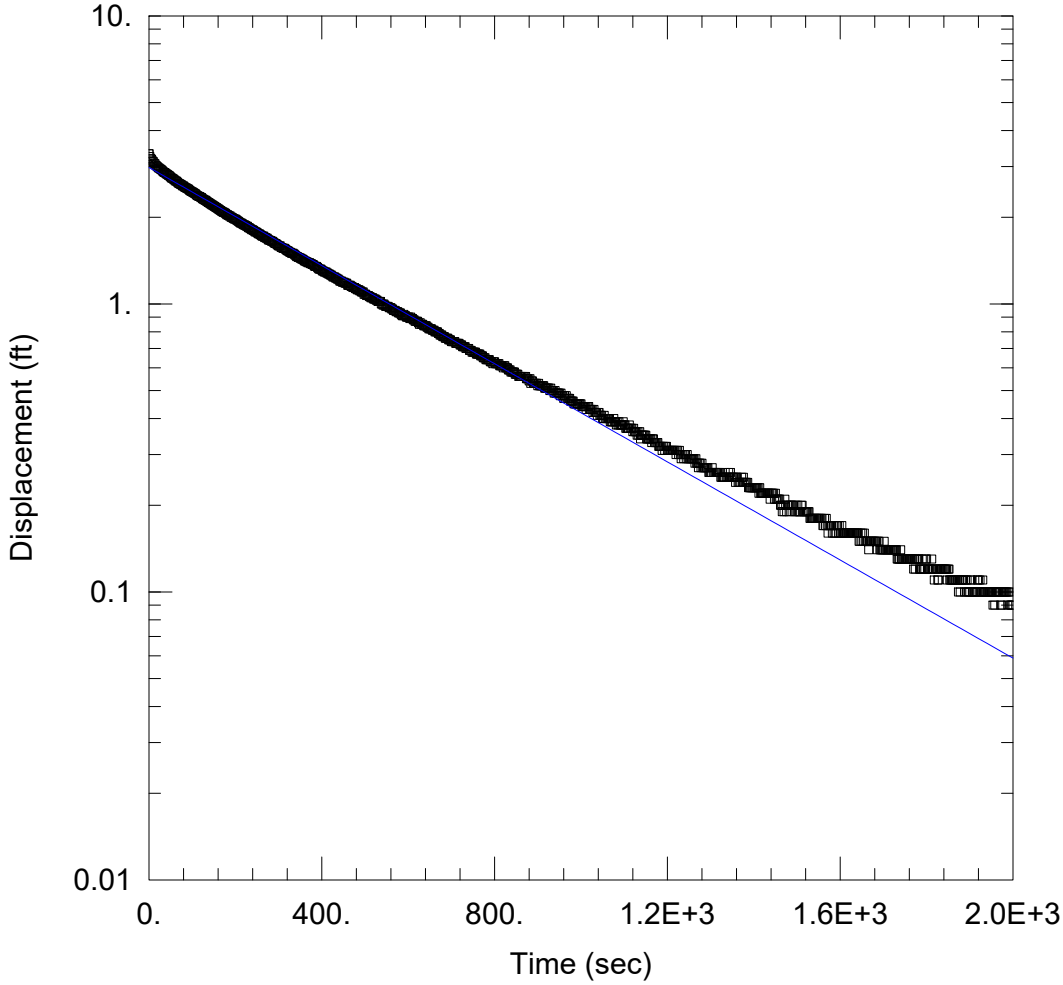
WELL DATA (PZ-26)

Initial Displacement: 3.15 ft Static Water Column Height: 20.67 ft
Total Well Penetration Depth: 20.67 ft Screen Length: 5. ft
Casing Radius: 0.083 ft Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.2489 ft/day y0 = 2.592 ft



RISING HEAD TEST

Data Set: C:\...\Rising Head Test.aqt
Date: 07/14/19 Time: 16:45:57

PROJECT INFORMATION

Company: Draper Aden Associates
Client: Green Ridge
Project: 18020117-030102
Location: Cumberland County
Test Well: PZ-26
Test Date: 5/16/19

AQUIFER DATA

Saturated Thickness: 21.67 ft Anisotropy Ratio (Kz/Kr): 1.

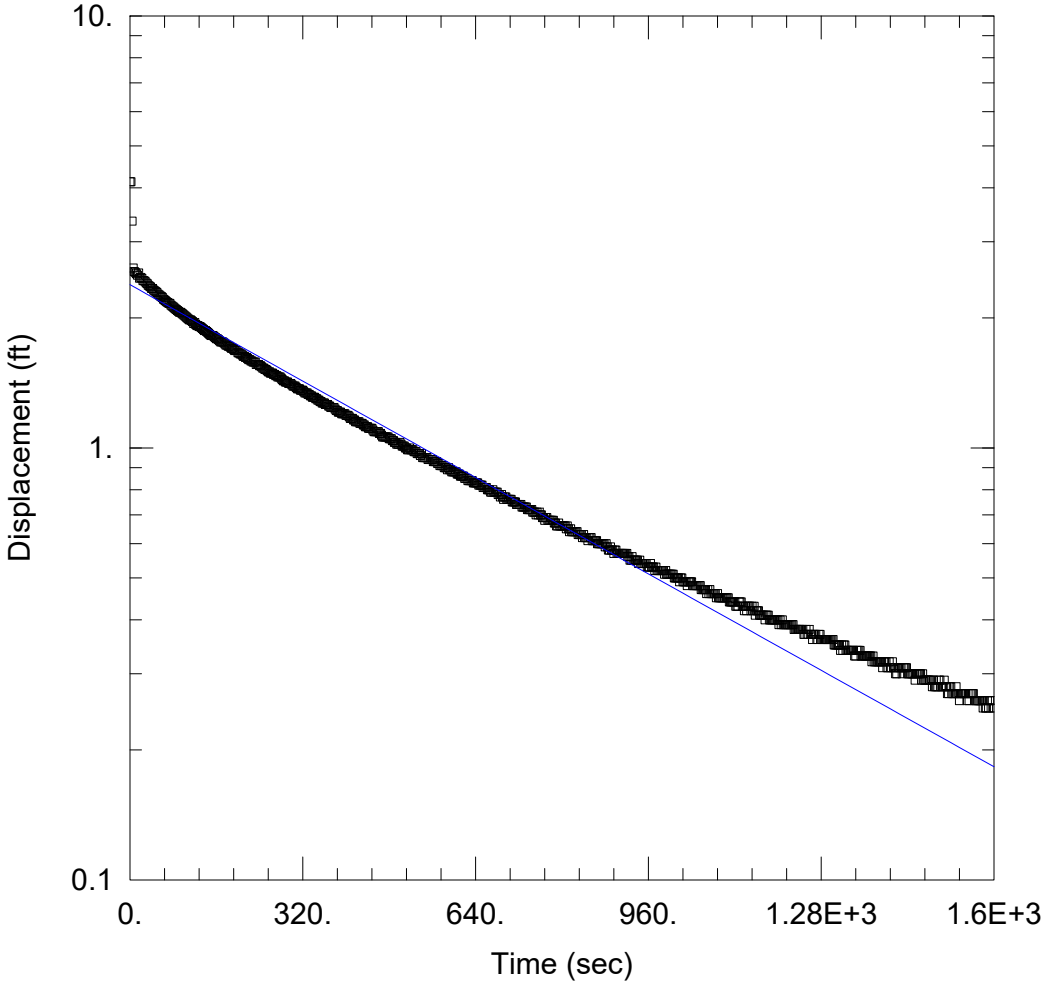
WELL DATA (PZ-26)

Initial Displacement: 3.32 ft Static Water Column Height: 20.67 ft
Total Well Penetration Depth: 20.67 ft Screen Length: 5. ft
Casing Radius: 0.083 ft Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.2407 ft/day y0 = 2.977 ft



FALLING HEAD TEST

Data Set: P:\...\PZ-29 (FHT).aqt
Date: 07/14/19 Time: 16:23:08

PROJECT INFORMATION

Company: Draper Aden Associates
Client: Green Ridge
Project: 18020117-030102
Location: Cumberland County
Test Well: PZ-29
Test Date: 6/06/19

AQUIFER DATA

Saturated Thickness: 16.89 ft Anisotropy Ratio (Kz/Kr): 1.

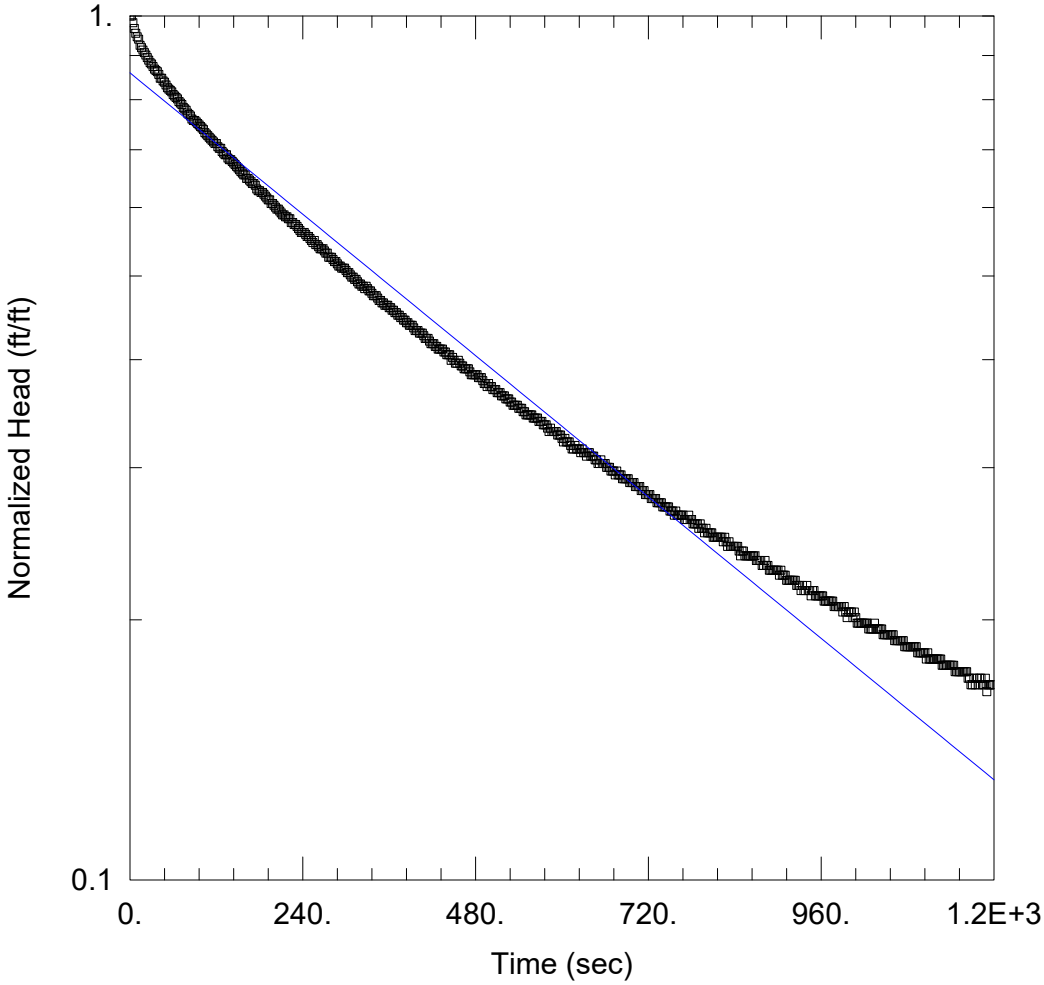
WELL DATA (PZ-29)

Initial Displacement: 4.13 ft Static Water Column Height: 15.89 ft
Total Well Penetration Depth: 15.89 ft Screen Length: 5. ft
Casing Radius: 0.083 ft Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.189 ft/day y0 = 2.387 ft



RISING HEAD TEST

Data Set: P:\...\PZ-29 (RHT).aqt
Date: 07/14/19 Time: 16:20:51

PROJECT INFORMATION

Company: Draper Aden Associates
Client: Green Ridge
Project: 18020117-030102
Location: Cumberland County
Test Well: PZ-29
Test Date: 6/06/19

AQUIFER DATA

Saturated Thickness: 16.89 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (PZ-29)

Initial Displacement: 3.33 ft Static Water Column Height: 15.89 ft
Total Well Penetration Depth: 15.89 ft Screen Length: 5. ft
Casing Radius: 0.083 ft Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.1848 ft/day y0 = 2.861 ft

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data								
Sample ID	DAA-01	DAA-02	DAA-02	DAA-02	DAA-03	DAA-03	DAA-03	DAA-03
Sample Depth	6'-8'	16'-18'	24'-26'	38'-40'	6'-8'	10'-12'	20'-22'	28'-30'
Sample Type	Jar	Jar	Jar	Jar	Jar	Jar	Jar	Jar
Visual Description	Brown	Brownish-Gray	Gray	Light Yellowish-Brown	Light Brownish-Gray	Brown	Brownish-Gray	Light Brownish-Gray
Classification Data								
Natural Moisture Content, %	19.9%	21.4%	9.0%	7.3%	42.4%	45.7%	49.4%	53.3%
Liquid Limit	Np	53	Np	Np	63	65	69	73
Plastic Limit	Np	45	Np	Np	48	44	44	41
Plastic Index	Np	8	Np	Np	15	21	25	32
Passing No. 200 Sieve, %	23.7%	20.7%	18.8%	16.9%	77.3%	79.6%	85.6%	78.0%
USCS Group Symbol	SM	SM	SM	SM	MH	MH	MH	MH
USCS Group Name	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Elastic SILT with Sand	Elastic SILT with Sand	Elastic SILT	Elastic SILT with Sand
Standard Proctor Data								
Maximum Dry Density, pcf	-	-	-	-	-	-	-	-
Optimum Moisture Content, %	-	-	-	-	-	-	-	-
Permeability Data								
Compacted Dry Density, pcf	-	-	-	-	-	-	-	-
Percent Compaction, %	-	-	-	-	-	-	-	-
Compacted Moisture Content, %	-	-	-	-	-	-	-	-
Deviation from Optimum	-	-	-	-	-	-	-	-
Permeability, cm/sec	-	-	-	-	-	-	-	-

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data								
Sample ID	DAA-03	DAA-03	DAA-04	DAA-04	DAA-04	DAA-04	DAA-04	DAA-04
Sample Depth	45'-47	55'-57'	10'-12'	12'-14'	18'-20'	24'-26'	28'-30'	36'-38'
Sample Type	Jar	Jar	Jar	Jar	Jar	Jar	Jar	Jar
Visual Description	Brownish-Gray	Brown	Light Brownish-Gray	Light Red-Brown	Brown	Light Gray	Brown	Brown
Classification Data								
Natural Moisture Content, %	51.3%	43.3%	44.1%	32.8%	49.8%	36.3%	33.3%	26.2%
Liquid Limit	56	63	44	Np	52	Np	41	Np
Plastic Limit	34	35	33	Np	42	Np	34	Np
Plastic Index	22	28	11	Np	10	Np	7	Np
Passing No. 200 Sieve, %	74.4%	69.9%	42.6%	33.6%	45.3%	31.1%	37.6%	30.6%
USCS Group Symbol	MH	MH	SM	SM	SM	SM	SM	SM
USCS Group Name	Elastic SILT with Sand	Sandy Elastic SILT	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND
Standard Proctor Data								
Maximum Dry Density, pcf	-	-	-	-	-	-	-	-
Optimum Moisture Content, %	-	-	-	-	-	-	-	-
Permeability Data								
Compacted Dry Density, pcf	-	-	-	-	-	-	-	-
Percent Compaction, %	-	-	-	-	-	-	-	-
Compacted Moisture Content, %	-	-	-	-	-	-	-	-
Deviation from Optimum	-	-	-	-	-	-	-	-
Permeability, cm/sec	-	-	-	-	-	-	-	-

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data								
Sample ID	DAA-05	DAA-05	DAA-06	DAA-07	DAA-07	DAA-07	DAA-08	DAA-08
Sample Depth	7'-9'	15'-17'	12'-14'	10'-12'	14'-16'	55'-57'	6'-8'	10'-11.5'
Sample Type	Jar	Jar	Jar	Jar	Jar	Jar	Jar	Shelby-Tube
Visual Description	Light Brownish-Gray	Light Red-Brown	Light Brown	Brownish-Gray	Brownish-Gray	Dark Red-Brown	Reddish-Brown	Gray
Classification Data								
Natural Moisture Content, %	7.1%	7.4%	4.8%	29.1%	24.4%	52.3%	32.7%	41.6%
Liquid Limit	Np	Np	Np	56	40	59	53	Np
Plastic Limit	Np	Np	Np	34	28	44	48	Np
Plastic Index	Np	Np	Np	22	12	15	5	Np
Passing No. 200 Sieve, %	16.6%	18.4%	17.1%	31.1%	25.9%	54.7%	39.8%	27.9%
USCS Group Symbol	SM	SM	SM	SM	SM	SM	SM	SM
USCS Group Name	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Sandy Elastic SILT	Silty SAND	Silty SAND
Standard Proctor Data								
Maximum Dry Density, pcf	-	-	-	-	-	-	-	-
Optimum Moisture Content, %	-	-	-	-	-	-	-	-
Permeability Data								
Compacted Dry Density, pcf	-	-	-	-	-	-	-	-
Percent Compaction, %	-	-	-	-	-	-	-	-
Compacted Moisture Content, %	-	-	-	-	-	-	-	-
Deviation from Optimum	-	-	-	-	-	-	-	-
Permeability, cm/sec	-	-	-	-	-	-	-	-

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data								
Sample ID	DAA-08	DAA-08	DAA-09	DAA-09	DAA-10	DAA-10	DAA-12	DAA-13
Sample Depth	12'-14'	20'-22'	6'-8'	20'-22'	22'-24'	24'-26'	25'-27'	8'-10'
Sample Type	Jar	Jar	Jar	Jar	Jar	Jar	Jar	Jar
Visual Description	Brown	Brownish-Gray	Light Brown	Brownish-Gray	Brownish-Gray	Gray	Gray	Light Brown
Classification Data								
Natural Moisture Content, %	43.8%	28.0%	31.3%	12.4%	11.8%	11.6%	3.7%	21.1%
Liquid Limit	43	Np	57	Np	36	Np	Np	39
Plastic Limit	36	Np	44	Np	28	Np	Np	29
Plastic Index	7	Np	13	Np	8	Np	Np	10
Passing No. 200 Sieve, %	26.4%	22.9%	42.3%	16.4%	17.8%	29.5%	18.2%	30.6%
USCS Group Symbol	SM	SM	SM	SM	SM	SM	SM	SM
USCS Group Name	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND
Standard Proctor Data								
Maximum Dry Density, pcf	-	-	-	-	-	-	-	-
Optimum Moisture Content, %	-	-	-	-	-	-	-	-
Permeability Data								
Compacted Dry Density, pcf	-	-	-	-	-	-	-	-
Percent Compaction, %	-	-	-	-	-	-	-	-
Compacted Moisture Content, %	-	-	-	-	-	-	-	-
Deviation from Optimum	-	-	-	-	-	-	-	-
Permeability, cm/sec	-	-	-	-	-	-	-	-

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data								
Sample ID	DAA-13	DAA-13	DAA-13	DAA-14	DAA-14	DAA-14	DAA-14	DAA-14
Sample Depth	14'-16'	26'-28'	28'-30'	6'-8'	10'-12'	14'-16'	24'-26'	26'-28'
Sample Type	Jar	Jar	Jar	Jar	Jar	Jar	Jar	Jar
Visual Description	Brown	Brownish-Gray	Light Brown	Reddish-Brown	Reddish-Brown	Reddish-Brown	Reddish-Brown	Light Brown
Classification Data								
Natural Moisture Content, %	12.6%	17.4%	15.1%	30.8%	36.7%	33.9%	38.4%	18.3%
Liquid Limit	34	Np	Np	66	72	66	55	Np
Plastic Limit	27	Np	Np	41	37	42	40	Np
Plastic Index	7	Np	Np	25	35	24	15	Np
Passing No. 200 Sieve, %	25.4%	17.5%	31.5%	54.4%	71.9%	51.5%	48.1%	26.4%
USCS Group Symbol	SM	SM	SM	MH	MH	MH	SM	SM
USCS Group Name	Silty SAND	Silty SAND	Silty SAND	Sandy Elastic SILT	Elastic SILT with Sand	Sandy Elastic SILT	Silty SAND	Silty SAND
Standard Proctor Data								
Maximum Dry Density, pcf	-	-	-	-	-	-	-	-
Optimum Moisture Content, %	-	-	-	-	-	-	-	-
Permeability Data								
Compacted Dry Density, pcf	-	-	-	-	-	-	-	-
Percent Compaction, %	-	-	-	-	-	-	-	-
Compacted Moisture Content, %	-	-	-	-	-	-	-	-
Deviation from Optimum	-	-	-	-	-	-	-	-
Permeability, cm/sec	-	-	-	-	-	-	-	-

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data								
Sample ID	DAA-14	DAA-17	DAA-17	DAA-18	DAA-19	DAA-20	DAA-21	DAA-22
Sample Depth	30'-32'	6'-8'	10'-12'	6'-8'	6'-8'	14'-16'	6'-8'	6'-8'
Sample Type	Jar	Jar	Jar	Jar	Jar	Jar	Jar	Jar
Visual Description	Light Red-Brown	Light Brown	Brownish-Gray	Light Brown	Brownish-Gray	Brownish-Gray	Light Brown	Light Brown
Classification Data								
Natural Moisture Content, %	13.8%	9.1%	8.6%	27.3%	17.6%	11.4%	14.8%	19.4%
Liquid Limit	Np	Np	41	Np	41	Np	38	Np
Plastic Limit	Np	Np	26	Np	26	Np	27	Np
Plastic Index	Np	Np	14	Np	15	Np	11	Np
Passing No. 200 Sieve, %	25.0%	27.8%	25.6%	23.1%	22.4%	26.7%	25.1%	29.8%
USCS Group Symbol	SM	SM	SM	SM	SM	SM	SM	SM
USCS Group Name	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND
Standard Proctor Data								
Maximum Dry Density, pcf	-	-	-	-	-	-	-	-
Optimum Moisture Content, %	-	-	-	-	-	-	-	-
Permeability Data								
Compacted Dry Density, pcf	-	-	-	-	-	-	-	-
Percent Compaction, %	-	-	-	-	-	-	-	-
Compacted Moisture Content, %	-	-	-	-	-	-	-	-
Deviation from Optimum	-	-	-	-	-	-	-	-
Permeability, cm/sec	-	-	-	-	-	-	-	-

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data								
Sample ID	DAA-22	DAA-22	DAA-23	DAA-23	DAA-23	DAA-25	DAA-25	DAA-26
Sample Depth	10'-12	35'-37'	14'-16'	26'-28'	28'-29.5'	6'-8'	16'-18'	2'-4'
Sample Type	Jar	Jar	Jar	Jar	Shelby-Tube	Jar	Jar	Jar
Visual Description	Brown	Brownish-Gray	Reddish-Brown	Brownish-Gray	Gray	Light Brown	Light Brown	Light Red-Brown
Classification Data								
Natural Moisture Content, %	20.9%	8.1%	22.3%	16.7%	16.5%	39.4%	24.0%	41.5%
Liquid Limit	Np	Np	Np	Np	Np	61	62	79
Plastic Limit	Np	Np	Np	Np	Np	38	38	37
Plastic Index	Np	Np	Np	Np	Np	23	24	42
Passing No. 200 Sieve, %	13.5%	15.5%	30.0%	16.0%	18.9%	40.3%	31.9%	93.8%
USCS Group Symbol	SM	SM	SM	SM	SM	SM	SM	MH
USCS Group Name	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Elastic SILT
Standard Proctor Data								
Maximum Dry Density, pcf	-	-	-	-	-	-	-	-
Optimum Moisture Content, %	-	-	-	-	-	-	-	-
Permeability Data								
Compacted Dry Density, pcf	-	-	-	-	-	-	-	-
Percent Compaction, %	-	-	-	-	-	-	-	-
Compacted Moisture Content, %	-	-	-	-	-	-	-	-
Deviation from Optimum	-	-	-	-	-	-	-	-
Permeability, cm/sec	-	-	-	-	-	-	-	-

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data								
Sample ID	DAA-26	DAA-26	DAA-26	DAA-26	DAA-26	DAA-26	DAA-26	DAA-26
Sample Depth	4'-6'	8'-10'	18'-20'	20'-22'	22'-24'	24'-26'	28'-30'	34'-36'
Sample Type	Jar	Jar	Jar	Jar	Jar	Jar	Jar	Jar
Visual Description	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown
Classification Data								
Natural Moisture Content, %	36.3%	36.1%	46.0%	58.8%	59.4%	60.2%	52.0%	26.3%
Liquid Limit	61	Np	64	67	62	69	51	54
Plastic Limit	38	Np	52	55	46	53	37	42
Plastic Index	23	Np	12	12	16	16	14	12
Passing No. 200 Sieve, %	86.8%	79.7%	70.3%	88.3%	80.9%	87.3%	61.8%	32.0%
USCS Group Symbol	MH	ML	MH	MH	MH	MH	MH	SM
USCS Group Name	Elastic SILT	SILT with Sand	Elastic SILT with Sand	Elastic SILT	Elastic SILT with Sand	Elastic SILT	Sandy Elastic SILT	Silty SAND
Standard Proctor Data								
Maximum Dry Density, pcf	-	-	-	-	-	-	-	-
Optimum Moisture Content, %	-	-	-	-	-	-	-	-
Permeability Data								
Compacted Dry Density, pcf	-	-	-	-	-	-	-	-
Percent Compaction, %	-	-	-	-	-	-	-	-
Compacted Moisture Content, %	-	-	-	-	-	-	-	-
Deviation from Optimum	-	-	-	-	-	-	-	-
Permeability, cm/sec	-	-	-	-	-	-	-	-

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data								
Sample ID	DAA-27	DAA-27	DAA-27	DAA-28	DAA-28	DAA-28	DAA-28	DAA-28
Sample Depth	2'-4'	14'-16'	16'-18'	2'-4'	4'-6'	10'-12'	28'-30'	34'-36'
Sample Type	Jar	Jar	Jar	Jar	Jar	Jar	Jar	Jar
Visual Description	Light Brown	Light Brownish-Gray	Light Gray	Dark Brown	Light Red-Brown	Light Brown	Brownish-Gray	Brown
Classification Data								
Natural Moisture Content, %	7.4%	12.2%	7.5%	24.7%	21.5%	16.1%	9.3%	18.5%
Liquid Limit	Np	Np	Np	38	52	39	Np	Np
Plastic Limit	Np	Np	Np	22	29	29	Np	Np
Plastic Index	Np	Np	Np	16	23	10	Np	Np
Passing No. 200 Sieve, %	23.2%	35.4%	25.9%	42.7%	33.4%	30.4%	19.1%	22.1%
USCS Group Symbol	SM	SM	SM	SC	SM	SM	SM	SM
USCS Group Name	Silty SAND	Silty SAND	Silty SAND	Clayey SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND
Standard Proctor Data								
Maximum Dry Density, pcf	-	-	-	-	-	-	-	-
Optimum Moisture Content, %	-	-	-	-	-	-	-	-
Permeability Data								
Compacted Dry Density, pcf	-	-	-	-	-	-	-	-
Percent Compaction, %	-	-	-	-	-	-	-	-
Compacted Moisture Content, %	-	-	-	-	-	-	-	-
Deviation from Optimum	-	-	-	-	-	-	-	-
Permeability, cm/sec	-	-	-	-	-	-	-	-

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data								
Sample ID	DAA-29	DAA-29	DAA-29	DAA-29	DAA-33	DAA-33	DAA-33	DAA-33
Sample Depth	2'-4'	6'-8'	12'-14'	24'-26'	2'-4'	4'-6'	6'-8'	8'-10'
Sample Type	Jar	Jar	Jar	Jar	Jar	Jar	Jar	Jar
Visual Description	Light Brown	Brown	Brown	Reddish-Brown	Red	Light Red-Brown	Light Brown	Light Gray
Classification Data								
Natural Moisture Content, %	19.4%	30.8%	36.6%	30.0%	27.7%	27.3%	21.9%	13.0%
Liquid Limit	48	63	53	51	64	60	Np	32
Plastic Limit	24	34	41	35	38	33	Np	21
Plastic Index	24	29	12	16	26	27	Np	11
Passing No. 200 Sieve, %	28.8%	23.0%	23.8%	37.4%	36.0%	29.2%	20.2%	40.9%
USCS Group Symbol	SC	SM	SM	SM	SM	SM	SM	SC
USCS Group Name	Clayey SAND	Silty SAND with Gravel	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Clayey SAND
Standard Proctor Data								
Maximum Dry Density, pcf	-	-	-	-	-	-	-	-
Optimum Moisture Content, %	-	-	-	-	-	-	-	-
Permeability Data								
Compacted Dry Density, pcf	-	-	-	-	-	-	-	-
Percent Compaction, %	-	-	-	-	-	-	-	-
Compacted Moisture Content, %	-	-	-	-	-	-	-	-
Deviation from Optimum	-	-	-	-	-	-	-	-
Permeability, cm/sec	-	-	-	-	-	-	-	-

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data								
Sample ID	DAA-33	DAA-33	DAA-34	DAA-34	DAA-34	DAA-35	DAA-35	DAA-35
Sample Depth	10'-12'	12'-14'	2'-4'	6'-8'	20'-22'	2'-4'	4'-6'	6'-8'
Sample Type	Jar	Jar	Jar	Jar	Jar	Jar	Jar	Jar
Visual Description	Light Gray	Light Red-Brown	Reddish-Brown	Light Brown	Light Brown	Red	Red	Reddish-Brown
Classification Data								
Natural Moisture Content, %	12.7%	8.5%	26.8%	10.1%	19.2%	20.9%	39.2%	30.1%
Liquid Limit	35	Np	65	35	Np	46	65	50
Plastic Limit	18	Np	20	19	Np	23	30	39
Plastic Index	17	Np	45	16	Np	23	35	11
Passing No. 200 Sieve, %	31.7%	20.5%	49.0%	17.4%	28.9%	57.7%	41.4%	39.4%
USCS Group Symbol	SC	SM	SC	SC	SM	CL	SC	SM
USCS Group Name	Clayey SAND	Silty SAND	Clayey SAND	Clayey SAND	Silty SAND	Sandy Lean CLAY	Clayey SAND	Silty SAND
Standard Proctor Data								
Maximum Dry Density, pcf	-	-	-	-	-	-	-	-
Optimum Moisture Content, %	-	-	-	-	-	-	-	-
Permeability Data								
Compacted Dry Density, pcf	-	-	-	-	-	-	-	-
Percent Compaction, %	-	-	-	-	-	-	-	-
Compacted Moisture Content, %	-	-	-	-	-	-	-	-
Deviation from Optimum	-	-	-	-	-	-	-	-
Permeability, cm/sec	-	-	-	-	-	-	-	-

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data								
Sample ID	DAA-36	DAA-36	DAA-36	DAA-36	DAA-37	DAA-40	DAA-40	DAA-40
Sample Depth	4'-6'	6'-8'	22'-24'	35'-37'	4'-6'	5'	10'	15'
Sample Type	Jar	Jar	Jar	Jar	Jar	Cuttings	Cuttings	Cuttings
Visual Description	Reddish-Brown	Light Brown	Light Brown	Light Red-Brown	Red	Reddish-Brown	Reddish-Brown	Brown
Classification Data								
Natural Moisture Content, %	35.4%	38.3%	31.9%	24.1%	25.8%	28.4%	19.9%	24.9%
Liquid Limit	69	54	43	41	52	54	42	63
Plastic Limit	52	34	29	30	33	35	32	34
Plastic Index	17	20	14	11	19	19	10	29
Passing No. 200 Sieve, %	40.7%	48.3%	27.2%	31.7%	46.0%	50.4%	40.9%	44.8%
USCS Group Symbol	SM	SM	SM	SM	SM	MH	SM	SM
USCS Group Name	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Sandy Elastic SILT	Silty SAND	Silty SAND
Standard Proctor Data								
Maximum Dry Density, pcf	-	-	-	-	-	-	-	-
Optimum Moisture Content, %	-	-	-	-	-	-	-	-
Permeability Data								
Compacted Dry Density, pcf	-	-	-	-	-	-	-	-
Percent Compaction, %	-	-	-	-	-	-	-	-
Compacted Moisture Content, %	-	-	-	-	-	-	-	-
Deviation from Optimum	-	-	-	-	-	-	-	-
Permeability, cm/sec	-	-	-	-	-	-	-	-

Summary Of Laboratory Tests

Draper Aden Associates
Engineering • Surveying • Environmental Services

Green Ridge,
Cumberland County Landfill
DAA# 18020117-030102
Prepared By: CBW Date: 6/11/2019

Sample Data							
Sample ID	DAA-40	East	East	West	West		
Sample Depth	25'	0'-2.5'	2.5'-5.0'	0'-2.5'	2.5'-5.0'		
Sample Type	Cuttings	Bulk	Bulk	Bulk	Bulk		
Visual Description	Brown	Brown	Light Brown	Brown	Brown		
Classification Data							
Natural Moisture Content, %	11.9%	9.4%	5.9%	18.4%	17.0%		
Liquid Limit	Np	33	34	55	54		
Plastic Limit	Np	20	20	22	22		
Plastic Index	Np	13	14	33	32		
Passing No. 200 Sieve, %	35.9%	33.9%	30.1%	46.9%	58.4%		
USCS Group Symbol	SM	SC	SC	SC	CH		
USCS Group Name	Silty SAND	Clayey SAND	Clayey SAND	Clayey SAND	Sandy Fat CLAY		
Standard Proctor Data							
Maximum Dry Density, pcf	-	113.7	108.8	101.2	103.2		
Optimum Moisture Content, %	-	13.6%	16.7%	18.0%	20.1%		
Permeability Data							
Compacted Dry Density, pcf	-	110.6	105.8	98.1	99.5		
Percent Compaction, %	-	97.3%	97.2%	96.9%	96.4%		
Compacted Moisture Content, %	-	14.3%	17.5%	20.3%	21.3%		
Deviation from Optimum	-	0.7%	0.8%	2.3%	1.2%		
Permeability, cm/sec	-	1.10E-07	1.00E-07	7.60E-08	7.10E-08		

Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-01	Sample Received:	3/19/2019
Sample Depth	6'-8'	Date Tested:	3/19/2019
Visual Sample Description	Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	41	
Pan Wt	194.41	grams
Pan + Soil (wet)	301.24	grams
Pan + Soil (dry)	283.50	grams
Natural Moisture Content	*19.9%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	262.40	grams
Percent Passing No. 200 Sieve	23.7%	
Pan + Soil retained on No. 4 sieve (dry)	194.41	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/15/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

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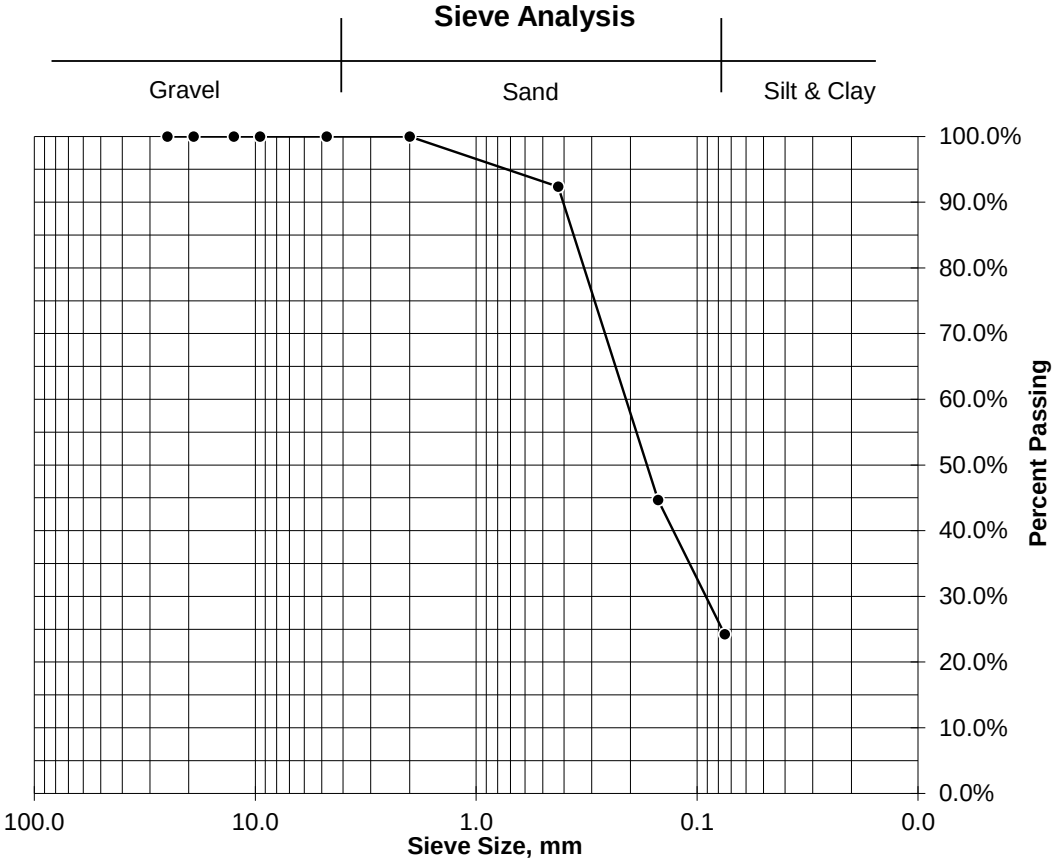
Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-01
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	6.79	7.6%	0.425	92.4%
No. 100	42.51	47.7%	0.15	44.7%
No. 200	18.21	20.4%	0.075	24.2%
Pan	0.45	0.5%		
Total	67.96	76.3%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-02	Sample Received:	3/19/2019
Sample Depth	16'-18'	Date Tested:	3/19/2019
Visual Sample Description	Micaceous Brownish-Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	21	
Pan Wt	193.80	grams
Pan + Soil (wet)	296.90	grams
Pan + Soil (dry)	278.75	grams
Natural Moisture Content	*21.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	261.20	grams
Percent Passing No. 200 Sieve	20.7%	
Pan + Soil retained on No. 4 sieve (dry)	193.80	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows	15	22	34
Pan ID	97	103	104
Pan Wt	26.10	27.43	26.26
Pan + Soil (wet)	44.31	45.25	40.90
Pan + Soil (dry)	37.59	39.04	36.08
Moisture Content	58.5%	53.5%	49.1%
Liquid Limit	55	53	51
Liquid Limit	*53*		

Plastic Limit

Pan ID	315	356
Pan Weight	9.14	9.09
Pan + Soil (wet)	21.79	23.44
Pan + Soil (dry)	17.89	19.00
Moisture Content	44.6%	44.8%
Plastic Limit	*45*	
Plastic Index	*8*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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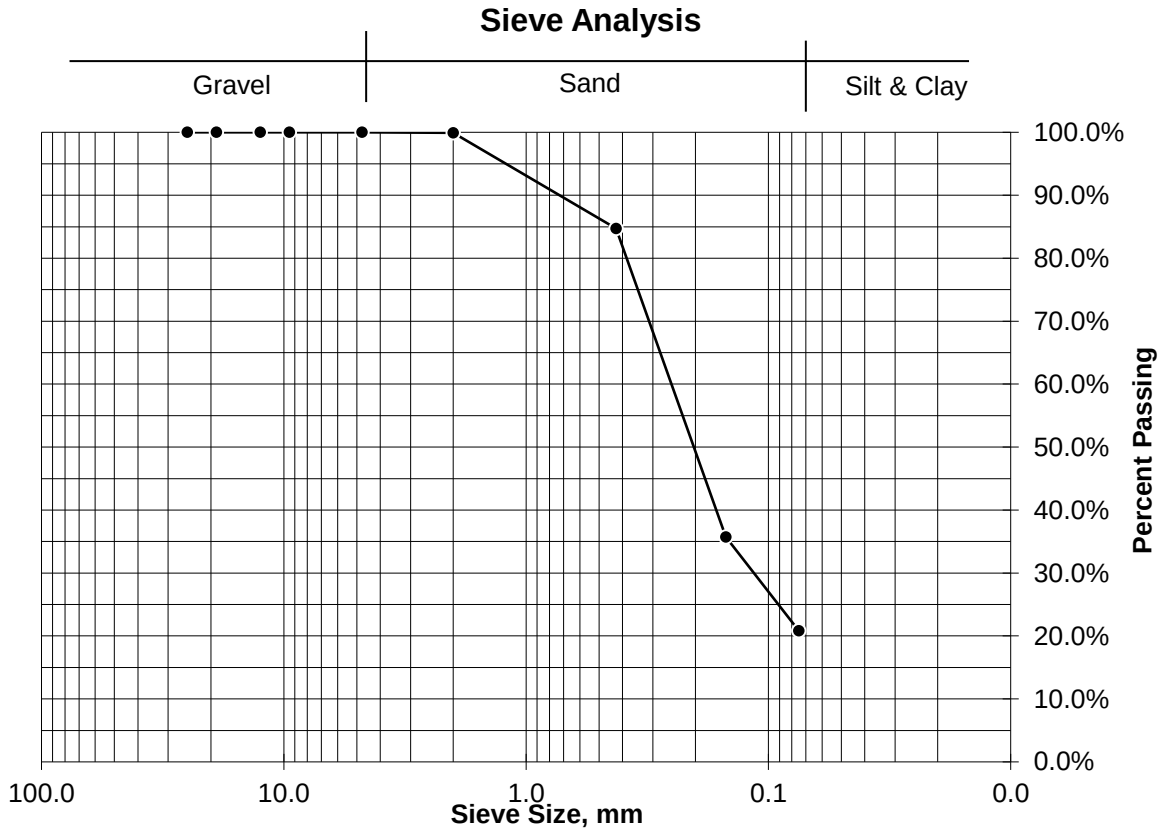
Sample ID DAA-02
Sample Depth 16'-18'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.07	0.1%	2.00	99.9%
No. 40	12.92	15.2%	0.425	84.7%
No. 100	41.59	49.0%	0.15	35.8%
No. 200	12.65	14.9%	0.075	20.9%
Pan	0.16	0.2%		
Total	67.39	79.3%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-02	Sample Received:	3/19/2019
Sample Depth	24'-26'	Date Tested:	3/22/2019
Visual Sample Description	Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	124	
Pan Wt	124.38	grams
Pan + Soil (wet)	229.97	grams
Pan + Soil (dry)	221.28	grams
Natural Moisture Content	*9.0%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	203.04	grams
Percent Passing No. 200 Sieve	18.8%	
Pan + Soil retained on No. 4 sieve (dry)	124.38	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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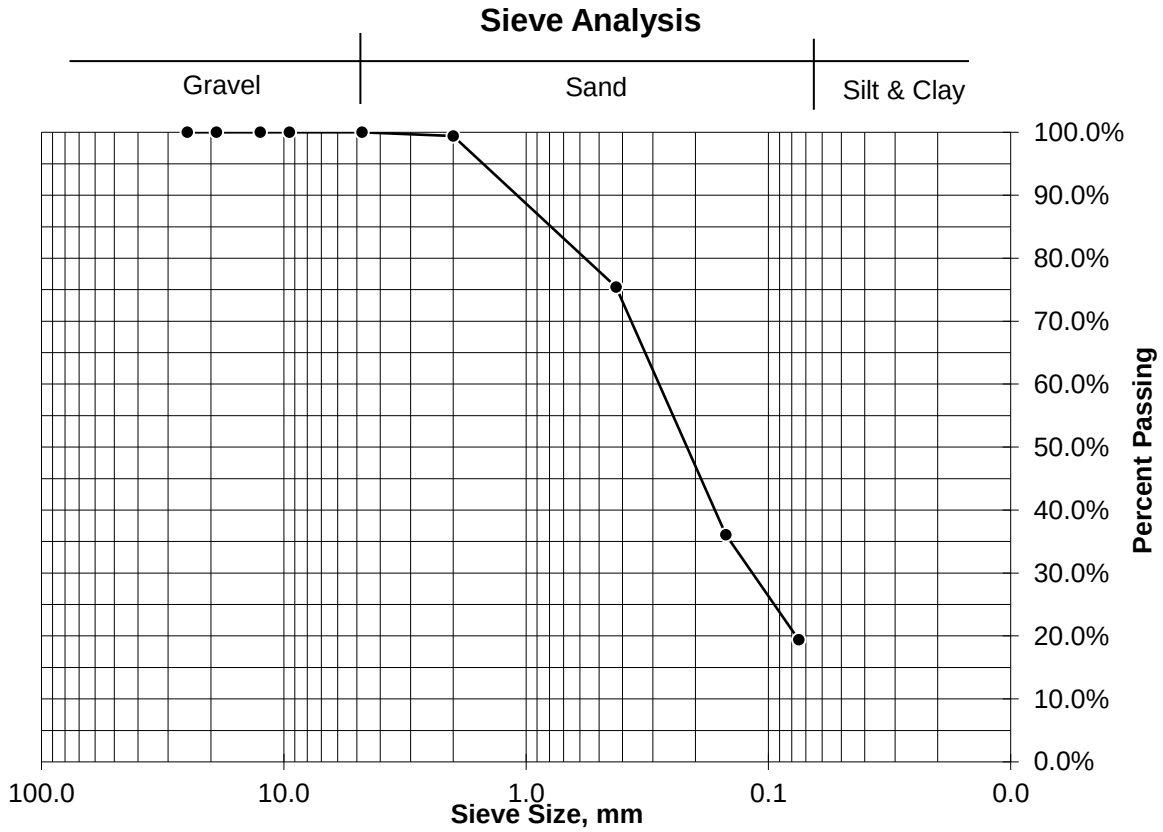
Sample ID DAA-02
Sample Depth 24'-26'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.56	0.6%	2.00	99.4%
No. 40	23.25	24.0%	0.425	75.4%
No. 100	38.15	39.4%	0.15	36.1%
No. 200	16.14	16.7%	0.075	19.4%
Pan	0.54	0.6%		
Total	78.64	81.2%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-02	Sample Received:	3/19/2019
Sample Depth	38'-40'	Date Tested:	3/19/2019
Visual Sample Description	Light Yellowish-Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	19	
Pan Wt	188.60	grams
Pan + Soil (wet)	289.46	grams
Pan + Soil (dry)	282.64	grams
Natural Moisture Content	*7.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	266.73	grams
Percent Passing No. 200 Sieve	16.9%	
Pan + Soil retained on No. 4 sieve (dry)	188.60	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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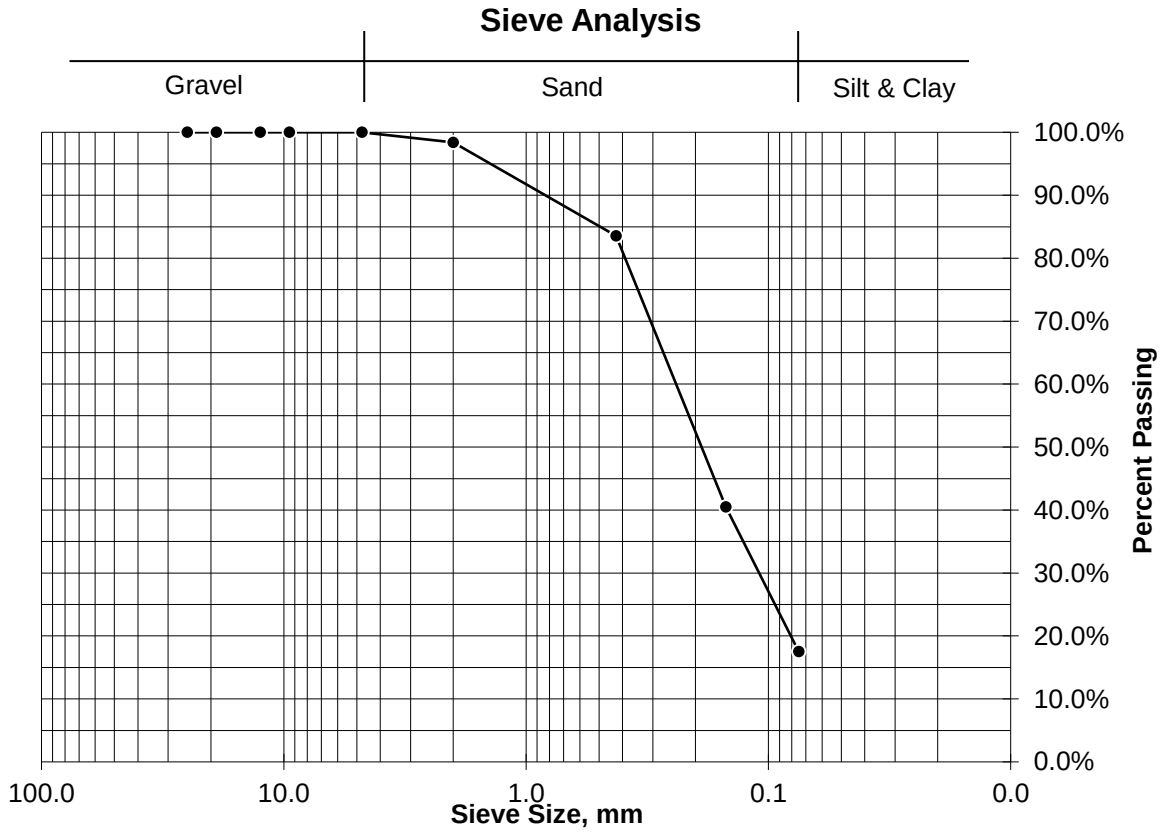
Sample ID DAA-02
Sample Depth 38'-40'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	1.53	1.6%	2.00	98.4%
No. 40	13.93	14.8%	0.425	83.6%
No. 100	40.48	43.0%	0.15	40.5%
No. 200	21.61	23.0%	0.075	17.5%
Pan	0.58	0.6%		
Total	78.13	83.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-03 — Sample Received: 3/19/2019
Sample Depth 6'-8' — Date Tested: 3/19/2019
Visual Sample Description Light Brownish-Gray Elastic SILT with Sand

Natural Moisture Content: ASTM D 2216

Pan ID	4	
Pan Wt	194.44	grams
Pan + Soil (wet)	298.58	grams
Pan + Soil (dry)	267.58	grams
Natural Moisture Content	*42.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	211.04	grams
Percent Passing No. 200 Sieve	77.3%	
Pan + Soil retained on No. 4 sieve (dry)	194.44	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/21/2019

Liquid Limit

No of Blows	15	24	34
Pan ID	94	108	95
Pan Wt	23.78	33.07	24.41
Pan + Soil (wet)	37.72	50.20	42.96
Pan + Soil (dry)	32.02	43.53	36.08
Moisture Content	69.1%	63.8%	59.0%
Liquid Limit	65	63	61
Liquid Limit	*63*		

Plastic Limit

Pan ID	0	1138
Pan Weight	6.07	6.15
Pan + Soil (wet)	20.20	18.53
Pan + Soil (dry)	15.56	14.52
Moisture Content	48.9%	47.9%
Plastic Limit	*48*	
Plastic Index	*15*	

USCS Classification: ASTM D 2487

Group Symbol **MH**
Group Name **Elastic SILT with Sand**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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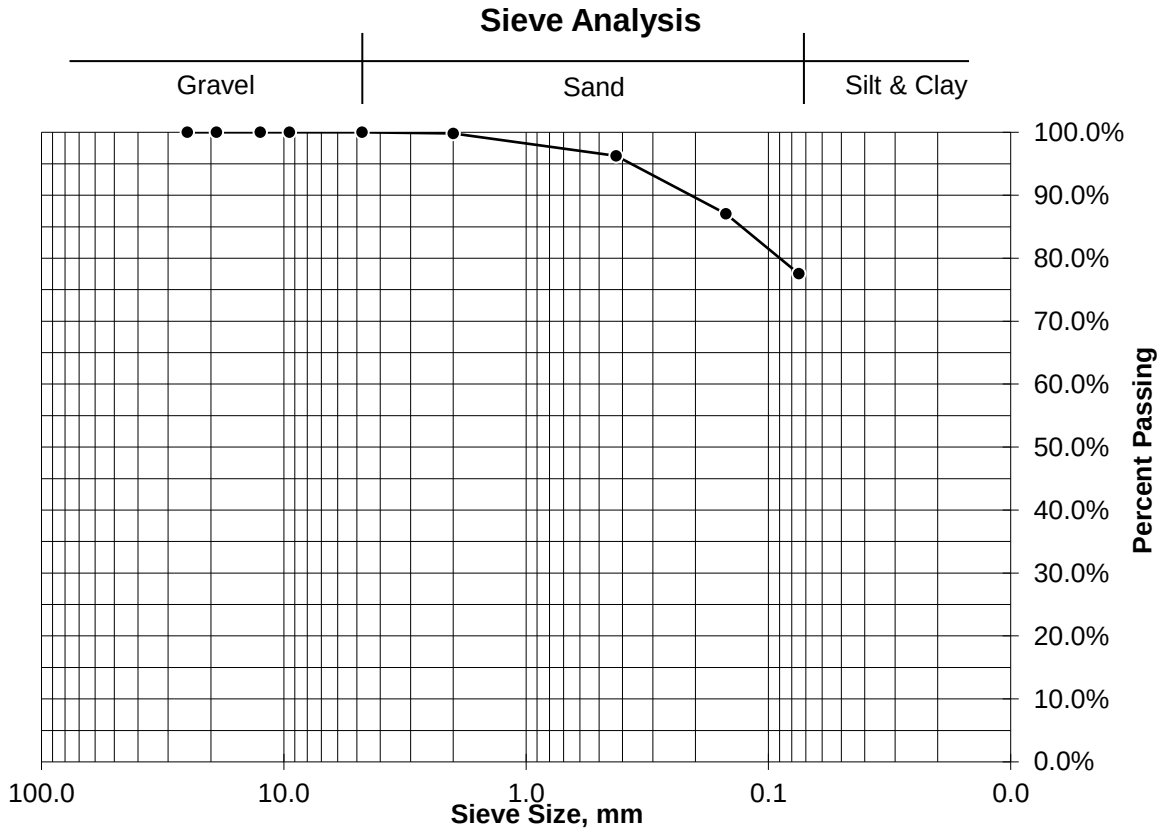
Sample ID DAA-03
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.15	0.2%	2.00	99.8%
No. 40	2.57	3.5%	0.425	96.3%
No. 100	6.74	9.2%	0.15	87.1%
No. 200	6.97	9.5%	0.075	77.5%
Pan	0.15	0.2%		
Total	16.58	22.7%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-03
Sample Depth 10'-12'
Visual Sample Description Brown Elastic SILT with Sand

Sample Received: 3/19/2019
Date Tested: 3/19/2019

Natural Moisture Content: ASTM D 2216

Pan ID	11	
Pan Wt	187.42	grams
Pan + Soil (wet)	298.94	grams
Pan + Soil (dry)	263.95	grams
Natural Moisture Content	*45.7%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	203.07	grams
Percent Passing No. 200 Sieve	79.6%	
Pan + Soil retained on No. 4 sieve (dry)	187.42	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/21/2019

Liquid Limit

No of Blows	19	22	33
Pan ID	96	101	169
Pan Wt	24.80	23.95	27.10
Pan + Soil (wet)	43.27	42.52	46.41
Pan + Soil (dry)	35.71	35.12	39.08
Moisture Content	69.3%	66.2%	61.1%
Liquid Limit	67	65	63
Liquid Limit	*65*		

Plastic Limit

Pan ID	318	78
Pan Weight	6.17	4.22
Pan + Soil (wet)	18.93	14.41
Pan + Soil (dry)	15.02	11.29
Moisture Content	44.2%	44.1%
Plastic Limit	*44*	
Plastic Index	*21*	

USCS Classification: ASTM D 2487

Group Symbol **MH**
Group Name **Elastic SILT with Sand**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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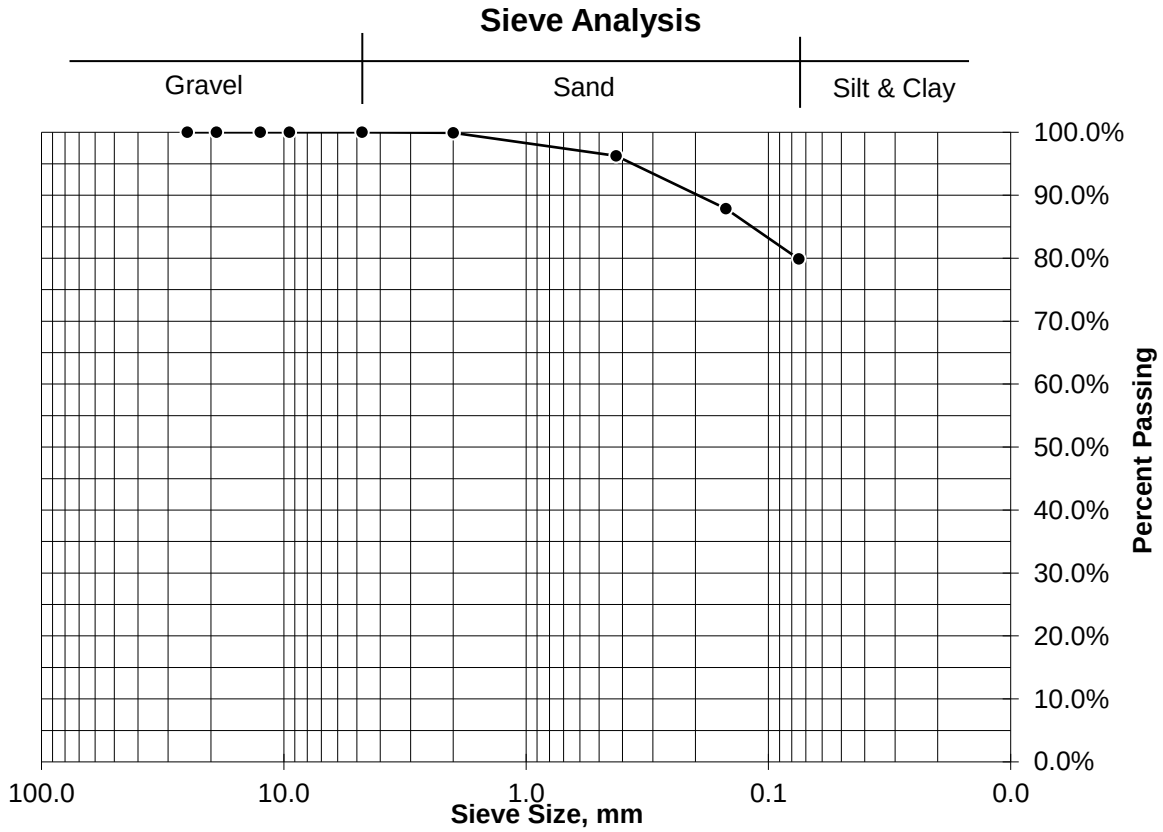
Sample ID DAA-03
Sample Depth 10'-12'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.06	0.1%	2.00	99.9%
No. 40	2.79	3.6%	0.425	96.3%
No. 100	6.42	8.4%	0.15	87.9%
No. 200	6.13	8.0%	0.075	79.9%
Pan	0.25	0.3%		
Total	15.65	20.4%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-03	Sample Received:	3/19/2019
Sample Depth	20'-22'	Date Tested:	3/19/2019
Visual Sample Description	Brownish-Gray Elastic SILT		

Natural Moisture Content: ASTM D 2216

Pan ID	32	
Pan Wt	191.70	grams
Pan + Soil (wet)	312.15	grams
Pan + Soil (dry)	272.30	grams
Natural Moisture Content	*49.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	203.34	grams
Percent Passing No. 200 Sieve	85.6%	
Pan + Soil retained on No. 4 sieve (dry)	191.70	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows	15	26	34
Pan ID	5	6	7
Pan Wt	11.04	11.17	11.10
Pan + Soil (wet)	26.52	28.70	25.05
Pan + Soil (dry)	19.86	21.56	19.59
Moisture Content	75.5%	68.7%	64.3%
Liquid Limit	71	69	67
Liquid Limit	*69*		

Plastic Limit

Pan ID	81	82
Pan Weight	4.33	4.24
Pan + Soil (wet)	15.52	16.80
Pan + Soil (dry)	12.13	12.93
Moisture Content	43.5%	44.5%
Plastic Limit	*44*	
Plastic Index	*25*	

USCS Classification: ASTM D 2487

Group Symbol	**MH**
Group Name	**Elastic SILT**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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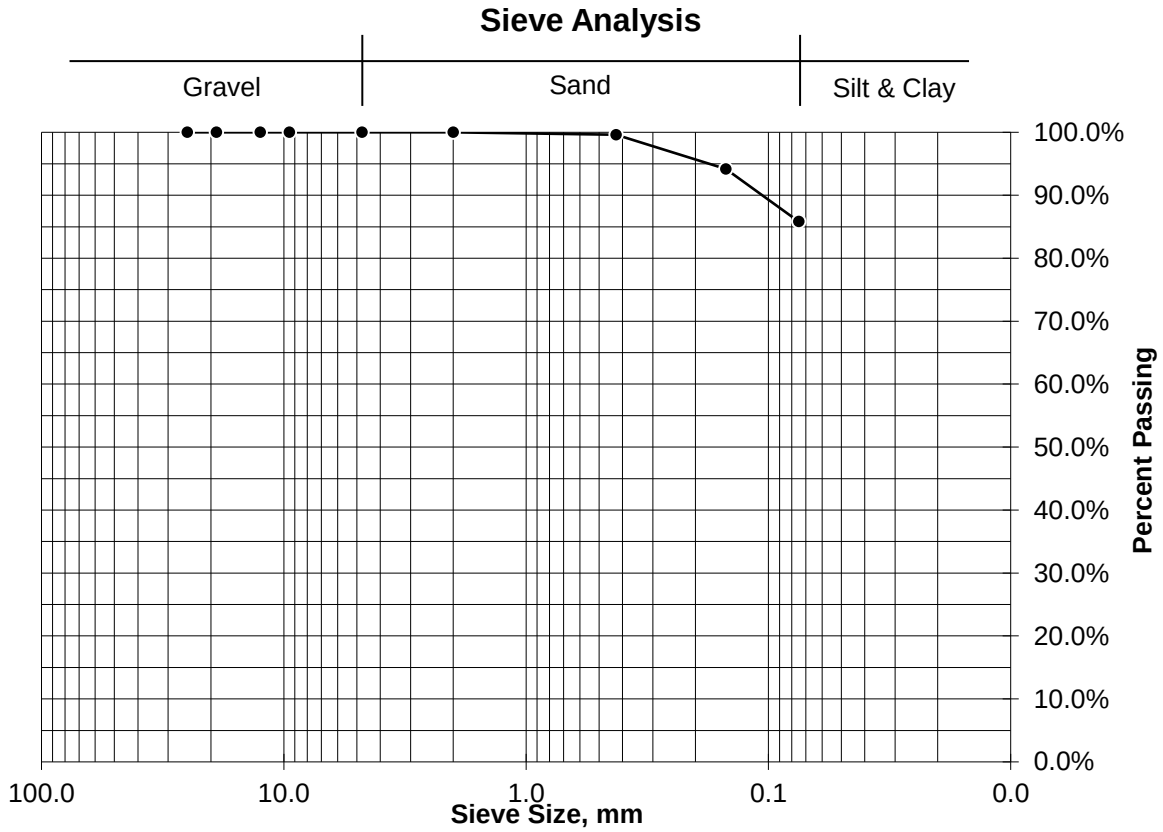
Sample ID DAA-03
Sample Depth 20'-22'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	0.32	0.4%	0.425	99.6%
No. 100	4.37	5.4%	0.15	94.2%
No. 200	6.74	8.4%	0.075	85.8%
Pan	0.21	0.3%		
Total	11.64	14.4%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-03	Sample Received:	3/19/2019
Sample Depth	28'-30'	Date Tested:	3/19/2019
Visual Sample Description	Light Brownish-Gray Elastic SILT with Sand		

