Attachment A

Topographic Survey

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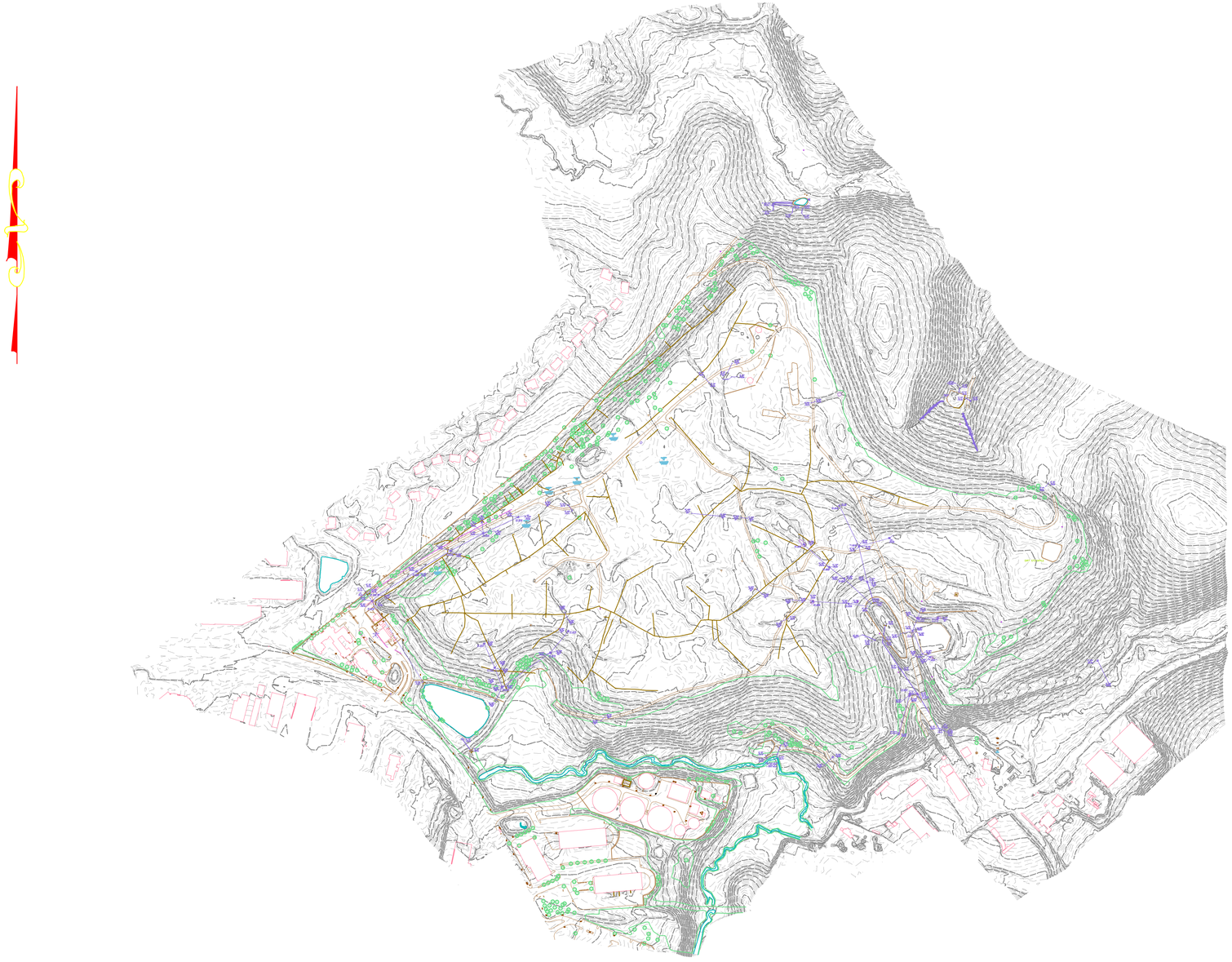

THE TOPOGRAPHICAL SURVEY SHOWN HERON ARE AN INTERPRETATION OF PHOTOGRAMETRY AND FIELD RUN SURVEYS COMPLETED ON JAN. 30, 2019, THE UNDERSIGNED WAS IN RESPONSIBLE CHARGE OF THE PREPARATION OF THIS MAP AND THE SURVEYING WORK REFLECTED IN IT. THIS MAP WAS DEVELOPED IN COMPLIANCE WITH THE REQUIREMENTS SET FORTH IN COMAR REGULATIONS 09.13.06.

STATE OF MARYLAND
ERIC COOPER
No. 21311
PROFESSIONAL LAND SURVEYOR

ERIC V COOPER DATE: 4-11-2019
PROFESSIONAL LAND SURVEYOR
MD.#21311 (expiration date JUNE 25, 2020)

MAP LEGEND

- TREE
- WOODS
- MANHOLE
- INLET
- POND
- FENCE
- GAS LINE
- HAND BOX
- LFG PIPING
- ELECT POLE
- LIGHT POLE
- GUY WIRE
- HYDRANT
- MISC FEATURE
- BOLLARD
- TRAFFIC SIGN
- GUARDRAIL
- TRANSFORMER

WALLACE MONTGOMERY
ENGINEERS • PLANNERS • SURVEYORS • CONSTRUCTION MANAGERS
10150 York Road, Suite 200
Hunt Valley, Maryland 21030
410.494.9093 Tel / 410.667.0925 Fax
www.WallaceMontgomery.com
A Limited Liability Partnership

TOPOGRAPHIC SURVEY

GUDE LANDFILL

150 0 150 300
1"= 150'

4h Election District	Montgomery County,MD
Sheet 1 of 1	Project No. 218007.0001
Drawn By: DBM	Checked By: EVC
Scale 1"=150'	Date January 30, 2019

Attachment B

Utility Locating Report

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EA Engineering, Science, and Technology, Inc., PBC
Attn: Mark Gutberlet
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031

November 21, 2018

Re: Report of Findings – Gude Landfill

Dear Mr. Gutberlet,

Master Locators, Inc. (ML) is pleased to provide this report regarding the geophysical investigation performed at 600 East Gude Drive in Rockville, MD. The scope of work included scanning for and marking out utilities/unknowns within approximately 30 acres of the Gude Landfill property. Approximate scope of work boundaries are included in *Attachment 1: Report Figures, Site Photos* at the end of this report.

METHODOLOGY

Underground utility data is considered Quality Level B (QLB) as defined in ASCE 38-02: Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data and is intended to show the approximate horizontal locations of existing underground utilities as marked by ML during a geophysical investigation performed within the scope of work boundaries.

ML utilized Electromagnetic (EM) and Ground Penetrating Radar (GPR) technology to perform the subsurface investigation with the following equipment.

- RD 8000 Digital Locator manufactured by Radiodetection
- A6 Tracer manufactured by Aquatronics (Spit-Box)
- Noggin SmartCart with 250MHz GPR antenna manufactured by Sensors and Software
- Carlson GPS unit

EM scanning was performed to trace all conductive utilities which were visually evident within or adjacent to the scan area. This included both active and inactive methods of locating with the RD 8000 Digital Locator. Active and inductive scans were performed on various frequencies ranging from 8 kHz to 200 kHz. Passive scans were performed on a 60 Hz frequency in a ten (10)-foot by ten (10)-foot grid over the accessible portions of the scan area.

Inductive EM scans were conducted using an A6 Tracer (Split-Box) at a frequency of 118 kHz and collected in a ten (10)-foot by ten (10)-foot grid over the accessible portions of the scan area. The A6 Tracer scans were performed to identify any potential metallic targets within the scan areas.

GPR scans were performed with a 250 MHz antenna. GPR data was collected in a five (5)-foot by five (5)-foot grid over the accessible portions of the scan area. During the scanning process, the GPR operator continuously monitored the imaging results displayed for indications of any anomalies associated with utilities or unknown targets. Any anomalies which were detected were investigated further to identify the target as a potential utility or unknown target.

The horizontal locations of utilities, utility structures, unknowns and site features (fence line, etc.) were collected using the Carlson GPS unit and included on the CAD mapping provided with this report.

RESULTS

Attachment 2: Utility Mapping contains the approximate locations of utilities and unknowns observed during the geophysical investigation. The geophysical investigation was performed within two (2) areas on landfill property. Area 1, measures approximately 28.3 acres and includes a gas utility right of way along the northwest perimeter of the landfill (gas line material unknown), the gazebo area near the model plane airport and current facility buildings all northeast of East Gude Drive. Area 2, measures approximately 1.1 acres and includes the roadway that led up the former incinerator known as Incinerator Lane.

Please note the following on the attached utility mapping:

- Utilities were marked in the field using the standard American Public Works Association (APWA) color code. Gas lines on *Attachment 2: Utility Mapping* are depicted in purple instead of yellow for better visibility when printed.
  See Figures 2 and 3 for examples in Attachment 1: Report Figures, Site Photos.
- Utility types marked out and mapped for Areas 1 &2 include: communications; electric; gas; landfill gas, sanitary sewer; storm drainage; water and unknowns.
- To differentiate between natural gas lines and landfill gas lines, each has a dedicated line type on the attached mapping. *-G-, underground gas lines* are natural gas lines. *-LFG-, underground landfill gas lines* are associated with the landfill gas extraction lines within the landfill property boundary.
- When a feature is observed during grid scans using either GPR or EM and cannot be traced to an above ground structure it is labeled as an unknown.
- When utilities are depicted with a dash only line type (no letter identifier), field staff dotted this path in the field as the suspected path/continuation of the line based upon field observations.
  See Sheets 3 and 7 for examples of this.
- Features that have an "last locatable point" symbol (X) may continue, but due to possible site or equipment limitations, access issues, and/or unfavorable subsurface conditions this can't be determined.
- Those utilities that end with a "line continues" symbol (~) either intersect with the scope of work boundaries or possibly continue through an area that was inaccessible to field staff.
- The bolded lines depicted along the northern perimeter of the landfill in Area 1 were marked out by a representative from Williams as part of the one-call design ticket that was placed. Three (3) gas lines and one (1) electric line were marked by Williams using grade stakes. No other utility companies/representatives marked out utilities in response to the one-call design ticket placed.
- ML utility locators grid scanned the area containing the utilities marked out by Williams to determine if any other utilities were in this section of the scope of work. No other utilities were observed in this section using the methods described in this report. ML GPS technicians collected the horizontal locations of the grade stakes planted by the representative from Williams.
- Heavy vegetation prevented access to some sections of the scope of work.
  See Sheets 2, 3 and 4 for examples of this.
  See Figure 4 in Attachment 1: Report Figures, Site Photos for an example area.

MAP SHEET SUMMARY

Sheet No.	Description
1	**Key Sheet** Project site (landfill and surrounding areas), Areas 1 & 2 scope of work boundaries, approximate landfill property line and remaining sheet locations.
2	**Southwest corner of Area 1, north of East Gude Drive** Three (3) natural gas lines and one (1) electric line marked out by Williams (one-call design ticket), multiple utilities associated with site buildings including: communications; electric; natural gas; sanitary sewer; storm drainage; and water.
3	**Section northeast of Sheet 2** Continuation of three (3) natural gas lines and one (1) electric line marked out by Williams (one-call design ticket), multiple utilities associated with site buildings including: electric; landfill gas, storm drainage; and water.
4	**Section southeast of Sheet 2, northeast of East Gude Drive** Multiple utilities associated with site buildings on including: electric; natural gas; sanitary sewer; storm drainage; water and an unknown. Dense vegetation prevented the continuous detection of some utilities on this sheet.
5	**Section southeast of Sheet 4, northeast of East Gude Drive** Suspected sanitary sewer line within scope of work boundary; dense vegetation prevented investigation in this area.
6	**Section northeast of Sheet 3** Continuation of three (3) natural gas lines and one (1) electric line marked out by Williams (one-call design ticket), storm drainage and one (1) landfill gas line (mark out was limited for this line, both ends of the line have the last locatable point symbol).
7	**Section northeast of Sheet 6** Continuation of three (3) natural gas lines and one (1) electric line marked out by Williams (one-call design ticket), continuation of storm drainage, and landfill gas lines. A portion of the landfill gas line is marked as “suspected location” (dashed line type without LFG) to where an above ground pipe structure was observed in the field.
8	**Section northeast of Sheet 7** Continuation of three (3) natural gas lines and one (1) electric line marked out by Williams (one-call design ticket), two (2) storm drainage lines running below landfill roadways and water lines associated with water fountains. “X” indicates last locatable point, ML field staff did not observe a feature or signal beyond the location of “X” but the lines may continue.
9	**Section northeast of Sheet 8** Continuation of three (3) natural gas lines and one (1) electric line marked out by Williams (one-call design ticket). These utility lines continue beyond scope of work.
10	**North side of Area 2, Incinerator Road** Storm drainage lines, an unknown and approximate location of an observed stream running below the road. Base map contains a surface structure not observed during the field investigation. ML suspects that the structure is either buried or possibly mis-mapped; feature may be storm drainage manhole nearby mapped by ML.
11	**South side of Area 2, Incinerator Road** Multiple utilities observed, features may be associated with existing or previous structures surrounding the scope of work and include electric, natural gas, storm drainage and unknowns. Unknowns may be associated with abandoned utilities.

CONCLUSIONS

Utilities observed and marked in the field were identified either by direct connection to utility structure at the surface or traced to a termination point at utility structure. Unknowns were marked out during the collection of grid scans within the scope of work. The unknowns were not identified because they could not be traced to a utility surface structure.

ML recommends non-destructive vacuum excavation to expose these utilities at their last locatable point to determine where they terminate and possible investigation of the unknowns to further attempt to identify their utility type and termination point.

As utility locations are approximate, if precise locations and depths of utilities are needed, ML can employee vacuum excavation to determine this information on the utilities depicted in the attached mapping.

Please reach out to us with any questions regarding the contents of this report.

Sincerely,

Crystal Gardener
Project Manager/Geologist

ATTACHMENTS

Attachment 1: Report Figures, Site Photos
Attachment 2: Utility Mapping

Attachment 1: Report Figures, Site Photos

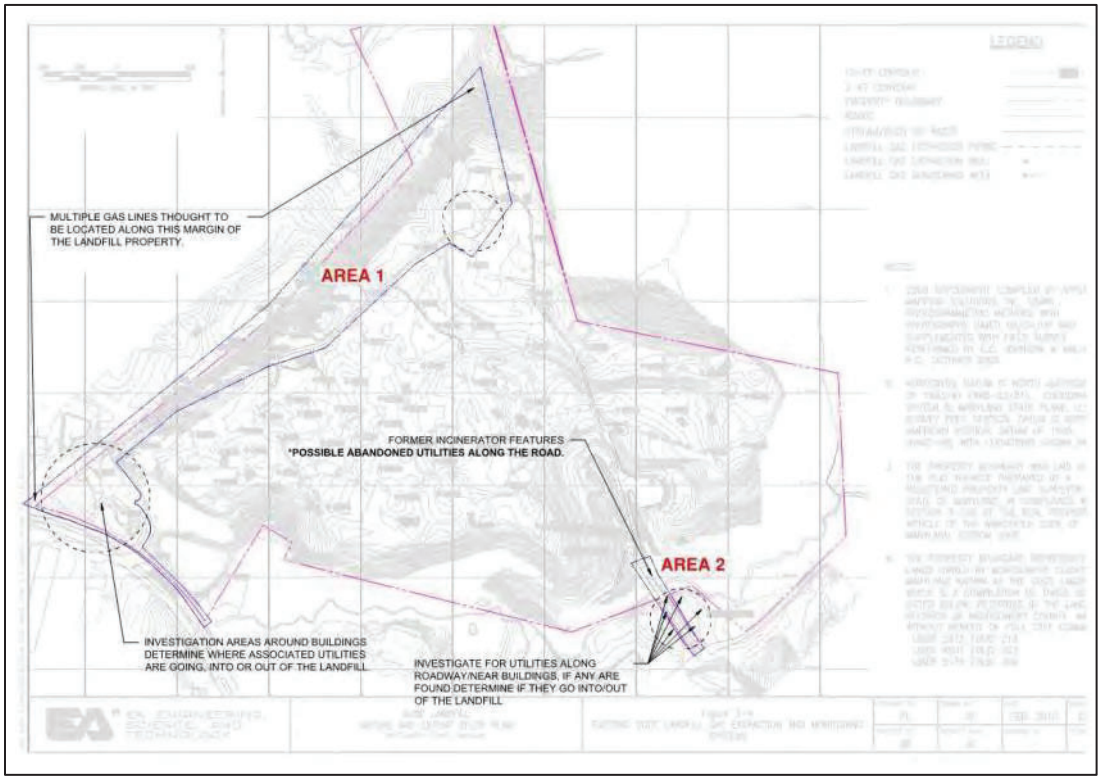


Figure 1: Scope of work includes areas bound by the blue outlines, Area1 and Area 2.
Client Provided Information: 100 foot ROW easement includes Williams Gas/Trans-continental Natural Gas Pipelines (near landfill side). 25-50 foot ROW easement contains Columbia Gas Pipeline and Fiber Optic Line (near community side).

Figure 2: Example of field mark out, picture depicts a section in Area 1 (near homeless shelter) where two (2) electric lines cross over a water and storm drainage lines.

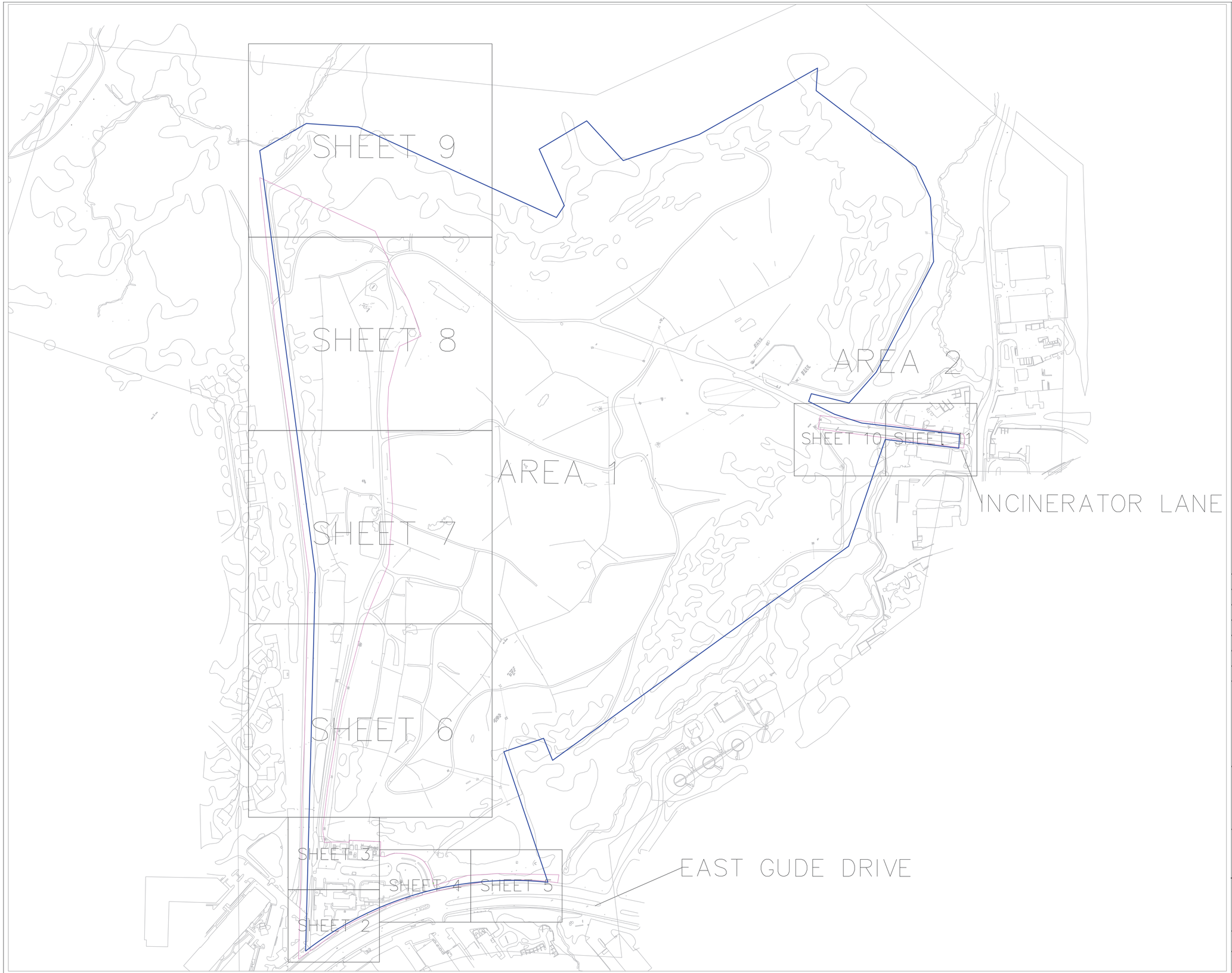
Attachment 1: Report Figures, Site Photos

Figure 3: Example of field mark out, picture depicts a congested section in Area 1 (near homeless shelter) where three (3) electric, two (2) communication and one (1) water line converge.

Attachment 1: Report Figures, Site Photos

Figure 4: Section of Area 1 on Sheet 2 where the communication, electric and storm drainage intersect the area of heavy vegetation called out on the utility mapping.

Attachment 2: Utility Mapping



NOTES:

1. UNLESS OTHERWISE NOTED UNDERGROUND UTILITY DATA IS CONSIDERED QUALITY LEVEL B (QLB) AS DEFINED IN ASCE 38-02: STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA AND IS INTENDED TO SHOW THE APPROXIMATE HORIZONTAL LOCATIONS OF EXISTING UNDERGROUND UTILITIES AS MARKED BY MASTER LOCATORS DURING A GEOPHYSICAL INVESTIGATION PERFORMED WITHIN THE SCOPE OF WORK.

2. POSITIONAL DATA WAS COLLECTED WITH A GPS SYSTEM, COORDINATES ARE IN THE MARYLAND STATE PLANE ZONE WITH NAD83 HORIZONTAL DATUM. GPS INFORMATION WAS OVERLAIN UPON A EXISTING CAD FILE "GudeLF2015_ver2010-151118".

3. AS THE BASE FILE FOR THIS PROJECT WAS NOT GEO-REFERENCED, MASTER LOCATORS SURVEYED IN FEATURES PRESENT BOTH IN THE FIELD AND ON THE BASE MAP IN ORDER TO OVERLAY THE APPROXIMATE UTILITY LOCATIONS. MASTER LOCATORS IS NOT RESPONSIBLE FOR THE VALIDITY OR POSITIONS OF STRUCTURES PRESENT IN THE CLIENT-PROVIDED BASE MAP.

4. ALL UTILITY LOCATIONS SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY. THIS PLAN SHOULD NOT BE USED FOR CONSTRUCTION OR DESIGN PURPOSES AND MASTER LOCATORS IS NOT RESPONSIBLE FOR DAMAGE TO UTILITIES RESULTING FROM ANY CONSTRUCTION WORK BASED ON THESE PLAN.

5. NO BOUNDARY OR PROPERTY SURVEY WORK WAS CONDUCTED IN THE DEVELOPMENT OF THIS PLAN.

6. BOLDED UTILITY LINES WERE MARKED OUT BY OTHERS VIA ONE CALL TICKET.

UTILITIES LEGEND

- E — U/G ELECTRIC LINE
- E-S — U/G SUSPECTED ELECTRIC LINE
- C — U/G COMMUNICATION LINE
- SD — U/G STORM DRAIN LINE
- W — U/G WATER LINE
- G — U/G GAS LINE
- LFG — U/G LANDFILL GAS LINE
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- SS — U/G SANITARY LINE
- UNK — UNKNOWN LINE
- FENCE LINE
- APPROXIMATE SCOPE OF WORK
- CLIENT-PROVIDED PROPERTY BOUNDARY
- MH — MANHOLE (MH)
- STORM INLET/CATCH BASIN (CB)
- LIGHT STANDARD/SITE LIGHT (SL)
- UTILITY POLE
- JUNCTION BOX/PULL BOX
- FH — FIRE HYDRANT (FH)
- LAST LOCATABLE POINT
- LINE CONTINUES
- CO — CLEANOUT
- GV — GAS VALVE
- WV — WATER VALVE
- T — TRANSFORMER
- MW — MONITOR WELL

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2	6/20/18	REVISION 1	IH / CY
3	9/11/18	CLIENT NOTES ADDRESSED	IH / CY
4	10/10/18	CLIENT NOTES ADDRESSED	IH / CY
5	11/05/18	CLIENT NOTES ADDRESSED	IH / CY
6	11/21/18	CLIENT NOTES ADDRESSED	IH / CY

REVISIONS

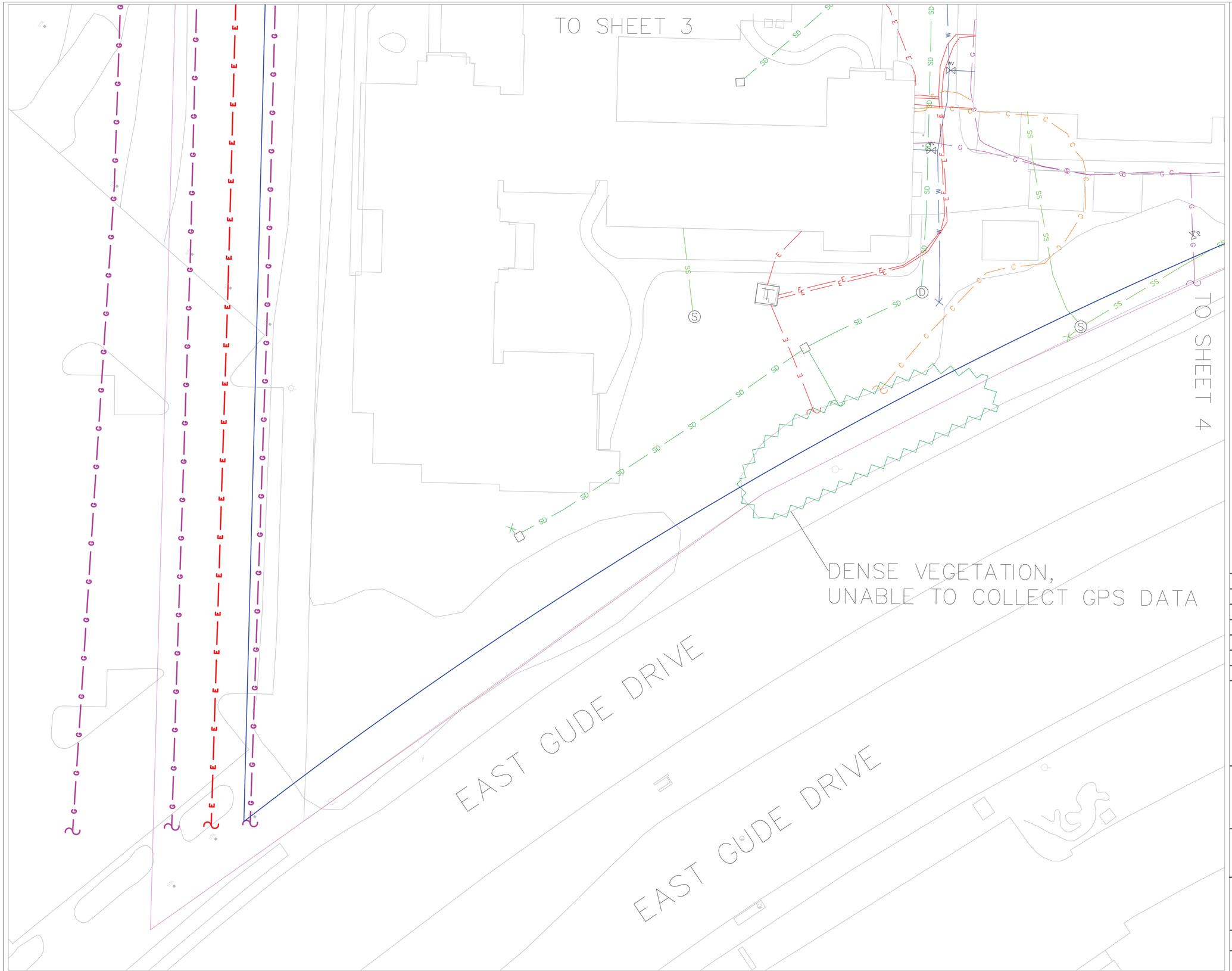
master locators
675 Concord Road
Glen Mills, PA 19342
Phone: 610-358-0172

CLIENT:
EA Engineering

SITE:
Gude Landfill
600 East Gude Drive
Rockville, MD

UNDERGROUND UTILITY PLAN KEY SHEET

SIZE	SCALE:	SHEET	REV
D	1"=200'	1 OF 11	6



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UNDERGROUND UTILITY PLAN SW CORNER AREA 1, NORTH OF EAST GUDE DRIVE

SIZE	SCALE:	SHEET	REV
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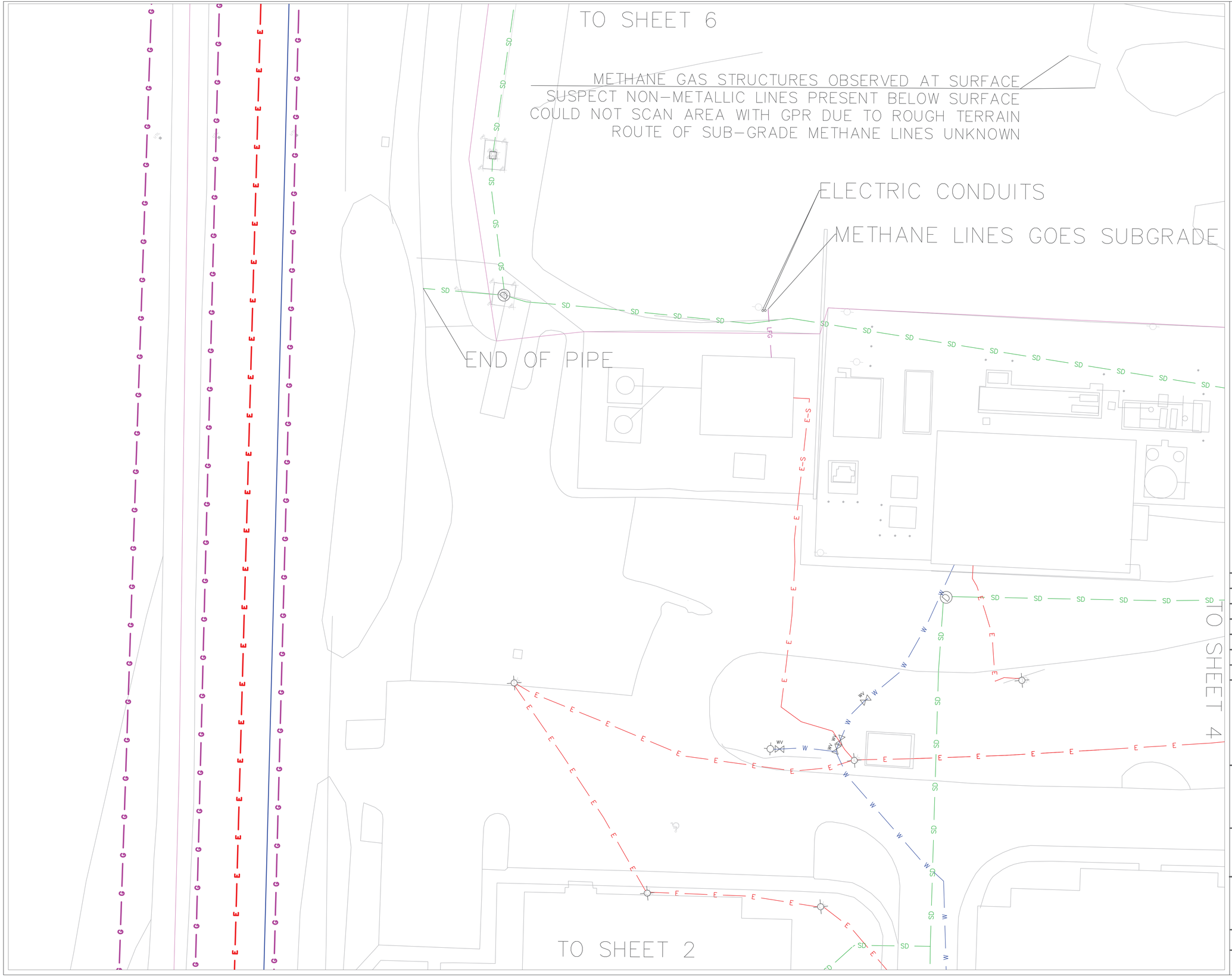

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UNDERGROUND UTILITY PLAN
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SIZE	SCALE:	SHEET	REV
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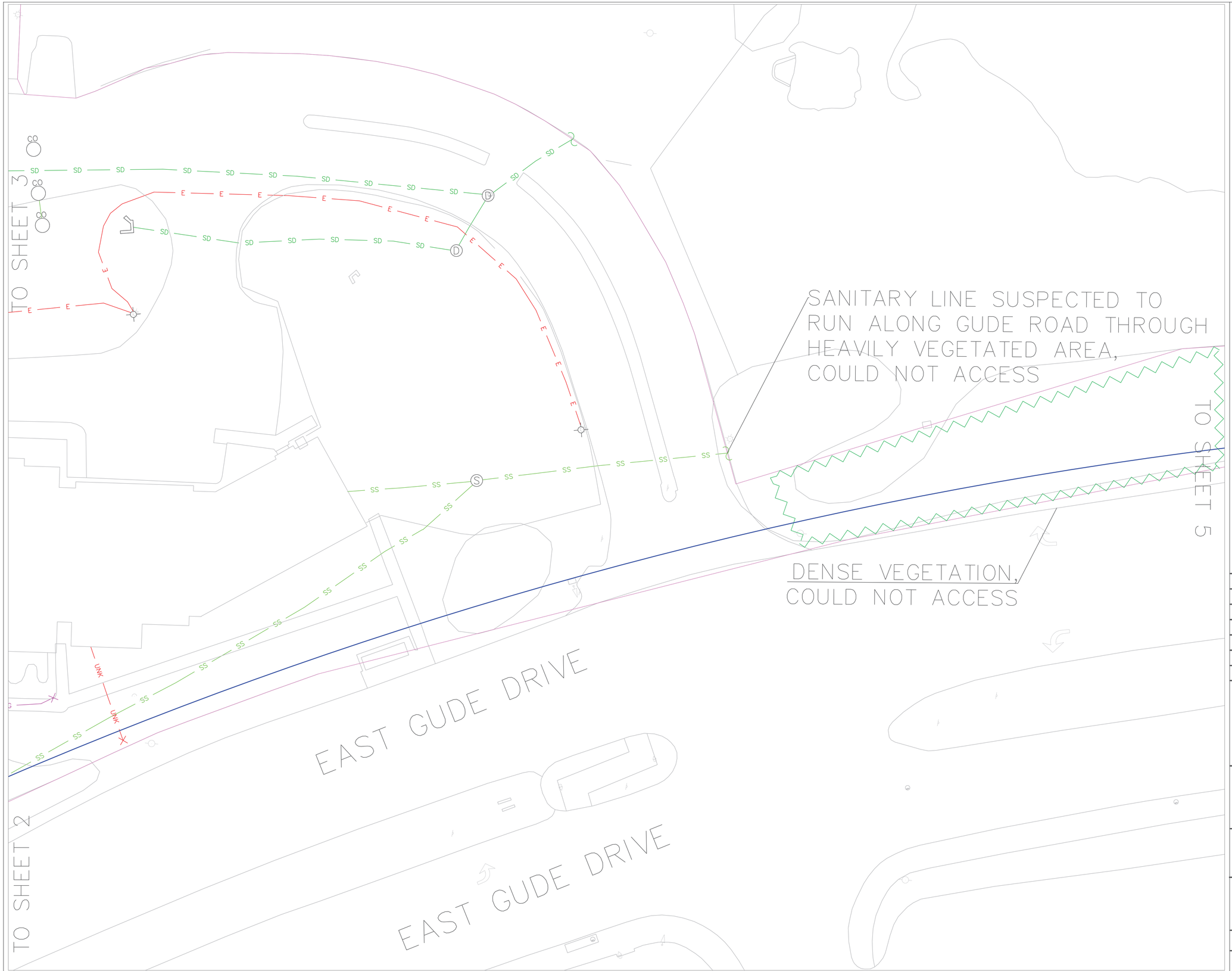

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CLIENT:
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SITE:
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UNDERGROUND UTILITY PLAN SE OF SHEET 2 NE OF EAST GUDE DRIVE

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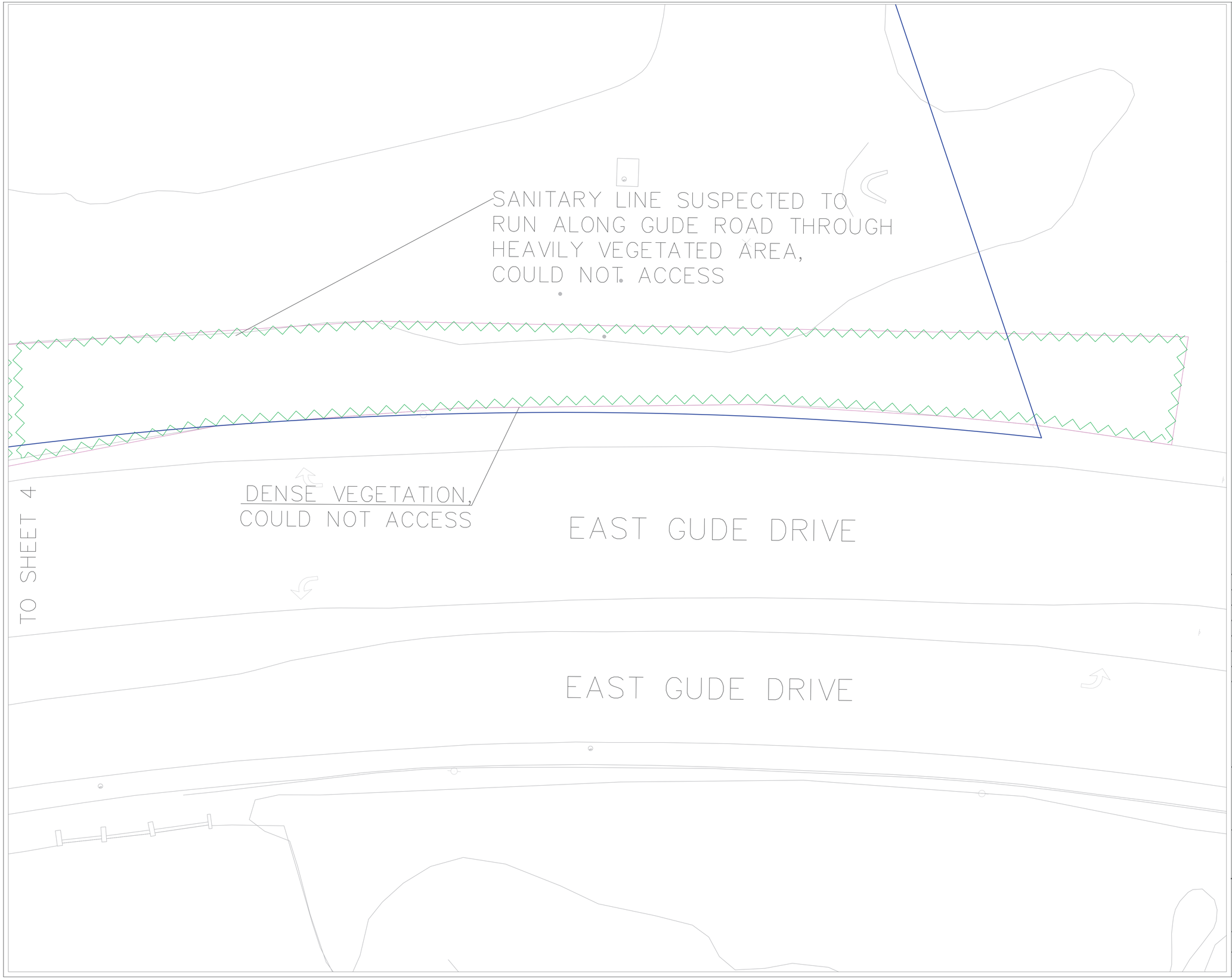

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REVISIONS

master locators
675 Concord Road
Glen Mills, PA 19342
Phone: 610-358-0172

CLIENT:
EA Engineering

SITE:
Gude Landfill
600 East Gude Drive
Rockville, MD

UNDERGROUND UTILITY PLAN SE OF SHEET 4, NE OF EAST GUDE DRIVE

SIZE	SCALE:	SHEET	REV
D	1"=15'	5 OF 11	6

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REVISIONS

master locators
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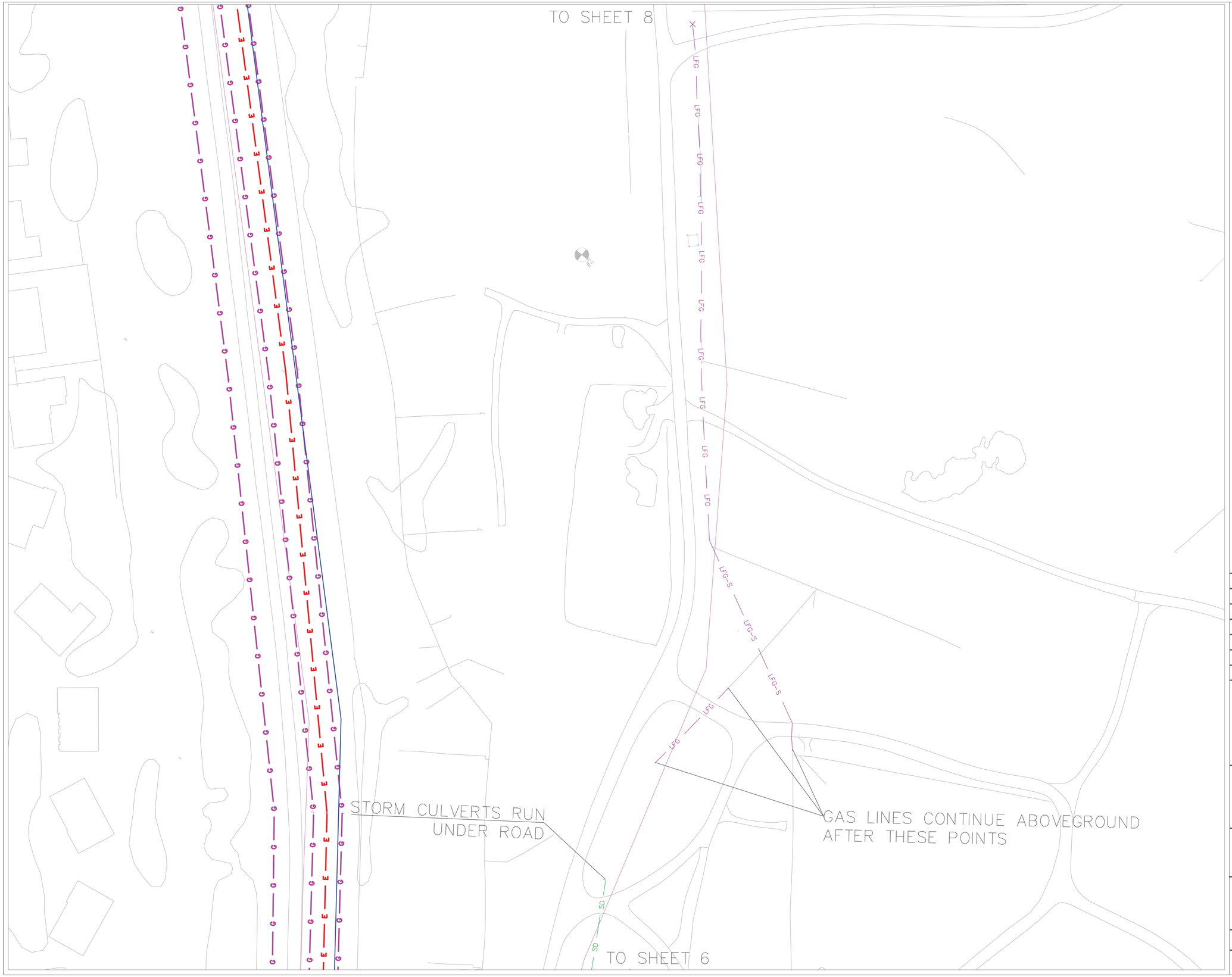
Phone: 610-358-0172

CLIENT:
EA Engineering

SITE:
Gude Landfill
600 East Gude Drive
Rockville, MD

UNDERGROUND UTILITY PLAN
NE OF SHEET 3

SIZE	SCALE:	SHEET	REV
D	1"=40'	6 OF 11	6



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SITE:
Gude Landfill
600 East Gude Drive
Rockville, MD

UNDERGROUND UTILITY PLAN
NE OF SHEET 6

SIZE	SCALE:	SHEET	REV
D	1"=40'	7 OF 11	6

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REVISIONS

master locators
675 Concord Road
Glen Mills, PA 19342
Phone: 610-358-0172

CLIENT:
EA Engineering

SITE:
Gude Landfill
600 East Gude Drive
Rockville, MD

UNDERGROUND UTILITY PLAN
NE OF SHEET 7

SIZE	SCALE:	SHEET	REV
D	1"=40'	8 OF 11	6

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Phone: 610-358-0172

CLIENT:

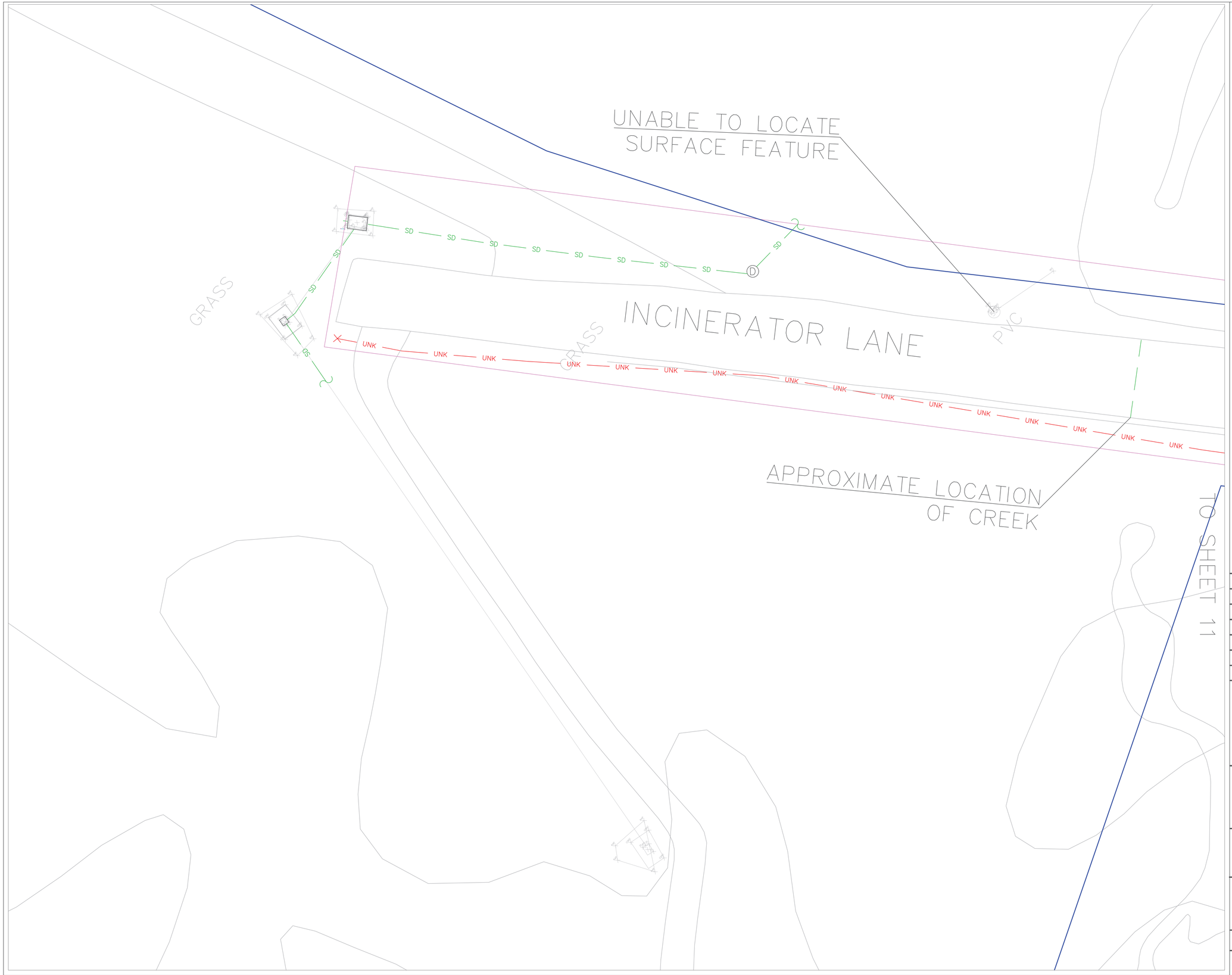
EA Engineering

SITE:

Gude Landfill — 600 East Gude Drive, Rockville, MD

UNDERGROUND UTILITY PLAN
NE OF SHEET 8

SIZE	SCALE:	SHEET	REV
D	1"=40'	9 OF 11	6



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CLIENT:

EA Engineering

SITE:

Gude Landfill — 600 East Gude Drive, Rockville, MD

UNDERGROUND UTILITY PLAN
NORTH SIDE OF AREA 2
INCINERATOR ROAD

SIZE	SCALE:	SHEET	REV
D	1"=15'	SHEET 10 OF 11	6

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CLIENT:

EA Engineering

SITE:

Gude Landfill — 600 East Gude Drive, Rockville, MD

UNDERGROUND UTILITY PLAN
SOUTH SIDE OF AREA 2
INCINERATOR ROAD

SIZE	SCALE:	SHEET	REV
D	1"=15'	11 OF 11	6

Attachment C

Geotechnical Evaluation

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September 10, 2018

Mr. Mark Gutberlet, PE
Project Manager
EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Rockville, MD 20850

RE: Geotechnical Evaluation
Gude Landfill
Rockville, Maryland
RBB Project No. 16943-0

Dear Mr. Gutberlet:

The Robert B. Balter Company is pleased to submit this geotechnical evaluation report for the subject project. The purpose was to assess the existing soil cap condition and provide recommendation regarding soil reuse.