Natural Moisture Content: ASTM D 2216

Pan ID	9	
Pan Wt	189.25	grams
Pan + Soil (wet)	306.75	grams
Pan + Soil (dry)	265.88	grams
Natural Moisture Content	*53.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	206.13	grams
Percent Passing No. 200 Sieve	78.0%	
Pan + Soil retained on No. 4 sieve (dry)	189.25	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/21/2019

Liquid Limit

No of Blows	16	26	34
Pan ID	10	70	72
Pan Wt	11.20	10.97	11.03
Pan + Soil (wet)	26.48	25.54	28.67
Pan + Soil (dry)	19.73	19.43	21.49
Moisture Content	79.2%	72.2%	68.6%
Liquid Limit	75	73	71
Liquid Limit	*73*		

Plastic Limit

Pan ID	313	316
Pan Weight	9.14	9.06
Pan + Soil (wet)	21.79	21.72
Pan + Soil (dry)	18.12	18.00
Moisture Content	40.9%	41.6%
Plastic Limit	*41*	
Plastic Index	*32*	

USCS Classification: ASTM D 2487

Group Symbol	**MH**
Group Name	**Elastic SILT with Sand**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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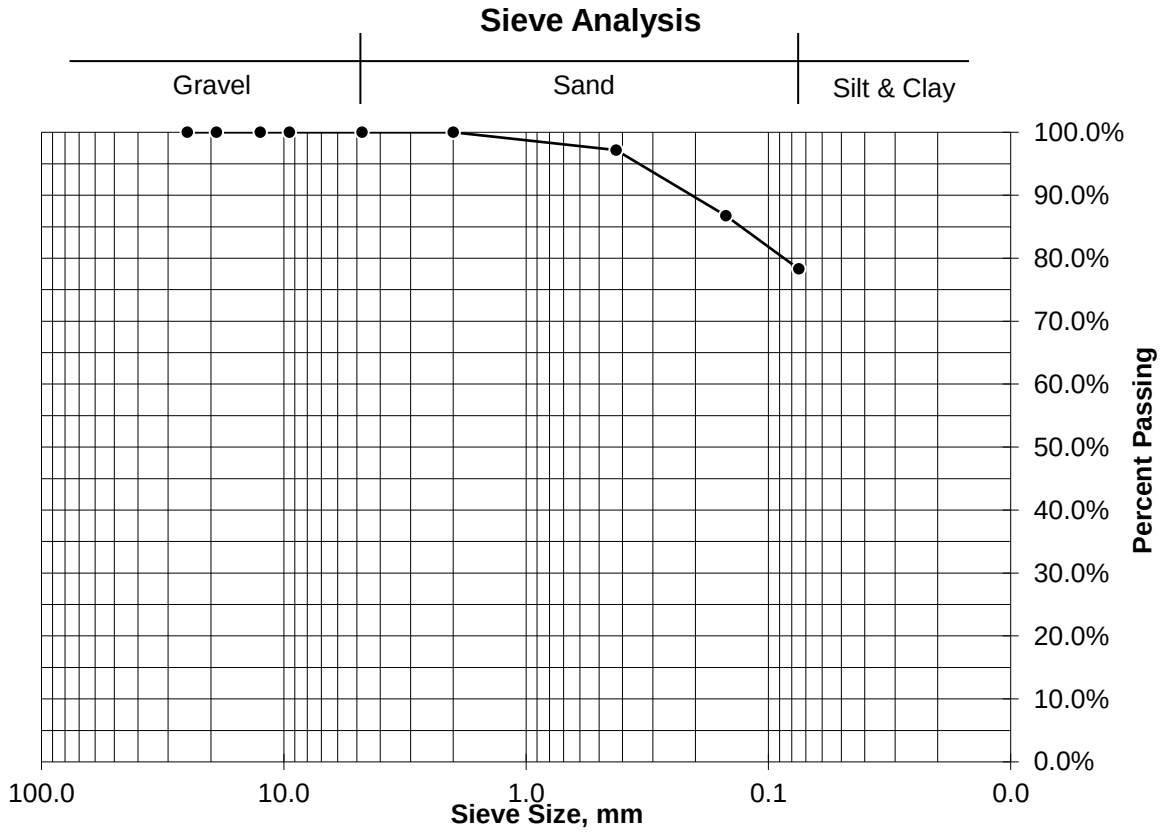
Sample ID DAA-03
Sample Depth 28'-30'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	2.16	2.8%	0.425	97.2%
No. 100	8.00	10.4%	0.15	86.7%
No. 200	6.47	8.4%	0.075	78.3%
Pan	0.25	0.3%		
Total	16.88	22.0%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-03 — Sample Received: 3/19/2019
Sample Depth 45'-47' — Date Tested: 3/19/2019
Visual Sample Description Brownish-gray Elastic SILT with Sand

Natural Moisture Content: ASTM D 2216

Pan ID	101	
Pan Wt	122.76	grams
Pan + Soil (wet)	246.78	grams
Pan + Soil (dry)	204.71	grams
Natural Moisture Content	*51.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	143.75	grams
Percent Passing No. 200 Sieve	74.4%	
Pan + Soil retained on No. 4 sieve (dry)	122.76	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/2/2019

Liquid Limit

No of Blows	18	21	33
Pan ID	101	105	107
Pan Wt	24.02	29.28	25.11
Pan + Soil (wet)	46.76	58.97	43.98
Pan + Soil (dry)	38.20	48.17	37.49
Moisture Content	60.4%	57.2%	52.4%
Liquid Limit	58	56	54
Liquid Limit	*56*		

Plastic Limit

Pan ID	75	78
Pan Weight	4.26	4.24
Pan + Soil (wet)	15.29	15.10
Pan + Soil (dry)	12.50	12.35
Moisture Content	33.8%	33.9%
Plastic Limit	*34*	
Plastic Index	*22*	

USCS Classification: ASTM D 2487

Group Symbol **MH**
Group Name **Elastic SILT with Sand**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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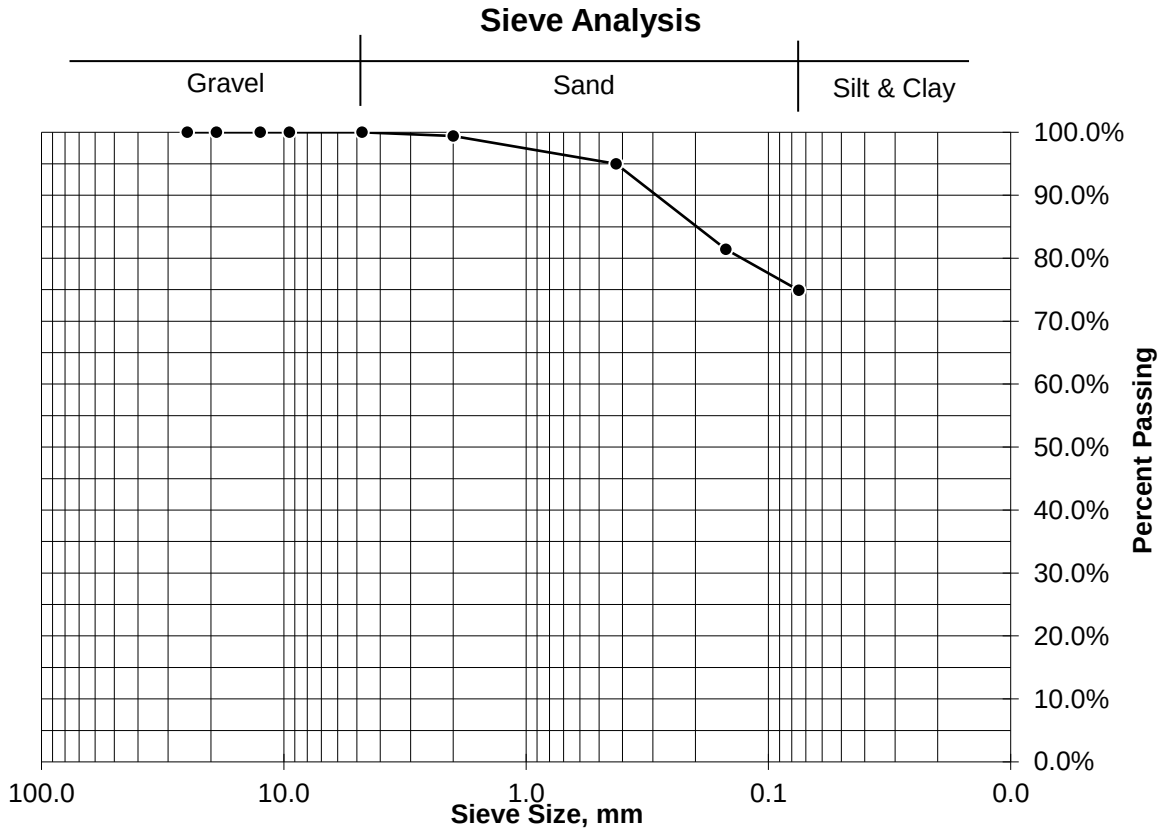
Sample ID DAA-03
Sample Depth 45'-47'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.50	0.6%	2.00	99.4%
No. 40	3.62	4.4%	0.425	95.0%
No. 100	11.10	13.5%	0.15	81.4%
No. 200	5.34	6.5%	0.075	74.9%
Pan	0.42	0.5%		
Total	20.98	25.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-03	Sample Received:	3/19/2019
Sample Depth	55'-57'	Date Tested:	3/19/2019
Visual Sample Description	Brown Sandy Elastic SILT		

Natural Moisture Content: ASTM D 2216

Pan ID	25	
Pan Wt	194.02	grams
Pan + Soil (wet)	294.69	grams
Pan + Soil (dry)	264.26	grams
Natural Moisture Content	*43.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	215.15	grams
Percent Passing No. 200 Sieve	69.9%	
Pan + Soil retained on No. 4 sieve (dry)	194.02	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/21/2019

Liquid Limit

No of Blows	15	24	35
Pan ID	102	92	2000
Pan Wt	23.99	25.64	25.72
Pan + Soil (wet)	44.19	43.75	44.08
Pan + Soil (dry)	35.93	36.76	37.31
Moisture Content	69.1%	62.9%	58.4%
Liquid Limit	65	63	61
Liquid Limit	*63*		

Plastic Limit

Pan ID	314	317
Pan Weight	9.13	8.07
Pan + Soil (wet)	21.53	22.12
Pan + Soil (dry)	18.30	18.56
Moisture Content	35.2%	33.9%
Plastic Limit	*35*	
Plastic Index	*28*	

USCS Classification: ASTM D 2487

Group Symbol	**MH**
Group Name	**Sandy Elastic SILT**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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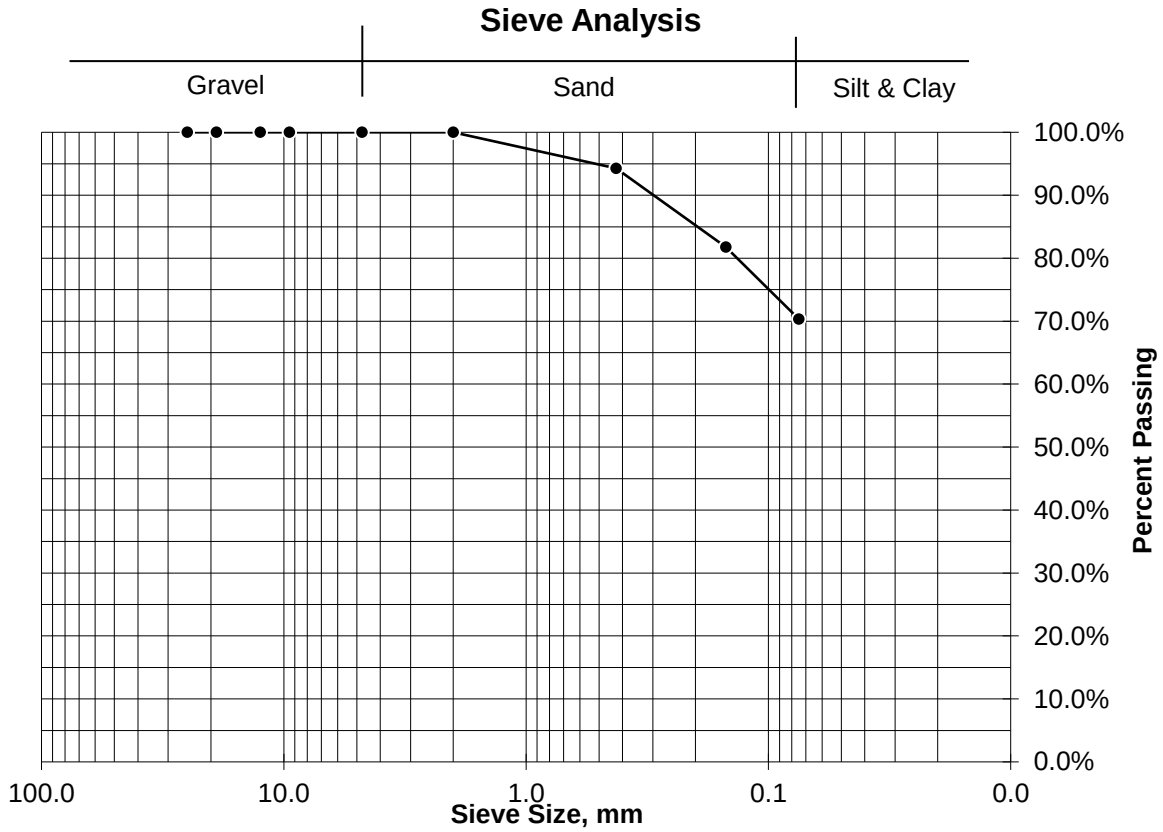
Sample ID DAA-03
Sample Depth 55'-57'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	4.01	5.7%	0.425	94.3%
No. 100	8.80	12.5%	0.15	81.8%
No. 200	8.01	11.4%	0.075	70.4%
Pan	0.29	0.4%		
Total	21.11	30.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-04 — Sample Received: 3/19/2019
Sample Depth 10'-12' — Date Tested: 3/19/2019
Visual Sample Description Miacecous Light Brownish-Gray Silty SAND

Natural Moisture Content: ASTM D 2216

Pan ID	40	
Pan Wt	192.70	grams
Pan + Soil (wet)	298.16	grams
Pan + Soil (dry)	265.91	grams
Natural Moisture Content	*44.1%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	234.75	grams
Percent Passing No. 200 Sieve	42.6%	
Pan + Soil retained on No. 4 sieve (dry)	192.70	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows	18	25	33
Pan ID	61	71	1
Pan Wt	10.95	10.92	11.23
Pan + Soil (wet)	23.05	22.82	21.86
Pan + Soil (dry)	19.13	19.19	18.79
Moisture Content	47.9%	43.9%	40.6%
Liquid Limit	46	44	42
Liquid Limit	*44*		

Plastic Limit

Pan ID	0	1138
Pan Weight	6.07	6.14
Pan + Soil (wet)	16.17	16.93
Pan + Soil (dry)	13.71	14.26
Moisture Content	32.2%	32.9%
Plastic Limit	*33*	
Plastic Index	*11*	

USCS Classification: ASTM D 2487

Group Symbol **SM**
Group Name **Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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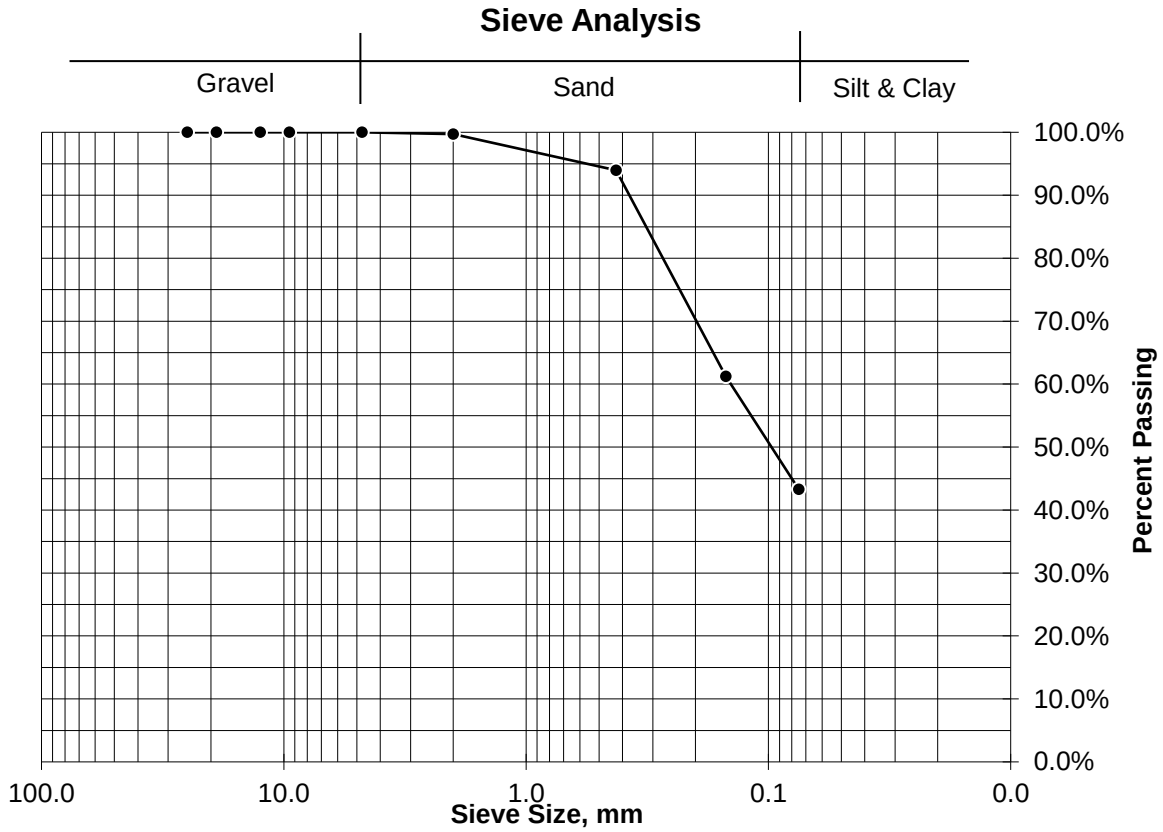
Sample ID DAA-04
Sample Depth 10'-12'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.22	0.3%	2.00	99.7%
No. 40	4.21	5.8%	0.425	93.9%
No. 100	23.94	32.7%	0.15	61.2%
No. 200	13.13	17.9%	0.075	43.3%
Pan	0.53	0.7%		
Total	42.03	57.4%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-04	Sample Received:	3/19/2019
Sample Depth	12'-14'	Date Tested:	3/22/2019
Visual Sample Description	Light Reddish-Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	23	
Pan Wt	193.95	grams
Pan + Soil (wet)	330.26	grams
Pan + Soil (dry)	296.59	grams
Natural Moisture Content	*32.8%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	262.13	grams
Percent Passing No. 200 Sieve	33.6%	
Pan + Soil retained on No. 4 sieve (dry)	193.95	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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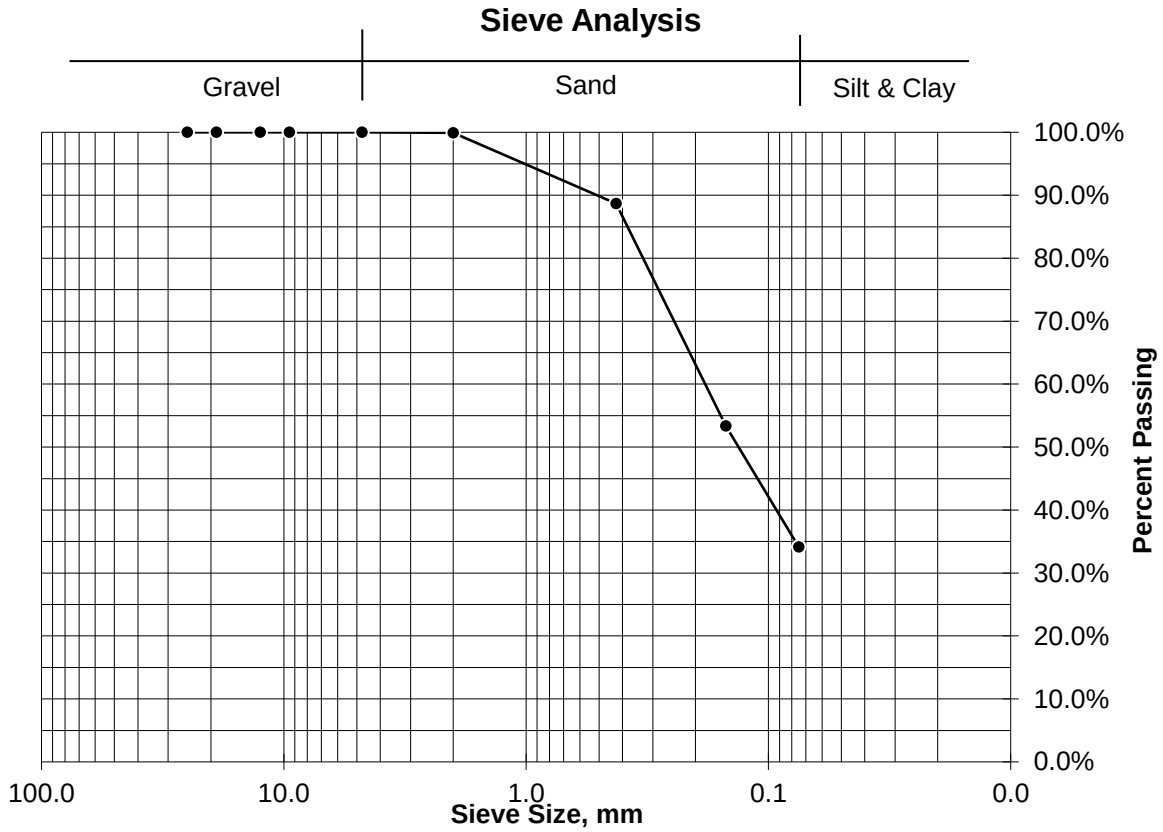
Sample ID DAA-04
Sample Depth 12'-14'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.10	0.1%	2.00	99.9%
No. 40	11.51	11.2%	0.425	88.7%
No. 100	36.26	35.3%	0.15	53.4%
No. 200	19.72	19.2%	0.075	34.1%
Pan	0.58	0.6%		
Total	68.17	66.4%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-04	Sample Received:	3/19/2019
Sample Depth	18'-20'	Date Tested:	3/19/2019
Visual Sample Description	Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	19	
Pan Wt	188.56	grams
Pan + Soil (wet)	291.38	grams
Pan + Soil (dry)	257.20	grams
Natural Moisture Content	*49.8%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	226.14	grams
Percent Passing No. 200 Sieve	45.3%	
Pan + Soil retained on No. 4 sieve (dry)	188.56	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows	18	23	31
Pan ID	705	710	711
Pan Wt	11.57	11.51	11.58
Pan + Soil (wet)	30.27	31.37	32.83
Pan + Soil (dry)	23.54	24.50	25.84
Moisture Content	56.2%	52.9%	49.0%
Liquid Limit	54	52	50
Liquid Limit	*52*		

Plastic Limit

Pan ID	314	317
Pan Weight	9.15	8.08
Pan + Soil (wet)	23.17	21.93
Pan + Soil (dry)	19.04	17.84
Moisture Content	41.8%	41.9%
Plastic Limit	*42*	
Plastic Index	*10*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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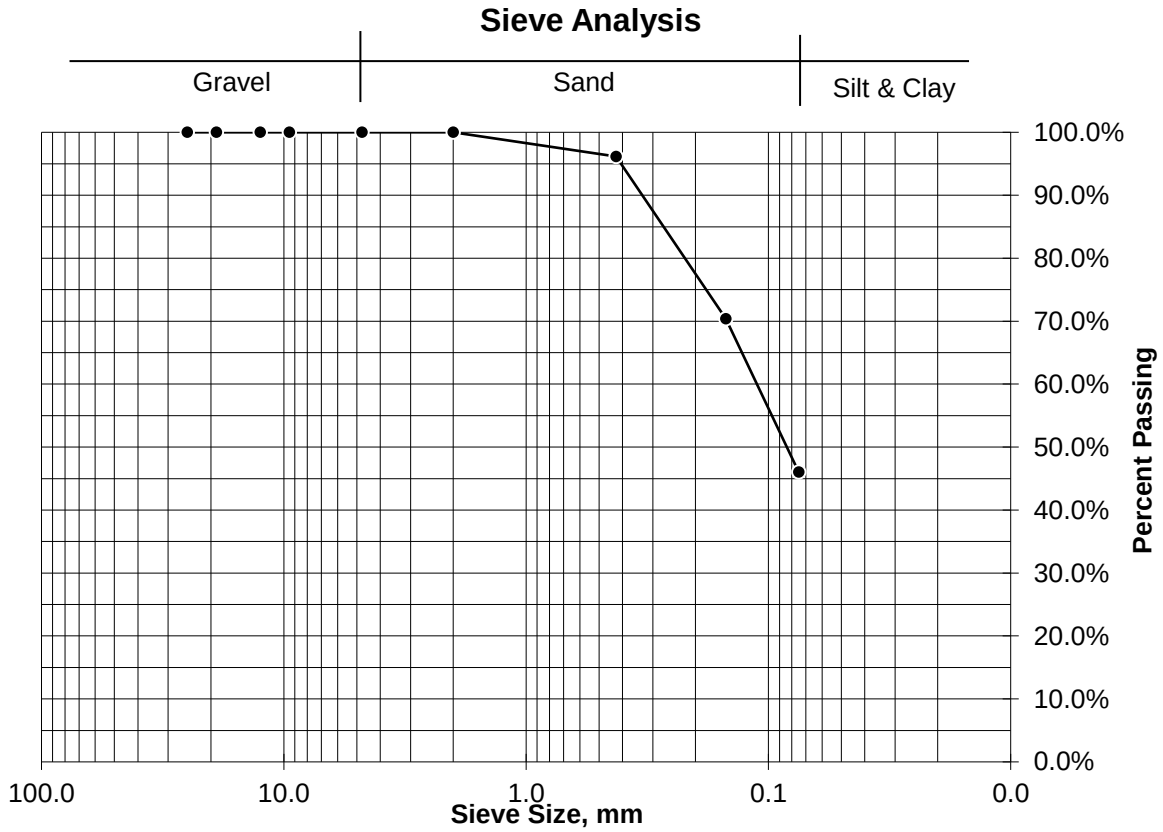
Sample ID DAA-04
Sample Depth 18'-20'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	2.65	3.9%	0.425	96.1%
No. 100	17.67	25.7%	0.15	70.4%
No. 200	16.71	24.3%	0.075	46.1%
Pan	0.55	0.8%		
Total	37.58	54.8%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-04	Sample Received:	3/19/2019
Sample Depth	24'-26'	Date Tested:	3/22/2019
Visual Sample Description	Light Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	5	
Pan Wt	192.72	grams
Pan + Soil (wet)	295.14	grams
Pan + Soil (dry)	267.88	grams
Natural Moisture Content	*36.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	244.49	grams
Percent Passing No. 200 Sieve	31.1%	
Pan + Soil retained on No. 4 sieve (dry)	192.89	grams
Percent Passing No. 4 Sieve	99.8%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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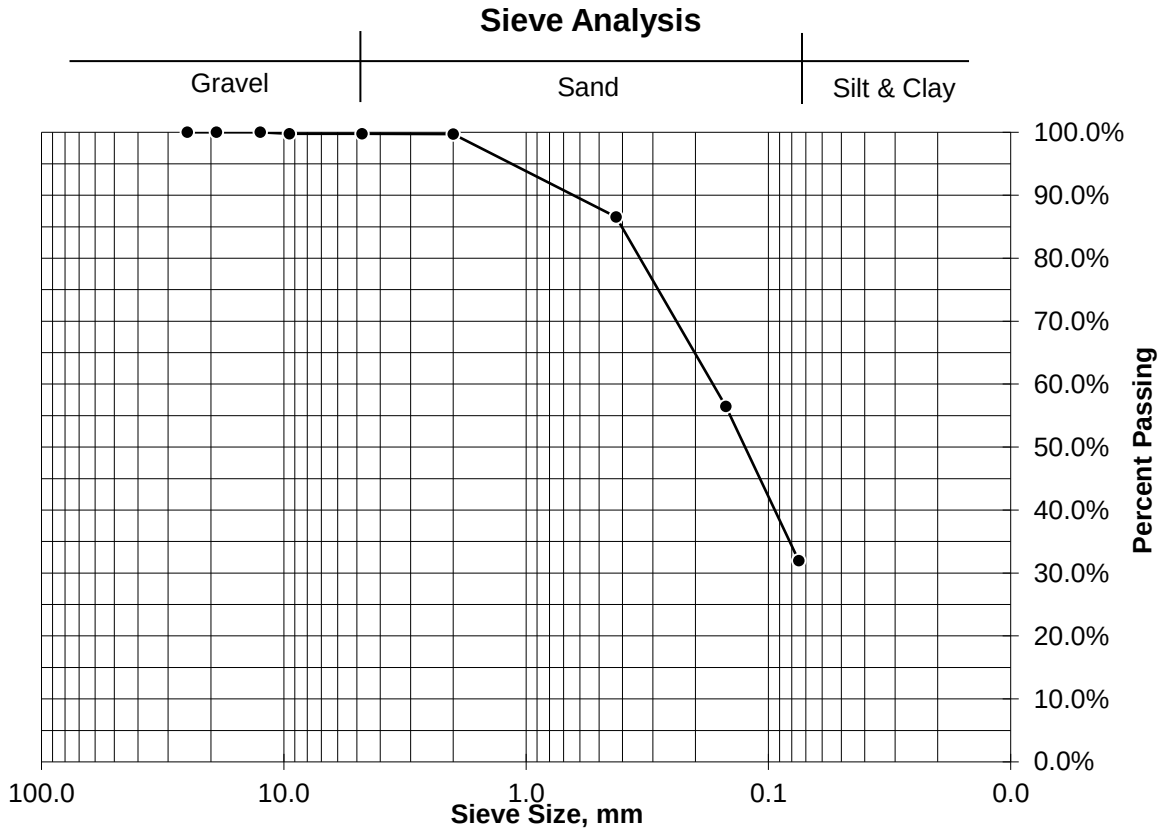
Army Corps of Engineers Certified Laboratory

Sample ID DAA-04
Sample Depth 24'-26'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.17	0.2%	9.50	99.8%
No. 4	0.00	0.0%	4.75	99.8%
No. 10	0.05	0.1%	2.00	99.7%
No. 40	9.90	13.2%	0.425	86.5%
No. 100	22.60	30.1%	0.15	56.5%
No. 200	18.40	24.5%	0.075	32.0%
Pan	0.61	0.8%		
Total	51.73	68.8%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Army Corps of Engineers Certified Laboratory

Sample ID	DAA-04	Sample Received:	3/19/2019
Sample Depth	28'-30'	Date Tested:	3/19/2019
Visual Sample Description	Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	17	
Pan Wt	188.64	grams
Pan + Soil (wet)	303.75	grams
Pan + Soil (dry)	275.02	grams
Natural Moisture Content	*33.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	242.56	grams
Percent Passing No. 200 Sieve	37.6%	
Pan + Soil retained on No. 4 sieve (dry)	188.64	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows	17	26	34
Pan ID	92	102	2000
Pan Wt	25.65	24.02	25.71
Pan + Soil (wet)	48.43	42.15	44.60
Pan + Soil (dry)	41.33	36.89	39.45
Moisture Content	45.3%	40.9%	37.5%
Liquid Limit	43	41	39
Liquid Limit	*41*		

Plastic Limit

Pan ID	22	75
Pan Weight	4.33	4.27
Pan + Soil (wet)	20.34	17.45
Pan + Soil (dry)	16.30	14.05
Moisture Content	33.8%	34.8%
Plastic Limit	*34*	
Plastic Index	*7*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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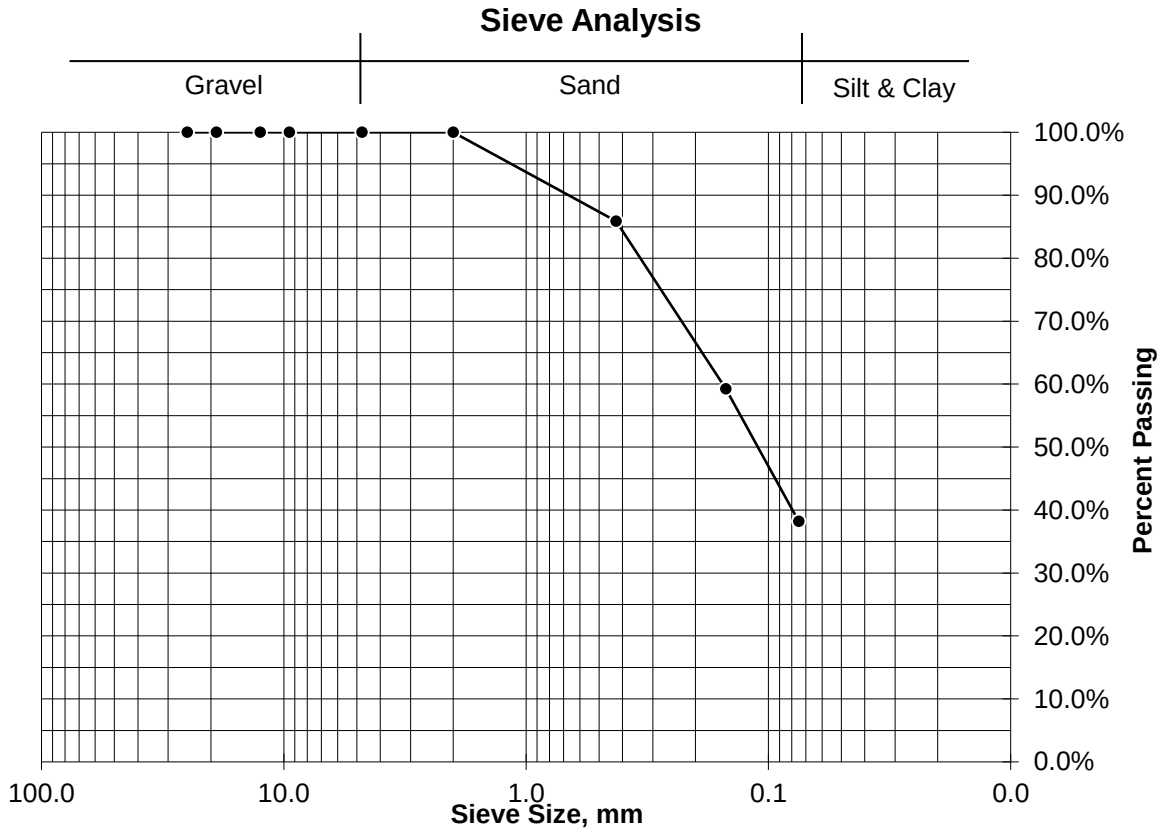
Sample ID DAA-04
Sample Depth 28'-30'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	12.20	14.1%	0.425	85.9%
No. 100	22.98	26.6%	0.15	59.3%
No. 200	18.19	21.1%	0.075	38.2%
Pan	0.55	0.6%		
Total	53.92	62.4%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-04	Sample Received:	3/19/2019
Sample Depth	36'-38'	Date Tested:	3/19/2019
Visual Sample Description	Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	42	
Pan Wt	192.28	grams
Pan + Soil (wet)	296.27	grams
Pan + Soil (dry)	274.70	grams
Natural Moisture Content	*26.2%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	249.52	grams
Percent Passing No. 200 Sieve	30.6%	
Pan + Soil retained on No. 4 sieve (dry)	192.28	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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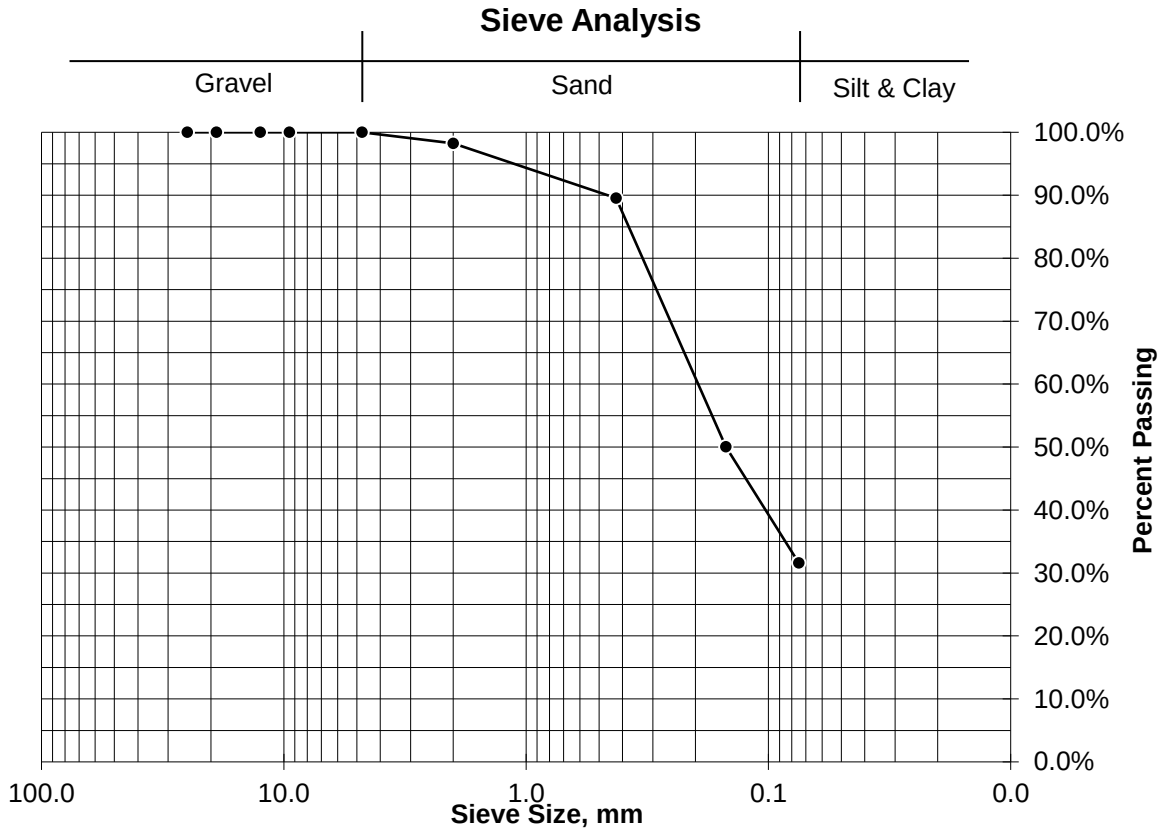
Sample ID DAA-04
Sample Depth 36'-38'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	1.44	1.7%	2.00	98.3%
No. 40	7.17	8.7%	0.425	89.6%
No. 100	32.57	39.5%	0.15	50.0%
No. 200	15.17	18.4%	0.075	31.6%
Pan	0.87	1.1%		
Total	57.22	69.4%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-05	Sample Received:	3/19/2019
Sample Depth	7'-9'	Date Tested:	3/19/2019
Visual Sample Description	Light Brownish-Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	24	
Pan Wt	186.11	grams
Pan + Soil (wet)	314.11	grams
Pan + Soil (dry)	305.66	grams
Natural Moisture Content	*7.1%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	285.82	grams
Percent Passing No. 200 Sieve	16.6%	
Pan + Soil retained on No. 4 sieve (dry)	186.11	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/19/2019

Liquid Limit

No of Blows			
Pan ID			
Pan Wt		Non-plastic	
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight		
Pan + Soil (wet)	Non-plastic	
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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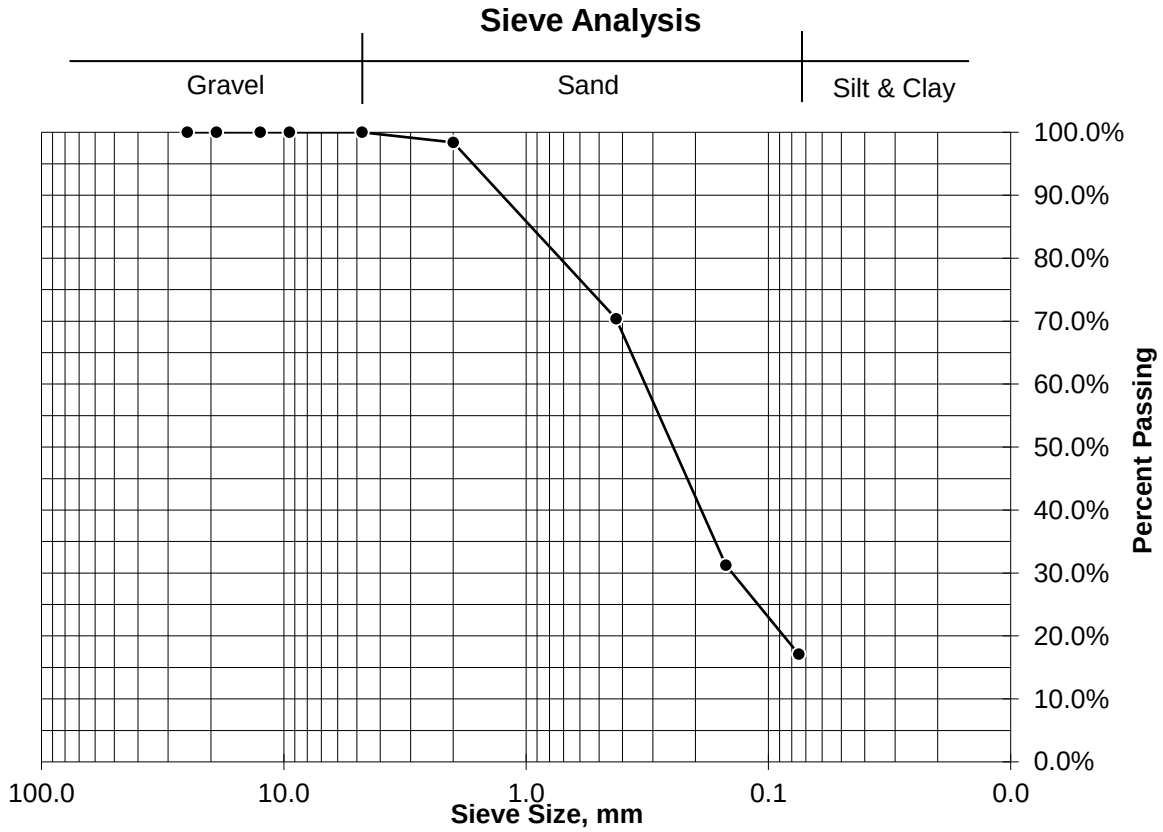
Sample ID DAA-05
Sample Depth 7'-9'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	1.90	1.6%	2.00	98.4%
No. 40	33.50	28.0%	0.425	70.4%
No. 100	46.78	39.1%	0.15	31.3%
No. 200	16.92	14.2%	0.075	17.1%
Pan	0.60	0.5%		
Total	99.70	83.4%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-05	Sample Received:	3/19/2019
Sample Depth	15'-17'	Date Tested:	3/19/2019
Visual Sample Description	Light Brownish-Red Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	1	
Pan Wt	195.45	grams
Pan + Soil (wet)	301.00	grams
Pan + Soil (dry)	293.74	grams
Natural Moisture Content	*7.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	275.64	grams
Percent Passing No. 200 Sieve	18.4%	
Pan + Soil retained on No. 4 sieve (dry)	195.61	grams
Percent Passing No. 4 Sieve	99.8%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/19/2019

Liquid Limit

No of Blows			
Pan ID			
Pan Wt		Non-plastic	
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight		
Pan + Soil (wet)	Non-plastic	
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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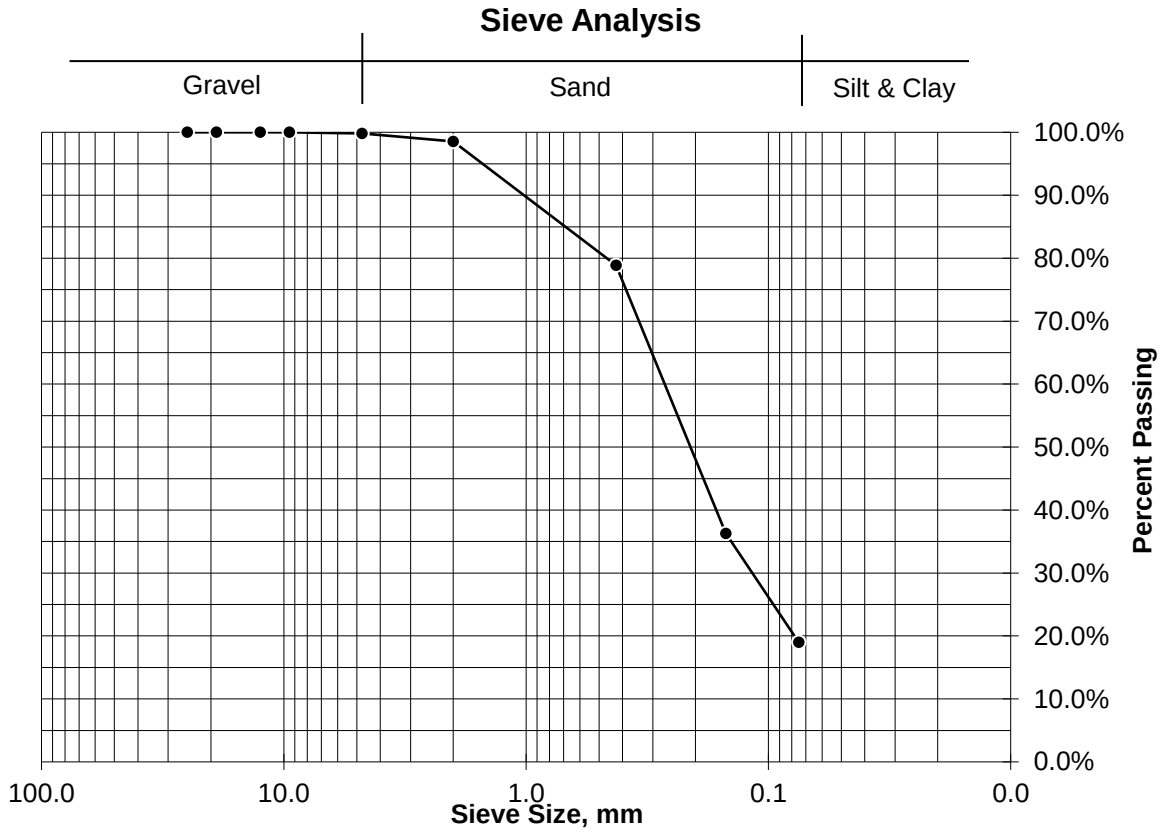
Sample ID DAA-05
Sample Depth 15'-17'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.16	0.2%	4.75	99.8%
No. 10	1.28	1.3%	2.00	98.5%
No. 40	19.31	19.6%	0.425	78.9%
No. 100	41.90	42.6%	0.15	36.3%
No. 200	16.96	17.3%	0.075	19.0%
Pan	0.57	0.6%		
Total	80.18	81.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-06	Sample Received:	3/19/2019
Sample Depth	12'-14'	Date Tested:	3/19/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	10	
Pan Wt	184.04	grams
Pan + Soil (wet)	298.73	grams
Pan + Soil (dry)	293.47	grams
Natural Moisture Content	*4.8%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	274.71	grams
Percent Passing No. 200 Sieve	17.1%	
Pan + Soil retained on No. 4 sieve (dry)	184.04	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/19/2019

Liquid Limit

No of Blows			
Pan ID			
Pan Wt		Non-plastic	
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight		
Pan + Soil (wet)	Non-plastic	
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-06
Sample Depth 12'-14'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.67	0.6%	2.00	99.4%
No. 40	33.23	30.4%	0.425	69.0%
No. 100	42.24	38.6%	0.15	30.4%
No. 200	13.55	12.4%	0.075	18.0%
Pan	0.96	0.9%		
Total	90.65	82.8%		

Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-07	Sample Received:	3/19/2019
Sample Depth	10'-12'	Date Tested:	3/19/2019
Visual Sample Description	Brownish-gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	30	
Pan Wt	193.24	grams
Pan + Soil (wet)	300.01	grams
Pan + Soil (dry)	275.97	grams
Natural Moisture Content	*29.1%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	250.28	grams
Percent Passing No. 200 Sieve	31.1%	
Pan + Soil retained on No. 4 sieve (dry)	193.24	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/21/2019

Liquid Limit

No of Blows	15	23	35
Pan ID	105	107	201
Pan Wt	29.29	25.13	27.70
Pan + Soil (wet)	49.71	42.20	50.08
Pan + Soil (dry)	41.92	36.00	42.44
Moisture Content	61.7%	57.0%	51.8%
Liquid Limit	58	56	54
Liquid Limit	*56*		

Plastic Limit

Pan ID	352	354
Pan Weight	9.13	9.19
Pan + Soil (wet)	20.33	20.54
Pan + Soil (dry)	17.50	17.67
Moisture Content	33.8%	33.9%
Plastic Limit	*34*	
Plastic Index	*22*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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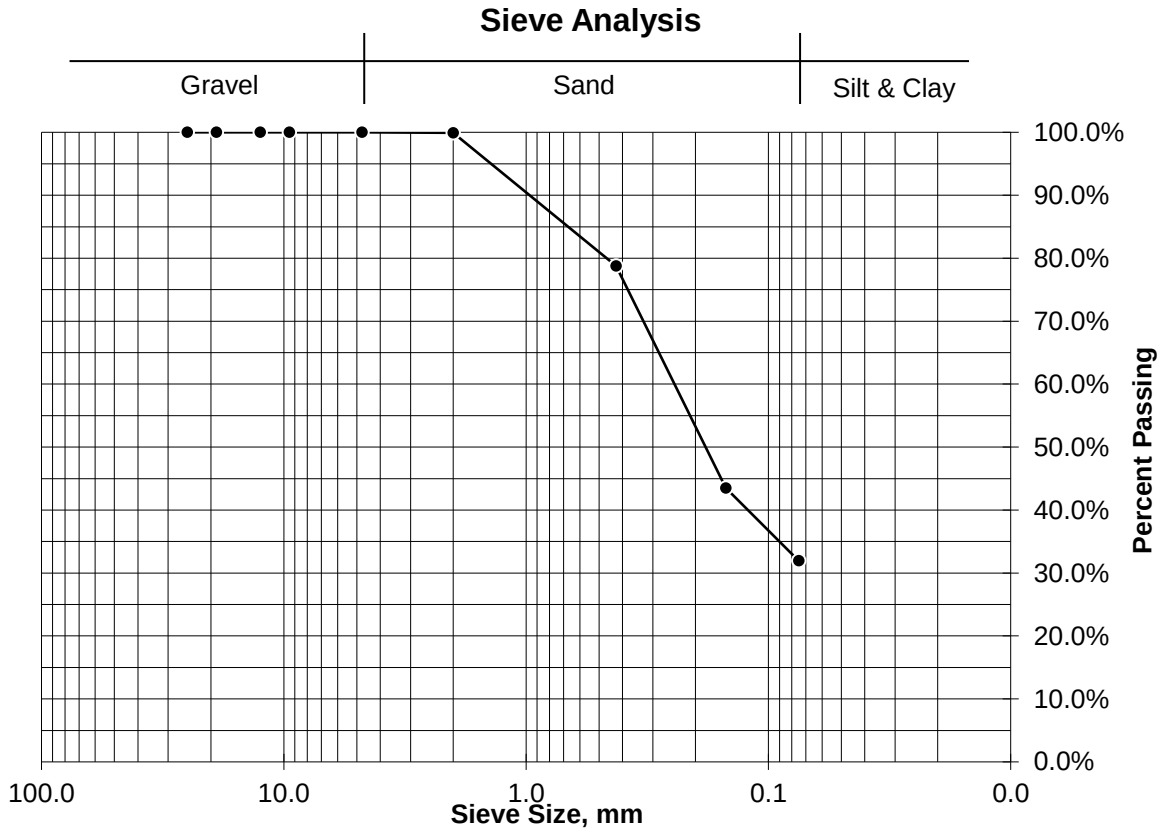
Sample ID DAA-07
Sample Depth 10'-12'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.08	0.1%	2.00	99.9%
No. 40	17.50	21.2%	0.425	78.8%
No. 100	29.16	35.2%	0.15	43.5%
No. 200	9.56	11.6%	0.075	31.9%
Pan	0.73	0.9%		
Total	57.03	68.9%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-07 — Sample Received: 3/19/2019
Sample Depth 14'-16' — Date Tested: 3/19/2019
Visual Sample Description Micaceous Brownish-Gray Silty SAND

Natural Moisture Content: ASTM D 2216

Pan ID	26	
Pan Wt	194.56	grams
Pan + Soil (wet)	309.39	grams
Pan + Soil (dry)	286.88	grams
Natural Moisture Content	*24.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	263.01	grams
Percent Passing No. 200 Sieve	25.9%	
Pan + Soil retained on No. 4 sieve (dry)	194.56	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows	17	28	35
Pan ID	70	9	65
Pan Wt	11.00	11.15	10.99
Pan + Soil (wet)	22.48	21.98	23.37
Pan + Soil (dry)	18.97	18.94	20.06
Moisture Content	44.0%	39.0%	36.5%
Liquid Limit	42	40	38
Liquid Limit	*40*		

Plastic Limit

Pan ID	84	83
Pan Weight	4.29	4.22
Pan + Soil (wet)	15.22	15.73
Pan + Soil (dry)	12.83	13.20
Moisture Content	28.0%	28.2%
Plastic Limit	*28*	
Plastic Index	*12*	

USCS Classification: ASTM D 2487

Group Symbol **SM**
Group Name **Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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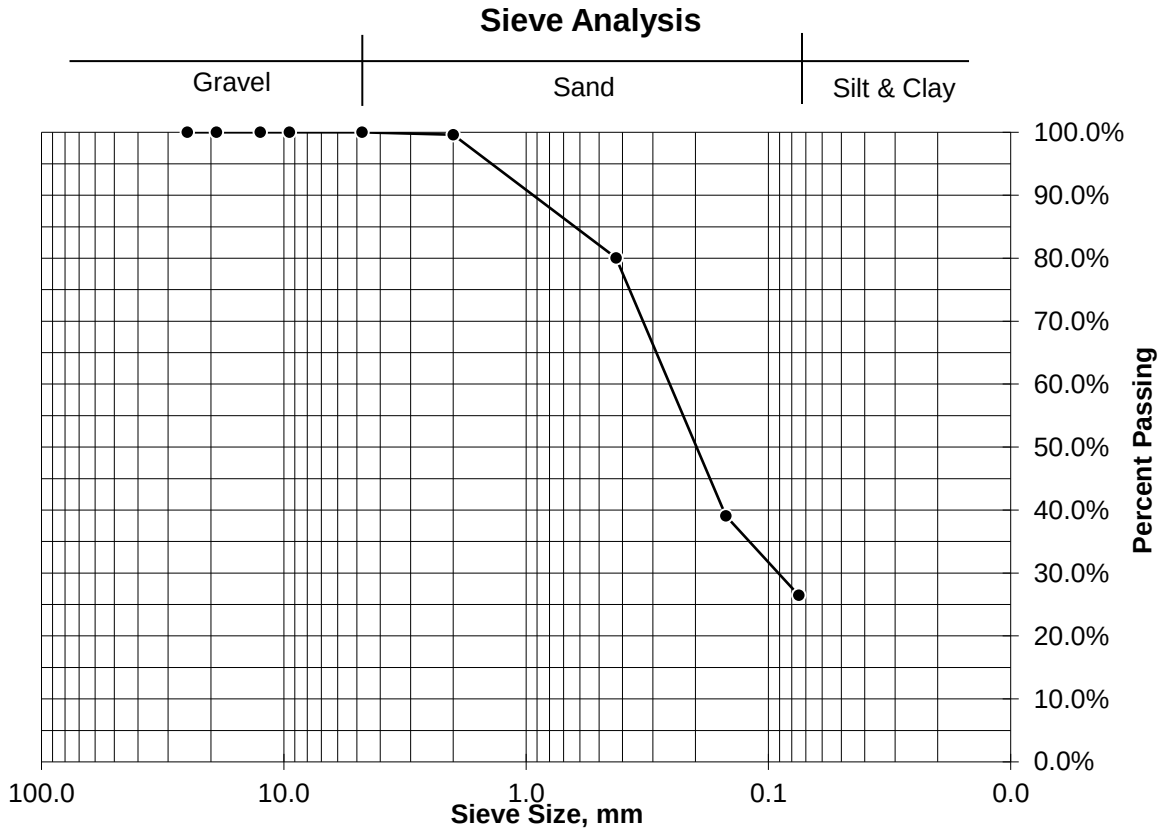
Sample ID DAA-07
Sample Depth 14'-16'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.35	0.4%	2.00	99.6%
No. 40	18.09	19.6%	0.425	80.0%
No. 100	37.80	40.9%	0.15	39.1%
No. 200	11.64	12.6%	0.075	26.5%
Pan	0.54	0.6%		
Total	68.42	74.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-07	Sample Received:	3/19/2019
Sample Depth	55'-57'	Date Tested:	3/19/2019
Visual Sample Description	Dark Reddish-Brown Sandy Elastic SILT		

Natural Moisture Content: ASTM D 2216

Pan ID	7	
Pan Wt	192.36	grams
Pan + Soil (wet)	300.83	grams
Pan + Soil (dry)	263.58	grams
Natural Moisture Content	*52.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	224.65	grams
Percent Passing No. 200 Sieve	54.7%	
Pan + Soil retained on No. 4 sieve (dry)	192.36	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/21/2019

Liquid Limit

No of Blows	15	26	34
Pan ID	91	93	98
Pan Wt	24.48	30.02	30.33
Pan + Soil (wet)	39.70	51.63	45.57
Pan + Soil (dry)	33.71	43.60	40.18
Moisture Content	64.9%	59.1%	54.7%
Liquid Limit	61	59	57
Liquid Limit	*59*		

Plastic Limit

Pan ID	22	84
Pan Weight	4.26	4.27
Pan + Soil (wet)	15.82	15.11
Pan + Soil (dry)	12.33	11.81
Moisture Content	43.2%	43.8%
Plastic Limit	*44*	
Plastic Index	*15*	

USCS Classification: ASTM D 2487

Group Symbol	**MH**
Group Name	**Sandy Elastic SILT**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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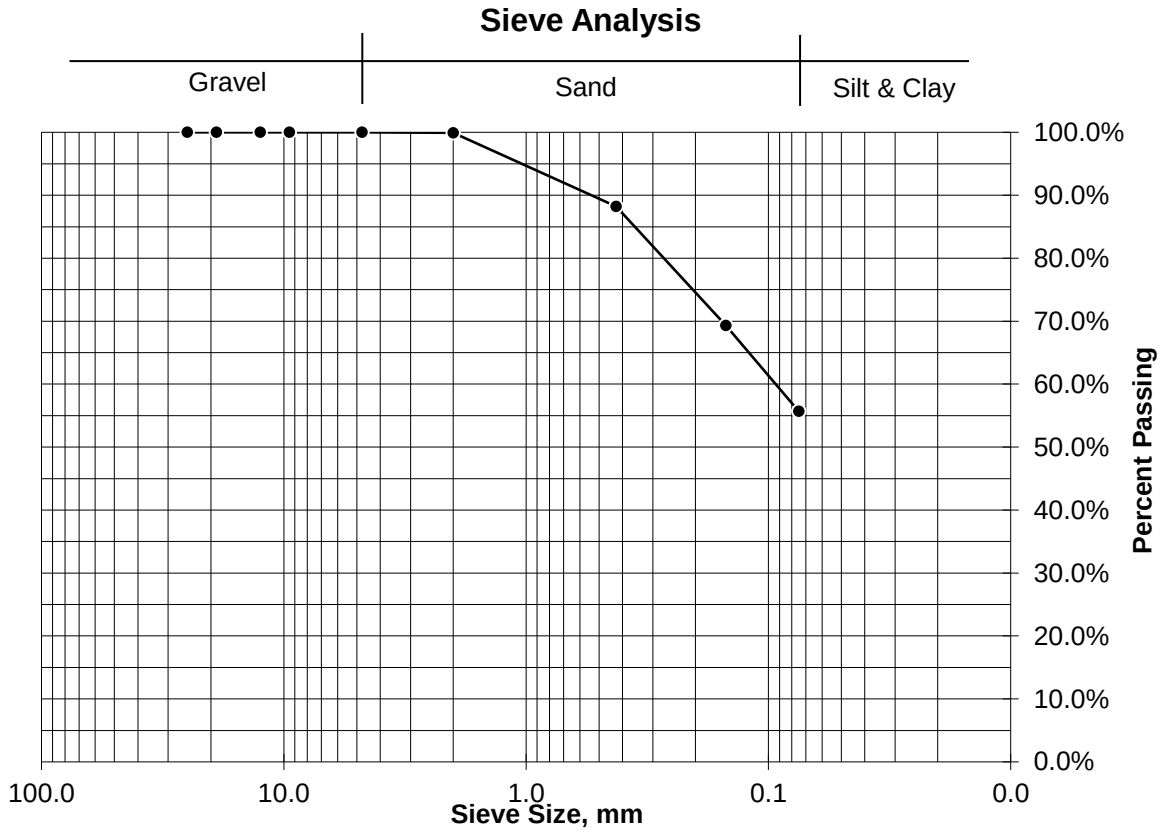
Sample ID DAA-07
Sample Depth 55'-57'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.07	0.1%	2.00	99.9%
No. 40	8.33	11.7%	0.425	88.2%
No. 100	13.45	18.9%	0.15	69.3%
No. 200	9.70	13.6%	0.075	55.7%
Pan	0.74	1.0%		
Total	32.29	45.3%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-08	Sample Received:	3/19/2019
Sample Depth	6'-8'	Date Tested:	3/19/2019
Visual Sample Description	Reddish-Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	6	
Pan Wt	195.41	grams
Pan + Soil (wet)	306.06	grams
Pan + Soil (dry)	278.78	grams
Natural Moisture Content	*32.7%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	245.61	grams
Percent Passing No. 200 Sieve	39.8%	
Pan + Soil retained on No. 4 sieve (dry)	195.41	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows	15	26	34
Pan ID	10	62	63
Pan Wt	11.20	10.85	10.81
Pan + Soil (wet)	28.75	27.80	27.63
Pan + Soil (dry)	22.27	21.93	22.09
Moisture Content	58.5%	53.0%	49.1%
Liquid Limit	55	53	51
Liquid Limit	*53*		