Project information provided to us by various parties helped form the basis for our recommendations. If any of the project information discussed in this report differs from the actual proposed construction, we should be contacted to re-evaluate the recommendations provided herein and provide revisions if necessary.

We have appreciated this opportunity to be of service. If you have any questions regarding this report, or if we can assist you in any way, please do not hesitate to call our office.

Sincerely,

THE ROBERT B. BALTER COMPANY

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 23261, Expiration Date: 06/25/2020

James M. Bailey, E.I.T.
Geotechnical Engineer

Joseph F. Whittle Jr., P.G., P.E.
Chief Engineer

STATE OF MARYLAND JOSEPH F. WHITTLE, JR. No. 23261 PROFESSIONAL ENGINEER

9/10/2018

TABLE OF CONTENTS

LIST OF TABLES

LIST OF PLATES

APPENDICES

1.0 INTRODUCTION

1.1 General

The proposed project will consist of a new toupee cap for the Gude Landfill, as well as an analysis of the stability of the site as it pertains to future developments, such as potential access roads, parking areas, and new facilities.

1.2 Authorization

The geotechnical evaluation was authorized by EA, based on our September 28, 2017 *Revised Proposal for Geotechnical Evaluation.*

1.3 Scope

The scope of the geotechnical evaluation included the following: site reconnaissance, subsurface sampling and testing, geotechnical laboratory testing, engineering evaluation and report preparation.

1.4 Summary of Recommendations

Cap Fill Soil Reuse	The existing site cap fill soils are expected to be suitable for reuse. However, laboratory testing indicated that site soils are presently in excess of the optimum moisture content and may require drying before placement. We would expect the moisture content of the existing fill soils to change over time.
Topsoil	The current site topsoil was only encountered sporadically, with most plant covering growing in the fill soils rather than a distinct topsoil stratum. It is unlikely to be cost-effective to salvage for reuse as topsoil

2.0 PROJECT DESCRIPTION

2.1 Site Conditions

The project is located at 600 East Gude Drive, Rockville, Maryland. The site is bordered to the northwest by Gude Trail, followed by a residential development, to the northeast by a heavily forested area, to the southeast by a mixed commercial/retail development, and to the southwest by East Gude Drive followed by mixed commercial/retail development. The site is currently occupied by the closed Gude MSW Landfill including a gas energy production facility and is currently being used as a radio-controlled (RC) model airplane recreational area. A **Vicinity Map** is shown on **Plate 1**, attached.

2.2 Project Information

The proposed project will consist of the reconstruction of the landfill cap. The purpose of this investigation was to determine the depth of the existing cap and to determine the potential for reuse of the existing cap soils.

2.3 Site Geology

According to the National Geologic Map Database provided by USGS, the subject site is underlain by the Wissahickon Formation. This formation is known to consist of Muscovite-chlorite-albite schist, muscovite-chlorite schist, chloritoid schist, and quartzite; intensely folded and cleaved.

3.0 EVALUATION PROGRAM

3.1 Subsurface Explorations

The subsurface exploration program for this study included a total of 128 new Test Pits, labeled TP-200 to TP-335, with the exclusions of TP-296, TP-297, TP-300, TP-306, TP-313, TP-316 and TP-328. These test locations were not performed due to time constraints. The locations for the test pits were selected by EA and located in the field by Balter using standard taping procedures and are assumed accurate to within 10 – 15 feet. Additionally, longitude and latitude coordinates were recorded by cell phone GPS for each test pit location and are assumed accurate to within 10 to 15 feet. Prior to the start of the test pit operations, the test pits were cleared for utilities by Miss Utility. The attached **Plate 2, Boring Location Plan,** indicates the approximate as-dug locations of the test pits.

The test were advanced to depths ranging from 1.5 feet to 8 feet below the existing ground surface using a Case 580 N backhoe. During the test operations, bulk samples of representative soils from the upper regions of the soils were recovered for laboratory evaluation. Following completion, the test pit locations were backfilled with landfill garbage at the bottom and soils on top lightly compacted with the backhoe bucket. After backfill, all test pits were strawed and seeded.

All test pits were screened for oxygen levels and combustible gases as per the site Health and Safety Plan.

The subsurface data obtained from the recent explorations are presented in log form in **Appendix A**.

The depths at which water was observed in the test were recorded upon completion. The method of classification used in preparing the strata descriptions is based on our interpretation of the Unified Soils Classification System (USCS).

Test pit logs show the estimated general soil classifications and the assumed boundaries between soil types. The actual boundaries in the field could vary significantly from those assumed for the logs. *It is noted that the subsurface data shown on the figures are an integral portion of this report. Separation of the figures from the remainder of the report may lead to misinterpretation of the data by others.*

3.2 Laboratory Testing Program

Selected samples were subjected to laboratory analyses to estimate their classifications according to the Unified Soils Classification System. This testing included moisture content determination, sieve gradation analyses, and Atterberg limits determinations. The bulk samples were subjected to evaluation of their compaction properties by AASHTO T-180 (Modified Proctor).

The results of our laboratory testing are presented in Appendix B and are summarized in **Table 1** of Section 4.2 Subsurface Materials.

4.0 SUBSURFACE CONDITIONS

4.1 General

This section provides a description of the estimated subsurface conditions encountered at the borings at the time of drilling. Significant variations may occur outside specific test locations.

4.2 Subsurface Materials

4.2.1 Surficial Materials

Topsoil - Topsoil was only encountered in borings TP-201, TP-202, TP-203, TP-254, TP-255, TP-256, TP-257, TP-258, TP-259, and TP-263 to depths ranging between 1 inch and 4.0 inches. The term "topsoil," as used in this report refers to surface soils having an apparently significant organic content, based only on visual estimates in the field. It does not imply that the subject materials meet the requirements or specifications for topsoil set by any particular organization or agency. Plant growth was present across the landfill, however the growth appears to be within the fill soils rather than within a distinct topsoil layer.

4.2.2 Existing Cap Fill Soils

Fill soils associated with the existing landfill cap were found to generally consist of Sand and Silt mixtures (SM, ML) and Sand and Clay mixtures (SC), and Clays (CL) with significant amounts of gravel and significant amounts of cobbles and boulders encountered in some borings. Some borings encountered crushed stone (CR-6) layers within the soil cap. Existing cap fill soils extended to depths ranging between 1.5 feet and 8 feet. Test pits TP-279, TP-293, and TP-298 terminated in the existing cap soils (i.e. they were not fully penetrated). The existing cap fill depths for each test pit are presented on the following page in Table 1.

Table 1 – Existing Cap Fill Soil Depths

Test Pit	Cap Thickness (ft)	Test Pit	Cap Thickness (ft)	Test Pit	Cap Thickness (ft)
TP-200	NA	TP-243	1.3	TP-286	3.0
TP-201	NA	TP-244	1.0	TP-287	6.5
TP-202	NA	TP-245	1.3	TP-288	2.3
TP-203	NA	TP-246	3.8	TP-289	4.3
TP-204	2.0	TP-247	3.3	TP-290	2.7
TP-205	5.0	TP-248	1.5	TP-291	3.5
TP-206	2.0	TP-249	3.0	TP-292	1.5
TP-207	2.0	TP-250	1.8	TP-293	NP
TP-208	5.0	TP-251	1.0	TP-294	4.0
TP-209	0.9	TP-252	1.5	TP-295	5.0
TP-210	2.5	TP-253	5.5	TP-298	NP
TP-211	1.7	TP-254	3.9	TP-299	2.0
TP-212	1.7	TP-255	3.3	TP-301	5.8
TP-213	2.3	TP-256	4.8	TP-302	2.0
TP-214	3.0	TP-257	1.9	TP-303	4.3
TP-215	5.3	TP-258	4.0	TP-304	1.8
TP-216	2.3	TP-259	6.0	TP-305	3.3
TP-217	4.0	TP-260	4.0	TP-307	3.5
TP-218	4.0	TP-261	6.0	TP-308	3.5
TP-219	4.3	TP-262	2.0	TP-309	3.0
TP-220	3.0	TP-263	6.0	TP-310	1.0
TP-221	1.3	TP-264	3.0	TP-311	1.6
TP-222	1.5	TP-265	3.0	TP-312	3.5
TP-223	0.9	TP-266	2.3	TP-314	3.5
TP-224	2.3	TP-267	2.0	TP-315	1.3
TP-225	0.3	TP-268	3.0	TP-317	3.2
TP-226	1.5	TP-269	2.5	TP-318	2.5
TP-227	2.0	TP-270	3.0	TP-319	1.5
TP-228	3.5	TP-271	2.0	TP-320	3.9
TP-229	5.3	TP-272	3.5	TP-321	1.5
TP-230	2.7	TP-273	6.5	TP-322	2.3
TP-231	5.0	TP-274	4.0	TP-323	4.0
TP-232	3.0	TP-275	3.5	TP-324	2.2
TP-233	2.2	TP-276	3.0	TP-325	2.5
TP-234	3.3	TP-277	1.8	TP-326	3.0
TP-235	2.0	TP-278	2.8	TP-327	3.3
TP-236	2.7	TP-279	NP	TP-329	2.3
TP-237	3.5	TP-280	5.5	TP-330	6.0
TP-238	1.7	TP-281	3.5	TP-331	3.5
TP-239	3.8	TP-282	4.0	TP-332	3.5
TP-240	2.3	TP-283	5.5	TP-333	2.0
TP-241	3.0	TP-284	3.8	TP-334	5.5
TP-242	3.0	TP-285	3.5	TP-335	2.3

Notes: NA = Cap penetrated but no trash encountered; NP = Cap not penetrated

4.2.3 Landfill Trash

Landfill Trash was encountered beneath the existing cap soils in all locations with the exception of test pits TP-200, TP-201, TP-202, TP-203, TP-279, TP-293, and TP-298. The landfill trash generally consisted of various types of debris intermixed with varying amounts of soils. The depth to trash for each test pit are presented on the following page in Table 1.

4.2.4 Residual Soils

Residual soils were encountered beneath the existing cap fill soils in Test Pits TP-200 through TP-203. These soils generally consisted of clay and sand mixtures (USCS: CL) with varying amounts of gravel and extended to the depth of termination where encountered. No landfill trash was encountered in these test pits.

4.2.5 Environmental Screenings

No Combustible Gas or Oxygen readings exceeding the requirements in the Health and Safety Plan were noted during the investigation. All oxygen readings were noted as 20.9% with the exception of test pits performed during a period of precipitation in which slightly lower oxygen levels were noted. It is possible that the precipitation was the cause of the lower level of oxygen. The results of the screening for oxygen and LELs are presented below.

Table 2 – Environmental Monitoring Results

Test Pit	O_2 (%)	LEL (%)	Test Pit	O_2 (%)	LEL (%)	Test Pit	O_2 (%)	LEL (%)
TP-200	20.9	0	TP-243	20.3	0	TP-286	20.9	0
TP-201	20.9	0	TP-244	20.6	0	TP-287	20.9	0
TP-202	20.9	0	TP-245	20.9	0	TP-288	20.9	0
TP-203	20.9	0	TP-246	20.9	0	TP-289	20.9	0
TP-204	20.9	0	TP-247	20.9	0	TP-290	20.9	0
TP-205	20.9	0	TP-248	20.9	0	TP-291	20.9	0
TP-206	20.9	0	TP-249	20.9	0	TP-292	20.9	0
TP-207	20.9	0	TP-250	20.6	0	TP-293	20.9	0
TP-208	20.9	0	TP-251	20.9	0	TP-294	20.9	0
TP-209	20.9	0	TP-252	20.9	0	TP-295	20.9	0
TP-210	20.9	0	TP-253	20.9	0	TP-298	20.9	0
TP-211	20.9	0	TP-254	20.9	0	TP-299	20.9	0
TP-212	20.9	0	TP-255	20.9	0	TP-301	20.9	0

Notes: O_2 = Oxygen; LEL = Lower Explosive limit

Table 2 – Environmental Monitoring Results (cont.)

TP-213	20.9	0	TP-256	20.9	0	TP-302	20.9	0
TP-214	20.9	0	TP-257	20.9	0	TP-303	20.9	0
TP-215	20.9	0	TP-258	20.9	0	TP-304	20.9	0
TP-216	20.9	0	TP-259	20.9	0	TP-305	20.9	0
TP-217	20.9	0	TP-260	20.9	0	TP-307	20.9	0
TP-218	20.9	0	TP-261	20.9	0	TP-308	20.9	0
TP-219	20.9	0	TP-262	20.9	0	TP-309	20.9	0
TP-220	20.9	0	TP-263	20.9	0	TP-310	20.9	0
TP-221	20.9	0	TP-264	20.9	0	TP-311	20.9	0
TP-222	20.9	0	TP-265	20.9	0	TP-312	20.9	0
TP-223	20.9	0	TP-266	20.9	0	TP-314	20.9	0
TP-224	20.9	0	TP-267	20.9	0	TP-315	20.9	0
TP-225	20.9	0	TP-268	20.9	0	TP-317	20.9	0
TP-226	20.9	0	TP-269	20.9	0	TP-318	20.9	0
TP-227	20.9	0	TP-270	20.9	0	TP-319	20.9	0
TP-228	20.9	0	TP-271	20.9	0	TP-320	20.9	0
TP-229	20.9	0	TP-272	20.9	0	TP-321	20.9	0
TP-230	20.9	0	TP-273	20.9	0	TP-322	20.9	0
TP-231	20.9	0	TP-274	20.9	0	TP-323	20.9	0
TP-232	20.9	0	TP-275	20.9	0	TP-324	20.9	0
TP-233	20.9	0	TP-276	20.9	0	TP-325	20.9	0
TP-234	20.6	0	TP-277	20.9	0	TP-326	20.9	0
TP-235	20.6	0	TP-278	20.9	0	TP-327	20.9	0
TP-236	20.6	0	TP-279	20.9	0	TP-329	20.9	0
TP-237	20.9	0	TP-280	20.9	0	TP-330	20.9	0
TP-238	20.9	0	TP-281	20.9	0	TP-331	20.9	0
TP-239	20.9	0	TP-282	20.9	0	TP-332	20.9	0
TP-240	20.9	0	TP-283	20.9	0	TP-333	20.9	0
TP-241	20.4	0	TP-284	20.9	0	TP-334	20.9	0
TP-242	20.3	0	TP-285	20.9	0	TP-335	20.9	0

Notes: O_2 = Oxygen; LEL = Lower Explosive limit

4.2.7 Ground Water Conditions

Static groundwater was not observed in any of the test pits. Subsurface water levels will fluctuate with changes in rainfall and runoff, construction and development activities, and other causes. Future groundwater levels across the site should be expected to vary from those noted during the recent exploration program.

4.2.8 Laboratory Test Results

The completed laboratory index tests performed on samples of the existing cap fill soils are summarized on the following Table 1 - Laboratory Test Results. The laboratory results are presented in graphic form in **Appendix B**.

Table 3 – Laboratory Test Results

Boring	Sample Depth (ft)	USCS Class.	In-Place Moisture (%)	Atterberg Limits			- #200 Sieve (%)	Modified Proctor [1]	
				LL	PL	PI		MDD (pcf)	OMC (%)
TP-208	0.0 - 2.0	SM	27.6	36	26	10	48	118.7	13.3
TP-215	0.0 - 2.0	ML	29.8	36	25	11	62	115.0	14.4
TP-228	0.0 - 2.0	ML	26.3	40	27	13	71	112.9	15.5
TP-231	0.0 - 2.0	ML	28.9	34	24	10	62	118.2	13.6
TP-241	0.0 - 2.0	ML	29.7	38	31	7	52	121.7	9.0
TP-253	0.0 - 2.0	SM	24.1	35	29	6	41	119.4	12.4
TP-258	0.0 - 2.0	ML	26.0	37	26	11	60	115.8	13.8
TP-259	0.0 - 2.0	ML	31.0	49	37	12	54	108.4	17.8
TP-263	0.0 - 2.0	SM	31.0	36	30	6	41	117.6	10.5
TP-273	0.0 - 2.0	SM	24.3	30	24	6	49	121.7	12.0

Notes: [1] Modified Proctor performed in accordance with AASHTO T-180; MDD = Maximum Dry Density, OMC = Optimum Moisture Content

5.0 EVALUATION AND RECOMMENDATIONS

5.1 Topsoil Reuse

Generally, topsoil was encountered sporadically, with most plant covering growing directly in the existing fill soils with no distinct topsoil stratum. As such, the existing topsoil is not expected to be suitable for reuse as topsoil, since it is likely not cost effective to collect. However, it could be mixed with the existing cap fill soils for reuse with them.

5.2 Cap Fill Soil Reuse

The site soils are suitable for reuse as controlled compacted fills. It should be noted that the fill materials may contain minor amounts of trash debris however these are not expected to affect the reusability of the soils. Fill placed at any location requiring stable support or minimal settlement shall be constructed as controlled compacted fill. Compacted fill should be placed in relatively horizontal 8-inch loose lifts. Each lift should be uniformly and evenly bladed and mixed during spreading to ensure uniformity of the material in each layer. Each layer should be compacted to a minimum of 95 percent of the Modified Proctor maximum dry density as determined by AASHTO T-180. The moisture content of the materials shall be maintained such that the required degree of compaction can be obtained.

If fills are to be placed on slopes, the original ground should be deeply scarified, or where slopes are steeper than 5 horizontal to 1 vertical, the slope should be stepped or benched, when considered necessary by the Geotechnical Engineer, in order that the placement of fill may be accomplished in horizontal lifts.

5.3 Compaction Moisture Contents

It was noted that the measured natural moisture contents were both higher than the optimum moisture values for most efficient compaction. As a result, drying of excessively wet soils by special manipulation (aerating, discing, etc.) will be required in order to achieve the specified degree of compaction. However it should also be noted that the investigation took place during a period of particularly active precipitation, and the moisture contents obtained may not be indicative of more typical site conditions.

Wet weather could exacerbate the potential compaction difficulties. Cement or lime modification, or mixing with drier or more granular soils, or other methods, could also be used to improve wet or unstable soils at the time of compaction. If earthwork operations are performed during the winter months, the contractor must not work with frozen soils.

5.4 Weather Conditions

Weather (rainfall and freezing) has a huge influence on site earthwork, foundations, and concrete placement. Average monthly weather data reported by the nearest National Oceanic and Atmospheric Administration (NOAA) station, located within Baltimore, provide an insight to the local temperature and precipitation conditions.

Table 4 –Baltimore City NOAA station

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Precipitation[1] (in.)	2.84	2.32	3.56	2.99	3.89	3.43	3.85	3.74	3.98	3.16	3.02	3.03	39.81
Below Freezing Days	25	21	14	3	*	0	0	0	0	2	11	21	97

Source: National Oceanic and Atmospheric Administration, minimum 30-year reporting period
[1]Adjusted precipitation to reflect rainfall only (excludes frozen precipitation- pellets, sleet and hail).
*Not reported

According to NOAA, the typical monthly precipitation for the reporting station averages from 2.32 inches in February to 3.98 inches in September. The number of days experiencing freezing temperatures varied from 2 days in October to 25 days in January.

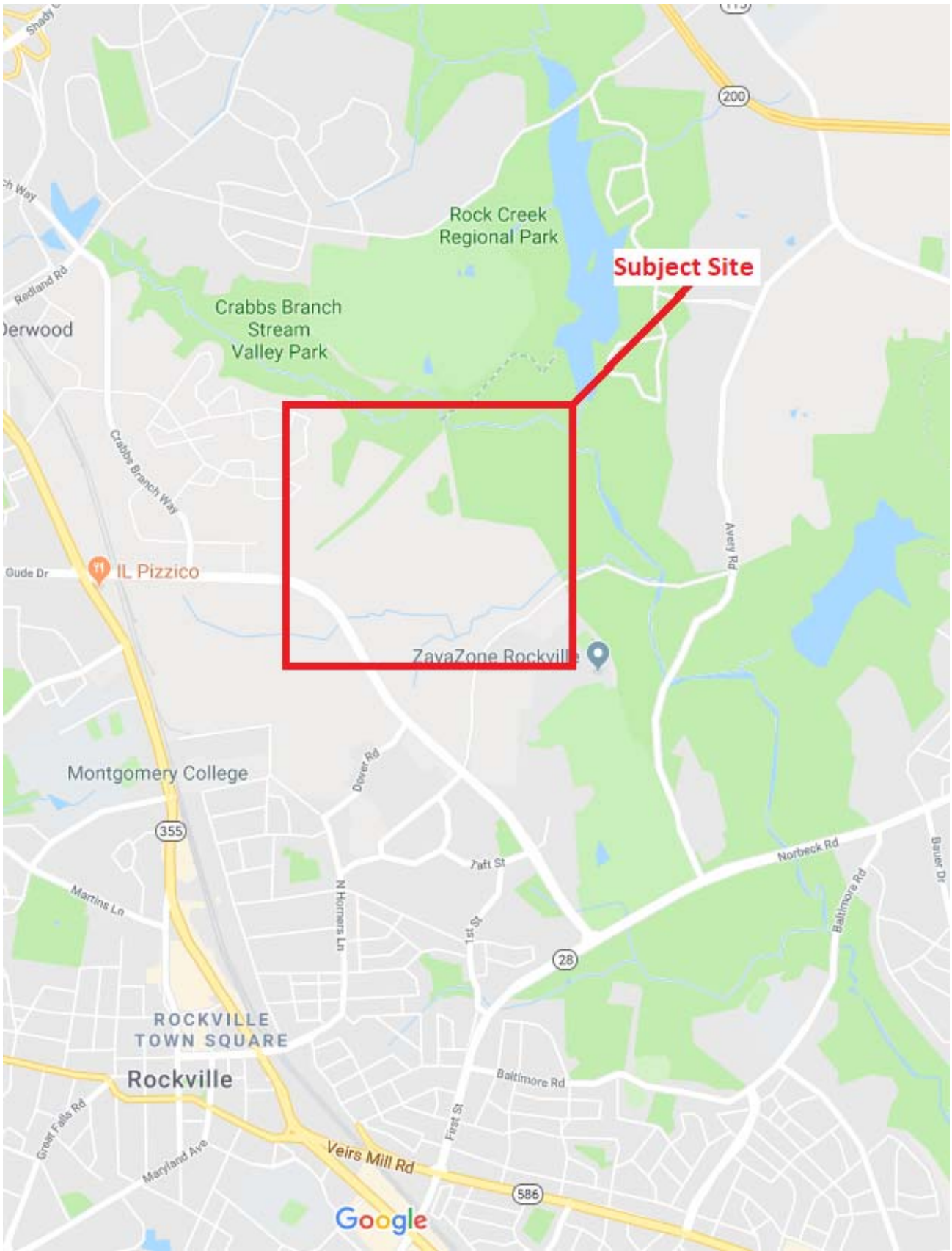
6.0 GEOTECHNICAL OBSERVATION AND TESTING

As variations in soil conditions can be expected to some degree on any project, it is strongly recommended that The Robert B. Balter Company, as project geotechnical engineer, provide full time, on-site observation and testing of all soil related aspects of construction. This is to assure compliance with design concepts and recommendations, and to verify that the subsurface conditions are consistent with those anticipated prior to construction.

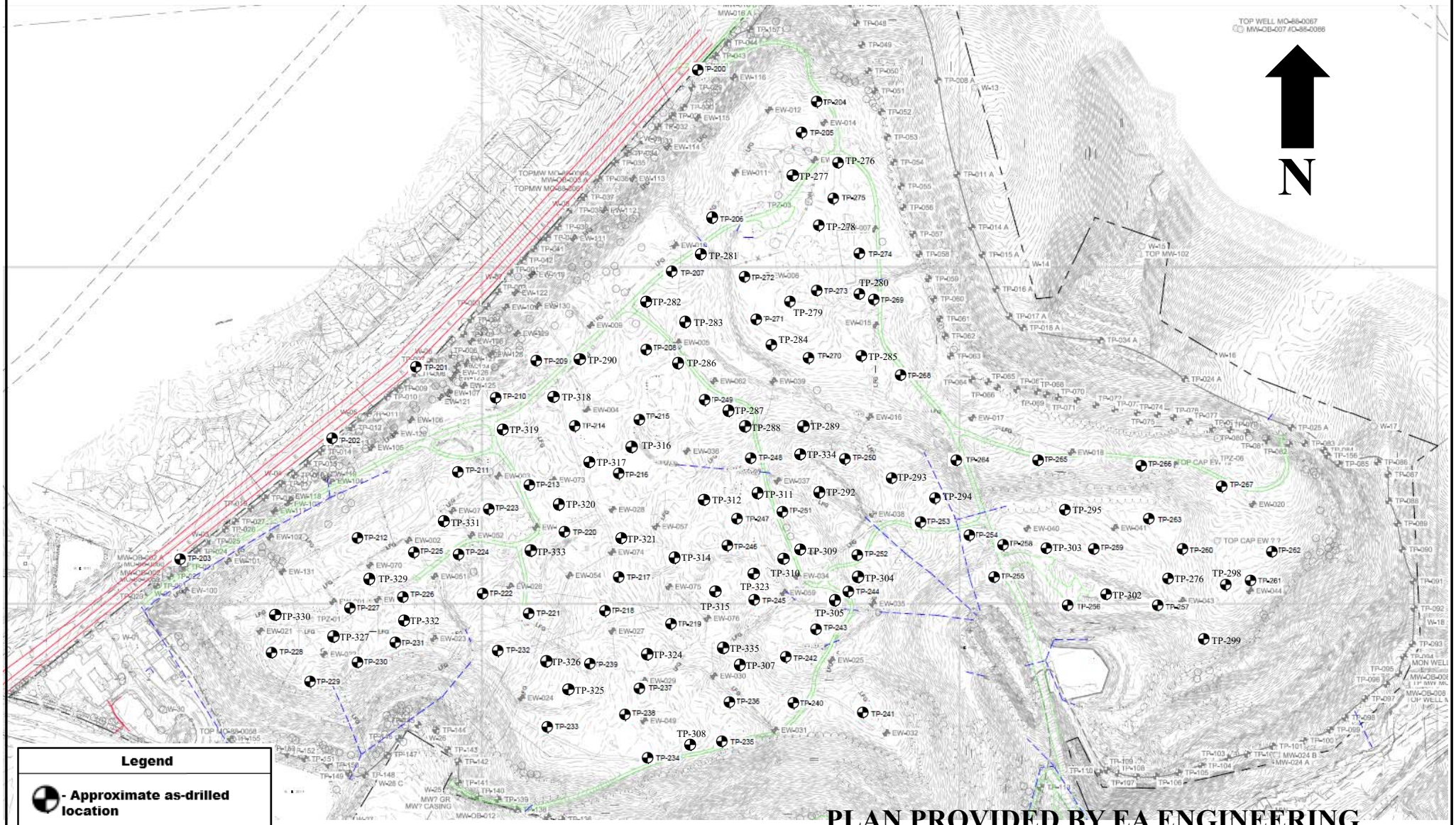
7.0 GENERAL COMMENTS

The evaluations and recommendations contained in this report were based upon the finite data obtained from the borings which are presented within this report. Although we have described typical variations which may affect the project, there is the possibility that significant unanticipated conditions may be present outside the specific boring locations. The nature and extent of differing subsurface conditions, as well as their impact on the proposed construction, will most likely not be evident until the time of construction. If significant differences are discovered in the field during construction, it may be necessary for us to re-evaluate and revise the contents of this report.

Also, this report specifically excludes exploration, sampling, testing, evaluation and recommendations relating to the presence of hazardous materials or other environmental concerns which could affect future development of the site. The Robert B. Balter Company performs such services and would be pleased to provide a proposal to address your needs.



Gude Landfill **Rockville, MD** THE ROBERT B. BALTER COMPANY® Geotechnical and Geo-environmental Engineers	**Site Vicinity Map**		**Project No.** **16943-0**
	Scale: None	**Date: Sept. 2018**	**PLATE 1**



PLAN PROVIDED BY EA ENGINEERING

THE ROBERT B. BALTER COMPANY®
Geotechnical and Geo-environmental Engineers

Gude Landfill
Rockville, MD

DRAFT BORING LOCATION PLAN

Project No. 16943-0

Date: August 2018

Plate 2

APPENDIX A

TEST PIT LOGS

THE ROBERT B. BALTER COMPANY

IDENTIFICATION OF SOIL SAMPLES

Soils are described in the boring logs according to the following criteria with the principal constituents written in capital letters. Other constituents are preceded by descriptive terminology that is used to denote the percentage of weight of each component. Soil descriptions are determined visually except where laboratory classification test data are available. Classifications are based on The Robert B. Balter Company's interpretation of ASTM D 2487-00.

COARSE GRAINED SOIL > 50% Retained on No. 200 Sieve	**GRAVEL**	0 to 5% Fines	Well Graded		**GW**	GRAVEL
			Poorly Graded		**GP**	GRAVEL
		6 to 12% Fines	Silty Fines	Well Graded	**GW-GM**	GRAVEL with Silt
				Poorly Graded	**GP-GM**	GRAVEL with Silt
			Clayey Fines	Well Graded	**GW-GC**	GRAVEL with Clay
				Poorly Graded	**GP-GC**	GRAVEL with Clay
		13 to 50% Fines	Silty Fines		**GM**	Silty GRAVEL
			Silty Clay Fines		**GC-GM**	Silty, Clayey GRAVEL
			Clayey Fines		**GC**	Clayey GRAVEL
	SAND	0 to 5% Fines	Well Graded		**SW**	SAND
			Poorly Graded		**SP**	SAND
		6 to 12% Fines	Silty Fines	Well Graded	**SW-SM**	SAND with Silt
				Poorly Graded	**SP-SM**	SAND with Silt
			Clayey Fines	Well Graded	**SW-SC**	SAND with Clay
				Poorly Graded	**SP-SC**	SAND with Clay
		13 to 50% Fines	Silty Fines		**SM**	Silty SAND
			Silty, Clayey Fines		**SC-SM**	Silty, Clayey SAND
			Clayey Fines		**SC**	Clayey SAND
FINE GRAINED SOIL ≥ 50% Passing No. 200 Sieve	**SILT & CLAY (LL<50)**	Low Plastic Fines, PI<4	Plots below "A" line		**ML**	SILT
		Low Plastic Fines, 4≤PI≤7	Plots on or above "A" line		**CL-ML**	Silty CLAY
		Plastic Fines, PI>7	Plots on or above "A" line		**CL**	Lean CLAY
		Significant Organics, PI<4	Plots below "A" line		**OL**	Organic SILT
		Significant Organics, PI≥4	Plots on or above "A" line		**OL**	Organic CLAY
	SILT & CLAY (LL≥50)	Elastic Fines	Plots below "A" line		**MH**	Elastic SILT
		Plastic Fines	Plots on or above "A" line		**CH**	Fat CLAY
		Significant Organics	Plots below "A" line		**OH**	Organic SILT
		Significant Organics	Plots on or above "A" line		**OH**	Organic CLAY
HIGHLY ORGANIC SOIL		Dark, highly organic, decomposed vegetative tissue			**PT**	PEAT

ADDITIONAL TERMINOLOGY:

Descriptive Components

Descriptive Terms	Proportions
Trace	1 - 5%
Little (Sand, Gravel)	6 - 14%
With (Sand, Gravel)	15 – 30%
With (Silt, Clay)	6 – 12%
Adjective Form (**Sandy, Gravelly**)	31 - 50%
Adjective Form (**Silty, Clayey**)	13 - 50%

Density or Consistency

SAND and GRAVEL		SILT and CLAY	
N-Value	**Density**	**N-Value**	**Consistency**
0-4	Very Loose	0-1	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Medium Stiff
31-50	Dense	9-15	Stiff
> 50	Very Dense	16-30	Very Stiff
		> 30	Hard

Fill materials are placed by man, and may be identified by unnatural artifacts, unnatural mixed grain sizes or layering, or trustworthy documentation of fill placement.
Possible Fill materials are difficult to distinguish from natural soils, exhibiting minor distinctions.
Decomposed Rock consists of residual soil with SPT N-values between 50 blows per foot and blows per 4 inches (50/4").
Highly Weathered Rock consists of residual soil with SPT N-values between 50/3" and 50/1".

The Robert B. Balter Company
Geotechnical and Environmental Engineers
Materials and Construction Inspection and Testing
Telephone No. (410) 363-1555
www.balterco.com

TEST PIT TP-200

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES _____

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			SM		Moist, Light Brown, Silty SAND (Fill)
					1.5
					Moist, Reddish Brown, Sandy CLAY
2.5					
5.0			CL		
7.5		Trash Not Encountered			8.0
					Bottom of test pit at 8.0 feet

The Robert B. Balter Company
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Materials and Construction Inspection and Testing
Telephone No. (410) 363-1555
www.balterco.com

TEST PIT TP-201

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES _____

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					
					Topsoil
0.3					
			CL		Moist, Reddish Brown, Sandy CLAY (Fill)
1.5					
					Moist, Reddish Brown, Sandy CLAY
2.5					
			CL		
5.0					
7.5					
		Trash Not Encountered			
8.0					
					Bottom of test pit at 8.0 feet

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TEST PIT TP-202

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES _____

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					0.1 Topsoil
			CL		Moist, Light Brown, Sandy CLAY (Fill)
					1.8 Moist, Red Brown, Sandy CLAY (Fill)
2.5					
5.0			CL		
7.5		Trash Not Encountered			8.0 Bottom of test pit at 8.0 feet

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TEST PIT TP-203

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES _____

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					0.1 Topsoil
			CL		Moist, Reddish Brown, Sandy CLAY (Fill)
					2.0
2.5					Moist, Reddish Brown, Sandy CLAY
5.0			CL		
7.5		Trash Not Encountered			8.0
					Bottom of test pit at 8.0 feet

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TEST PIT TP-204

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.11148 Long: -77.13783

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
4.0				
				Trash
4.5				
				Bottom of test pit at 4.0 feet

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TEST PIT TP-205

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.11118 Long: -77.13796

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				Moist, Light Brown, Silty SAND
2.5		SM		
5.0				5.0
				Trash
				5.5
				Bottom of test pit at 5.5 feet

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TEST PIT TP-206

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.11053 Long: -77.13894

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.0				Trash
2.5				
3.0				Bottom of test pit at 3.0 feet

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TEST PIT TP-207

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.11008 Long: -77.13921

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.0				Trash
2.5				Bottom of test pit at 2.5 feet

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TEST PIT TP-208

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10939 Long: -77.13972

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					
			SM		Moist, Light Brown, Silty SAND
2.5					
5.0					5.0
					Trash
					6.0
					Bottom of test pit at 6.0 feet

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TEST PIT TP-209

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10926 Long: -77.14083

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM	F F	Moist, Light Brown, Silty SAND
0.9				Trash
1.5				Bottom of test pit at 1.5 feet

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TEST PIT TP-210

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10896 Long: -77.14148

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				Trash
				4.0
				Bottom of test pit at 4.0 feet

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TEST PIT TP-211

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10841 Long: -77.14166

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.7				Trash
2.3				Bottom of test pit at 2.3 feet

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TEST PIT TP-212

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10788 Long: -77.14278

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.7				Trash
2.5				Bottom of test pit at 2.5 feet

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TEST PIT TP-213

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10826 Long: -77.1409

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.3				Trash
2.5				
3.2				Bottom of test pit at 3.2 feet

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TEST PIT TP-214

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10877 Long: -77.14042

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
				3.0
				Trash
				3.5
				Bottom of test pit at 3.5 feet

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TEST PIT TP-215

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10899 Long: -77.13973

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					Moist, Light Brown, Sandy SILT
2.5			ML		
5.0					
					5.3
					Trash
					6.5
					Bottom of test pit at 6.5 feet

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TEST PIT TP-216

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10851 Long: -77.13996

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.3				
2.5				Trash
3.5				Bottom of test pit at 3.5 feet

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TEST PIT TP-217

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10756 Long: -77.13993

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
4.0				Trash
4.7				Bottom of test pit at 4.7 feet

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TEST PIT TP-218

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10719 Long: -77.14022

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
4.0				Trash
5.0				Bottom of test pit at 5.0 feet

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TEST PIT TP-219

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10721 Long: -77.1394

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
4.3				Trash
5.0				Bottom of test pit at 5.0 feet

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TEST PIT TP-220

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10789 Long: -77.14055

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
				3.0
				Trash
				3.3
				Bottom of test pit at 3.3 feet

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TEST PIT TP-221

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10726 Long: -77.14095

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.3				Trash
1.7				Bottom of test pit at 1.7 feet

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TEST PIT TP-222

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10736 Long: -77.14129

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.5				Trash
2.0				Bottom of test pit at 2.0 feet

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TEST PIT TP-223

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10799 Long: -77.14142

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM	F F	Moist, Light Brown, Silty SAND
0.9				Trash
2.0				Bottom of test pit at 2.0 feet

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TEST PIT TP-224

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10762 Long: -77.14197

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.3				Trash
2.5				Bottom of test pit at 2.7 feet
2.7				

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TEST PIT TP-225

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10778 Long: -77.14199

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM	F	Moist, Light Brown, Silty SAND
0.3				Trash
1.7				Bottom of test pit at 1.7 feet

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TEST PIT TP-226

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10732 Long: -77.14234

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.5				Trash
2.0				Bottom of test pit at 2.1 feet

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TEST PIT TP-227

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10709 Long: -77.14275

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.0				Trash
2.5				Bottom of test pit at 2.5 feet

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TEST PIT TP-228

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.1069 Long: -77.14385

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			ML		Moist, Light Brown, Sandy SILT
2.5					
					3.5
					Trash
					4.0
					Bottom of test pit at 4.0 feet

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TEST PIT TP-229

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10657 Long: -77.1433

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
5.3				Trash
5.7				Bottom of test pit at 5.7 feet

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TEST PIT TP-230

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10674 Long: -77.14291

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
			2.7	
				Trash
			4.0	
				Bottom of test pit at 4.0 feet

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TEST PIT TP-231

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10682 Long: -77.14237

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					Moist, Light Brown, Silty SAND
2.5			ML		
5.0					5.0
					Trash
					5.5
					Bottom of test pit at 5.5 feet

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TEST PIT TP-232

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10691 Long: -77.1414

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
				3.0
				Trash
				3.3
				Bottom of test pit at 3.3 feet

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TEST PIT TP-233

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10613 Long: -77.14079

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.2				Trash
2.5				
3.5				Bottom of test pit at 3.5 feet

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TEST PIT TP-234

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10595 Long: -77.13967

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.3				Trash
4.0				Bottom of test pit at 4.0 feet

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TEST PIT TP-235

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10613 Long: -77.13878

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.0				Trash
2.5				Bottom of test pit at 2.7 feet

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TEST PIT TP-236

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10645 Long: -77.13873

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
			2.7	
				Trash
			3.0	
				Bottom of test pit at 3.0 feet

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TEST PIT TP-237

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10652 Long: -77.1396

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.5				Trash
4.0				Bottom of test pit at 4.1 feet

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TEST PIT TP-238

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10627 Long: -77.13977

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.7				Trash
2.5				Bottom of test pit at 2.7 feet
2.7				

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TEST PIT TP-239

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10656 Long: -77.14034

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/18/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
3.8				Trash
5.0				Bottom of test pit at 5.0 feet

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TEST PIT TP-240

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: N/A Long: N/A

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.3				Trash
2.5				
3.0				Bottom of test pit at 3.0 feet

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TEST PIT TP-241

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10637 Long: -77.13711

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			ML		Moist, Light Brown, Sandy SILT
2.5					
					3.0
					3.3 Trash
					Bottom of test pit at 3.0 feet

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TEST PIT TP-242

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD _____
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.1065 Long: -77.13825

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
			3.0	
			3.3	Trash
				Bottom of test pit at 3.0 feet

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TEST PIT TP-243

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10665 Long: -77.13783

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.3				Trash
2.3				Bottom of test pit at 2.3 feet

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TEST PIT TP-244

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10739 Long: -77.13747

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.0				Trash
1.3				Bottom of test pit at 1.4 feet

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TEST PIT TP-245

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10734 Long: -77.13841

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.3				Trash
2.5				
3.3				Bottom of test pit at 3.3 feet

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TEST PIT TP-246

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10779 Long: -77.13878

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
3.8				Trash
5.2				Bottom of test pit at 6.2 feet
2.5				
5.0				

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TEST PIT TP-247

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10806 Long: -77.13856

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.3				
3.5				Trash
				Bottom of test pit at 3.6 feet

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TEST PIT TP-248

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10856 Long: -77.1384

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.5				Trash
2.0				Bottom of test pit at 2.0 feet

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TEST PIT TP-249

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10801 Long: -77.13895

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
				3.0
				Trash
				3.5
				Bottom of test pit at 3.5 feet

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TEST PIT TP-250

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10853 Long: -77.13708

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.8				Trash
2.0				Bottom of test pit at 2.0 feet

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TEST PIT TP-251

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10802 Long: -77.13806

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.0				Trash
2.5				
3.0				Bottom of test pit at 3.0 feet

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TEST PIT TP-252

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10769 Long: -77.13729

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.5				Trash
2.0				Bottom of test pit at 2.0 feet

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TEST PIT TP-253

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10805 Long: -77.1365

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			SM		Moist, Light Brown, Silty SAND
5.5					Trash
7.0					
10.0					Bottom of test pit at 10.0 feet

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TEST PIT TP-254

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.107852 Long: -77.13603

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
			0.3	Topsoil
		SM		Moist, Reddish Brown, Silty SAND with Gravel (Fill)
2.5				
			3.9	
				Trash
			4.3	
				Bottom of test pit at 4.3 feet

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TEST PIT TP-255

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.107514 Long: -77.135773

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				Topsoil
			0.3	
		SM		Moist, Brown, Silty SAND with Gravel And Boulders
2.5				
			3.3	
			3.5	Trash
				Bottom of test pit at 3.3 feet

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TEST PIT TP-256

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.107207 Long: -77.135056

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				Topsoil
			0.3	
		SM		Moist, Brown, Silty SAND with Gravel
2.5				
			4.8	
5.0				Trash
			6.5	
				Bottom of test pit at 6.5 feet

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TEST PIT TP-257

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10724 Long: -77.134086

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
		SM		0.1 Topsoil Dry, Brown, Silty SAND with Gravel
				1.9 Trash
2.5				3.0 Bottom of test pit at 3.0 feet

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TEST PIT TP-258

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.107704 Long: -77.135629

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					Topsoil
					0.5
			ML		Moist, Brown, Sandy SILT
2.5					
					4.0
					Trash
					4.5
					Bottom of test pit at 4.5 feet

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TEST PIT TP-259

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.107749 Long: -77.134712

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					Topsoil
				0.3	
			ML		Moist, Brown, Sandy SILT
2.5					
5.0					
				6.0	
					Trash
				6.9	
					Bottom of test pit at 6.8 feet

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TEST PIT TP-260

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10566 Long: -77.13373

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Brown, SIlty SAND
2.5				
4.0				Trash
4.5				Bottom of test pit at 4.6 feet

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TEST PIT TP-261

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10746 Long: -77.133188

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
5.0				
6.0				Trash
6.5				Bottom of test pit at 6.5 feet

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TEST PIT TP-262

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.107675 Long: -77.133093

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Brown, Silty SAND
2.0				Trash
2.5				
3.8				Bottom of test pit at 3.8 feet

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TEST PIT TP-263

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.107969 Long: -77.134034

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					Topsoil
0.5					Moist, Brown, Silty SAND
2.5			SM		
5.0					
6.0					Trash
7.5					
10.0					

Bottom of test pit at 10.0 feet

GENERAL BH / TP / WELL 16943-0 GUDE LANDFILL.GPJ ROBERT B BALTER.GDT 9/5/18

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TEST PIT TP-264

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.108534 Long: -77.136183

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Brown, Silty SAND with Boulders
3.0				Trash
5.5				Bottom of test pit at 5.5 feet

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TEST PIT TP-265

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.108515 Long: -77.135298

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Reddish Brown, Silty SAND
2.5				
				3.0
				Trash
				3.7
				Bottom of test pit at 3.7 feet

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TEST PIT TP-266

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.108506 Long: -77.134112

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Brown, Silty SAND
2.3				Trash
2.5				
3.2				Bottom of test pit at 3.2 feet

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TEST PIT TP-267

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/16/18 **COMPLETED** 7/16/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.108229 Long: -77.13338

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/16/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Brown, Silty SAND
2.0				Trash
2.5				
3.0				Bottom of test pit at 3.0 feet

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TEST PIT TP-268

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10909 Long: -77.13675

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
				3.0
				Trash
				3.5
				Bottom of test pit at 3.5 feet

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TEST PIT TP-269

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10985 Long: -77.13716

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				Trash
3.5				Bottom of test pit at 3.5 feet

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Telephone No. (410) 363-1555
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TEST PIT TP-270

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10939 Long: -77.1377

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
				3.0
				Trash
				3.5
				Bottom of test pit at 3.5 feet

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TEST PIT TP-271

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10966 Long: -77.13839

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.0				Trash
2.3				Bottom of test pit at 2.3 feet

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TEST PIT TP-272

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10686 Long: -77.1832

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.0		GM		Moist, Gray, Silty GRAVEL
1.5		SM		Moist, Light Brown, Silty SAND
2.5				
3.5				Trash
4.5				Bottom of test pit at 4.5 feet

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TEST PIT TP-273

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10993 Long: -77.13773

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					Moist, Reddish Brown, Sandy CLAY
2.5			CL		
5.0					
					6.5
					Trash
					7.0
					Bottom of test pit at 7.0 feet

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TEST PIT TP-274

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.11031 Long: -77.13718

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
4.0				Trash
4.5				Bottom of test pit at 4.5 feet

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TEST PIT TP-275

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/17/18 **COMPLETED** 7/17/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.11088 Long: -77.13745

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/17/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.5				Trash
4.0				Bottom of test pit at 4.0 feet

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TEST PIT TP-276

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.11103 Long: -77.13744

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
			3.0	
				Trash
			3.8	
				Bottom of test pit at 3.8 feet

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TEST PIT TP-277

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.11097 Long: -77.13793

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		GM		Crushed Stone
				0.9
		SM		Moist, Light Brown, Silty SAND
				1.8
2.5				Trash
				2.7
				Bottom of test pit at 2.7 feet

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TEST PIT TP-278

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.11052 Long: -77.13746

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
			2.8	Trash
			3.7	Bottom of test pit at 3.7 feet

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TEST PIT TP-279

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10976 Long: -77.13802

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			SM		Moist, Light Brown, Silty SAND with trace amount of trash debris
2.5					
5.0					
7.5		Trash Not Encountered			8.0
					Bottom of test pit at 8.0 feet

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TEST PIT TP-280

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10993 Long: -77.1375

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				Asphalt Debris
0.8		SM		Moist, Light Brown, Silty SAND with variable amounts of garbage
2.5				
5.0				
5.5				Trash
6.5				Bottom of test pit at 6.5 feet

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TEST PIT TP-281

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.11028 Long: -77.1391

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.5				Trash
4.8				Bottom of test pit at 4.8 feet

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TEST PIT TP-282

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10991 Long: -77.13948

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
4.0				Trash
5.3				Bottom of test pit at 5.3 feet

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TEST PIT TP-283

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10964 Long: -77.13941

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				Moist, Light Brown, Silty SAND
2.5		SM		
5.0				
				5.5
				Trash
				7.0
				Bottom of test pit at 7.0 feet

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TEST PIT TP-284

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10951 Long: -77.13799

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.8				Trash
4.5				Bottom of test pit at 4.5 feet

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TEST PIT TP-285

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10952 Long: -77.13738

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.5				Trash
4.7				Bottom of test pit at 4.7 feet

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TEST PIT TP-286

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10932 Long: -77.13918

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
				3.0
				Trash
				3.7
				Bottom of test pit at 3.7 feet

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TEST PIT TP-287

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.1089 Long: -77.13878

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
6.5				Trash
7.5				Bottom of test pit at 7.5 feet

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TEST PIT TP-288

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10865 Long: -77.13855

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.3				Trash
2.5				
4.0				Bottom of test pit at 4.0 feet

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TEST PIT TP-289

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10885 Long: -77.13804

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
4.3				Trash
6.5				Bottom of test pit at 6.5 feet
2.5				
5.0				

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TEST PIT TP-290

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10935 Long: -77.14033

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
			2.7	
				Trash
			3.0	
				Bottom of test pit at 3.0 feet

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TEST PIT TP-291

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10877 Long: -77.13928

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
3.5				Trash
5.0				Bottom of test pit at 5.0 feet

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TEST PIT TP-292

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10834 Long: -77.13774

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.5				Trash
2.5				
4.0				Bottom of test pit at 4.0 feet

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TEST PIT TP-293

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.1085 Long: -77.13673

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					Moist, Light Brown, Silty SAND
2.5			SM		
5.0					
7.5					
		Trash Not Encountered			8.0
					Bottom of test pit at 8.0 feet

The Robert B. Balter Company
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Telephone No. (410) 363-1555
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TEST PIT TP-294

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10817 Long: -77.13632

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
4.0				Trash
4.5				Bottom of test pit at 4.5 feet

The Robert B. Balter Company
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TEST PIT TP-295

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.1081 Long: -77.13471

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				Moist, Light Brown, Silty SAND
2.5		SM		
5.0				5.0
				Trash
				6.0
				Bottom of test pit at 6.0 feet

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TEST PIT TP-298

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.1073 Long: -77.13336

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					Moist, Light Brown, Silty SAND
2.5			SM		
5.0					
7.5					
		Trash Not Encountered			8.0
					Bottom of test pit at 8.0 feet

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TEST PIT TP-299

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10701 Long: -77.13348

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.0				Trash
2.5				2.7
				Bottom of test pit at 2.7 feet

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TEST PIT TP-301

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10739 Long: -77.13395

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
5.8				Trash
7.0				Bottom of test pit at 7.0 feet

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TEST PIT TP-302

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10737 Long: -77.13473

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.0				Trash
2.5				3.0
				Bottom of test pit at 3.0 feet

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TEST PIT TP-303

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10767 Long: -77.13531

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
4.3				Trash
5.0				Bottom of test pit at 5.0 feet

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TEST PIT TP-304

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10749 Long: -77.13753

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.8				Trash
2.5				
3.0				Bottom of test pit at 3.0 feet

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TEST PIT TP-305

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.1074 Long: -77.13733

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.3				Trash
4.0				Bottom of test pit at 4.0 feet

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TEST PIT TP-307

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10668 Long: -77.13871

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.5				Trash
4.0				Bottom of test pit at 4.0 feet

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TEST PIT TP-308

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10613 Long: -77.13903

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
3.5				
3.7				Trash
				Bottom of test pit at 1.8 feet

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TEST PIT TP-309

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10789 Long: -77.13805

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
			3.0	
				Trash
			3.8	
				Bottom of test pit at 3.8 feet

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TEST PIT TP-310

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10764 Long: -77.13807

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.0				Trash
2.5				
4.1				Bottom of test pit at 4.1 feet

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TEST PIT TP-311

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10814 Long: -77.13841

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.6				Trash
2.5				
3.0				Bottom of test pit at 3.0 feet

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TEST PIT TP-312

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10807 Long: -77.13892

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.5				Trash
4.0				Bottom of test pit at 4.0 feet

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TEST PIT TP-314

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: N/A Long: N/A

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.5				Trash
4.5				Bottom of test pit at 4.5 feet

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TEST PIT TP-315

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10742 Long: -77.139

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.3				Trash
2.5				
3.3				Bottom of test pit at 3.3 feet

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TEST PIT TP-317

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10847 Long: -77.14028

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.2				Trash
4.0				Bottom of test pit at 4.0 feet

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TEST PIT TP-318

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10904 Long: -77.14062

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				Trash
3.8				Bottom of test pit at 3.8 feet

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TEST PIT TP-319

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10879 Long: -77.14117

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.5				Trash
2.5				Bottom of test pit at 2.5 feet

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TEST PIT TP-320

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10809 Long: -77.14083

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.9				Trash
4.9				Bottom of test pit at 4.8 feet

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TEST PIT TP-321

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10799 Long: -77.14

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
1.5				Trash
2.5				
3.2				Bottom of test pit at 3.2 feet

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TEST PIT TP-322

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10762 Long: -77.14041

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.3				Trash
2.5				
3.0				Bottom of test pit at 3.0 feet

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TEST PIT TP-323

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10753 Long: -77.1384

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
4.0				Trash
5.2				Bottom of test pit at 5.2 feet

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Telephone No. (410) 363-1555
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TEST PIT TP-324

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10692 Long: -77.13959

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.2				Trash
2.5				
3.8				Bottom of test pit at 4.0 feet

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TEST PIT TP-325

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.1064 Long: -77.14037

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				Trash
				4.0
				Bottom of test pit at 4.0 feet

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TEST PIT TP-326

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10673 Long: -77.14073

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
				3.0
				Trash
				4.5
				Bottom of test pit at 4.5 feet

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TEST PIT TP-327

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10714 Long: -77.14309

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.3				Trash
4.2				Bottom of test pit at 4.2 feet

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TEST PIT TP-329

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10752 Long: -77.14253

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.3				Trash
2.5				
3.0				Bottom of test pit at 3.0 feet

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TEST PIT TP-330

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10728 Long: -77.14366

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
6.0				Trash
7.0				Bottom of test pit at 7.0 feet

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TEST PIT TP-331

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10803 Long: -77.14175

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.5				Trash
4.2				Bottom of test pit at 4.2 feet

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TEST PIT TP-332

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10711 Long: -77.1423

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.5				
3.5				Trash
4.5				Bottom of test pit at 4.5 feet

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TEST PIT TP-333

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10778 Long: -77.1409

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.0				Trash
2.5				
3.3				Bottom of test pit at 3.3 feet

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TEST PIT TP-334

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/19/18 **COMPLETED** 7/19/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10849 Long: -77.13795

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/19/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				Moist, Light Brown, Silty SAND
2.5		SM		
5.0				
				5.5
				Trash
				6.0
				Bottom of test pit at 6.0 feet

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TEST PIT TP-335

CLIENT EA Engineering, Inc.
PROJECT NAME Gude Landfill
PROJECT LOCATION Montgomery County, Maryland
PROJECT NUMBER 16943-0 MD
DATE STARTED 7/20/18 **COMPLETED** 7/20/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR The Robert B. Balter Company
EXCAVATION METHOD Case 580N Backhoe
LOGGED BY J. Bailey **CHECKED BY** K. Crist
NOTES Lat: 39.10695 Long: -77.13868

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
7/20/18		0 ▽			NE	

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		SM		Moist, Light Brown, Silty SAND
2.3				Trash
2.5				
3.0				Bottom of test pit at 3.0 feet

APPENDIX B

LABORATORY TEST RESULTS

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SUMMARY OF LABORATORY RESULTS

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/31/2018

Borehole	Depth	Sample Number	Liquid Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	AASHTO Classification	ASTM Classification	Water Content (%)	Max Dry Density (pcf)	Optimum Moisture (%)	CBR Value
TP-208	0.0' - 2.0'	BULK	36	10	37.5	48	A-4	SM	27.6	118.7	13.3	
TP-215	0.0' - 2.0'	BULK	36	11	25	62	A-6	ML	29.8	115.0	14.4	
TP-228	0.0' - 2.0'	BULK	40	13	12.5	71	A-6	ML	26.3	112.9	15.5	
TP-231	0.0' - 2.0'	BULK	34	10	19	62	A-4	ML	28.9	118.2	13.6	
TP-241	0.0' - 2.0'	BULK	38	7	12.5	52	A-4	ML	29.7	121.7	9.0	
TP-253	0.0' - 2.0'	BULK	35	6	37.5	41	A-4	SM	24.1	119.4	12.4	
TP-258	0.0' - 2.0'	BULK	37	11	37.5	60	A-6	ML	26.0	115.8	13.8	
TP-259	0.0' - 2.0'	BULK	49	12	37.5	54	A-7-5	ML	31.0	108.4	17.8	
TP-263	0.0' - 2.0'	BULK	36	6	25	41	A-4	SM	31.0	117.6	10.5	
TP-273	0.0' - 2.0'	BULK	30	6	25	49	A-4	SM	24.3	121.7	12.0	

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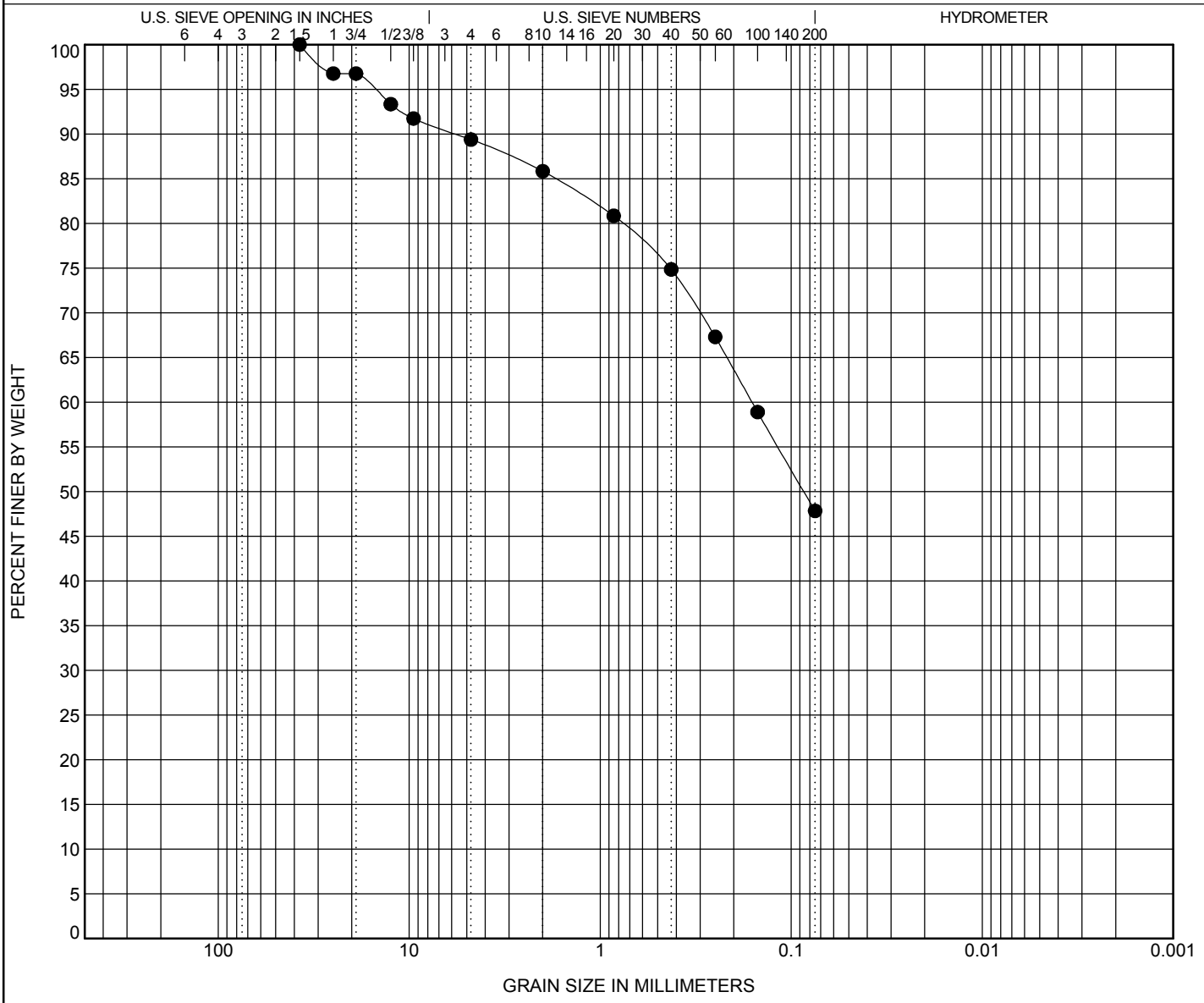
TEST METHOD ASTM D422

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/31/2018



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**TP-208, BULK**	**Darek Yellowish Brown SILTY SAND(SM) {A-4, GI=2}**	**36**	**26**	**10**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-208, BULK**	**37.5**	**0.16**			**10.6**	**41.5**	**47.8**	

COPY OF GRAIN SIZE ASTM AND AASHTO 16943-0 GUDE LANDFILL.GPJ MTA REDLINE.GDT 8/6/18

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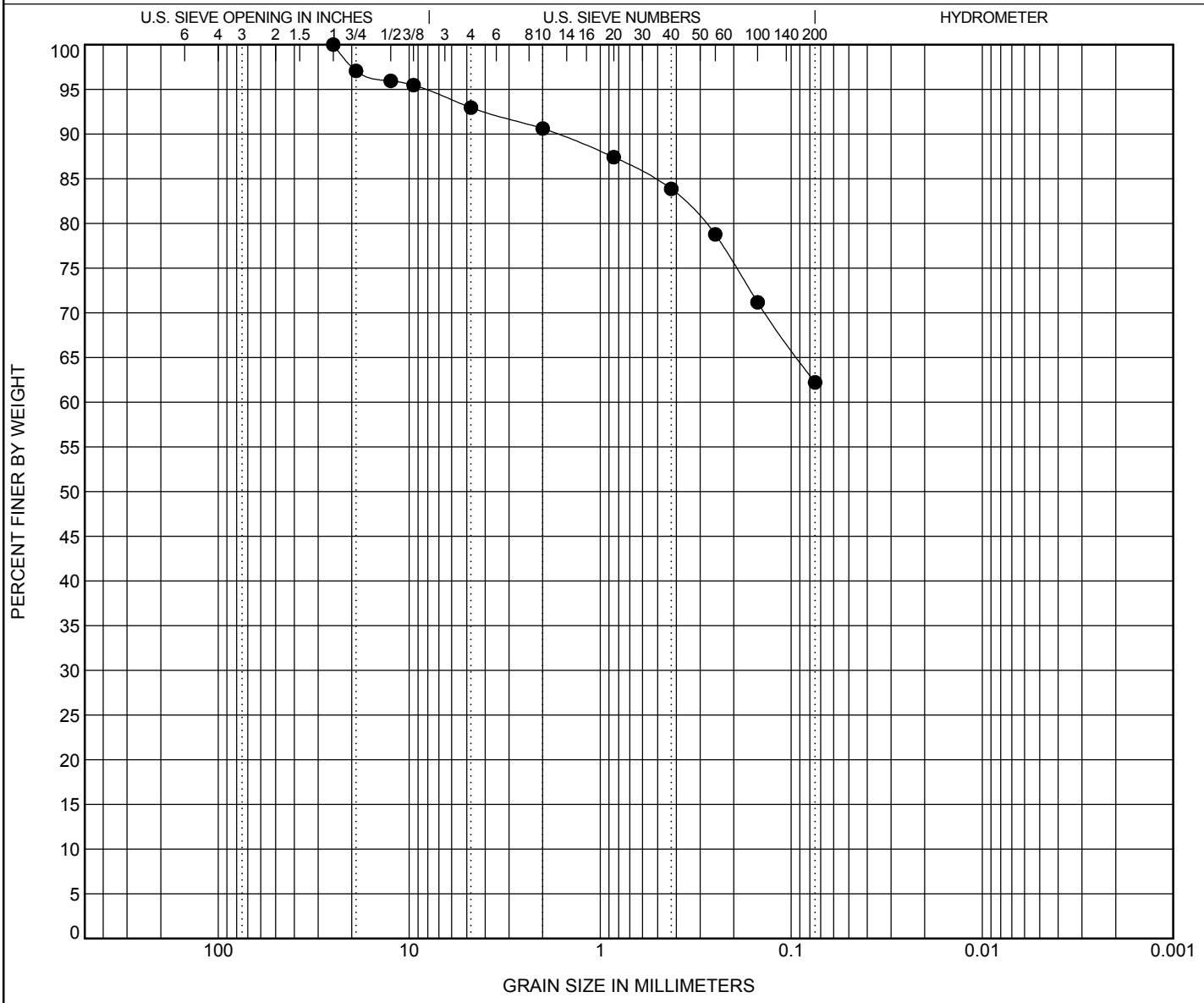
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/31/2018



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**TP-215, BULK**	**Reddish Brown SANDY SILT(ML) {A-6, GI=5}**	**36**	**25**	**11**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-215, BULK**	**25**				**7.1**	**30.7**	**62.2**	

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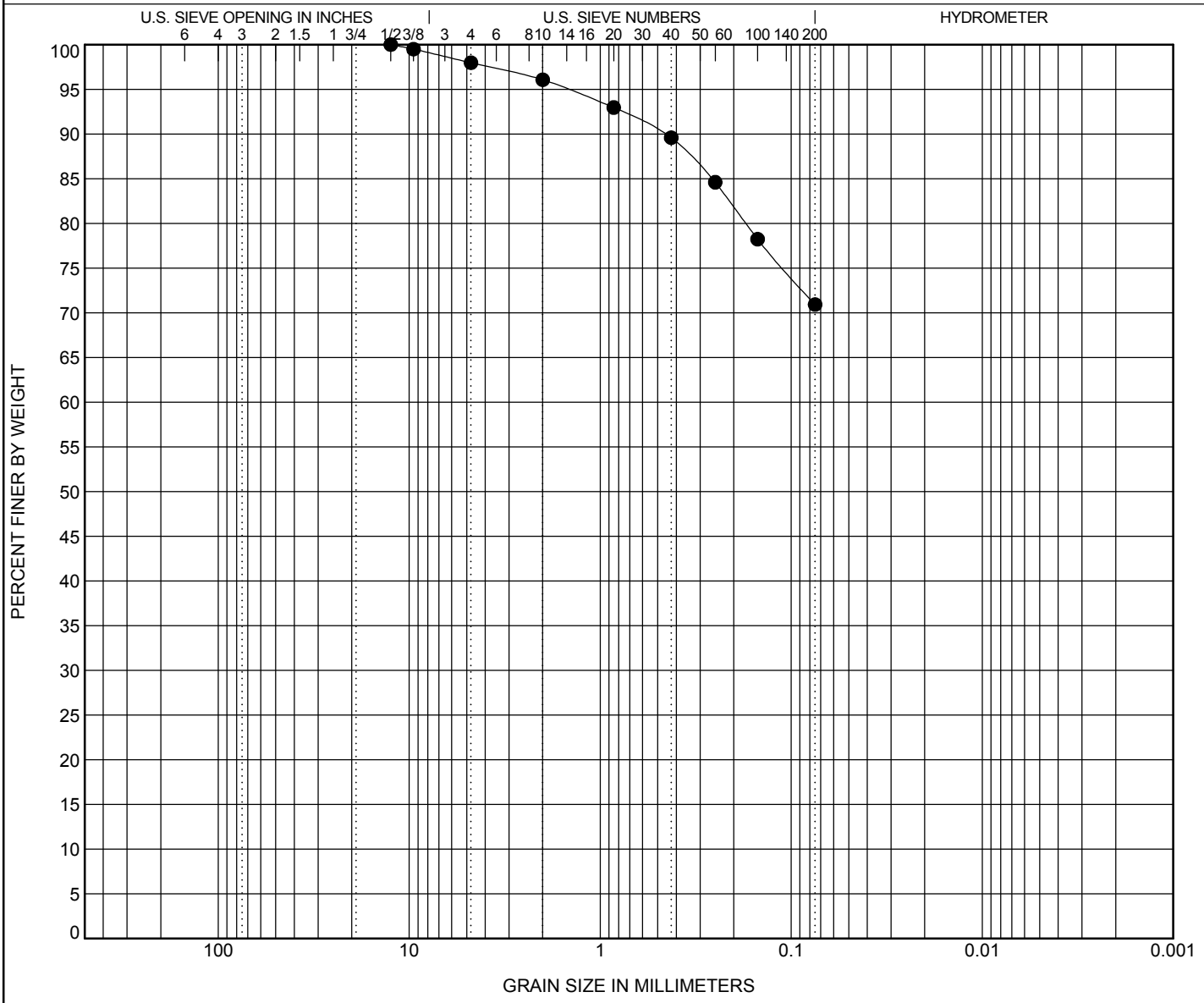
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/29/2018



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**TP-228, BULK**	**Yellowish Red SILT with SAND(ML) {A-6, GI=9}**	**40**	**27**	**13**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-228, BULK**	**12.5**				**2.0**	**27.0**	**70.9**	

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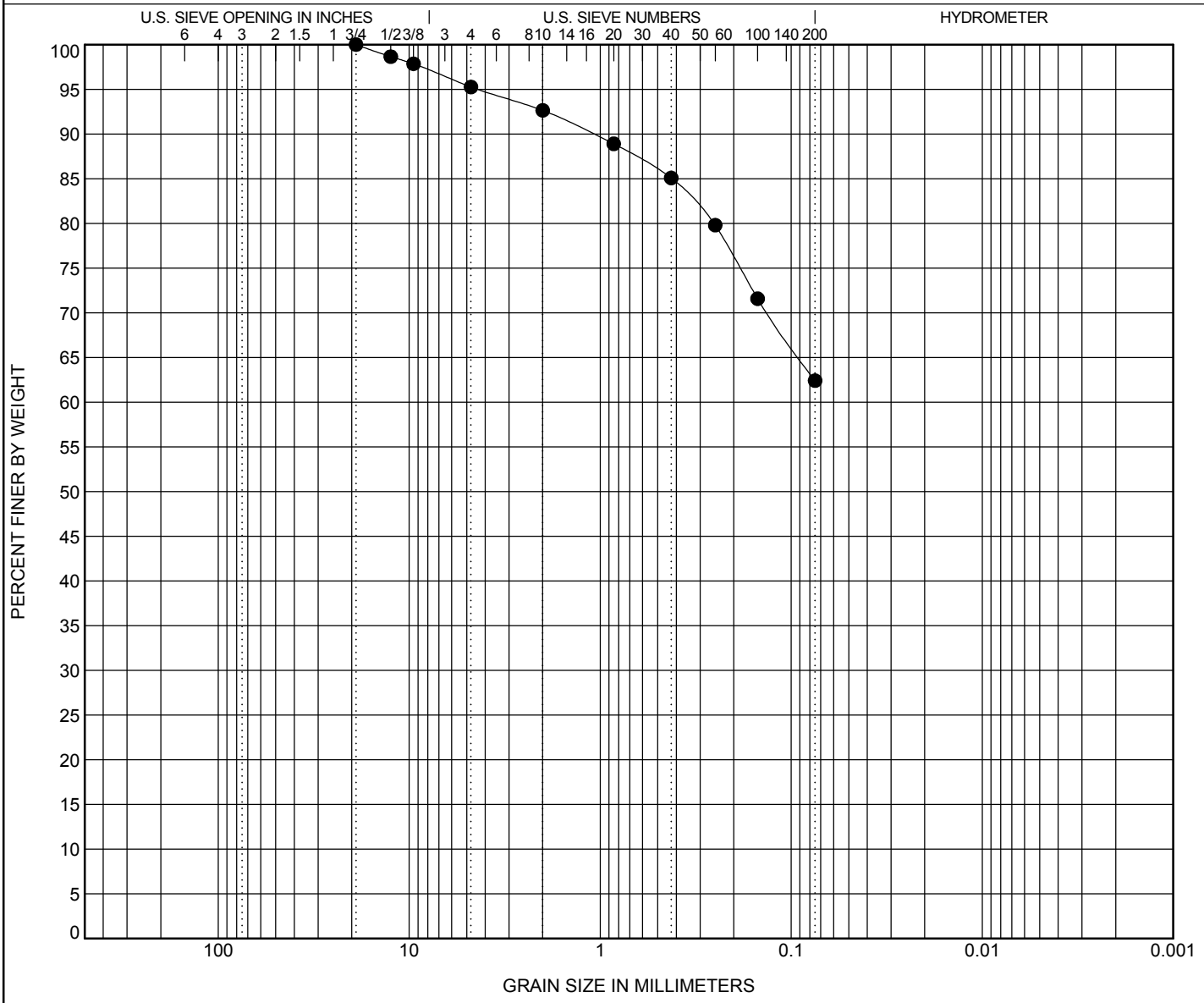
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/29/2018



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**TP-231, BULK**	**Yellowish Red SANDY SILT(ML) {A-4, GI=5}**	**34**	**24**	**10**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-231, BULK**	**19**				**4.7**	**32.9**	**62.4**	

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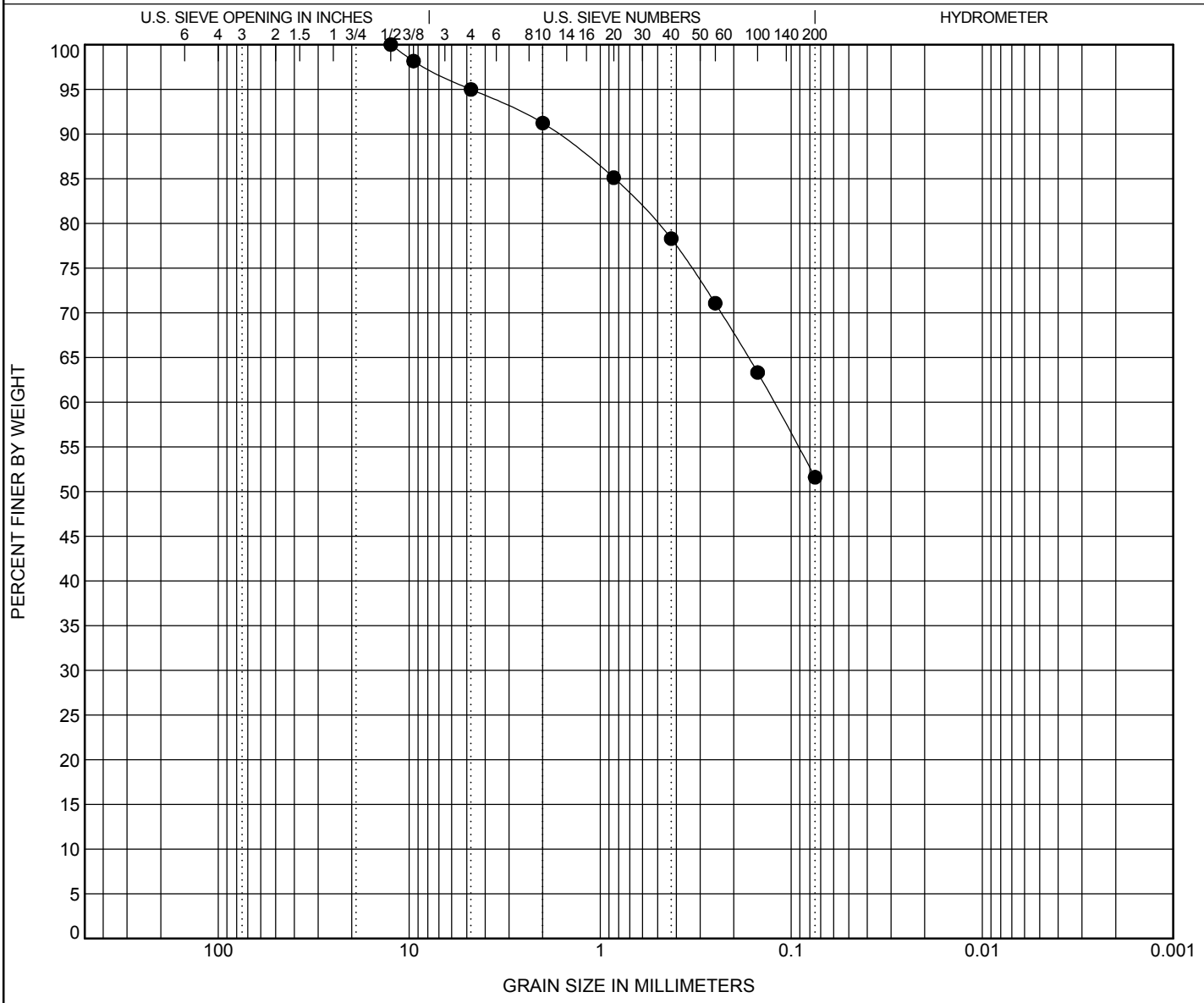
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/29/2018



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**TP-241, BULK**	**Yellowish Red SANDY SILT(ML) {A-4, GI=2}**	**38**	**31**	**7**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-241, BULK**	**12.5**	**0.123**			**5.0**	**43.4**	**51.6**	

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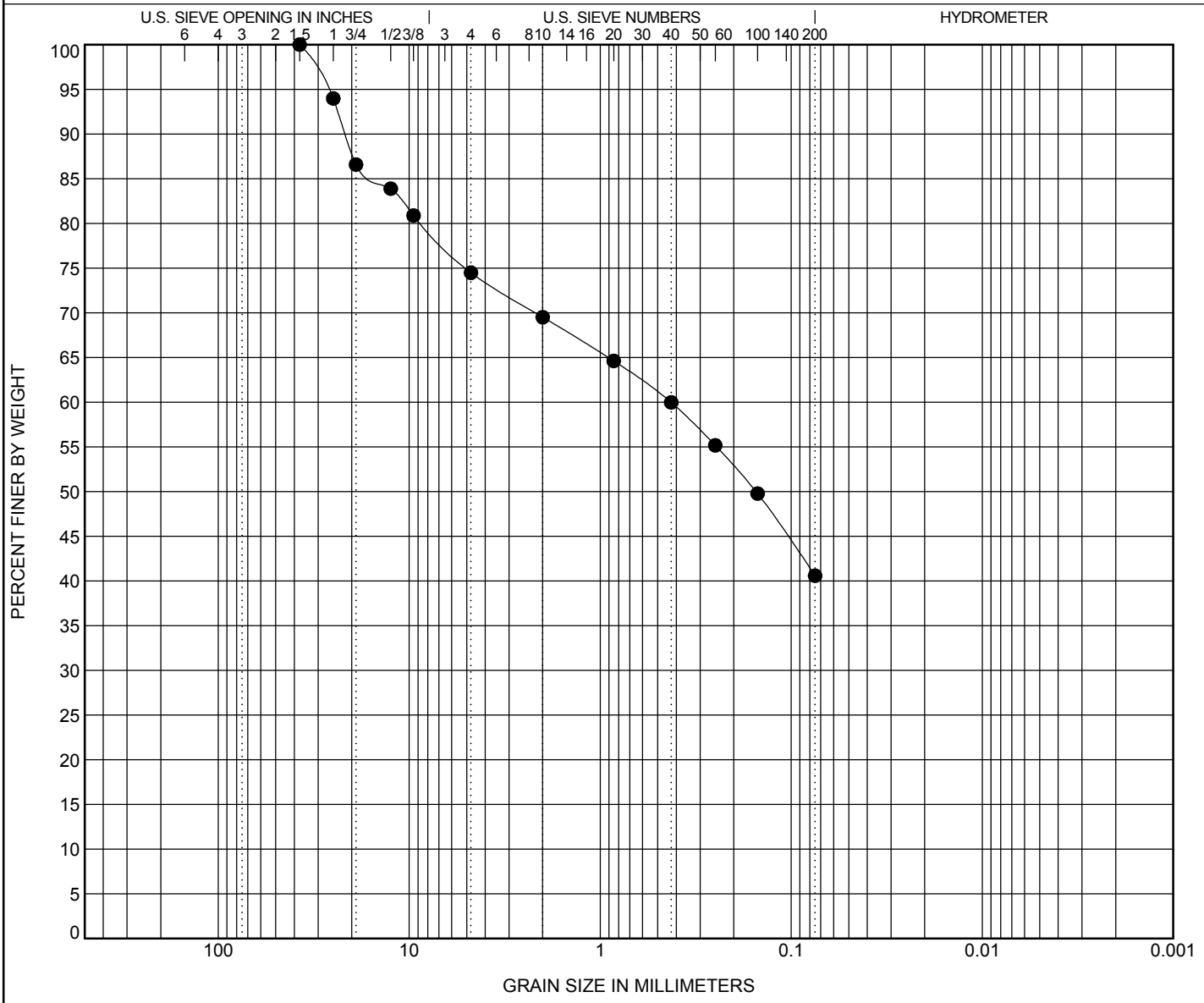
TEST METHOD ASTM D422

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/27/2018



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**TP-253, BULK**	**Brown SILTY SAND with GRAVEL(SM) {A-4, GI=0}**	**35**	**29**	**6**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-253, BULK**	**37.5**	**0.427**			**25.5**	**33.9**	**40.6**	

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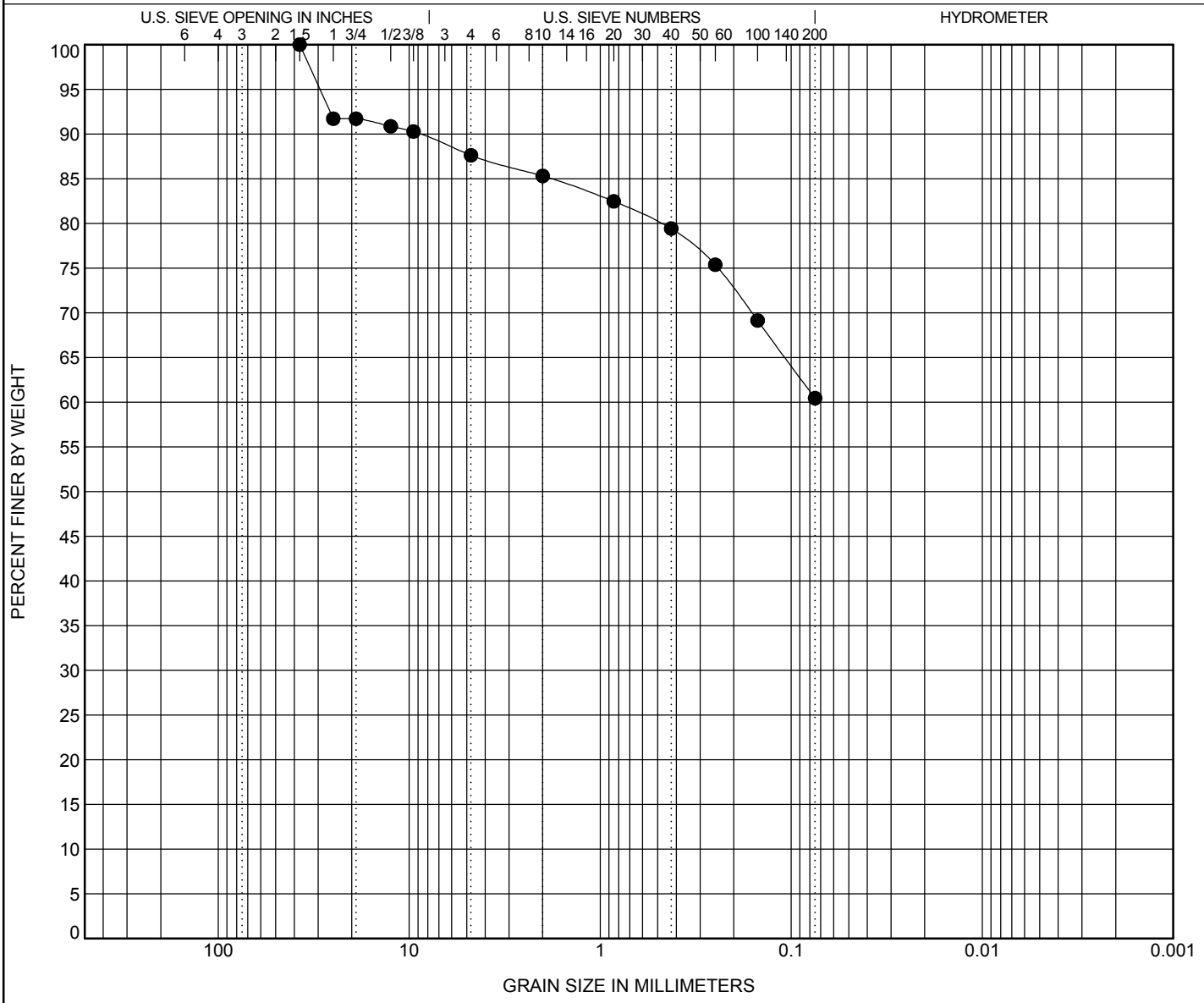
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/30/2018