Plastic Limit

Pan ID	23	74
Pan Weight	4.34	4.26
Pan + Soil (wet)	15.71	15.31
Pan + Soil (dry)	12.03	11.73
Moisture Content	47.8%	47.9%
Plastic Limit	*48*	
Plastic Index	*5*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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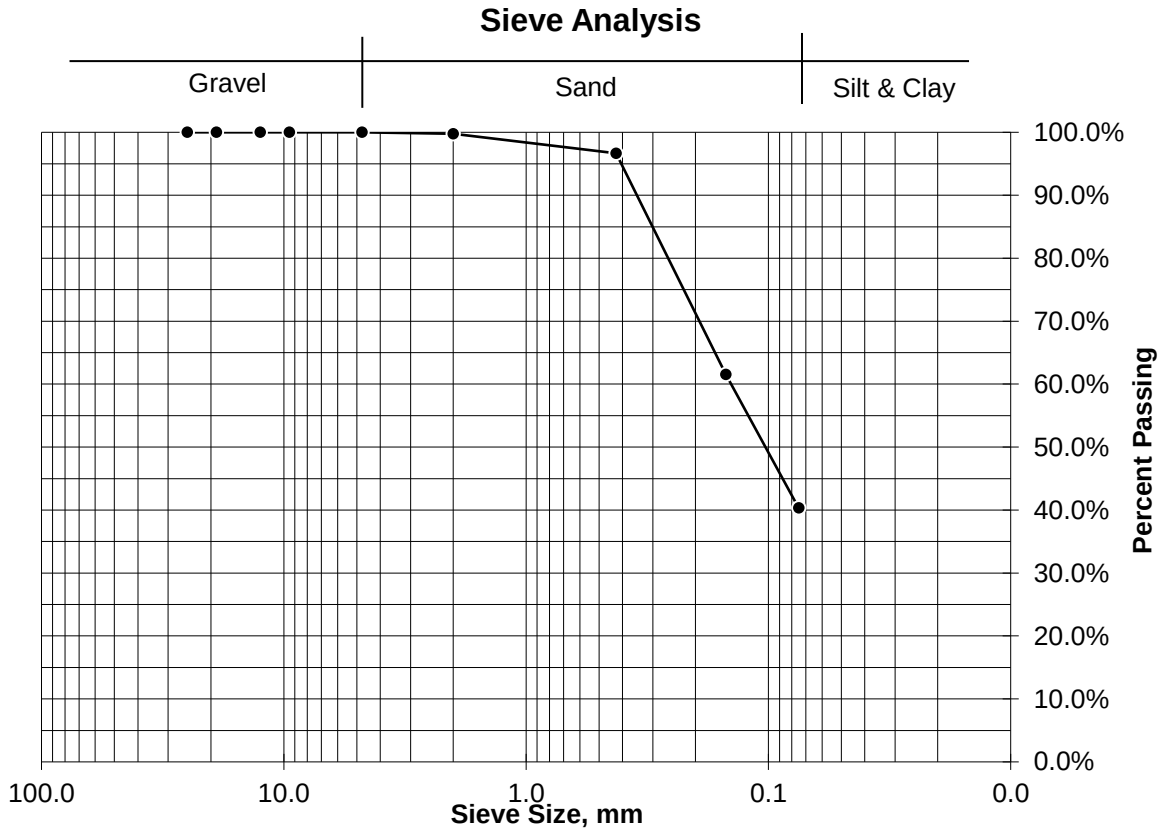
Sample ID DAA-08
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.21	0.3%	2.00	99.7%
No. 40	2.57	3.1%	0.425	96.7%
No. 100	29.28	35.1%	0.15	61.5%
No. 200	17.69	21.2%	0.075	40.3%
Pan	0.45	0.5%		
Total	50.20	60.2%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-08	Sample Recieved:	4/26/2019
Sample Depth	10'-11.5'	Date Tested:	4/26/2019
Visual Sample Description	Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	35	
Pan Wt	192.71	grams
Pan + Soil (wet)	485.76	grams
Pan + Soil (dry)	399.72	grams
Natural Moisture Content	*41.6%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	341.96	grams
Percent Passing No. 200 Sieve	27.9%	
Pan + Soil retained on No. 4 sieve (dry)	194.03	grams
Percent Passing No. 4 Sieve	99.4%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/1/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

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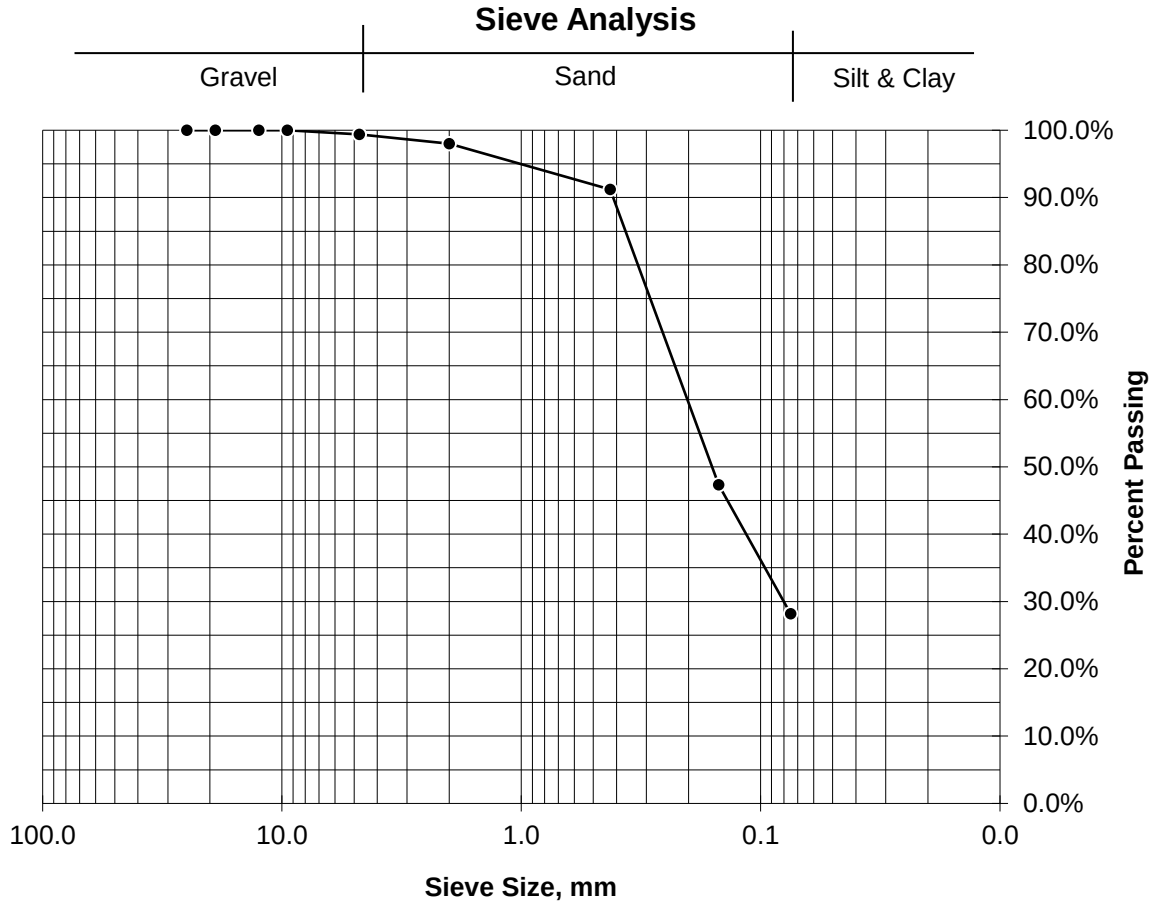
Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-08
Sample Depth 10'-11.5'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Date Tested: Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.5	100.0%
No. 4	1.32	0.6%	4.75	99.4%
No. 10	2.77	1.3%	2.0	98.0%
No. 40	14.15	6.8%	0.425	91.2%
No. 100	90.77	43.8%	0.15	47.3%
No. 200	39.67	19.2%	0.075	28.2%
Pan	0.54	0.3%		
Total	149.22	72.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-08	Sample Received:	3/19/2019
Sample Depth	12'-14'	Date Tested:	3/19/2019
Visual Sample Description	Micaceous Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	37	
Pan Wt	193.55	grams
Pan + Soil (wet)	302.87	grams
Pan + Soil (dry)	269.55	grams
Natural Moisture Content	*43.8%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	249.49	grams
Percent Passing No. 200 Sieve	26.4%	
Pan + Soil retained on No. 4 sieve (dry)	193.55	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows	15	22	35
Pan ID	96	169	201
Pan Wt	24.82	27.15	27.65
Pan + Soil (wet)	41.90	45.82	47.45
Pan + Soil (dry)	36.35	40.19	41.86
Moisture Content	48.1%	43.2%	39.4%
Liquid Limit	45	43	41
Liquid Limit	*43*		

Plastic Limit

Pan ID	13	353
Pan Weight	4.28	9.12
Pan + Soil (wet)	17.45	22.46
Pan + Soil (dry)	13.97	18.94
Moisture Content	35.9%	35.8%
Plastic Limit	*36*	
Plastic Index	*7*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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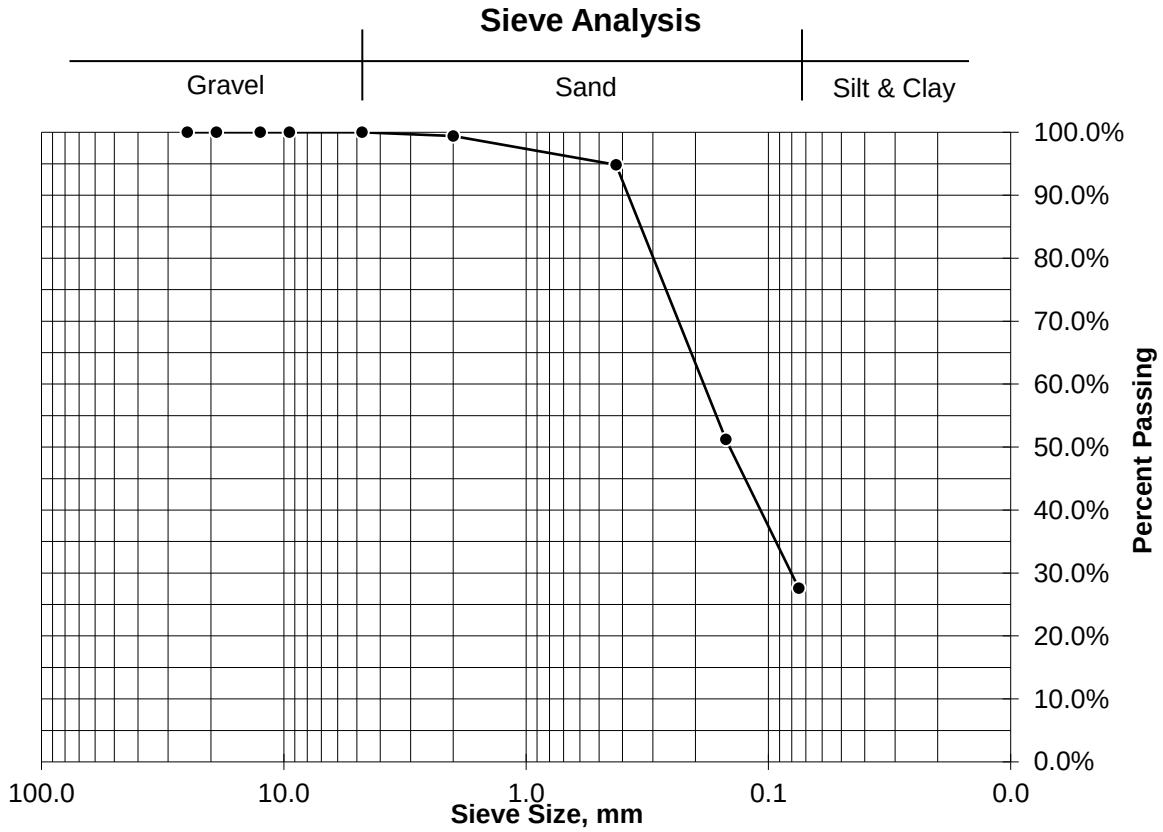
Sample ID DAA-08
Sample Depth 12'-14'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.45	0.6%	2.00	99.4%
No. 40	3.48	4.6%	0.425	94.8%
No. 100	33.13	43.6%	0.15	51.2%
No. 200	17.95	23.6%	0.075	27.6%
Pan	0.92	1.2%		
Total	55.93	73.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-08	Sample Received:	3/19/2019
Sample Depth	20'-22'	Date Tested:	3/19/2019
Visual Sample Description	Micaceous Brownish-Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	20	
Pan Wt	189.94	grams
Pan + Soil (wet)	298.08	grams
Pan + Soil (dry)	274.42	grams
Natural Moisture Content	*28.0%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	255.08	grams
Percent Passing No. 200 Sieve	22.9%	
Pan + Soil retained on No. 4 sieve (dry)	190.42	grams
Percent Passing No. 4 Sieve	99.4%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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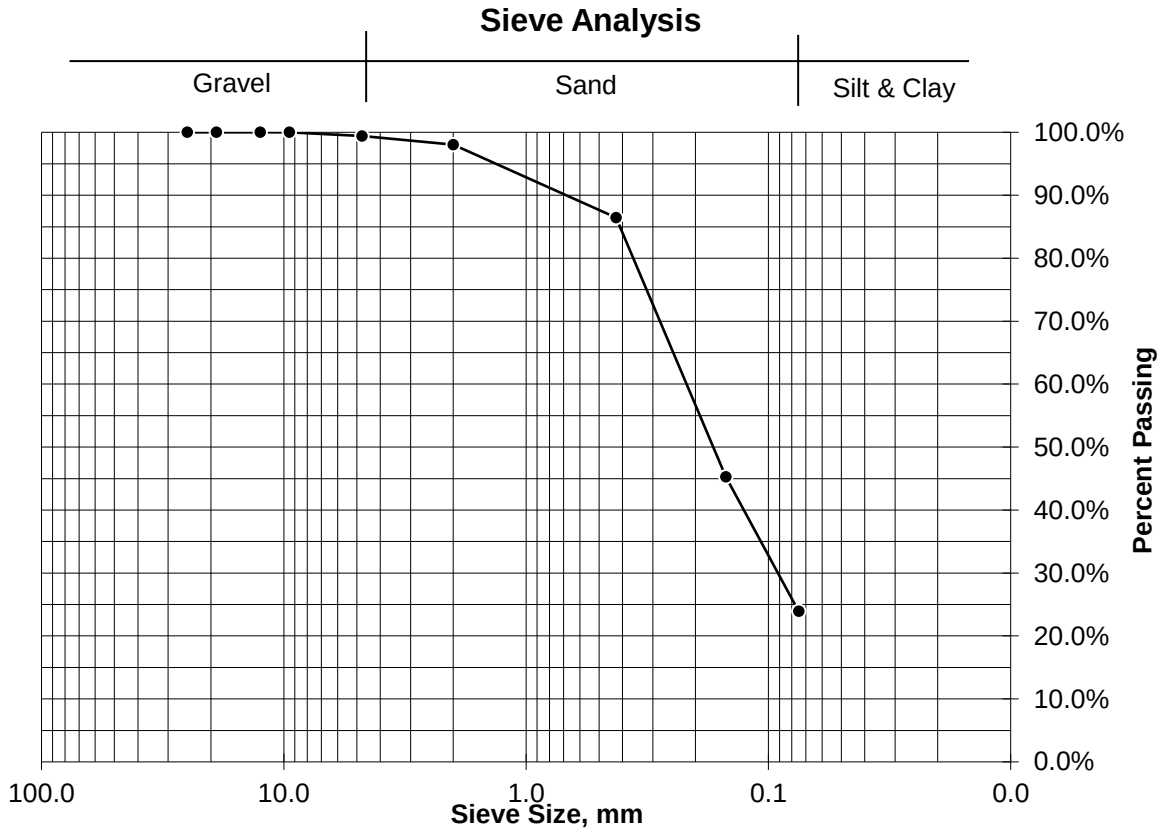
Sample ID DAA-08
Sample Depth 20'-22'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.48	0.6%	4.75	99.4%
No. 10	1.16	1.4%	2.00	98.1%
No. 40	9.80	11.6%	0.425	86.5%
No. 100	34.77	41.2%	0.15	45.3%
No. 200	18.07	21.4%	0.075	23.9%
Pan	0.83	1.0%		
Total	65.11	77.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-09	Sample Received:	3/19/2019
Sample Depth	6'-8'	Date Tested:	3/19/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	38	
Pan Wt	193.63	grams
Pan + Soil (wet)	296.08	grams
Pan + Soil (dry)	271.63	grams
Natural Moisture Content	*31.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	238.65	grams
Percent Passing No. 200 Sieve	42.3%	
Pan + Soil retained on No. 4 sieve (dry)	193.63	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/2/2019

Liquid Limit

No of Blows	17	23	34
Pan ID	6	9	62
Pan Wt	11.18	11.14	10.87
Pan + Soil (wet)	20.78	31.60	21.61
Pan + Soil (dry)	17.11	24.10	17.87
Moisture Content	61.8%	57.9%	53.4%
Liquid Limit	59	57	55
Liquid Limit	*57*		

Plastic Limit

Pan ID	79	317
Pan Weight	4.24	8.09
Pan + Soil (wet)	14.44	18.73
Pan + Soil (dry)	11.31	15.46
Moisture Content	44.3%	44.4%
Plastic Limit	*44*	
Plastic Index	*13*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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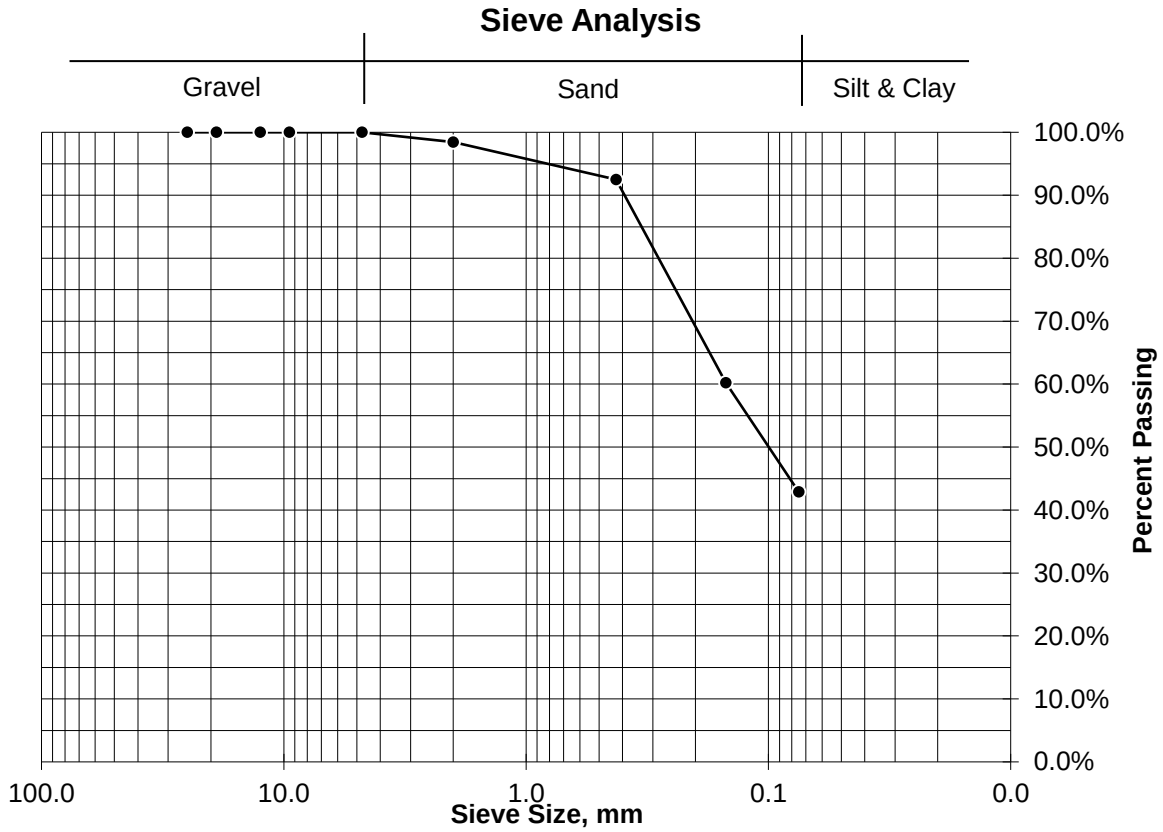
Sample ID DAA-09
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	1.21	1.6%	2.00	98.4%
No. 40	4.63	5.9%	0.425	92.5%
No. 100	25.17	32.3%	0.15	60.2%
No. 200	13.53	17.3%	0.075	42.9%
Pan	0.48	0.6%		
Total	45.02	57.7%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-09	Sample Received:	3/19/2019
Sample Depth	20'-22'	Date Tested:	3/19/2019
Visual Sample Description	Micaceous Brownish-Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	31	
Pan Wt	193.03	grams
Pan + Soil (wet)	308.43	grams
Pan + Soil (dry)	295.67	grams
Natural Moisture Content	*12.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	278.85	grams
Percent Passing No. 200 Sieve	16.4%	
Pan + Soil retained on No. 4 sieve (dry)	193.49	grams
Percent Passing No. 4 Sieve	99.6%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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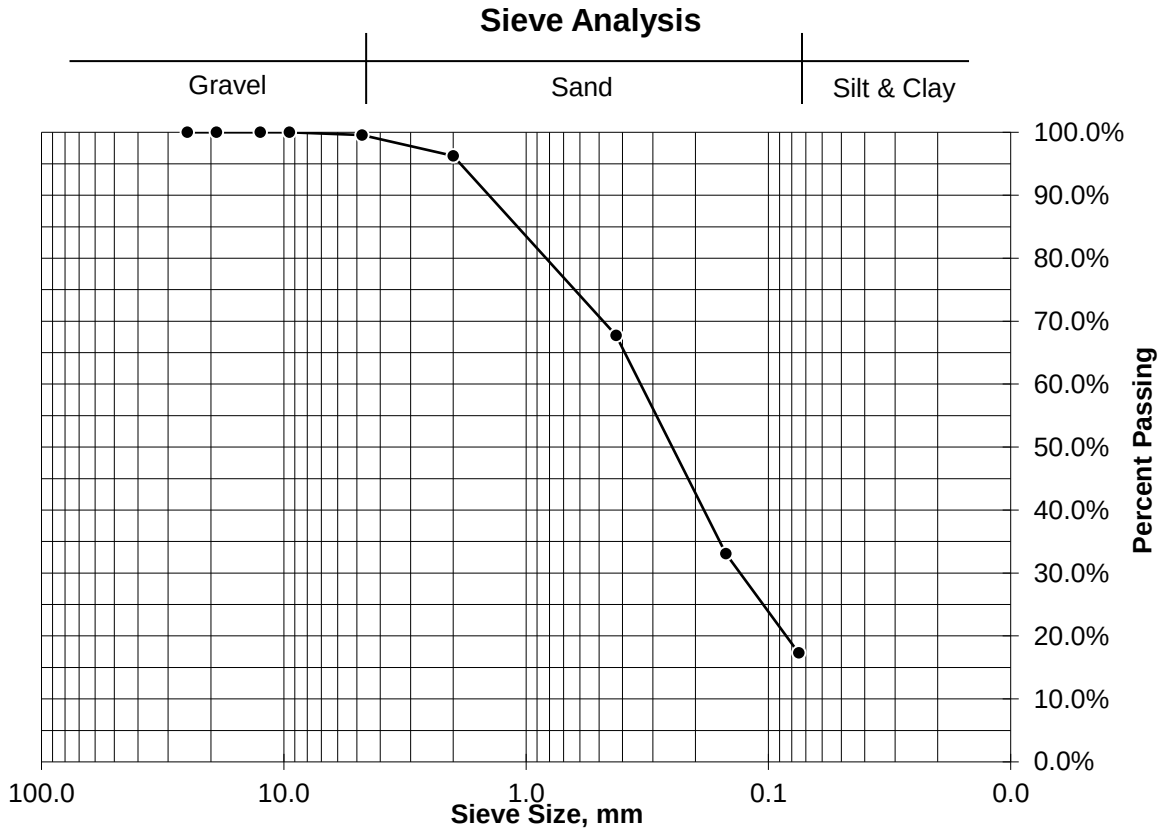
Sample ID DAA-09
Sample Depth 20'-22'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.46	0.4%	4.75	99.6%
No. 10	3.36	3.3%	2.00	96.3%
No. 40	29.30	28.5%	0.425	67.7%
No. 100	35.57	34.7%	0.15	33.1%
No. 200	16.19	15.8%	0.075	17.3%
Pan	0.93	0.9%		
Total	85.81	83.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-10	Sample Received:	3/19/2019
Sample Depth	22'-24'	Date Tested:	3/22/2019
Visual Sample Description	Brownish Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	101	
Pan Wt	122.79	grams
Pan + Soil (wet)	236.05	grams
Pan + Soil (dry)	224.08	grams
Natural Moisture Content	*11.8%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	206.06	grams
Percent Passing No. 200 Sieve	17.8%	
Pan + Soil retained on No. 4 sieve (dry)	125.12	grams
Percent Passing No. 4 Sieve	97.7%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/25/2019

Liquid Limit

No of Blows	18	24	34
Pan ID	2000	92	102
Pan Wt	25.70	25.63	24.01
Pan + Soil (wet)	37.17	36.23	37.46
Pan + Soil (dry)	33.92	33.39	34.14
Moisture Content	39.5%	36.6%	32.8%
Liquid Limit	38	36	34
Liquid Limit	*36*		

Plastic Limit

Pan ID	315	353
Pan Weight	9.14	9.12
Pan + Soil (wet)	22.89	22.11
Pan + Soil (dry)	19.88	19.28
Moisture Content	28.0%	27.9%
Plastic Limit	*28*	
Plastic Index	*8*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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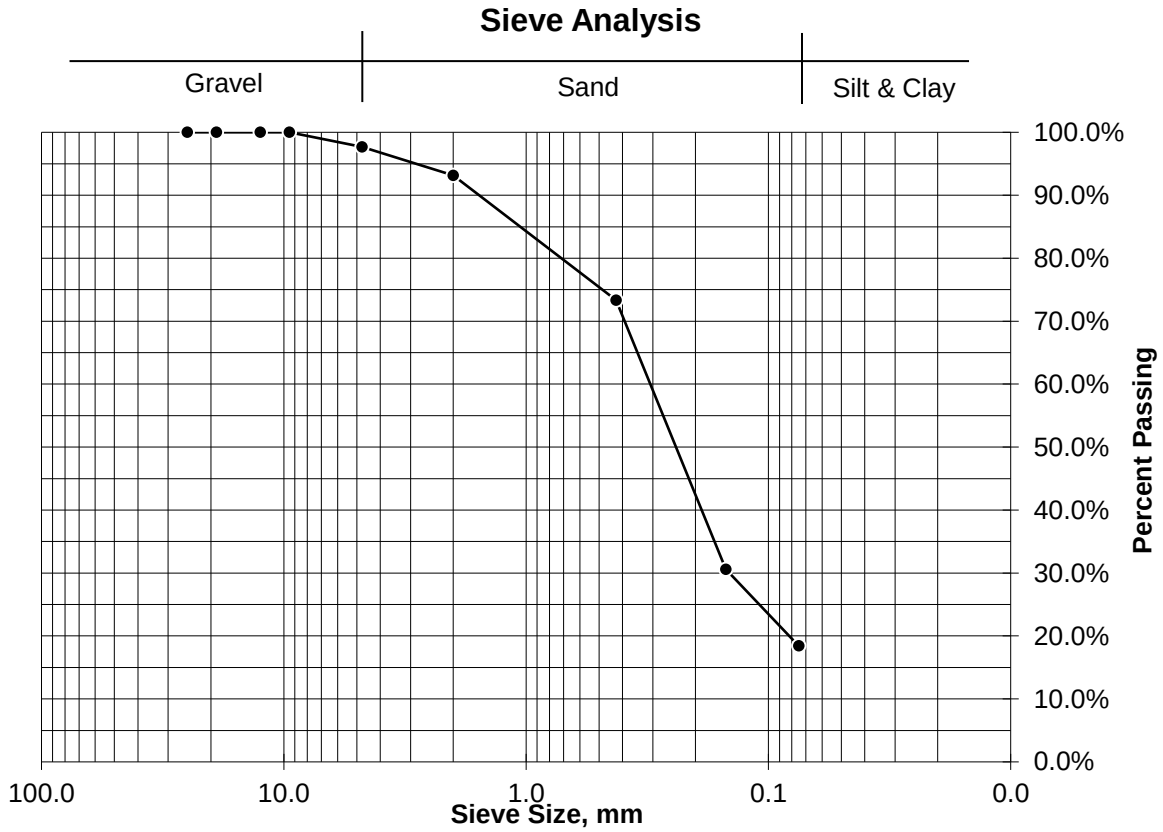
Sample ID DAA-10
Sample Depth 22'-24'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	2.33	2.3%	4.75	97.7%
No. 10	4.62	4.6%	2.00	93.1%
No. 40	20.05	19.8%	0.425	73.3%
No. 100	43.31	42.8%	0.15	30.6%
No. 200	12.32	12.2%	0.075	18.4%
Pan	0.64	0.6%		
Total	83.27	82.2%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-10	Sample Received:	3/19/2019
Sample Depth	24'-26'	Date Tested:	3/19/2019
Visual Sample Description	Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	39	
Pan Wt	192.99	grams
Pan + Soil (wet)	305.74	grams
Pan + Soil (dry)	294.04	grams
Natural Moisture Content	*11.6%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	264.20	grams
Percent Passing No. 200 Sieve	29.5%	
Pan + Soil retained on No. 4 sieve (dry)	192.99	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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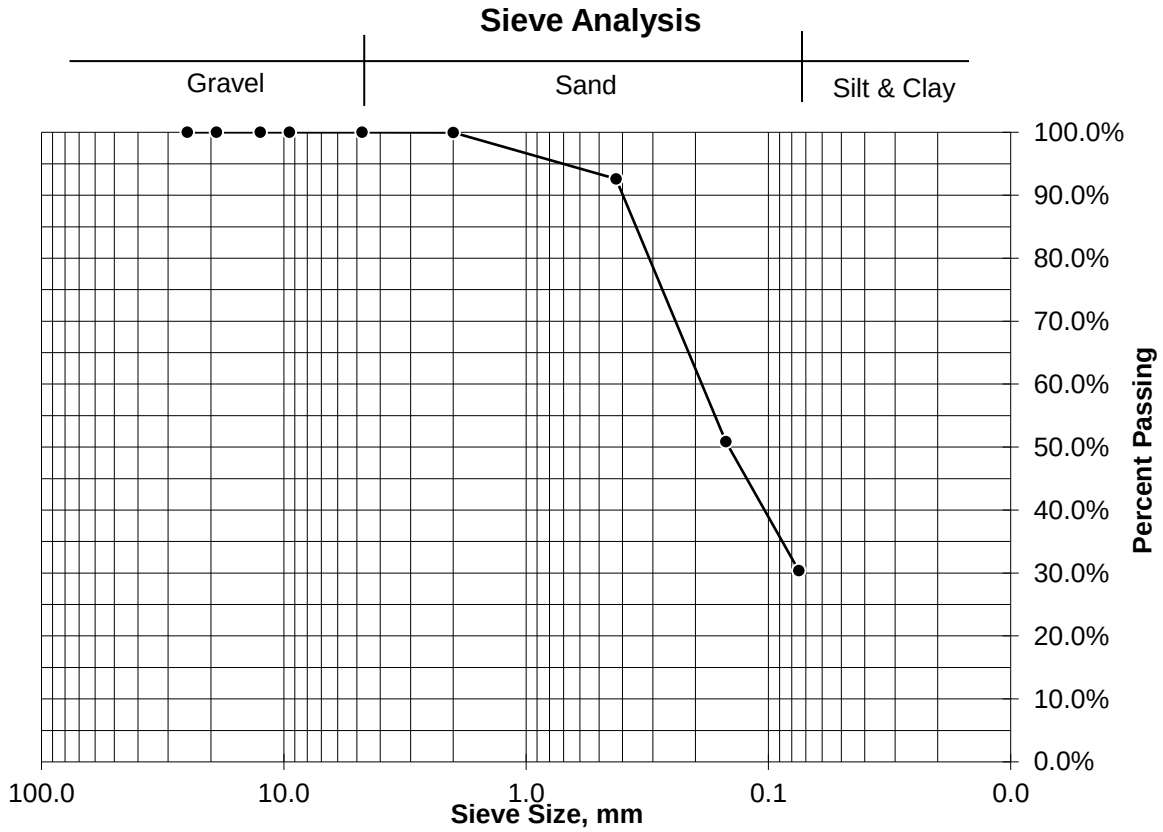
Sample ID DAA-10
Sample Depth 24'-26'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.03	0.0%	2.00	100.0%
No. 40	7.45	7.4%	0.425	92.6%
No. 100	42.14	41.7%	0.15	50.9%
No. 200	20.70	20.5%	0.075	30.4%
Pan	0.88	0.9%		
Total	71.20	70.5%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-12	Sample Received:	3/19/2019
Sample Depth	25'-27'	Date Tested:	3/19/2019
Visual Sample Description	Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	33	
Pan Wt	193.68	grams
Pan + Soil (wet)	312.10	grams
Pan + Soil (dry)	307.83	grams
Natural Moisture Content	*3.7%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	287.06	grams
Percent Passing No. 200 Sieve	18.2%	
Pan + Soil retained on No. 4 sieve (dry)	194.40	grams
Percent Passing No. 4 Sieve	99.4%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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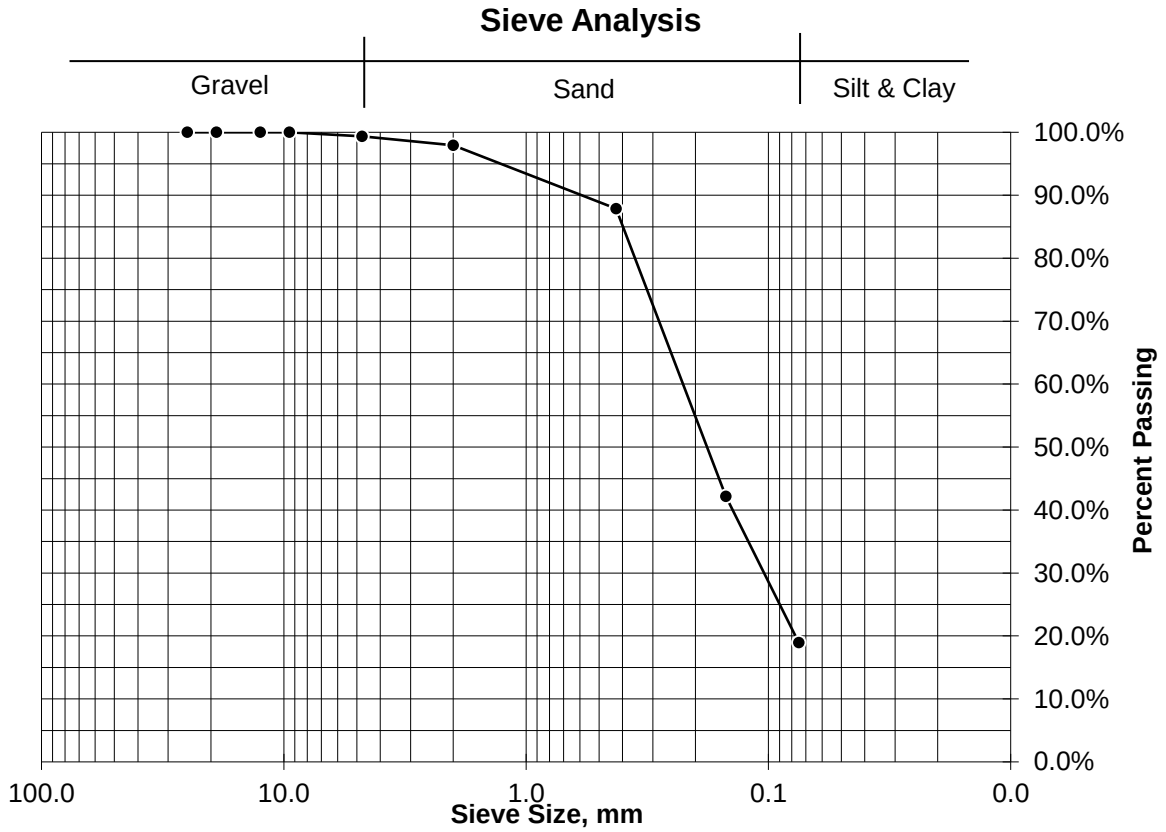
Sample ID DAA-12
Sample Depth 25'-27'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.72	0.6%	4.75	99.4%
No. 10	1.65	1.4%	2.00	97.9%
No. 40	11.45	10.0%	0.425	87.9%
No. 100	52.16	45.7%	0.15	42.2%
No. 200	26.51	23.2%	0.075	19.0%
Pan	0.87	0.8%		
Total	93.36	81.8%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-13	Sample Received:	3/19/2019
Sample Depth	8'-10'	Date Tested:	3/19/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	22	
Pan Wt	189.00	grams
Pan + Soil (wet)	296.08	grams
Pan + Soil (dry)	277.42	grams
Natural Moisture Content	*21.1%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	250.40	grams
Percent Passing No. 200 Sieve	30.6%	
Pan + Soil retained on No. 4 sieve (dry)	189.00	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/21/2019

Liquid Limit

No of Blows	18	24	35
Pan ID	94	108	109
Pan Wt	23.81	33.16	25.00
Pan + Soil (wet)	42.00	51.14	42.51
Pan + Soil (dry)	36.56	46.05	37.92
Moisture Content	42.7%	39.5%	35.5%
Liquid Limit	41	39	37
Liquid Limit	*39*		

Plastic Limit

Pan ID	313	316
Pan Weight	9.17	9.09
Pan + Soil (wet)	22.43	22.78
Pan + Soil (dry)	19.42	19.68
Moisture Content	29.4%	29.3%
Plastic Limit	*29*	
Plastic Index	*10*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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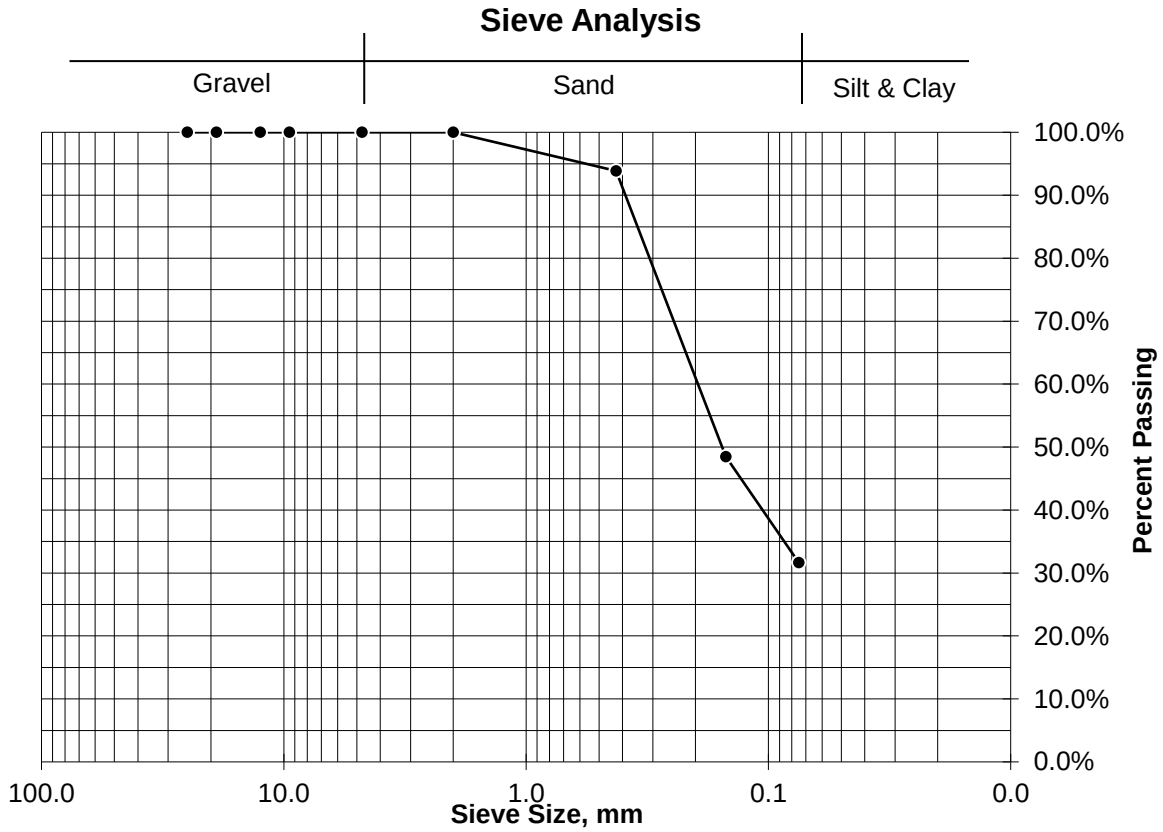
Sample ID DAA-13
Sample Depth 8'-10'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	5.40	6.1%	0.425	93.9%
No. 100	40.17	45.4%	0.15	48.5%
No. 200	14.84	16.8%	0.075	31.7%
Pan	0.98	1.1%		
Total	61.39	69.4%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-13
Sample Depth 14'-16'
Visual Sample Description Micaceous Brown Silty SAND

Sample Received: 3/19/2019
Date Tested: 3/19/2019

Natural Moisture Content: ASTM D 2216

Pan ID	36	
Pan Wt	193.75	grams
Pan + Soil (wet)	296.27	grams
Pan + Soil (dry)	284.81	grams
Natural Moisture Content	*12.6%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	261.66	grams
Percent Passing No. 200 Sieve	25.4%	
Pan + Soil retained on No. 4 sieve (dry)	194.29	grams
Percent Passing No. 4 Sieve	99.4%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows	16	25	32
Pan ID	101	105	107
Pan Wt	24.02	29.28	25.11
Pan + Soil (wet)	41.09	50.43	44.11
Pan + Soil (dry)	36.36	45.01	39.58
Moisture Content	38.3%	34.5%	31.3%
Liquid Limit	36	34	32
Liquid Limit	*34*		

Plastic Limit

Pan ID	2	4
Pan Weight	9.03	9.02
Pan + Soil (wet)	26.00	24.05
Pan + Soil (dry)	22.37	20.83
Moisture Content	27.2%	27.3%
Plastic Limit	*27*	
Plastic Index	*7*	

USCS Classification: ASTM D 2487

Group Symbol **SM**
Group Name **Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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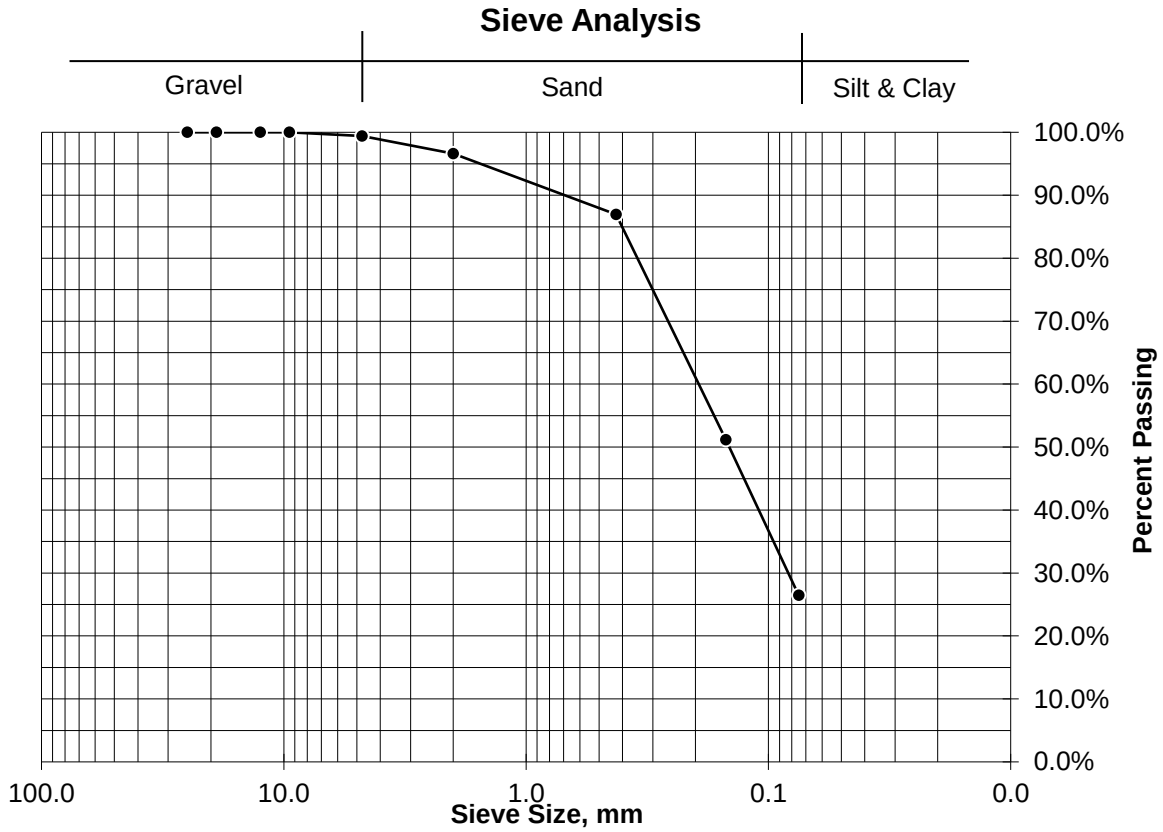
Sample ID DAA-13
Sample Depth 14'-16'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.54	0.6%	4.75	99.4%
No. 10	2.55	2.8%	2.00	96.6%
No. 40	8.77	9.6%	0.425	87.0%
No. 100	32.59	35.8%	0.15	51.2%
No. 200	22.50	24.7%	0.075	26.5%
Pan	0.95	1.0%		
Total	67.90	74.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-13	Sample Received:	3/19/2019
Sample Depth	26'-28'	Date Tested:	3/22/2019
Visual Sample Description	Brownish-Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	42	
Pan Wt	192.26	grams
Pan + Soil (wet)	295.02	grams
Pan + Soil (dry)	279.80	grams
Natural Moisture Content	*17.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	264.47	grams
Percent Passing No. 200 Sieve	17.5%	
Pan + Soil retained on No. 4 sieve (dry)	192.26	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID			
Pan Wt		Non-plastic	
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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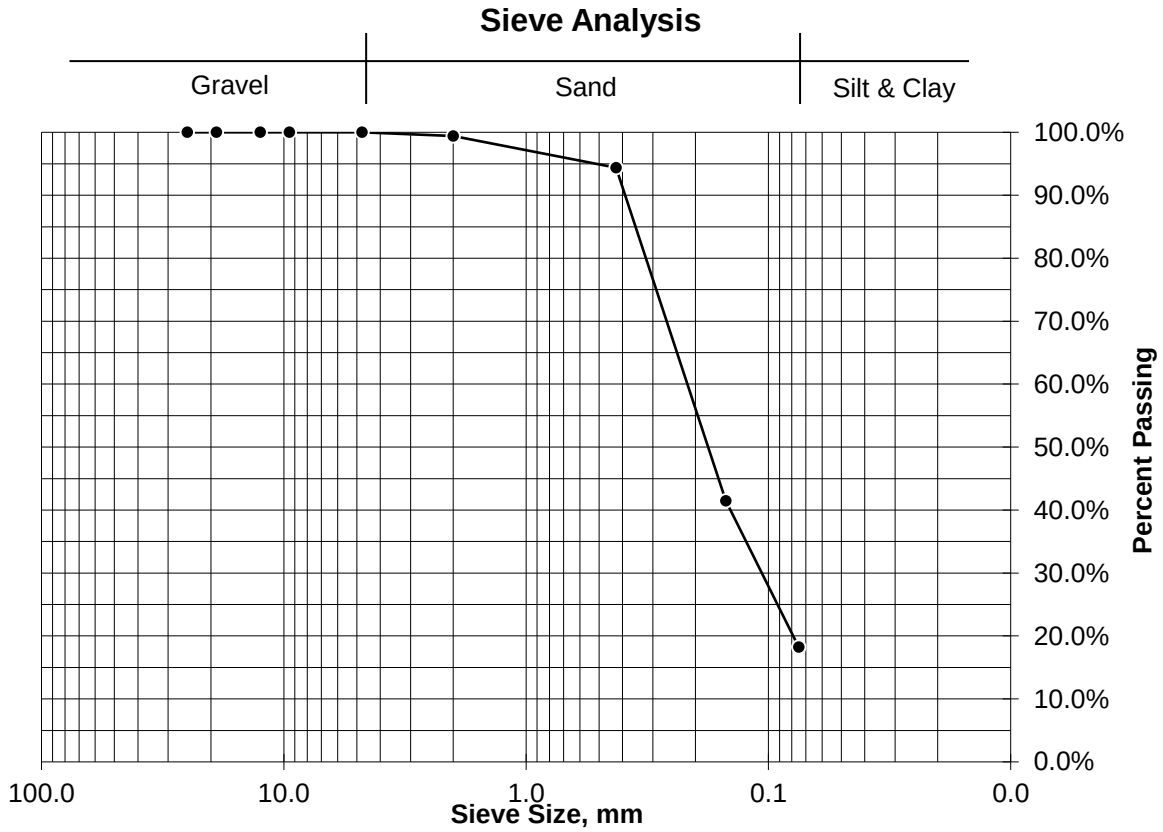
Sample ID DAA-13
Sample Depth 26'-28'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.50	0.6%	2.00	99.4%
No. 40	4.43	5.1%	0.425	94.4%
No. 100	46.33	52.9%	0.15	41.4%
No. 200	20.30	23.2%	0.075	18.3%
Pan	0.65	0.7%		
Total	72.21	82.5%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-13	Sample Received:	3/19/2019
Sample Depth	28'-30'	Date Tested:	3/19/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	27	
Pan Wt	193.73	grams
Pan + Soil (wet)	306.26	grams
Pan + Soil (dry)	291.52	grams
Natural Moisture Content	*15.1%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	260.69	grams
Percent Passing No. 200 Sieve	31.5%	
Pan + Soil retained on No. 4 sieve (dry)	193.73	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/21/2019

Liquid Limit

No of Blows			
Pan ID			
Pan Wt		Non-plastic	
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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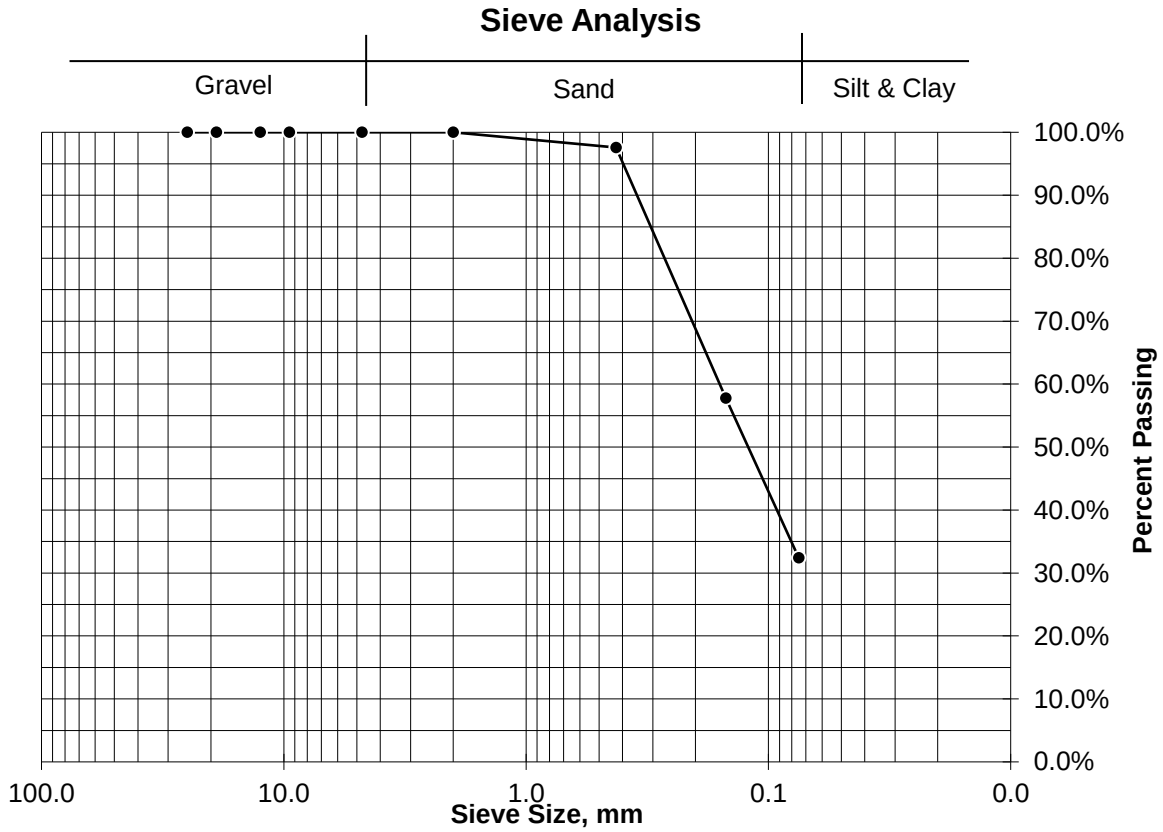
Sample ID DAA-13
Sample Depth 28'-30'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	2.36	2.4%	0.425	97.6%
No. 100	38.90	39.8%	0.15	57.8%
No. 200	24.81	25.4%	0.075	32.4%
Pan	0.86	0.9%		
Total	66.93	68.4%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-14	Sample Received:	3/19/2019
Sample Depth	6'-8'	Date Tested:	3/22/2019
Visual Sample Description	Reddish-Brown Sandy Elastic SILT		

Natural Moisture Content: ASTM D 2216

Pan ID	1	
Pan Wt	195.48	grams
Pan + Soil (wet)	297.07	grams
Pan + Soil (dry)	273.14	grams
Natural Moisture Content	*30.8%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	230.92	grams
Percent Passing No. 200 Sieve	54.4%	
Pan + Soil retained on No. 4 sieve (dry)	195.48	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/26/2019

Liquid Limit

No of Blows	16	27	33
Pan ID	2000	102	92
Pan Wt	25.73	24.03	25.68
Pan + Soil (wet)	36.84	35.62	36.77
Pan + Soil (dry)	32.18	31.05	32.53
Moisture Content	72.2%	65.1%	61.9%
Liquid Limit	68	66	64
Liquid Limit	*66*		

Plastic Limit

Pan ID	19	18
Pan Weight	4.36	4.27
Pan + Soil (wet)	15.87	14.96
Pan + Soil (dry)	12.53	11.89
Moisture Content	40.9%	40.3%
Plastic Limit	*41*	
Plastic Index	*25*	

USCS Classification: ASTM D 2487

Group Symbol	**MH**
Group Name	**Sandy Elastic SILT**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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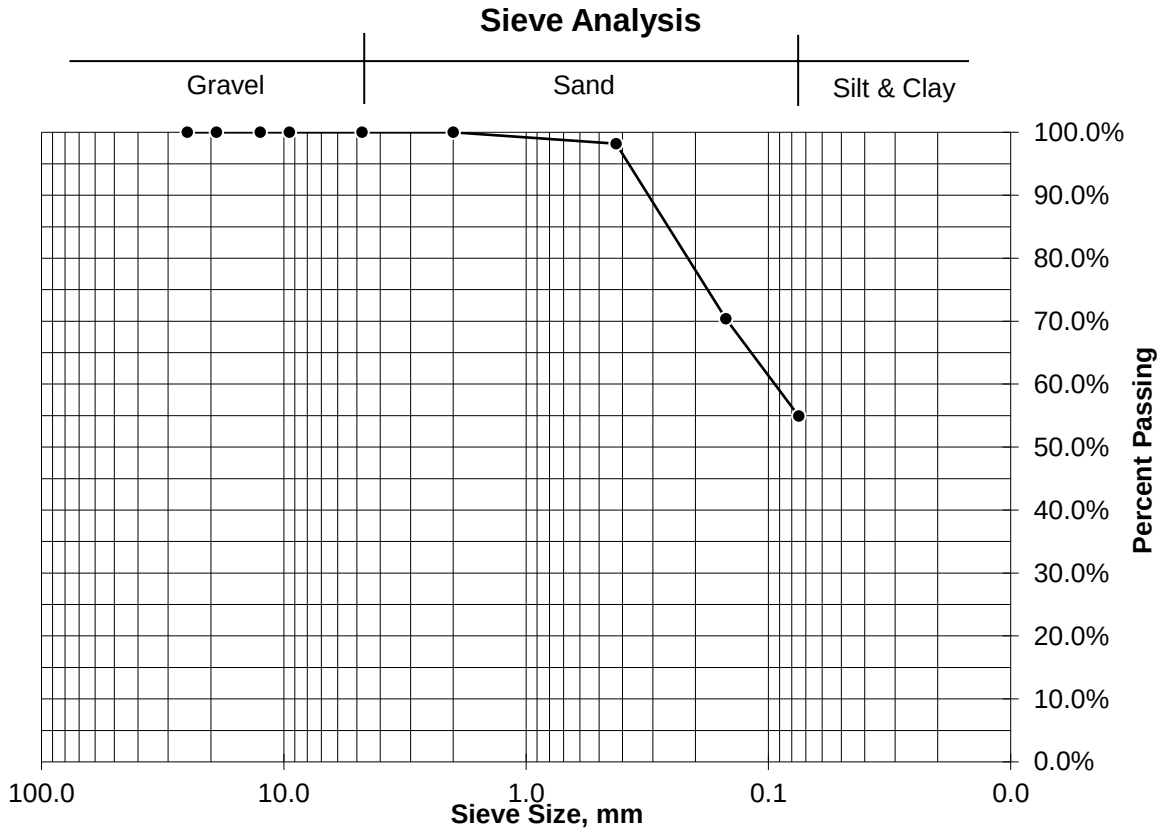
Sample ID DAA-14
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	1.40	1.8%	0.425	98.2%
No. 100	21.59	27.8%	0.15	70.4%
No. 200	12.01	15.5%	0.075	54.9%
Pan	0.44	0.6%		
Total	35.44	45.6%		



Soil Classification Calculations

Green Rideg, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-14	Sample Received:	3/19/2019
Sample Depth	10'-12'	Date Tested:	3/22/2019
Visual Sample Description	Reddish-Brown Elastic SILT with Sand		

Natural Moisture Content: ASTM D 2216

Pan ID	33	
Pan Wt	193.65	grams
Pan + Soil (wet)	299.18	grams
Pan + Soil (dry)	270.84	grams
Natural Moisture Content	*36.7%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	215.35	grams
Percent Passing No. 200 Sieve	71.9%	
Pan + Soil retained on No. 4 sieve (dry)	193.65	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/26/2019

Liquid Limit

No of Blows	19	28	33
Pan ID	107	101	105
Pan Wt	25.12	24.01	29.31
Pan + Soil (wet)	35.16	35.82	40.30
Pan + Soil (dry)	30.82	30.92	35.88
Moisture Content	76.1%	70.9%	67.2%
Liquid Limit	74	72	70
Liquid Limit	*72*		

Plastic Limit

Pan ID	76	79
Pan Weight	4.21	4.24
Pan + Soil (wet)	14.55	15.55
Pan + Soil (dry)	11.80	12.47
Moisture Content	36.2%	37.4%
Plastic Limit	*37*	
Plastic Index	*35*	

USCS Classification: ASTM D 2487

Group Symbol	**MH**
Group Name	**Elastic SILT with Sand**

Grain Size Distribution Calculations

Green Rideg, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
Engineering • Surveying • Environmental Services
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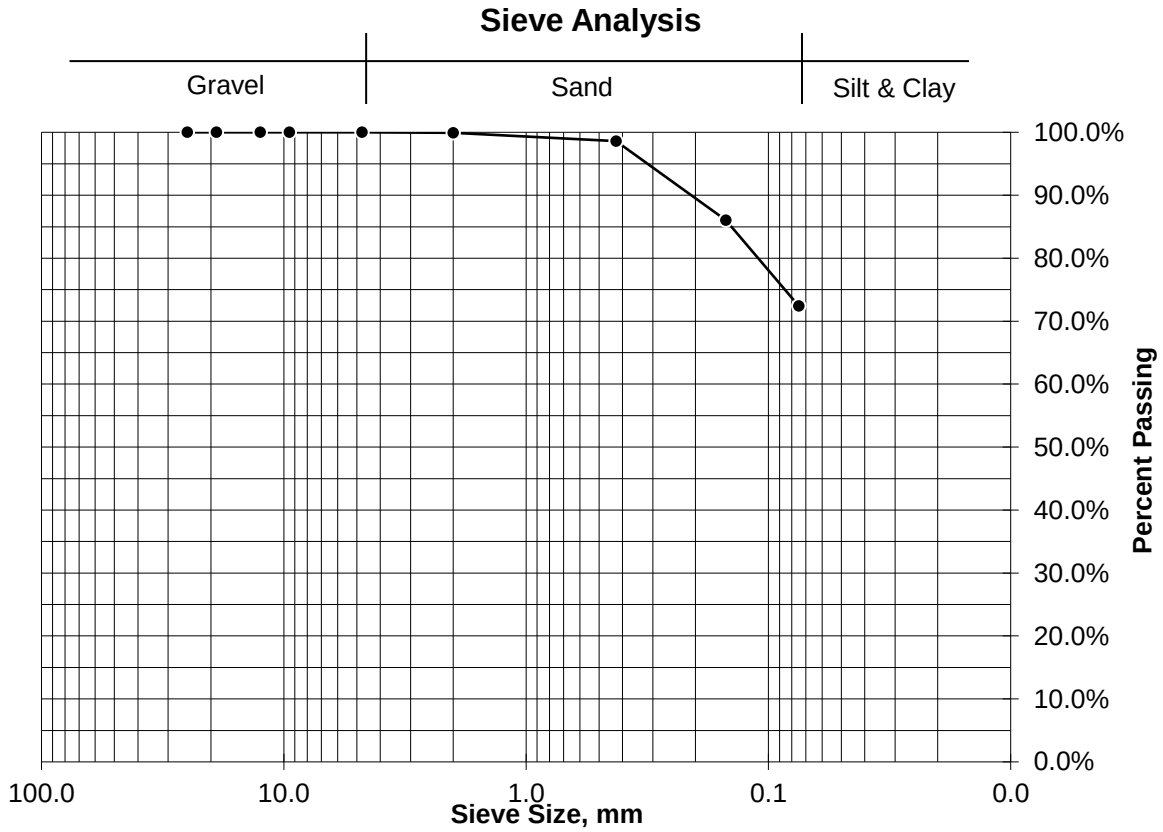
Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Sample ID DAA-14
Sample Depth 10'-12'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.08	0.1%	2.00	99.9%
No. 40	1.01	1.3%	0.425	98.6%
No. 100	9.67	12.5%	0.15	86.1%
No. 200	10.52	13.6%	0.075	72.4%
Pan	0.42	0.5%		
Total	21.70	28.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
Engineering • Surveying • Environmental Services
1030 Wilmer Ave., Ste. 100
Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Sample ID DAA-14
Sample Depth 14'-16'
Visual Sample Description Reddish-Brown Sandy Elastic SILT

Sample Received: 3/19/2019
Date Tested: 3/22/2019

Natural Moisture Content: ASTM D 2216

Pan ID	15	
Pan Wt	188.25	grams
Pan + Soil (wet)	288.54	grams
Pan + Soil (dry)	263.15	grams
Natural Moisture Content	*33.9%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	224.55	grams
Percent Passing No. 200 Sieve	51.5%	
Pan + Soil retained on No. 4 sieve (dry)	189.26	grams
Percent Passing No. 4 Sieve	98.7%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/26/2019