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**TP-258, BULK**	**Reddish Brown SANDY SILT(ML) {A-6, GI=5}**	**37**	**26**	**11**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-258, BULK**	**37.5**				**12.4**	**27.2**	**60.4**	

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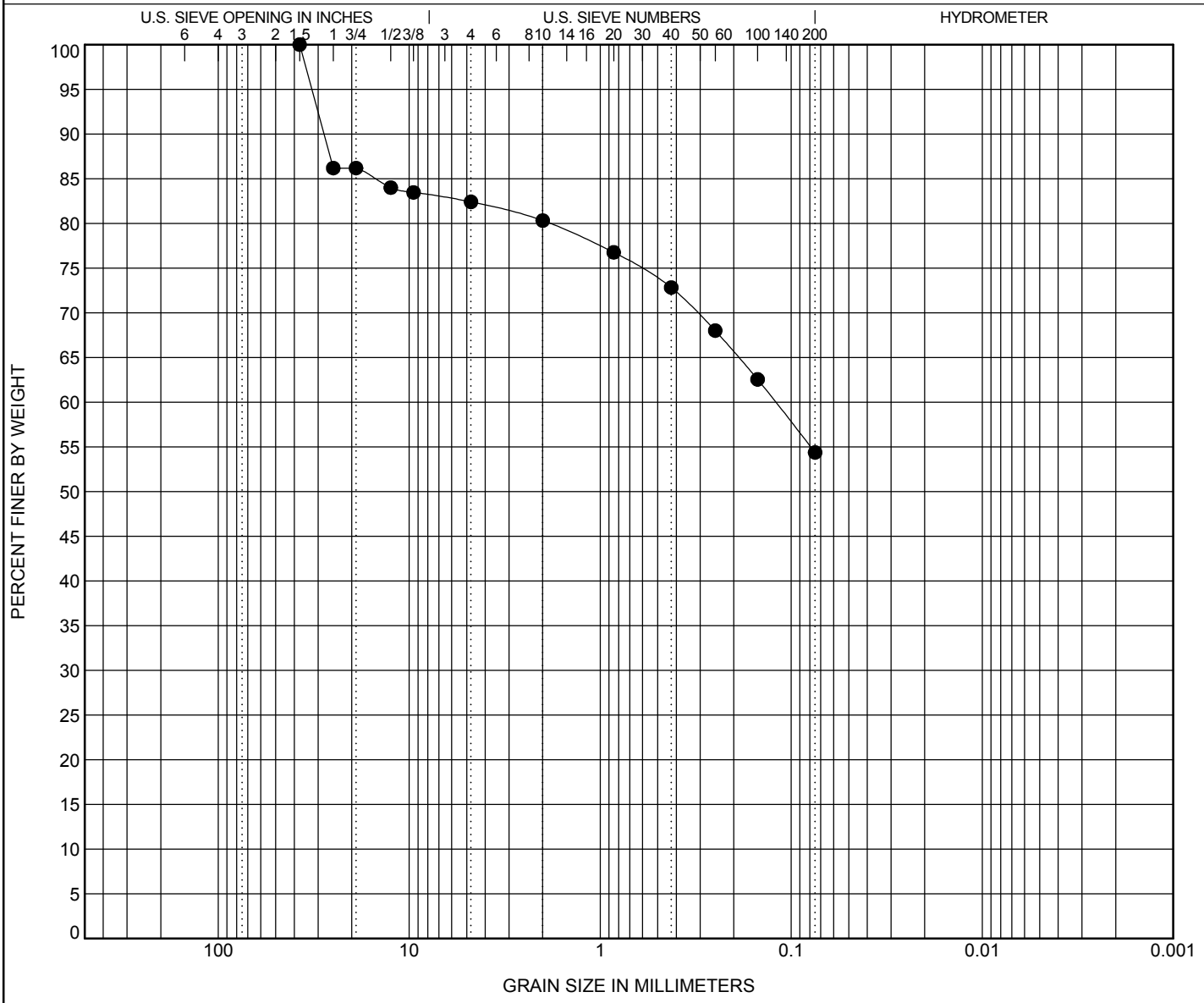
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/28/2018



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**TP-259, BULK**	**Brown SANDY SILT with GRAVEL(ML) {A-7-5, GI=5}**	**49**	**37**	**12**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-259, BULK**	**37.5**	**0.121**			**17.6**	**28.0**	**54.4**	

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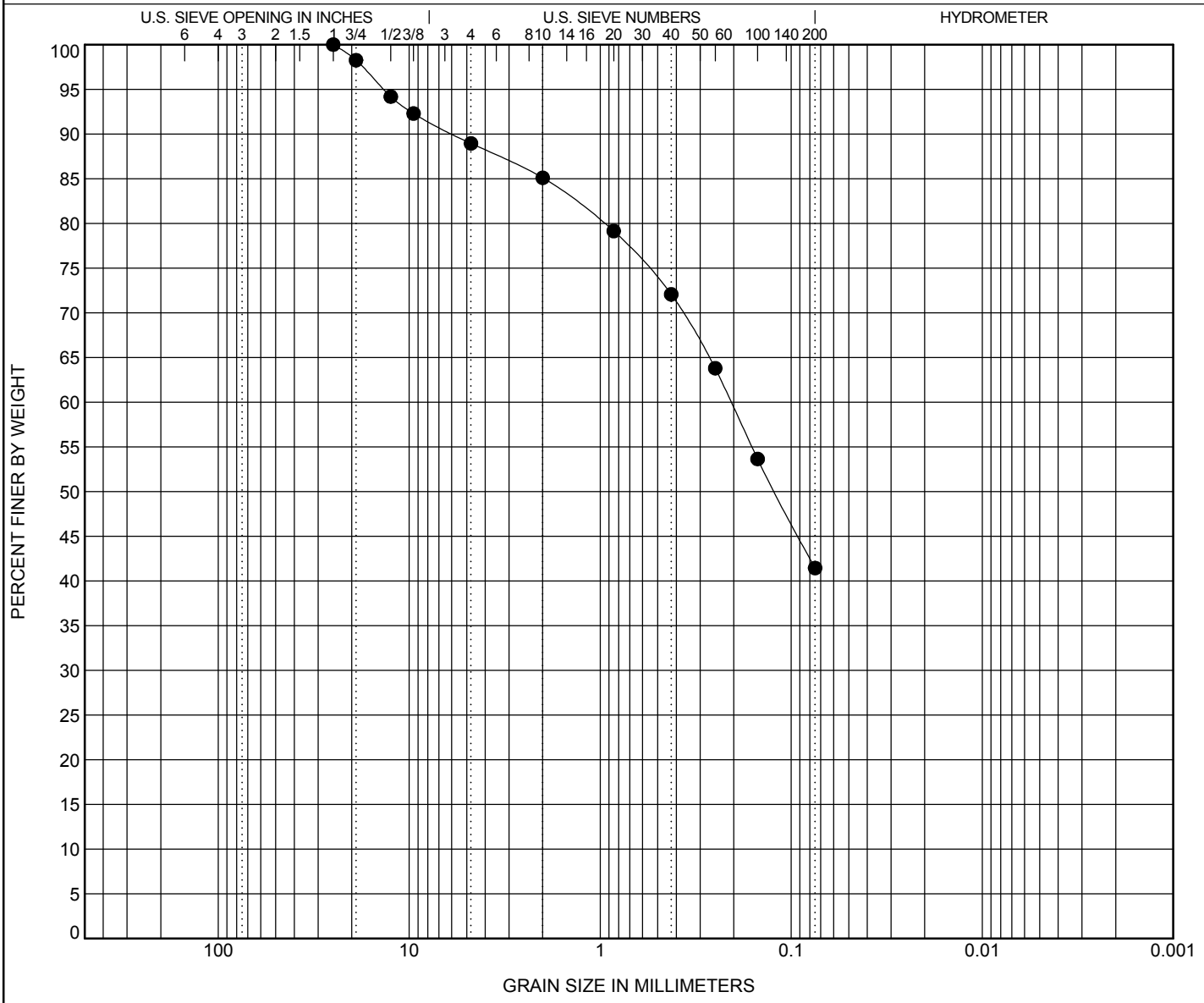
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/30/2018



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**TP-263, BULK**	**Brown SILTY SAND(SM) {A-4, GI=0}**	**36**	**30**	**6**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-263, BULK**	**25**	**0.207**			**11.1**	**47.5**	**41.4**	

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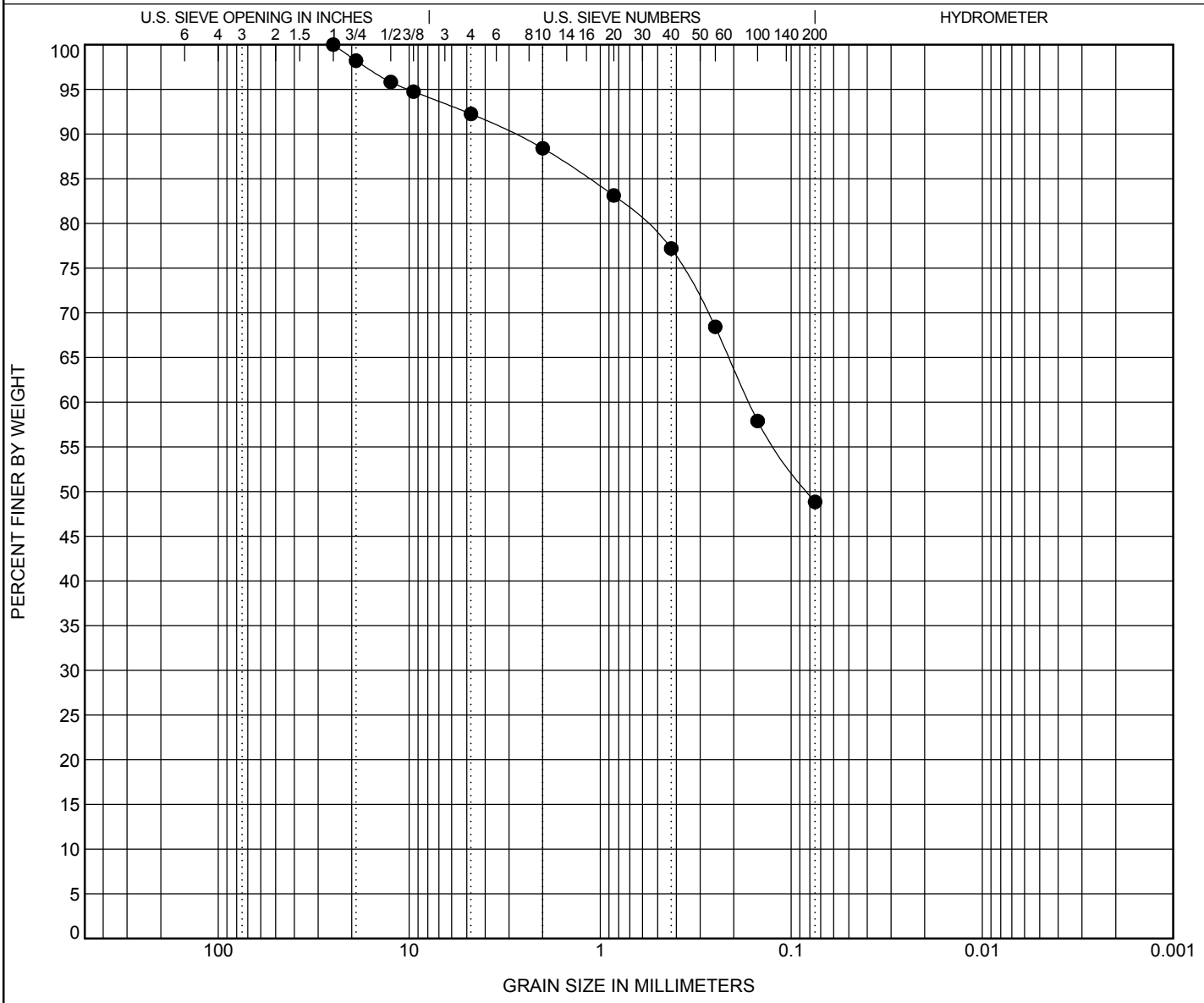
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/27/2018



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**TP-273, BULK**	**Red SILTY SAND(SM) {A-4, GI=1}**	**30**	**24**	**6**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-273, BULK**	**25**	**0.166**			**7.8**	**43.4**	**48.8**	

COPY OF GRAIN SIZE ASTM AND AASHTO 16943-0 GUDE LANDFILL.GPJ MTA REDLINE.GDT 8/6/18

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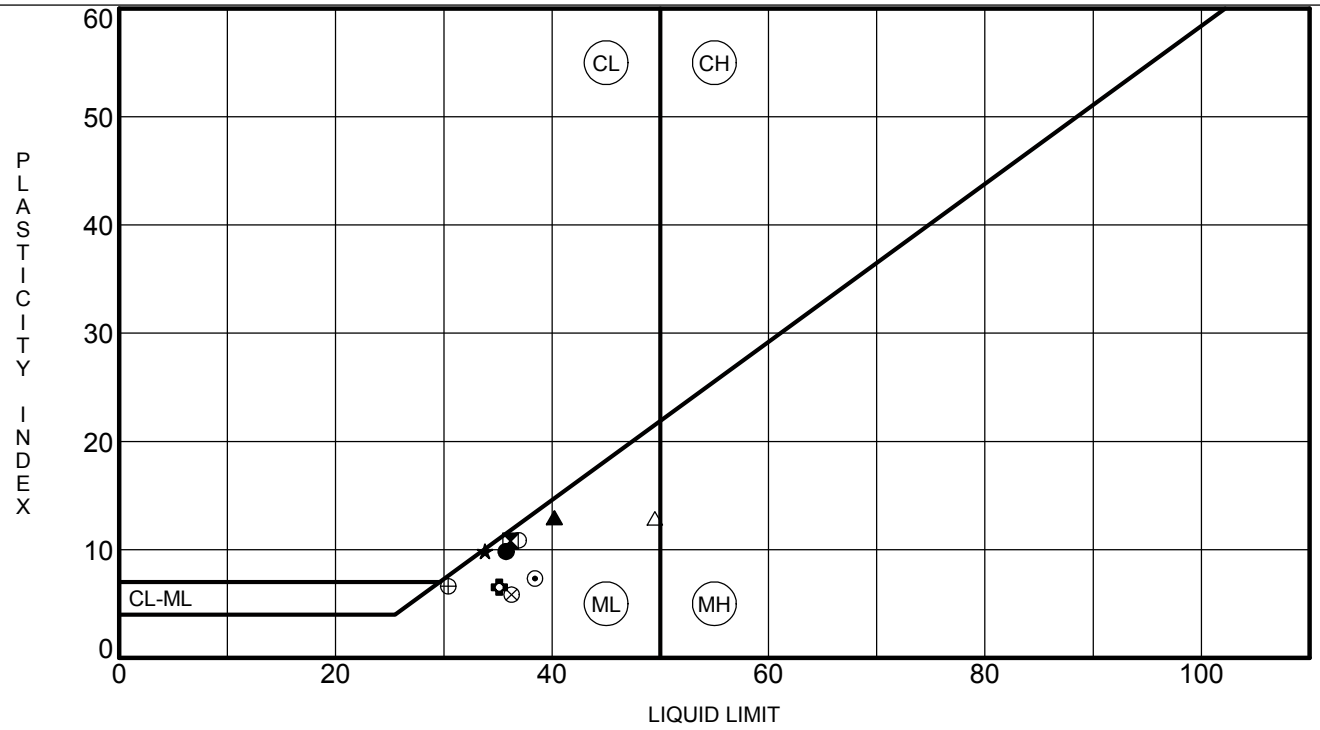
Geotechnical and Environmental Engineers
Materials and Construction Inspection and Testing
Telephone No. (410) 363-1555
www.balterco.com

ATTERBERG LIMITS' RESULTS

TEST METHOD ASTM D4318

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/27/2018



	Specimen Identification	LL	PL	PI	Fines	Classification
●	TP-208, BULK @ 0.0' - 2.0',	36	26	10	48	Darek Yellowish Brown SILTY SAND(SM) {A-4, GI=2}
⊠	TP-215, BULK @ 0.0' - 2.0',	36	25	11	62	Reddish Brown SANDY SILT(ML) {A-6, GI=5}
▲	TP-228, BULK @ 0.0' - 2.0',	40	27	13	71	Yellowish Red SILT with SAND(ML) {A-6, GI=9}
★	TP-231, BULK @ 0.0' - 2.0',	34	24	10	62	Yellowish Red SANDY SILT(ML) {A-4, GI=5}
⊙	TP-241, BULK @ 0.0' - 2.0',	38	31	7	52	Yellowish Red SANDY SILT(ML) {A-4, GI=2}
✿	TP-253, BULK @ 0.0' - 2.0',	35	29	6	41	Brown SILTY SAND with GRAVEL(SM) {A-4, GI=0}
○	TP-258, BULK @ 0.0' - 2.0',	37	26	11	60	Reddish Brown SANDY SILT(ML) {A-6, GI=5}
△	TP-259, BULK @ 0.0' - 2.0',	49	37	12	54	Brown SANDY SILT with GRAVEL(ML) {A-7-5, GI=5}
⊗	TP-263, BULK @ 0.0' - 2.0',	36	30	6	41	Brown SILTY SAND(SM) {A-4, GI=0}
⊕	TP-273, BULK @ 0.0' - 2.0',	30	24	6	49	Red SILTY SAND(SM) {A-4, GI=1}

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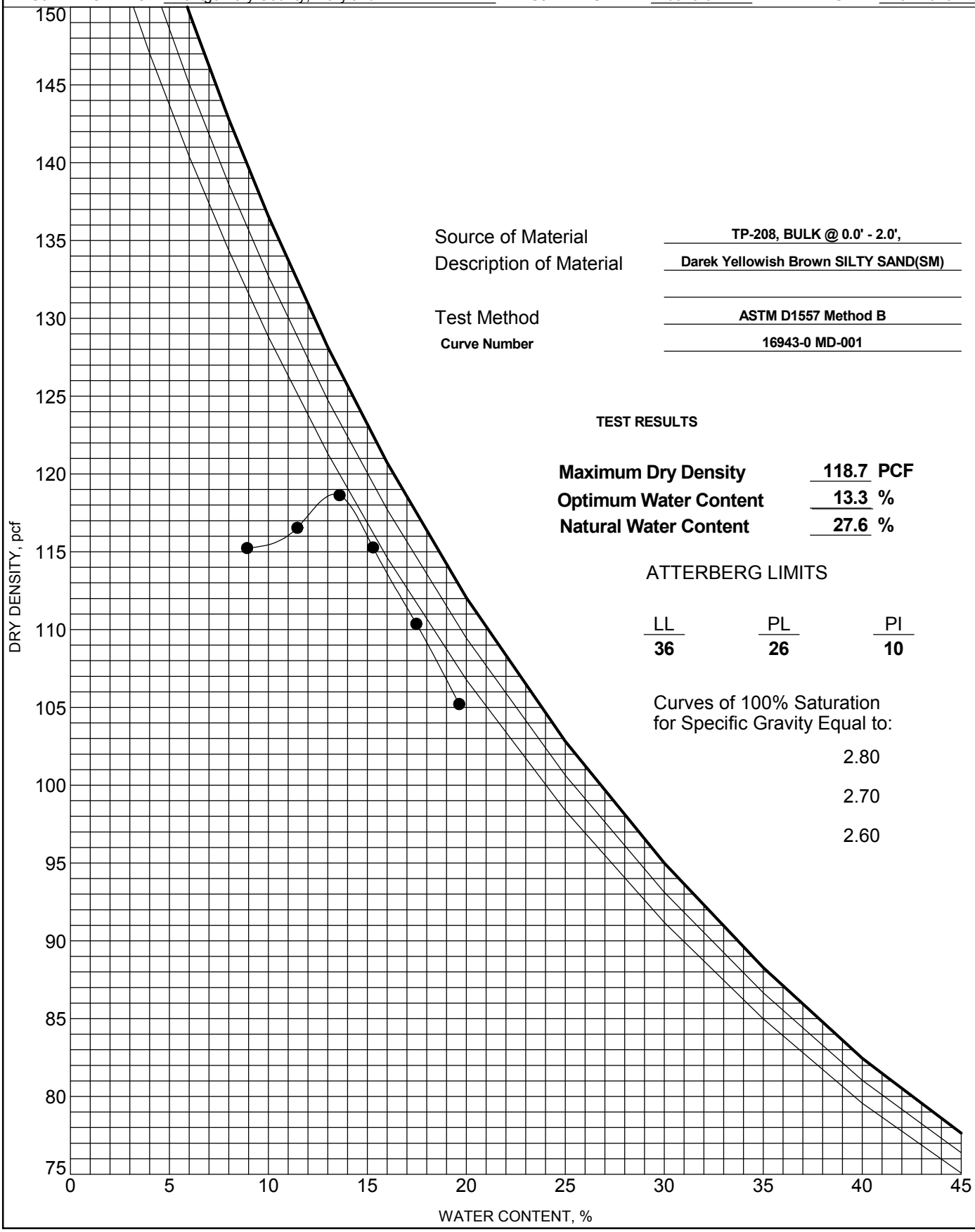
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/31/2018



Source of Material: **TP-208, BULK @ 0.0' - 2.0',**

Description of Material: **Darek Yellowish Brown SILTY SAND(SM)**

Test Method: **ASTM D1557 Method B**

Curve Number **16943-0 MD-001**

TEST RESULTS

Maximum Dry Density	**118.7**	**PCF**
Optimum Water Content	**13.3**	**%**
Natural Water Content	**27.6**	**%**

ATTERBERG LIMITS

LL	PL	PI
36	**26**	**10**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 16943-0 GUDE LANDFILL.GPJ MTA REDLINE.GDT 8/6/18

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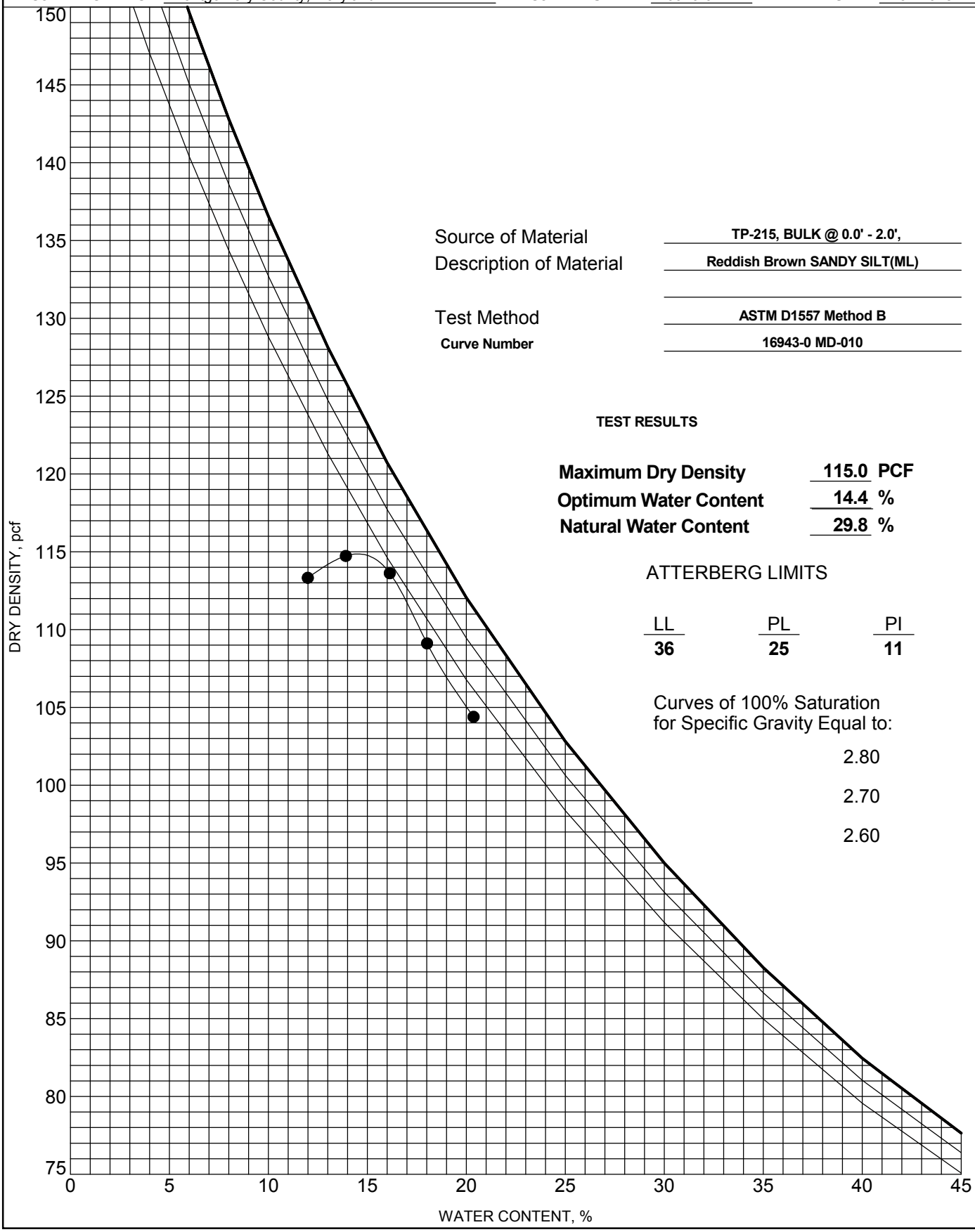
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/31/2018



Source of Material: **TP-215, BULK @ 0.0' - 2.0',**

Description of Material: **Reddish Brown SANDY SILT(ML)**

Test Method: **ASTM D1557 Method B**

Curve Number **16943-0 MD-010**

TEST RESULTS

Maximum Dry Density	**115.0**	**PCF**
Optimum Water Content	**14.4**	**%**
Natural Water Content	**29.8**	**%**

ATTERBERG LIMITS

LL	PL	PI
36	**25**	**11**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

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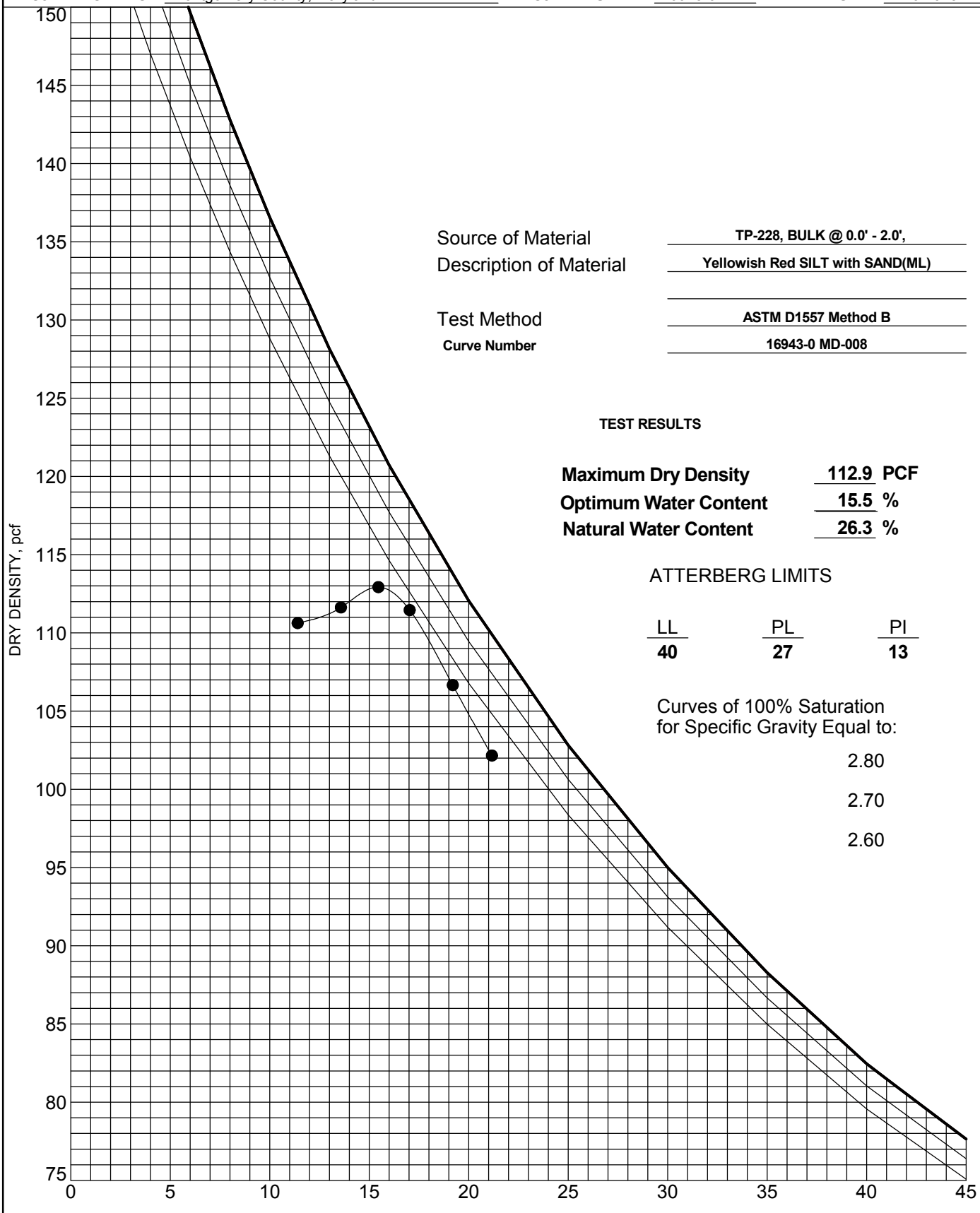
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/29/2018



Source of Material: **TP-228, BULK @ 0.0' - 2.0',**

Description of Material: **Yellowish Red SILT with SAND(ML)**

Test Method: **ASTM D1557 Method B**

Curve Number **16943-0 MD-008**

TEST RESULTS

Maximum Dry Density	**112.9**	**PCF**
Optimum Water Content	**15.5**	**%**
Natural Water Content	**26.3**	**%**

ATTERBERG LIMITS

LL	PL	PI
40	**27**	**13**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 16943-0 GUDE LANDFILL.GPJ MTA REDLINE.GDT 8/6/18

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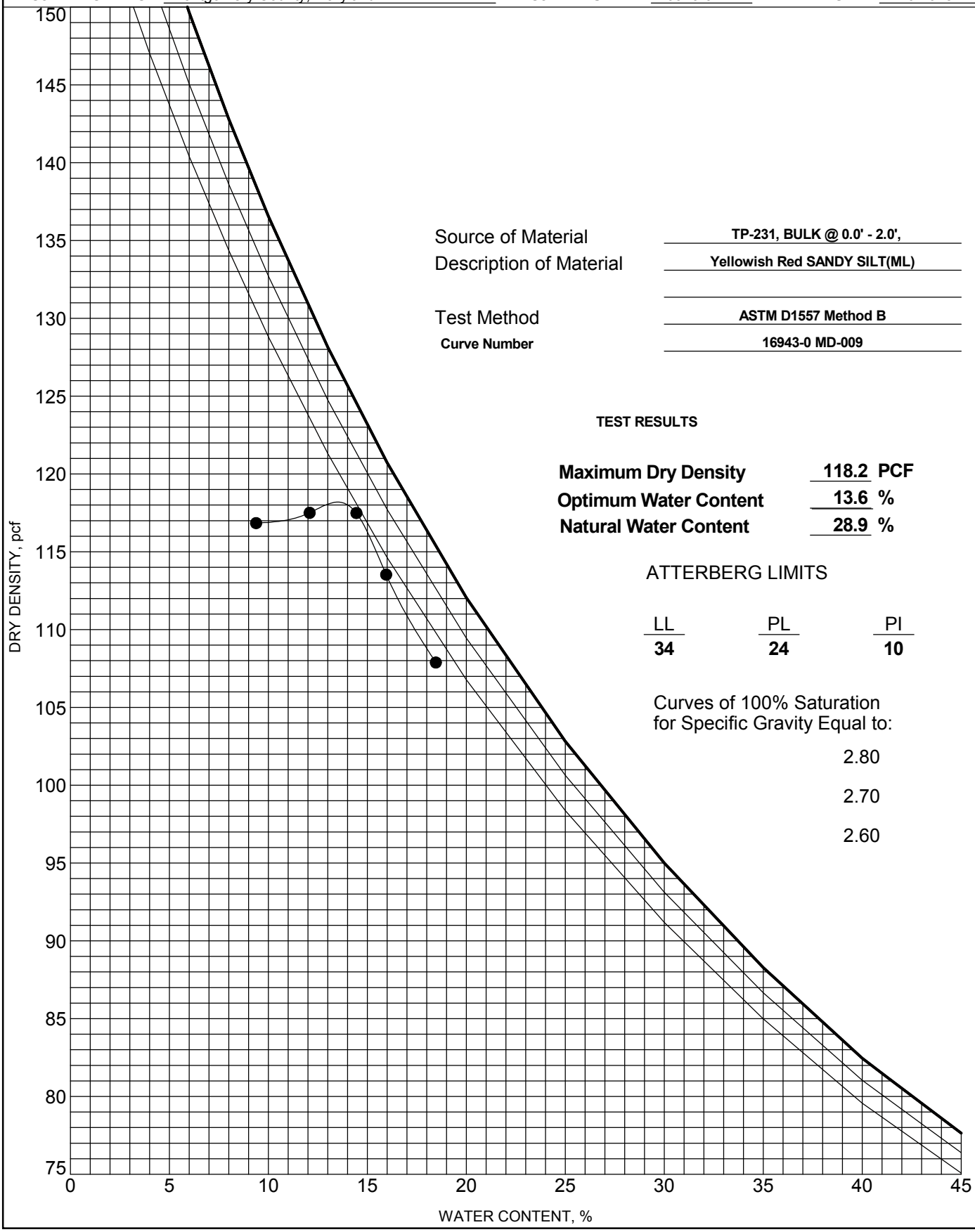
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/29/2018



Source of Material: **TP-231, BULK @ 0.0' - 2.0',**

Description of Material: **Yellowish Red SANDY SILT(ML)**

Test Method: **ASTM D1557 Method B**

Curve Number **16943-0 MD-009**

TEST RESULTS

Maximum Dry Density	**118.2**	**PCF**
Optimum Water Content	**13.6**	**%**
Natural Water Content	**28.9**	**%**

ATTERBERG LIMITS

LL	PL	PI
34	**24**	**10**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

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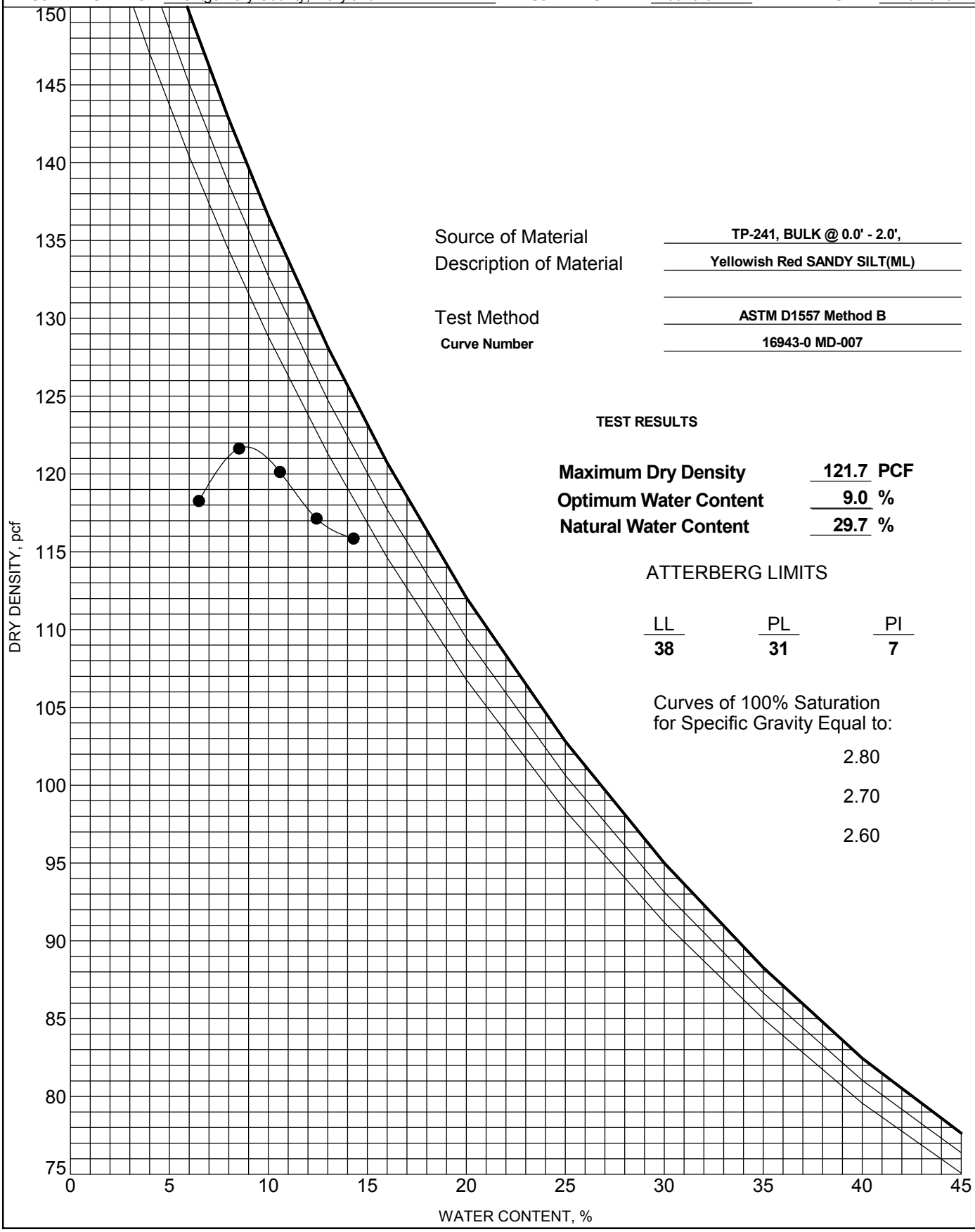
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/29/2018



Source of Material: **TP-241, BULK @ 0.0' - 2.0',**

Description of Material: **Yellowish Red SANDY SILT(ML)**

Test Method: **ASTM D1557 Method B**

Curve Number **16943-0 MD-007**

TEST RESULTS

Maximum Dry Density	**121.7**	**PCF**
Optimum Water Content	**9.0**	**%**
Natural Water Content	**29.7**	**%**

ATTERBERG LIMITS

LL	PL	PI
38	**31**	**7**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

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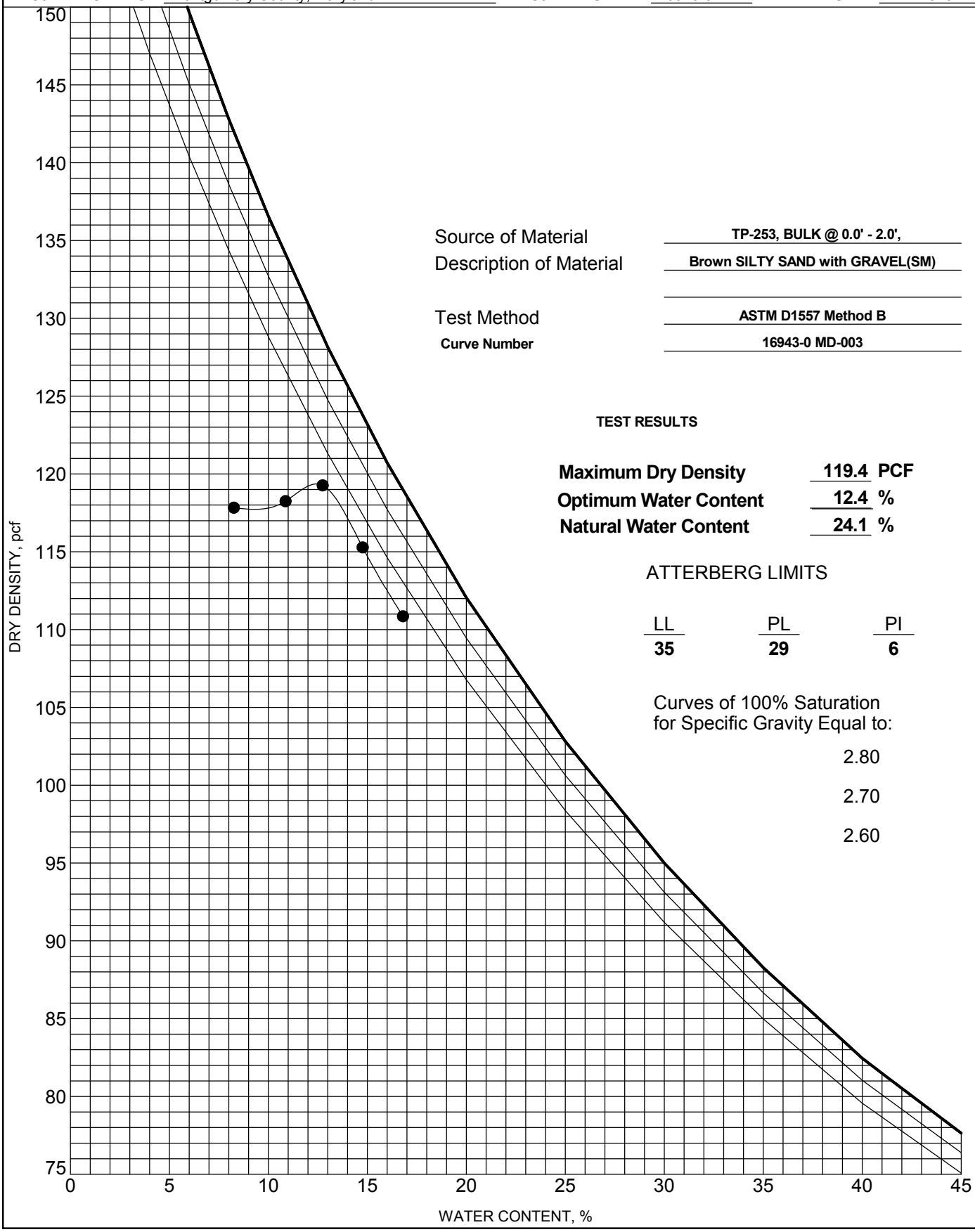
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/27/2018



Source of Material: **TP-253, BULK @ 0.0' - 2.0',**

Description of Material: **Brown SILTY SAND with GRAVEL(SM)**

Test Method: **ASTM D1557 Method B**

Curve Number **16943-0 MD-003**

TEST RESULTS

Maximum Dry Density	**119.4**	**PCF**
Optimum Water Content	**12.4**	**%**
Natural Water Content	**24.1**	**%**