Liquid Limit

No of Blows	15	27	33
Pan ID	91	98	93
Pan Wt	24.52	30.34	30.11
Pan + Soil (wet)	36.76	43.64	46.23
Pan + Soil (dry)	31.62	38.37	40.07
Moisture Content	72.3%	65.6%	61.9%
Liquid Limit	68	66	64
Liquid Limit	*66*		

Plastic Limit

Pan ID	316	2
Pan Weight	9.08	9.03
Pan + Soil (wet)	19.78	19.28
Pan + Soil (dry)	16.62	16.21
Moisture Content	41.9%	42.8%
Plastic Limit	*42*	
Plastic Index	*24*	

USCS Classification: ASTM D 2487

Group Symbol **MH**
Group Name **Sandy Elastic SILT**

Grain Size Distribution Calculations

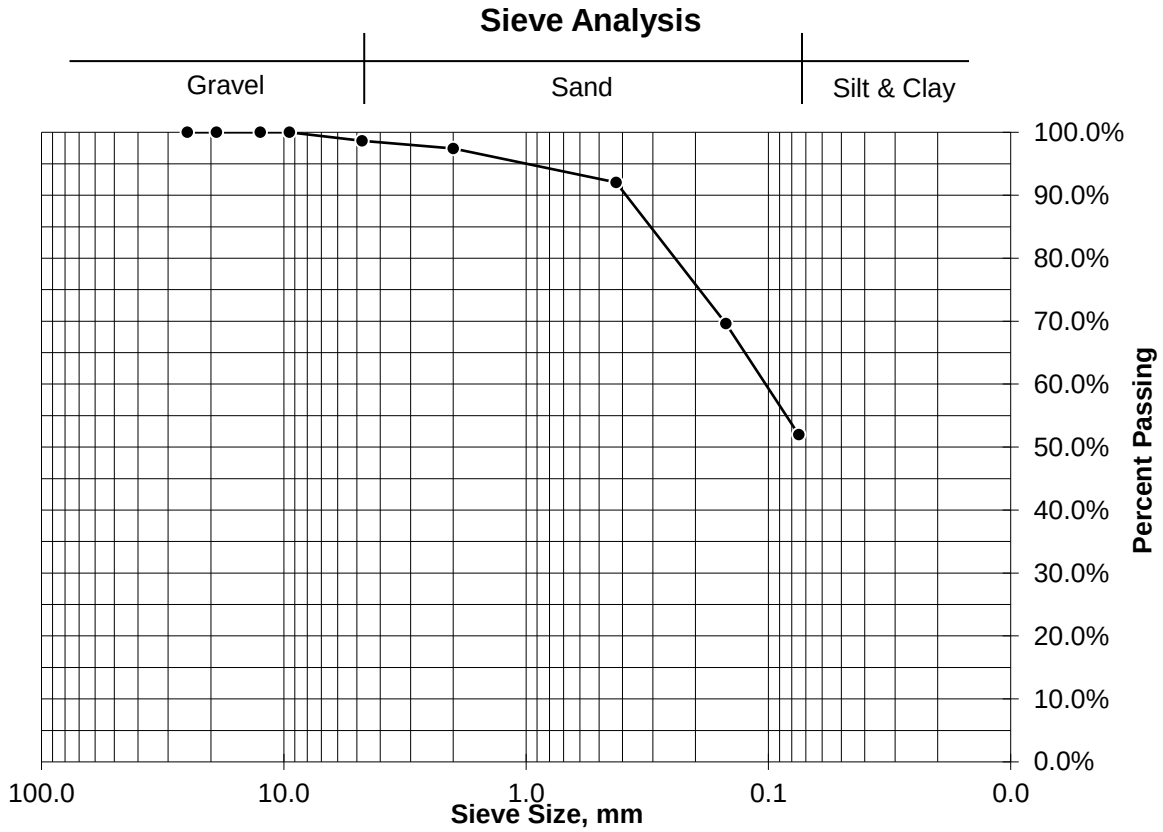
Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
Engineering • Surveying • Environmental Services
1030 Wilmer Ave., Ste. 100
Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Sample ID DAA-14
Sample Depth 14'-16'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	1.01	1.3%	4.75	98.7%
No. 10	0.90	1.2%	2.00	97.4%
No. 40	4.07	5.4%	0.425	92.0%
No. 100	16.76	22.4%	0.15	69.6%
No. 200	13.22	17.7%	0.075	52.0%
Pan	0.31	0.4%		
Total	36.27	48.4%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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Sample ID	DAA-14	Sample Received:	3/19/2019
Sample Depth	24'-26'	Date Tested:	3/19/2019
Visual Sample Description	Reddish-Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	27	
Pan Wt	193.72	grams
Pan + Soil (wet)	300.75	grams
Pan + Soil (dry)	271.07	grams
Natural Moisture Content	*38.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	233.89	grams
Percent Passing No. 200 Sieve	48.1%	
Pan + Soil retained on No. 4 sieve (dry)	193.88	grams
Percent Passing No. 4 Sieve	99.8%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/25/2019

Liquid Limit

No of Blows	18	27	33
Pan ID	103	104	97
Pan Wt	27.43	26.24	26.09
Pan + Soil (wet)	37.76	36.38	36.36
Pan + Soil (dry)	33.93	32.79	32.88
Moisture Content	58.9%	54.8%	51.2%
Liquid Limit	57	55	53
Liquid Limit	*55*		

Plastic Limit

Pan ID	83	4
Pan Weight	4.23	9.02
Pan + Soil (wet)	14.83	19.32
Pan + Soil (dry)	11.81	16.39
Moisture Content	39.8%	39.8%
Plastic Limit	*40*	
Plastic Index	*15*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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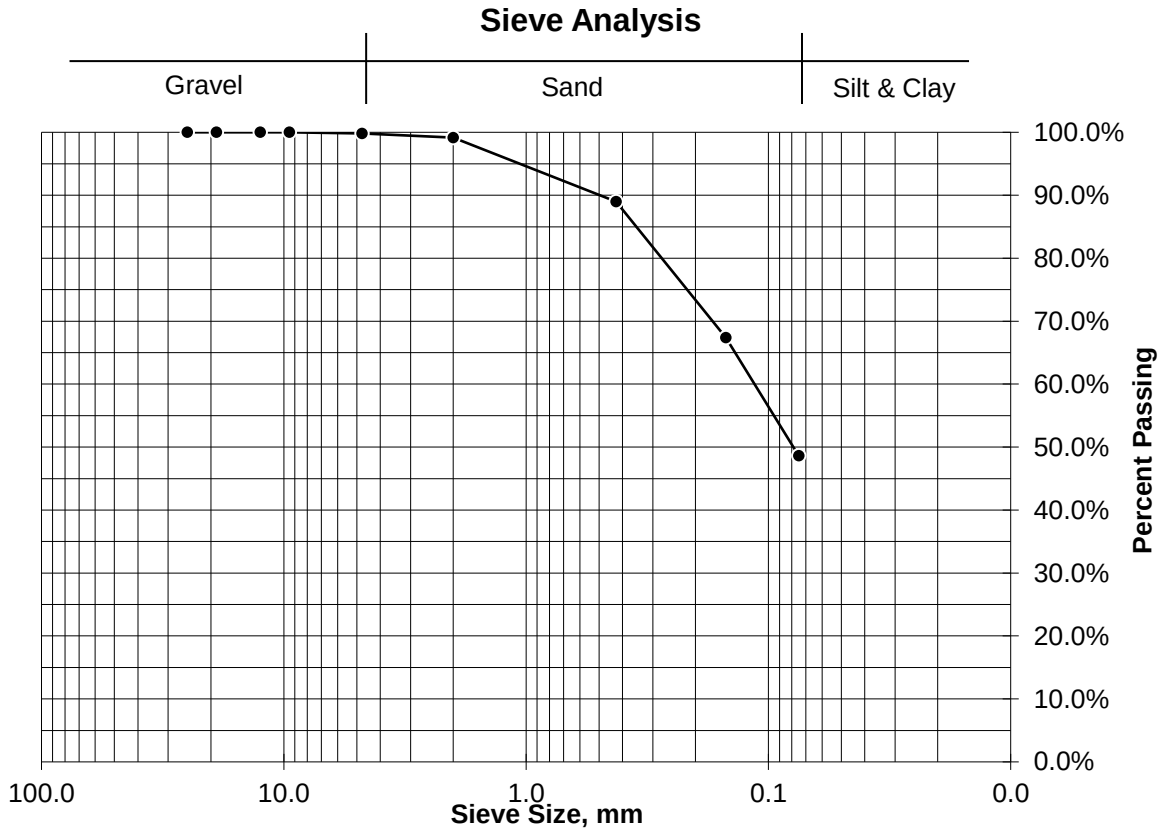
Sample ID DAA-14
Sample Depth 24'-26'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.16	0.2%	4.75	99.8%
No. 10	0.50	0.6%	2.00	99.1%
No. 40	7.87	10.2%	0.425	89.0%
No. 100	16.71	21.6%	0.15	67.4%
No. 200	14.49	18.7%	0.075	48.6%
Pan	0.44	0.6%		
Total	40.17	51.9%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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Sample ID	DAA-14	Sample Received:	3/19/2019
Sample Depth	26'-28'	Date Tested:	3/22/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	8	
Pan Wt	187.14	grams
Pan + Soil (wet)	289.88	grams
Pan + Soil (dry)	273.99	grams
Natural Moisture Content	*18.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	251.07	grams
Percent Passing No. 200 Sieve	26.4%	
Pan + Soil retained on No. 4 sieve (dry)	189.22	grams
Percent Passing No. 4 Sieve	97.6%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/25/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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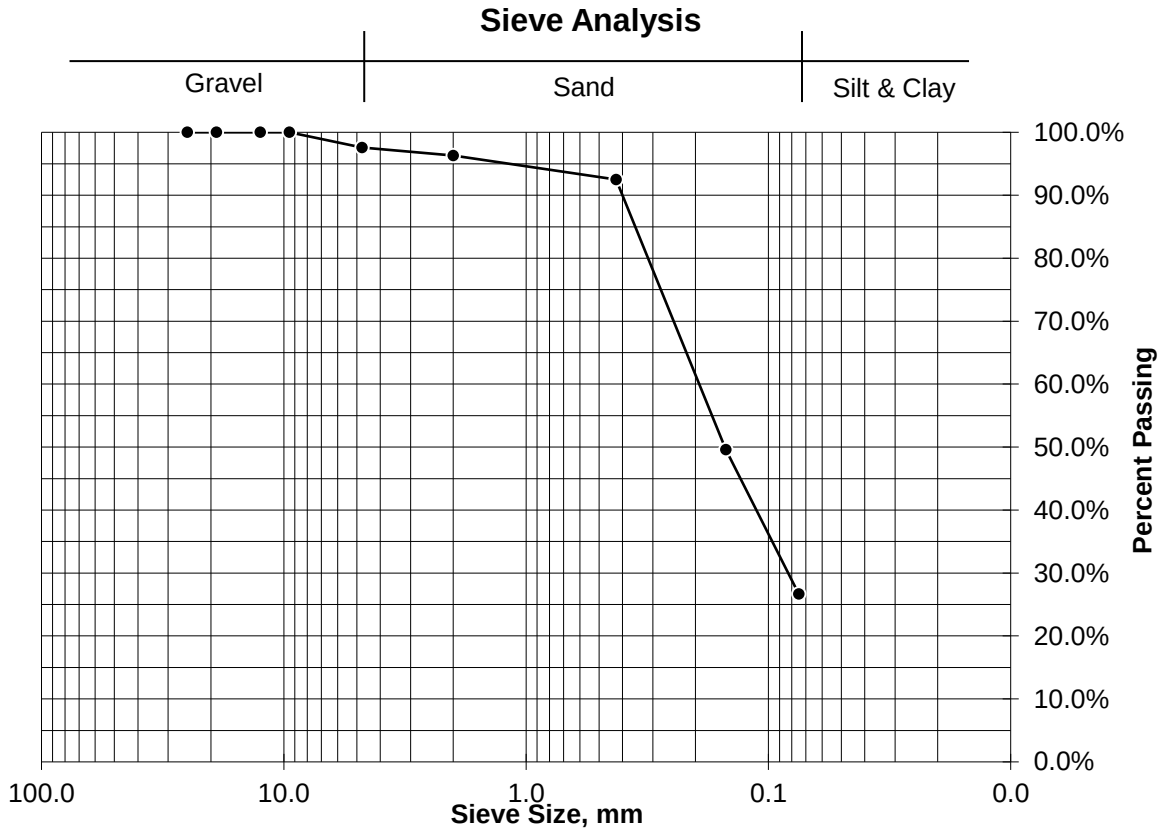
Sample ID DAA-14
Sample Depth 26'-28'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	2.08	2.4%	4.75	97.6%
No. 10	1.14	1.3%	2.00	96.3%
No. 40	3.30	3.8%	0.425	92.5%
No. 100	37.27	42.9%	0.15	49.6%
No. 200	19.87	22.9%	0.075	26.7%
Pan	0.27	0.3%		
Total	63.93	73.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-14	Sample Received:	3/19/2019
Sample Depth	30'-32'	Date Tested:	3/22/2019
Visual Sample Description	Light Reddish-Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	17	
Pan Wt	188.67	grams
Pan + Soil (wet)	296.57	grams
Pan + Soil (dry)	283.45	grams
Natural Moisture Content	*13.8%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	259.80	grams
Percent Passing No. 200 Sieve	25.0%	
Pan + Soil retained on No. 4 sieve (dry)	195.36	grams
Percent Passing No. 4 Sieve	92.9%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID			
Pan Wt		Non-plastic	
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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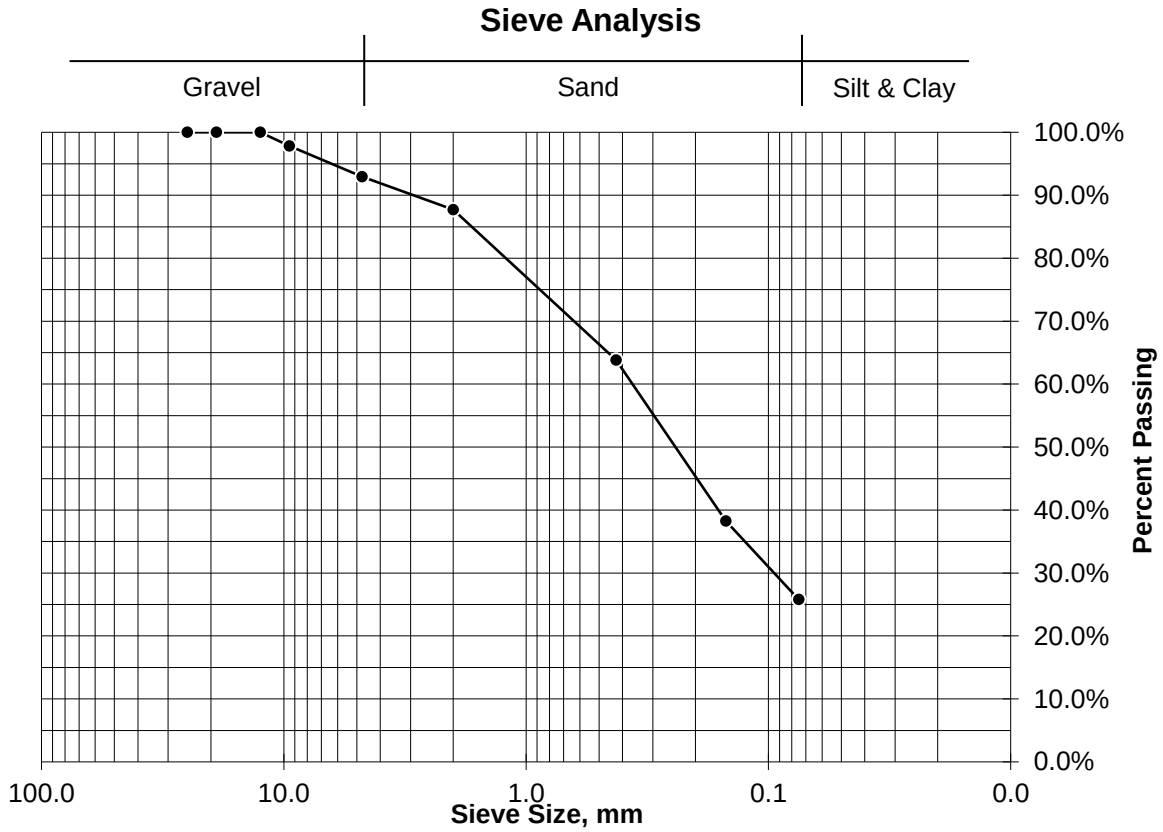
Sample ID DAA-14
Sample Depth 30'-32'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	2.07	2.2%	9.50	97.8%
No. 4	4.62	4.9%	4.75	92.9%
No. 10	4.96	5.2%	2.00	87.7%
No. 40	22.61	23.9%	0.425	63.9%
No. 100	24.27	25.6%	0.15	38.2%
No. 200	11.80	12.4%	0.075	25.8%
Pan	0.79	0.8%		
Total	71.12	75.0%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-17	Sample Received:	3/19/2019
Sample Depth	6'-8'	Date Tested:	3/22/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	4	
Pan Wt	194.50	grams
Pan + Soil (wet)	301.33	grams
Pan + Soil (dry)	292.45	grams
Natural Moisture Content	*9.1%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	265.18	grams
Percent Passing No. 200 Sieve	27.8%	
Pan + Soil retained on No. 4 sieve (dry)	194.76	grams
Percent Passing No. 4 Sieve	99.7%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID			
Pan Wt		Non-plastic	
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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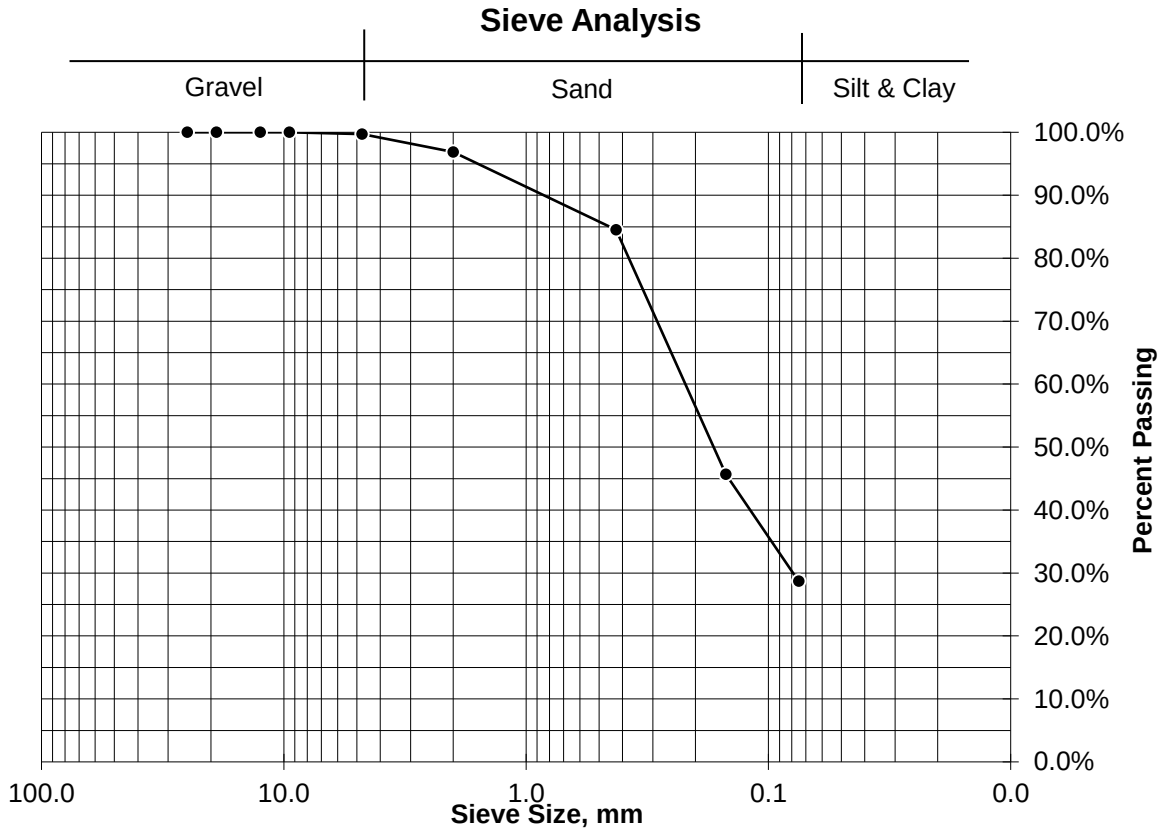
Sample ID DAA-17
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.26	0.3%	4.75	99.7%
No. 10	2.81	2.9%	2.00	96.9%
No. 40	12.08	12.3%	0.425	84.5%
No. 100	38.03	38.8%	0.15	45.7%
No. 200	16.67	17.0%	0.075	28.7%
Pan	0.82	0.8%		
Total	70.67	72.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Army Corps of Engineers Certified Laboratory

Sample ID	DAA-17	Sample Received:	3/19/2019
Sample Depth	10'-12'	Date Tested:	3/22/2019
Visual Sample Description	Brownish-Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	30	
Pan Wt	193.25	grams
Pan + Soil (wet)	298.76	grams
Pan + Soil (dry)	290.37	grams
Natural Moisture Content	*8.6%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	265.51	grams
Percent Passing No. 200 Sieve	25.6%	
Pan + Soil retained on No. 4 sieve (dry)	195.30	grams
Percent Passing No. 4 Sieve	97.9%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/25/2019

Liquid Limit

No of Blows	18	23	32
Pan ID	169	201	96
Pan Wt	27.16	27.65	24.85
Pan + Soil (wet)	38.29	38.22	35.06
Pan + Soil (dry)	34.85	35.10	32.26
Moisture Content	44.7%	41.9%	37.9%
Liquid Limit	43	41	39
Liquid Limit	*41*		

Plastic Limit

Pan ID	82	13
Pan Weight	4.23	4.27
Pan + Soil (wet)	14.55	15.29
Pan + Soil (dry)	12.39	12.99
Moisture Content	26.5%	26.4%
Plastic Limit	*26*	
Plastic Index	*14*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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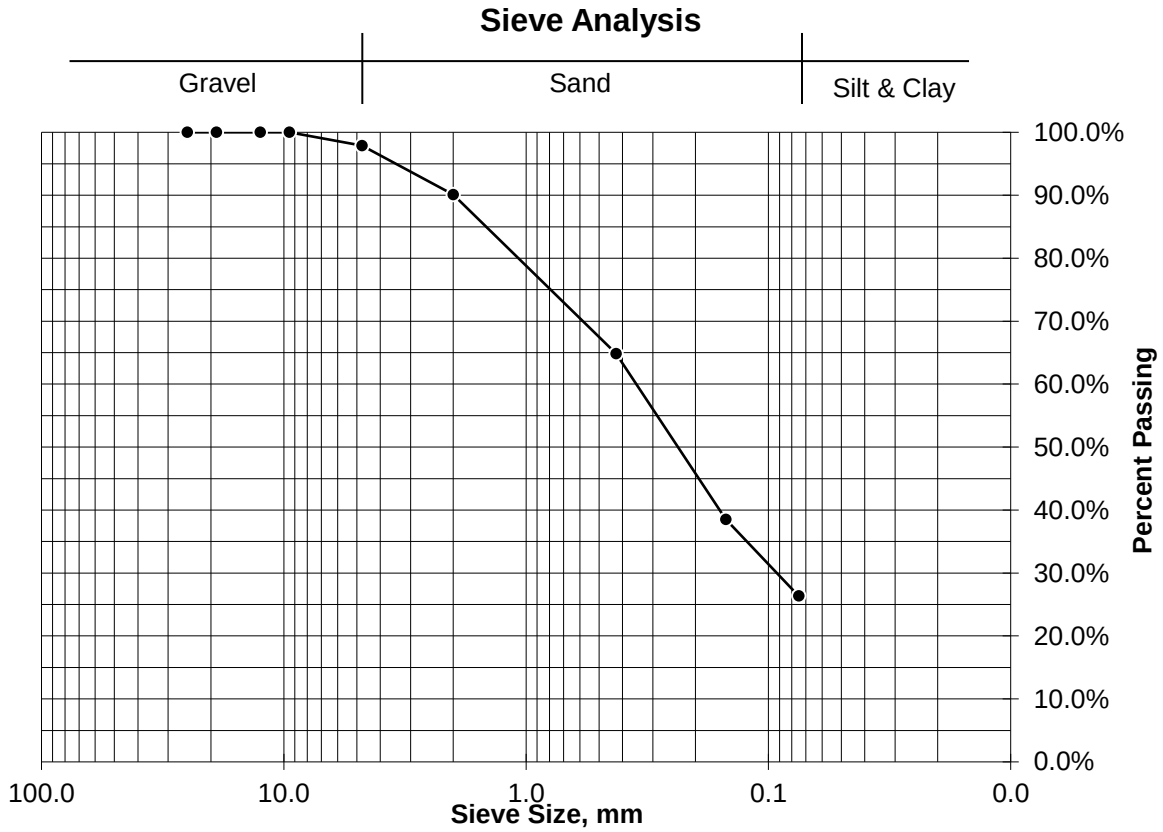
Sample ID DAA-17
Sample Depth 10'-12'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	2.05	2.1%	4.75	97.9%
No. 10	7.56	7.8%	2.00	90.1%
No. 40	24.55	25.3%	0.425	64.8%
No. 100	25.55	26.3%	0.15	38.5%
No. 200	11.82	12.2%	0.075	26.3%
Pan	0.73	0.8%		
Total	72.26	74.4%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-18	Sample Received:	3/19/2019
Sample Depth	6'-8'	Date Tested:	3/22/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	34	
Pan Wt	192.79	grams
Pan + Soil (wet)	310.43	grams
Pan + Soil (dry)	285.19	grams
Natural Moisture Content	*27.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	263.85	grams
Percent Passing No. 200 Sieve	23.1%	
Pan + Soil retained on No. 4 sieve (dry)	194.87	grams
Percent Passing No. 4 Sieve	97.7%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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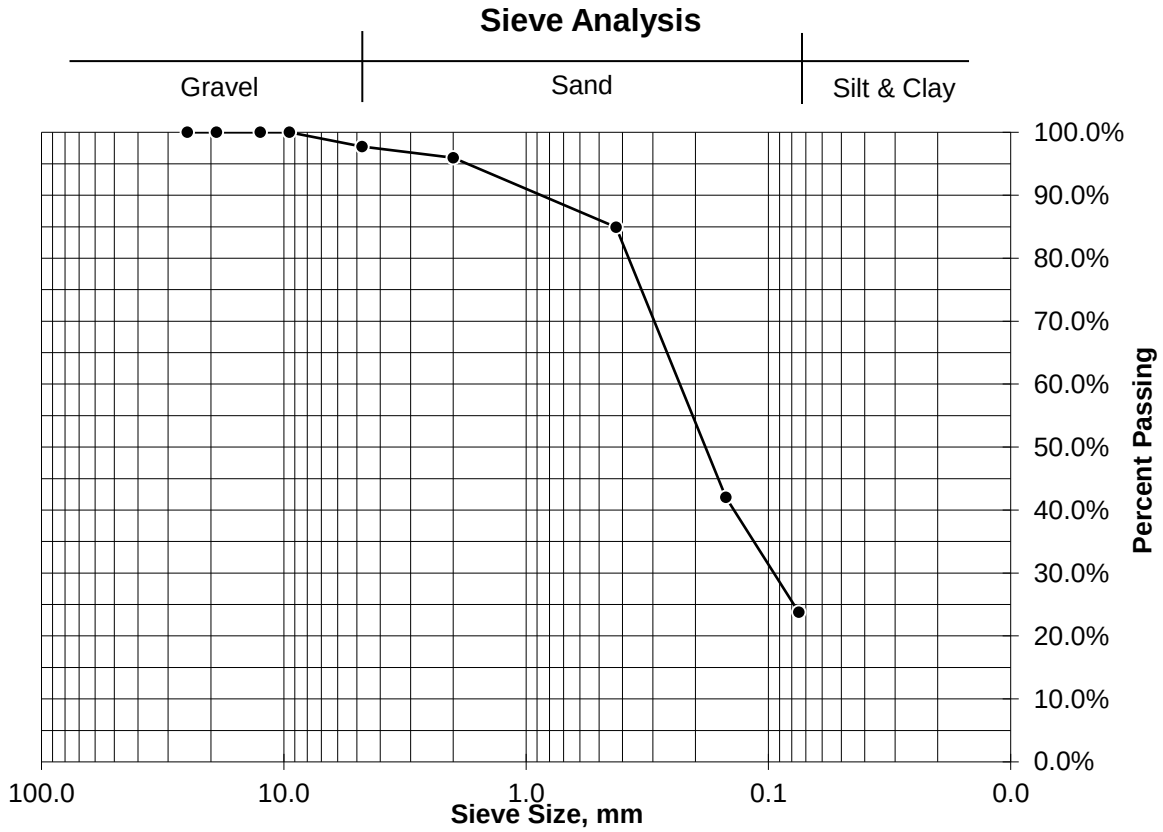
Sample ID DAA-18
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	2.08	2.3%	4.75	97.7%
No. 10	1.64	1.8%	2.00	96.0%
No. 40	10.19	11.0%	0.425	84.9%
No. 100	39.64	42.9%	0.15	42.0%
No. 200	16.87	18.3%	0.075	23.8%
Pan	0.63	0.7%		
Total	71.05	76.9%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-19	Sample Received:	3/19/2019
Sample Depth	6'-8'	Date Tested:	3/22/2019
Visual Sample Description	Brownish-Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	35	
Pan Wt	192.73	grams
Pan + Soil (wet)	294.78	grams
Pan + Soil (dry)	279.51	grams
Natural Moisture Content	*17.6%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	260.05	grams
Percent Passing No. 200 Sieve	22.4%	
Pan + Soil retained on No. 4 sieve (dry)	192.73	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/29/2019

Liquid Limit

No of Blows	19	26	33
Pan ID	10	7	72
Pan Wt	11.33	10.98	11.06
Pan + Soil (wet)	27.79	26.58	25.37
Pan + Soil (dry)	22.73	22.04	21.45
Moisture Content	44.4%	41.0%	37.7%
Liquid Limit	43	41	39
Liquid Limit	*41*		

Plastic Limit

Pan ID	82	13
Pan Weight	4.23	4.27
Pan + Soil (wet)	14.55	15.29
Pan + Soil (dry)	12.39	12.99
Moisture Content	26.5%	26.4%
Plastic Limit	*26*	
Plastic Index	*15*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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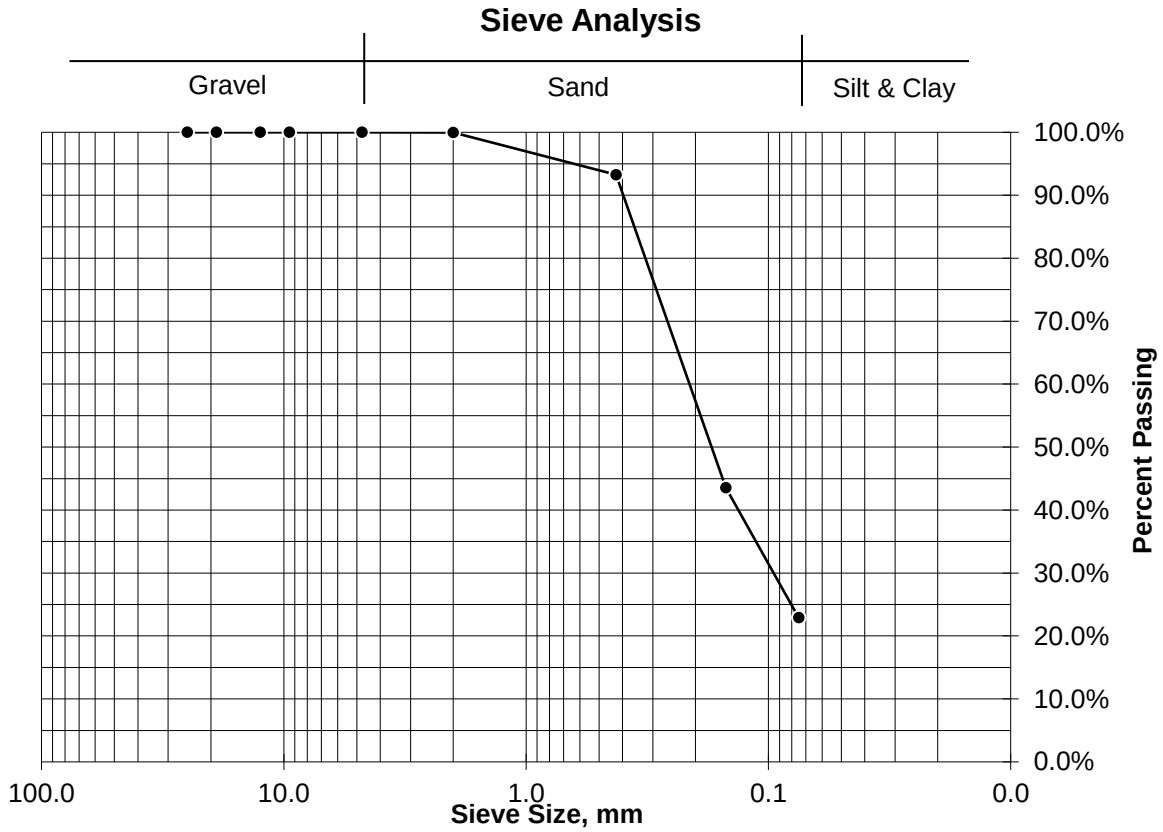
1030 Wilmer Ave., Ste. 100
Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Sample ID DAA-19
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.04	0.0%	2.00	100.0%
No. 40	5.79	6.7%	0.425	93.3%
No. 100	43.16	49.7%	0.15	43.5%
No. 200	17.92	20.6%	0.075	22.9%
Pan	0.41	0.5%		
Total	67.32	77.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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Army Corps of Engineers Certified Laboratory

Sample ID	DAA-20	Sample Received:	3/19/2019
Sample Depth	14'-16'	Date Tested:	3/22/2019
Visual Sample Description	Brownish-gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	22	
Pan Wt	189.03	grams
Pan + Soil (wet)	291.46	grams
Pan + Soil (dry)	280.94	grams
Natural Moisture Content	*11.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	256.41	grams
Percent Passing No. 200 Sieve	26.7%	
Pan + Soil retained on No. 4 sieve (dry)	191.13	grams
Percent Passing No. 4 Sieve	97.7%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/23/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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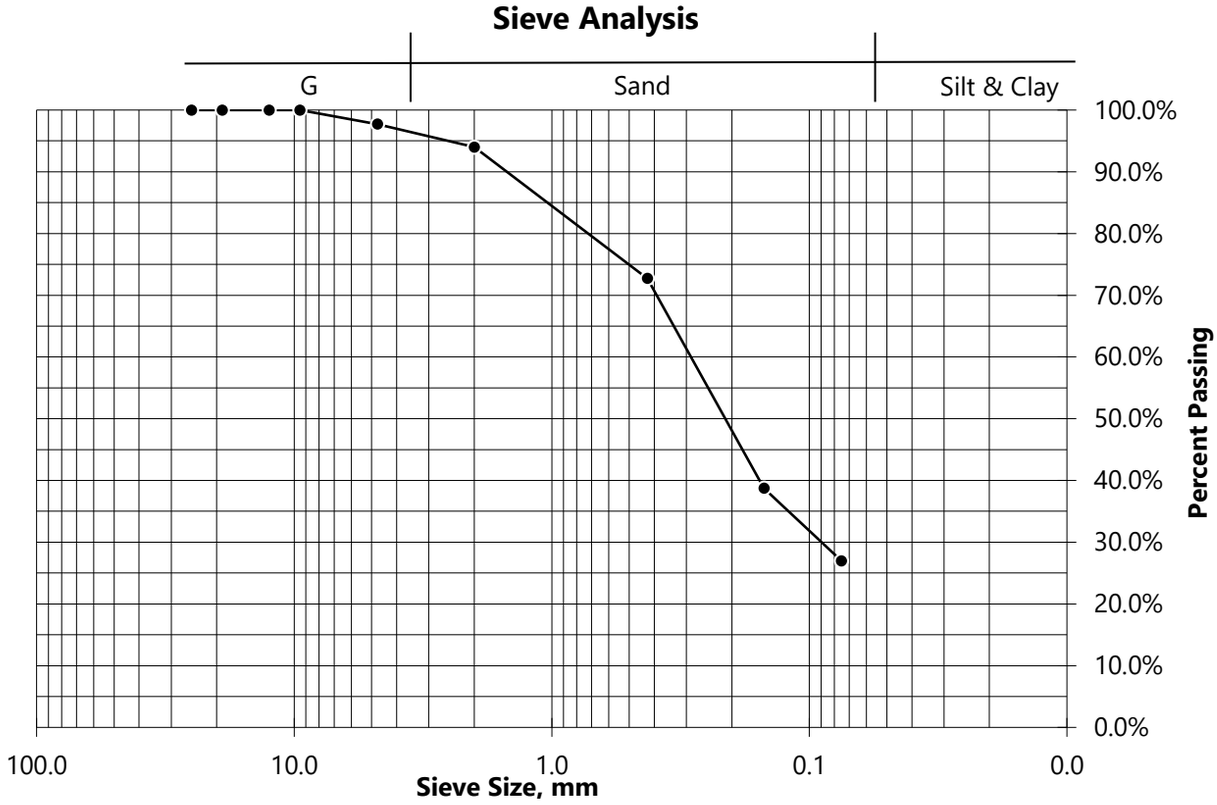
Sample ID DAA-20
Sample Depth 14'-16'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	2.10	2.3%	4.75	97.7%
No. 10	3.41	3.7%	2.00	94.0%
No. 40	19.56	21.3%	0.425	72.7%
No. 100	31.24	34.0%	0.15	38.7%
No. 200	10.81	11.8%	0.075	27.0%
Pan	0.21	0.2%		
Total	67.33	73.3%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-21	Sample Received:	3/19/2019
Sample Depth	6'-8'	Date Tested:	3/22/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	20	
Pan Wt	189.93	grams
Pan + Soil (wet)	298.07	grams
Pan + Soil (dry)	284.10	grams
Natural Moisture Content	*14.8%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	260.46	grams
Percent Passing No. 200 Sieve	25.1%	
Pan + Soil retained on No. 4 sieve (dry)	189.93	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/25/2019

Liquid Limit

No of Blows	16	23	31
Pan ID	72	70	10
Pan Wt	11.06	10.97	11.27
Pan + Soil (wet)	21.29	21.05	21.31
Pan + Soil (dry)	18.25	18.25	18.70
Moisture Content	42.2%	38.5%	35.1%
Liquid Limit	40	38	36
Liquid Limit	*38*		

Plastic Limit

Pan ID	4	313
Pan Weight	8.98	9.14
Pan + Soil (wet)	19.49	21.27
Pan + Soil (dry)	17.28	18.71
Moisture Content	26.6%	26.7%
Plastic Limit	*27*	
Plastic Index	*11*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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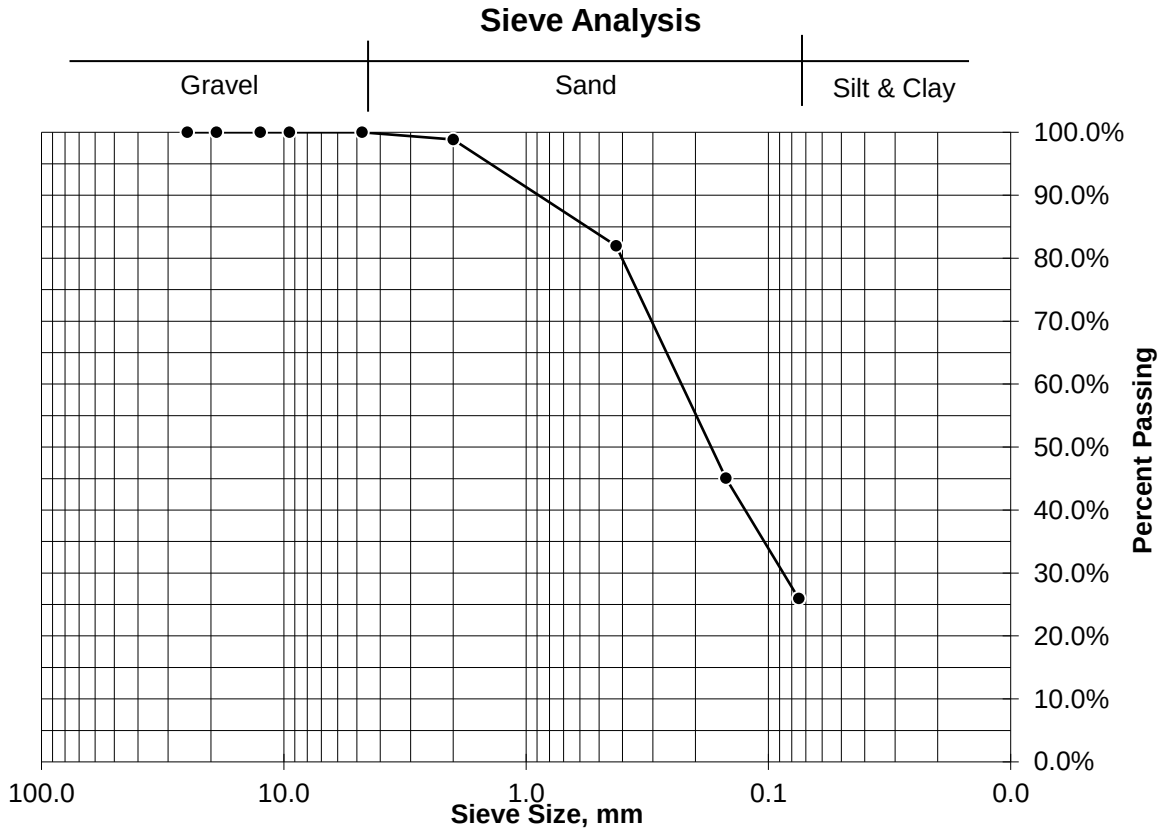
Sample ID DAA-21
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	1.06	1.1%	2.00	98.9%
No. 40	15.90	16.9%	0.425	82.0%
No. 100	34.75	36.9%	0.15	45.1%
No. 200	18.02	19.1%	0.075	26.0%
Pan	0.78	0.8%		
Total	70.51	74.9%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-22	Sample Received:	3/19/2019
Sample Depth	6'-8'	Date Tested:	3/22/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	123	
Pan Wt	124.43	grams
Pan + Soil (wet)	233.34	grams
Pan + Soil (dry)	215.67	grams
Natural Moisture Content	*19.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	188.44	grams
Percent Passing No. 200 Sieve	29.8%	
Pan + Soil retained on No. 4 sieve (dry)	124.97	grams
Percent Passing No. 4 Sieve	99.4%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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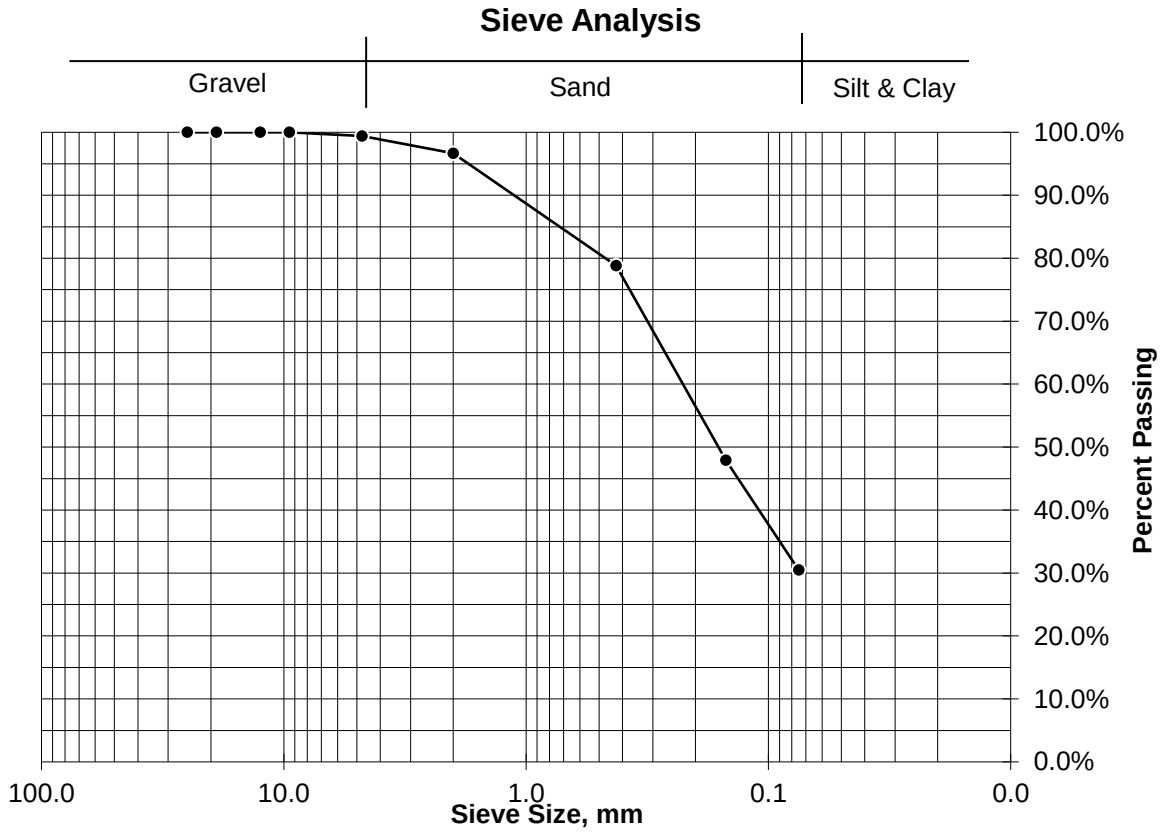
Sample ID DAA-22
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.54	0.6%	4.75	99.4%
No. 10	2.48	2.7%	2.00	96.7%
No. 40	16.28	17.8%	0.425	78.8%
No. 100	28.23	30.9%	0.15	47.9%
No. 200	15.90	17.4%	0.075	30.5%
Pan	0.57	0.6%		
Total	64.00	70.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-22	Sample Received:	3/19/2019
Sample Depth	10'-12'	Date Tested:	3/22/2019
Visual Sample Description	Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	122	
Pan Wt	123.30	grams
Pan + Soil (wet)	225.80	grams
Pan + Soil (dry)	208.05	grams
Natural Moisture Content	*20.9%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	196.59	grams
Percent Passing No. 200 Sieve	13.5%	
Pan + Soil retained on No. 4 sieve (dry)	123.30	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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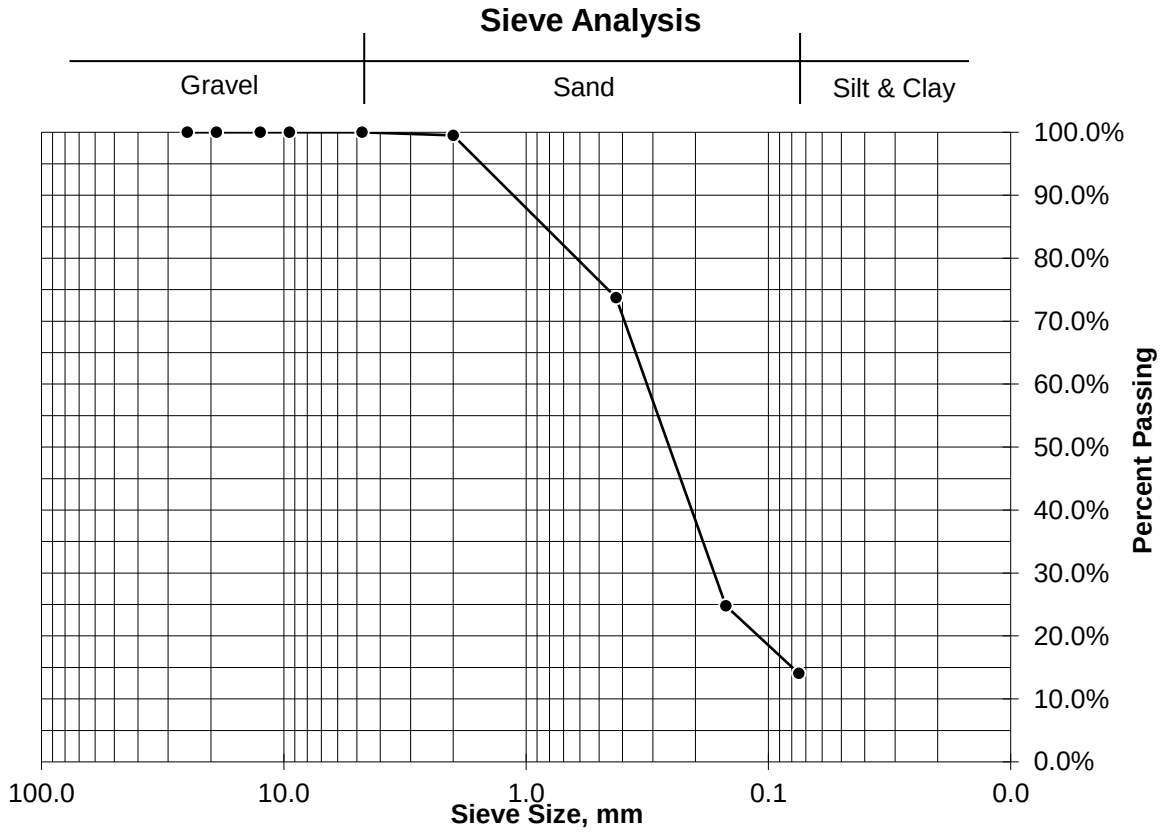
Sample ID DAA-22
Sample Depth 10'-12'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.43	0.5%	2.00	99.5%
No. 40	21.84	25.8%	0.425	73.7%
No. 100	41.47	48.9%	0.15	24.8%
No. 200	9.09	10.7%	0.075	14.1%
Pan	0.46	0.5%		
Total	73.29	86.5%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-22	Sample Received:	3/19/2019
Sample Depth	35'-37'	Date Tested:	3/22/2019
Visual Sample Description	Brownish-Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	36	
Pan Wt	193.74	grams
Pan + Soil (wet)	296.82	grams
Pan + Soil (dry)	289.12	grams
Natural Moisture Content	*8.1%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	274.32	grams
Percent Passing No. 200 Sieve	15.5%	
Pan + Soil retained on No. 4 sieve (dry)	193.97	grams
Percent Passing No. 4 Sieve	99.8%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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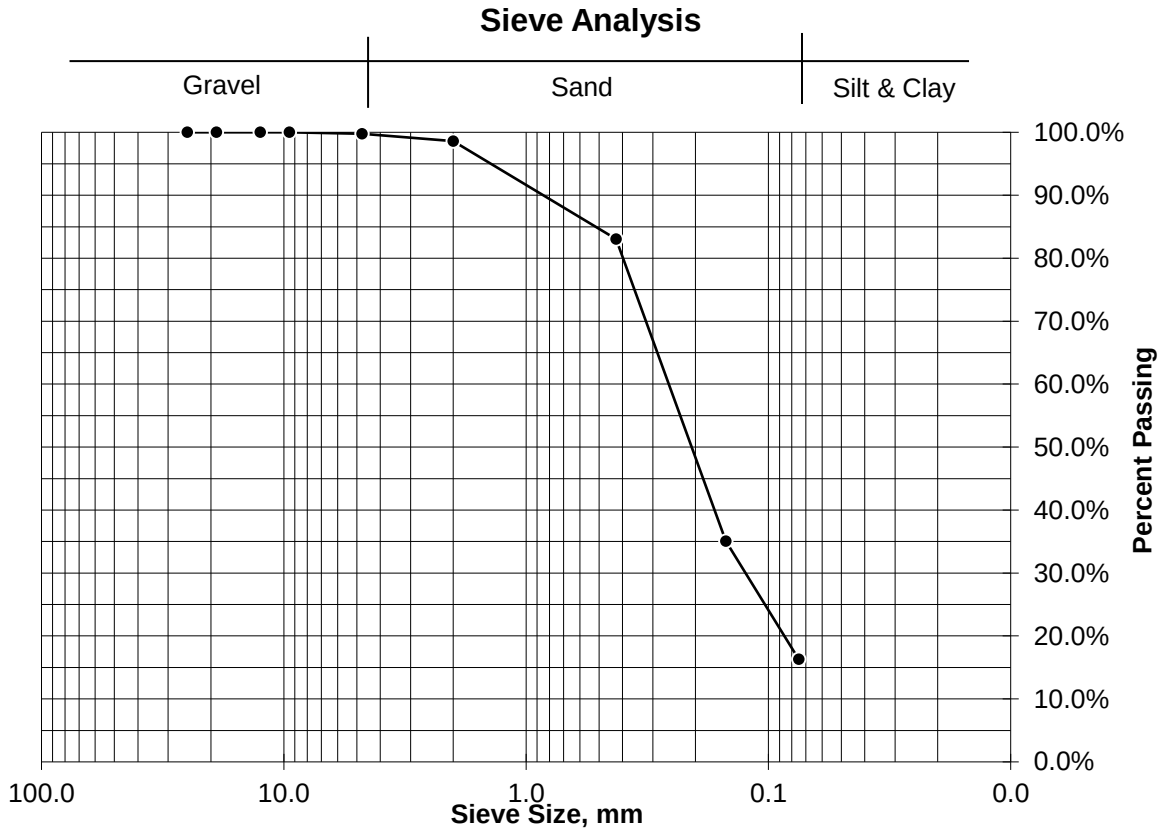
Sample ID DAA-22
Sample Depth 35'-37'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.23	0.2%	4.75	99.8%
No. 10	1.11	1.2%	2.00	98.6%
No. 40	14.82	15.5%	0.425	83.1%
No. 100	45.77	48.0%	0.15	35.1%
No. 200	17.89	18.8%	0.075	16.3%
Pan	0.76	0.8%		
Total	80.58	84.5%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-23	Sample Received:	3/19/2019
Sample Depth	14'-16'	Date Tested:	3/22/2019
Visual Sample Description	Reddish-brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	24	
Pan Wt	186.13	grams
Pan + Soil (wet)	290.13	grams
Pan + Soil (dry)	271.17	grams
Natural Moisture Content	*22.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	245.63	grams
Percent Passing No. 200 Sieve	30.0%	
Pan + Soil retained on No. 4 sieve (dry)	186.13	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/15/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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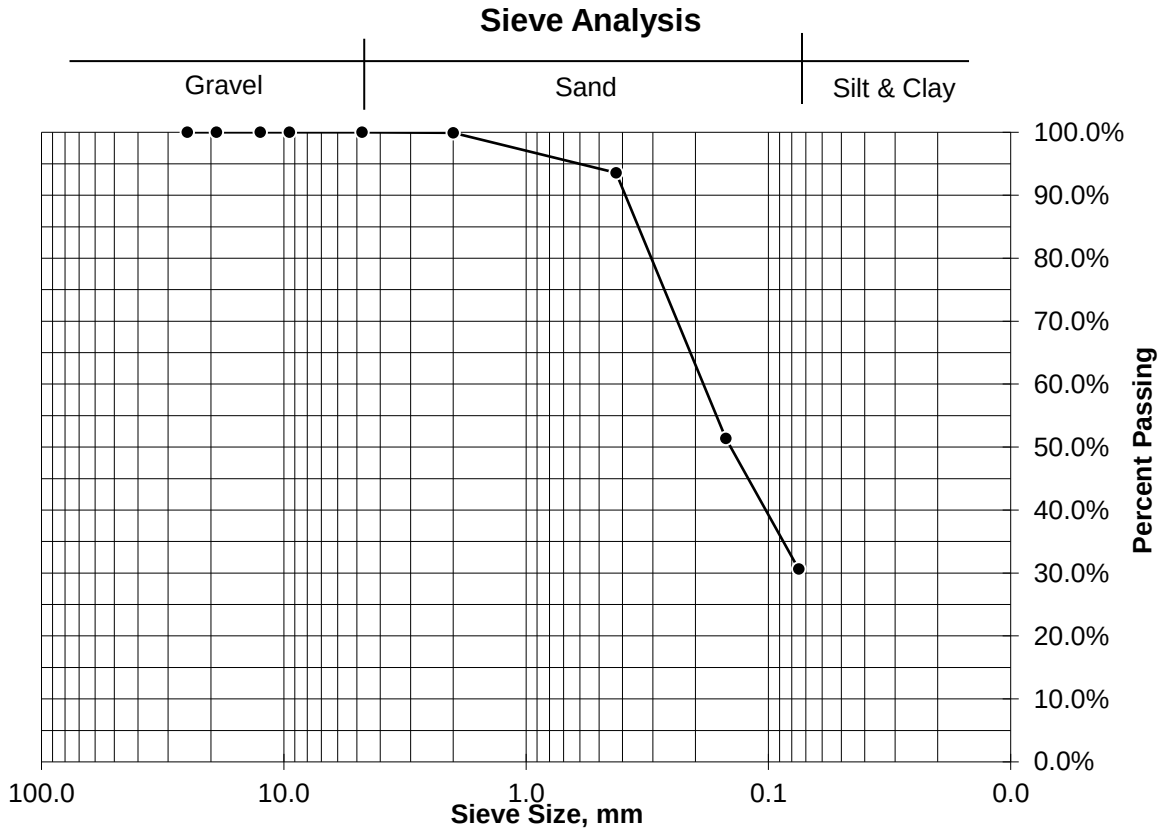
Sample ID DAA-23
Sample Depth 14'-16'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.09	0.1%	2.00	99.9%
No. 40	5.37	6.3%	0.425	93.6%
No. 100	35.87	42.2%	0.15	51.4%
No. 200	17.67	20.8%	0.075	30.6%
Pan	0.50	0.6%		
Total	59.50	70.0%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-23	Sample Received:	3/19/2019
Sample Depth	26'-28'	Date Tested:	3/22/2019
Visual Sample Description	Brownish-Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	11	
Pan Wt	187.47	grams
Pan + Soil (wet)	305.65	grams
Pan + Soil (dry)	288.73	grams
Natural Moisture Content	*16.7%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	272.53	grams
Percent Passing No. 200 Sieve	16.0%	
Pan + Soil retained on No. 4 sieve (dry)	187.47	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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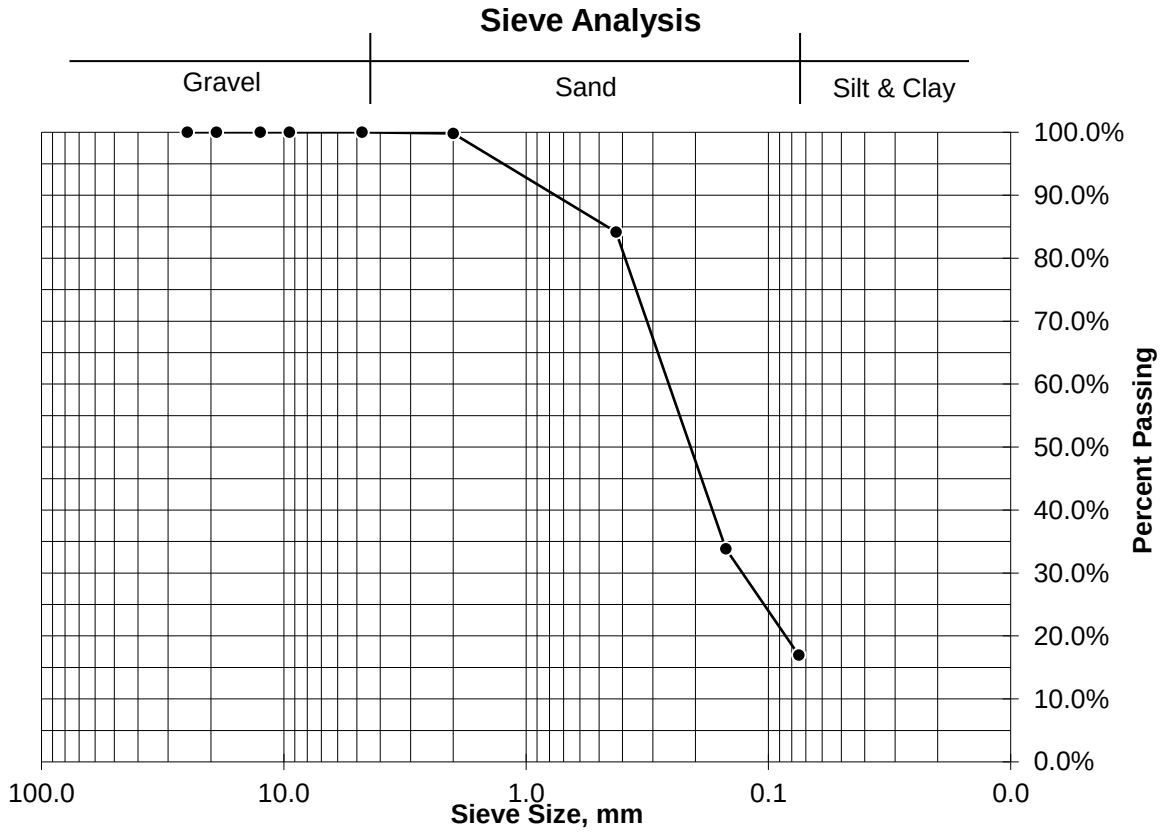
Army Corps of Engineers Certified Laboratory

Sample ID DAA-23
Sample Depth 26'-28'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.20	0.2%	2.00	99.8%
No. 40	15.84	15.6%	0.425	84.2%
No. 100	50.95	50.3%	0.15	33.8%
No. 200	17.08	16.9%	0.075	17.0%
Pan	0.95	0.9%		
Total	85.02	84.0%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Army Corps of Engineers Certified Laboratory

Sample ID	DAA-23	Sample Recieved:	4/26/2019
Sample Depth	28'-29.5'	Date Tested:	4/26/2019
Visual Sample Description	Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	11	
Pan Wt	187.50	grams
Pan + Soil (wet)	428.90	grams
Pan + Soil (dry)	394.65	grams
Natural Moisture Content	*16.5%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	355.60	grams
Percent Passing No. 200 Sieve	18.9%	
Pan + Soil retained on No. 4 sieve (dry)	188.82	grams
Percent Passing No. 4 Sieve	99.4%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/1/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

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Army Corps of Engineers Certified Laboratory

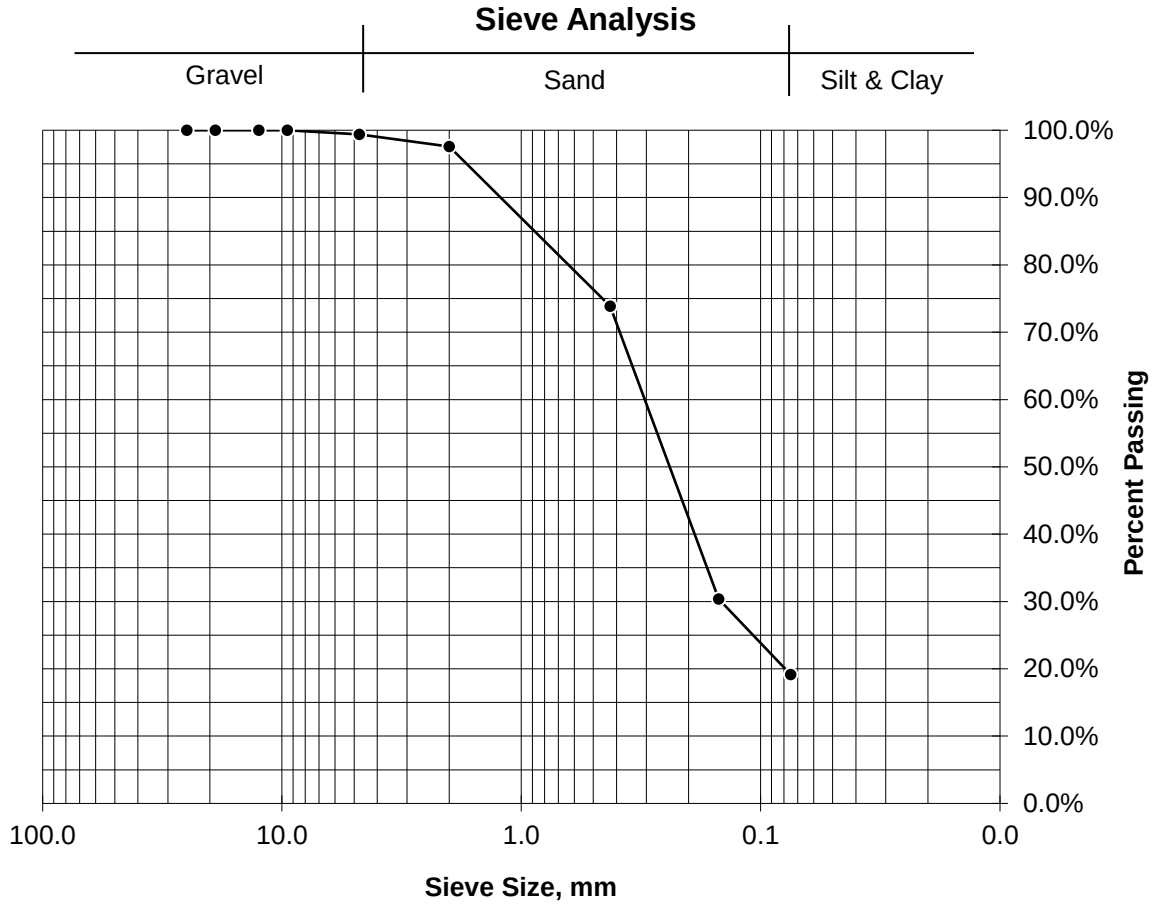
Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-23
Sample Depth 28'-29.5'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Date Tested: Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.5	100.0%
No. 4	1.32	0.6%	4.75	99.4%
No. 10	3.67	1.8%	2.0	97.6%
No. 40	49.17	23.7%	0.425	73.9%
No. 100	90.09	43.5%	0.15	30.4%
No. 200	23.21	11.2%	0.075	19.2%
Pan	0.60	0.3%		
Total	168.06	81.1%		



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Permeability Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID:	DAA-23	Sample Received:	4/26/2019
Sample Depth:	28'-29.5'	Date Tested:	4/26/2019
Permeability Method:	ASTM D5084		
Sample Length, in:	3.71		
Sample Diameter, in:	2.86		
Sample Condition:	Undisturbed		

Moisture Content

Pan Wt	187.50	grams
Pan + Soil (wet)	428.90	grams
Pan + Soil (dry)	394.65	grams
Moisture Content	*16.5%*	

Dry Density

Soil (wet)	797.58	grams
Wet Density	127.4	pcf
Dry Density	*109.4*	pcf

Test Conditions

Backpressure, psi	40.0
Cell Pressure, psi	50.0
Influent Buret Area, cm^2	0.03142
Effluent Buret Area, cm^2	0.76712
Effective Stress, psi	10.0
Pearment Liquid Temp.(°C):	

Date Tested:

Initial Data

Assumed Specific Gravity	2.65	
Percent Voids	33.9%	
Actual Volume of Voids	132.3	ml
Porosity	33.9%	
Saturation	85.6%	

Permeability Trials

Time min	Influent Head, cm	Influent Flow, cm^3	Effluent Head, cm	Effluent Flow, cm^3	Flow Deviation Ratio	Gradient mm-Hg	Permeabilty, k cm/sec

Failed, unable to get reading

Average Permeability #DIV/0! cm/sec Corrected for 20°C

Final Data

Assumed Specific Gravity	2.65				
Final Weight of Sample	836.42	grams			
Final Moisture Content	22.2%		Final Sample Length, in:	3.67	
Percent Voids	33.6%		Final Sample Diameter, in:	2.87	
Actual Volume of Voids	130.7	ml	Wet Density	134.2	pcf
Porosity	33.6%		*Dry Density*	*109.8*	pcf
Saturation	100.0%				

Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-25	Sample Received:	3/19/2019
Sample Depth	6'-8'	Date Tested:	3/22/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	25	
Pan Wt	194.03	grams
Pan + Soil (wet)	296.42	grams
Pan + Soil (dry)	267.47	grams
Natural Moisture Content	*39.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	237.91	grams
Percent Passing No. 200 Sieve	40.3%	
Pan + Soil retained on No. 4 sieve (dry)	194.52	grams
Percent Passing No. 4 Sieve	99.3%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 3/26/2019

Liquid Limit

No of Blows	19	24	35
Pan ID	169	201	96
Pan Wt	27.18	27.71	24.87
Pan + Soil (wet)	39.50	38.36	35.41
Pan + Soil (dry)	34.64	34.32	31.60
Moisture Content	65.1%	61.1%	56.6%
Liquid Limit	63	61	59
Liquid Limit	*61*		

Plastic Limit

Pan ID	73	74
Pan Weight	4.26	4.28
Pan + Soil (wet)	14.40	16.68
Pan + Soil (dry)	11.59	13.24
Moisture Content	38.3%	38.4%
Plastic Limit	*38*	
Plastic Index	*23*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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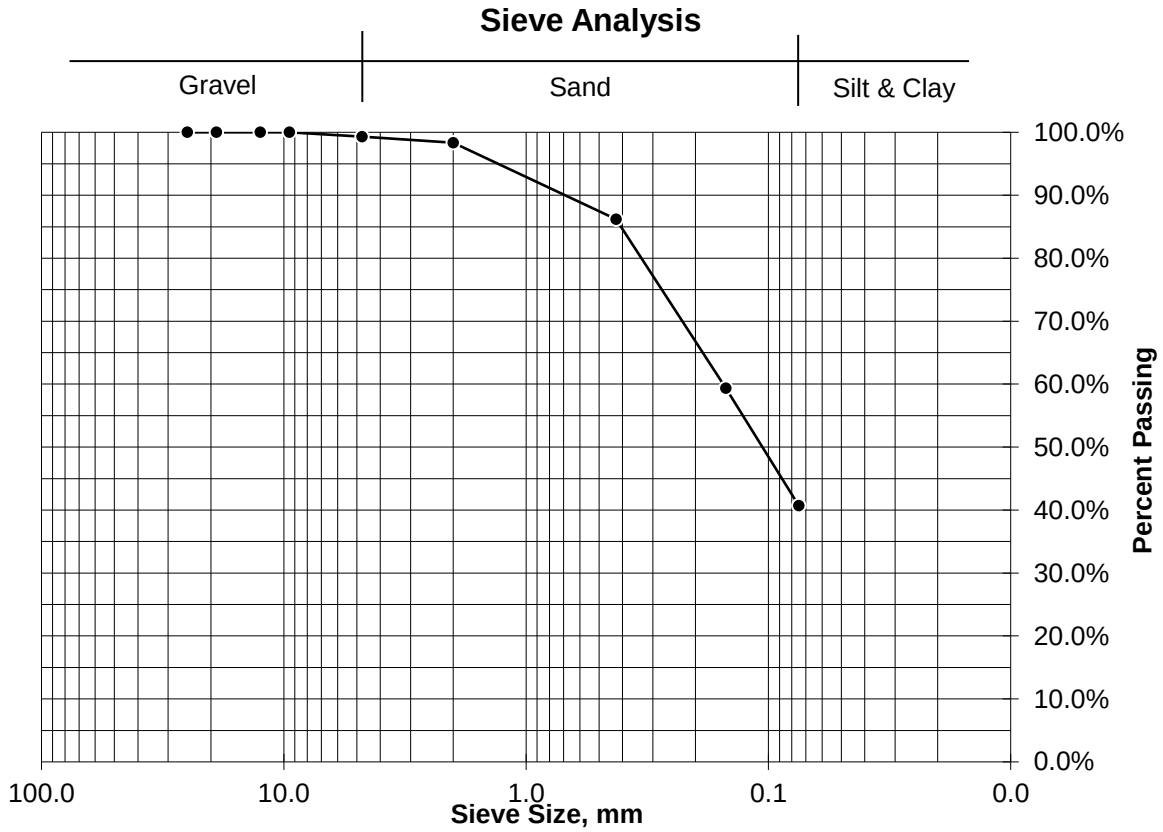
Sample ID DAA-25
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.49	0.7%	4.75	99.3%
No. 10	0.71	1.0%	2.00	98.4%
No. 40	8.92	12.1%	0.425	86.2%
No. 100	19.72	26.9%	0.15	59.4%
No. 200	13.69	18.6%	0.075	40.7%
Pan	0.35	0.5%		
Total	43.88	59.7%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-25	Sample Received:	3/19/2019
Sample Depth	16'-18'	Date Tested:	3/22/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	110	
Pan Wt	122.63	grams
Pan + Soil (wet)	231.01	grams
Pan + Soil (dry)	210.04	grams
Natural Moisture Content	*24.0%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	182.18	grams
Percent Passing No. 200 Sieve	31.9%	
Pan + Soil retained on No. 4 sieve (dry)	128.16	grams
Percent Passing No. 4 Sieve	93.7%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/15/2019

Liquid Limit

No of Blows	16	26	32
Pan ID	1	64	96
Pan Wt	11.24	11.04	24.78
Pan + Soil (wet)	29.45	27.98	31.00
Pan + Soil (dry)	22.11	21.51	28.71
Moisture Content	67.6%	61.8%	58.2%
Liquid Limit	64	62	60
Liquid Limit	*62*		

Plastic Limit

Pan ID	78	81
Pan Weight	4.24	4.33
Pan + Soil (wet)	15.31	15.09
Pan + Soil (dry)	12.28	12.10
Moisture Content	37.7%	38.5%
Plastic Limit	*38*	
Plastic Index	*24*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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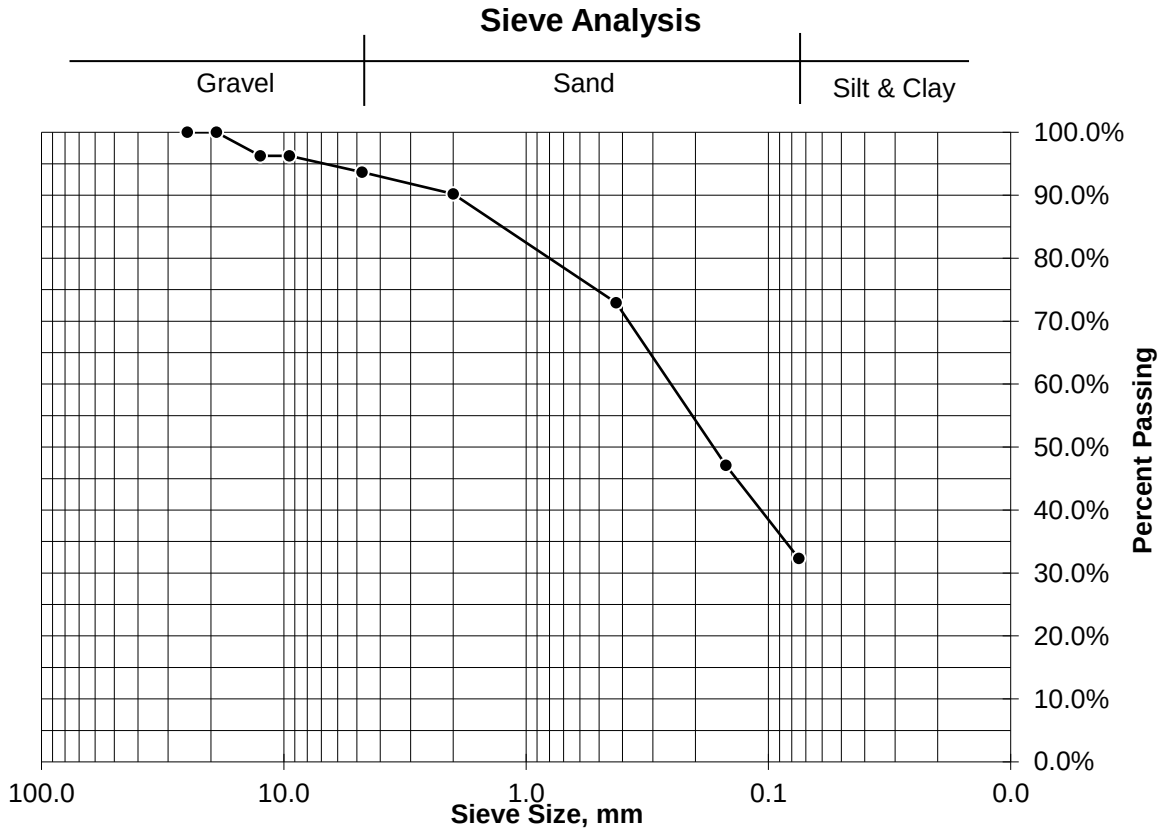
Sample ID DAA-25
Sample Depth 16'-18'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	3.27	3.7%	12.5	96.3%
3/8"	0.00	0.0%	9.50	96.3%
No. 4	2.26	2.6%	4.75	93.7%
No. 10	3.03	3.5%	2.00	90.2%
No. 40	15.10	17.3%	0.425	72.9%
No. 100	22.59	25.8%	0.15	47.1%
No. 200	12.89	14.7%	0.075	32.3%
Pan	0.40	0.5%		
Total	59.54	68.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-26	Sample Received:	4/17/2019
Sample Depth	2'-4'	Date Tested:	4/22/2019
Visual Sample Description	Light Reddish-brown Elastic SILT		

Natural Moisture Content: ASTM D 2216

Pan ID	9	
Pan Wt	189.24	grams
Pan + Soil (wet)	293.77	grams
Pan + Soil (dry)	263.10	grams
Natural Moisture Content	*41.5%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	193.83	grams
Percent Passing No. 200 Sieve	93.8%	
Pan + Soil retained on No. 4 sieve (dry)	189.24	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/29/2019

Liquid Limit

No of Blows	15	27	34
Pan ID	61	63	10
Pan Wt	10.96	10.86	11.26
Pan + Soil (wet)	17.72	20.86	19.33
Pan + Soil (dry)	14.59	16.48	15.90
Moisture Content	86.2%	77.9%	73.9%
Liquid Limit	81	79	77
Liquid Limit	*79*		

Plastic Limit

Pan ID	74	22
Pan Weight	4.29	4.31
Pan + Soil (wet)	14.49	14.34
Pan + Soil (dry)	11.73	11.62
Moisture Content	37.1%	37.2%
Plastic Limit	*37*	
Plastic Index	*42*	

USCS Classification: ASTM D 2487

Group Symbol	**MH**
Group Name	**Elastic SILT**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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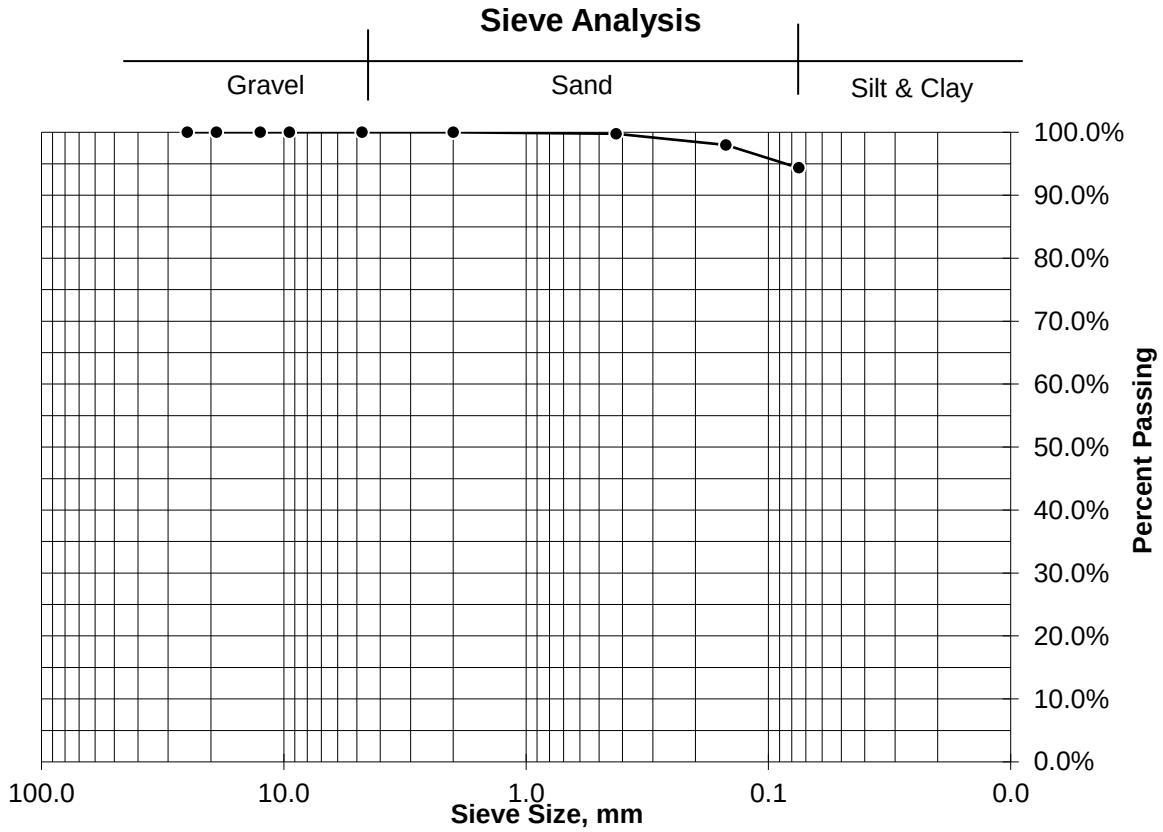
Sample ID DAA-26
Sample Depth 2'-4'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	0.18	0.2%	0.425	99.8%
No. 100	1.31	1.8%	0.15	98.0%
No. 200	2.68	3.6%	0.075	94.4%
Pan	0.41	0.6%		
Total	4.58	6.2%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-26
Sample Depth 4'-6'
Visual Sample Description Light Brown Elastic SILT

Sample Received: 4/11/2019
Date Tested: 4/17/2019

Natural Moisture Content: ASTM D 2216

Pan ID	118	
Pan Wt	122.25	grams
Pan + Soil (wet)	224.18	grams
Pan + Soil (dry)	197.03	grams
Natural Moisture Content	*36.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	132.14	grams
Percent Passing No. 200 Sieve	86.8%	
Pan + Soil retained on No. 4 sieve (dry)	122.25	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/25/2019

Liquid Limit

No of Blows	19	28	30
Pan ID	1	96	64
Pan Wt	11.23	24.79	11.03
Pan + Soil (wet)	22.55	33.44	40.61
Pan + Soil (dry)	18.07	30.20	29.81
Moisture Content	65.5%	59.9%	57.5%
Liquid Limit	63	61	59
Liquid Limit	*61*		

Plastic Limit

Pan ID	352	353
Pan Weight	9.06	9.10
Pan + Soil (wet)	19.61	19.98
Pan + Soil (dry)	16.71	17.02
Moisture Content	37.9%	37.4%
Plastic Limit	*38*	
Plastic Index	*23*	

USCS Classification: ASTM D 2487

Group Symbol **MH**
Group Name **Elastic SILT**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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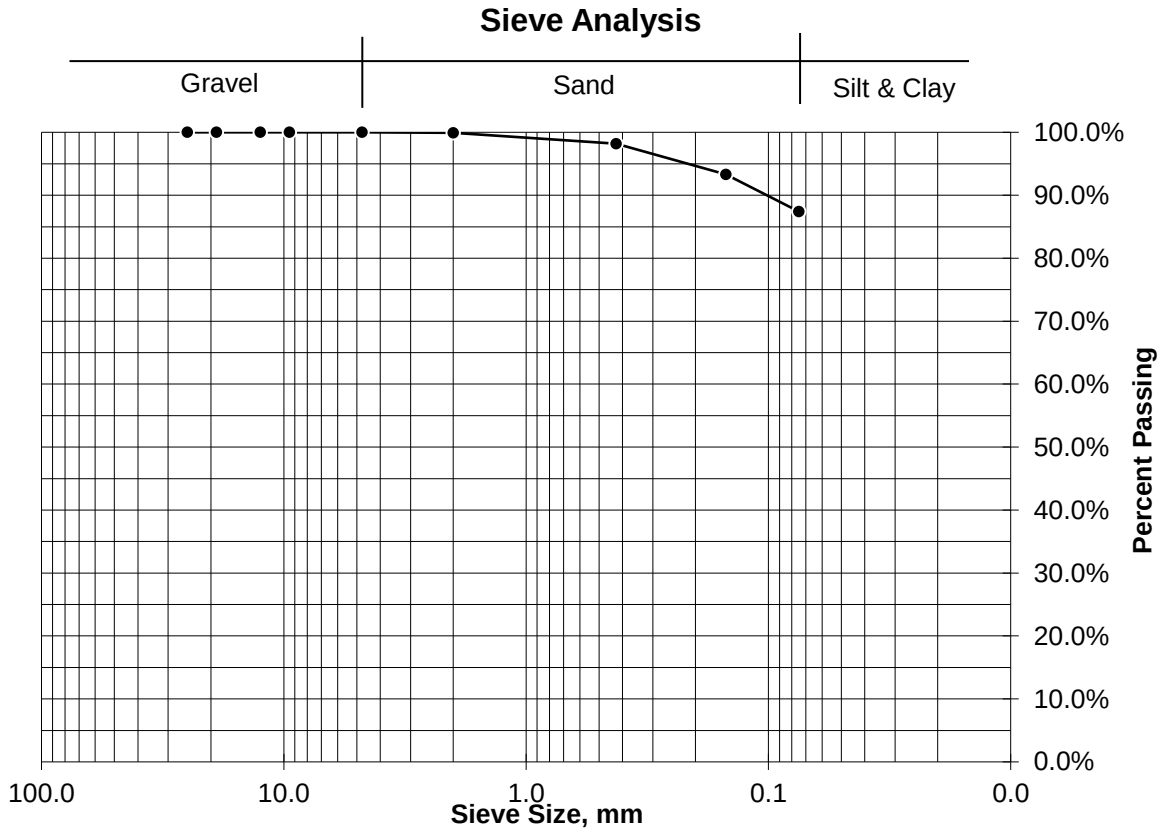
Sample ID DAA-26
Sample Depth 4'-6'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.06	0.1%	2.00	99.9%
No. 40	1.30	1.7%	0.425	98.2%
No. 100	3.65	4.9%	0.15	93.3%
No. 200	4.39	5.9%	0.075	87.4%
Pan	0.45	0.6%		
Total	9.85	13.2%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-26	Sample Received:	4/11/2019
Sample Depth	8'-10'	Date Tested:	4/22/2019
Visual Sample Description	Light Brown SILT with Sand		

Natural Moisture Content: ASTM D 2216

Pan ID	6	
Pan Wt	195.32	grams
Pan + Soil (wet)	307.70	grams
Pan + Soil (dry)	277.87	grams
Natural Moisture Content	*36.1%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	212.08	grams
Percent Passing No. 200 Sieve	79.7%	
Pan + Soil retained on No. 4 sieve (dry)	195.32	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**ML**
Group Name	**SILT with Sand**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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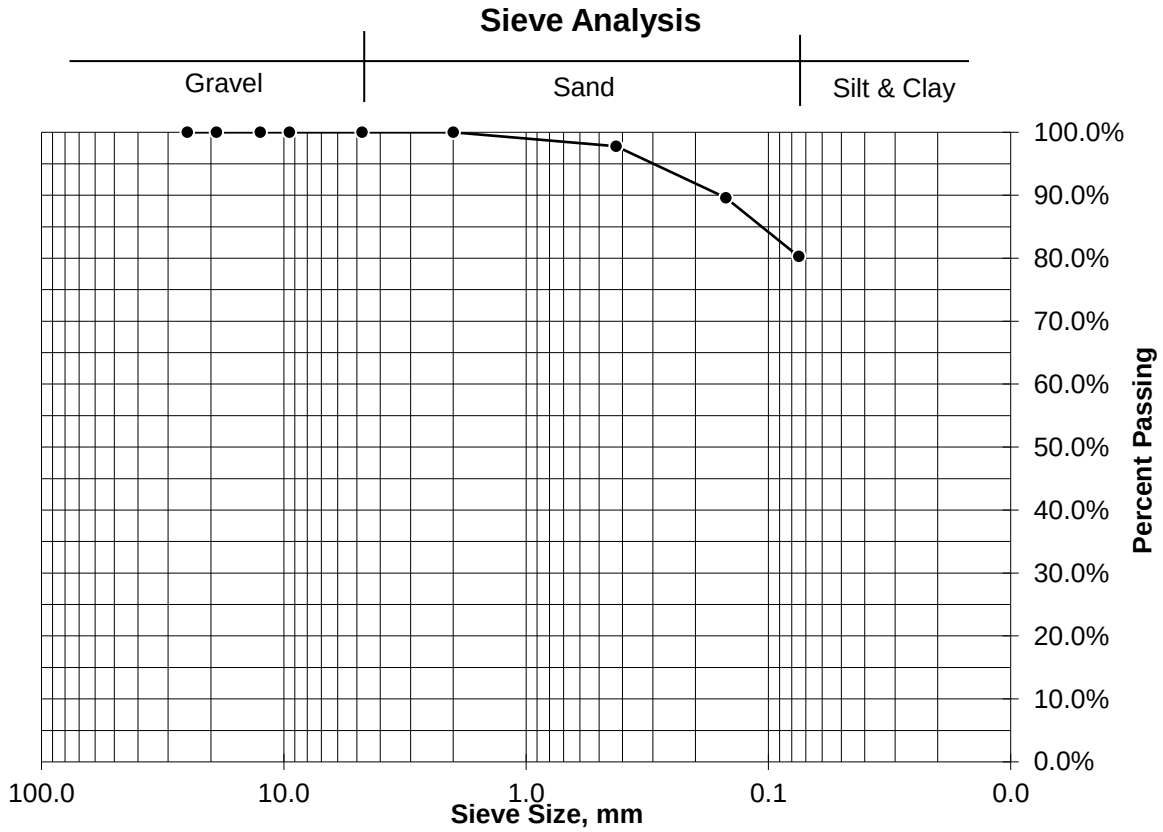
Sample ID DAA-26
Sample Depth 8'-10'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	1.82	2.2%	0.425	97.8%
No. 100	6.75	8.2%	0.15	89.6%
No. 200	7.71	9.3%	0.075	80.3%
Pan	0.48	0.6%		
Total	16.76	20.3%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-26
Sample Depth 18'-20'
Visual Sample Description Light Brown Elastic SILT with Sand

Sample Received: 4/17/2019
Date Tested: 4/17/2019

Natural Moisture Content: ASTM D 2216

Pan ID	26	
Pan Wt	194.57	grams
Pan + Soil (wet)	323.67	grams
Pan + Soil (dry)	282.99	grams
Natural Moisture Content	*46.0%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	220.82	grams
Percent Passing No. 200 Sieve	70.3%	
Pan + Soil retained on No. 4 sieve (dry)	194.75	grams
Percent Passing No. 4 Sieve	99.8%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/1/2019

Liquid Limit

No of Blows	16	23	31
Pan ID	107	64	70
Pan Wt	25.10	10.98	10.99
Pan + Soil (wet)	39.42	27.99	39.40
Pan + Soil (dry)	33.54	21.32	28.70
Moisture Content	69.7%	64.5%	60.4%
Liquid Limit	66	64	62
Liquid Limit	*64*		

Plastic Limit

Pan ID	354	4
Pan Weight	9.17	9.06
Pan + Soil (wet)	20.46	19.76
Pan + Soil (dry)	16.63	16.11
Moisture Content	51.3%	51.8%
Plastic Limit	*52*	
Plastic Index	*12*	

USCS Classification: ASTM D 2487

Group Symbol **MH**
Group Name **Elastic SILT with Sand**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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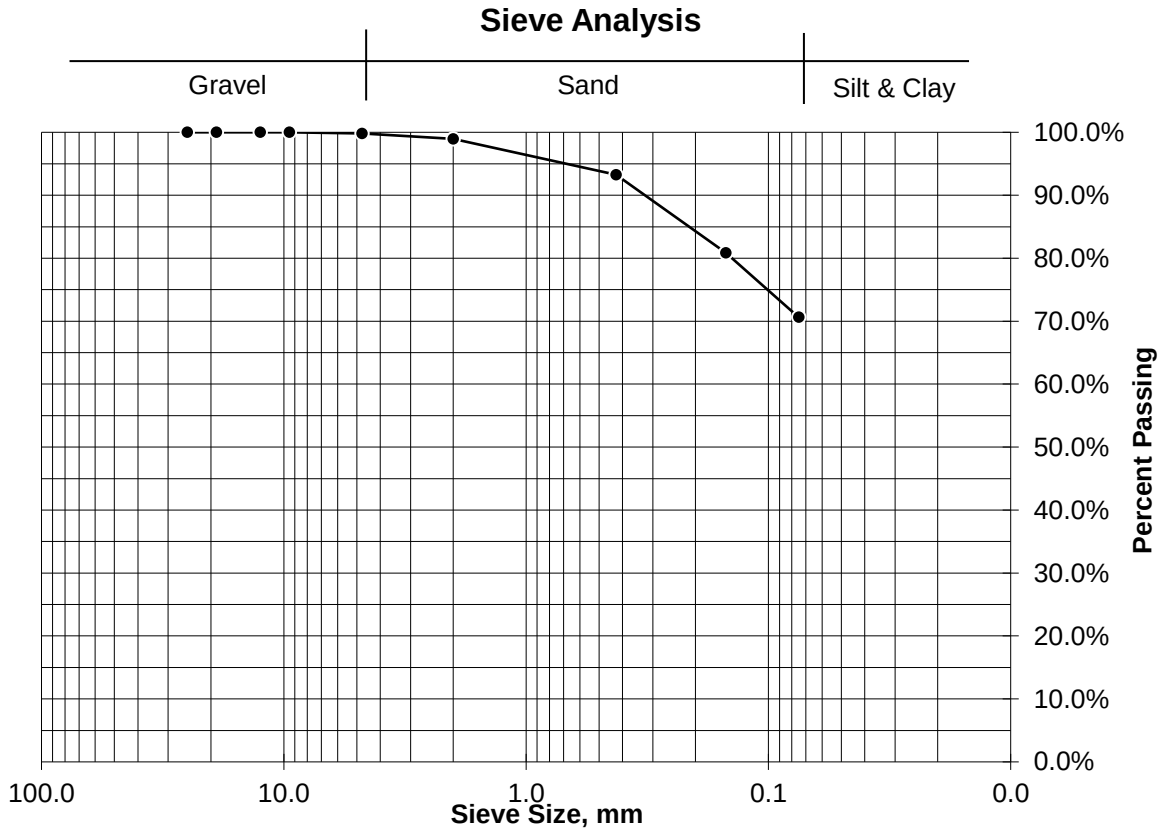
Sample ID DAA-26
Sample Depth 18'-20'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.18	0.2%	4.75	99.8%
No. 10	0.74	0.8%	2.00	99.0%
No. 40	5.03	5.7%	0.425	93.3%
No. 100	10.99	12.4%	0.15	80.8%
No. 200	9.04	10.2%	0.075	70.6%
Pan	0.27	0.3%		
Total	26.25	29.7%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-26
Sample Depth 20'-22'
Visual Sample Description Light Brown Elastic SILT

Sample Received: 4/17/2019
Date Tested: 4/17/2019

Natural Moisture Content: ASTM D 2216

Pan ID	124	
Pan Wt	124.38	grams
Pan + Soil (wet)	252.16	grams
Pan + Soil (dry)	204.84	grams
Natural Moisture Content	*58.8%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	133.77	grams
Percent Passing No. 200 Sieve	88.3%	
Pan + Soil retained on No. 4 sieve (dry)	124.38	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/26/2019

Liquid Limit

No of Blows	17	21	32
Pan ID	91	62	108
Pan Wt	24.52	10.87	33.14
Pan + Soil (wet)	36.06	27.36	41.26
Pan + Soil (dry)	31.22	20.68	38.11
Moisture Content	72.3%	68.1%	63.3%
Liquid Limit	69	67	65
Liquid Limit	*67*		

Plastic Limit

Pan ID	313	352
Pan Weight	9.14	9.05
Pan + Soil (wet)	23.99	19.79
Pan + Soil (dry)	18.74	15.99
Moisture Content	54.7%	54.8%
Plastic Limit	*55*	
Plastic Index	*12*	

USCS Classification: ASTM D 2487

Group Symbol **MH**
Group Name **Elastic SILT**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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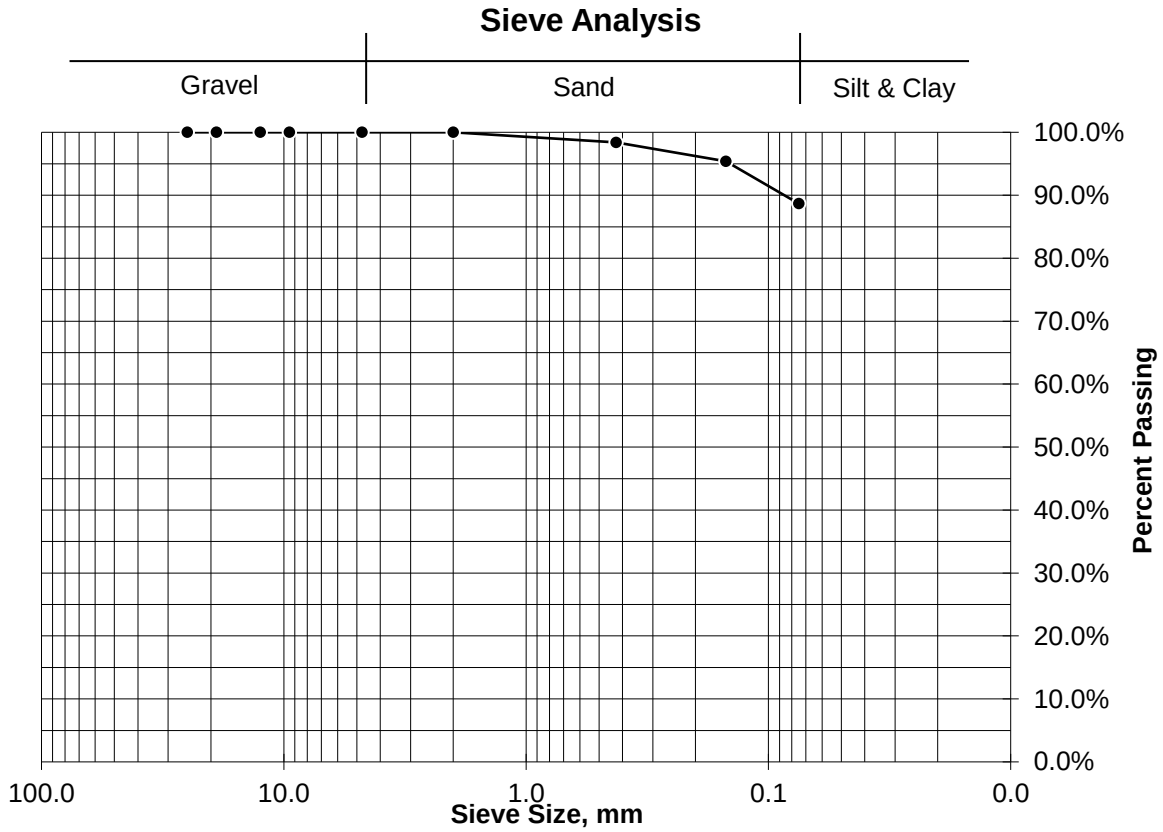
Army Corps of Engineers Certified Laboratory

Sample ID DAA-26
Sample Depth 20'-22'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	1.31	1.6%	0.425	98.4%
No. 100	2.40	3.0%	0.15	95.4%
No. 200	5.40	6.7%	0.075	88.7%
Pan	0.28	0.3%		
Total	9.39	11.7%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-26
Sample Depth 22'-24'
Visual Sample Description Light Brown Elastic SILT with Sand

Sample Received: 4/11/2019
Date Tested: 4/17/2019

Natural Moisture Content: ASTM D 2216

Pan ID	100	
Pan Wt	123.77	grams
Pan + Soil (wet)	224.48	grams
Pan + Soil (dry)	186.94	grams
Natural Moisture Content	*59.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	135.86	grams
Percent Passing No. 200 Sieve	80.9%	
Pan + Soil retained on No. 4 sieve (dry)	123.77	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/25/2019

Liquid Limit

No of Blows	17	26	33
Pan ID	98	109	6
Pan Wt	30.31	25.03	11.17
Pan + Soil (wet)	40.96	38.05	28.39
Pan + Soil (dry)	36.70	33.10	22.07
Moisture Content	66.7%	61.3%	58.0%
Liquid Limit	64	62	60
Liquid Limit	*62*		

Plastic Limit

Pan ID	2	4
Pan Weight	9.04	9.06
Pan + Soil (wet)	19.64	21.14
Pan + Soil (dry)	16.30	17.36
Moisture Content	46.0%	45.5%
Plastic Limit	*46*	
Plastic Index	*16*	

USCS Classification: ASTM D 2487

Group Symbol **MH**
Group Name **Elastic SILT with Sand**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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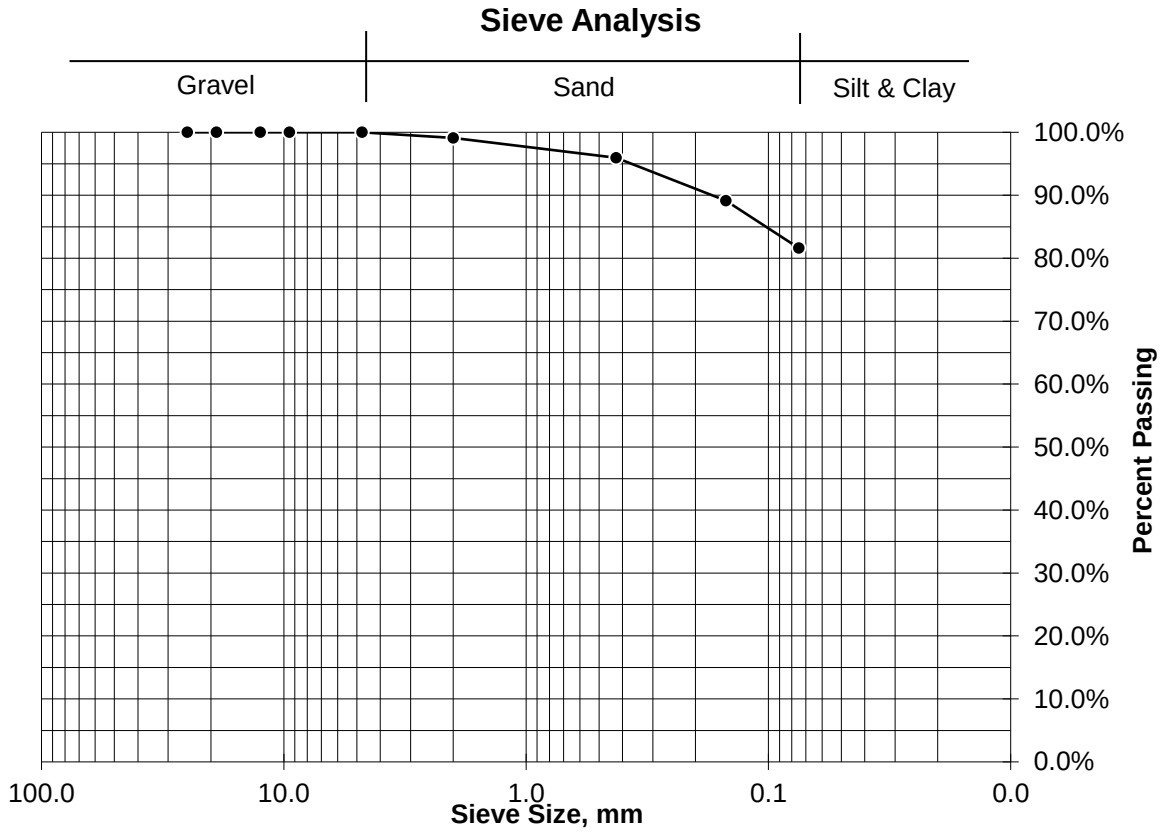
Sample ID DAA-26
Sample Depth 22'-24'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.57	0.9%	2.00	99.1%
No. 40	1.99	3.2%	0.425	95.9%
No. 100	4.31	6.8%	0.15	89.1%
No. 200	4.74	7.5%	0.075	81.6%
Pan	0.47	0.7%		
Total	12.08	19.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-26	Sample Received:	4/17/2019
Sample Depth	24'-26'	Date Tested:	4/17/2019
Visual Sample Description	Light Brown Elastic SILT		

Natural Moisture Content: ASTM D 2216

Pan ID	37	
Pan Wt	193.60	grams
Pan + Soil (wet)	302.92	grams
Pan + Soil (dry)	261.86	grams
Natural Moisture Content	*60.2%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	202.27	grams
Percent Passing No. 200 Sieve	87.3%	
Pan + Soil retained on No. 4 sieve (dry)	193.60	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/26/2019

Liquid Limit

No of Blows	16	21	31
Pan ID	6	9	93
Pan Wt	11.18	11.11	30.11
Pan + Soil (wet)	32.28	28.61	46.24
Pan + Soil (dry)	23.24	21.37	39.87
Moisture Content	74.9%	70.6%	65.3%
Liquid Limit	71	69	67
Liquid Limit	*69*		

Plastic Limit

Pan ID	317	353
Pan Weight	8.08	9.13
Pan + Soil (wet)	18.44	19.36
Pan + Soil (dry)	14.87	15.84
Moisture Content	52.6%	52.5%
Plastic Limit	*53*	
Plastic Index	*16*	

USCS Classification: ASTM D 2487

Group Symbol	**MH**
Group Name	**Elastic SILT**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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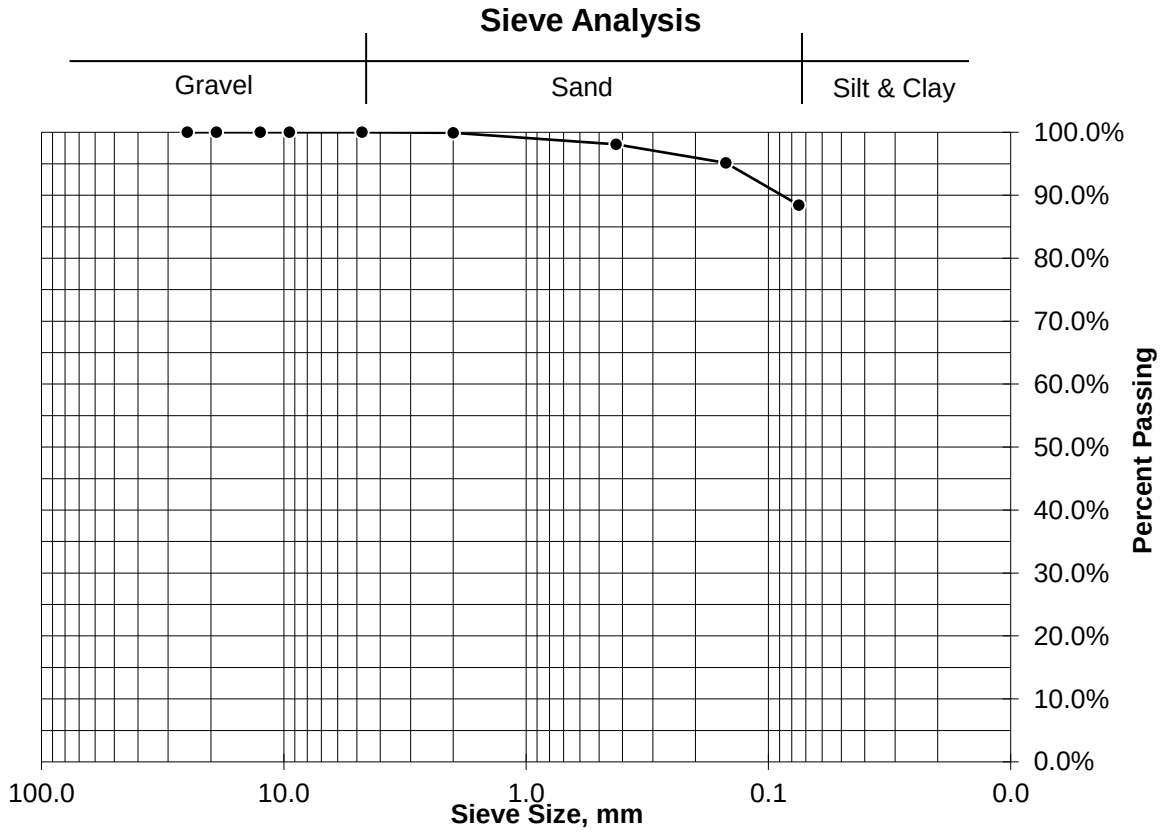
Sample ID DAA-26
Sample Depth 24'-26'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.06	0.1%	2.00	99.9%
No. 40	1.26	1.8%	0.425	98.1%
No. 100	2.01	2.9%	0.15	95.1%
No. 200	4.55	6.7%	0.075	88.5%
Pan	0.72	1.1%		
Total	8.60	12.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-26
Sample Depth 28'-30'
Visual Sample Description Light Brown Sandy Elastic SILT

Sample Received: 4/17/2019
Date Tested: 4/22/2019

Natural Moisture Content: ASTM D 2216

Pan ID	11	
Pan Wt	187.45	grams
Pan + Soil (wet)	294.74	grams
Pan + Soil (dry)	258.02	grams
Natural Moisture Content	*52.0%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	214.44	grams
Percent Passing No. 200 Sieve	61.8%	
Pan + Soil retained on No. 4 sieve (dry)	187.45	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 6/3/2019

Liquid Limit

No of Blows	20	24	32
Pan ID	6	63	69
Pan Wt	11.20	10.83	10.96
Pan + Soil (wet)	21.84	20.02	19.57
Pan + Soil (dry)	18.09	16.91	16.78
Moisture Content	54.5%	51.2%	47.9%
Liquid Limit	53	51	49
Liquid Limit	*51*		

Plastic Limit

Pan ID	33	52
Pan Weight	2.40	2.39
Pan + Soil (wet)	9.45	9.69
Pan + Soil (dry)	7.53	7.72
Moisture Content	37.4%	37.0%
Plastic Limit	*37*	
Plastic Index	*14*	

USCS Classification: ASTM D 2487

Group Symbol **MH**
Group Name **Sandy Elastic SILT**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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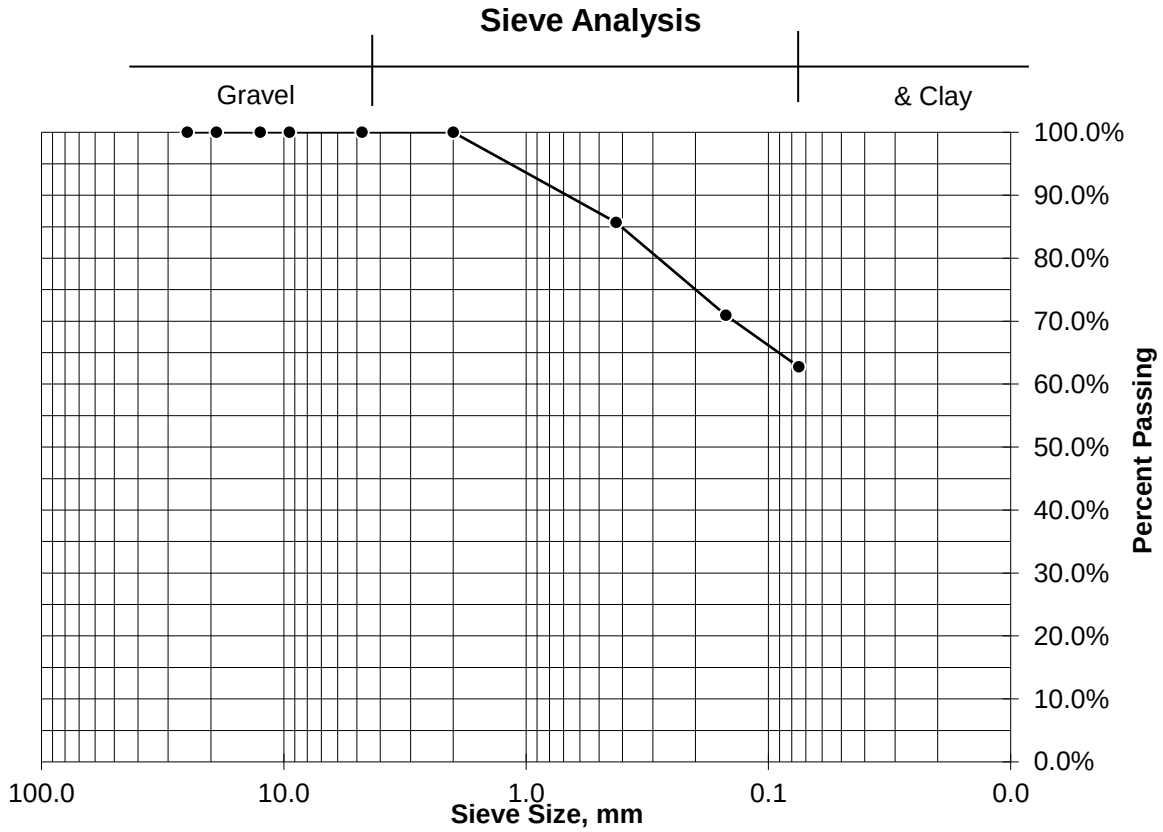
Sample ID DAA-26
Sample Depth 28'-30'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	10.11	14.3%	0.425	85.7%
No. 100	10.38	14.7%	0.15	71.0%
No. 200	5.79	8.2%	0.075	62.8%
Pan	0.68	1.0%		
Total	26.96	38.2%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-26	Sample Received:	4/17/2019
Sample Depth	34'-36'	Date Tested:	4/22/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	42	
Pan Wt	192.29	grams
Pan + Soil (wet)	306.28	grams
Pan + Soil (dry)	282.57	grams
Natural Moisture Content	*26.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	253.65	grams
Percent Passing No. 200 Sieve	32.0%	
Pan + Soil retained on No. 4 sieve (dry)	205.44	grams
Percent Passing No. 4 Sieve	85.4%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/1/2019

Liquid Limit

No of Blows	17	21	33
Pan ID	91	65	98
Pan Wt	24.52	10.99	30.34
Pan + Soil (wet)	33.03	28.80	33.17
Pan + Soil (dry)	29.87	22.44	32.22
Moisture Content	59.1%	55.5%	50.5%
Liquid Limit	56	54	52
Liquid Limit	*54*		

Plastic Limit

Pan ID	2	313
Pan Weight	9.02	9.14
Pan + Soil (wet)	20.85	20.02
Pan + Soil (dry)	17.34	16.79
Moisture Content	42.2%	42.2%
Plastic Limit	*42*	
Plastic Index	*12*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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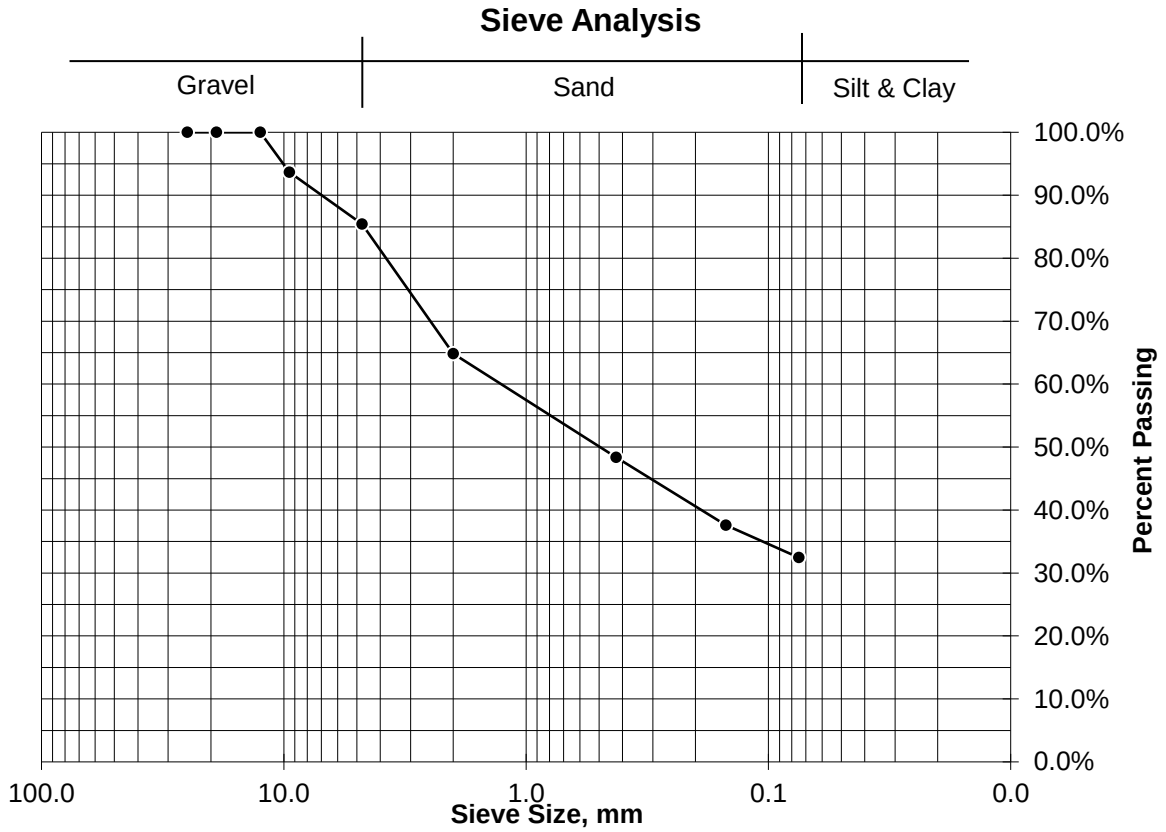
Sample ID DAA-26
Sample Depth 34'-36'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	5.73	6.3%	9.50	93.7%
No. 4	7.42	8.2%	4.75	85.4%
No. 10	18.59	20.6%	2.00	64.8%
No. 40	14.88	16.5%	0.425	48.4%
No. 100	9.70	10.7%	0.15	37.6%
No. 200	4.65	5.2%	0.075	32.5%
Pan	0.38	0.4%		
Total	61.35	68.0%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-27	Sample Received:	4/11/2019
Sample Depth	2'-4'	Date Tested:	4/22/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	21	
Pan Wt	193.79	grams
Pan + Soil (wet)	357.07	grams
Pan + Soil (dry)	345.85	grams
Natural Moisture Content	*7.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	310.60	grams
Percent Passing No. 200 Sieve	23.2%	
Pan + Soil retained on No. 4 sieve (dry)	193.79	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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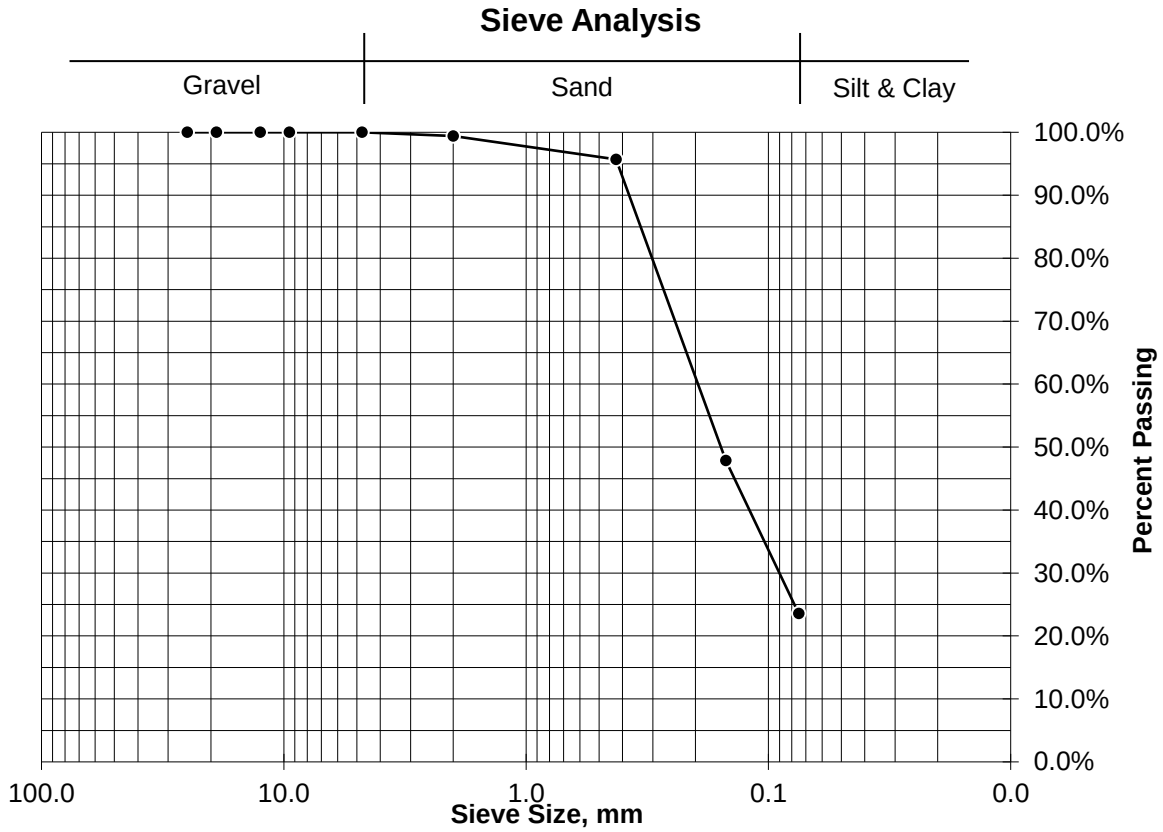
Sample ID DAA-27
Sample Depth 2'-4'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.93	0.6%	2.00	99.4%
No. 40	5.61	3.7%	0.425	95.7%
No. 100	72.74	47.8%	0.15	47.9%
No. 200	36.94	24.3%	0.075	23.6%
Pan	0.59	0.4%		
Total	116.81	76.8%		



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Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID	DAA-27	Sample Received:	4/15/2019
Sample Depth	14'-16'	Date Tested:	4/22/2019
Visual Sample Description	Light Brownish-gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	29	
Pan Wt	191.85	grams
Pan + Soil (wet)	349.47	grams
Pan + Soil (dry)	332.37	grams
Natural Moisture Content	*12.2%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	282.63	grams
Percent Passing No. 200 Sieve	35.4%	
Pan + Soil retained on No. 4 sieve (dry)	192.16	grams
Percent Passing No. 4 Sieve	99.8%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/23/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

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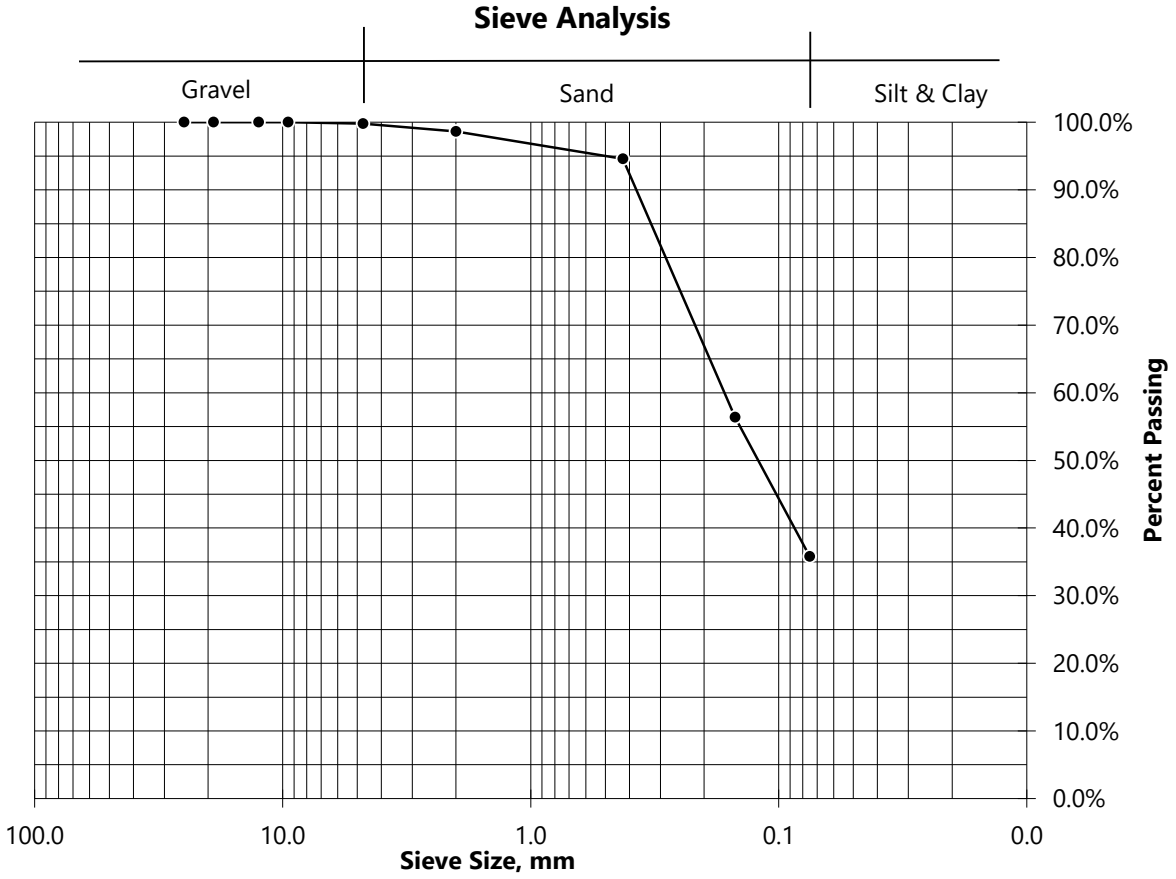
Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-27
Sample Depth 14'-16'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.31	0.2%	4.75	99.8%
No. 10	1.64	1.2%	2.00	98.6%
No. 40	5.69	4.0%	0.425	94.6%
No. 100	53.68	38.2%	0.15	56.4%
No. 200	28.91	20.6%	0.075	35.8%
Pan	0.55	0.4%		
Total	90.78	64.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-27	Sample Received:	4/11/2019
Sample Depth	16'-18'	Date Tested:	4/22/2019
Visual Sample Description	Light Gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	20	
Pan Wt	189.95	grams
Pan + Soil (wet)	373.46	grams
Pan + Soil (dry)	360.71	grams
Natural Moisture Content	*7.5%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	316.54	grams
Percent Passing No. 200 Sieve	25.9%	
Pan + Soil retained on No. 4 sieve (dry)	191.06	grams
Percent Passing No. 4 Sieve	99.3%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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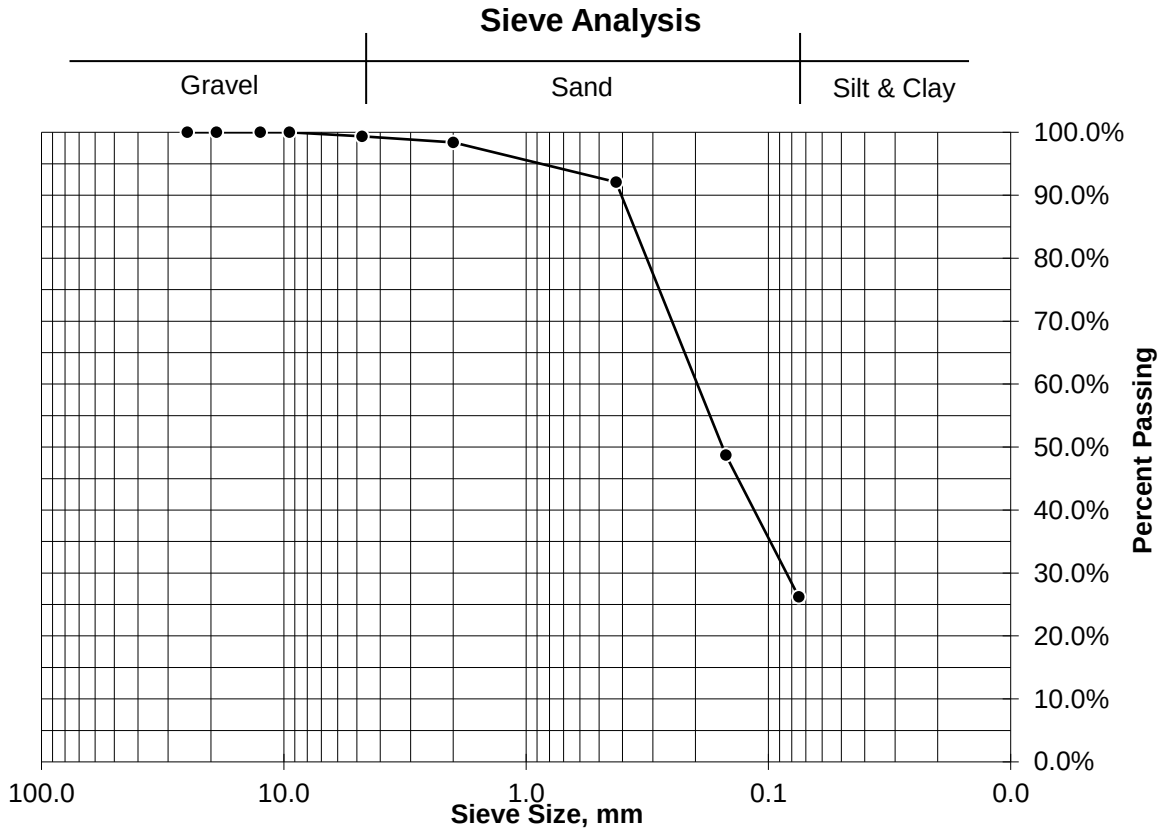
Sample ID DAA-27
Sample Depth 16'-18'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	1.11	0.7%	4.75	99.3%
No. 10	1.66	1.0%	2.00	98.4%
No. 40	10.74	6.3%	0.425	92.1%
No. 100	74.06	43.4%	0.15	48.7%
No. 200	38.39	22.5%	0.075	26.2%
Pan	0.58	0.3%		
Total	126.54	74.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-28	Sample Received:	4/11/2019
Sample Depth	2'-4'	Date Tested:	4/17/2019
Visual Sample Description	Dark Brown Clayey SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	105	
Pan Wt	124.05	grams
Pan + Soil (wet)	248.62	grams
Pan + Soil (dry)	223.97	grams
Natural Moisture Content	*24.7%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	181.28	grams
Percent Passing No. 200 Sieve	42.7%	
Pan + Soil retained on No. 4 sieve (dry)	124.05	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/25/2019