ATTERBERG LIMITS

LL	PL	PI
35	**29**	**6**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

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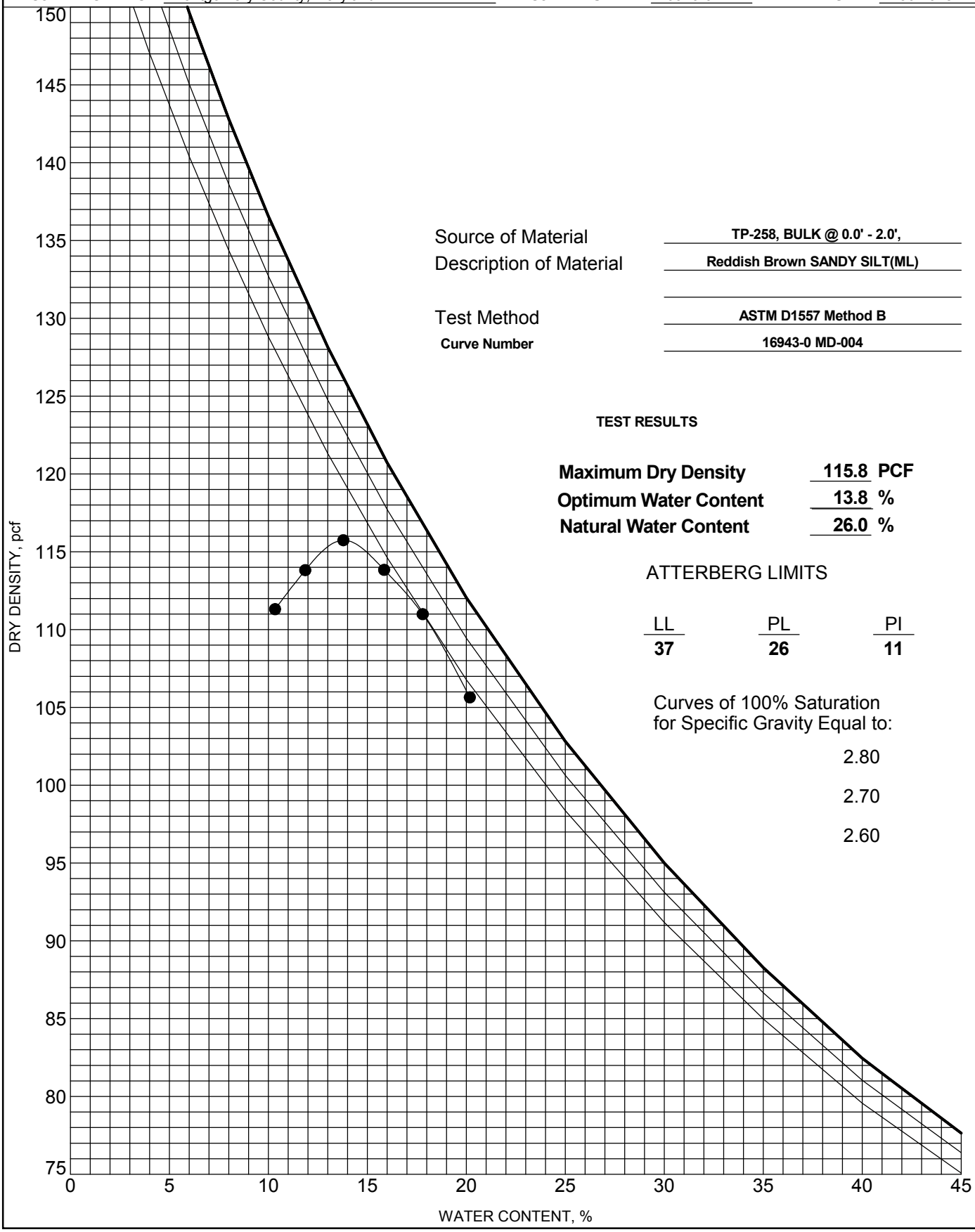
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/30/2018



Source of Material: **TP-258, BULK @ 0.0' - 2.0',**

Description of Material: **Reddish Brown SANDY SILT(ML)**

Test Method: **ASTM D1557 Method B**

Curve Number **16943-0 MD-004**

TEST RESULTS

Maximum Dry Density	**115.8**	**PCF**
Optimum Water Content	**13.8**	**%**
Natural Water Content	**26.0**	**%**

ATTERBERG LIMITS

LL	PL	PI
37	**26**	**11**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

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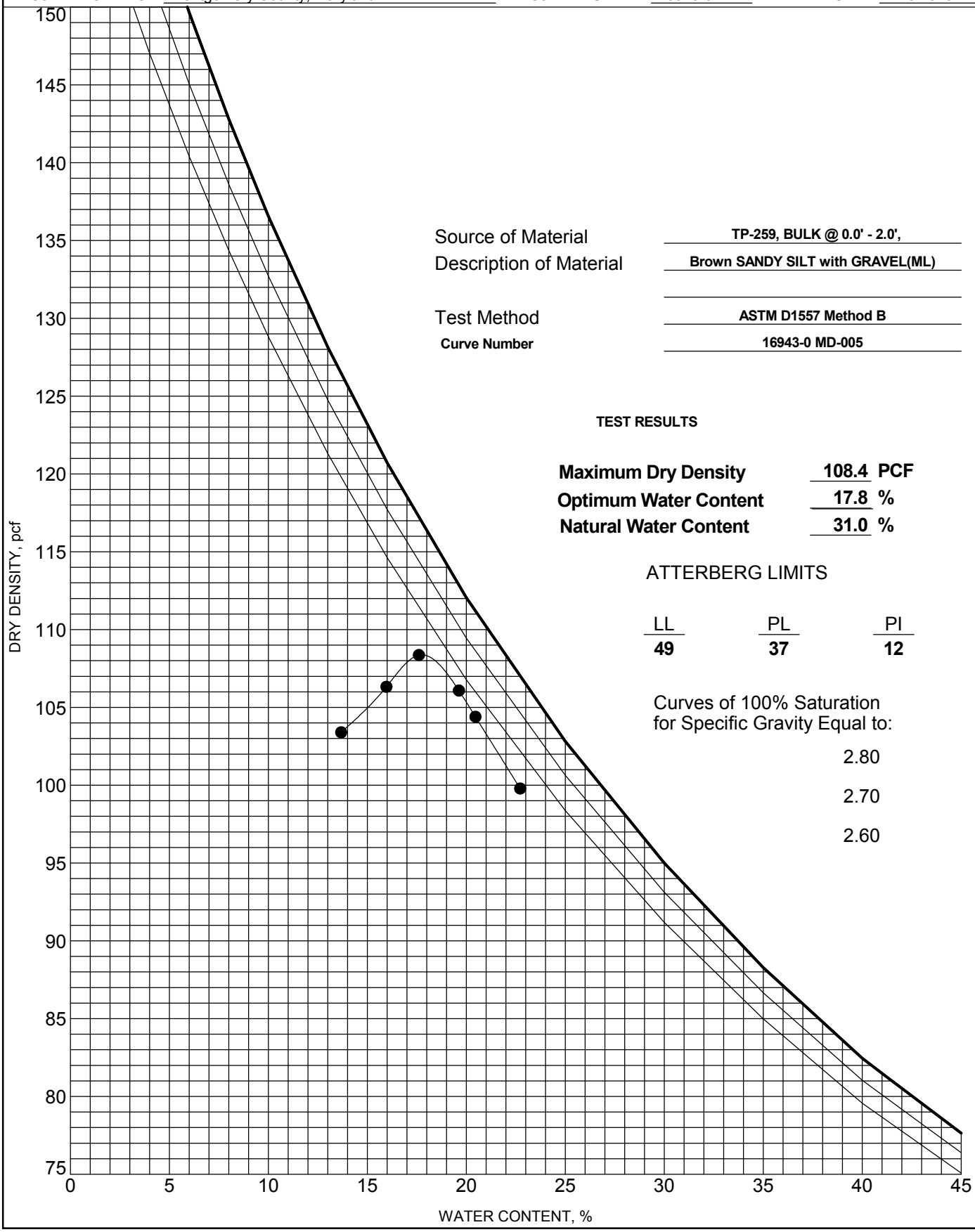
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/28/2018



Source of Material: **TP-259, BULK @ 0.0' - 2.0',**

Description of Material: **Brown SANDY SILT with GRAVEL(ML)**

Test Method: **ASTM D1557 Method B**

Curve Number **16943-0 MD-005**

TEST RESULTS

Maximum Dry Density	**108.4**	**PCF**
Optimum Water Content	**17.8**	**%**
Natural Water Content	**31.0**	**%**

ATTERBERG LIMITS

LL	PL	PI
49	**37**	**12**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 16943-0 GUDE LANDFILL.GPJ MTA REDLINE.GDT 8/6/18

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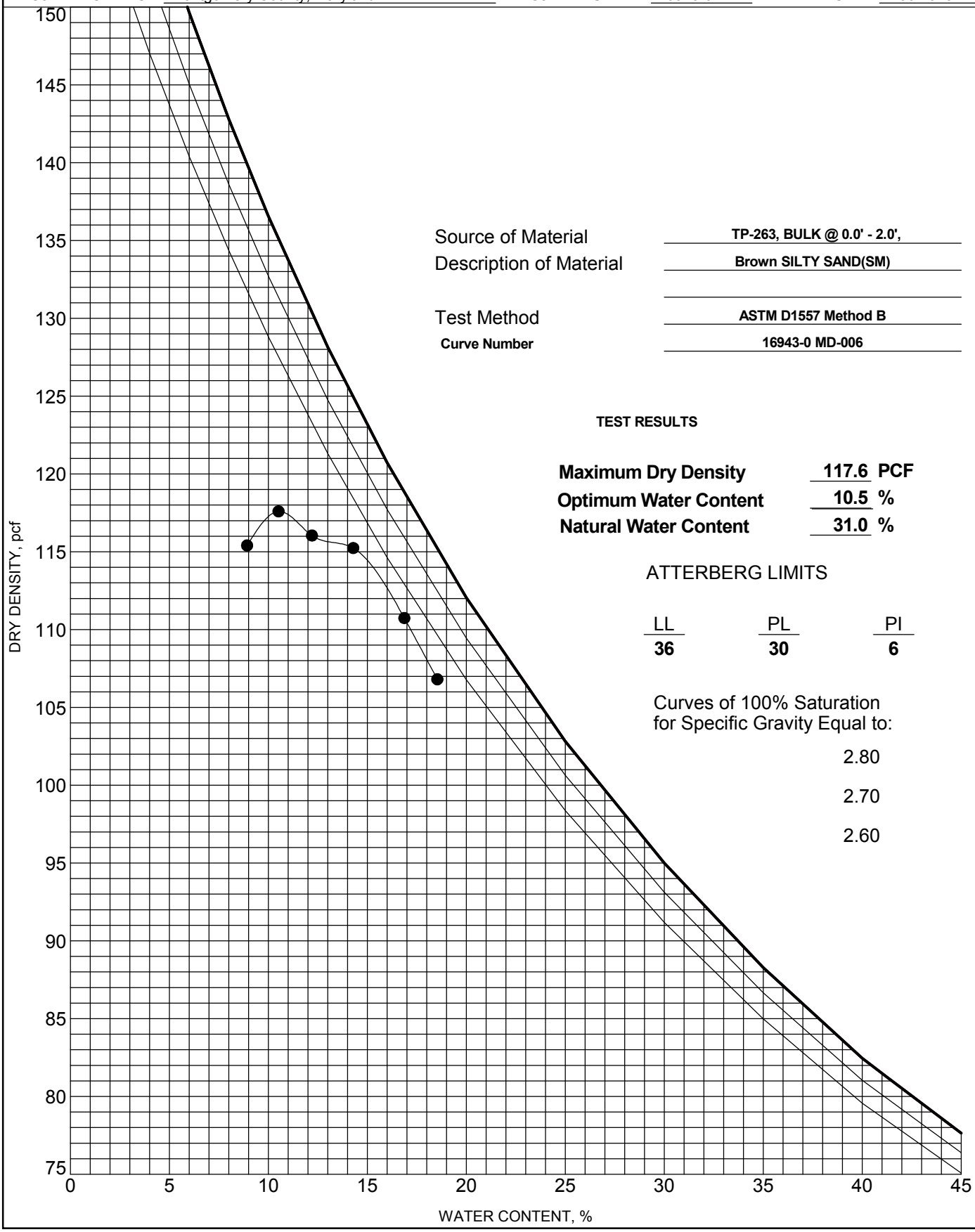
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/30/2018



Source of Material: **TP-263, BULK @ 0.0' - 2.0',**

Description of Material: **Brown SILTY SAND(SM)**

Test Method: **ASTM D1557 Method B**

Curve Number **16943-0 MD-006**

TEST RESULTS

Maximum Dry Density	**117.6**	**PCF**
Optimum Water Content	**10.5**	**%**
Natural Water Content	**31.0**	**%**

ATTERBERG LIMITS

LL	PL	PI
36	**30**	**6**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 16943-0 GUDE LANDFILL.GPJ MTA REDLINE.GDT 8/6/18

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Materials and Construction Inspection and Testing
Telephone No. (410) 363-1555
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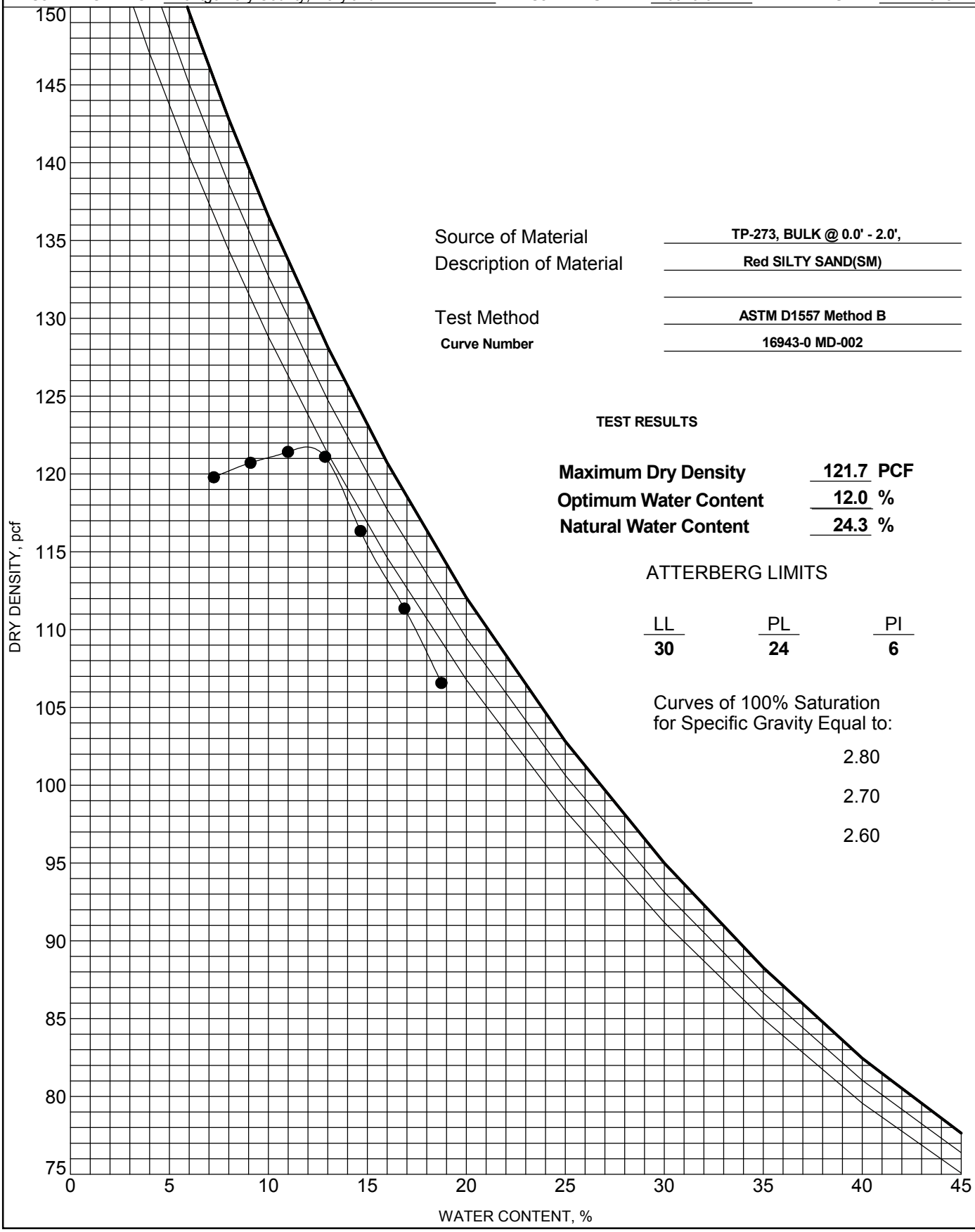
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering, Inc. **PROJECT NAME** Gude Landfill

PROJECT LOCATION Montgomery County, Maryland **PROJECT NUMBER** 16943-0 MD **DATE TESTED** 7/27/2018



Source of Material: **TP-273, BULK @ 0.0' - 2.0',**

Description of Material: **Red SILTY SAND(SM)**

Test Method: **ASTM D1557 Method B**

Curve Number **16943-0 MD-002**

TEST RESULTS

Maximum Dry Density	**121.7**	**PCF**
Optimum Water Content	**12.0**	**%**
Natural Water Content	**24.3**	**%**

ATTERBERG LIMITS

LL	PL	PI
30	**24**	**6**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 16943-0 GUDE LANDFILL.GPJ MTA REDLINE.GDT 8/6/18

THE ROBERT B. BALTER COMPANY®

October 27, 2020

Kerry E. Feuz, P.E.
Civil Engineer
EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031

RE: Geotechnical Data Report
Gude Landfill
600 East Gude Drive
Rockville, Maryland 20850
RBB Project No. 17359-0 MD

Dear Ms. Feuz:

The Robert B. Balter Company is pleased to submit this geotechnical data report for the subject project. The purpose of this data report was to assess subsurface conditions for the slope stability analysis to be performed by EA Engineering, Science, and Technology, Inc., PBC at the existing Gude Landfill. A separate letter will be sent providing the laboratory test results for the soils collected in the purple line stockpile.

Project information provided to us by various parties helped form the basis for our data report. If any of the project information discussed in this report differs from the actual proposed analysis, we should be contacted to re-evaluate the data provided herein and provide revisions or further investigation if requested.

We have appreciated this opportunity to be of service. If you have any questions regarding this report, or if we can assist you in any way, please do not hesitate to call our office.

Sincerely,

THE ROBERT B. BALTER COMPANY

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 41312, Expiration Date: 01/05/2022

Christopher D. Karg II, E.I.T.
Project Engineer

Kristopher M. Crist, P.G., P.E.
Senior Geotechnical Engineer

10/27/2020

STATE OF MARYLAND
KRISTOPHER M. CRIST
No. 41312
PROFESSIONAL ENGINEER

Joseph F. Whittle Jr., P.G., P.E.
Chief Engineer

10/27/2020

STATE OF MARYLAND
JOSEPH F. WHITTLE, JR.
No. 23281
PROFESSIONAL ENGINEER

GEOTECHNICAL DATA REPORT
GUDE LANDFILL
600 EAST GUDE DRIVE
ROCKVILLE, MARYLAND
RBB Project No. 17359-0 MD

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LIST OF PLATES

APPENDICES

1.0 INTRODUCTION

1.1 General

The proposed project generally consists of a slope stability analysis to be performed by others at the existing Gude Landfill. The purpose of our work was to perform a geotechnical evaluation of the subsurface conditions, and to provide certain geotechnical related data for the use in analysis for slope stability toward the Northwest side of the project site. Geotechnical evaluations and recommendations are not part of the scope of this work.

1.2 Authorization

The geotechnical evaluation was authorized by EA Engineering, Science, and Technology, Inc., PBC (EA), based on our August 12, 2020 *Revised Proposal for Geotechnical Services.*

1.3 Scope

The scope of the geotechnical evaluation included the following: site reconnaissance, subsurface sampling and testing, geotechnical laboratory testing and data report preparation.

2.0 PROJECT DESCRIPTION

2.1 Site Location and Proposed Project

The project is located at 600 East Gude Drive, Rockville, Maryland. The site is bordered to the northwest by Gude Trail, followed by a residential development, to the northeast by a heavily forested area, to the southeast by a mixed commercial/retail development, and to the southwest by East Gude Drive followed by mixed commercial/retail development. The site is currently occupied by the closed Gude MSW Landfill including a gas energy production facility and is currently being used as a radio-controlled (RC) model airplane recreational area. A **Vicinity Map** is shown on **Plate 1**, attached.

The proposed project consists of the slope stability analysis by others at existing slopes located adjacent to the road running along the Northwest portion of the site. Data collected by Balter will be used in all analyses performed by EA.

The scope of work also included the collection of bulk grab samples from the existing purple line stockpile, located at the Northeast corner of the site. These samples are to be subjected to laboratory testing for certain geotechnical parameters. That information will be presented under a separate letter.

2.2 Site Geology

According to the Geologic Map of Montgomery County and the District of Columbia (1953), the project site is underlain by the Wissahickon Formation. The age of this formation is reported as unknown. It generally consists of banded or laminated quartz-rich Phyllites and Schists with magnetite. Quartz veins, sandstone, and conglomerate beds composed of muscovite, chlorite, albite, and quartz are common throughout the formation.

Previous borings, performed by others as part of monitoring well operations, indicated the presence of 20 feet to 46 feet of landfilled materials underlain by bedrock comprised of Schist within the subject area.

3.0 EVALUATION PROGRAM

3.1 Subsurface Explorations

The subsurface exploration program for this study included a total of 3 new Standard Penetration Test (SPT) borings, including B-4 to B-6. The locations for the borings were selected by EA based on the proposed plan for the slope stability analysis, marked up on the provided "Existing Conditions Plan – Key Sheet" (Drawing No. C-101). Borings were located in the field from a hand-held GPS based on coordinates provided by EA. They were not surveyed.

Prior to the start of the drilling operation, the subject area was cleared for utilities by Miss Utility. An environmental health and safety plan, prepared by EA, was used and followed while onsite. Balter representatives were onsite with the crew and provided monitoring of the LEL and O_2 combustible gas levels during the drilling.

Balter mobilized a Mobil B45 rubber-tracked ATV-mounted drill rig to the site to drill the borings. The rig was equipped with conventional 3.25-inch I.D. hollow stem augers with carbide drill head bits and a calibrated automatic hammer. Our field personnel were OSHA Hazwoper and Supervisor trained, as appropriate.

The borings were drilled to depth ranging from 25 feet to 50 feet below the existing ground surface. Standard Penetration Testing (SPT) and sampling was performed through the auger stems at 5-foot intervals. The testing and sampling procedures were performed in general accordance with ASTM D-1586 procedures, using a standard 2-inch O.D. sampling spoon, driven by an automatic 140-pound hammer freely falling 30 inches. During the drilling operations, bulk samples and Shelby Tubes of representative soils from elevations not containing trash were recovered from the auger flights for laboratory evaluation.

The drill rig was equipped with an automatic hammer which requires an approximate correction factor of x1.5 to the recorded N-Values. This correction factor is based on calibration of our rig and hammer. This allows comparison to "standard" N values for a less-efficient manual hammer (N_{60} values, for 60 % energy efficiency). Corrected values (N_{60}) are not shown on the boring logs.

The borings were overseen by an experienced geotechnical engineer who logged each boring and collected the samples. The method of classification used in preparing the strata descriptions is based on our interpretation of the Unified Soils Classification System (USCS).

The depths at which water was observed in the uncased holes were recorded upon completion (i.e., after the augers were withdrawn). At borings B-4 and B-5, 24-hour (or longer) readings of depths at which water was observed were recorded as well. Boring B-6 did not include a 24-hour reading due to budget and time restraints. Because the borings were drilled in the existing landfill, they were backfilled with the drill spoils and topped off with Bentonite chips once water levels were recorded.

The attached **Plate 2, Boring Location Plan,** indicates the approximate as-drilled locations of the borings.

The subsurface data obtained from the recent explorations are presented in log form in **Appendix A**. Ground surfaces were estimated using the GPS and boring location plan for any boring offset. The numeric values (N-values) shown within the individual boring columns on the Boring Logs indicate the standard penetration resistances, in blows per foot, or as otherwise noted.

Boring logs show the estimated general soil classifications and the assumed boundaries between soil types. The actual boundaries in the field could vary significantly from those assumed for the logs. *It is noted that the subsurface data shown on the figures are an integral portion of this report. Separation of the figures from the remainder of the report may lead to misinterpretation of the data by others.*

3.1.1 Environmental Measures

A site specific Health and Safety Plan (HASP), developed by EA Engineering, was used onsite as a result of the potential for methane gas from the existing landfill. It was reviewed every day before work at the site commenced. The HASP covered site hazards and included information related to the use of a Combustible Gas Indicator (CGI) to measure the Oxygen levels and the LEL levels for methane. Carbon Monoxide (CO) and Hydrogen Sulfide (H_2S) were also monitored. A representative was onsite from Balter with a CGI to monitor the workspace of the drill rig.

Meter levels from each boring were recorded on an EA provided form. The completed sign-in and monitoring forms from the provided HASP are included in Appendix C.

3.2 Laboratory Testing Program

Selected samples were subjected to laboratory analyses to estimate their classifications according to the Unified Soils Classification System. This testing included moisture content determination, sieve gradation analyses and Atterberg limits determinations. Pocket penetrometers were also performed on the fine-grained samples. The Shelby tubes were subjected to Unit Weight testing.

The results of our laboratory testing are presented in Appendix B and are summarized in **Table 2** of Section 4.4 Results of Laboratory Testing. Pocket penetrometer, - #200 sieve, moisture and Atterberg limits testing results are included on the boring logs.

4.0 SUBSURFACE CONDITIONS

4.1 General

This section provides a description of the estimated subsurface conditions encountered at the borings at the time of drilling. The on-landfill borings (B-4, B-5) encountered surficial materials (i.e., topsoil, root mat) overlying fills to a depth of 8.0 feet overlying the Landfill materials. The off-landfill boring (B-6) encountered surficial materials (i.e., topsoil, root mat) overlying fills to a depth of 3.0 feet, followed by residual soils to a depth of 22.0 feet and decomposed rock to a depth of 25.5 feet. The borings were advanced into the landfill materials to the specified depths as directed by EA Engineering. The transition between the stratigraphy at the boring locations may be more gradual than indicated on the logs, and significant variations may occur outside specific boring locations or sampled intervals. The following sections provide a summary of the encountered materials.

4.2 Surface Materials

Topsoil - Topsoil was encountered in borings B-4, B-5, and B-6 to a depth of 4.0 inches at each location. The term "topsoil," as used in this report refers to surface soils having an apparently significant organic content, based only on visual estimates in the field. It does not imply that the subject materials meet the requirements or specifications for topsoil set by any particular organization or agency.

4.3 Subsurface Materials

4.3.1 Fill Soils

Fill was identified in all 3 borings under the surface soils to depths ranging from 3.0 to 8.0 feet below the existing ground surface. Borings B-4 and B-5 both exhibited 8.0 feet of fill soils above the Landfill. These soil samples did not exhibit trash and are considered to be landfill cover soils. Because all the borings are located at the existing landfill, these soils are assumed to have been imported to the site.

The fills generally consisted of Sand (SM), Gravel (GC), Silt (ML), and Clay (CL) with varying amounts of organics and gravel. SPT N-values generally ranged from 3 blows per foot (bpf) to 18 bpf. Pocket penetrometers were performed in the fine-grained soils. They ranged from 1.8 tons per square foot (tsf) to 3.2 tsf.

4.3.2 Landfill Materials

Materials associated with the landfill were encountered underlying the fills soils to the maximum explored depth of 50.5 feet below the existing ground surface. Landfill materials were comprised of layers of soil which included Sand (SC-SM, SM), Silt (ML), and Clay (CL) interbedded with trash (ie, paper, metals, etc.) and Wood. Strong organic odors were noted

throughout the landfill materials. Methane was not encountered in notable amounts throughout the three borings. This was checked by monitoring for variations in O_2 and LEL levels.

SPT samples were collected throughout the landfill materials. The resultant SPT N-values generally ranged from the 5 bpf to 60 bpf. Elevated N-values were due to the presence of the landfill materials and not soil.

4.3.3 Existing Residual Soils

Residual soils were identified in boring B-6 below the fills to a depth of 22.0 feet below the existing ground soils. The residual soils are generally the result of the in-place weathering of underlying bedrock into soils. They often will exhibit the original structure of the rock (i.e. relic rock structure).

The residual soils generally consisted of Sand (SC-SM, SM) and exhibited SPT N-values ranging from 7 bpf to 23 bpf.

4.3.4 Decomposed Rock

Decomposed Rock was encountered underlying the fills and residual soils in boring B-6 to a depth up to 25.5 feet below the existing ground surface (approximate elevation EL 388.0). Decomposed rock is arbitrarily defined as having SPT N-values greater than 50 bpf and up to 50 blows for 4 inches of penetration. During the sampling process, the split spoon sampler pulverizes the material; therefore, the actual sample may not be representative of the true in-situ condition.

The pulverized decomposed rock sample generally consisted of Sand (SM) exhibiting an SPT N-value of 51 blows per foot of penetration.

4.4 Standard Penetration Resistances

Figure 1 below shows the distribution of the collected N_{60}-values, of all soil types, versus depth across the site.

Figure 1 - Standard Penetration Resistances Depth vs. N_{60}

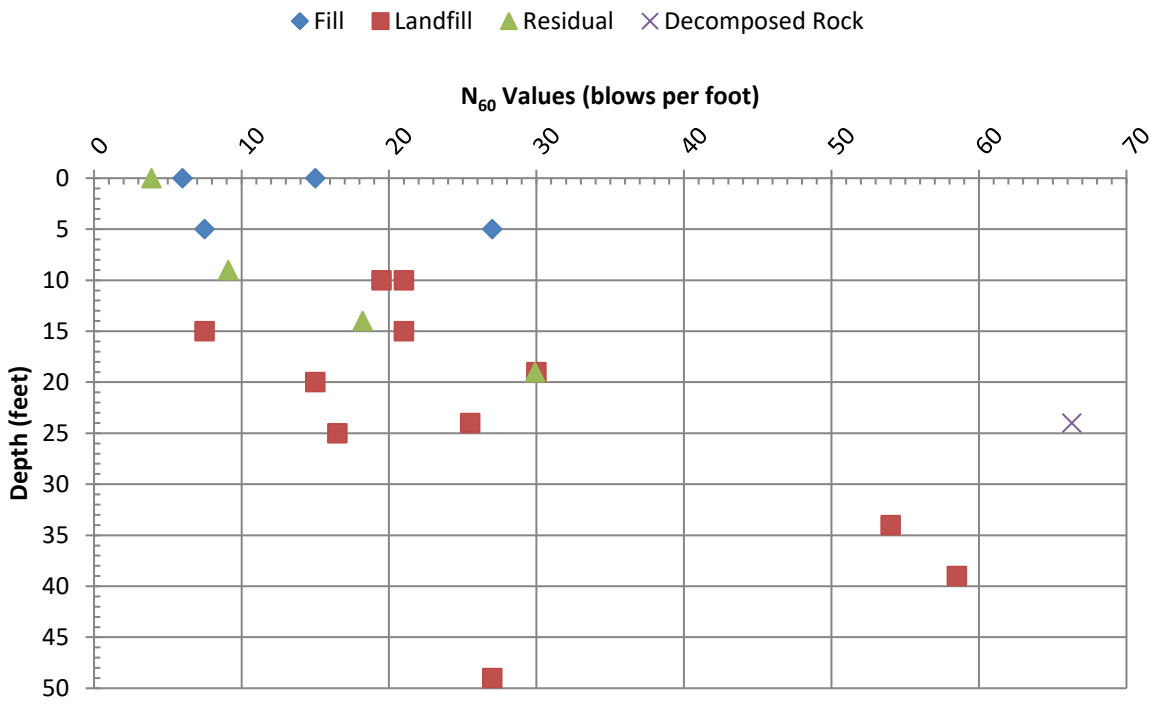
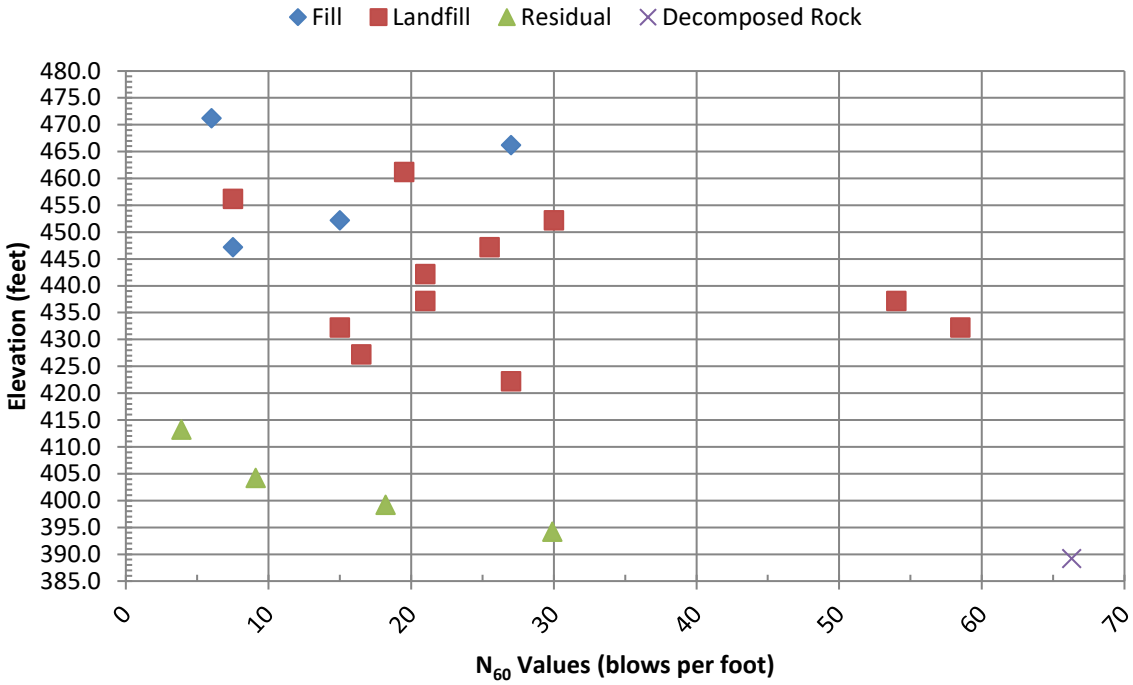


Figure 2 below shows the distribution of the collected N_{60}-values, of all soil types, versus elevation across the site.

Figure 2 - Standard Penetration Resistances Elevation vs. N_{60}



4.5 Results of Laboratory Testing

The completed laboratory index tests performed on samples of the subsurface materials are summarized on the following Table 1 - Laboratory Test Results. The laboratory results are presented in graphic form in **Appendix B**.

Table 1 – Laboratory Test Results

Boring	Sample Depth (ft)	USCS Class.	In-Place Moisture (%)	Atterberg Limits[1]			-#200 Sieve (%)	Unit Weight (lb/ft^3)
				LL	PL	PI		
B-4	0-1.5	SM[1]	5.5	30	26	4	---	---
B-4	4-6	CL[1]	19.1	---	---	---	---	118.4
B-4	9-10.5	SM[1]	26.8	---	---	---	---	---
B-5	0-1.5	SM[1]	16.4	---	---	---	---	---
B-5	4-6	SM[1]	15.3	---	---	---	---	118.6
B-5	5-6.5	SM	13.4	26	23	3	41	---
B-6	4-6	SC-SM	20.7	27	20	7	50	112.4
B-6	9-10.5	SM[1]	18.2	---	---	---	---	---
B-6	14-15.5	SM[1]	15.6	---	---	---	---	---
B-6	19-20.5	SM	13.0	26	22	4	32	---

Notes: [1] USCS Classification for samples noted are determined by visual observation

4.6 Ground Water Conditions

Ground water observations were made during the drilling operation, immediately after the augers were withdrawn, and after 26 to 68-hours from the augers being withdrawn. Borings were backfilled at completion of water readings with the drill spoils and capped off with Bentonite chips.

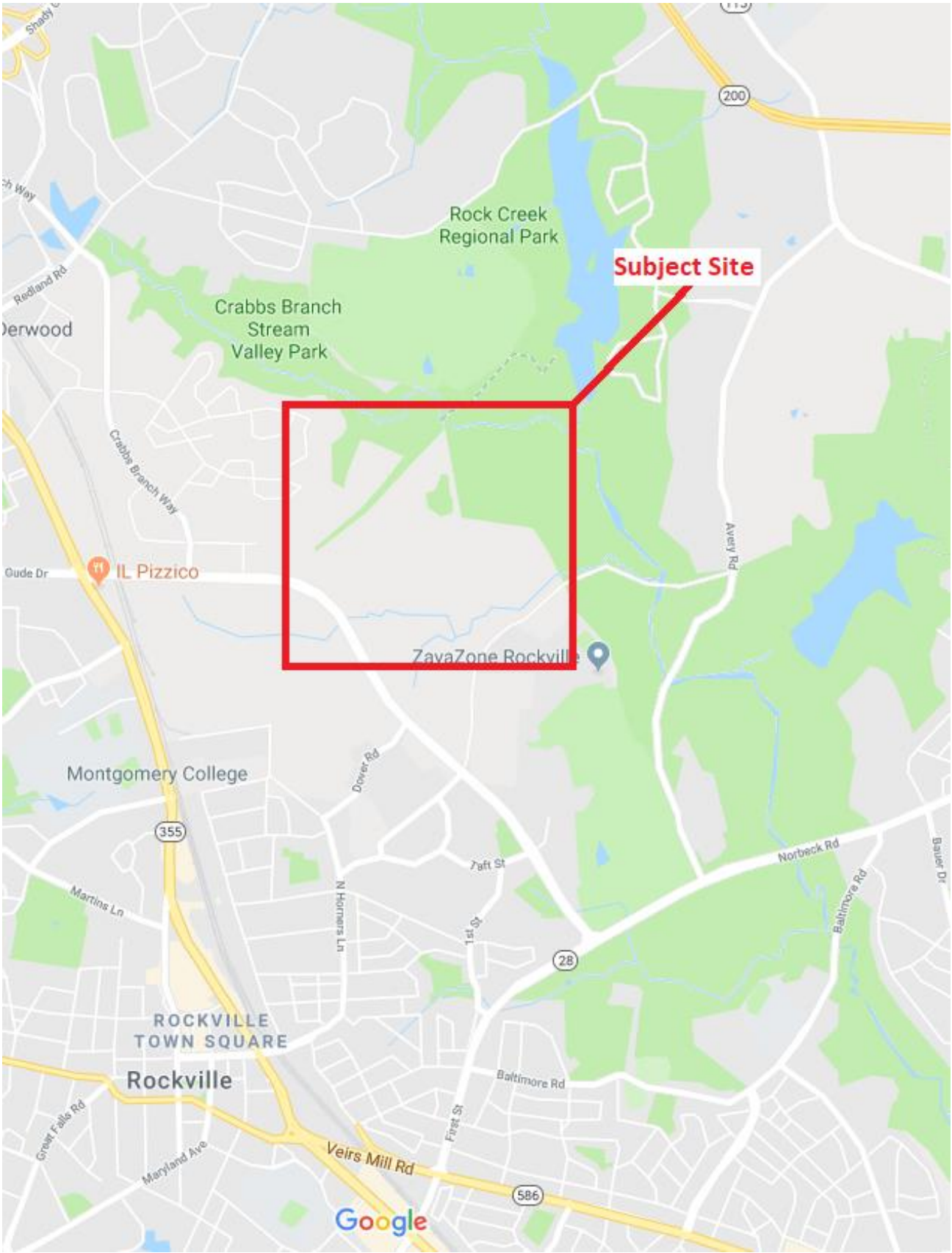
Based on the water readings collected, ground water was encountered in 2 of the 3 borings at depths ranging from 10.0 feet to 14.0 feet below the existing ground surface (approximate elevations EL 443.7 to EL 457.2). We understand that ground water in this area is generally around EL 340 to EL 350 based off previous information provided by EA; therefore, the presence of water in the recent borings would suggest that it is trapped or perched in the landfill.

Boring B-6 exhibited dry conditions during drilling and after removal of the augers. It must be noted that this does not indicate that water is not present, only that ground water did not seep into the borehole while it was drilled, or that the boreholes caved at depths shallower than the current water levels. It should be assumed that ground water at this location is present at a deeper depth than drilled. Table 2 below provides the at-completion and 24+ hours ground water measurements recorded.

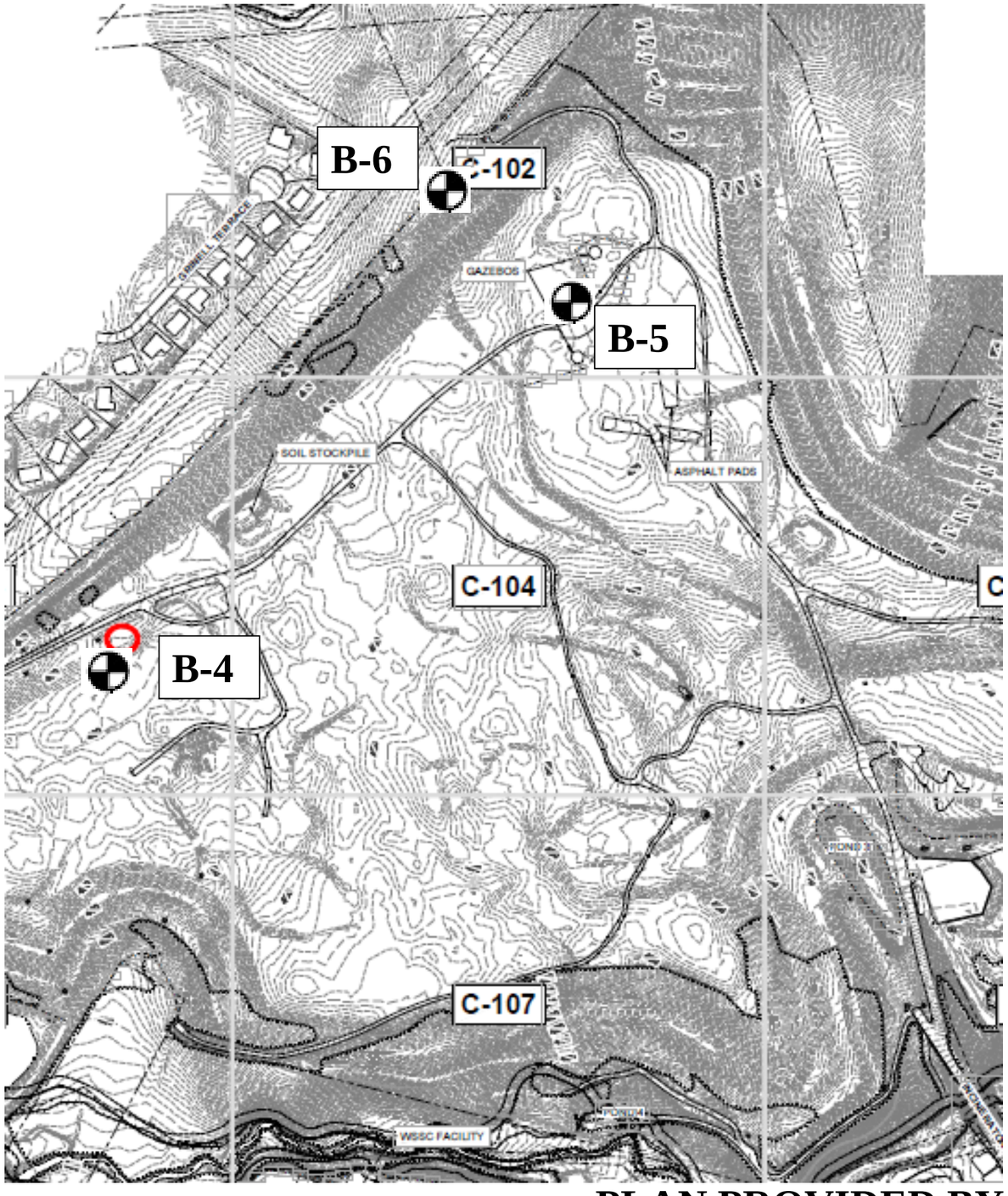
Table 2 – Ground Water Measurements

Boring	*Ground Elev. (feet)*	*Measured Water Depth at Completion (feet)*	*Measured Water Depth after 24-hours (feet)*	*At-Completion Water Elevation (feet)*	*Water Elevation After 24+ Hours (feet)*
B-4	457.0	13.3	9.8	443.7	447.2
B-5	471.2	14.3	11.0	457.2	460.5
B-6	413.2	Dry	Dry	<388.0	N/A

Subsurface water levels will fluctuate with changes in rainfall and runoff, construction and development activities, and other causes. Future groundwater levels across the site should be expected to vary from those noted during the recent exploration program.



Gude Landfill **Rockville, MD** THE ROBERT B. BALTER COMPANY® Geotechnical and Geo-environmental Engineers	**Site Vicinity Map**		**Project No.** **17359-0**
	Scale: None	**Date: Oct. 2020**	**PLATE 1**



N

Legend

- Approximate as-drilled location

PLAN PROVIDED BY EA ENGINEERING

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Gude Landfill
Rockville, MD

DRAFT BORING LOCATION PLAN		Project No. 17359-0
Scale: 1” ~ 457’	Date: October 2020	Plate 2

APPENDIX A

BORING LOGS

THE ROBERT B. BALTER COMPANY

IDENTIFICATION OF SOIL SAMPLES

Soils are described in the boring logs according to the following criteria with the principal constituents written in capital letters. Other constituents are preceded by descriptive terminology that is used to denote the percentage of weight of each component. Soil descriptions are determined visually except where laboratory classification test data are available. Classifications are based on The Robert B. Balter Company's interpretation of ASTM D 2487-00.