Liquid Limit

No of Blows	17	27	31
Pan ID	103	201	2000
Pan Wt	27.42	27.63	25.69
Pan + Soil (wet)	44.21	43.99	36.60
Pan + Soil (dry)	39.25	39.51	33.77
Moisture Content	41.9%	37.7%	35.1%
Liquid Limit	40	38	36
Liquid Limit	*38*		

Plastic Limit

Pan ID	315	354
Pan Weight	9.16	9.14
Pan + Soil (wet)	19.68	20.18
Pan + Soil (dry)	17.81	18.20
Moisture Content	21.6%	21.9%
Plastic Limit	*22*	
Plastic Index	*16*	

USCS Classification: ASTM D 2487

Group Symbol	**SC**
Group Name	**Clayey SAND**

Grain Size Distribution Calculations

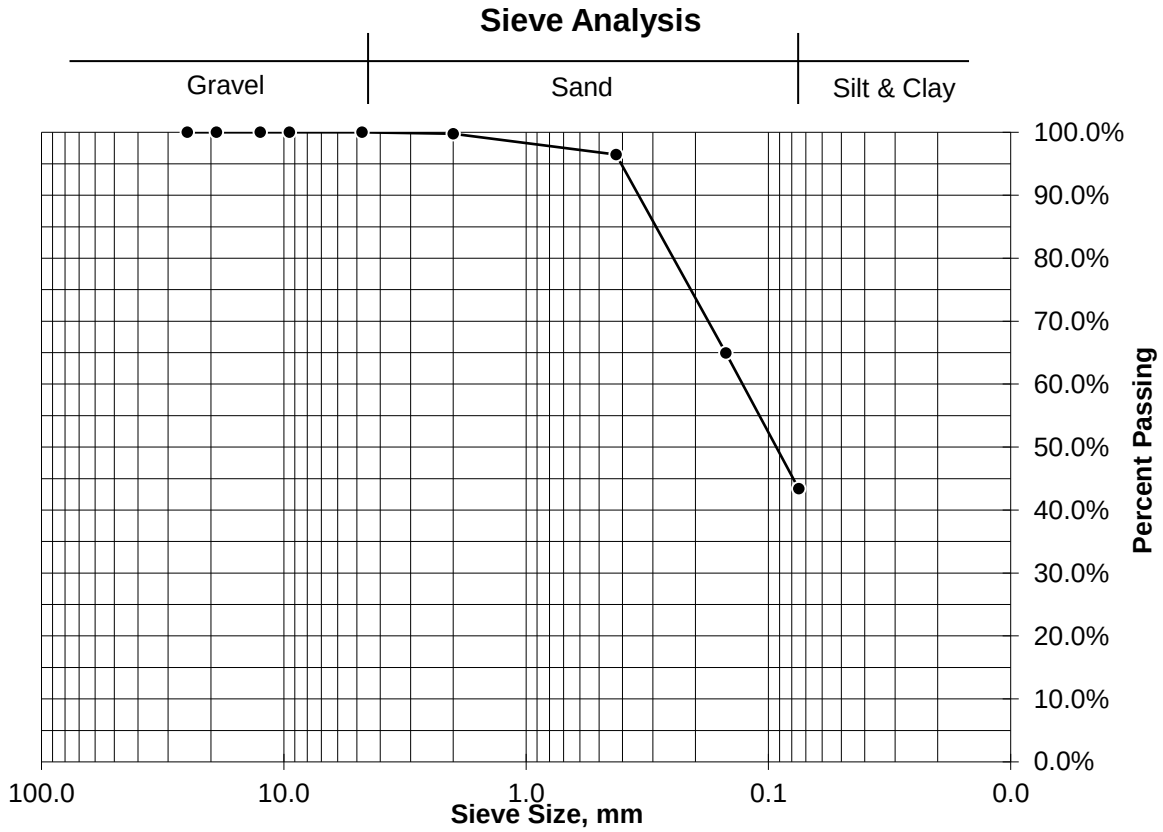
Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
Engineering • Surveying • Environmental Services
1030 Wilmer Ave., Ste. 100
Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Sample ID DAA-28
Sample Depth 2'-4'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.25	0.3%	2.00	99.7%
No. 40	3.30	3.3%	0.425	96.4%
No. 100	31.45	31.5%	0.15	65.0%
No. 200	21.57	21.6%	0.075	43.4%
Pan	0.65	0.7%		
Total	57.22	57.3%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Sample ID DAA-28
Sample Depth 4'-6'
Visual Sample Description Light Reddish-brown Silty SAND

Sample Received: 4/17/2019
Date Tested: 4/17/2019

Natural Moisture Content: ASTM D 2216

Pan ID	110	
Pan Wt	122.64	grams
Pan + Soil (wet)	248.23	grams
Pan + Soil (dry)	225.98	grams
Natural Moisture Content	*21.5%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	191.50	grams
Percent Passing No. 200 Sieve	33.4%	
Pan + Soil retained on No. 4 sieve (dry)	122.64	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 6/4/2019

Liquid Limit

No of Blows	17	23	35
Pan ID	98	103	109
Pan Wt	30.34	27.36	25.00
Pan + Soil (wet)	44.45	41.12	36.79
Pan + Soil (dry)	39.35	36.38	32.95
Moisture Content	56.6%	52.5%	48.3%
Liquid Limit	54	52	50
Liquid Limit	*52*		

Plastic Limit

Pan ID	78	315
Pan Weight	4.24	9.16
Pan + Soil (wet)	19.06	25.26
Pan + Soil (dry)	15.70	21.60
Moisture Content	29.3%	29.4%
Plastic Limit	*29*	
Plastic Index	*23*	

USCS Classification: ASTM D 2487

Group Symbol **SM**
Group Name **Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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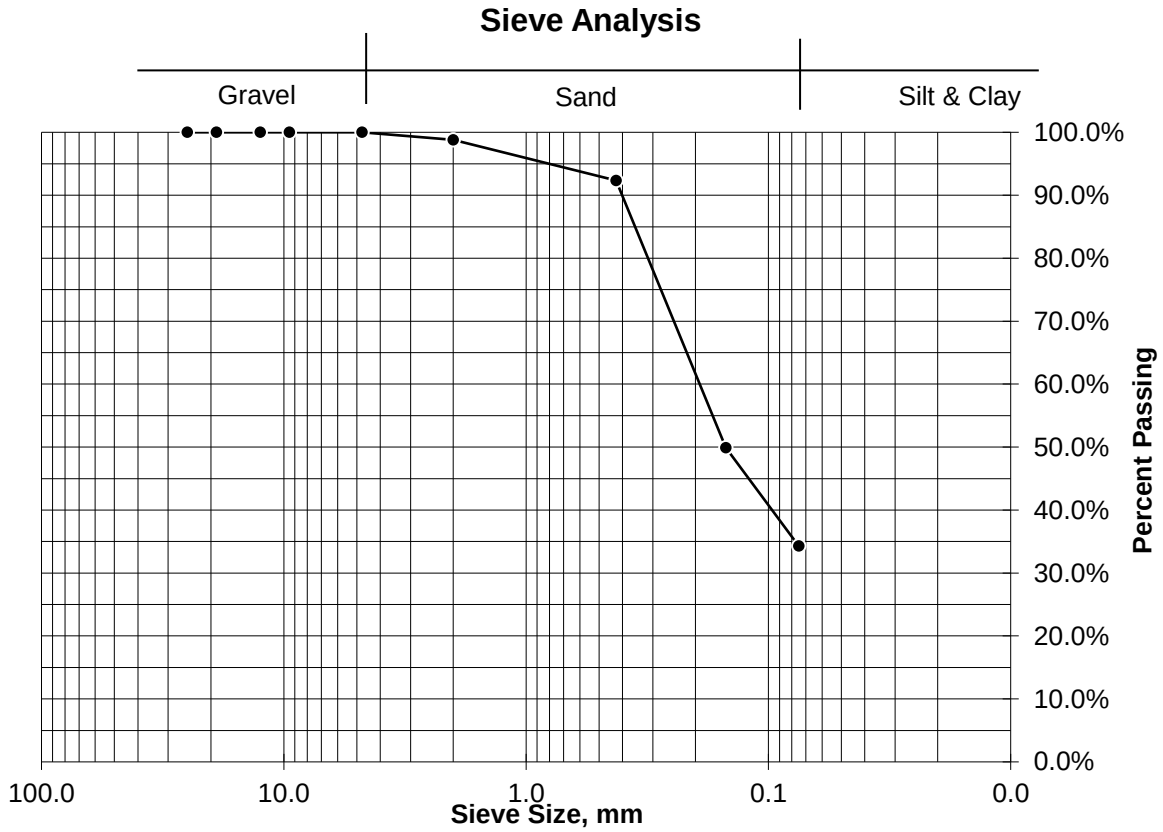
Sample ID DAA-28
Sample Depth 4'-6'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	1.24	1.2%	2.00	98.8%
No. 40	6.69	6.5%	0.425	92.3%
No. 100	43.84	42.4%	0.15	49.9%
No. 200	16.12	15.6%	0.075	34.3%
Pan	0.93	0.9%		
Total	68.82	66.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-28	Sample Received:	4/17/2019
Sample Depth	10'-12'	Date Tested:	4/22/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	31	
Pan Wt	192.97	grams
Pan + Soil (wet)	325.95	grams
Pan + Soil (dry)	307.47	grams
Natural Moisture Content	*16.1%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	272.63	grams
Percent Passing No. 200 Sieve	30.4%	
Pan + Soil retained on No. 4 sieve (dry)	192.97	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 6/3/2019

Liquid Limit

No of Blows	20	25	34
Pan ID	92	103	109
Pan Wt	25.59	27.35	25.00
Pan + Soil (wet)	43.11	44.41	40.63
Pan + Soil (dry)	37.92	39.62	36.53
Moisture Content	42.1%	39.0%	35.5%
Liquid Limit	41	39	37
Liquid Limit	*39*		

Plastic Limit

Pan ID	352	356
Pan Weight	9.08	9.11
Pan + Soil (wet)	24.74	27.56
Pan + Soil (dry)	21.17	23.41
Moisture Content	29.5%	29.0%
Plastic Limit	*29*	
Plastic Index	*10*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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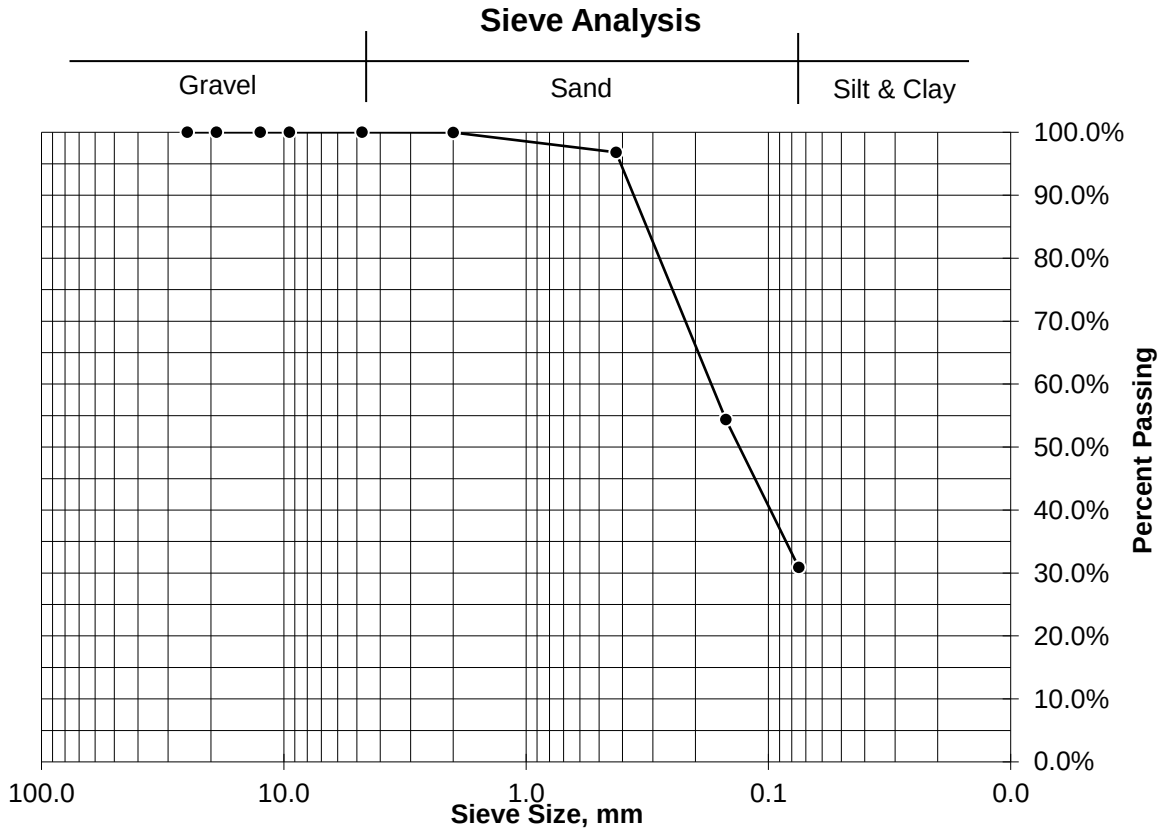
Army Corps of Engineers Certified Laboratory

Sample ID DAA-28
Sample Depth 10'-12'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.03	0.0%	2.00	100.0%
No. 40	3.62	3.2%	0.425	96.8%
No. 100	48.60	42.4%	0.15	54.4%
No. 200	26.85	23.4%	0.075	30.9%
Pan	0.52	0.5%		
Total	79.62	69.5%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-28	Sample Received:	4/11/2019
Sample Depth	28'-30'	Date Tested:	4/22/2019
Visual Sample Description	Brownish-gray Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	22	
Pan Wt	188.96	grams
Pan + Soil (wet)	399.90	grams
Pan + Soil (dry)	382.04	grams
Natural Moisture Content	*9.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	345.09	grams
Percent Passing No. 200 Sieve	19.1%	
Pan + Soil retained on No. 4 sieve (dry)	194.04	grams
Percent Passing No. 4 Sieve	97.4%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/22/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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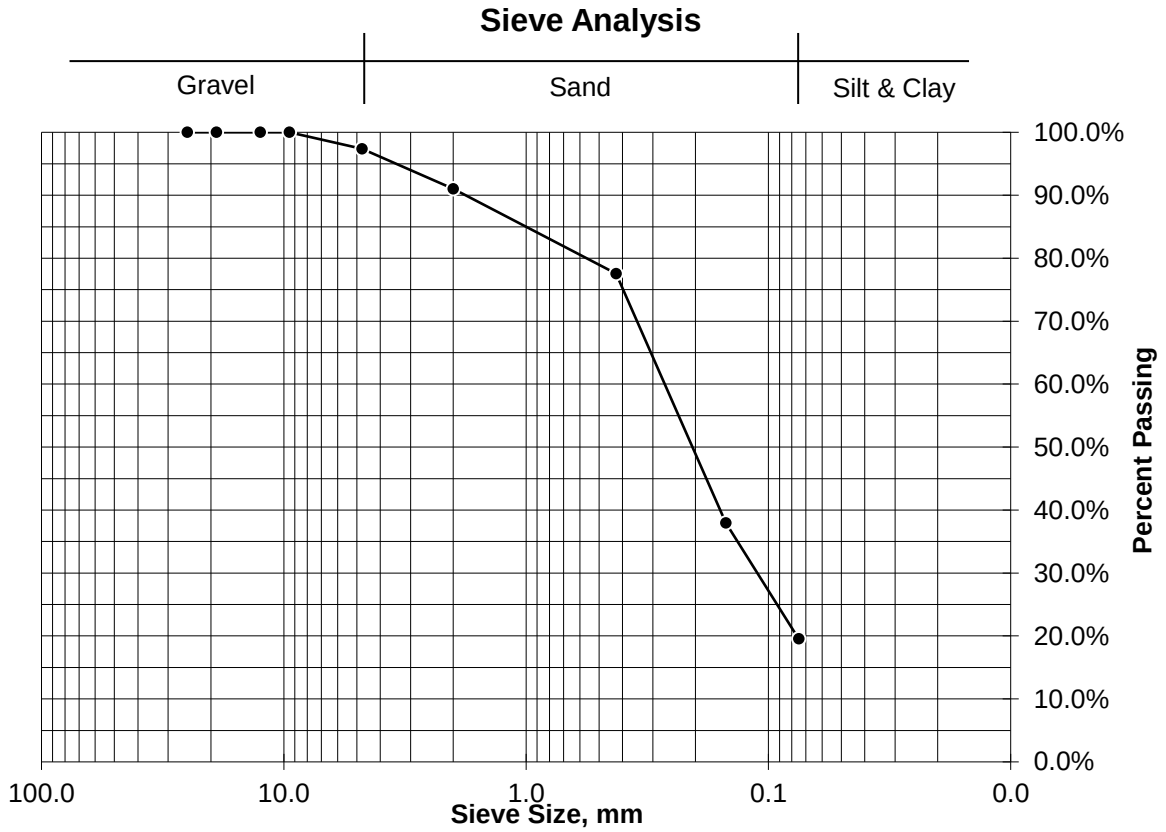
Sample ID DAA-28
Sample Depth 28'-30'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	5.08	2.6%	4.75	97.4%
No. 10	12.25	6.3%	2.00	91.0%
No. 40	26.00	13.5%	0.425	77.6%
No. 100	76.44	39.6%	0.15	38.0%
No. 200	35.58	18.4%	0.075	19.5%
Pan	0.77	0.4%		
Total	156.12	80.9%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-28	Sample Received:	4/11/2019
Sample Depth	34'-36'	Date Tested:	4/17/2019
Visual Sample Description	Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	24	
Pan Wt	186.15	grams
Pan + Soil (wet)	314.37	grams
Pan + Soil (dry)	294.31	grams
Natural Moisture Content	*18.5%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	270.42	grams
Percent Passing No. 200 Sieve	22.1%	
Pan + Soil retained on No. 4 sieve (dry)	186.15	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/24/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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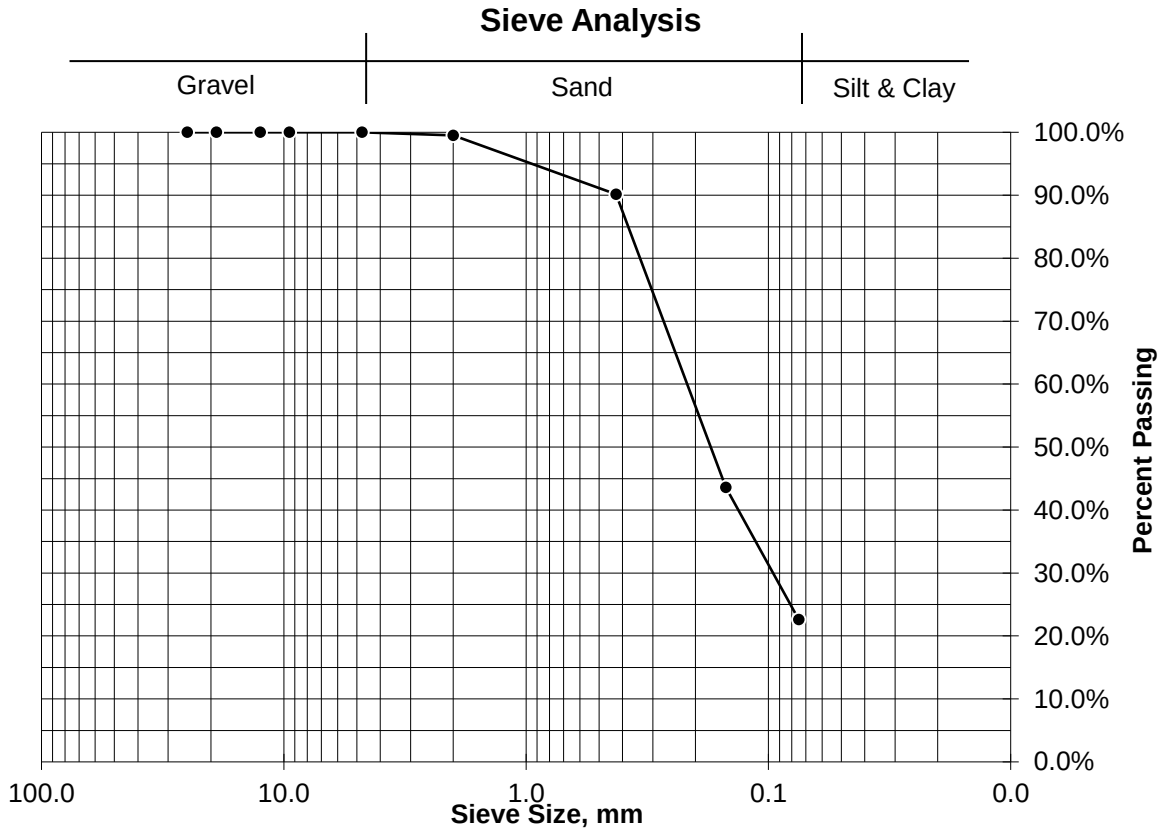
Sample ID DAA-28
Sample Depth 34'-36'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.51	0.5%	2.00	99.5%
No. 40	10.16	9.4%	0.425	90.1%
No. 100	50.34	46.5%	0.15	43.6%
No. 200	22.68	21.0%	0.075	22.6%
Pan	0.56	0.5%		
Total	84.25	77.9%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-29
Sample Depth 2'-4'
Visual Sample Description Light Brown Clayey SAND

Sample Received: 4/17/2019
Date Tested: 4/17/2019

Natural Moisture Content: ASTM D 2216

Pan ID	21	
Pan Wt	193.75	grams
Pan + Soil (wet)	328.60	grams
Pan + Soil (dry)	306.68	grams
Natural Moisture Content	*19.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	274.10	grams
Percent Passing No. 200 Sieve	28.8%	
Pan + Soil retained on No. 4 sieve (dry)	194.04	grams
Percent Passing No. 4 Sieve	99.7%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/1/2019

Liquid Limit

No of Blows	18	27	32
Pan ID	93	62	96
Pan Wt	30.11	10.87	24.80
Pan + Soil (wet)	43.28	33.01	34.09
Pan + Soil (dry)	38.77	25.91	31.22
Moisture Content	52.0%	47.2%	44.6%
Liquid Limit	50	48	46
Liquid Limit	*48*		

Plastic Limit

Pan ID	315	314
Pan Weight	9.15	9.13
Pan + Soil (wet)	19.24	19.81
Pan + Soil (dry)	17.26	17.80
Moisture Content	24.4%	23.2%
Plastic Limit	*24*	
Plastic Index	*24*	

USCS Classification: ASTM D 2487

Group Symbol **SC**
Group Name **Clayey SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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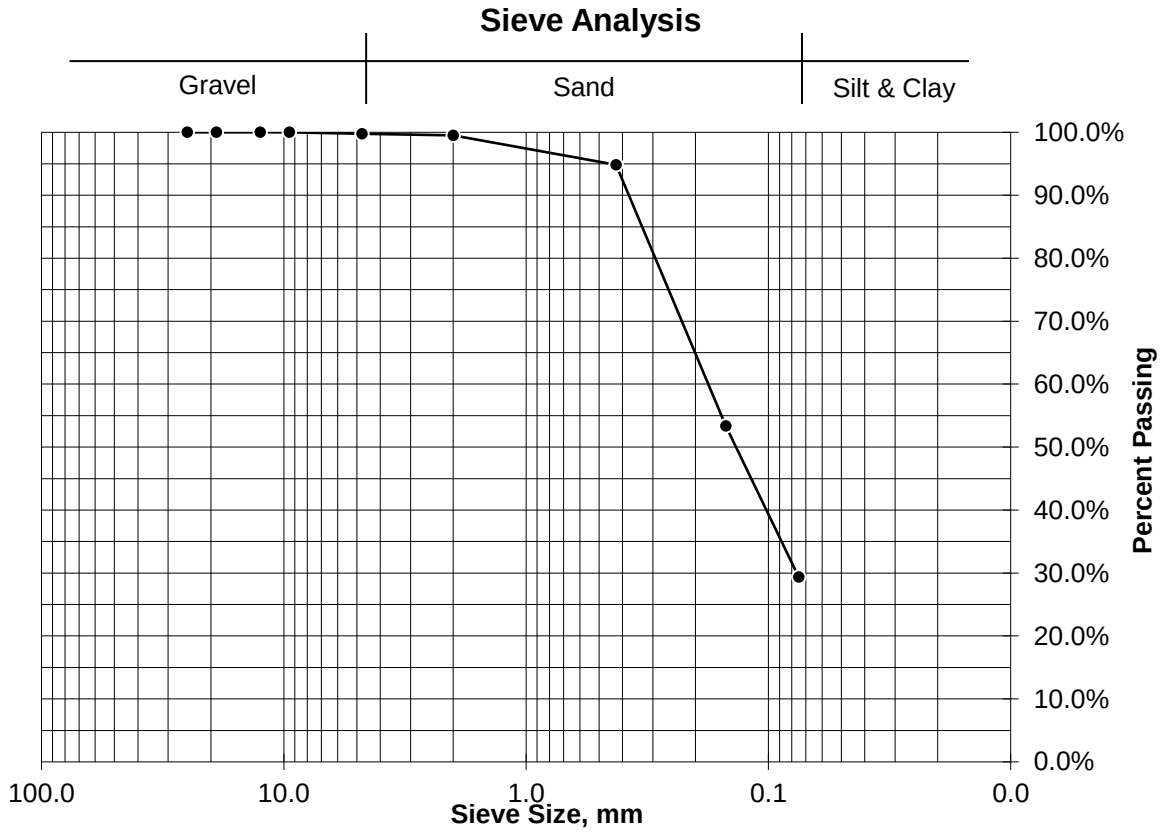
Sample ID DAA-29
Sample Depth 2'-4'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.29	0.3%	4.75	99.7%
No. 10	0.25	0.2%	2.00	99.5%
No. 40	5.30	4.7%	0.425	94.8%
No. 100	46.80	41.4%	0.15	53.4%
No. 200	27.13	24.0%	0.075	29.4%
Pan	0.57	0.5%		
Total	80.34	71.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-29	Sample Received:	4/17/2019
Sample Depth	6'-8'	Date Tested:	4/17/2019
Visual Sample Description	Brown Silty SAND with Gravel		

Natural Moisture Content: ASTM D 2216

Pan ID	41	
Pan Wt	194.44	grams
Pan + Soil (wet)	318.66	grams
Pan + Soil (dry)	289.38	grams
Natural Moisture Content	*30.8%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	267.58	grams
Percent Passing No. 200 Sieve	23.0%	
Pan + Soil retained on No. 4 sieve (dry)	220.35	grams
Percent Passing No. 4 Sieve	72.7%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/29/2019

Liquid Limit

No of Blows	18	26	32
Pan ID	701	704	708
Pan Wt	11.42	11.39	11.55
Pan + Soil (wet)	15.93	15.99	15.82
Pan + Soil (dry)	14.11	14.22	14.23
Moisture Content	67.6%	62.5%	59.2%
Liquid Limit	65	63	61
Liquid Limit	*63*		

Plastic Limit

Pan ID	58	359
Pan Weight	1.94	1.93
Pan + Soil (wet)	9.81	9.50
Pan + Soil (dry)	7.83	7.60
Moisture Content	33.6%	33.5%
Plastic Limit	*34*	
Plastic Index	*29*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND with Gravel**

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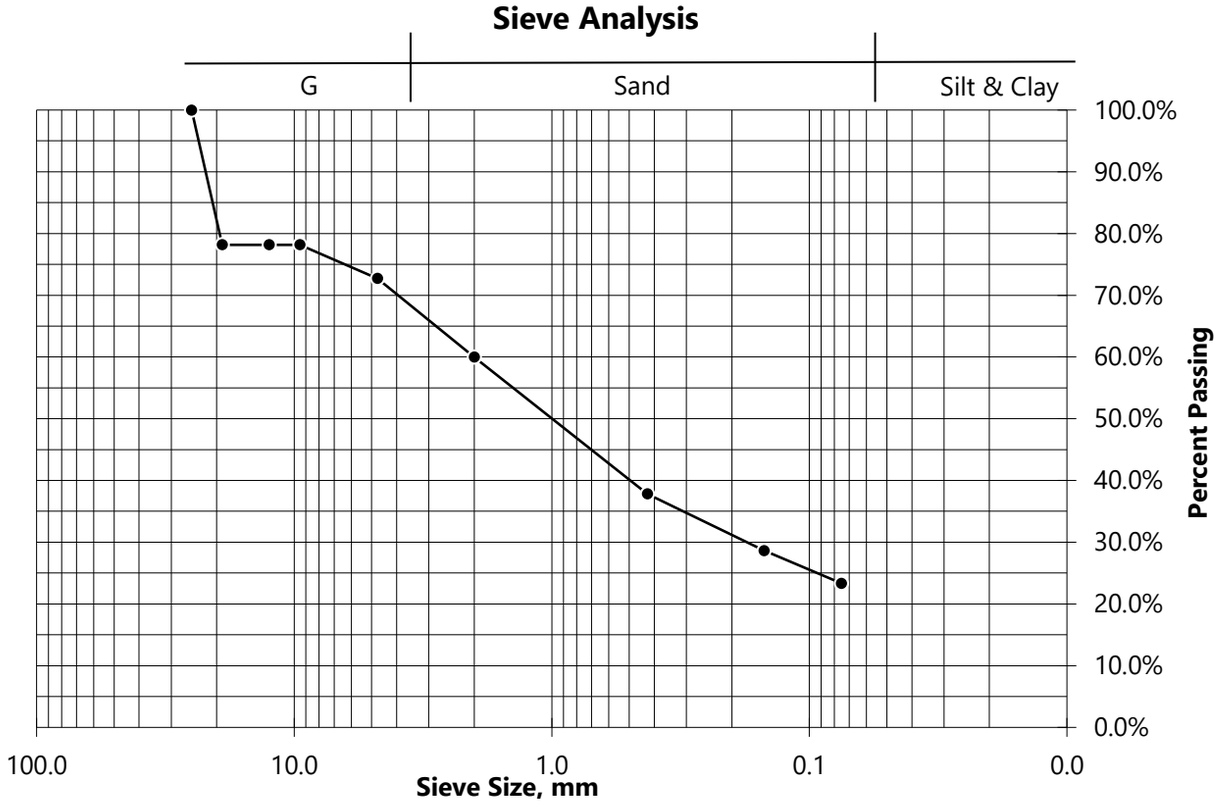
Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-29
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	20.71	21.8%	19.0	78.2%
1/2"	0.00	0.0%	12.5	78.2%
3/8"	0.00	0.0%	9.50	78.2%
No. 4	5.20	5.5%	4.75	72.7%
No. 10	12.08	12.7%	2.00	60.0%
No. 40	21.04	22.2%	0.425	37.8%
No. 100	8.71	9.2%	0.15	28.6%
No. 200	5.05	5.3%	0.075	23.3%
Pan	0.35	0.4%		
Total	73.14	77.0%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-29	Sample Received:	4/17/2019
Sample Depth	12'-14'	Date Tested:	4/17/2019
Visual Sample Description	Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	23	
Pan Wt	193.98	grams
Pan + Soil (wet)	300.48	grams
Pan + Soil (dry)	271.97	grams
Natural Moisture Content	*36.6%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	253.44	grams
Percent Passing No. 200 Sieve	23.8%	
Pan + Soil retained on No. 4 sieve (dry)	202.00	grams
Percent Passing No. 4 Sieve	89.7%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 6/4/2019

Liquid Limit

No of Blows	18	26	32
Pan ID	98	103	109
Pan Wt	30.33	27.37	24.99
Pan + Soil (wet)	40.82	36.76	32.63
Pan + Soil (dry)	37.00	33.53	30.10
Moisture Content	57.2%	52.4%	49.5%
Liquid Limit	55	53	51
Liquid Limit	*53*		

Plastic Limit

Pan ID	313	314
Pan Weight	9.14	9.13
Pan + Soil (wet)	26.19	24.82
Pan + Soil (dry)	21.25	20.28
Moisture Content	40.8%	40.7%
Plastic Limit	*41*	
Plastic Index	*12*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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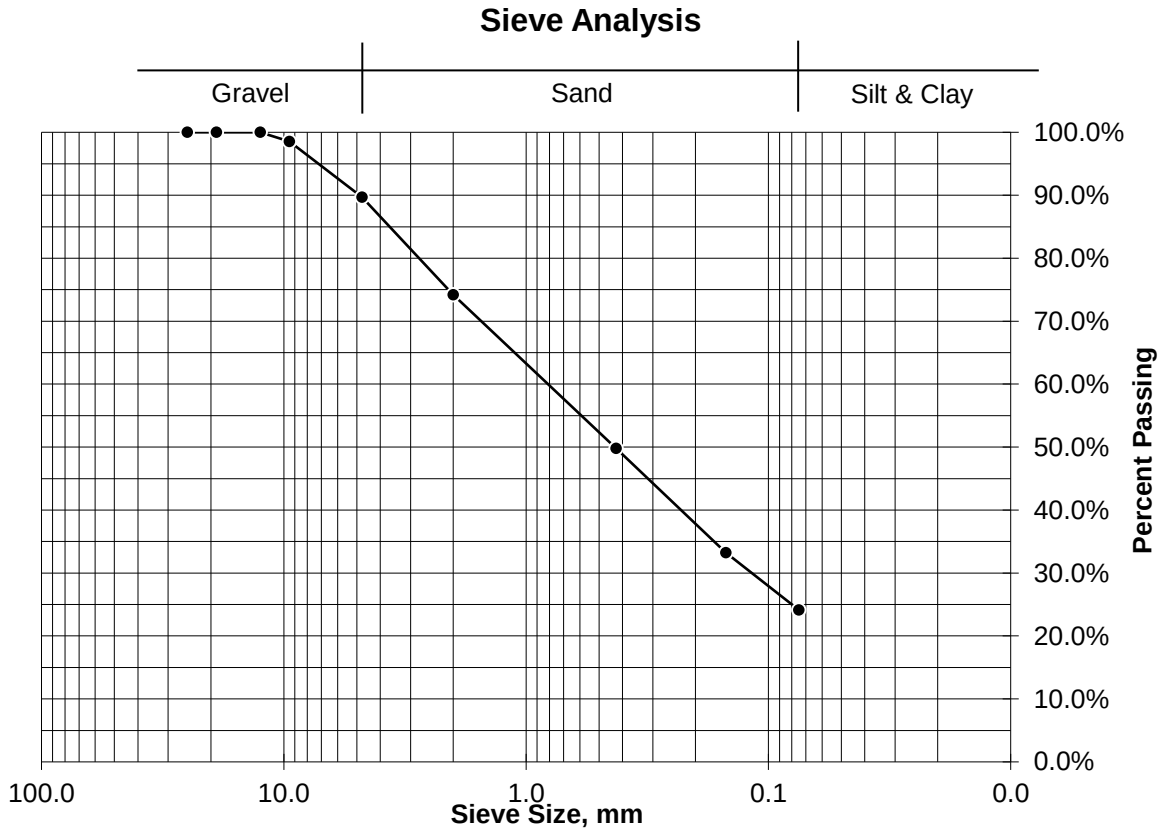
Army Corps of Engineers Certified Laboratory

Sample ID DAA-29
Sample Depth 12'-14'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	1.12	1.4%	9.50	98.6%
No. 4	6.90	8.8%	4.75	89.7%
No. 10	12.09	15.5%	2.00	74.2%
No. 40	19.04	24.4%	0.425	49.8%
No. 100	12.93	16.6%	0.15	33.2%
No. 200	7.07	9.1%	0.075	24.2%
Pan	0.31	0.4%		
Total	59.46	76.2%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-29	Sample Received:	4/17/2019
Sample Depth	24'-26'	Date Tested:	4/17/2019
Visual Sample Description	Reddish-Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	36	
Pan Wt	193.75	grams
Pan + Soil (wet)	349.90	grams
Pan + Soil (dry)	313.89	grams
Natural Moisture Content	*30.0%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	268.96	grams
Percent Passing No. 200 Sieve	37.4%	
Pan + Soil retained on No. 4 sieve (dry)	193.75	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/29/2019

Liquid Limit

No of Blows	17	26	32
Pan ID	70	72	65
Pan Wt	10.99	11.06	10.99
Pan + Soil (wet)	28.38	21.90	36.69
Pan + Soil (dry)	22.17	18.24	28.41
Moisture Content	55.5%	51.0%	47.6%
Liquid Limit	53	51	49
Liquid Limit	*51*		

Plastic Limit

Pan ID	18	73
Pan Weight	4.33	4.22
Pan + Soil (wet)	15.50	15.86
Pan + Soil (dry)	12.60	12.83
Moisture Content	35.1%	35.2%
Plastic Limit	*35*	
Plastic Index	*16*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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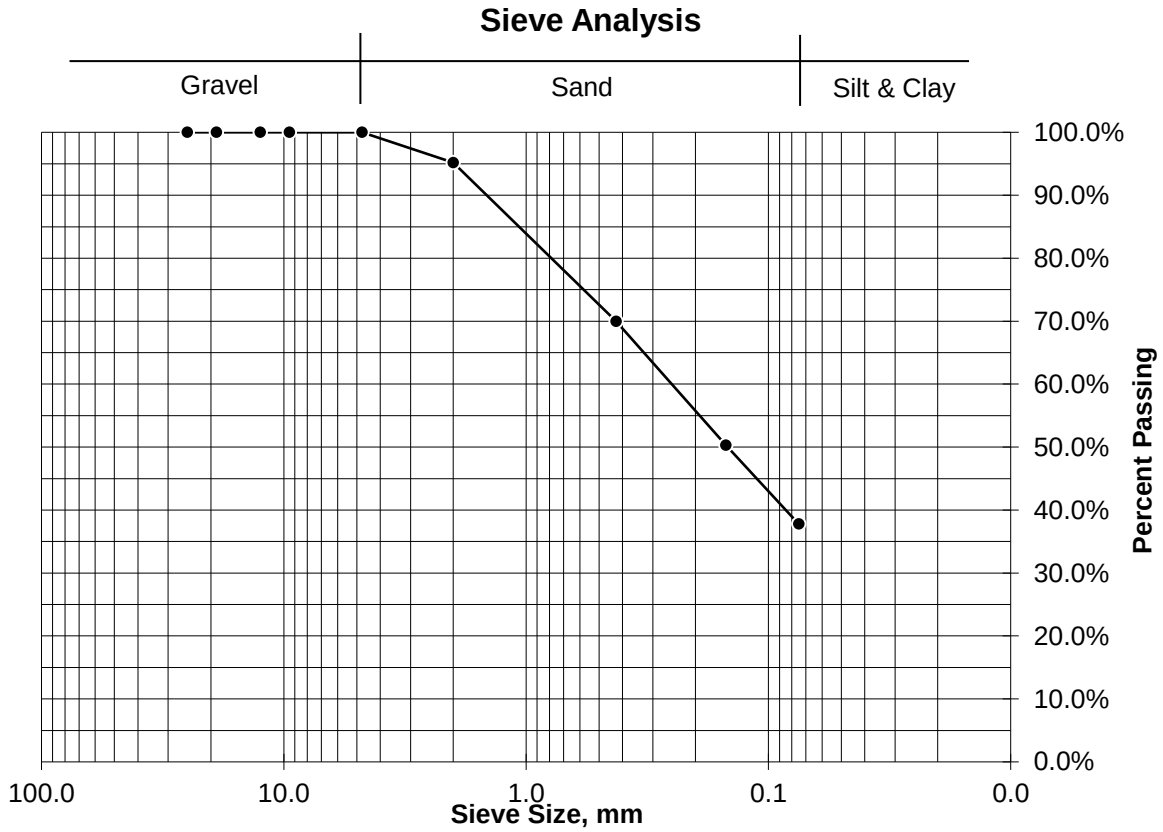
Sample ID DAA-29
Sample Depth 24'-26'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	5.78	4.8%	2.00	95.2%
No. 40	30.30	25.2%	0.425	70.0%
No. 100	23.64	19.7%	0.15	50.3%
No. 200	15.02	12.5%	0.075	37.8%
Pan	0.47	0.4%		
Total	75.21	62.6%		



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Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID	DAA-33	Sample Received:	4/17/2019
Sample Depth	2'-4'	Date Tested:	4/17/2019
Visual Sample Description	Red Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	8	
Pan Wt	187.15	grams
Pan + Soil (wet)	335.23	grams
Pan + Soil (dry)	303.13	grams
Natural Moisture Content	*27.7%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	261.34	grams
Percent Passing No. 200 Sieve	36.0%	
Pan + Soil retained on No. 4 sieve (dry)	187.15	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/29/2019

Liquid Limit

No of Blows	17	26	32
Pan ID	2	314	703
Pan Wt	9.02	9.12	11.53
Pan + Soil (wet)	19.41	20.30	21.05
Pan + Soil (dry)	15.16	15.96	17.46
Moisture Content	69.2%	63.5%	60.5%
Liquid Limit	66	64	62
Liquid Limit	*64*		

Plastic Limit

Pan ID	23	73
Pan Weight	4.32	4.23
Pan + Soil (wet)	15.69	14.27
Pan + Soil (dry)	12.56	11.51
Moisture Content	38.0%	37.9%
Plastic Limit	*38*	
Plastic Index	*26*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

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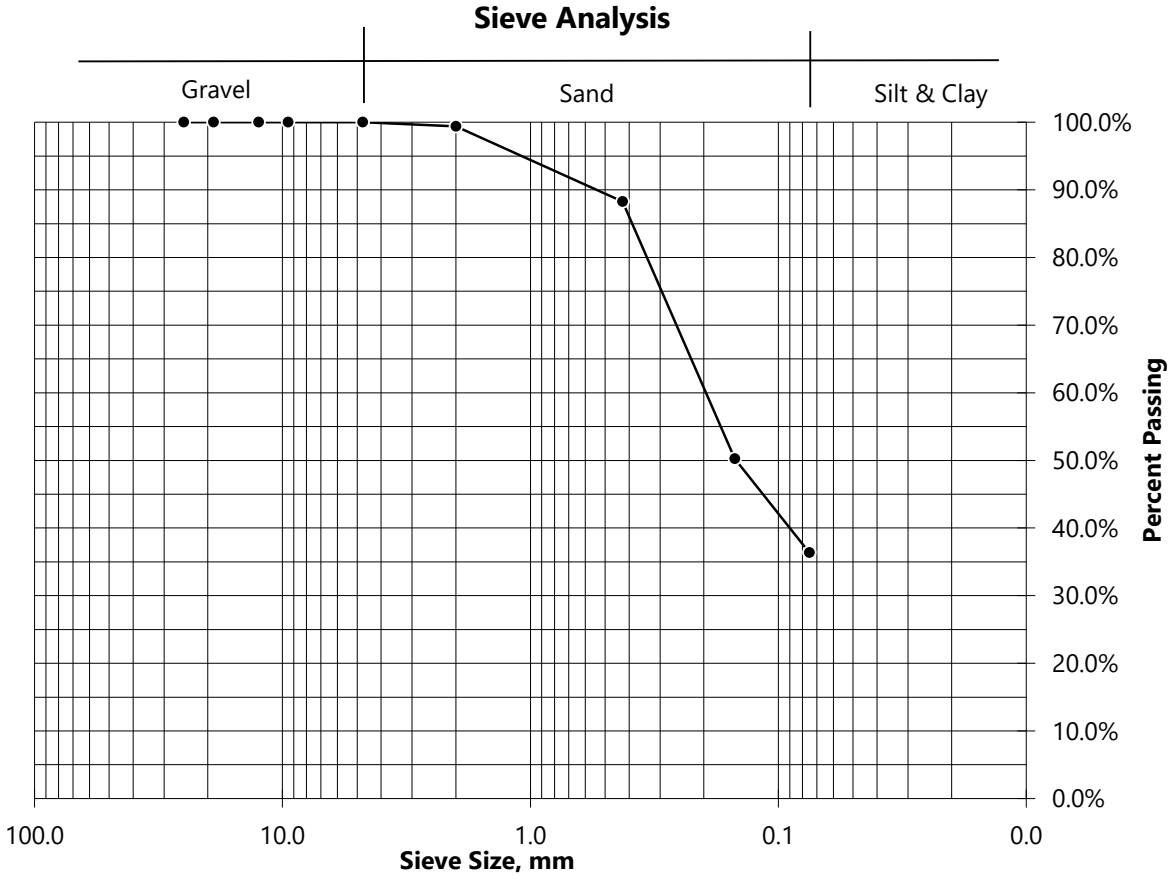
Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-33
Sample Depth 2'-4'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.73	0.6%	2.00	99.4%
No. 40	12.90	11.1%	0.425	88.2%
No. 100	44.08	38.0%	0.15	50.2%
No. 200	16.09	13.9%	0.075	36.4%
Pan	0.33	0.3%		
Total	74.13	63.9%		



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Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-33 — Sample Received: 4/17/2019
Sample Depth 4'-6' — Date Tested: 4/17/2019
Visual Sample Description Light Reddish-brown Silty SAND

Natural Moisture Content: ASTM D 2216

Pan ID	38	
Pan Wt	193.65	grams
Pan + Soil (wet)	300.60	grams
Pan + Soil (dry)	277.67	grams
Natural Moisture Content	*27.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	253.13	grams
Percent Passing No. 200 Sieve	29.2%	
Pan + Soil retained on No. 4 sieve (dry)	193.65	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/29/2019

Liquid Limit

No of Blows	19	23	35
Pan ID	91	169	201
Pan Wt	24.49	27.13	27.63
Pan + Soil (wet)	34.09	36.18	36.99
Pan + Soil (dry)	30.35	32.78	33.64
Moisture Content	63.8%	60.2%	55.7%
Liquid Limit	62	60	58
Liquid Limit	*60*		

Plastic Limit

Pan ID	354	356
Pan Weight	9.13	9.08
Pan + Soil (wet)	24.29	24.75
Pan + Soil (dry)	20.53	20.85
Moisture Content	33.0%	33.1%
Plastic Limit	*33*	
Plastic Index	*27*	

USCS Classification: ASTM D 2487

Group Symbol **SM**
Group Name **Silty SAND**

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Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill

DAA# 18020117-030102

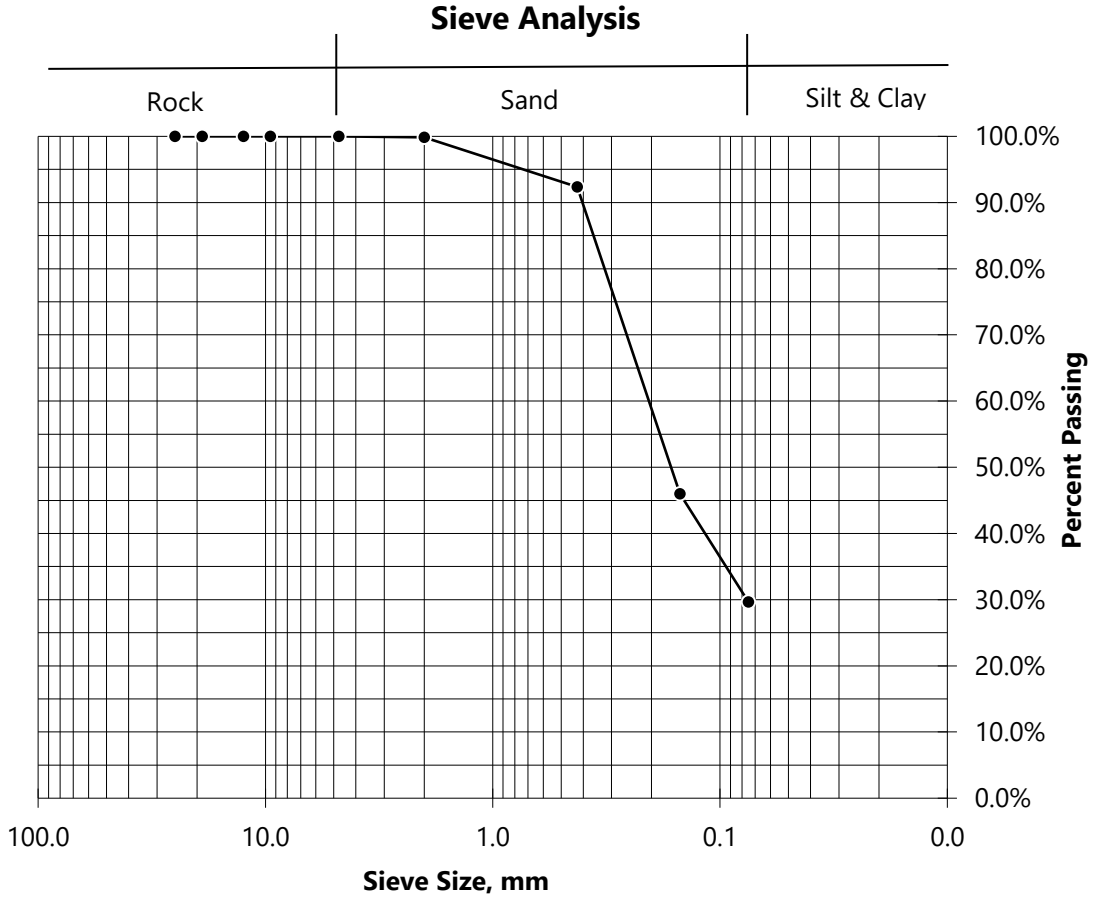
Prepared By: CBW

Sample ID DAA-33

Sample Depth 4'-6'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.14	0.2%	2.00	99.8%
No. 40	6.28	7.5%	0.425	92.4%
No. 100	38.97	46.4%	0.15	46.0%
No. 200	13.72	16.3%	0.075	29.6%
Pan	0.32	0.4%		
Total	59.43	70.7%		



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Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID	DAA-33	Sample Received:	4/15/2019
Sample Depth	6'-8'	Date Tested:	4/15/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	19	
Pan Wt	188.54	grams
Pan + Soil (wet)	363.97	grams
Pan + Soil (dry)	332.50	grams
Natural Moisture Content	*21.9%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	303.48	grams
Percent Passing No. 200 Sieve	20.2%	
Pan + Soil retained on No. 4 sieve (dry)	190.18	grams
Percent Passing No. 4 Sieve	98.9%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/23/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

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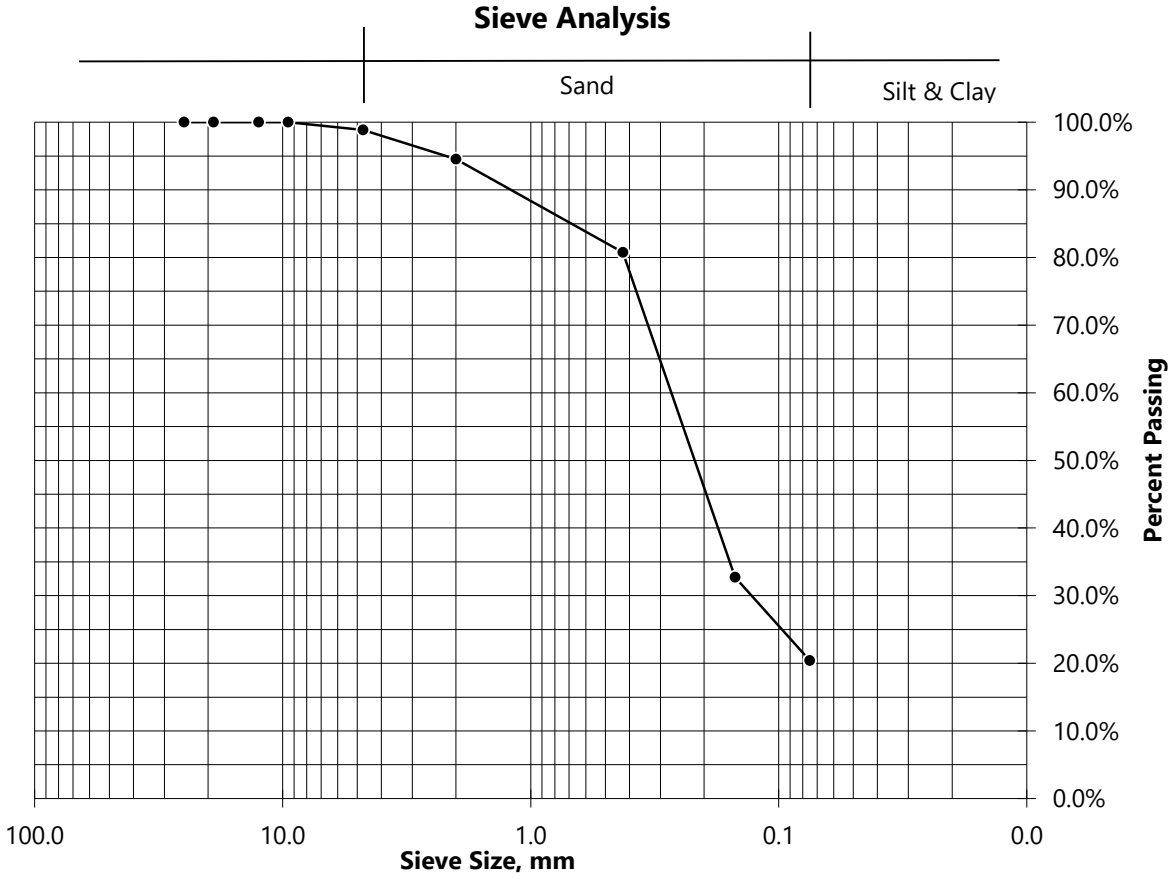
Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-33
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	1.64	1.1%	4.75	98.9%
No. 10	6.24	4.3%	2.00	94.5%
No. 40	19.85	13.8%	0.425	80.7%
No. 100	69.12	48.0%	0.15	32.7%
No. 200	17.71	12.3%	0.075	20.4%
Pan	0.36	0.3%		
Total	114.92	79.8%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-33	Sample Received:	4/17/2019
Sample Depth	8'-10'	Date Tested:	4/17/2019
Visual Sample Description	Light Gray Clayey SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	6	
Pan Wt	195.34	grams
Pan + Soil (wet)	307.15	grams
Pan + Soil (dry)	294.30	grams
Natural Moisture Content	*13.0%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	253.78	grams
Percent Passing No. 200 Sieve	40.9%	
Pan + Soil retained on No. 4 sieve (dry)	198.00	grams
Percent Passing No. 4 Sieve	97.3%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 6/4/2019

Liquid Limit

No of Blows	15	23	35
Pan ID	101	107	108
Pan Wt	23.99	25.11	33.14
Pan + Soil (wet)	39.02	37.64	44.89
Pan + Soil (dry)	35.03	34.57	42.26
Moisture Content	36.2%	32.5%	28.8%
Liquid Limit	34	32	30
Liquid Limit	*32*		

Plastic Limit

Pan ID	315	352
Pan Weight	9.15	9.07
Pan + Soil (wet)	31.65	29.36
Pan + Soil (dry)	27.76	25.84
Moisture Content	20.9%	21.0%
Plastic Limit	*21*	
Plastic Index	*11*	

USCS Classification: ASTM D 2487

Group Symbol	**SC**
Group Name	**Clayey SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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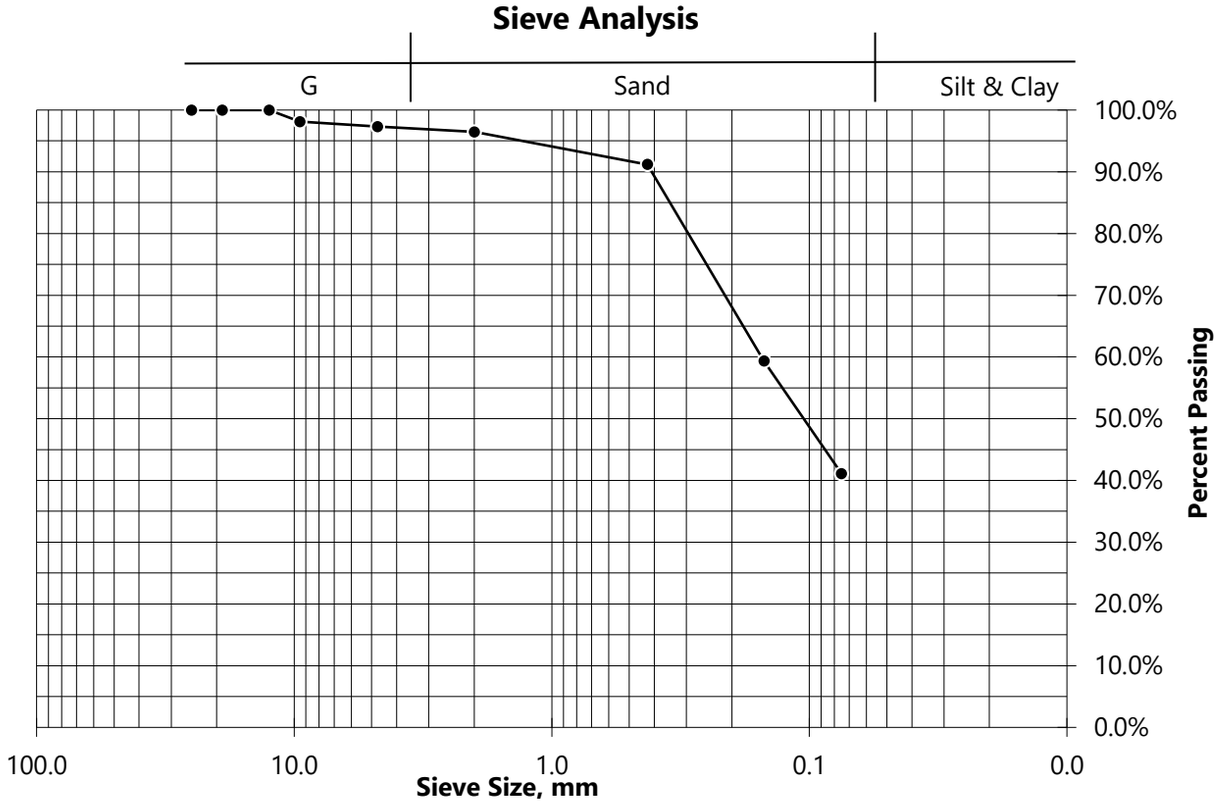
Sample ID DAA-33
Sample Depth 8'-10'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	1.85	1.9%	9.50	98.1%
No. 4	0.81	0.8%	4.75	97.3%
No. 10	0.85	0.9%	2.00	96.5%
No. 40	5.22	5.3%	0.425	91.2%
No. 100	31.50	31.8%	0.15	59.3%
No. 200	18.04	18.2%	0.075	41.1%
Pan	0.17	0.2%		
Total	58.44	59.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-33	Sample Received:	4/17/2019
Sample Depth	10'-12'	Date Tested:	4/17/2019
Visual Sample Description	Light Gray Clayey SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	7	
Pan Wt	192.34	grams
Pan + Soil (wet)	333.57	grams
Pan + Soil (dry)	317.63	grams
Natural Moisture Content	*12.7%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	277.96	grams
Percent Passing No. 200 Sieve	31.7%	
Pan + Soil retained on No. 4 sieve (dry)	203.21	grams
Percent Passing No. 4 Sieve	91.3%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 6/4/2019

Liquid Limit

No of Blows	16	26	31
Pan ID	91	96	102
Pan Wt	24.50	24.82	23.96
Pan + Soil (wet)	34.07	34.41	36.18
Pan + Soil (dry)	31.39	31.93	33.21
Moisture Content	38.9%	34.8%	32.2%
Liquid Limit	37	35	33
Liquid Limit	*35*		

Plastic Limit

Pan ID	19	74
Pan Weight	4.35	4.24
Pan + Soil (wet)	17.26	17.16
Pan + Soil (dry)	15.32	15.22
Moisture Content	17.7%	17.7%
Plastic Limit	*18*	
Plastic Index	*17*	

USCS Classification: ASTM D 2487

Group Symbol	**SC**
Group Name	**Clayey SAND**

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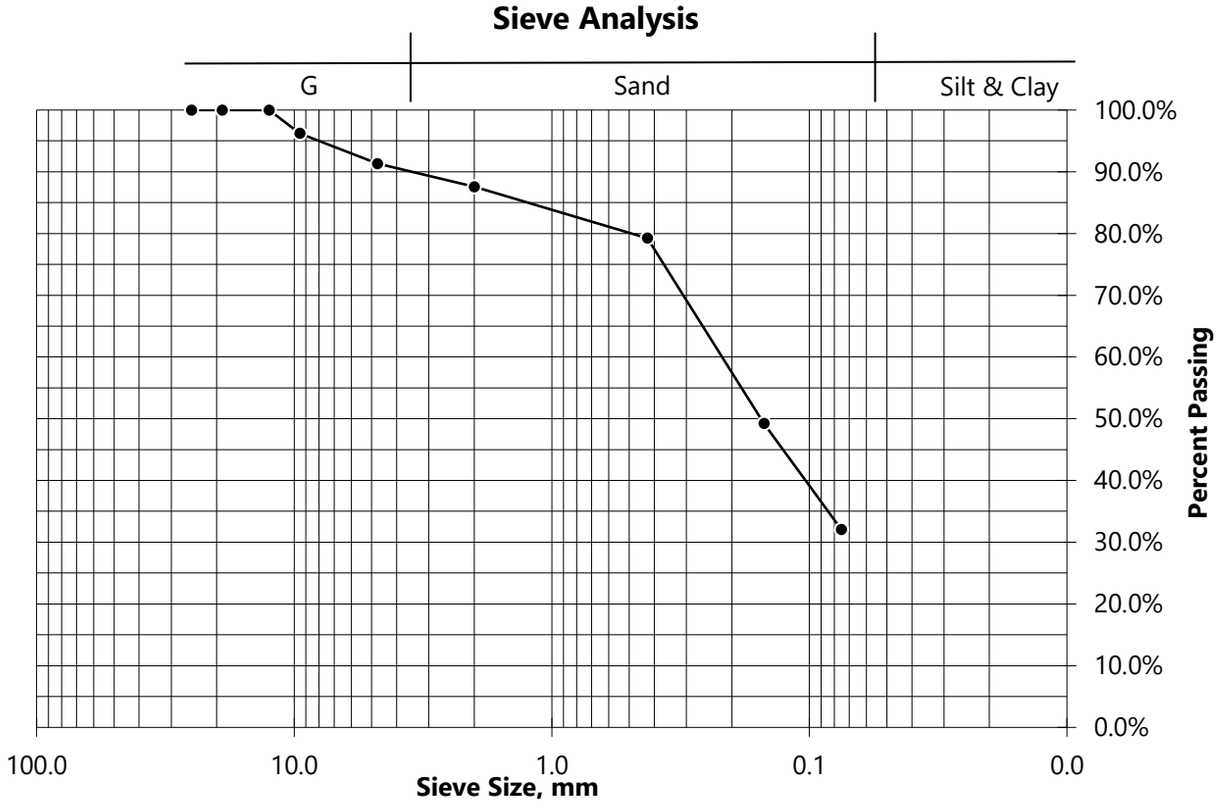
Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-33
Sample Depth 10'-12'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	4.75	3.8%	9.50	96.2%
No. 4	6.12	4.9%	4.75	91.3%
No. 10	4.69	3.7%	2.00	87.6%
No. 40	10.44	8.3%	0.425	79.2%
No. 100	37.63	30.0%	0.15	49.2%
No. 200	21.53	17.2%	0.075	32.0%
Pan	0.46	0.4%		
Total	85.62	68.3%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-33	Sample Received:	4/15/2019
Sample Depth	12'-14'	Date Tested:	4/15/2019
Visual Sample Description	Light Reddish-brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	22	
Pan Wt	189.01	grams
Pan + Soil (wet)	336.96	grams
Pan + Soil (dry)	325.31	grams
Natural Moisture Content	*8.5%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	297.36	grams
Percent Passing No. 200 Sieve	20.5%	
Pan + Soil retained on No. 4 sieve (dry)	189.22	grams
Percent Passing No. 4 Sieve	99.8%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/17/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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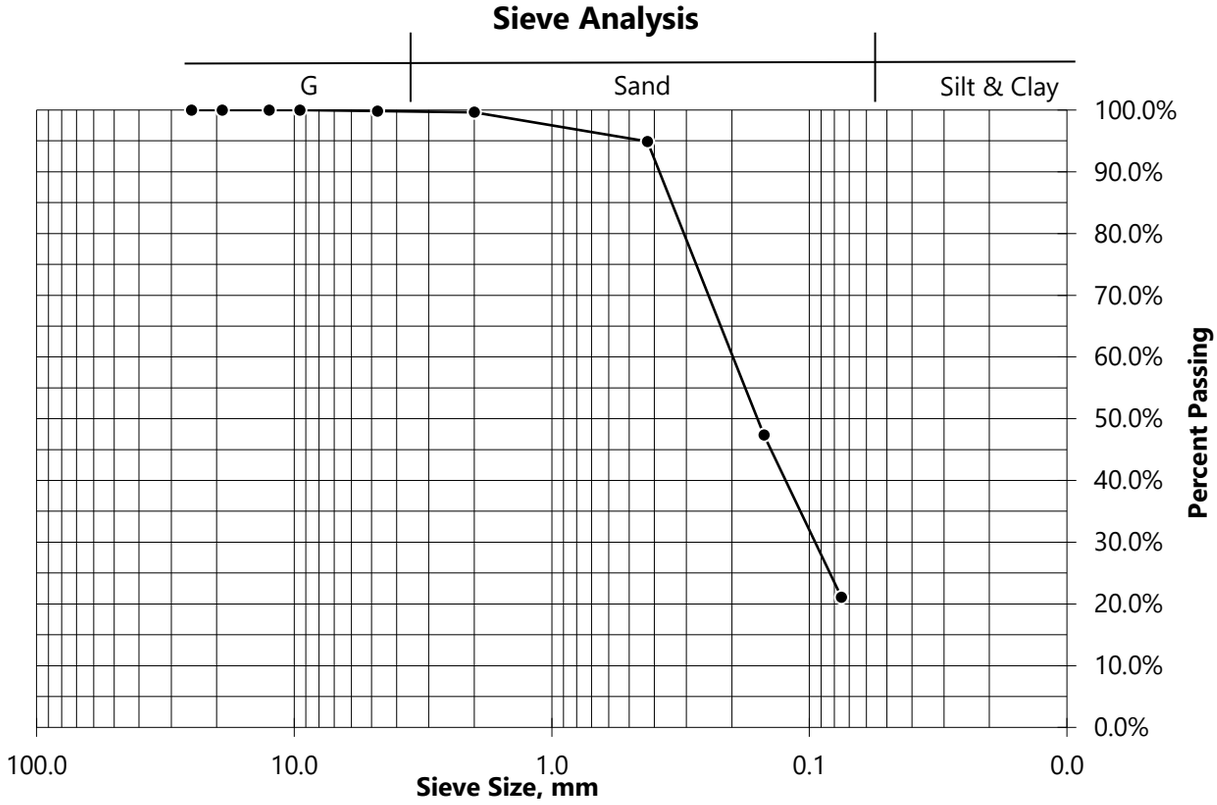
Sample ID DAA-33
Sample Depth 12'-14'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.21	0.2%	4.75	99.8%
No. 10	0.29	0.2%	2.00	99.6%
No. 40	6.46	4.7%	0.425	94.9%
No. 100	64.82	47.6%	0.15	47.3%
No. 200	35.81	26.3%	0.075	21.1%
Pan	0.74	0.5%		
Total	108.33	79.5%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-34
Sample Depth 2'-4'
Visual Sample Description Reddish-brown Clayey SAND

Sample Received: 4/15/2019
Date Tested: 4/15/2019

Natural Moisture Content: ASTM D 2216

Pan ID	25	
Pan Wt	194.03	grams
Pan + Soil (wet)	297.16	grams
Pan + Soil (dry)	275.38	grams
Natural Moisture Content	*26.8%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	235.52	grams
Percent Passing No. 200 Sieve	49.0%	
Pan + Soil retained on No. 4 sieve (dry)	194.03	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/21/2019

Liquid Limit

No of Blows	19	25	33
Pan ID	61	65	6
Pan Wt	10.89	10.94	11.19
Pan + Soil (wet)	21.21	22.31	21.59
Pan + Soil (dry)	16.99	17.84	17.65
Moisture Content	69.3%	64.8%	60.9%
Liquid Limit	67	65	63
Liquid Limit	*65*		

Plastic Limit

Pan ID	82	74
Pan Weight	4.23	4.25
Pan + Soil (wet)	14.30	14.52
Pan + Soil (dry)	12.65	12.83
Moisture Content	19.6%	19.7%
Plastic Limit	*20*	
Plastic Index	*45*	

USCS Classification: ASTM D 2487

Group Symbol **SC**
Group Name **Clayey SAND**

Grain Size Distribution Calculations

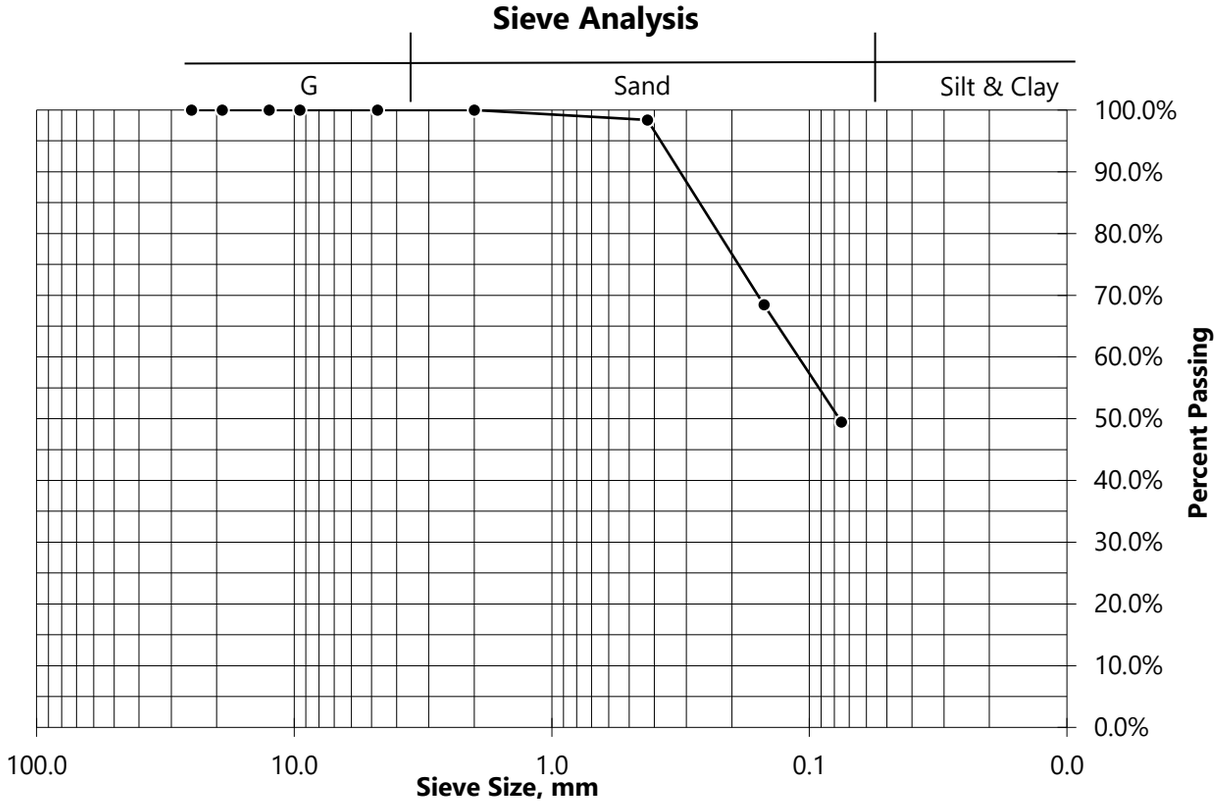
Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
Engineering • Surveying • Environmental Services
1030 Wilmer Ave., Ste. 100
Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Sample ID DAA-34
Sample Depth 2'-4'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.00	0.0%	2.00	100.0%
No. 40	1.31	1.6%	0.425	98.4%
No. 100	24.37	30.0%	0.15	68.4%
No. 200	15.43	19.0%	0.075	49.5%
Pan	0.37	0.5%		
Total	41.48	51.0%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Sample ID DAA-34
Sample Depth 6'-8'
Visual Sample Description Light Brown Clayey SAND

Sample Received: 4/15/2019
Date Tested: 4/15/2019

Natural Moisture Content: ASTM D 2216

Pan ID	39	
Pan Wt	193.09	grams
Pan + Soil (wet)	295.84	grams
Pan + Soil (dry)	286.39	grams
Natural Moisture Content	*10.1%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	270.19	grams
Percent Passing No. 200 Sieve	17.4%	
Pan + Soil retained on No. 4 sieve (dry)	193.34	grams
Percent Passing No. 4 Sieve	99.7%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/29/2019

Liquid Limit

No of Blows	19	24	34
Pan ID	705	710	711
Pan Wt	11.53	11.49	11.55
Pan + Soil (wet)	16.80	16.03	16.39
Pan + Soil (dry)	15.34	14.85	15.22
Moisture Content	38.2%	35.1%	31.8%
Liquid Limit	37	35	33
Liquid Limit	*35*		

Plastic Limit

Pan ID	26	122
Pan Weight	2.41	2.42
Pan + Soil (wet)	9.25	11.34
Pan + Soil (dry)	8.15	9.90
Moisture Content	19.2%	19.3%
Plastic Limit	*19*	
Plastic Index	*16*	

USCS Classification: ASTM D 2487

Group Symbol **SC**
Group Name **Clayey SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Engineering • Surveying • Environmental Services
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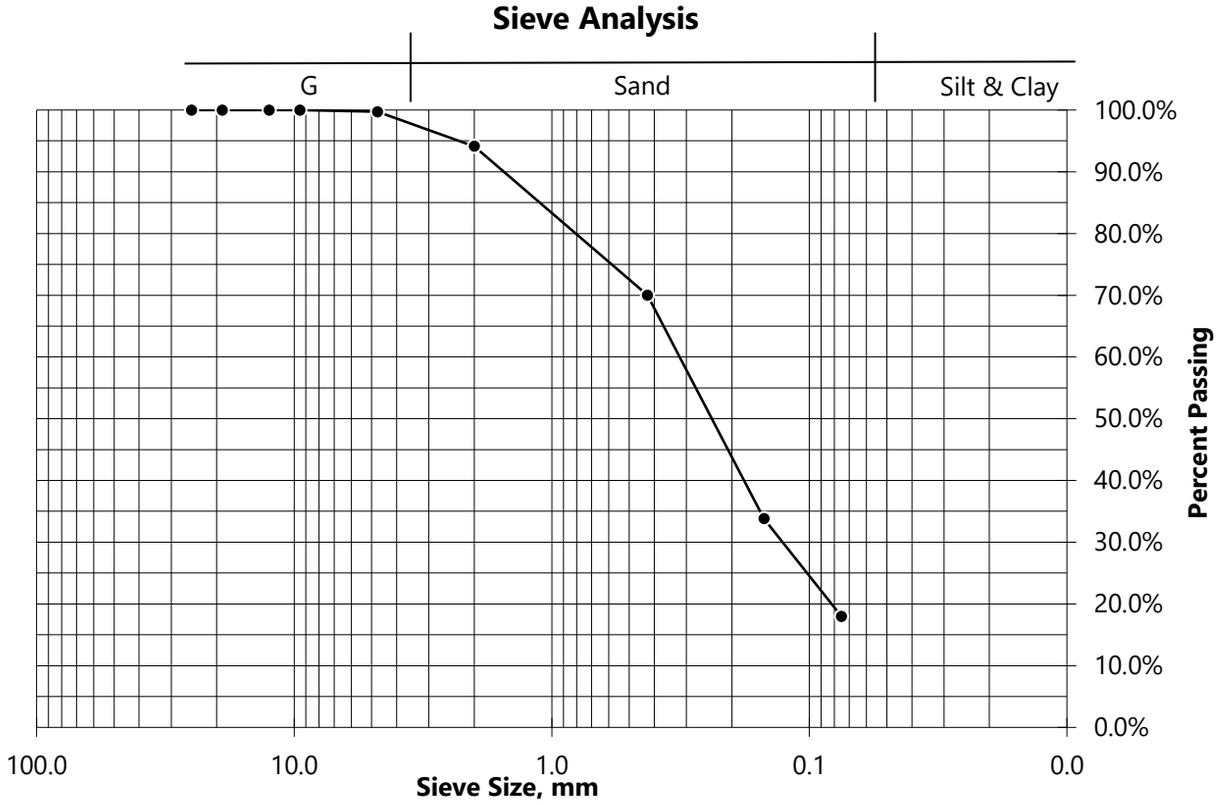
Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Sample ID DAA-34
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.25	0.3%	4.75	99.7%
No. 10	5.23	5.6%	2.00	94.1%
No. 40	22.50	24.1%	0.425	70.0%
No. 100	33.77	36.2%	0.15	33.8%
No. 200	14.78	15.8%	0.075	18.0%
Pan	0.54	0.6%		
Total	77.07	82.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Sample ID	DAA-33	Sample Received:	4/15/2019
Sample Depth	20'-22'	Date Tested:	4/15/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	4	
Pan Wt	194.52	grams
Pan + Soil (wet)	307.70	grams
Pan + Soil (dry)	289.46	grams
Natural Moisture Content	*19.2%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	262.04	grams
Percent Passing No. 200 Sieve	28.9%	
Pan + Soil retained on No. 4 sieve (dry)	194.52	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/29/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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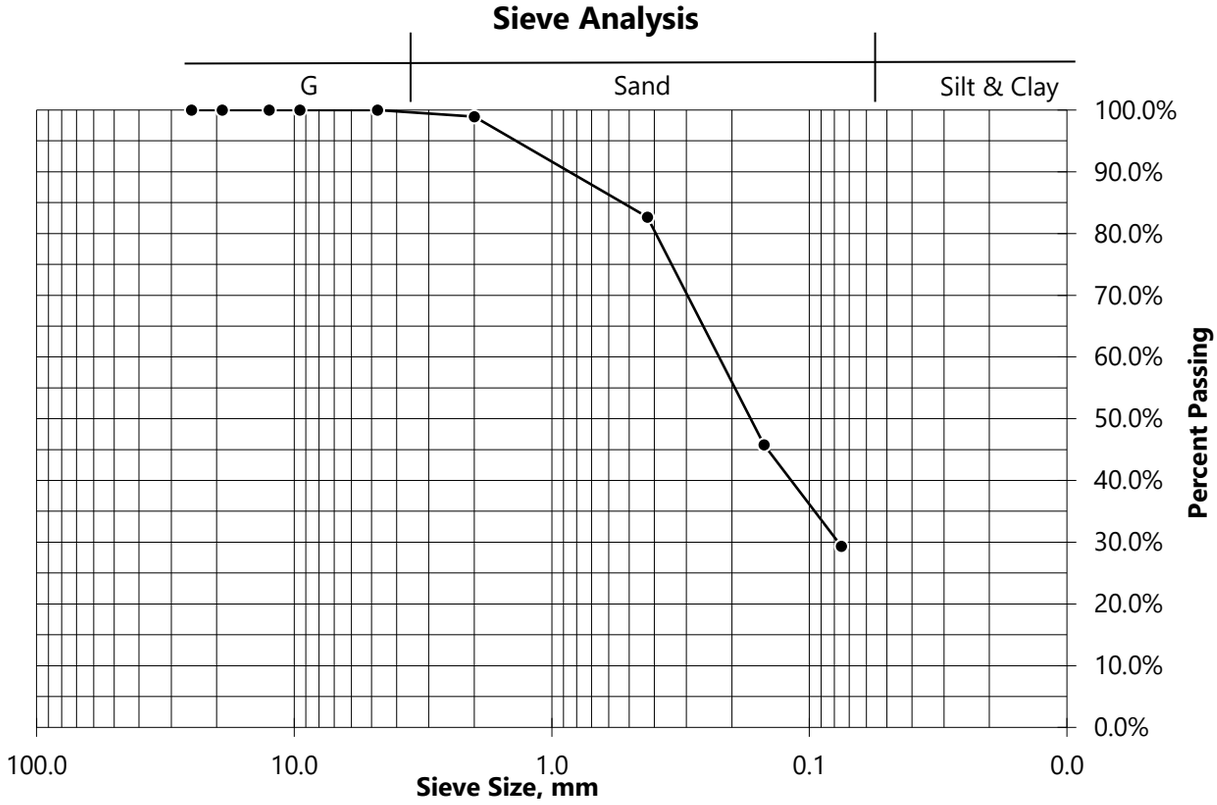
Sample ID DAA-33
Sample Depth 20'-22'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	1.01	1.1%	2.00	98.9%
No. 40	15.46	16.3%	0.425	82.7%
No. 100	35.01	36.9%	0.15	45.8%
No. 200	15.64	16.5%	0.075	29.3%
Pan	0.40	0.4%		
Total	67.52	71.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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Army Corps of Engineers Certified Laboratory

Sample ID DAA-35
Sample Depth 2'-4'
Visual Sample Description Red Sandy Lean CLAY

Sample Received: 4/15/2019
Date Tested: 4/15/2019

Natural Moisture Content: ASTM D 2216

Pan ID	10	
Pan Wt	184.07	grams
Pan + Soil (wet)	299.66	grams
Pan + Soil (dry)	279.65	grams
Natural Moisture Content	*20.9%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	224.48	grams
Percent Passing No. 200 Sieve	57.7%	
Pan + Soil retained on No. 4 sieve (dry)	184.07	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 6/4/2019

Liquid Limit

No of Blows	16	27	35
Pan ID	108	169	201
Pan Wt	33.14	27.12	27.64
Pan + Soil (wet)	43.65	40.63	40.98
Pan + Soil (dry)	40.12	36.39	37.02
Moisture Content	50.6%	45.7%	42.2%
Liquid Limit	48	46	44
Liquid Limit	*46*		

Plastic Limit

Pan ID	313	352
Pan Weight	9.14	9.09
Pan + Soil (wet)	25.41	21.57
Pan + Soil (dry)	22.33	19.26
Moisture Content	23.4%	22.7%
Plastic Limit	*23*	
Plastic Index	*23*	

USCS Classification: ASTM D 2487

Group Symbol **CL**
Group Name **Sandy Lean CLAY**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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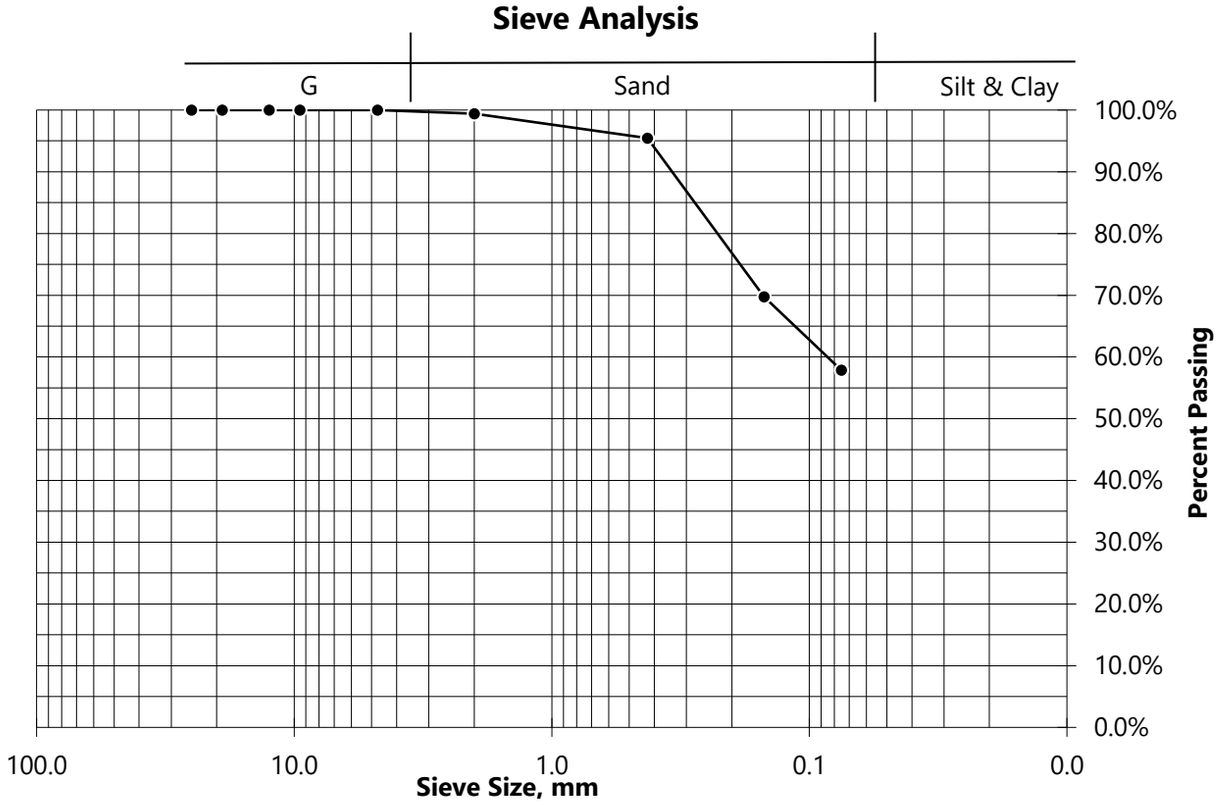
Sample ID DAA-35
Sample Depth 2'-4'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.58	0.6%	2.00	99.4%
No. 40	3.78	4.0%	0.425	95.4%
No. 100	24.54	25.7%	0.15	69.8%
No. 200	11.40	11.9%	0.075	57.8%
Pan	0.10	0.1%		
Total	40.40	42.3%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-35
Sample Depth 4'-6'
Visual Sample Description Red Clayey SAND

Sample Received: 4/15/2019
Date Tested: 4/15/2019

Natural Moisture Content: ASTM D 2216

Pan ID	17	
Pan Wt	188.69	grams
Pan + Soil (wet)	313.98	grams
Pan + Soil (dry)	278.70	grams
Natural Moisture Content	*39.2%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	241.47	grams
Percent Passing No. 200 Sieve	41.4%	
Pan + Soil retained on No. 4 sieve (dry)	189.64	grams
Percent Passing No. 4 Sieve	98.9%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/20/2019

Liquid Limit

No of Blows	16	22	34
Pan ID	6	10	69
Pan Wt	11.21	11.24	10.96
Pan + Soil (wet)	22.60	22.30	22.56
Pan + Soil (dry)	17.88	17.91	18.18
Moisture Content	70.7%	65.8%	60.7%
Liquid Limit	67	65	63
Liquid Limit	*65*		

Plastic Limit

Pan ID	33	52
Pan Weight	2.44	2.42
Pan + Soil (wet)	12.28	13.01
Pan + Soil (dry)	10.03	10.60
Moisture Content	29.6%	29.5%
Plastic Limit	*30*	
Plastic Index	*35*	

USCS Classification: ASTM D 2487

Group Symbol **SC**
Group Name **Clayey SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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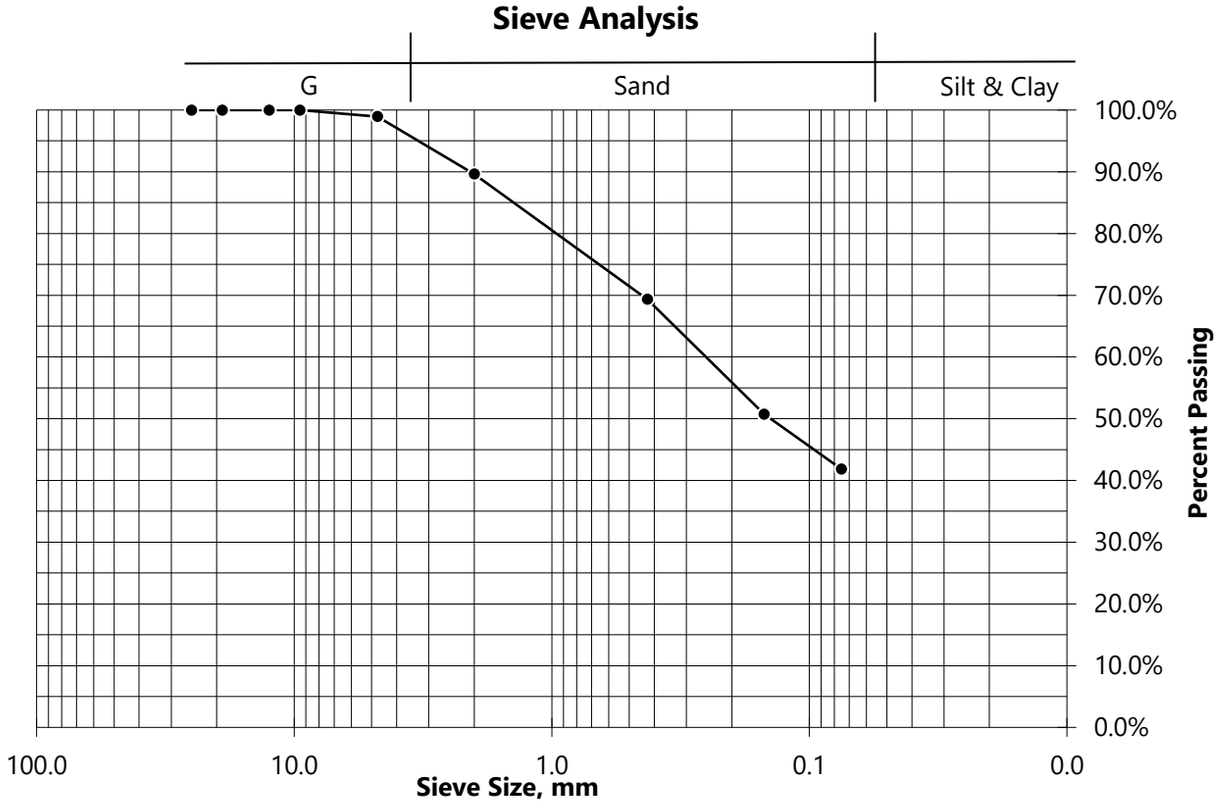
Army Corps of Engineers Certified Laboratory

Sample ID DAA-35
Sample Depth 4'-6'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.95	1.1%	4.75	98.9%
No. 10	8.39	9.3%	2.00	89.6%
No. 40	18.25	20.3%	0.425	69.3%
No. 100	16.74	18.6%	0.15	50.7%
No. 200	8.03	8.9%	0.075	41.8%
Pan	0.41	0.5%		
Total	52.77	58.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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Army Corps of Engineers Certified Laboratory

Sample ID	DAA-35	Sample Received:	4/15/2019
Sample Depth	6'-8'	Date Tested:	4/15/2019
Visual Sample Description	Reddish-brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	30	
Pan Wt	193.23	grams
Pan + Soil (wet)	330.76	grams
Pan + Soil (dry)	298.94	grams
Natural Moisture Content	*30.1%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	257.27	grams
Percent Passing No. 200 Sieve	39.4%	
Pan + Soil retained on No. 4 sieve (dry)	193.23	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/9/2019

Liquid Limit

No of Blows	17	22	31
Pan ID	93	103	2000
Pan Wt	30.12	27.36	25.68
Pan + Soil (wet)	40.59	37.49	36.47
Pan + Soil (dry)	36.90	34.06	33.02
Moisture Content	54.5%	51.2%	47.0%
Liquid Limit	52	50	48
Liquid Limit	*50*		

Plastic Limit

Pan ID	19	22
Pan Weight	4.38	4.31
Pan + Soil (wet)	14.59	14.41
Pan + Soil (dry)	11.74	11.58
Moisture Content	38.7%	38.9%
Plastic Limit	*39*	
Plastic Index	*11*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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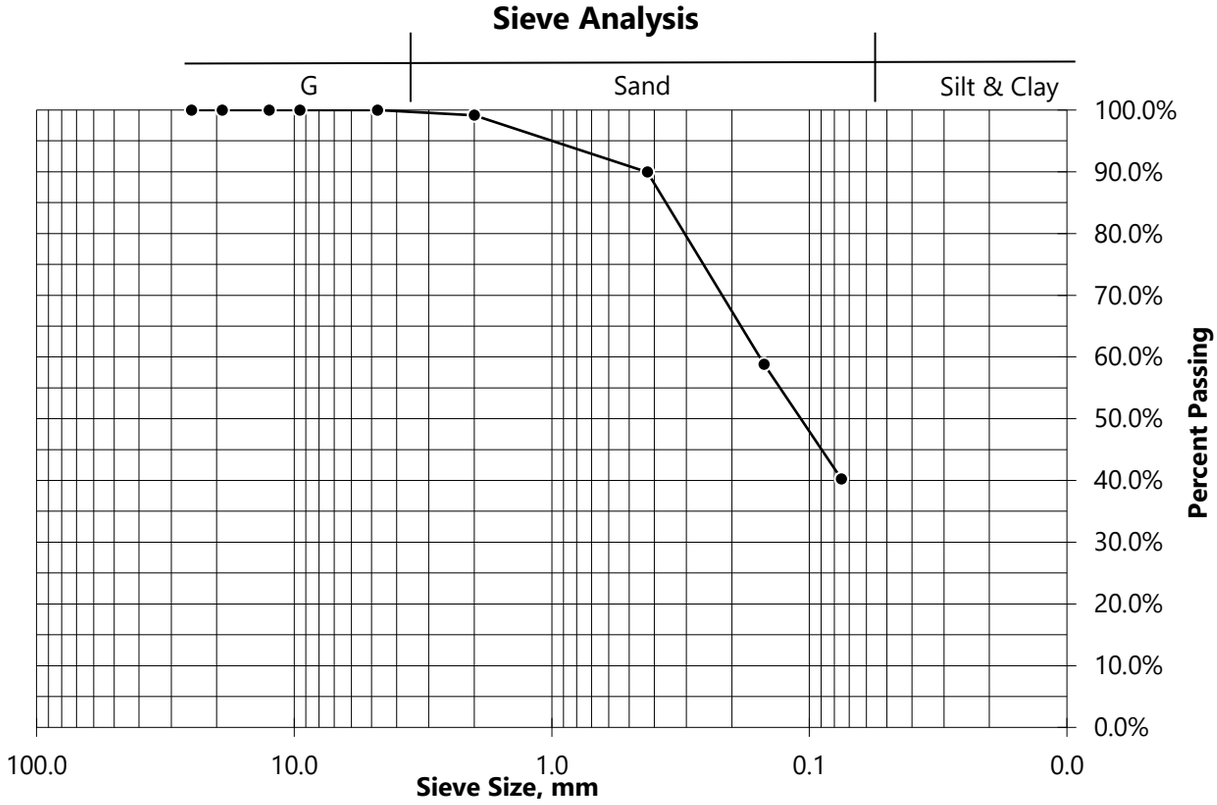
Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Sample ID DAA-35
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.88	0.8%	2.00	99.2%
No. 40	9.74	9.2%	0.425	90.0%
No. 100	32.89	31.1%	0.15	58.8%
No. 200	19.68	18.6%	0.075	40.2%
Pan	0.85	0.8%		
Total	64.04	60.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Army Corps of Engineers Certified Laboratory

Sample ID DAA-36
Sample Depth 4'-6'
Visual Sample Description Reddish-brown Silty SAND

Sample Received: 4/15/2019
Date Tested: 4/15/2019

Natural Moisture Content: ASTM D 2216

Pan ID	20	
Pan Wt	190.00	grams
Pan + Soil (wet)	295.89	grams
Pan + Soil (dry)	268.23	grams
Natural Moisture Content	*35.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	236.40	grams
Percent Passing No. 200 Sieve	40.7%	
Pan + Soil retained on No. 4 sieve (dry)	190.00	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/31/2019

Liquid Limit

No of Blows	18	23	32
Pan ID	72	70	64
Pan Wt	11.01	10.95	10.97
Pan + Soil (wet)	22.28	22.70	20.56
Pan + Soil (dry)	17.49	17.87	16.78
Moisture Content	73.9%	69.8%	65.0%
Liquid Limit	71	69	67
Liquid Limit	*69*		

Plastic Limit

Pan ID	75	82
Pan Weight	4.24	4.23
Pan + Soil (wet)	15.88	14.90
Pan + Soil (dry)	11.91	11.27
Moisture Content	51.7%	51.6%
Plastic Limit	*52*	
Plastic Index	*17*	

USCS Classification: ASTM D 2487

Group Symbol **SM**
Group Name **Silty SAND**

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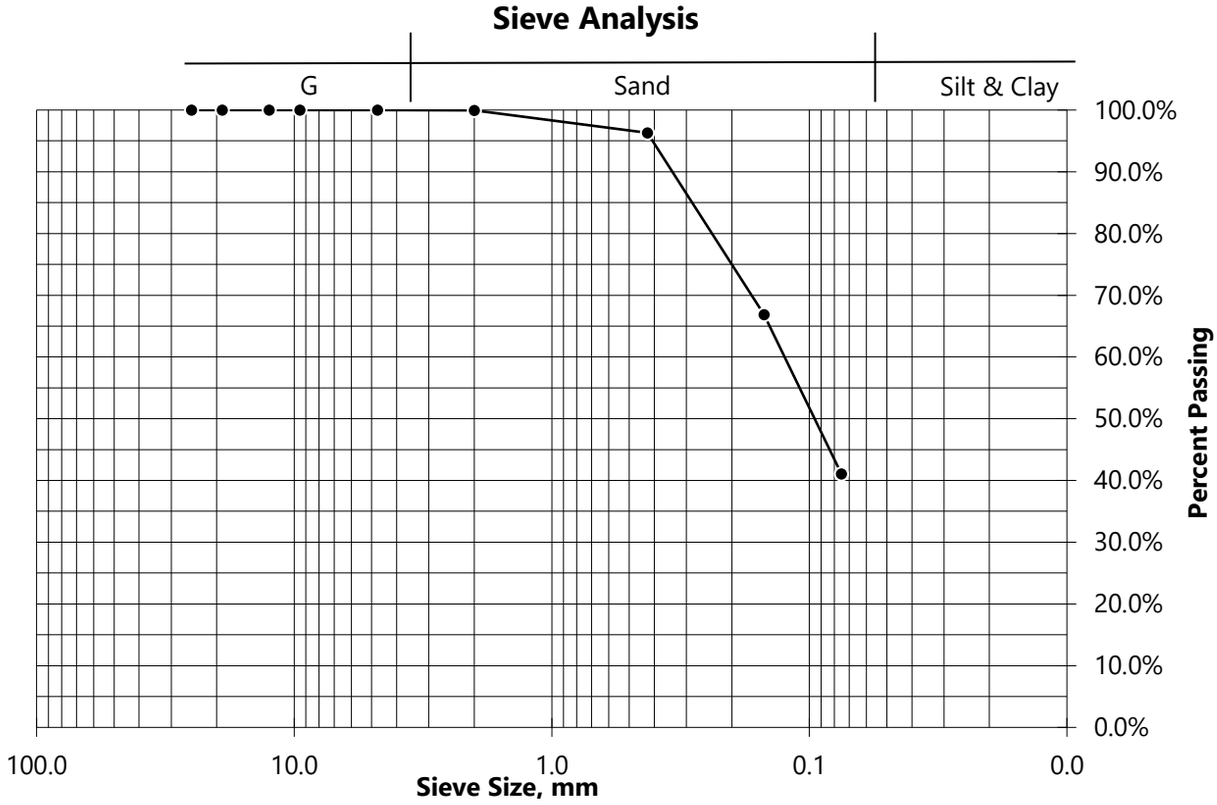
Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-36
Sample Depth 4'-6'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.06	0.1%	2.00	99.9%
No. 40	2.84	3.6%	0.425	96.3%
No. 100	23.02	29.4%	0.15	66.9%
No. 200	20.21	25.8%	0.075	41.0%
Pan	0.21	0.3%		
Total	46.34	59.2%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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Army Corps of Engineers Certified Laboratory

Sample ID	DAA-36	Sample Received:	4/15/2019
Sample Depth	6'-8'	Date Tested:	4/15/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	122	
Pan Wt	123.35	grams
Pan + Soil (wet)	240.36	grams
Pan + Soil (dry)	207.93	grams
Natural Moisture Content	*38.3%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	167.12	grams
Percent Passing No. 200 Sieve	48.3%	
Pan + Soil retained on No. 4 sieve (dry)	123.35	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 6/3/2019

Liquid Limit

No of Blows	15	25	34
Pan ID	97	105	108
Pan Wt	26.03	29.25	33.13
Pan + Soil (wet)	35.05	45.44	49.58
Pan + Soil (dry)	31.68	39.77	44.09
Moisture Content	59.6%	53.9%	50.1%
Liquid Limit	56	54	52
Liquid Limit	*54*		

Plastic Limit

Pan ID	75	78
Pan Weight	4.25	4.22
Pan + Soil (wet)	13.42	13.09
Pan + Soil (dry)	11.10	10.83
Moisture Content	33.9%	34.2%
Plastic Limit	*34*	
Plastic Index	*20*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

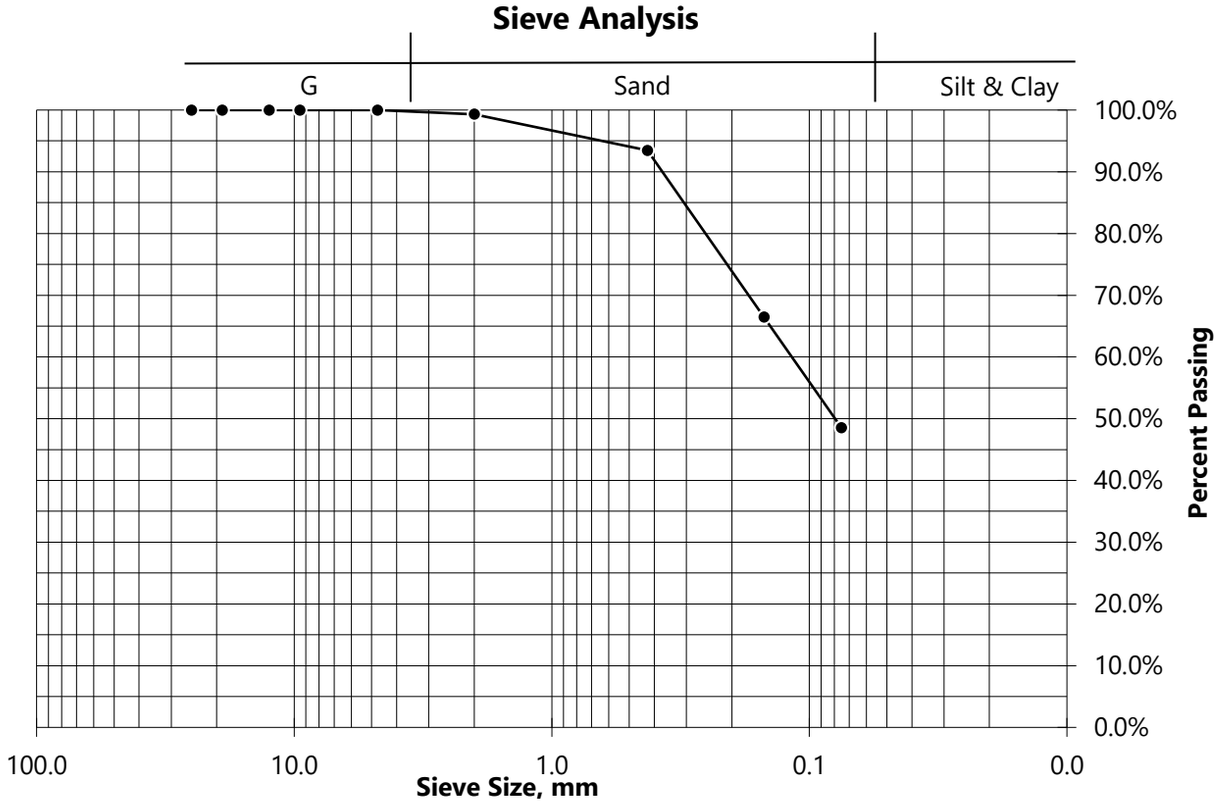
Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
Engineering • Surveying • Environmental Services
1030 Wilmer Ave., Ste. 100
Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Sample ID DAA-36
Sample Depth 6'-8'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.58	0.7%	2.00	99.3%
No. 40	4.94	5.8%	0.425	93.5%
No. 100	22.85	27.0%	0.15	66.5%
No. 200	15.17	17.9%	0.075	48.5%
Pan	0.23	0.3%		
Total	43.77	51.7%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-36	Sample Received:	4/15/2019
Sample Depth	22'-24'	Date Tested:	4/15/2019
Visual Sample Description	Light Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	27	
Pan Wt	193.73	grams
Pan + Soil (wet)	364.00	grams
Pan + Soil (dry)	322.86	grams
Natural Moisture Content	*31.9%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	287.74	grams
Percent Passing No. 200 Sieve	27.2%	
Pan + Soil retained on No. 4 sieve (dry)	194.53	grams
Percent Passing No. 4 Sieve	99.4%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/31/2019

Liquid Limit

No of Blows	16	24	33
Pan ID	97	7	108
Pan Wt	26.03	11.18	33.13
Pan + Soil (wet)	31.71	23.16	44.41
Pan + Soil (dry)	29.88	19.54	41.21
Moisture Content	47.5%	43.3%	39.6%
Liquid Limit	45	43	41
Liquid Limit	*43*		

Plastic Limit

Pan ID	19	73
Pan Weight	4.37	4.24
Pan + Soil (wet)	16.38	16.92
Pan + Soil (dry)	13.68	14.08
Moisture Content	29.0%	28.9%
Plastic Limit	*29*	
Plastic Index	*14*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

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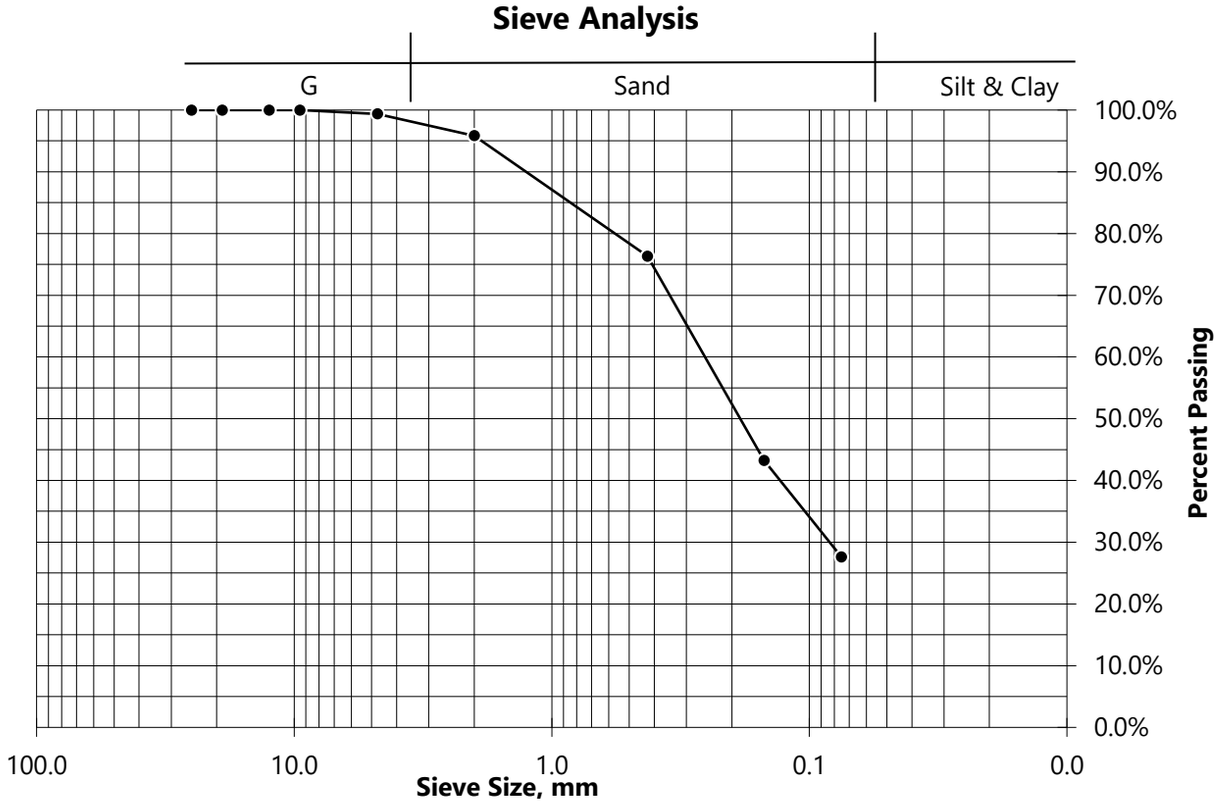
Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-36
Sample Depth 22'-24'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.80	0.6%	4.75	99.4%
No. 10	4.57	3.5%	2.00	95.8%
No. 40	25.19	19.5%	0.425	76.3%
No. 100	42.70	33.1%	0.15	43.3%
No. 200	20.24	15.7%	0.075	27.6%
Pan	0.51	0.4%		
Total	94.01	72.8%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-36	Sample Received:	4/15/2019
Sample Depth	35'-37'	Date Tested:	4/15/2019
Visual Sample Description	Light Reddish-brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	34	
Pan Wt	192.79	grams
Pan + Soil (wet)	314.64	grams
Pan + Soil (dry)	290.95	grams
Natural Moisture Content	*24.1%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	259.87	grams
Percent Passing No. 200 Sieve	31.7%	
Pan + Soil retained on No. 4 sieve (dry)	192.79	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 6/3/2019

Liquid Limit

No of Blows	15	26	31
Pan ID	101	107	2000
Pan Wt	23.99	25.10	25.67
Pan + Soil (wet)	35.58	37.10	33.29
Pan + Soil (dry)	31.94	33.62	31.19
Moisture Content	45.7%	40.8%	38.0%
Liquid Limit	43	41	39
Liquid Limit	*41*		

Plastic Limit

Pan ID	354	356
Pan Weight	9.16	9.10
Pan + Soil (wet)	23.82	26.44
Pan + Soil (dry)	20.46	22.45
Moisture Content	29.7%	29.9%
Plastic Limit	*30*	
Plastic Index	*11*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

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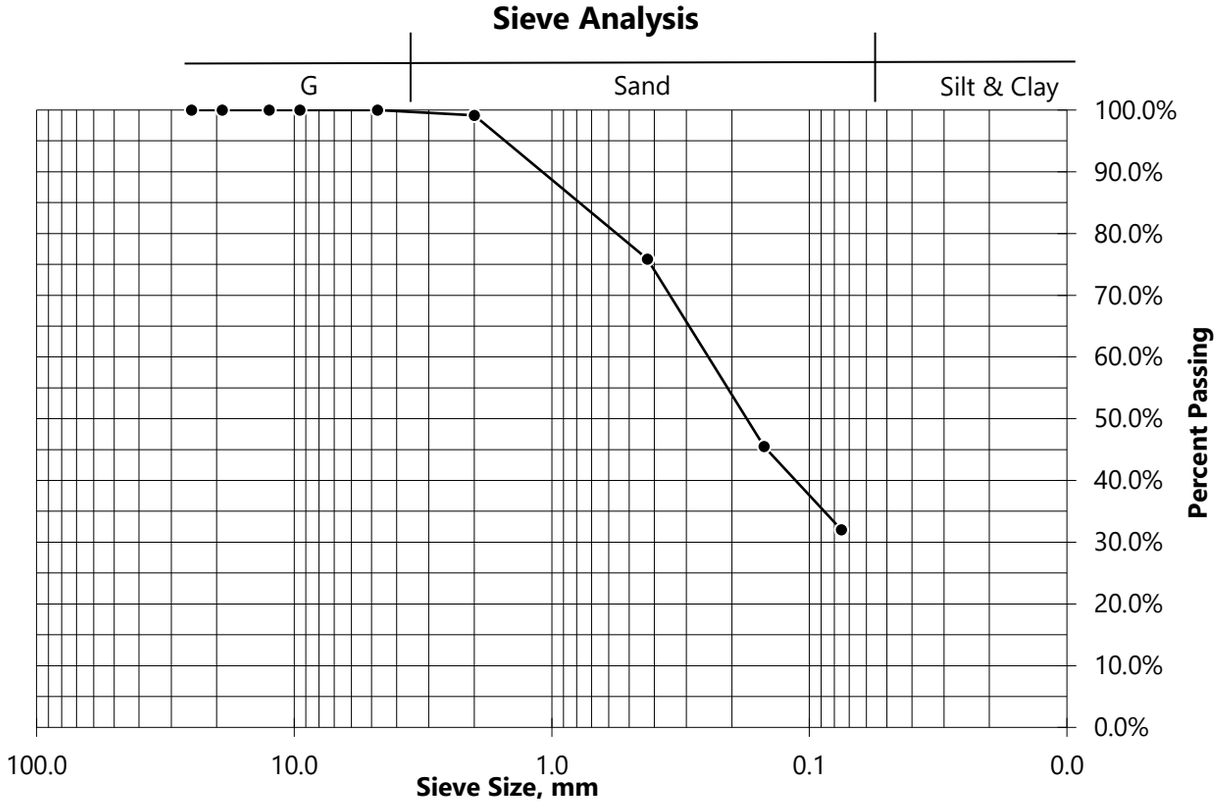
Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-36
Sample Depth 35'-37'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.85	0.9%	2.00	99.1%
No. 40	22.86	23.3%	0.425	75.8%
No. 100	29.78	30.3%	0.15	45.5%
No. 200	13.27	13.5%	0.075	32.0%
Pan	0.31	0.3%		
Total	67.07	68.3%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID DAA-37
Sample Depth 4'-6'
Visual Sample Description Red Silty SAND

Sample Received: 4/15/2019
Date Tested: 4/17/2019

Natural Moisture Content: ASTM D 2216

Pan ID	108	
Pan Wt	125.54	grams
Pan + Soil (wet)	238.24	grams
Pan + Soil (dry)	215.11	grams
Natural Moisture Content	*25.8%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	173.89	grams
Percent Passing No. 200 Sieve	46.0%	
Pan + Soil retained on No. 4 sieve (dry)	125.54	grams
Percent Passing No. 4 Sieve	100.0%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/21/2019

Liquid Limit

No of Blows	16	26	34
Pan ID	10	71	69
Pan Wt	11.25	10.91	10.97
Pan + Soil (wet)	22.55	22.90	21.96
Pan + Soil (dry)	18.45	18.82	18.37
Moisture Content	57.0%	51.6%	48.5%
Liquid Limit	54	52	50
Liquid Limit	*52*		

Plastic Limit

Pan ID	353	315
Pan Weight	9.12	9.15
Pan + Soil (wet)	20.72	20.18
Pan + Soil (dry)	17.82	17.42
Moisture Content	33.3%	33.4%
Plastic Limit	*33*	
Plastic Index	*19*	

USCS Classification: ASTM D 2487

Group Symbol **SM**
Group Name **Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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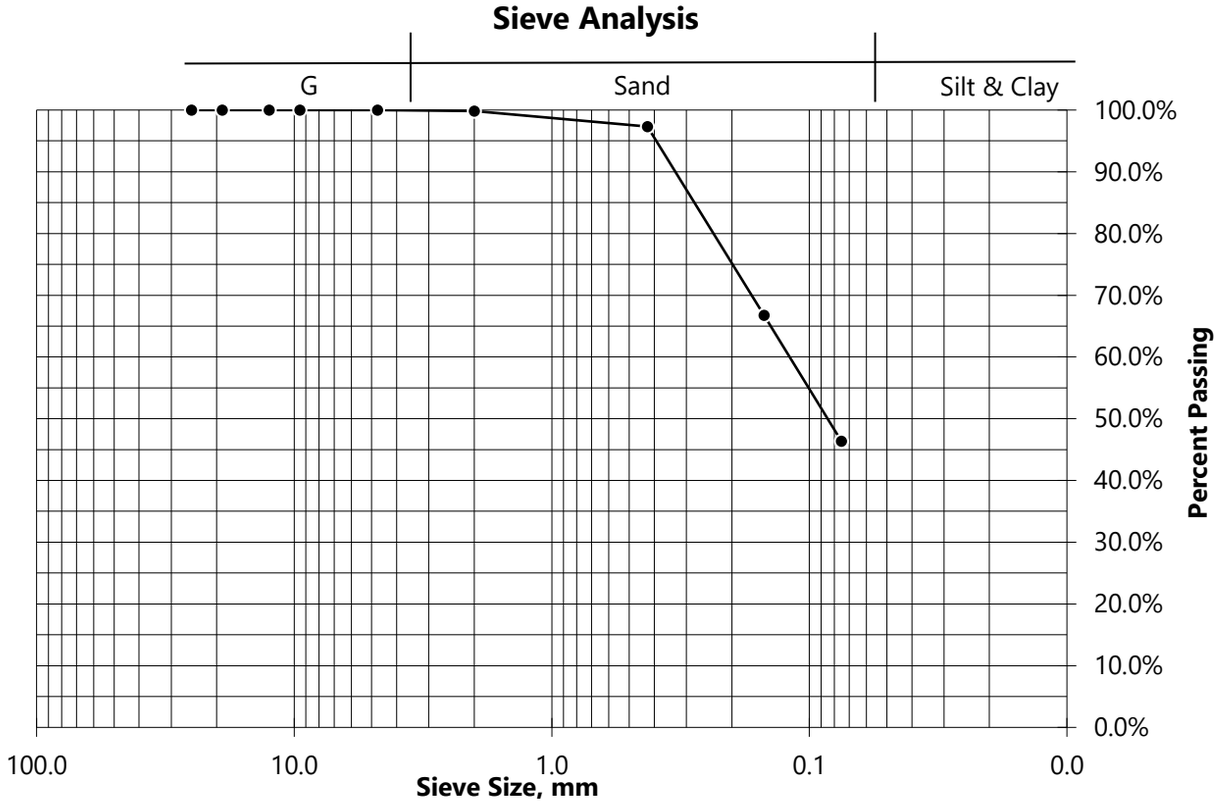
Sample ID DAA-37
Sample Depth 4'-6'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.00	0.0%	4.75	100.0%
No. 10	0.16	0.2%	2.00	99.8%
No. 40	2.26	2.5%	0.425	97.3%
No. 100	27.35	30.5%	0.15	66.8%
No. 200	18.30	20.4%	0.075	46.3%
Pan	0.28	0.3%		
Total	48.35	54.0%		



Soil Classification Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-40	Sample Received:	4/17/2019
Sample Depth	5'	Date Tested:	4/17/2019
Visual Sample Description	Reddish-Brown Sandy Elastic SILT		

Natural Moisture Content: ASTM D 2216

Pan ID	24	
Pan Wt	186.14	grams
Pan + Soil (wet)	295.88	grams
Pan + Soil (dry)	271.59	grams
Natural Moisture Content	*28.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	228.52	grams
Percent Passing No. 200 Sieve	50.4%	
Pan + Soil retained on No. 4 sieve (dry)	186.94	grams
Percent Passing No. 4 Sieve	99.1%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/29/2019

Liquid Limit

No of Blows	19	26	31
Pan ID	6	72	9
Pan Wt	11.18	11.08	11.11
Pan + Soil (wet)	31.14	28.22	33.35
Pan + Soil (dry)	23.82	22.20	25.87
Moisture Content	57.9%	54.1%	50.7%
Liquid Limit	56	54	52
Liquid Limit	*54*		

Plastic Limit

Pan ID	18	73
Pan Weight	4.33	4.24
Pan + Soil (wet)	14.66	15.30
Pan + Soil (dry)	11.98	12.47
Moisture Content	35.0%	34.4%
Plastic Limit	*35*	
Plastic Index	*19*	

USCS Classification: ASTM D 2487

Group Symbol	**MH**
Group Name	**Sandy Elastic SILT**

Grain Size Distribution Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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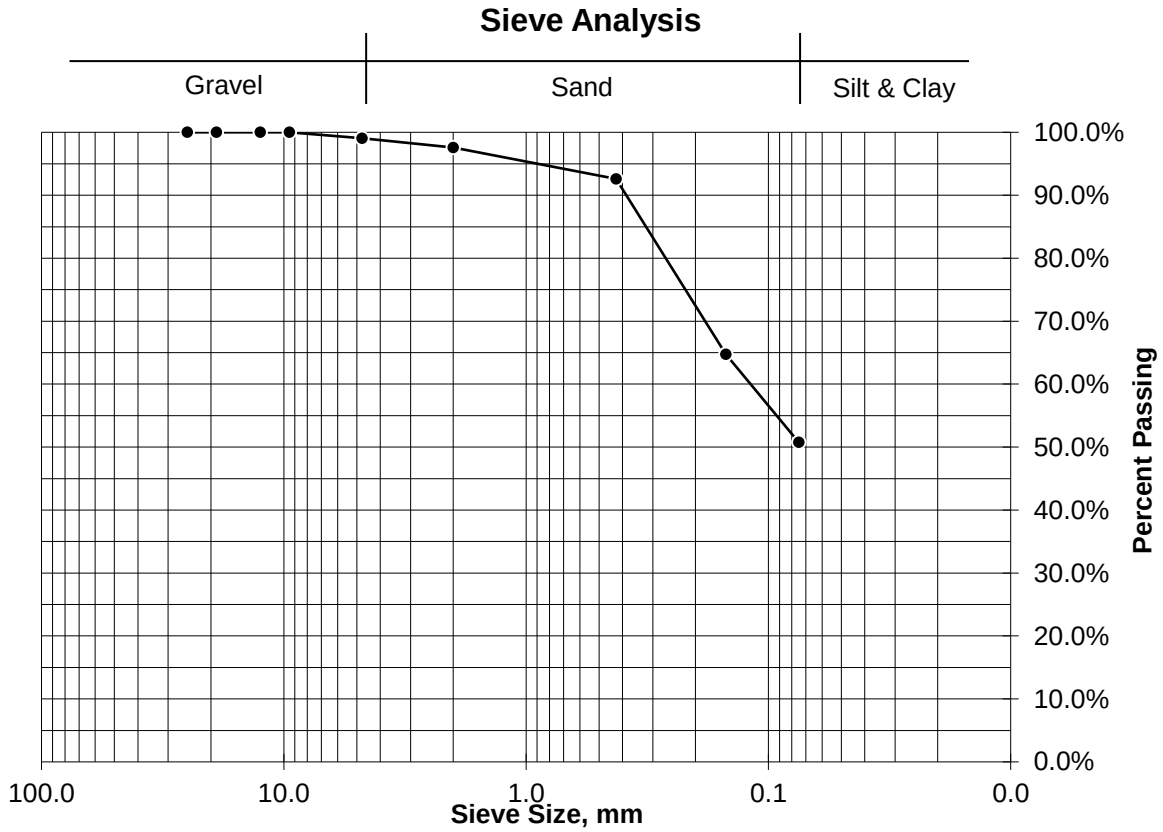
Sample ID DAA-40
Sample Depth 5'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.80	0.9%	4.75	99.1%
No. 10	1.28	1.5%	2.00	97.6%
No. 40	4.24	5.0%	0.425	92.6%
No. 100	23.80	27.9%	0.15	64.8%
No. 200	11.94	14.0%	0.075	50.8%
Pan	0.30	0.4%		
Total	42.36	49.6%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-40	Sample Received:	4/15/2019
Sample Depth	10'	Date Tested:	4/22/2019
Visual Sample Description	Reddish-brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	35	
Pan Wt	192.68	grams
Pan + Soil (wet)	303.95	grams
Pan + Soil (dry)	285.48	grams
Natural Moisture Content	*19.9%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	247.54	grams
Percent Passing No. 200 Sieve	40.9%	
Pan + Soil retained on No. 4 sieve (dry)	193.35	grams
Percent Passing No. 4 Sieve	99.3%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/7/2019