COARSE GRAINED SOIL > 50% Retained on No. 200 Sieve	**GRAVEL**	0 to 5% Fines	Well Graded		**GW**	GRAVEL
			Poorly Graded		**GP**	GRAVEL
		6 to 12% Fines	Silty Fines	Well Graded	**GW-GM**	GRAVEL with Silt
				Poorly Graded	**GP-GM**	GRAVEL with Silt
			Clayey Fines	Well Graded	**GW-GC**	GRAVEL with Clay
				Poorly Graded	**GP-GC**	GRAVEL with Clay
		13 to 50% Fines	Silty Fines		**GM**	Silty GRAVEL
			Silty Clay Fines		**GC-GM**	Silty, Clayey GRAVEL
			Clayey Fines		**GC**	Clayey GRAVEL
	SAND	0 to 5% Fines	Well Graded		**SW**	SAND
			Poorly Graded		**SP**	SAND
		6 to 12% Fines	Silty Fines	Well Graded	**SW-SM**	SAND with Silt
				Poorly Graded	**SP-SM**	SAND with Silt
			Clayey Fines	Well Graded	**SW-SC**	SAND with Clay
				Poorly Graded	**SP-SC**	SAND with Clay
		13 to 50% Fines	Silty Fines		**SM**	Silty SAND
			Silty, Clayey Fines		**SC-SM**	Silty, Clayey SAND
			Clayey Fines		**SC**	Clayey SAND
FINE GRAINED SOIL ≥ 50% Passing No. 200 Sieve	**SILT & CLAY (LL<50)**	Low Plastic Fines, PI<4	Plots below "A" line		**ML**	SILT
		Low Plastic Fines, 4≤PI≤7	Plots on or above "A" line		**CL-ML**	Silty CLAY
		Plastic Fines, PI>7	Plots on or above "A" line		**CL**	Lean CLAY
		Significant Organics, PI<4	Plots below "A" line		**OL**	Organic SILT
		Significant Organics, PI≥4	Plots on or above "A" line		**OL**	Organic CLAY
	SILT & CLAY (LL≥50)	Elastic Fines	Plots below "A" line		**MH**	Elastic SILT
		Plastic Fines	Plots on or above "A" line		**CH**	Fat CLAY
		Significant Organics	Plots below "A" line		**OH**	Organic SILT
		Significant Organics	Plots on or above "A" line		**OH**	Organic CLAY
HIGHLY ORGANIC SOIL		Dark, highly organic, decomposed vegetative tissue			**PT**	PEAT

ADDITIONAL TERMINOLOGY:

Descriptive Components

Descriptive Terms	Proportions
Trace	1 - 5%
Little (Sand, Gravel)	6 - 14%
With (Sand, Gravel)	15 – 30%
With (Silt, Clay)	6 – 12%
Adjective Form (**Sandy, Gravelly**)	31 - 50%
Adjective Form (**Silty, Clayey**)	13 - 50%

Density or Consistency

SAND and GRAVEL		SILT and CLAY	
N-Value	**Density**	**N-Value**	**Consistency**
0-4	Very Loose	0-1	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Medium Stiff
31-50	Dense	9-15	Stiff
> 50	Very Dense	16-30	Very Stiff
		> 30	Hard

Fill materials are placed by man, and may be identified by unnatural artifacts, unnatural mixed grain sizes or layering, or trustworthy documentation of fill placement.
Possible Fill materials are difficult to distinguish from natural soils, exhibiting minor distinctions.
Decomposed Rock consists of residual soil with SPT N-values between 50 blows per foot and blows per 4 inches (50/4").
Highly Weathered Rock consists of residual soil with SPT N-values between 50/3" and 50/1".

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BORING LOG

BORING B-4

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**

RIG Mobil B45 **METHOD** Hollow Stem Auger **SAMPLER:** 2-in OD SS **HAMMER:** 140# **FALL:** 30" **AUTO?** Yes

DATE STARTED 10/1/20 **COMPLETED** 10/1/20

DRILLER Dan Ditman **HELPER** Kenny Putman

REVIEWED BY Chris Karg **SITE DELAYS**

LOCATION approximately 40' South **BULK SAMPLES** 1'-5'

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
10/1/20		0 ▽		20.5	13.3	443.7
10/2/20		26 ▼		17.0	9.8	447.2

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/EL (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS PL	ATTERBERGS LL	ATTERBERGS PI	REMARKS
								SURFACE EL = 457.0 ft							
	S1	4-6-4	10	0.3 / 456.7		SM		Topsoil (4")		5		26	30	4	
								Moist, Loose, Brown Silty Sand with Small Rock Fragments (Fill)							
				4.0 / 453.0						19					
5								Moist, Medium Stiff, Grayish Sandy Clay (Fill)							
	S2	3-2-3	5			CL			1.90	27					
	T1	11 / 24		8.0 / 449.0				LANDFILL							
10							▼	Wet, Medium Dense, Brown Silty Sand and Trash (Plastic, Wood, etc.)							(1)
	S3	5-11-3	14			SM									
				13.0 / 444.0			▽	Wet, Stiff, Brown Sandy Silt							
15						ML									
	S4	9-9-5	14												
				17.0 / 440.0				Moist, Stiff, Brown Sandy, Clayey Silt with Rock and Trash (Wallpaper, etc.)							
20															
	S5	3-4-6	10			CL-ML			3.25						
25															
	S6	9-5-6	11	26.5 / 430.5				Terminated at 26.5 feet							

REMARKS: (1)Water encountered on spoon at 10'

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BORING LOG

BORING B-5

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**

RIG Mobil B45 **METHOD** Hollow Stem Auger **SAMPLER:** 2-in OD SS **HAMMER:** 140# **FALL:** 30" **AUTO?** Yes

DATE STARTED 10/1/20 **COMPLETED** 10/2/20

DRILLER Dan Ditman **HELPER** Kenny Putman

REVIEWED BY Chris Karg **SITE DELAYS**

LOCATION As Staked **BULK SAMPLES** 1'-5'

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
10/2/20		0 ▽		15.2	14.3	457.2
10/5/20		68 ▼		12.3	11.0	460.5

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/EL (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS PL	ATTERBERGS LL	ATTERBERGS PI	REMARKS
								SURFACE EL = 471.5 ft							
	S1	1-2-2	4	0.3 471.2				Topsoil (4") Moist, Loose to Medium Dense, Orangish Brown Silty Sand (Fill)	1.80	16					
5						SM		Tube at 4' in offset hole (Recovery = 13")		15					
	S2	7-9-9	18						3.25	13	41	23	26	3	
				8.0 463.5				LANDFILL							
10	S3	8-8-5	13			ML	▼	Moist, Stiff, Orangish Brown/Black Sandy Silt (Fill, Possible wood obstruction augering)							
				13.0 458.5			▽	Wet, Loose, Grayish Silty Sand with Trash (Wood, Metal)							(1)
15	S4	4-3-2	5			SM									
				18.0 453.5				Offset hole 5' West at approximately 18' after hitting obstruction (possible steel pieces) Moist, Medium Dense Trash (Wood, Newspaper)							(2)
20	S5	15-10-10	20												
				22.0 449.5				Wet, Medium Dense, Light Brown Silty Sand with Trash (Wood)							
25	S6	14-9-8	17			SM									
				27.0 444.5				Wet, Very Dense, Gravel with Sand and Trash (Wood)							
30	S7	50				GC									
				31.0 440.5				Wet, Medium Dense to Very Dense, Dark Gray Trash (Rubber, Plastic Pieces)							
35	S8	15-20-	36												

REMARKS: (1)Water encountered on spoon at 14' (2)Hole offset 5' West after hitting obstruction/refusal

(Continued Next Page)

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BORING LOG

BORING B-5

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/EL (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS PL	LL	PI	REMARKS
		16			F			Wet, Medium Dense to Very Dense, Dark Gray Trash (Rubber, Plastic Pieces) *(continued)*							
40	S9	18-25-14	39		F										
45	S10	24-33-27	60		F										
50	S11	20-11-7	18	50.5 421.0	F										
								Terminated at 50.5 feet							

REMARKS: (1)Water encountered on spoon at 14' (2)Hole offset 5' West after hitting obstruction/refusal

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BORING LOG

BORING B-6

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**

RIG Mobil B45 **METHOD** Hollow Stem Auger **SAMPLER:** 2-in OD SS **HAMMER:** 140# **FALL:** 30" **AUTO?** Yes

DATE STARTED 10/5/20 **COMPLETED** 10/5/20

DRILLER Dan Ditman **HELPER** Kenny Putman

REVIEWED BY Chris Karg **SITE DELAYS**

LOCATION As Staked **BULK SAMPLES** 1'-14'

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
10/5/20		0 ▽		16.3	Dry	

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/EL (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS PL	ATTERBERGS LL	ATTERBERGS PI	REMARKS
								SURFACE EL = 413.5 ft							
	S1	1-1-2	3	0.3 413.2	F	ML		Topsoil (4") Moist, Soft, Brown Clayey Silt, little Sand, trace roots (Fill)							
				3.0 410.5		SC-SM		Moist, Loose to Medium Dense, Reddish Brown Silty Clayey Sand (Residual)							
5	T1	23 / 24								21	50	20	27	7	
				8.0 405.5				Moist, Loose to Medium Dense, Reddish Brown Silty Sand (Residual)							
10	S2	2-3-4	7							18					
15	S3	5-6-8	14			SM		Relic Rock Structure Color to Light Brown		16					
20	S4	8-11-12	23							13	32	22	26	4	
				22.0 391.5		SM		Decomposed Rock sampled as: Moist, Very Dense, Brown Silty Sand							
25	S5	14-24-27	51	25.5 388.0				Terminated at 25.5 feet							

REMARKS:

APPENDIX B

LABORATORY TEST RESULTS

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SUMMARY OF LABORATORY RESULTS

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION **PROJECT NUMBER** 17359-0 **DATE TESTED**

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Class-ification	Water Content (%)	Dry Density (pcf)	Satur-ation (%)	Void Ratio
B-4	0.0	30	26	4				5.5			
B-4	4.0							19.1			
B-4	5.0							26.8			
B-5	0.0							16.4			
B-5	4.0							15.3			
B-5	5.0	26	23	3	12.5	41	SM	13.4			
B-6	4.0	27	20	7	25	50	SC-SM	20.7			
B-6	9.0							18.2			
B-6	14.0							15.6			
B-6	19.0	26	22	4	4.75	32	SM	13.0			

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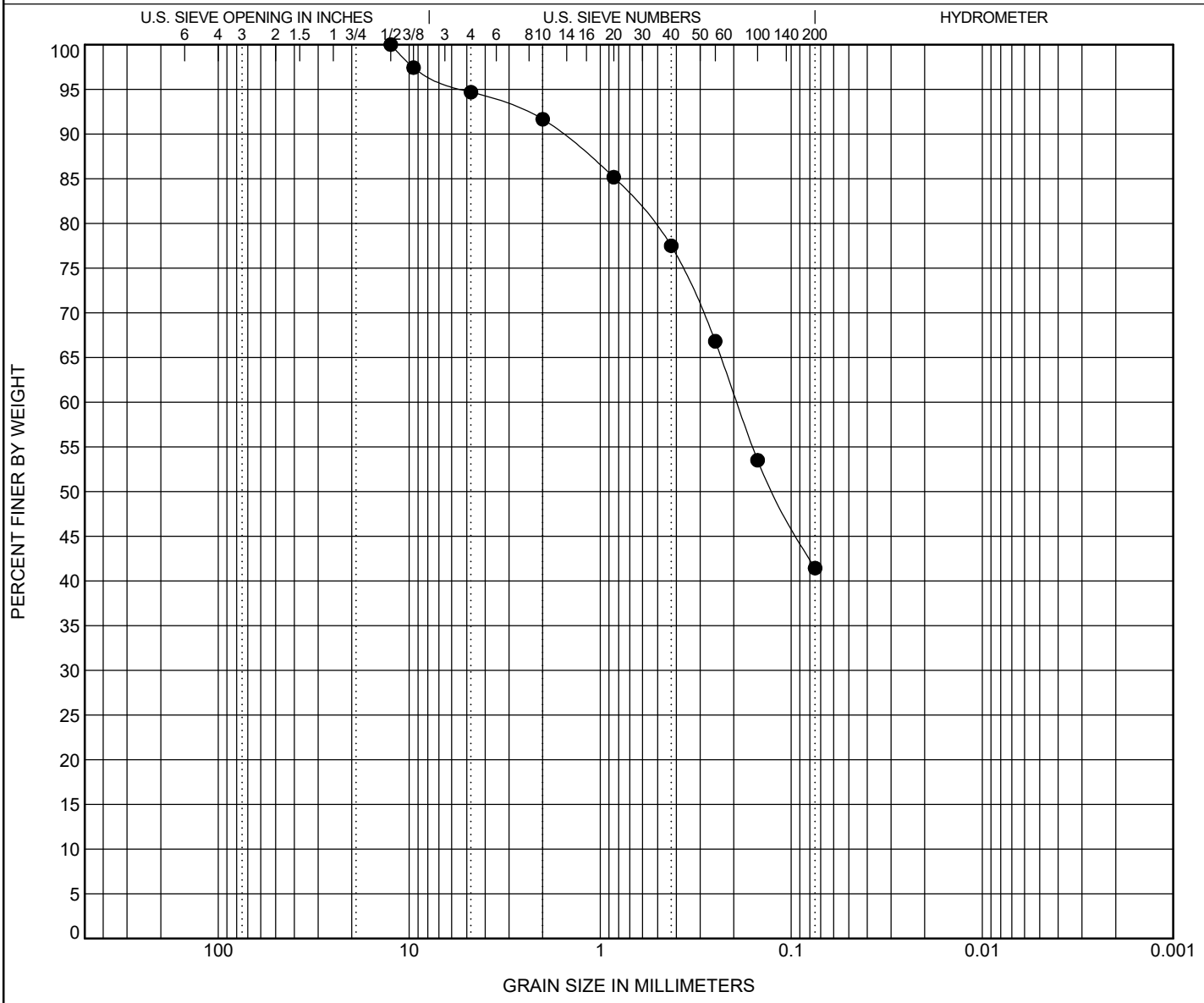
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION **PROJECT NUMBER** 17359-0 **DATE TESTED**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	B-5, S-2 @ 5.0' - 6.5',	**Reddish Brown SILTY SAND(SM)**	**26**	**23**	**3**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-5, S-2 @ 5.0' - 6.5',	**12.5**	**0.192**			**5.3**	**53.2**	**41.4**	

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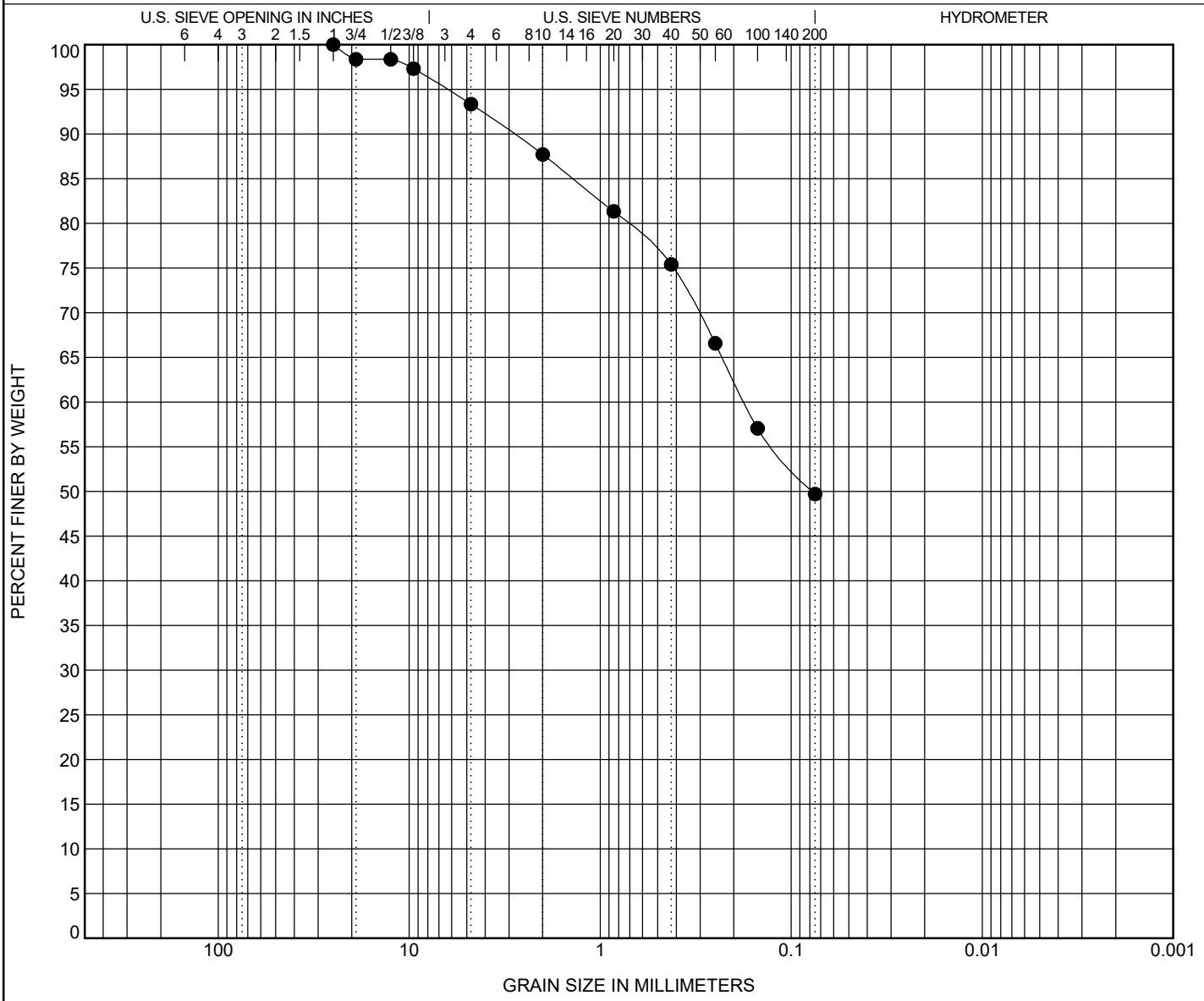
TEST METHOD ASTM D422

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION **PROJECT NUMBER** 17359-0 **DATE TESTED**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	B-6, T-1 @ 4.0' - 6.0',	**Red SILTY, CLAYEY SAND(SC-SM)**	**27**	**20**	**7**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-6, T-1 @ 4.0' - 6.0',	**25**	**0.176**			**6.7**	**43.6**	**49.7**	

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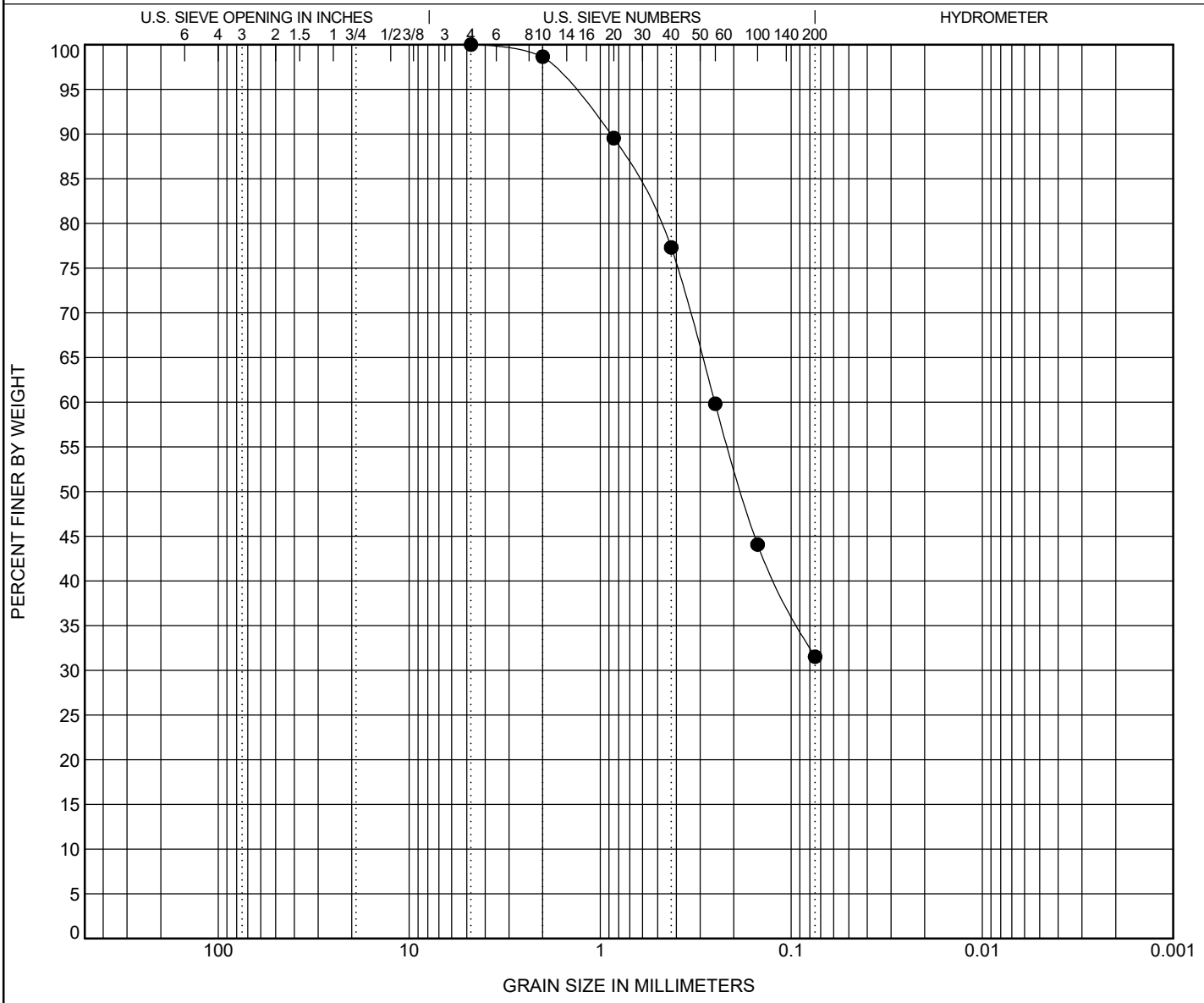
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION **PROJECT NUMBER** 17359-0 **DATE TESTED**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	B-6, S-4 @ 19.0' - 20.5',	Reddish Yellow SILTY SAND(SM)	26	22	4		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-6, S-4 @ 19.0' - 20.5',	4.75	0.251			0.0	68.5	31.5	

APPENDIX C

ENVIRONMENTAL MEASURES

HEALTH AND SAFETY PLAN REVIEW RECORD

SITE: Gude Landfill

EA Project No. 1564601

I have read the Health and Safety Plan (s) and have been briefed on the nature, level, and degree of exposure likely as a result of participation of field activities. I agree to conform to all the requirements of this Plan.

Name	Signature	Affiliation	Date
Kristopher Crist		RB Balter Co	9/29/2020
Dennis STraunderman		RB Balter Co.	9-29-20
Kenneth Putman Jr		RB Balter Co.	9-29-20
Daniel Ditman		RB Balter Co.	9-29-20
Chris Karg		RB Balter Co.	9-29-20
Kristopher Crist		"	10-1-20
Dennis STraunderman		" "	10-1-20
Kenneth Putman Jr		" "	10-1-20
Daniel Ditman		" "	10-1-20
Chris Karg		" "	10-1-20
Chris Karg		" "	10-2-20
Kenneth Putman Jr		" "	10-2-20
Daniel Ditman		" "	10-2-20
Dennis STraunderman		" "	10-2-20
Chris Karg		" "	10-5-20
Daniel Ditman		" "	10-5-20
Kenneth Putman Jr		" "	10-5-20
Dennis Straunderman		" "	10-5-20

SITE ENTRY AND EXIT LOG

Project/Site : Gude Landfill
Project No.: 1564601

Date	Name	Representing	Time In	Time Out
10/1/20	Kris Crist	RBB	8:05	1:30
	Dennis Strawderman			
	Chris Karg			
	Kenny Putman			
	Dan Ditman			
10/2/20	Dennis Strawderman	RBB	8:10	2:00
	Chris Karg			
	Kenny Putman			
	Dan Ditman			
10/5/20	Dennis Strawderman		8:15	12:00
	Chris Karg			
	Kenny Putman			
	Dan Ditman			

ENVIRONMENTAL MONITORING RECORD

SITE: Gude Landfill
PROJECT NO.: 1564601
INSTRUMENT: Gas Detector - ALTAIR 4X Ser #: 506331

CALIBRATION: Gas: _____ Conc: _____ Span: _____

	Time	Monitoring Location	Reading	Corrective Action Taken[a]
10/1/20	9:30	B-4 @ beginning	LEL = 0 20.8 O_2 0 CO 0 H_2S	—
	11:10	B-4 @ 10-15' ("Top Landfill")	O_2 = 20.8, CO = 0, H_2S = 0	—
	11:45	B-4 @ Completion	" "	
	12:00	B-5 @ 5'	O_2 = 20.8, CO = 0, H_2S = 0, LEL = 0	—
	13:30	B-5 @ 10'	" "	
10/2/20	8:30	B-5 @ 10'	O_2 = 20.8, CO = 0, H_2S = 0, LEL = 0	—
	10:00	B-5 @ 15'	" "	—
	10:40	B-5 @ 20'	" "	—
	11:40	B-5 @ 30'	" , CO = 1, "	(CO returned to 0)
	12:30	B-5 @ 40'	O_2 = 20.8, CO = 0, H_2S = 0, LEL = 0	
10/5/20	9:30	B-6 @ beginning	O_2 = 20.8, CO = 0, H_2S = 0, LEL = 0	—
	10:25	B-6 @ 15'	" "	—
	11:00am	B-6 @ completion	O_2 = 20.8, CO = 0, H_2S = 1, LEL = 0	— (H_2S returned to 0)

Comments: _____

(a) Corrective actions taken must be documented whenever readings at or above action levels are reached.

Recorded By: _____ Date: 10/5/2020
Site Health & Safety Supervisor

THE ROBERT B. BALTER COMPANY®

November 23, 2020

Kerry E. Feuz, P.E.
Civil Engineer
EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031

RE:

Laboratory Soils Test Results
Purple Line Stockpile
600 East Gude Drive
Rockville, Maryland 20850
RBB Project No. 17359-0 MD

Dear Ms. Feuz:

The Robert B. Balter Company is pleased to submit the laboratory test results from the samples collected at six (6) locations from the purple line stockpile within the Gude Landfill. The laboratory testing included six (6) of each of the following: Atterberg Limits, Direct Shears (remolded), Flexible Wall Permeability tests (remolded), Moisture Contents, Sieve Analyses, and Standard Proctors. See the lab summary sheet and associated laboratory test reports attached at the end of this document for further information.

Project information provided to us by various parties helped form the basis for our data report. If any of the project information discussed in this report differs from the actual proposed analysis, we should be contacted to re-evaluate the data provided herein and provide revisions or further investigation if requested.

We have appreciated this opportunity to be of service. If you have any questions regarding this report, or if we can assist you in any way, please do not hesitate to call our office.

Sincerely,

THE ROBERT B. BALTER COMPANY

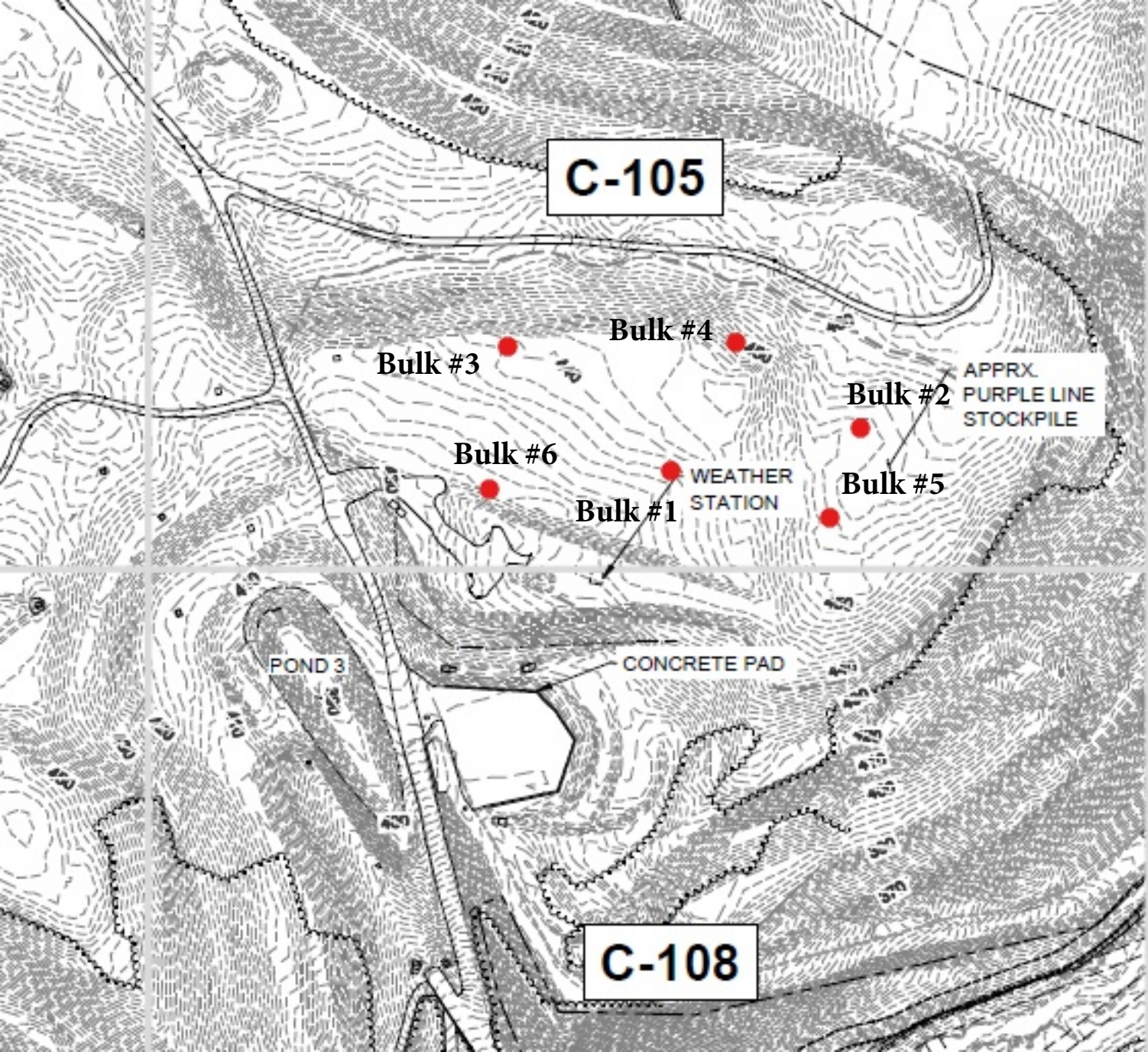
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 41312, Expiration Date: 01/05/2022

Christopher D. Karg II, E.I.T.
Project Engineer

Kristopher M. Crist, P.G., P.E.
Senior Geotechnical Engineer

11/25/2020

STATE OF MARYLAND
KRISTOPHER M CRIST
No. 41312
PROFESSIONAL ENGINEER


C-105
Bulk #4
Bulk #3
Bulk #2
APPRX.
PURPLE LINE
STOCKPILE
Bulk #6
WEATHER
STATION
Bulk #5
Bulk #1
POND 3
CONCRETE PAD
C-108

Purple Line Stockpile
Bulk #1 Lab Results

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Materials and Construction Inspection and Testing
Telephone No. (410) 363-1555
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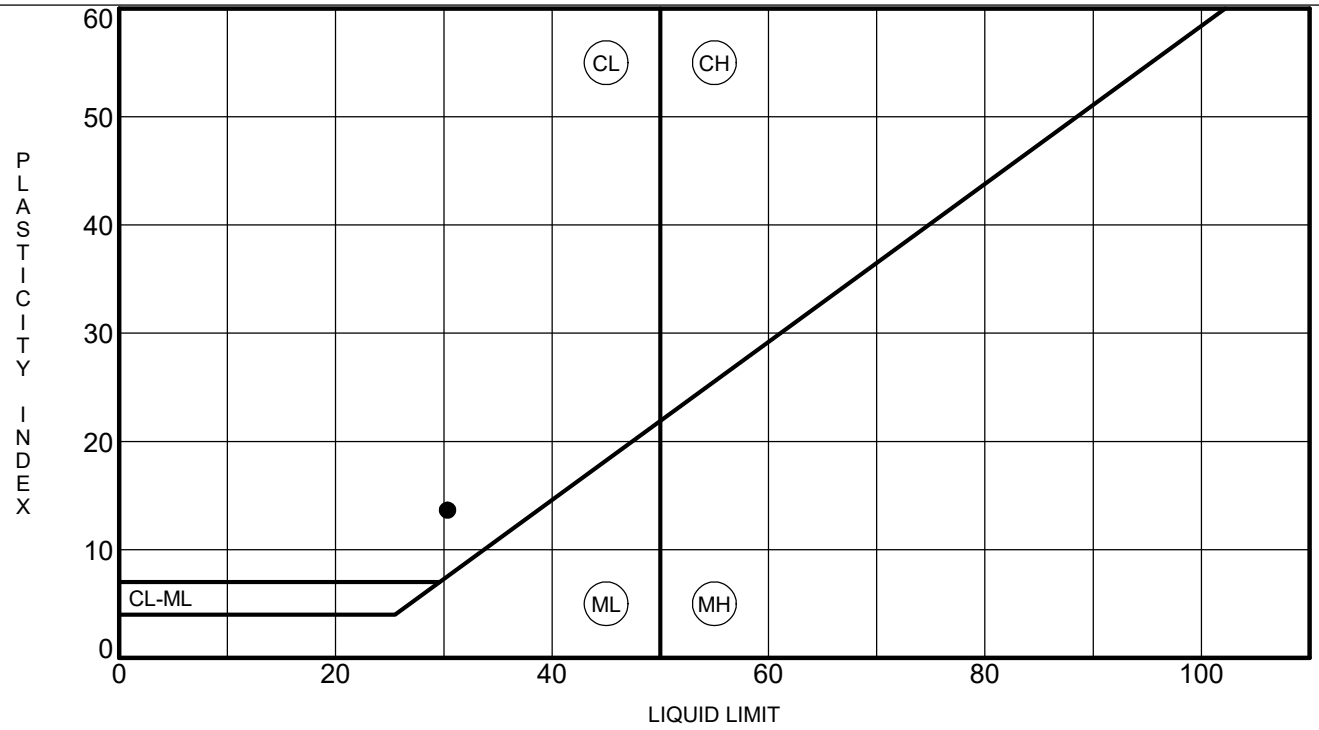
ATTERBERG LIMITS' RESULTS

TEST METHOD ASTM D4318

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

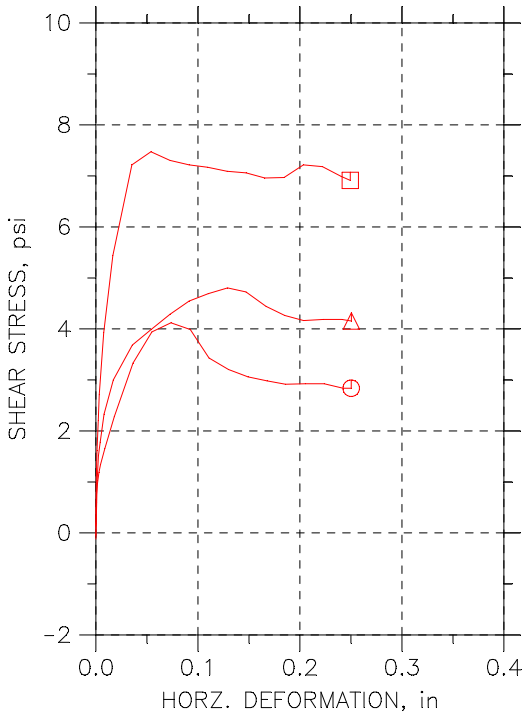
PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**

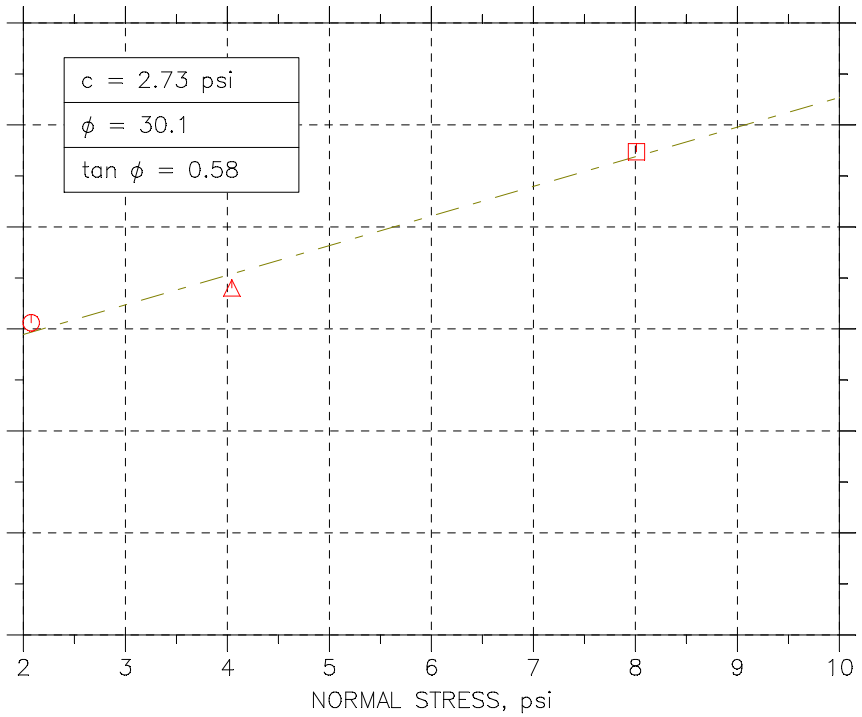


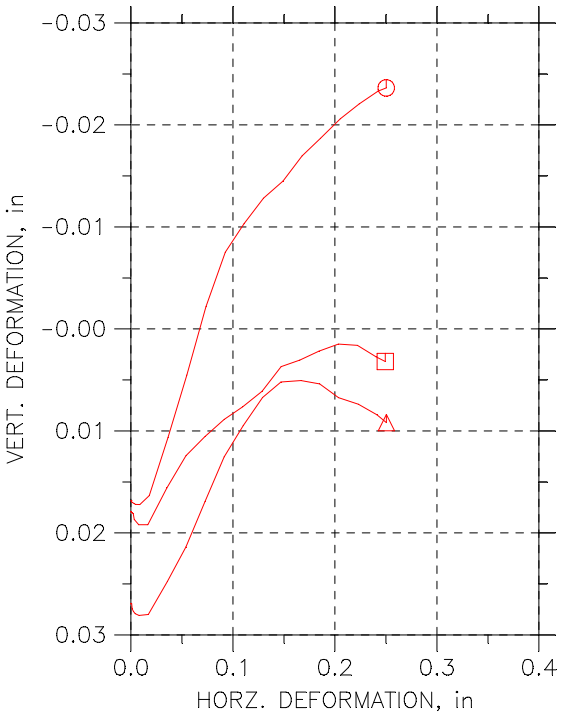
	Specimen Identification	LL	PL	PI	Fines	Classification
●	**Purple Line - Bulk 1, Bulk @ 0.0' - 5.0',**	**30**	**17**	**13**	**37**	**CLAYEY SAND(SC)**

ATTERBERG LIMITS 17359-0 GUDE LANDFILL - PURPLE LINE STOCKPILE.GPJ MTA REDLINE.GDT 11/23/20

DIRECT SHEAR TEST REPORT







Symbol		○	△	□	
Test No.		2	3	4	
Sample No.		Bulk	Bulk	Bulk	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.492	2.489	2.49	
	Area, in^2	4.8774	4.8656	4.8695	
	Height, in	0.996	0.996	0.984	
	Water Content, %	16.34	15.56	16.05	
	Dry Density, pcf	107.78	108.57	110.1	
	Saturation, %	74.89	72.71	77.89	
	Void Ratio	0.6044	0.59278	0.57064	
Consol. Height, in		0.98408	0.97114	0.96819	
Consol. Void Ratio		0.5852	0.55301	0.54541	
Final	Water Content, %	20.93	19.19	19.58	
	Dry Density, pcf	105.28	109.58	110.46	
	Saturation, %	90.22	91.94	95.92	
	Void Ratio	0.64246	0.57808	0.56554	
Normal Stress, psi		2.0764	4.0439	8.01	
Max. Shear Stress, psi		4.1211	4.8028	7.4725	
Ult. Shear Stress, psi		2.8368	4.1535	6.9132	
Time to Failure, min		8.0033	14.003	6.0036	
Disp. Rate, in/min		0.02	0.02	0.02	
Estimated Specific Gravity		2.77	2.77	2.77	
Liquid Limit		30	30	30	
Plastic Limit		17	17	17	
Plasticity Index		13	13	13	

Project: Gude Landfill
Location:
Project No.: 17359-0
Boring No.: B-1
Sample Type: Remolded
Description: Visual Classification: Dark Brown CLAY
Remarks:

Mon, 09-NOV-2020 07:58:36

Client:	Robert B. Balter Company		
Project Name:	Gude Landfill		
Project Location:	Maryland		
GTX #:	312644		
Start Date:	11/13/2020	Tested By:	jlw
End Date:	11/18/2020	Checked By:	emm
Boring #:	---		
Sample #:	Bulk 1		
Depth:	0.0-5.0 ft		
Visual Description:	Clayey Sand		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D5084

Constant Volume

Sample Type:	Remolded	Permeant Fluid:	De-aired Distilled water
Orientation:	Vertical	Cell #:	---

Sample Preparation: Target Compaction: 95% of the 115.9 pcf at 13.5% moisture content. Values specified by client. Material > 3/8-inch screened out of sample prior to testing (0%). Trimmings moisture content = 13.3%

Assumed Specific Gravity: 2.70

Parameter	Initial	Final
Height, in	2.00	1.97
Diameter, in	2.86	2.83
Area, in^2	6.42	6.29
Volume, in^3	12.8	12.4
Mass, g	420.7	436.7
Bulk Density, pcf	124.5	134.0
Moisture Content, %	13.3	17.6
Dry Density, pcf	109.9	114.0
Degree of Saturation, %	67	99

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	89.99	Increased Cell Pressure, psi:	95.04	Cell Pressure Increment, psi:	5.05
Sample Pressure, psi:	84.97	Corresponding Sample Pressure, psi:	89.67	Sample Pressure Increment, psi:	4.70
				B Coefficient:	0.93

*B value did not increase with increase in pressure. Final degree of saturation >95%.

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time,	Gradient	Permeability K,	Temp,		Permeability K @ 20 °C,
		Cell	Sample	Z_1	Z_2	Z_1-Z_2	sec		cm/sec	°C	R_t	cm/sec
11/17	1	90.0	85.0	8.0	7.7	0.3	33	20.1	3.6E-07	19.5	1.013	3.6E-07
11/17	2	90.0	85.0	8.0	7.7	0.3	32	20.1	3.7E-07	19.5	1.013	3.7E-07
11/17	3	90.0	85.0	8.0	7.7	0.3	34	20.1	3.5E-07	19.5	1.013	3.5E-07
11/17	4	90.0	85.0	8.0	7.7	0.3	33	20.1	3.6E-07	19.5	1.013	3.6E-07

PERMEABILITY AT 20° C: 3.7 x 10^{-7} cm/sec (@ 5 psi effective stress)

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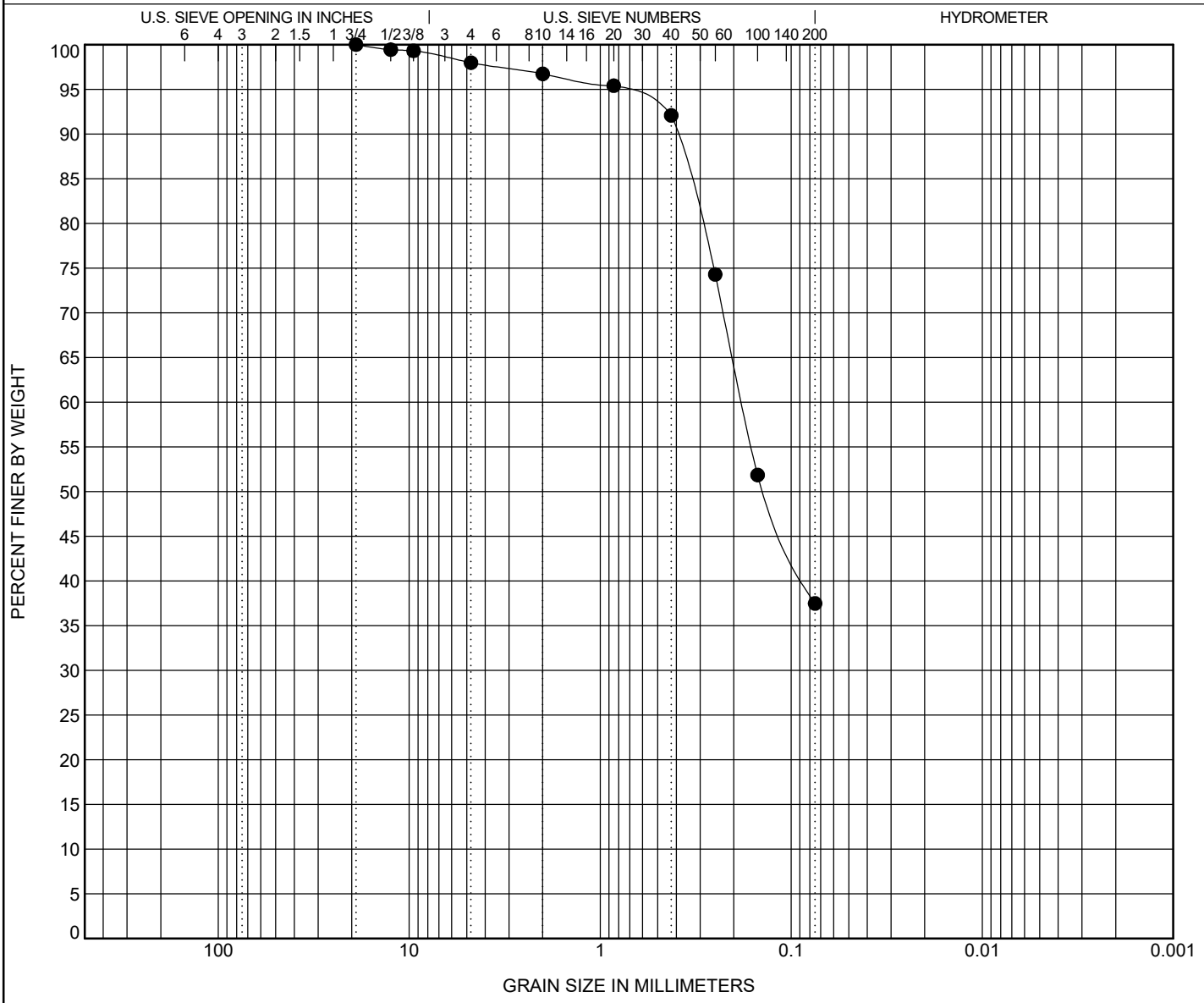
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**Purple Line - Bulk 1, Bulk @ 0.0' - 5.0',**	**CLAYEY SAND(SC)**	**30**	**17**	**13**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**Purple Line - Bulk 1, Bulk @ 0.0' - 5.0',**	**19**	**0.181**			**2.0**	**60.5**	**37.5**	

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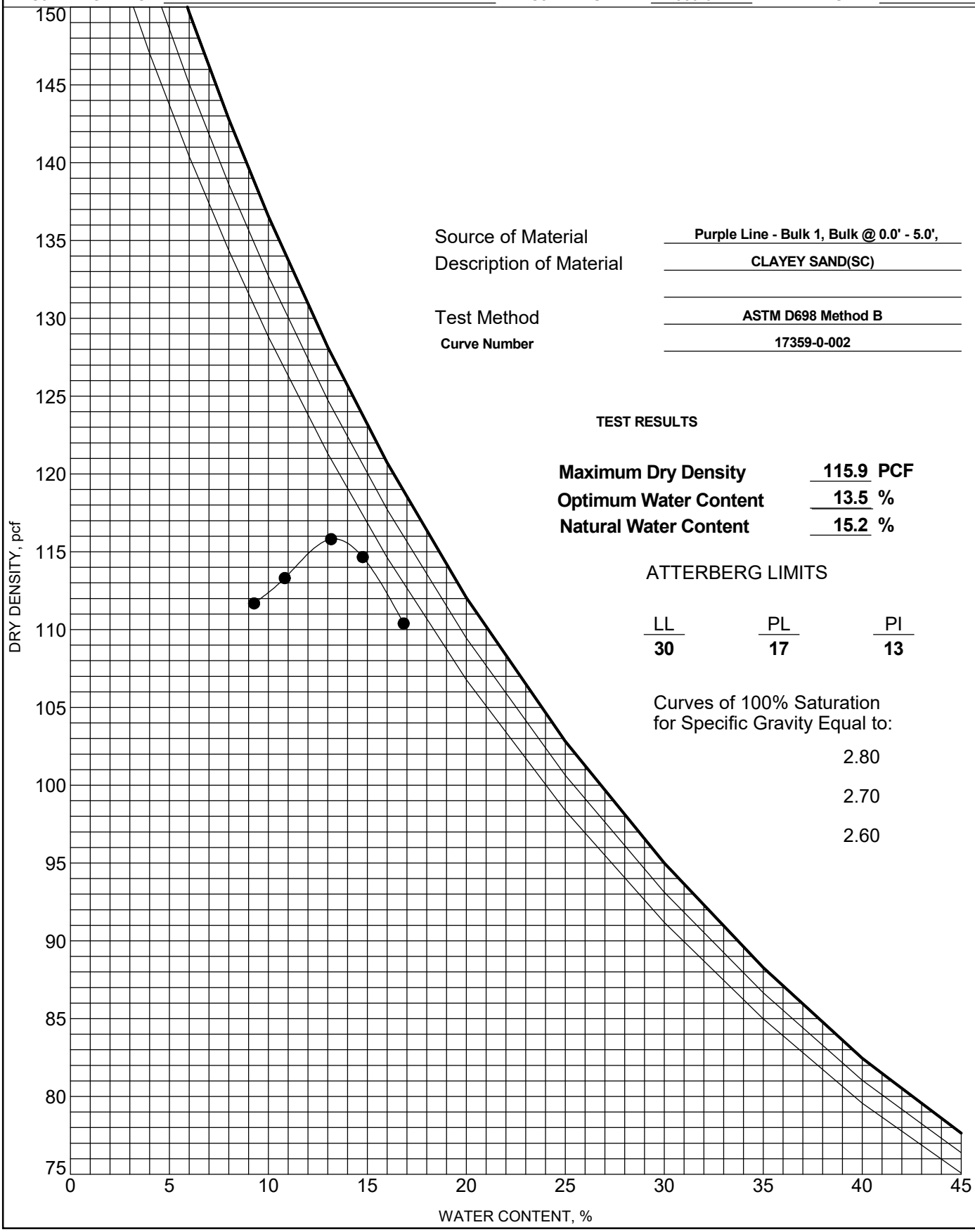
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**



Source of Material: **Purple Line - Bulk 1, Bulk @ 0.0' - 5.0',**

Description of Material: **CLAYEY SAND(SC)**

Test Method: **ASTM D698 Method B**

Curve Number **17359-0-002**

TEST RESULTS

Maximum Dry Density	**115.9**	**PCF**
Optimum Water Content	**13.5**	**%**
Natural Water Content	**15.2**	**%**

ATTERBERG LIMITS

LL	PL	PI
30	**17**	**13**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 17359-0 GUDE LANDFILL - PURPLE LINE STOCKPILE.GPJ MTA REDLINE.GDT 10/23/20

Purple Line Stockpile
Bulk #2 Lab Results

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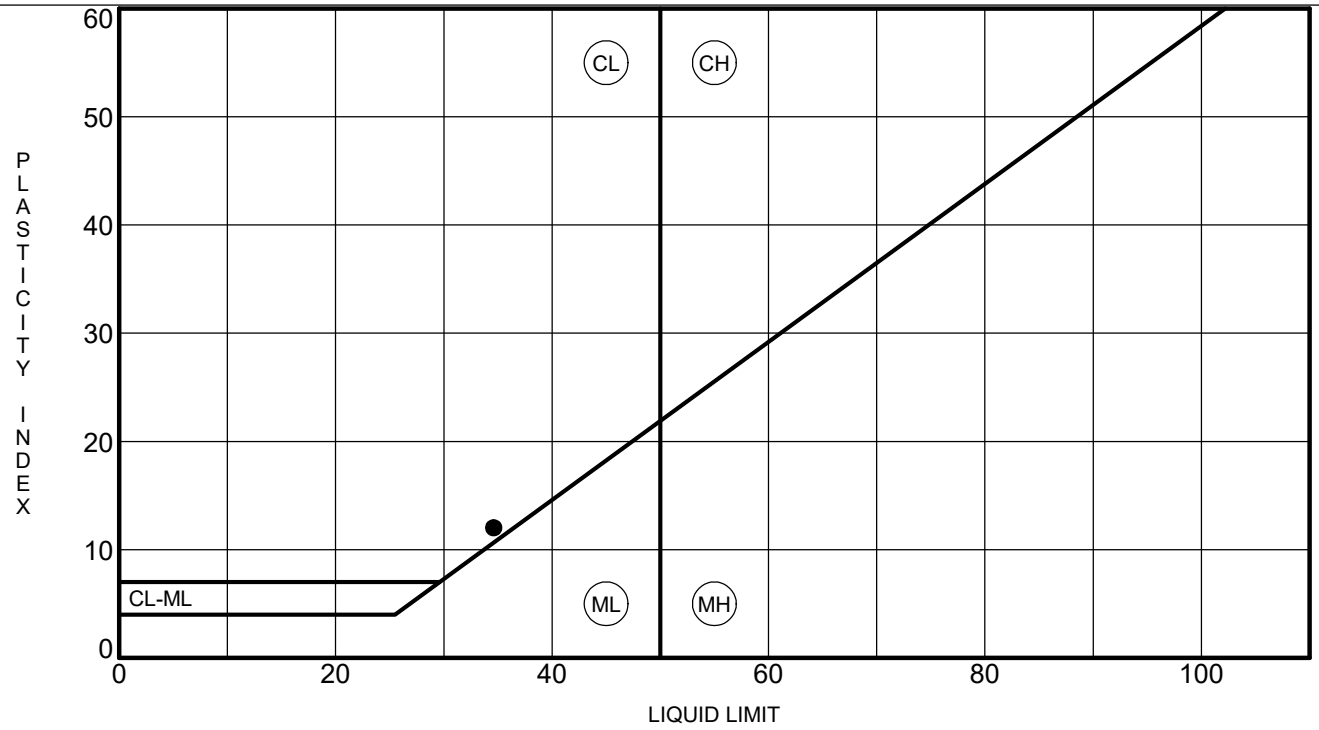
ATTERBERG LIMITS' RESULTS

TEST METHOD ASTM D4318

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

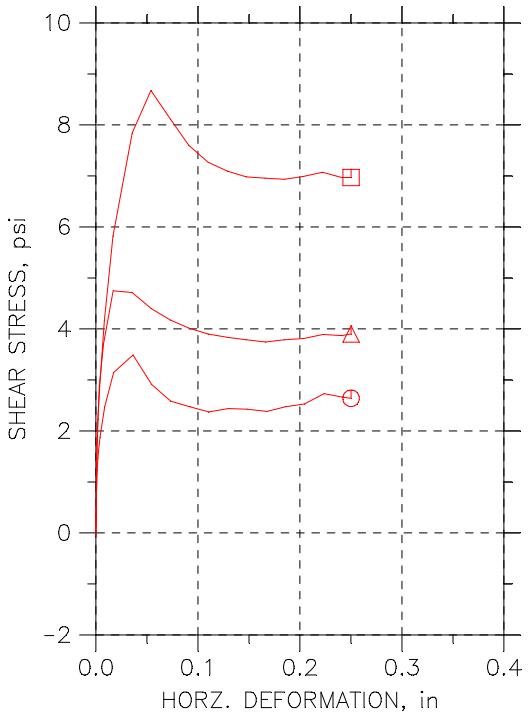
PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**

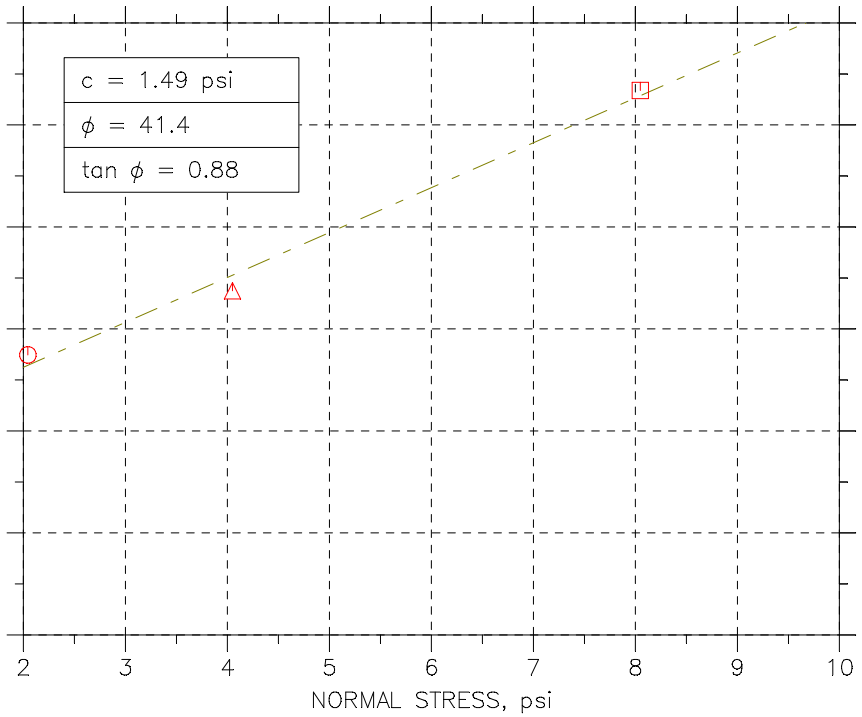


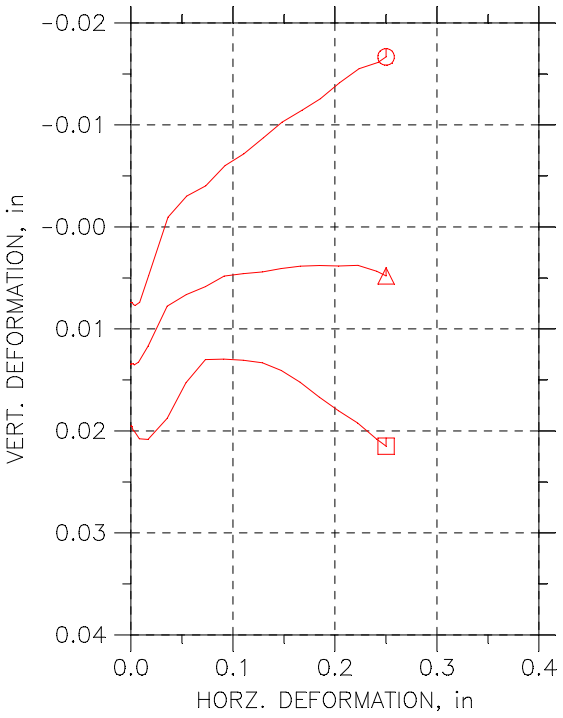
	Specimen Identification	LL	PL	PI	Fines	Classification
●	**Purple Line - Bulk 2, Bulk @ 0.0' - 5.0',**	**35**	**23**	**12**	**38**	**CLAYEY SAND(SC)**

ATTERBERG LIMITS 17359-0 GUDE LANDFILL - PURPLE LINE STOCKPILE.GPJ MTA REDLINE.GDT 11/23/20

DIRECT SHEAR TEST REPORT







Symbol		⏲	△	⊡	
Test No.		2	3	4	
Sample No.		Bulk	Bulk	Bulk	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.49	2.48	2.46	
	Area, in^2	4.8695	4.8305	4.7529	
	Height, in	0.987	0.989	0.989	
	Water Content, %	17.31	16.89	17.12	
	Dry Density, pcf	107.03	108.34	109.81	
	Saturation, %	77.87	78.45	82.53	
	Void Ratio	0.61568	0.59617	0.5747	
Consol. Height, in		0.97999	0.97642	0.97024	
Consol. Void Ratio		0.6042	0.57587	0.54484	
Final	Water Content, %	21.68	20.56	20.69	
	Dry Density, pcf	105.25	108.87	112.25	
	Saturation, %	93.39	96.78	100.00	
	Void Ratio	0.64296	0.58841	0.54049	
Normal Stress, psi		2.0441	4.0493	8.0482	
Max. Shear Stress, psi		3.4901	4.7475	8.6759	
Ult. Shear Stress, psi		2.64	3.9018	6.9682	
Time to Failure, min		4.0038	2.0038	6.0036	
Disp. Rate, in/min		0.02	0.02	0.02	
Estimated Specific Gravity		2.77	2.77	2.77	
Liquid Limit		35	35	35	
Plastic Limit		23	23	23	
Plasticity Index		12	12	12	

Project: Gude Landfill
Location:
Project No.: 17359-0
Boring No.: B-2
Sample Type: Remolded
Description: USCS Classification: Orangish Brown CLAYEY SAND (SC)
Remarks:

Mon, 09-NOV-2020 08:29:41

Client:	Robert B. Balter Company		
Project Name:	Gude Landfill		
Project Location:	Maryland		
GTX #:	312644		
Start Date:	11/19/2020	Tested By:	jlw
End Date:	11/20/2020	Checked By:	emm
Boring #:	---		
Sample #:	Bulk 2		
Depth:	0.0-5.0 ft		
Visual Description:	Orangish Brown Clayey Sand		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D5084
Constant Gradient

Sample Type:	Remolded	Permeant Fluid:	De-aired Distilled water
Orientation:	Vertical	Cell #:	---

Sample Preparation: Target Compaction: 95% of 114.0 pcf at 13.8% moisture content. Values specified by client. Material > 3/8-inch screened out of sample prior to testing (0%). Trimmings moisture content = 13.7%

Assumed Specific Gravity: 2.70

Parameter	Initial	Final
Height, in	2.00	2.00
Diameter, in	2.86	2.80
Area, in^2	6.42	6.16
Volume, in^3	12.8	12.3
Mass, g	415.3	431.0
Bulk Density, pcf	122.9	133.1
Moisture Content, %	13.7	18.0
Dry Density, pcf	108.0	112.7
Degree of Saturation, %	66	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	90.00	Increased Cell Pressure, psi:	94.99	Cell Pressure Increment, ps	4.99
Sample Pressure, psi:	85.04	Corresponding Sample Pressure, psi:	89.25	Sample Pressure Increment	4.21
				B Coefficient:	0.84

B-value did not increase with increase in pressure. Final degree of saturation >95%.

FLOW DATA

Date	Time, sec	Pressure, psi Cell	Inlet	Outlet	Gradient	Flow Volume, cc In	Out	Δ In	Δ Out	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
11/20	---	90.0	85.5	84.5	13.8	7.00	14.00	---	---	---	---	---
11/20	118	90.0	85.5	84.5	13.8	7.10	13.90	0.10	0.10	19.5	1.013	1.6E-06
11/20	----	90.0	85.5	84.5	13.8	7.00	14.00	---	---	---	---	---
11/20	112	90.0	85.5	84.5	13.8	7.10	13.90	0.10	0.10	19.5	1.013	1.6E-06
11/20	----	90.0	85.5	84.5	13.8	7.00	14.00	---	---	---	---	---
11/20	132	90.0	85.5	84.5	13.8	7.10	13.90	0.10	0.10	19.5	1.013	1.4E-06
11/20	----	90.0	85.5	84.5	13.8	7.00	14.00	---	---	---	---	---
11/20	129	90.0	85.5	84.5	13.8	7.10	13.90	0.10	0.10	19.5	1.013	1.4E-06

PERMEABILITY AT 20° C: 1.5 x 10^{-6} cm/sec (@ 5 psi effective stress)

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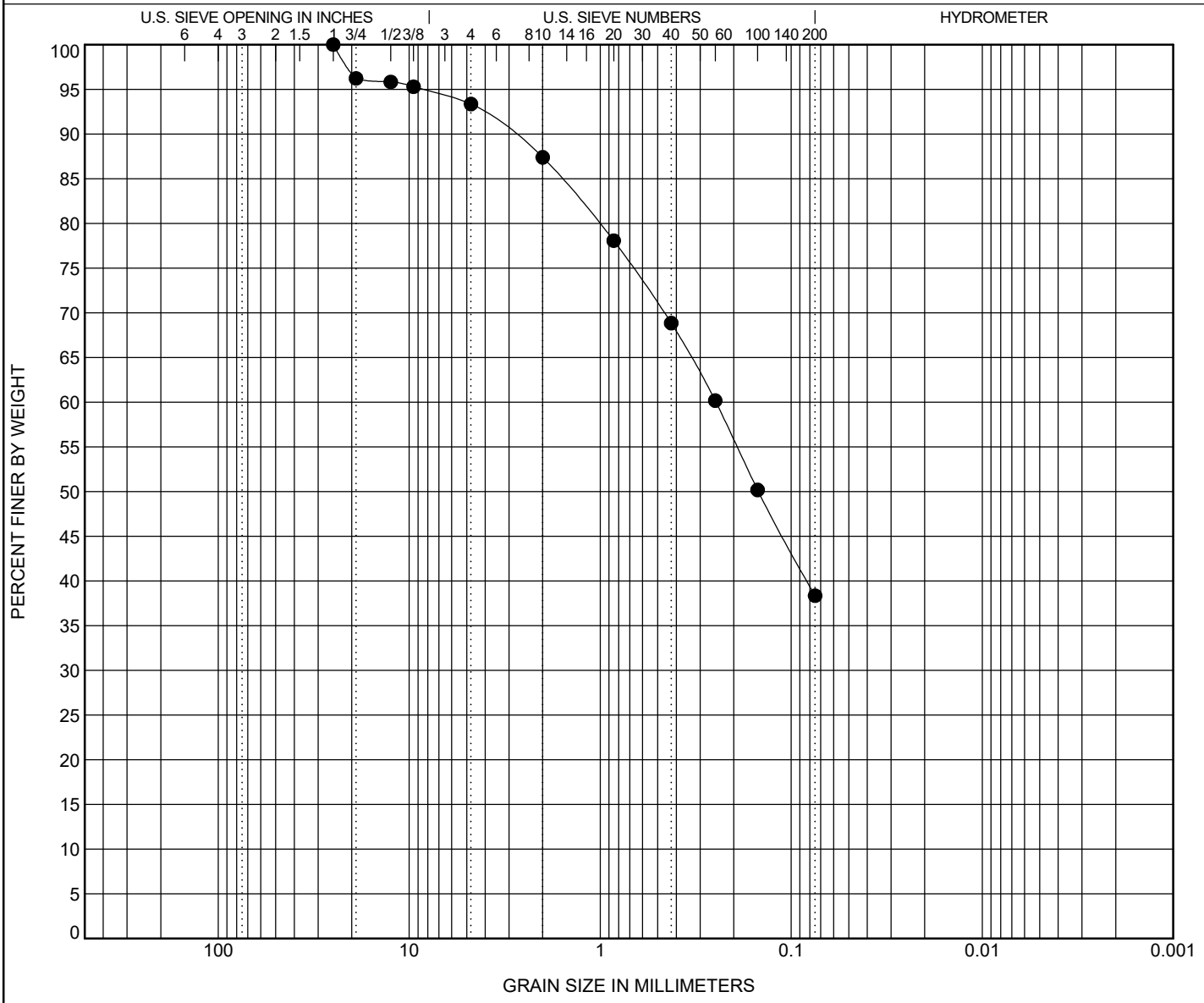
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**Purple Line - Bulk 2, Bulk @ 0.0' - 5.0',**	**CLAYEY SAND(SC)**	**35**	**23**	**12**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**Purple Line - Bulk 2, Bulk @ 0.0' - 5.0',**	**25**	**0.248**			**6.6**	**55.0**	**38.3**	

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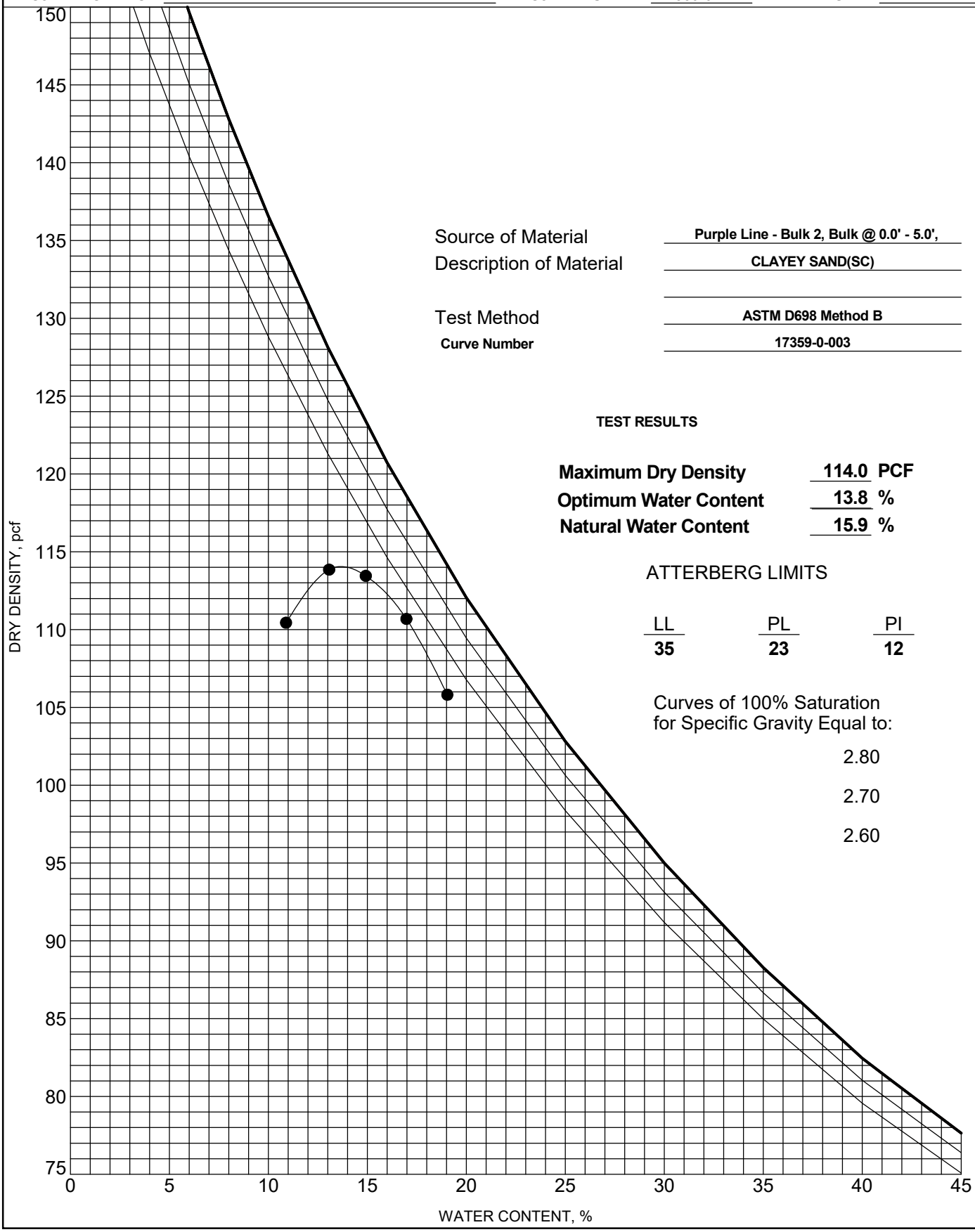
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**



Source of Material: **Purple Line - Bulk 2, Bulk @ 0.0' - 5.0',**

Description of Material: **CLAYEY SAND(SC)**

Test Method: **ASTM D698 Method B**

Curve Number **17359-0-003**

TEST RESULTS

Maximum Dry Density	**114.0**	**PCF**
Optimum Water Content	**13.8**	**%**
Natural Water Content	**15.9**	**%**

ATTERBERG LIMITS

LL	PL	PI
35	**23**	**12**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 17359-0 GUDE LANDFILL - PURPLE LINE STOCKPILE.GPJ MTA REDLINE.GDT 10/23/20

Purple Line Stockpile
Bulk #3 Lab Results

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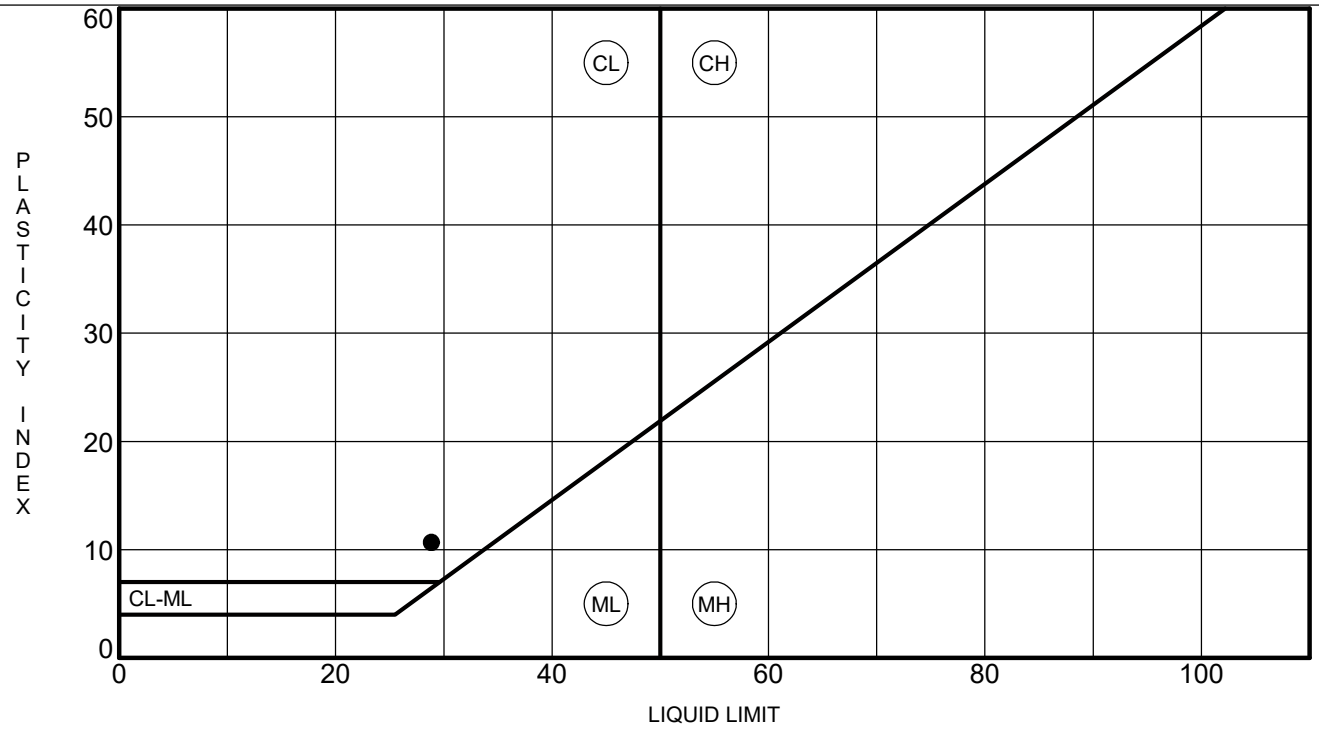
ATTERBERG LIMITS' RESULTS

TEST METHOD ASTM D4318

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

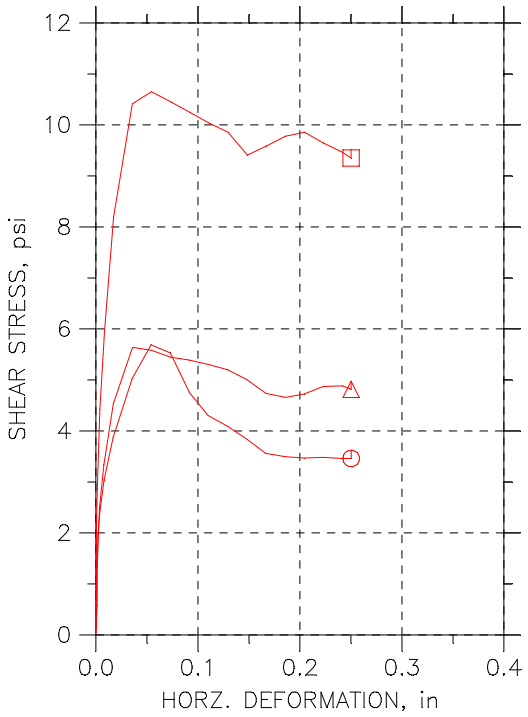
PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**

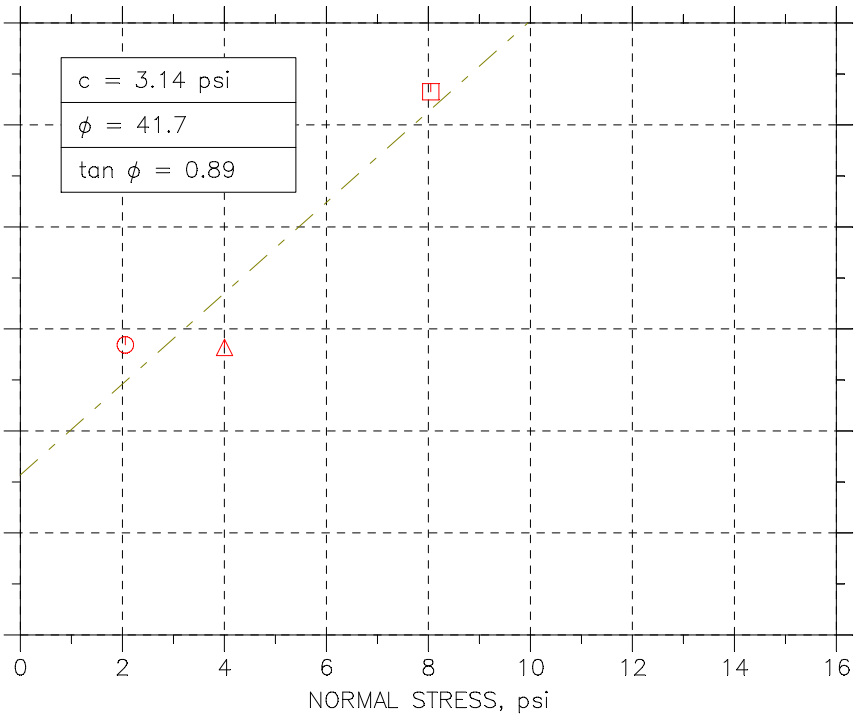


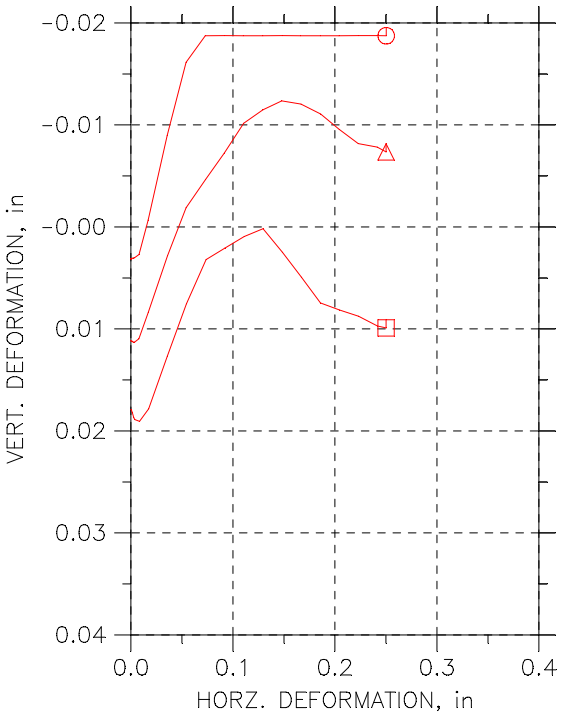
	Specimen Identification	LL	PL	PI	Fines	Classification
●	**Purple Line - Bulk 3, Bulk @ 0.0' - 5.0',**	**29**	**18**	**11**	**36**	**CLAYEY SAND(SC)**

ATTERBERG LIMITS 17359-0 GUDE LANDFILL - PURPLE LINE STOCKPILE.GPJ MTA REDLINE.GDT 11/23/20

DIRECT SHEAR TEST REPORT







Symbol		◷	△	□	
Test No.		2	3	4	
Sample No.		Bulk	Bulk	Bulk	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.489	2.48	2.49	
	Area, in^2	4.8656	4.8305	4.8695	
	Height, in	0.987	0.986	0.972	
	Water Content, %	15.04	15.14	15.06	
	Dry Density, pcf	112.05	112.88	113.6	
	Saturation, %	76.70	78.86	79.89	
	Void Ratio	0.5433	0.5319	0.52225	
Consol. Height, in		0.98392	0.97513	0.95497	
Consol. Void Ratio		0.53848	0.51502	0.49558	
Final	Water Content, %	18.56	17.55	16.34	
	Dry Density, pcf	109.96	112.05	114.77	
	Saturation, %	89.77	89.48	89.31	
	Void Ratio	0.5726	0.54334	0.50675	
Normal Stress, psi		2.0576	4.0014	8.0456	
Max. Shear Stress, psi		5.6872	5.6384	10.649	
Ult. Shear Stress, psi		3.4594	4.8152	9.3518	
Time to Failure, min		6.0035	4.0036	6.0034	
Disp. Rate, in/min		0.02	0.02	0.02	
Estimated Specific Gravity		2.77	2.77	2.77	
Liquid Limit		29	29	29	
Plastic Limit		18	18	18	
Plasticity Index		11	11	11	

Project: Gude Landfill
Location:
Project No.: 17359-0
Boring No.: B-3
Sample Type: Remolded
Description: USCS Classification: Orangish Brown CLAYEY SAND (SC)
Remarks:

Mon, 09-NOV-2020 08:34:30

Client:	Robert B. Balter Company		
Project Name:	Gude Landfill		
Project Location:	Maryland		
GTX #:	312644		
Start Date:	11/19/2020	Tested By:	jlw
End Date:	11/20/2020	Checked By:	emm
Boring #:	---		
Sample #:	Bulk 3		
Depth:	0.0-5.0 ft		
Visual Description:	Orangish Brown Clayey Sand		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D5084

Constant Volume

Sample Type:	Remolded	Permeant Fluid:	De-aired Distilled water
Orientation:	Vertical	Cell #:	---

Sample Preparation: Target Compaction: 95% of 117.8 pcf at 12.7% moisture content. Values specified by client. Material > 3/8-inch screened out of sample prior to testing (0%). Trimmings moisture content = 13.1%

Assumed Specific Gravity: 2.70

Parameter	Initial	Final
Height, in	2.00	2.00
Diameter, in	2.86	2.86
Area, in^2	6.42	6.42
Volume, in^3	12.8	12.8
Mass, g	426.9	445.7
Bulk Density, pcf	126.3	131.9
Moisture Content, %	13.1	18.1
Dry Density, pcf	111.7	111.7
Degree of Saturation, %	69	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	89.99	Increased Cell Pressure, psi:	95.01	Cell Pressure Increment, psi:	5.02
Sample Pressure, psi:	84.99	Corresponding Sample Pressure, psi:	89.04	Sample Pressure Increment, psi:	4.05
				B Coefficient:	0.81

*B value did not increase with increase in pressure. Final degree of saturation >95%.