Liquid Limit

No of Blows	16	29	30
Pan ID	101	64	107
Pan Wt	23.99	10.96	25.10
Pan + Soil (wet)	32.60	24.88	35.01
Pan + Soil (dry)	29.87	20.82	32.22
Moisture Content	46.4%	41.2%	39.1%
Liquid Limit	44	42	40
Liquid Limit	*42*		

Plastic Limit

Pan ID	75	315
Pan Weight	4.22	9.15
Pan + Soil (wet)	14.54	20.20
Pan + Soil (dry)	12.05	17.53
Moisture Content	31.8%	31.9%
Plastic Limit	*32*	
Plastic Index	*10*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

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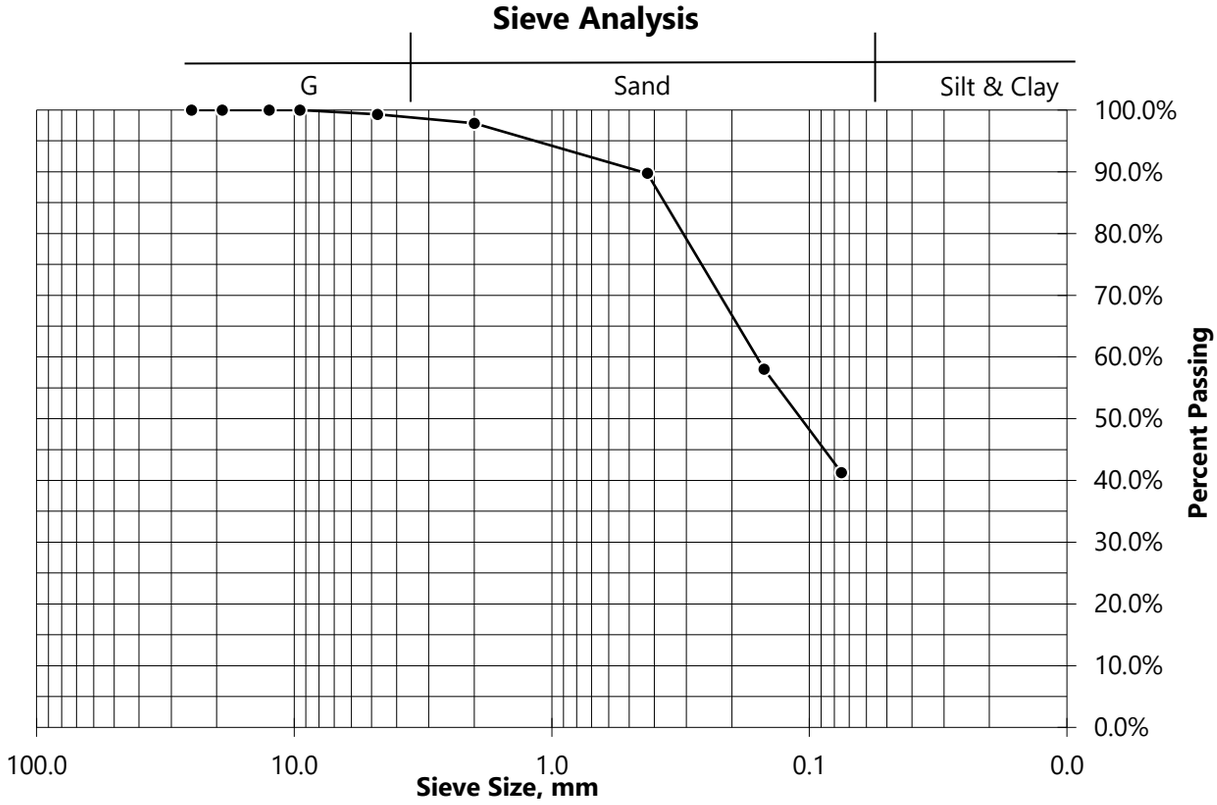
Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID DAA-40
Sample Depth 10'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.67	0.7%	4.75	99.3%
No. 10	1.32	1.4%	2.00	97.9%
No. 40	7.53	8.1%	0.425	89.7%
No. 100	29.43	31.7%	0.15	58.0%
No. 200	15.55	16.8%	0.075	41.3%
Pan	0.33	0.4%		
Total	54.83	59.1%		



Soil Classification Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-40	Sample Received:	4/15/2019
Sample Depth	15'	Date Tested:	4/17/2019
Visual Sample Description	Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	114	
Pan Wt	123.19	grams
Pan + Soil (wet)	230.16	grams
Pan + Soil (dry)	208.83	grams
Natural Moisture Content	*24.9%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	170.44	grams
Percent Passing No. 200 Sieve	44.8%	
Pan + Soil retained on No. 4 sieve (dry)	123.37	grams
Percent Passing No. 4 Sieve	99.8%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 6/4/2019

Liquid Limit

No of Blows	15	25	34
Pan ID	92	93	94
Pan Wt	25.62	30.06	23.74
Pan + Soil (wet)	32.10	37.18	30.23
Pan + Soil (dry)	29.45	34.44	27.83
Moisture Content	69.1%	62.6%	58.8%
Liquid Limit	65	63	61
Liquid Limit	*63*		

Plastic Limit

Pan ID	76	79
Pan Weight	4.22	4.23
Pan + Soil (wet)	14.27	16.19
Pan + Soil (dry)	11.74	13.14
Moisture Content	33.6%	34.2%
Plastic Limit	*34*	
Plastic Index	*29*	

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Green Ridge, Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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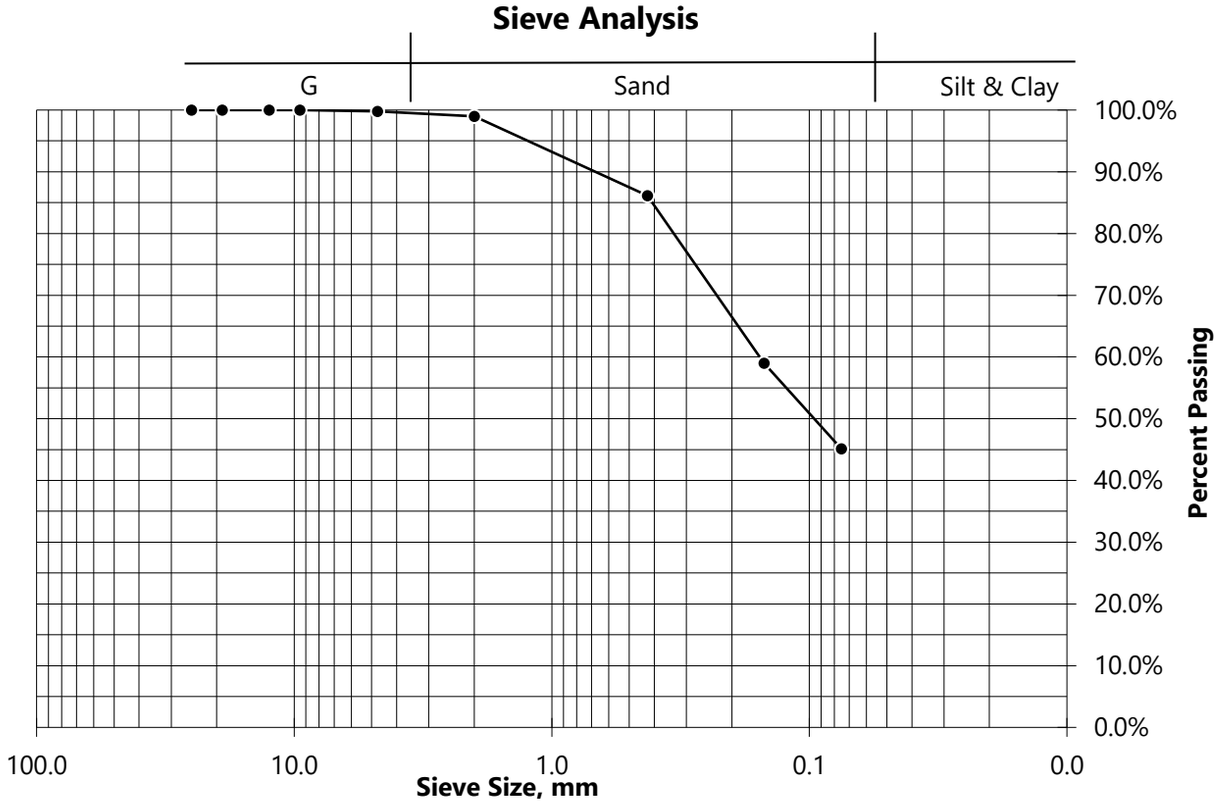
Sample ID DAA-40
Sample Depth 15'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.50	100.0%
No. 4	0.18	0.2%	4.75	99.8%
No. 10	0.70	0.8%	2.00	99.0%
No. 40	11.01	12.9%	0.425	86.1%
No. 100	23.23	27.1%	0.15	59.0%
No. 200	11.90	13.9%	0.075	45.1%
Pan	0.23	0.3%		
Total	47.25	55.2%		



Soil Classification Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	DAA-40	Sample Received:	4/17/2019
Sample Depth	25'	Date Tested:	4/22/2019
Visual Sample Description	Brown Silty SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	40	
Pan Wt	192.72	grams
Pan + Soil (wet)	302.04	grams
Pan + Soil (dry)	290.44	grams
Natural Moisture Content	*11.9%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	255.31	grams
Percent Passing No. 200 Sieve	35.9%	
Pan + Soil retained on No. 4 sieve (dry)	199.47	grams
Percent Passing No. 4 Sieve	93.1%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 5/1/2019

Liquid Limit

No of Blows			
Pan ID		Non-plastic	
Pan Wt			
Pan + Soil (wet)			
Pan + Soil (dry)			
Moisture Content			
Liquid Limit			
Liquid Limit			

Plastic Limit

Pan ID		
Pan Weight	Non-plastic	
Pan + Soil (wet)		
Pan + Soil (dry)		
Moisture Content		
Plastic Limit		
Plastic Index		

USCS Classification: ASTM D 2487

Group Symbol	**SM**
Group Name	**Silty SAND**

Grain Size Distribution Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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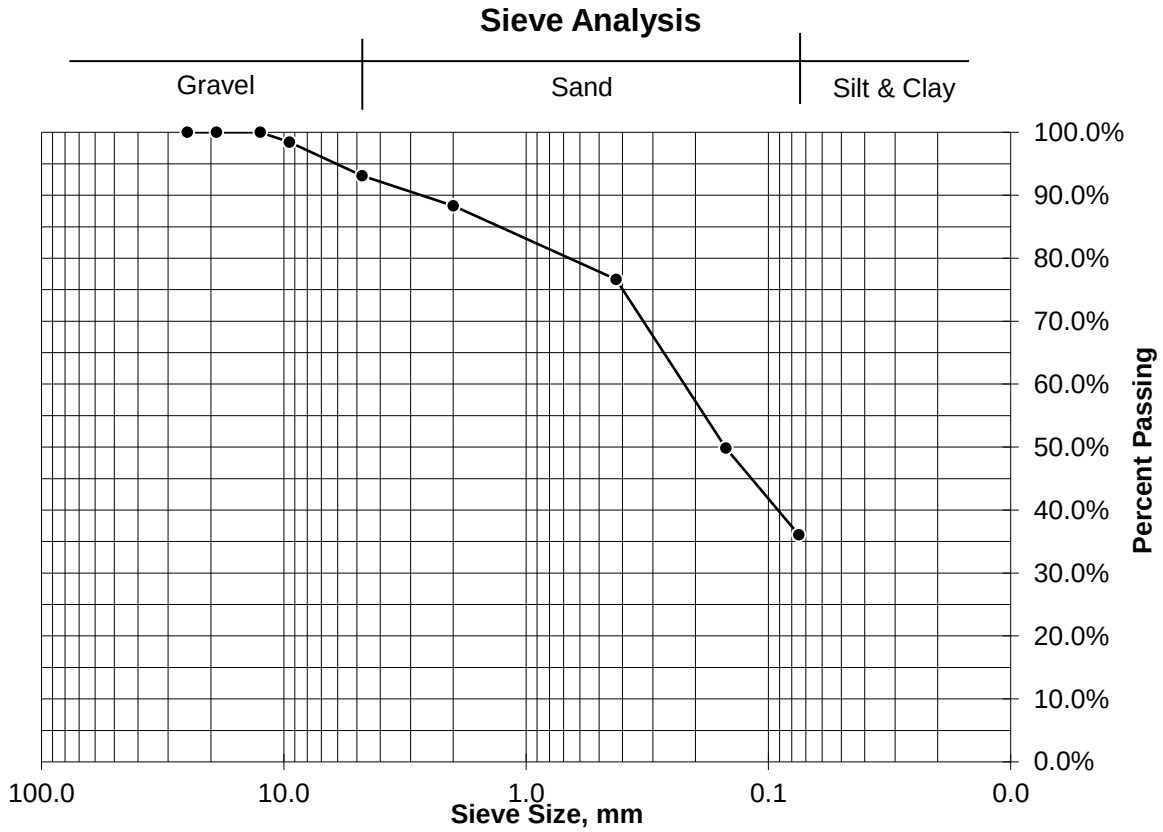
Sample ID DAA-40
Sample Depth 25'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	1.52	1.6%	9.50	98.4%
No. 4	5.23	5.4%	4.75	93.1%
No. 10	4.65	4.8%	2.00	88.3%
No. 40	11.45	11.7%	0.425	76.6%
No. 100	26.14	26.7%	0.15	49.9%
No. 200	13.47	13.8%	0.075	36.1%
Pan	0.13	0.1%		
Total	62.59	64.1%		



Soil Classification Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	East	Sample Recieved:	4/11/2019
Sample Depth	0'-2.5'	Date Tested:	4/15/2019
Visual Sample Description	Brown Clayey SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	101	
Pan Wt	122.74	grams
Pan + Soil (wet)	486.18	grams
Pan + Soil (dry)	454.83	grams
Natural Moisture Content	*9.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	342.33	grams
Percent Passing No. 200 Sieve	33.9%	
Pan + Soil retained on No. 4 sieve (dry)	127.58	grams
Percent Passing No. 4 Sieve	98.5%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/15/2019

Liquid Limit

No of Blows	18	23	33
Pan ID	1	72	65
Pan Wt	11.22	11.08	11.07
Pan + Soil (wet)	34.59	33.46	31.71
Pan + Soil (dry)	28.32	27.89	26.91
Moisture Content	36.7%	33.1%	30.3%
Liquid Limit	35	33	31
Liquid Limit	*33*		

Plastic Limit

Pan ID	313	354
Pan Weight	9.15	9.14
Pan + Soil (wet)	19.63	19.44
Pan + Soil (dry)	17.91	17.75
Moisture Content	19.6%	19.6%
Plastic Limit	*20*	
Plastic Index	*13*	

USCS Classification: ASTM D 2487

Group Symbol	**SC**
Group Name	**Clayey SAND**

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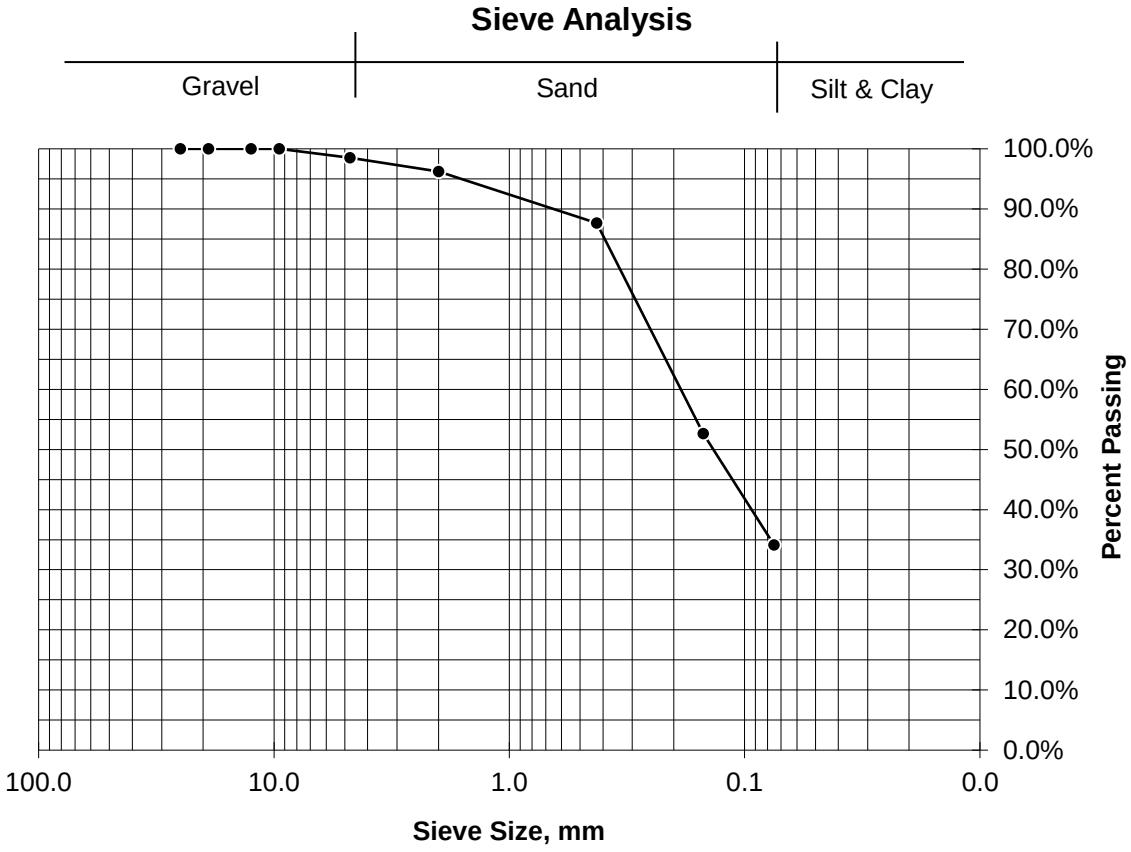
Grain Size Distribution Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID East
Sample Depth 0'-2.5'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.5	100.0%
No. 4	4.84	1.5%	4.75	98.5%
No. 10	7.67	2.3%	2.0	96.2%
No. 40	28.50	8.6%	0.425	87.7%
No. 100	116.30	35.0%	0.15	52.6%
No. 200	61.42	18.5%	0.075	34.1%
Pan	0.84	0.3%		
Total	219.57	66.1%		



Proctor Test Report

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Soil and Test Method Data

Sample ID	East
Sample Depth	0'-2.5'
Sample Classification	Clayey SAND
USCS Group Symbol	SC
Test Method	ASTM D698, Method B, with mechanical hammer
Sample Preparation	Air dried and sieved through a 3/8" sieve.
Mold Size, in	4.0
Assumed Specific Gravity:	2.65

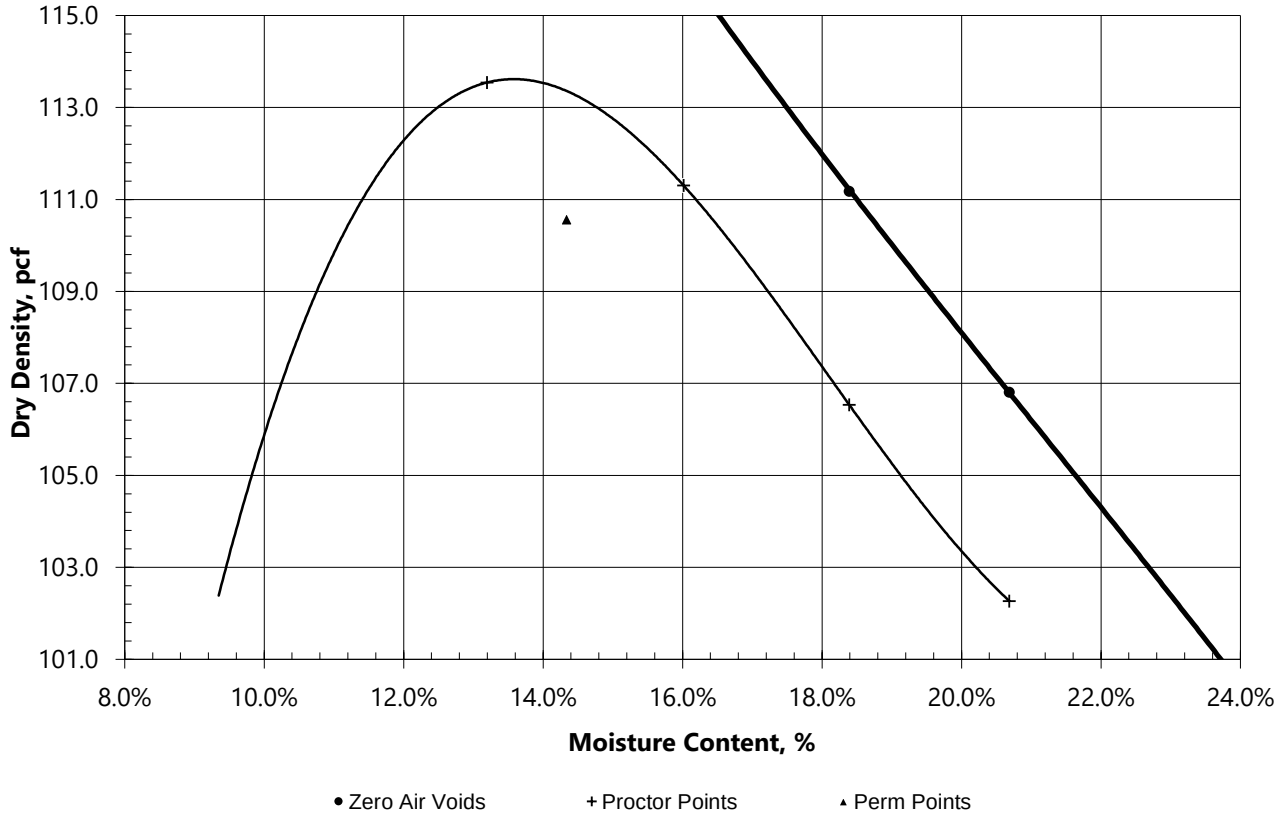
Sample Recieved: 4/11/2019
Date Tested: 4/18/2019

Test Data

	#1	#2	#3	#4	#5
Moisture Content	**13.2%**	**16.0%**	**18.4%**	**20.7%**	
Dry Density, pcf	**113.5**	**111.3**	**106.5**	**102.3**	

Moisture-Density Curve

Maximum Dry Density, pcf = 113.7 , Optimum Moisture, % = 13.6



Permeability Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID:	East	Sample Recieved:	4/11/2019
Sample Depth:	0'-2.5'	Date Tested:	5/1/2019
Permeability Method:	ASTM D5084		
Sample Length, in:	3.26		
Sample Diameter, in:	2.86		
Sample Condition:	Remolded		

Moisture Content

Pan Wt	6.64	grams
Pan + Soil (wet)	342.71	grams
Pan + Soil (dry)	300.57	grams
Moisture Content	*14.3%*	

Dry Density

Soil (wet)	695.38	grams
Wet Density	126.5	pcf
Dry Density	*110.6*	pcf

Test Conditions

Backpressure, psi	40.0
Cell Pressure, psi	50.0
Influent Buret Area, cm^2	0.03142
Effluent Buret Area, cm^2	0.76712
Effective Stress, psi	10.0
Pearment Liquid Temp.(°C):	De-aired Water

Initial Data

Assumed Specific Gravity	2.65	
Percent Voids	33.1%	
Actual Volume of Voids	113.7	ml
Porosity	33.1%	
Saturation	76.7%	

Permeability Trials

Time min	Influent Head, cm	Influent Flow, cm^3	Effluent Head, cm	Effluent Flow, cm^3	Flow Deviation Ratio	Gradient mm-Hg	Permeabilty, k cm/sec
2-May 17:50	15.500		1.600				
2-May 17:51	15.000	0.016	1.620	0.016	1.00	21.07	3.1E-07
2-May 17:52	14.800	0.006	1.629	0.006	1.00	20.28	1.3E-07
2-May 17:53	14.500	0.009	1.641	0.009	1.00	19.96	1.9E-07
2-May 17:54	14.000	0.016	1.661	0.016	1.00	19.49	3.3E-07
2-May 17:55	13.700	0.009	1.674	0.009	1.00	18.70	2.1E-07
2-May 17:56	13.500	0.006	1.682	0.006	1.00	18.23	1.4E-07
2-May 17:57	13.300	0.006	1.690	0.006	1.00	17.91	1.4E-07
2-May 17:58	13.200	0.003	1.694	0.003	1.00	17.60	7.2E-08
2-May 18:04	12.500	0.022	1.723	0.022	1.00	17.44	8.7E-08

Average Permeability 1.1E-07 cm/sec Corrected for 20°C

Final Data

Assumed Specific Gravity	2.65				
Final Weight of Sample	719.46	grams			
Final Moisture Content	18.3%		Final Sample Length, in:	3.22	
Percent Voids	32.3%		Final Sample Diameter, in:	2.86	
Actual Volume of Voids	109.4	ml	Wet Density	132.5	pcf
Porosity	32.3%		*Dry Density*	*112.0*	pcf
Saturation	100.0%				

Soil Classification Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	East	Sample Recieved:	4/11/2019
Sample Depth	2.5'-5'	Date Tested:	4/15/2019
Visual Sample Description	Light Brown Clayey SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	104	
Pan Wt	125.63	grams
Pan + Soil (wet)	538.52	grams
Pan + Soil (dry)	515.37	grams
Natural Moisture Content	*5.9%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	398.08	grams
Percent Passing No. 200 Sieve	30.1%	
Pan + Soil retained on No. 4 sieve (dry)	126.51	grams
Percent Passing No. 4 Sieve	99.8%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/26/2019

Liquid Limit

No of Blows	16	22	35
Pan ID	107	102	96
Pan Wt	25.10	23.97	24.80
Pan + Soil (wet)	42.64	42.16	43.15
Pan + Soil (dry)	37.79	37.49	38.84
Moisture Content	38.2%	34.5%	30.7%
Liquid Limit	36	34	32
Liquid Limit	*34*		

Plastic Limit

Pan ID	315	316
Pan Weight	9.16	9.08
Pan + Soil (wet)	21.90	19.35
Pan + Soil (dry)	19.81	17.66
Moisture Content	19.6%	19.7%
Plastic Limit	*20*	
Plastic Index	*14*	

USCS Classification: ASTM D 2487

Group Symbol	**SC**
Group Name	**Clayey SAND**

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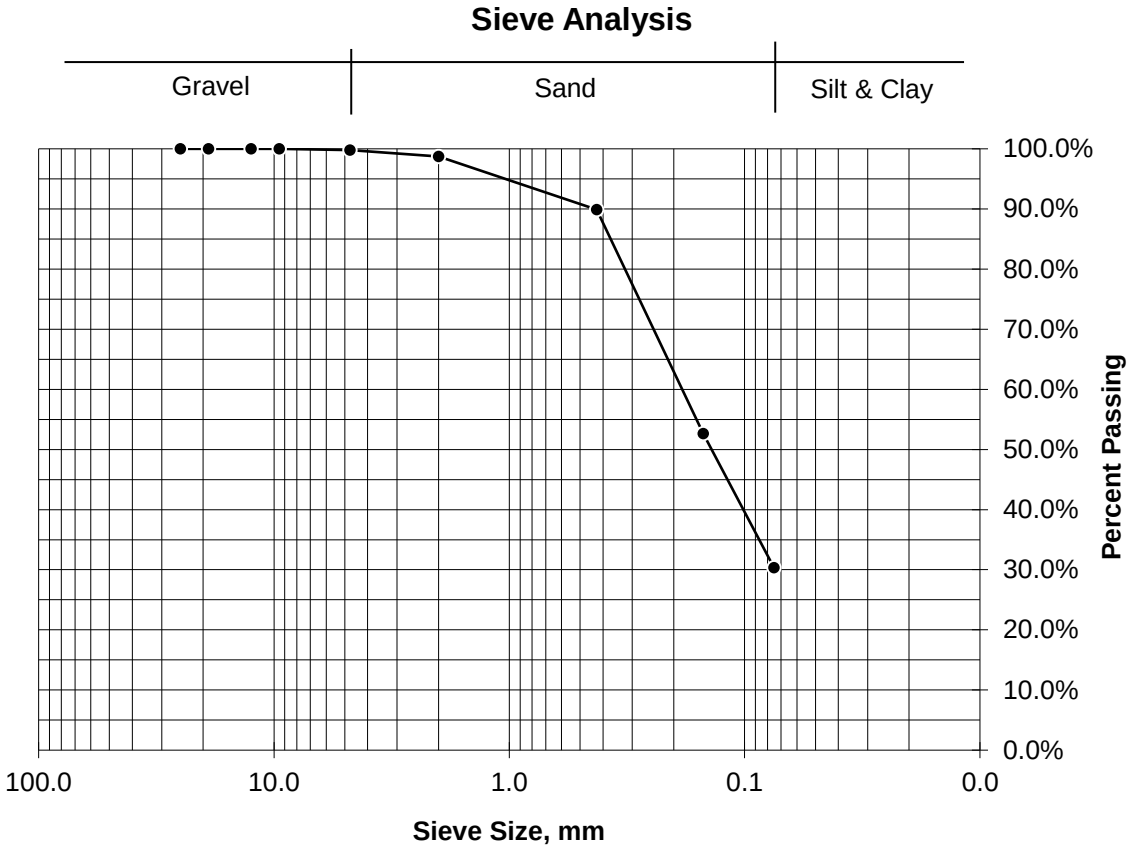
Grain Size Distribution Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID East
Sample Depth 2.5'-5'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.5	100.0%
No. 4	0.88	0.2%	4.75	99.8%
No. 10	4.05	1.0%	2.0	98.7%
No. 40	34.43	8.8%	0.425	89.9%
No. 100	145.18	37.3%	0.15	52.7%
No. 200	87.01	22.3%	0.075	30.3%
Pan	0.90	0.2%		
Total	272.45	69.9%		



Proctor Test Report

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Soil and Test Method Data

Sample ID	East
Sample Depth	2.5'-5'
Sample Classification	Clayey SAND
USCS Group Symbol	SC
Test Method	ASTM D698, Method B, with mechanical hammer
Sample Preparation	Air dried and sieved through a 3/8" sieve.
Mold Size, in	4.0
Assumed Specific Gravity:	2.65

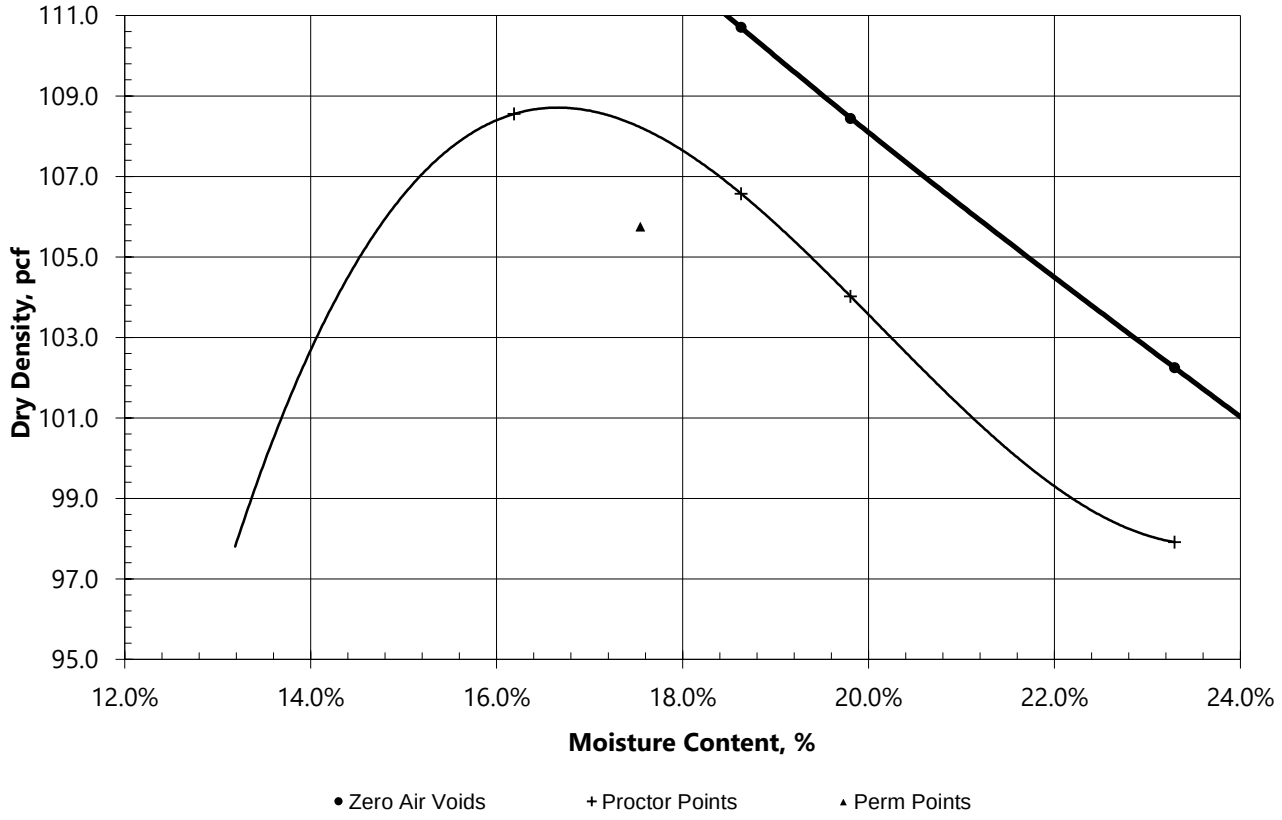
Sample Recieved: 4/11/2019
Date Tested: 4/18/2019

Test Data

	#1	#2	#3	#4	#5
Moisture Content	**16.2%**	**18.6%**	**19.8%**	**23.3%**	
Dry Density, pcf	**108.6**	**106.6**	**104.0**	**97.9**	

Moisture-Density Curve

Maximum Dry Density, pcf = 108.8 , Optimum Moisture, % = 16.7



Permeability Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID:	East	Sample Recieved:	4/11/2019
Sample Depth:	2.5'-5'	Date Tested:	5/1/2019
Permeability Method:	ASTM D5084		
Sample Length, in:	3.29		
Sample Diameter, in:	2.85		
Sample Condition:	Remolded		

Moisture Content

Pan Wt	6.62	grams
Pan + Soil (wet)	307.15	grams
Pan + Soil (dry)	262.29	grams
Moisture Content	*17.5%*	

Dry Density

Soil (wet)	685.35	grams
Wet Density	124.4	pcf
Dry Density	*105.8*	pcf

Test Conditions

Backpressure, psi	40.0
Cell Pressure, psi	50.0
Influent Buret Area, cm^2	0.03142
Effluent Buret Area, cm^2	0.76712
Effective Stress, psi	10.0
Pearment Liquid Temp.(°C):	De-aired Water

Initial Data

Assumed Specific Gravity	2.65	
Percent Voids	36.0%	
Actual Volume of Voids	123.9	ml
Porosity	36.0%	
Saturation	82.6%	

Permeability Trials

Time min	Influent Head, cm	Influent Flow, cm^3	Effluent Head, cm	Effluent Flow, cm^3	Flow Deviation Ratio	Gradient mm-Hg	Permeabilty, k cm/sec
2-May 17:35	15.700		1.600				
2-May 17:36	15.400	0.009	1.612	0.009	1.00	21.18	1.8E-07
2-May 17:37	15.100	0.009	1.625	0.009	1.00	20.71	1.9E-07
2-May 17:38	14.900	0.006	1.633	0.006	1.00	20.24	1.3E-07
2-May 17:39	14.700	0.006	1.641	0.006	1.00	19.92	1.3E-07
2-May 17:40	14.500	0.006	1.649	0.006	1.00	19.61	1.3E-07
2-May 17:41	14.300	0.006	1.657	0.006	1.00	19.30	1.3E-07
2-May 17:42	14.100	0.006	1.666	0.006	1.00	18.99	1.4E-07
2-May 17:43	13.950	0.005	1.672	0.005	1.00	18.67	1.0E-07
2-May 17:48	13.700	0.008	1.682	0.008	1.00	18.44	3.5E-08

Average Permeability 1.0E-07 cm/sec Corrected for 20°C

Final Data

Assumed Specific Gravity	2.65				
Final Weight of Sample	704.08	grams			
Final Moisture Content	20.8%		Final Sample Length, in:	3.25	
Percent Voids	35.7%		Final Sample Diameter, in:	2.86	
Actual Volume of Voids	122.1	ml	Wet Density	128.4	pcf
Porosity	35.7%		*Dry Density*	*106.4*	pcf
Saturation	99.1%				

Soil Classification Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
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Sample ID	West	Sample Recieved:	4/11/2019
Sample Depth	0'-2.5'	Date Tested:	4/15/2019
Visual Sample Description	Brown Clayey SAND		

Natural Moisture Content: ASTM D 2216

Pan ID	5	
Pan Wt	194.83	grams
Pan + Soil (wet)	551.40	grams
Pan + Soil (dry)	495.88	grams
Natural Moisture Content	*18.4%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	354.62	grams
Percent Passing No. 200 Sieve	46.9%	
Pan + Soil retained on No. 4 sieve (dry)	196.72	grams
Percent Passing No. 4 Sieve	99.4%	
Soil Classifies as	*Coarse-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/26/2019

Liquid Limit

No of Blows	17	23	31
Pan ID	64	69	70
Pan Wt	10.99	10.97	10.99
Pan + Soil (wet)	31.87	28.30	29.17
Pan + Soil (dry)	24.06	22.08	22.96
Moisture Content	59.7%	56.0%	51.8%
Liquid Limit	57	55	53
Liquid Limit	*55*		

Plastic Limit

Pan ID	2	4
Pan Weight	9.01	9.00
Pan + Soil (wet)	19.06	19.15
Pan + Soil (dry)	17.23	17.30
Moisture Content	22.3%	22.3%
Plastic Limit	*22*	
Plastic Index	*33*	

USCS Classification: ASTM D 2487

Group Symbol	**SC**
Group Name	**Clayey SAND**

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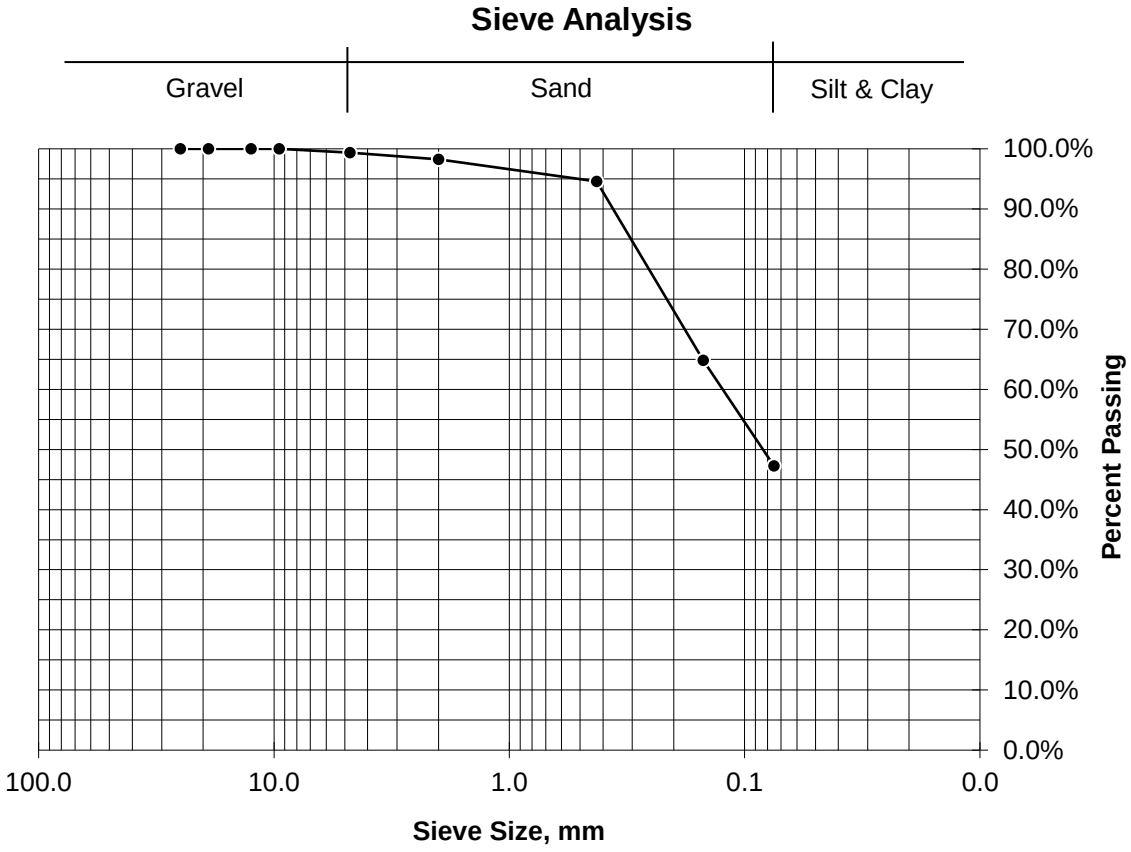
Grain Size Distribution Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID West
Sample Depth 0'-2.5'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.5	100.0%
No. 4	1.89	0.6%	4.75	99.4%
No. 10	3.42	1.1%	2.0	98.2%
No. 40	11.00	3.7%	0.425	94.6%
No. 100	89.53	29.7%	0.15	64.8%
No. 200	52.95	17.6%	0.075	47.3%
Pan	0.99	0.3%		
Total	159.78	53.1%		



Proctor Test Report

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Soil and Test Method Data

Sample ID	West
Sample Depth	0'-2.5'
Sample Classification	Clayey SAND
USCS Group Symbol	SC
Test Method	ASTM D698, Method B, with mechanical hammer
Sample Preparation	Air dried and sieved through a 3/8" sieve.
Mold Size, in	4.0
Assumed Specific Gravity:	2.65

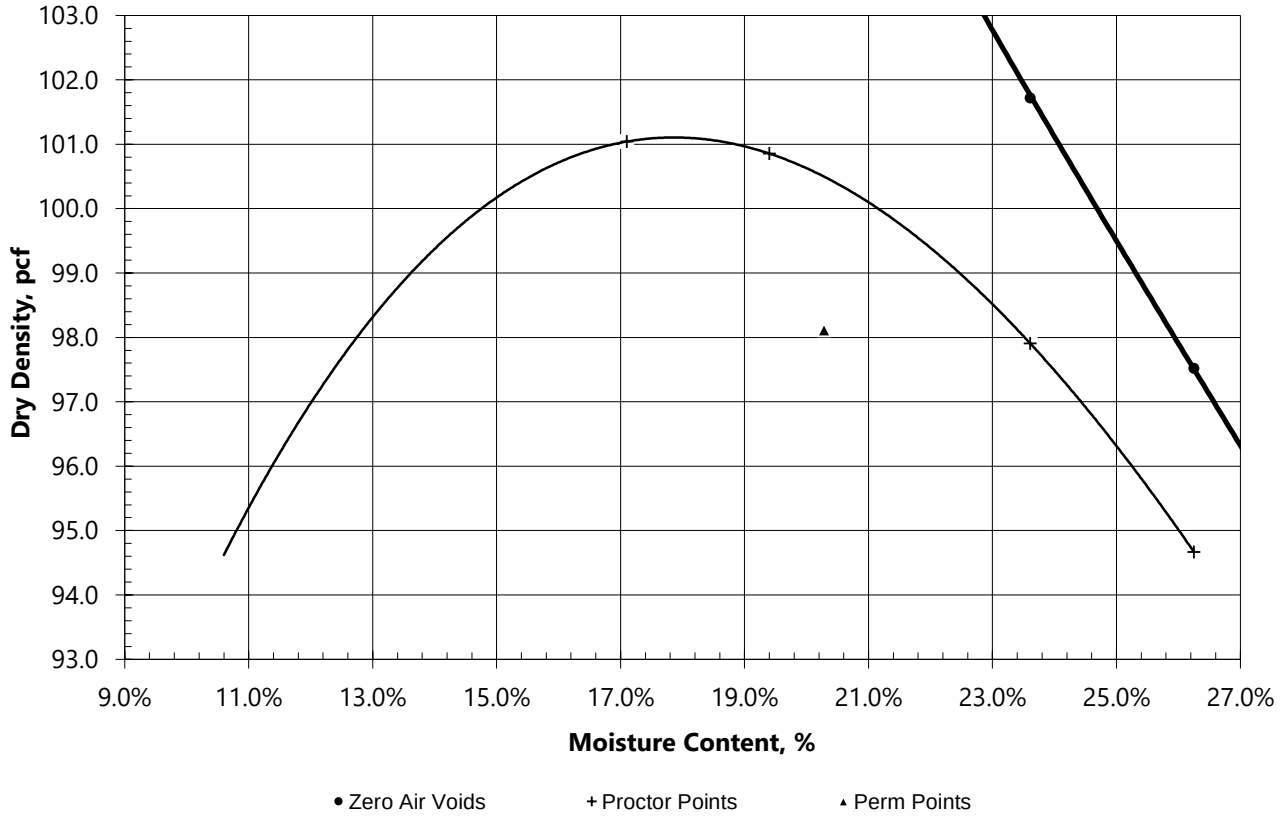
Sample Recieved: 4/11/2019
Date Tested: 4/18/2019

Test Data

	#1	#2	#3	#4	#5
Moisture Content	**17.1%**	**19.4%**	**23.6%**	**26.3%**	
Dry Density, pcf	**101.0**	**100.9**	**97.9**	**94.7**	

Moisture-Density Curve

Maximum Dry Density, pcf = 101.2 , Optimum Moisture, % = 18.0



Permeability Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID:	West	Sample Recieved:	4/11/2019
Sample Depth:	0'-2.5'	Date Tested:	5/1/2019
Permeability Method:	ASTM D5084		
Sample Length, in:	3.62		
Sample Diameter, in:	2.85		
Sample Condition:	Remolded		

Moisture Content

Pan Wt	6.59	grams
Pan + Soil (wet)	218.55	grams
Pan + Soil (dry)	182.81	grams
Moisture Content	*20.3%*	

Dry Density

Soil (wet)	715.49	grams
Wet Density	118.0	pcf
Dry Density	*98.1*	pcf

Test Conditions

Backpressure, psi	40.0
Cell Pressure, psi	50.0
Influent Buret Area, cm^2	0.03142
Effluent Buret Area, cm^2	0.76712
Effective Stress, psi	10.0
Pearment Liquid Temp.(°C):	De-aired Water

Initial Data

Assumed Specific Gravity	2.65	
Percent Voids	40.7%	
Actual Volume of Voids	153.9	ml
Porosity	40.7%	
Saturation	78.4%	

Permeability Trials

Time min	Influent Head, cm	Influent Flow, cm^3	Effluent Head, cm	Effluent Flow, cm^3	Flow Deviation Ratio	Gradient mm-Hg	Permeabilty, k cm/sec
2-May 16:55	15.500		1.600				
2-May 16:56	15.000	0.016	1.620	0.016	1.00	18.97	3.4E-07
2-May 16:57	14.800	0.006	1.629	0.006	1.00	18.26	1.4E-07
2-May 16:58	14.600	0.006	1.637	0.006	1.00	17.98	1.4E-07
2-May 16:59	14.400	0.006	1.645	0.006	1.00	17.69	1.4E-07
2-May 17:00	14.200	0.006	1.653	0.006	1.00	17.41	1.5E-07
2-May 17:01	14.100	0.003	1.657	0.003	1.00	17.13	7.5E-08
2-May 17:02	14.000	0.003	1.661	0.003	1.00	16.98	7.5E-08
2-May 17:03	13.900	0.003	1.666	0.003	1.00	16.84	7.6E-08
2-May 17:08	13.400	0.016	1.686	0.016	1.00	16.70	7.8E-08

Average Permeability 7.6E-08 cm/sec Corrected for 20°C

Final Data

Assumed Specific Gravity	2.65				
Final Weight of Sample	745.09	grams			
Final Moisture Content	25.3%		Final Sample Length, in:	3.58	
Percent Voids	40.4%		Final Sample Diameter, in:	2.86	
Actual Volume of Voids	152.4	ml	Wet Density	123.4	pcf
Porosity	40.4%		*Dry Density*	*98.5*	pcf
Saturation	98.6%				

Soil Classification Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

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Sample ID	West	Sample Recieved:	4/11/2019
Sample Depth	2.5'-5'	Date Tested:	4/16/2019
Visual Sample Description	Brown Sandy Fat CLAY		

Natural Moisture Content: ASTM D 2216

Pan ID	111	
Pan Wt	123.54	grams
Pan + Soil (wet)	443.36	grams
Pan + Soil (dry)	396.90	grams
Natural Moisture Content	*17.0%*	

Coarse or Fine Grained: ASTM D 422

Pan + Soil retained on No. 200 sieve (dry)	237.27	grams
Percent Passing No. 200 Sieve	58.4%	
Pan + Soil retained on No. 4 sieve (dry)	123.81	grams
Percent Passing No. 4 Sieve	99.9%	
Soil Classifies as	*Fine-Grained Soil*	

Atterberg Limits: ASTM D 4318

Date Tested: 4/29/2019

Liquid Limit

No of Blows	18	21	32
Pan ID	92	94	108
Pan Wt	25.60	23.78	33.14
Pan + Soil (wet)	43.31	40.76	50.43
Pan + Soil (dry)	36.76	34.75	44.60
Moisture Content	58.7%	54.8%	50.9%
Liquid Limit	56	54	52
Liquid Limit	*54*		

Plastic Limit

Pan ID	75	78
Pan Weight	4.26	4.25
Pan + Soil (wet)	14.50	14.80
Pan + Soil (dry)	12.67	12.90
Moisture Content	21.8%	22.0%
Plastic Limit	*22*	
Plastic Index	*32*	

USCS Classification: ASTM D 2487

Group Symbol	**CH**
Group Name	**Sandy Fat CLAY**

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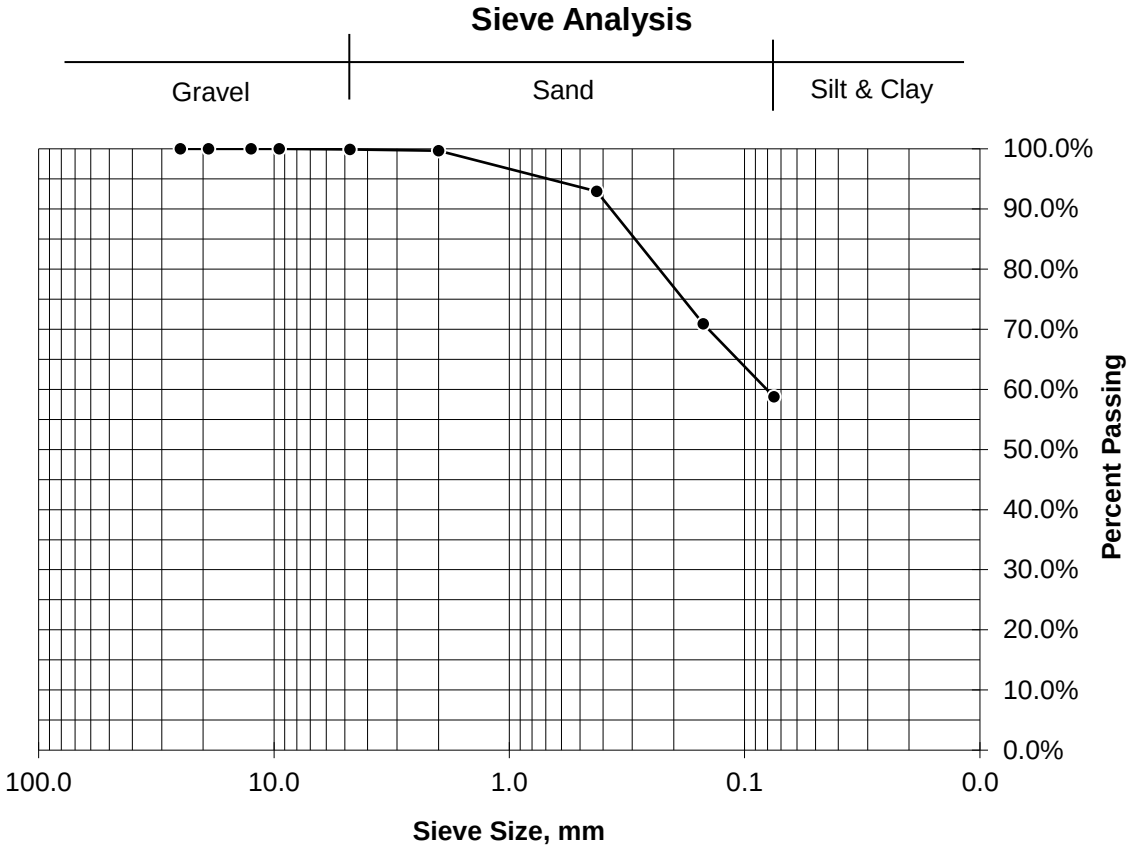
Grain Size Distribution Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Sample ID West
Sample Depth 2.5'-5'

Mechanical Sieve Analysis: ASTM D 422

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
1"	0.00	0.0%	25.0	100.0%
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.5	100.0%
No. 4	0.27	0.1%	4.75	99.9%
No. 10	0.60	0.2%	2.0	99.7%
No. 40	18.40	6.7%	0.425	93.0%
No. 100	60.25	22.0%	0.15	70.9%
No. 200	33.27	12.2%	0.075	58.7%
Pan	0.94	0.3%		
Total	113.73	41.6%		



Proctor Test Report

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
Engineering • Surveying • Environmental Services
1030 Wilmer Ave., Ste. 100
Richmond, VA 23227
Army Corps of Engineers Certified Laboratory

Soil and Test Method Data

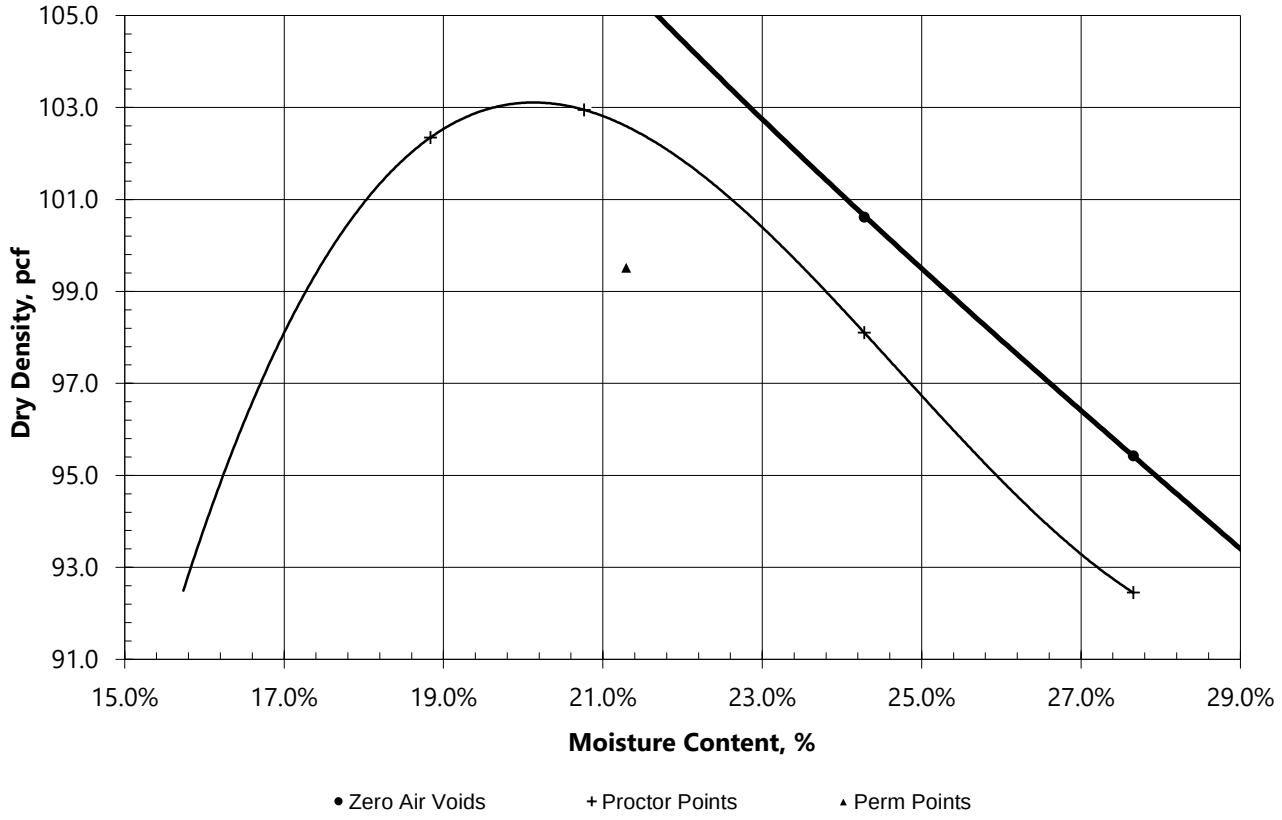
Sample ID	West	Sample Recieved:	4/11/2019
Sample Depth	2.5'-5'	Date Tested:	4/18/2019
Sample Classification	Sandy Fat CLAY		
USCS Group Symbol	CH		
Test Method	ASTM D698, Method B, with mechanical hammer		
Sample Preparation	Air dried and sieved through a 3/8" sieve.		
Mold Size, in	4.0		
Assumed Specific Gravity:	2.65		

Test Data

	#1	#2	#3	#4	#5
Moisture Content	**18.8%**	**20.8%**	**24.3%**	**27.7%**	
Dry Density, pcf	**102.3**	**102.9**	**98.1**	**92.5**	

Moisture-Density Curve

Maximum Dry Density, pcf = 103.2 , Optimum Moisture, % = 20.1



Permeability Calculations

Cumberland Landfill
DAA# 18020117-030102
Prepared By: CBW

Draper Aden Associates
Engineering • Surveying • Environmental Services
1030 Wilmer Ave., Ste. 100
Richmond, VA 23227
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Sample ID:	West	Sample Recieved:	4/11/2019
Sample Depth:	2.5'-5'	Date Tested:	5/2/2019
Permeability Method:	ASTM D5084		
Sample Length, in:	3.64		
Sample Diameter, in:	2.86		
Sample Condition:	Remolded		

Moisture Content

Pan Wt	6.65	grams
Pan + Soil (wet)	241.12	grams
Pan + Soil (dry)	199.96	grams
Moisture Content	*21.3%*	

Dry Density

Soil (wet)	741.01	grams
Wet Density	120.7	pcf
Dry Density	*99.5*	pcf

Test Conditions

Backpressure, psi	40.0
Cell Pressure, psi	50.0
Influent Buret Area, cm^2	0.03142
Effluent Buret Area, cm^2	0.76712
Effective Stress, psi	10.0
Pearment Liquid Temp.(°C):	De-aired Water

Initial Data

Assumed Specific Gravity	2.65	
Percent Voids	39.8%	
Actual Volume of Voids	152.6	ml
Porosity	39.8%	
Saturation	85.2%	

Permeability Trials

Time min	Influent Head, cm	Influent Flow, cm^3	Effluent Head, cm	Effluent Flow, cm^3	Flow Deviation Ratio	Gradient mm-Hg	Permeabilty, k cm/sec
7-May 8:45	15.500		1.600				
7-May 8:46	14.900	0.019	1.625	0.019	1.00	18.87	4.1E-07
7-May 8:47	14.700	0.006	1.633	0.006	1.00	18.02	1.4E-07
7-May 8:48	14.600	0.003	1.637	0.003	1.00	17.74	7.2E-08
7-May 8:49	14.500	0.003	1.641	0.003	1.00	17.60	7.2E-08
7-May 8:50	14.400	0.003	1.645	0.003	1.00	17.45	7.3E-08
7-May 8:51	14.300	0.003	1.649	0.003	1.00	17.31	7.3E-08
7-May 8:52	14.200	0.003	1.653	0.003	1.00	17.17	7.4E-08
7-May 8:53	14.100	0.003	1.657	0.003	1.00	17.03	7.4E-08
7-May 8:58	13.700	0.013	1.674	0.013	1.00	16.89	6.1E-08

Average Permeability 7.1E-08 cm/sec Corrected for 20°C

Final Data

Assumed Specific Gravity	2.65				
Final Weight of Sample	761.99	grams			
Final Moisture Content	24.7%		Final Sample Length, in:	3.60	
Percent Voids	39.6%		Final Sample Diameter, in:	2.87	
Actual Volume of Voids	151.1	ml	Wet Density	124.6	pcf
Porosity	39.6%		*Dry Density*	*99.9*	pcf
Saturation	100.0%				

ATTACHMENT PTA-XIV - MATERIALS VOLUME CALCULATIONS

As required by §9 VAC 20-81-460.E.2.b.(3), calculations supporting the estimate of soil materials required for development and operation of the landfill are provided as Attachment XIV. On-site soil materials will be used for structural fill, bedding layers, upper layers of closure cap, intermediate cover and some operations. On-site soils will not be used for liner or the infiltration layer component of the cap. A geosynthetic clay liner will be used in place of clay soil materials. Green Ridge plans to use alternate daily covers in lieu of the 6″ soil where appropriate.

Note that the calculations indicate a slight excess. Should additional soil be needed in the future, it could come from borrowing soil from properties adjacent to the site currently owned by Green Ridge.

Green Ridge Recycling and Disposal Facility, LLC					
Material Balance Calculations - 8:1 Waste to Soil					
Western Fill area - ONLY					
Prepared 12/7/19	(Based on 9/26/19 fill area modifications)				
Assumptions:					
Western Fill area					
Area(acres)		238			
Available soil resource (cy)		4,900,000	Estimated		
Conceptual airspace (cy)		54,000,000	Estimated		
On-site borrow areas					
Area (acres)		180	Estimated borrow		
Depth of excavation (ft)		15	Average		
Available soil resource (cy)		4,356,000	Estimated borrow		
MATERIAL USAGE	**THICKNESS OF LAYER (ft)**	**WESTERN FILL AREA**	**ON-SITE BORROW AREAS**	**TOTALS**	**COMMENTS**
Available soil material		**4,900,000**	**4,356,000**	**9,256,000**	
Engineered uses					
Perimeter road fill (concept)	Varies	1,140,000	0	1,140,000	Fill for perimeter road and berm
Structural fill (other)	Varies	500,000			Estimated - no design parameters
Low permeability soil liner material	2.0	0	0	0	Will use GCL instead of 24" clay
Liner bedding layer	0.5	191,987	0	191,987	
Interim cover	1.0	383,973	0	383,973	
Infiltration layer	1.5	0	0	0	Will use GCL instead of 18" clay
Cap bedding layer	0.5	191,987	0	191,987	
Erosion layer	1.5	575,960	0	575,960	
Vegetative layer	0.5	191,987	0	191,987	
SUBTOTAL		***3,175,893***	***0***	**3,175,893**	
Operations (intermediate cover, others)		6,000,000	0	6,000,000	Waste to soil ratio 8:1
TOTAL		***9,175,893***	***0***	**9,175,893**	
Soil Balance		-4,275,893	4,356,000	**80,107**	Can borrow from adjacent properties under ownership