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time,	Gradient	Permeability K,	Temp,		Permeability K @ 20 °C,
		Cell	Sample	Z_1	Z_2	Z_1-Z_2	sec		cm/sec	°C	R_t	cm/sec
11/20	1	90.0	85.0	8.0	7.5	0.5	35	19.8	5.6E-07	19.5	1.013	5.7E-07
11/20	2	90.0	85.0	8.0	7.5	0.5	38	19.8	5.2E-07	19.5	1.013	5.3E-07
11/20	3	90.0	85.0	8.0	7.5	0.5	36	19.8	5.5E-07	19.5	1.013	5.6E-07
11/20	4	90.0	85.0	8.0	7.5	0.5	37	19.8	5.3E-07	19.5	1.013	5.4E-07

PERMEABILITY AT 20° C: 5.5 x 10^{-7} cm/sec (@ 5 psi effective stress)

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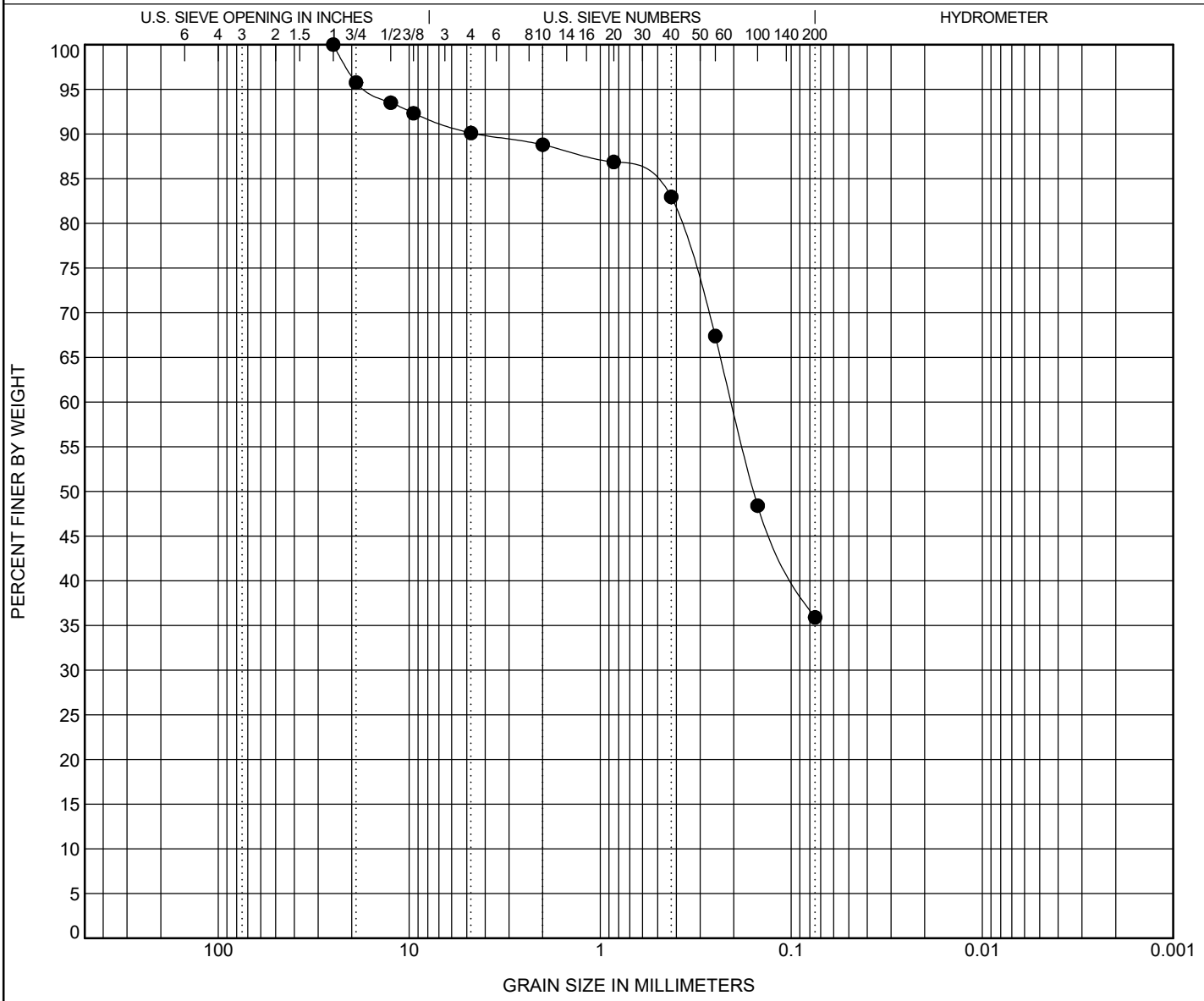
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	Purple Line - Bulk 3, Bulk @ 0.0' - 5.0',	**CLAYEY SAND(SC)**	**29**	**18**	**11**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	Purple Line - Bulk 3, Bulk @ 0.0' - 5.0',	**25**	**0.205**			**9.9**	**54.2**	**35.9**	

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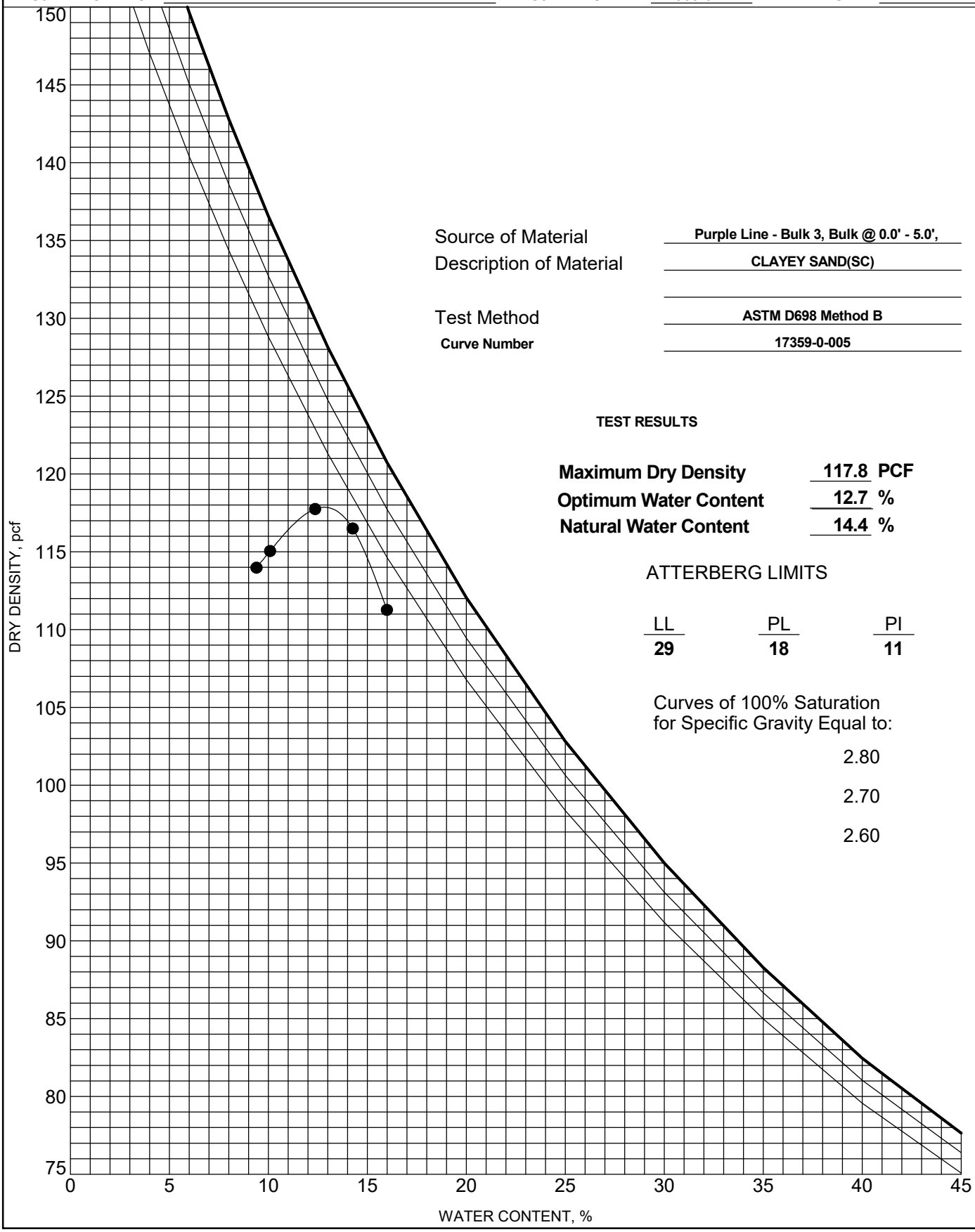
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**



Source of Material: **Purple Line - Bulk 3, Bulk @ 0.0' - 5.0',**

Description of Material: **CLAYEY SAND(SC)**

Test Method: **ASTM D698 Method B**

Curve Number **17359-0-005**

TEST RESULTS

Maximum Dry Density	**117.8**	**PCF**
Optimum Water Content	**12.7**	**%**
Natural Water Content	**14.4**	**%**

ATTERBERG LIMITS

LL	PL	PI
29	**18**	**11**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 17359-0 GUDE LANDFILL - PURPLE LINE STOCKPILE.GPJ MTA REDLINE.GDT 10/23/20

Purple Line Stockpile
Bulk #4 Lab Results

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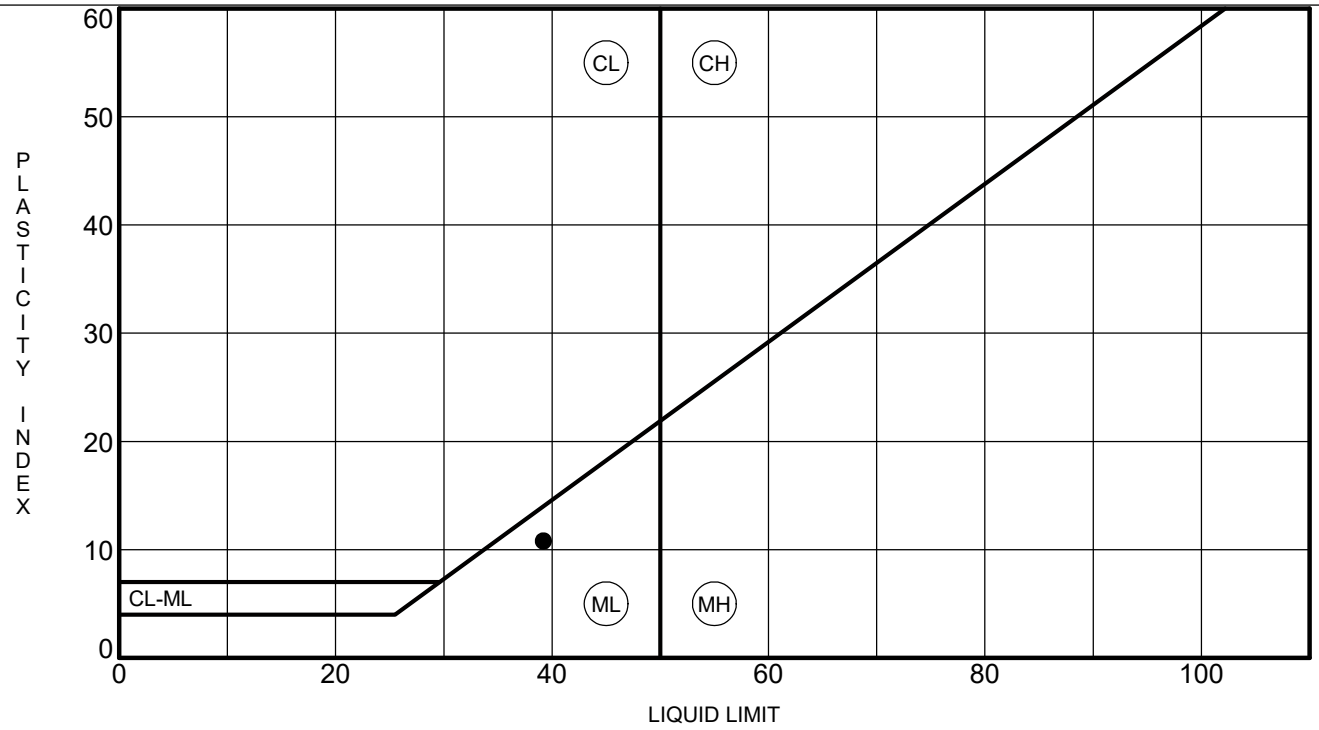
ATTERBERG LIMITS' RESULTS

TEST METHOD ASTM D4318

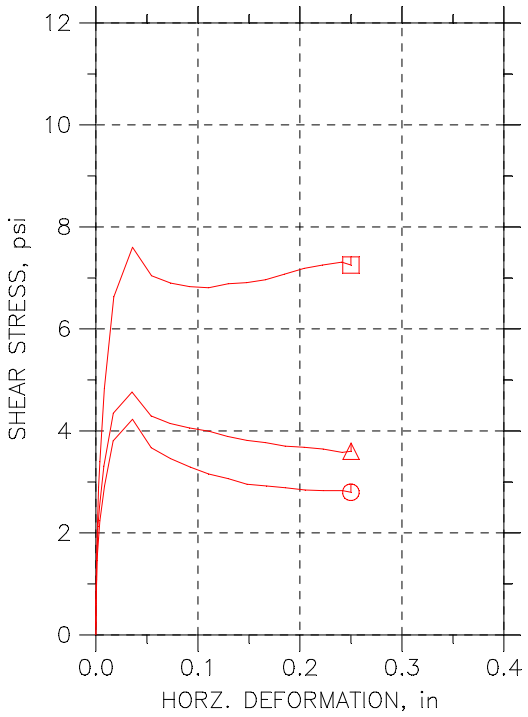
CLIENT EA Engineering **PROJECT NAME** Gude Landfill

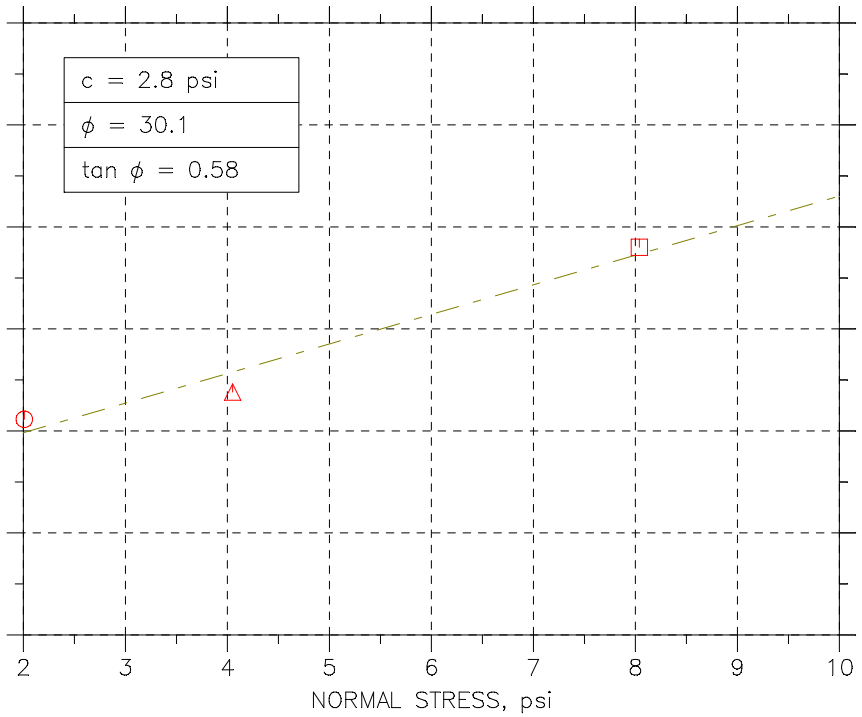
PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**

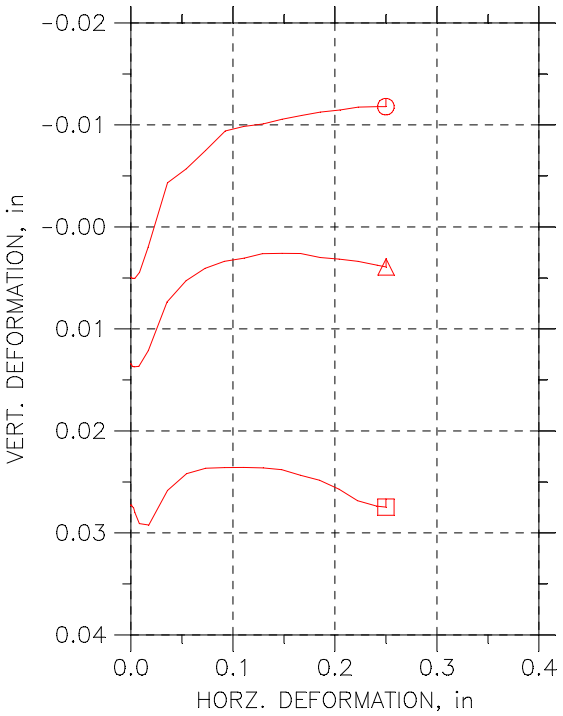


	Specimen Identification	LL	PL	PI	Fines	Classification
●	**Purple Line - Bulk 4, Bulk @ 0.0' - 5.0',**	**39**	**28**	**11**	**40**	**SILTY SAND(SM)**

DIRECT SHEAR TEST REPORT







Symbol		○	△	□	
Test No.		4	2	3	
Sample No.		Bulk	Bulk	Bulk	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.49	2.494	2.493	
	Area, in^2	4.8695	4.8852	4.8813	
	Height, in	0.985	0.989	0.989	
	Water Content, %	17.12	16.73	17.30	
	Dry Density, pcf	106.81	106.19	105.76	
	Saturation, %	76.60	73.73	75.44	
	Void Ratio	0.619	0.62851	0.63509	
Consol. Height, in		0.98006	0.97601	0.96191	
Consol. Void Ratio		0.61088	0.60711	0.59031	
Final	Water Content, %	22.20	22.43	20.75	
	Dry Density, pcf	105.55	106.61	108.78	
	Saturation, %	96.35	99.86	97.47	
	Void Ratio	0.63838	0.62205	0.58968	
Normal Stress, psi		2.0084	4.0514	8.0381	
Max. Shear Stress, psi		4.2284	4.7613	7.5996	
Ult. Shear Stress, psi		2.7966	3.6016	7.2536	
Time to Failure, min		4.0036	4.0036	4.0035	
Disp. Rate, in/min		0.02	0.02	0.02	
Estimated Specific Gravity		2.77	2.77	2.77	
Liquid Limit		39	39	39	
Plastic Limit		28	28	28	
Plasticity Index		11	11	11	

Project: Gude Landfill
Location:
Project No.: 17359-0
Boring No.: B-4
Sample Type: Remolded
Description: USCS Classification: Dark Brown SILTY SAND (SM)
Remarks:

Mon, 09-NOV-2020 08:35:29

Client:	Robert B. Balter Company		
Project Name:	Gude Landfill		
Project Location:	Maryland		
GTX #:	312644		
Start Date:	11/19/2020	Tested By:	jlw
End Date:	11/20/2020	Checked By:	emm
Boring #:	---		
Sample #:	Bulk 4		
Depth:	0.0-5.0 ft		
Visual Description:	Dark Brown Silty Sand		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D5084
Constant Gradient

Sample Type:	Remolded	Permeant Fluid:	De-aired Distilled water
Orientation:	Vertical	Cell #:	---

Sample Preparation: Target Compaction: 95% of the 111.8 pcf at 15.2% moisture content. Values specified by client. Material > 3/8-inch screened out of sample prior to testing (0%). Trimmings moisture content = 15.4%

Assumed Specific Gravity: 2.70

Parameter	Initial	Final
Height, in	2.00	2.00
Diameter, in	2.86	2.86
Area, in^2	6.42	6.42
Volume, in^3	12.8	12.8
Mass, g	412.7	432.1
Bulk Density, pcf	122.1	127.8
Moisture Content, %	15.4	20.8
Dry Density, pcf	105.8	105.8
Degree of Saturation, %	70	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	90.01	Increased Cell Pressure, psi:	94.99	Cell Pressure Increment, ps	4.98
Sample Pressure, psi:	85.02	Corresponding Sample Pressure, psi:	89.44	Sample Pressure Increment	4.42
				B Coefficient:	0.89

B-value did not increase with increase in pressure. Final degree of saturation >95%.

FLOW DATA

Date	Time, sec	Pressure, psi Cell	Inlet	Outlet	Gradient	Flow Volume, cc In	Out	Δ In	Δ Out	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
11/20	---	90.0	85.5	84.5	13.8	7.00	14.00	---	---	---	---	---
11/20	83	90.0	85.5	84.5	13.8	7.10	13.90	0.10	0.10	19.5	1.013	2.1E-06
11/20	----	90.0	85.5	84.5	13.8	7.00	14.00	---	---	---	---	---
11/20	79	90.0	85.5	84.5	13.8	7.10	13.90	0.10	0.10	19.5	1.013	2.2E-06
11/20	----	90.0	85.5	84.5	13.8	7.00	14.00	---	---	---	---	---
11/20	89	90.0	85.5	84.5	13.8	7.10	13.90	0.10	0.10	19.5	1.013	2.0E-06
11/20	----	90.0	85.5	84.5	13.8	7.00	14.00	---	---	---	---	---
11/20	92	90.0	85.5	84.5	13.8	7.10	13.90	0.10	0.10	19.5	1.013	1.9E-06

PERMEABILITY AT 20° C: 2.1 x 10^{-6} cm/sec (@ 5 psi effective stress)

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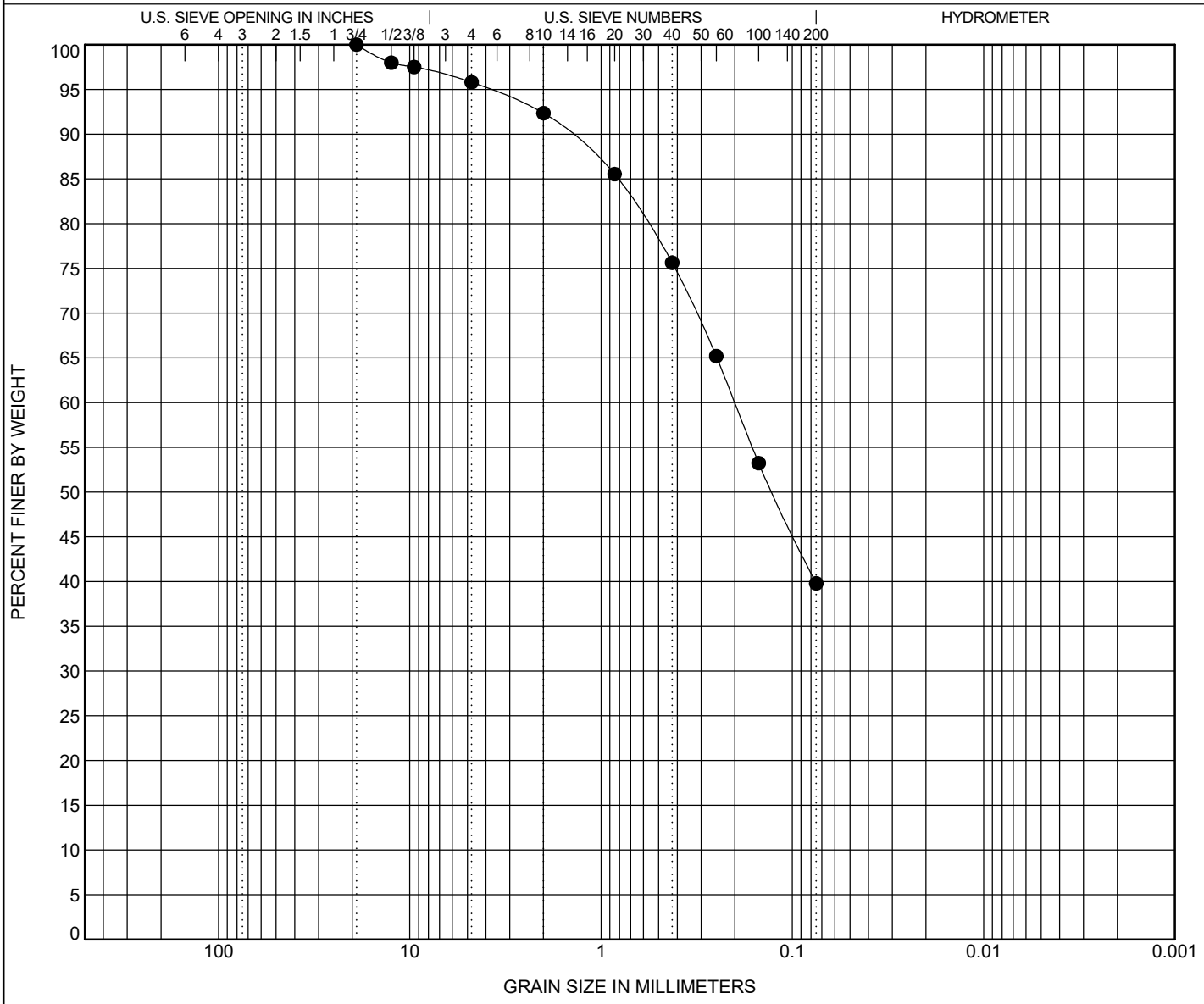
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	Purple Line - Bulk 4, Bulk @ 0.0' - 5.0',	**SILTY SAND(SM)**	**39**	**28**	**11**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	Purple Line - Bulk 4, Bulk @ 0.0' - 5.0',	**19**	**0.2**			**4.2**	**56.0**	**39.8**	

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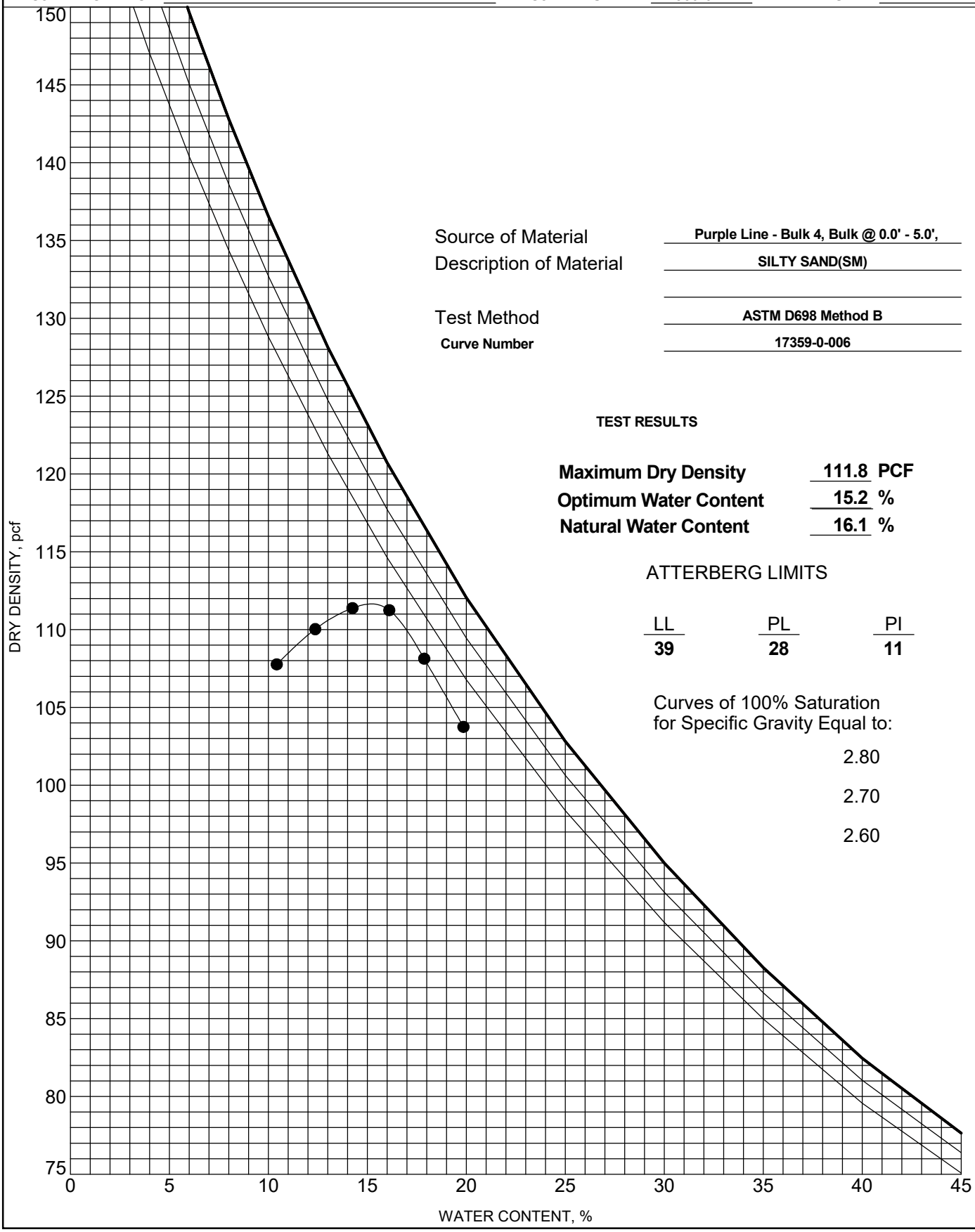
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**



Source of Material: **Purple Line - Bulk 4, Bulk @ 0.0' - 5.0',**

Description of Material: **SILTY SAND(SM)**

Test Method: **ASTM D698 Method B**

Curve Number **17359-0-006**

TEST RESULTS

Maximum Dry Density	**111.8**	**PCF**
Optimum Water Content	**15.2**	**%**
Natural Water Content	**16.1**	**%**

ATTERBERG LIMITS

LL	PL	PI
39	**28**	**11**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 17359-0 GUDE LANDFILL - PURPLE LINE STOCKPILE.GPJ MTA REDLINE.GDT 10/23/20

Purple Line Stockpile
Bulk #5 Lab Results

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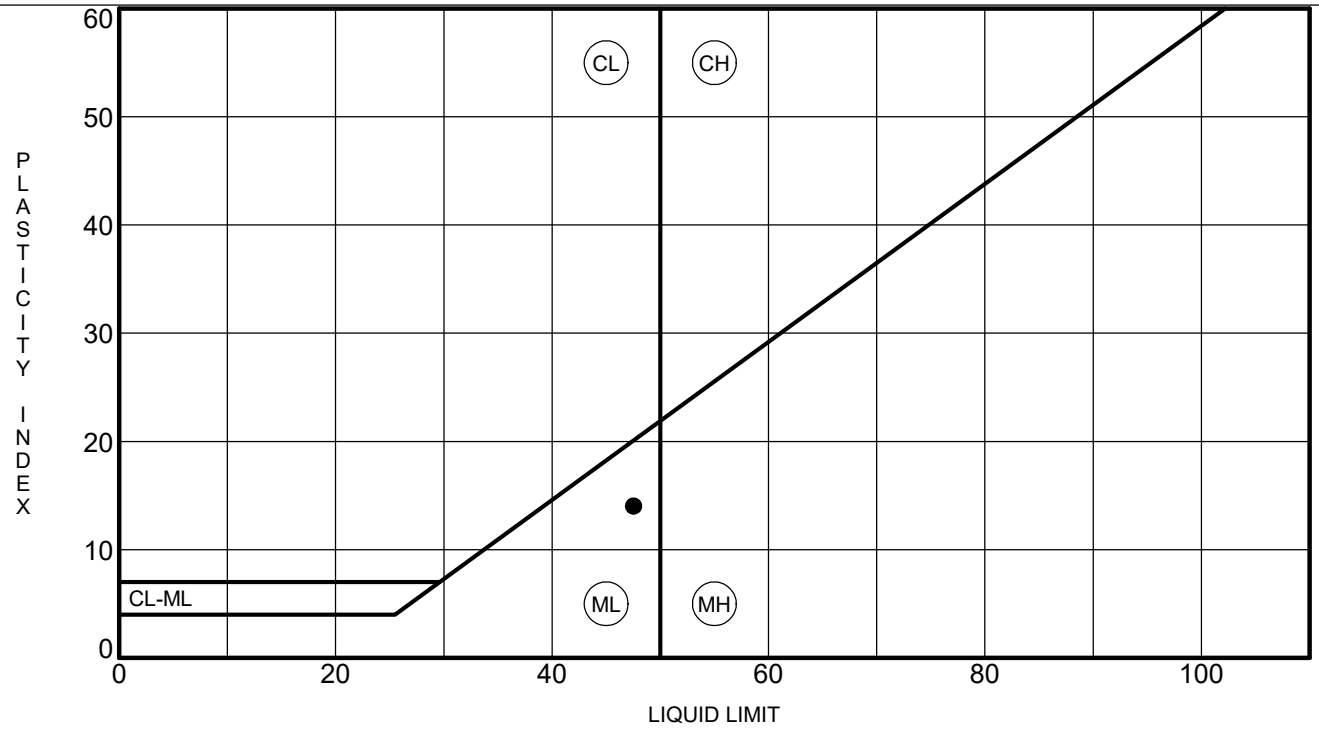
ATTERBERG LIMITS' RESULTS

TEST METHOD ASTM D4318

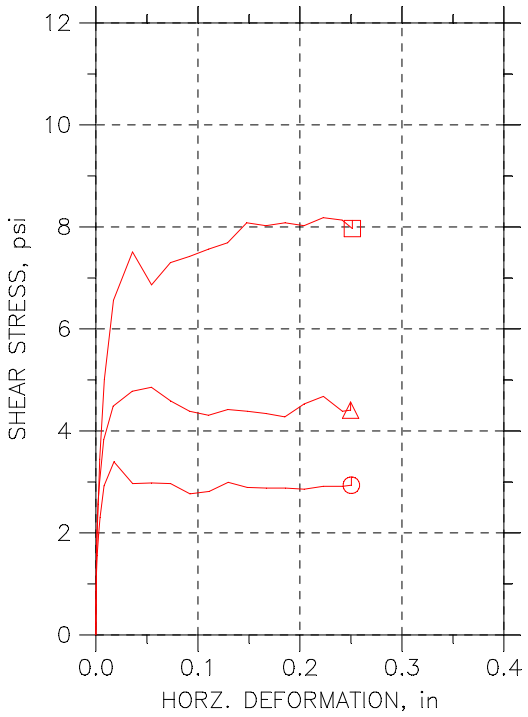
CLIENT EA Engineering **PROJECT NAME** Gude Landfill

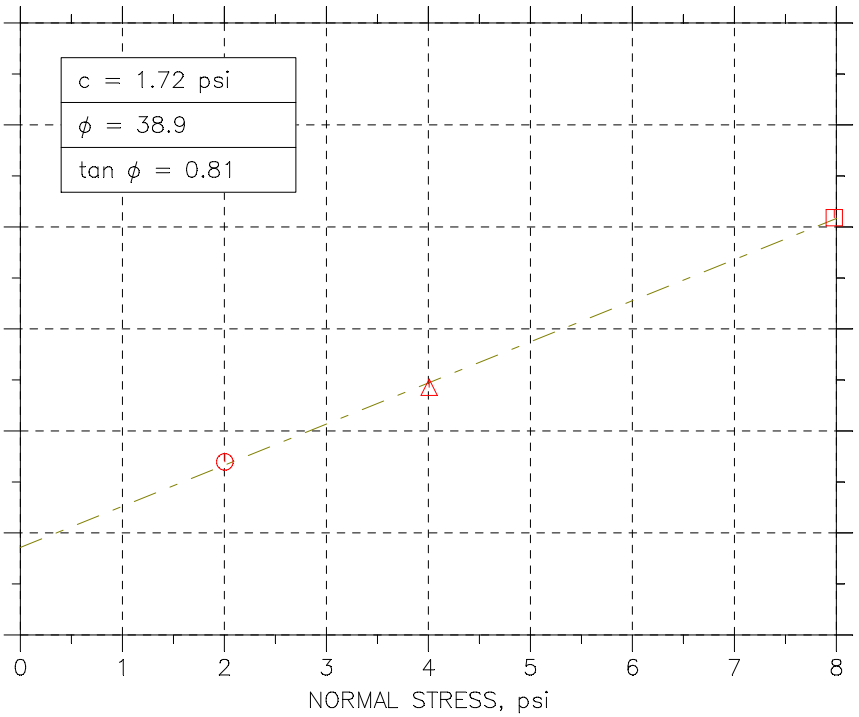
PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**

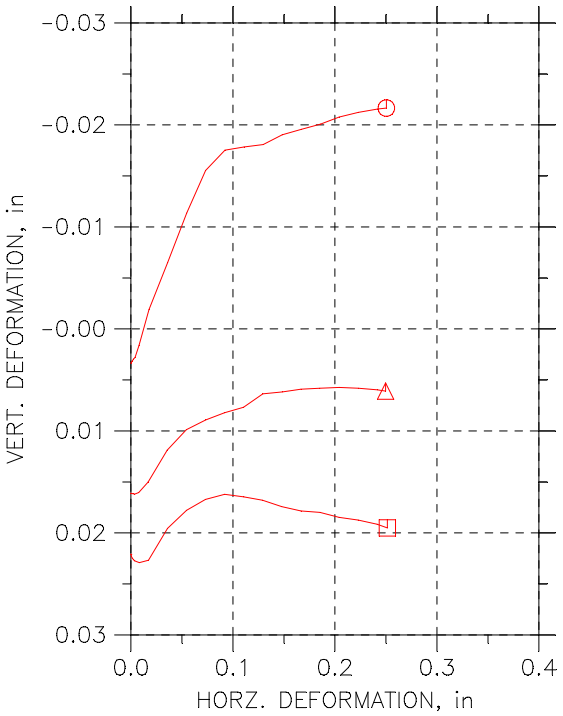


	Specimen Identification	LL	PL	PI	Fines	Classification
●	**Purple Line - Bulk 5, Bulk @ 0.0' - 5.0',**	**48**	**34**	**14**	**44**	**Brown SILTY SAND(SM)**

DIRECT SHEAR TEST REPORT







Symbol		◷	△	□	
Test No.		1	2	3	
Sample No.		Bulk	Bulk	Bulk	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.493	2.493	2.493	
	Area, in^2	4.8813	4.8813	4.8813	
	Height, in	0.989	0.989	0.989	
	Water Content, %	18.36	19.20	18.97	
	Dry Density, pcf	99.612	99.036	99.627	
	Saturation, %	69.08	71.29	71.42	
	Void Ratio	0.736	0.7461	0.73572	
Consol. Height, in		0.98502	0.97346	0.96702	
Consol. Void Ratio		0.729	0.71865	0.69714	
Final	Water Content, %	25.40	25.87	24.33	
	Dry Density, pcf	97.477	99.649	101.63	
	Saturation, %	90.89	97.46	96.09	
	Void Ratio	0.77401	0.73534	0.70148	
Normal Stress, psi		2.0036	4.0072	7.9789	
Max. Shear Stress, psi		3.3925	4.8544	8.1799	
Ult. Shear Stress, psi		2.9349	4.408	7.9679	
Time to Failure, min		2.004	6.0035	24.002	
Disp. Rate, in/min		0.02	0.02	0.02	
Estimated Specific Gravity		2.77	2.77	2.77	
Liquid Limit		26	26	26	
Plastic Limit		23	23	23	
Plasticity Index		3	3	3	

Project: Gude Landfill
Location:
Project No.: 17359-0
Boring No.: B-5
Sample Type: Remolded
Description: USCS Classification: SILTY SAND (SM)
Remarks:

Thu, 12-NOV-2020 08:44:44

Client:	Robert B. Balter Company		
Project Name:	Gude Landfill		
Project Location:	Maryland		
GTX #:	312644		
Start Date:	11/12/2020	Tested By:	jlw
End Date:	11/16/2020	Checked By:	emm
Boring #:	---		
Sample #:	Bulk 5		
Depth:	0.0-5.0 ft		
Visual Description:	Brown Silty Sand		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D5084
Constant Volume

Sample Type:	Remolded	Permeant Fluid:	De-aired Distilled water
Orientation:	Vertical	Cell #:	---

Sample Preparation: Target Compaction: 95% of 104.1 pcf at 18.0%. Values specified by client. Material > 3/8-inch screened out of sample prior to testing (0%). Trimmings moisture content = 18.0%

Assumed Specific Gravity: 2.70

Parameter	Initial	Final
Height, in	2.00	2.00
Diameter, in	2.86	2.83
Area, in^2	6.42	6.29
Volume, in^3	12.8	12.6
Mass, g	393.6	416.6
Bulk Density, pcf	116.5	125.9
Moisture Content, %	18.0	25.0
Dry Density, pcf	98.6	100.8
Degree of Saturation, %	69	100

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	90.01	Increased Cell Pressure, psi:	95.00	Cell Pressure Increment, psi:	4.99
Sample Pressure, psi:	85.00	Corresponding Sample Pressure, psi:	89.48	Sample Pressure Increment, psi:	4.48
				B Coefficient:	0.90

*B value did not increase with increase in pressure. Final degree of saturation >95%.

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
11/13	1	90.0	85.0	8.0	7.3	0.7	37	19.8	7.7E-07	19.5	1.013	7.8E-07
11/13	2	90.0	85.0	8.0	7.3	0.7	39	19.8	7.3E-07	19.5	1.013	7.4E-07
11/13	3	90.0	85.0	8.0	7.3	0.7	41	19.8	7.0E-07	19.5	1.013	7.1E-07
11/13	4	90.0	85.0	8.0	7.3	0.7	42	19.8	6.8E-07	19.5	1.013	6.9E-07

PERMEABILITY AT 20° C: 7.3 x 10^{-7} cm/sec (@ 5 psi effective stress)

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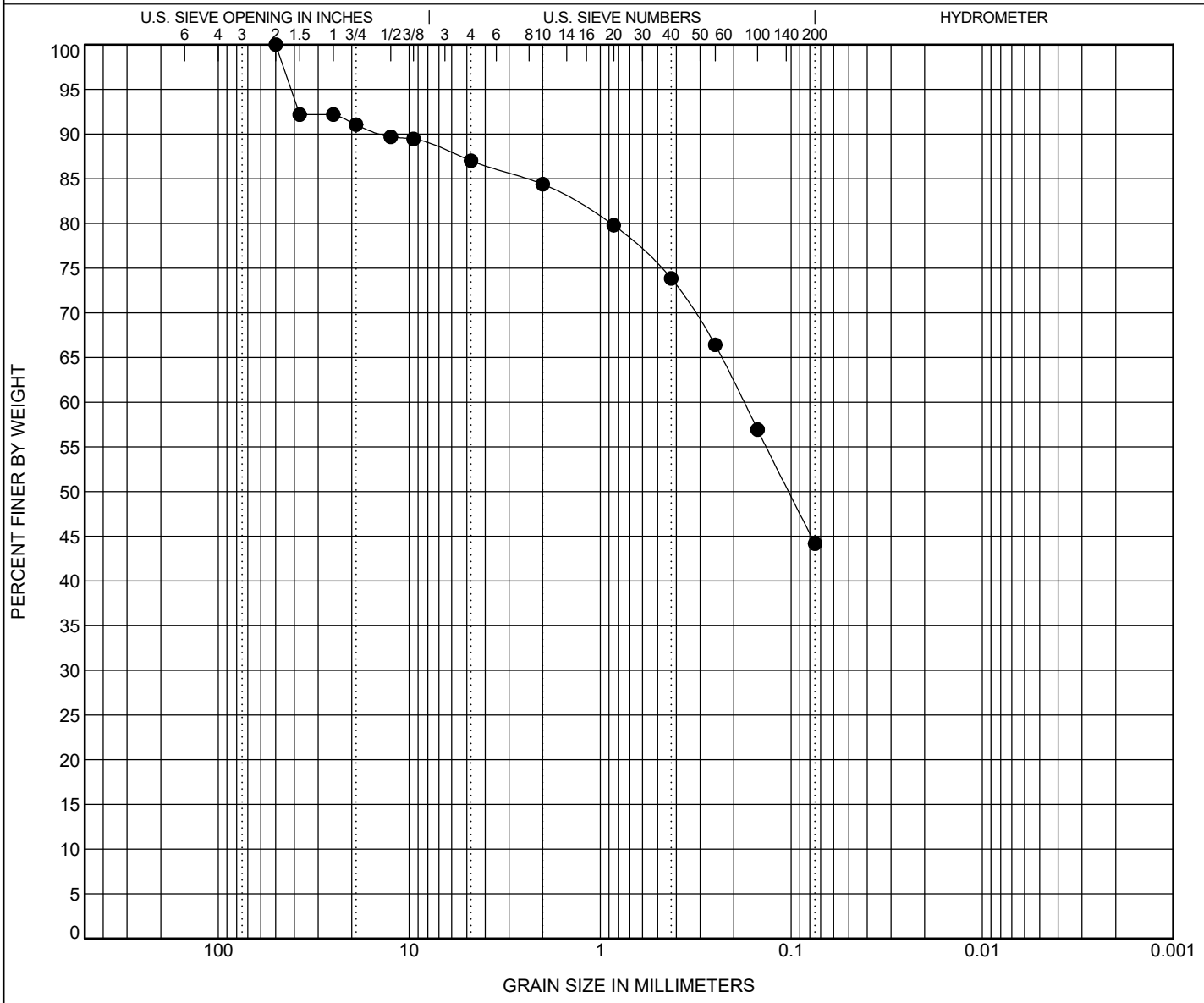
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	Purple Line - Bulk 5, Bulk @ 0.0' - 5.0',	Brown SILTY SAND(SM)	48	34	14		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	Purple Line - Bulk 5, Bulk @ 0.0' - 5.0',	50	0.177			13.0	42.8	44.2	

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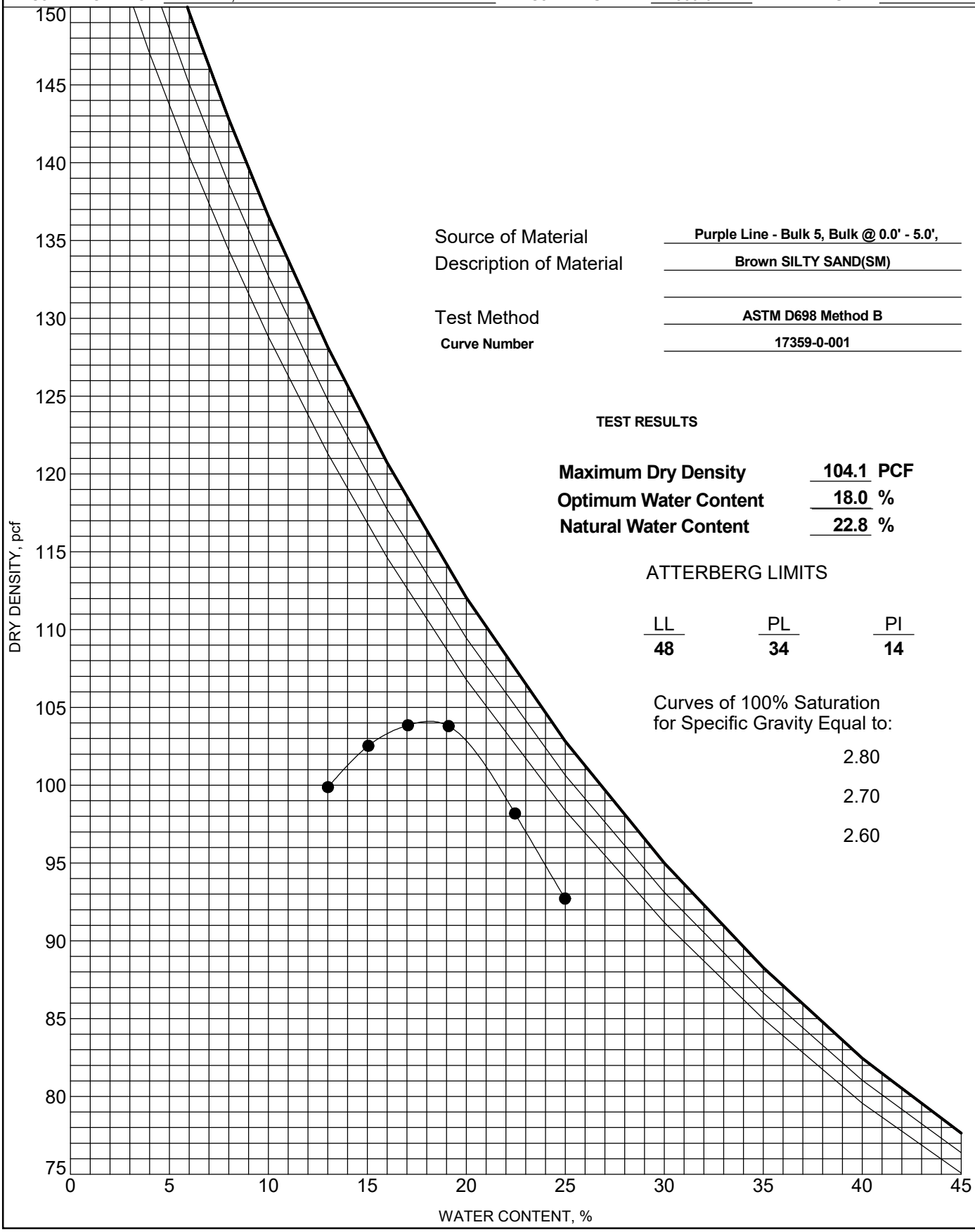
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**



Source of Material: **Purple Line - Bulk 5, Bulk @ 0.0' - 5.0',**

Description of Material: **Brown SILTY SAND(SM)**

Test Method: **ASTM D698 Method B**

Curve Number **17359-0-001**

TEST RESULTS

Maximum Dry Density	**104.1**	**PCF**
Optimum Water Content	**18.0**	**%**
Natural Water Content	**22.8**	**%**

ATTERBERG LIMITS

LL	PL	PI
48	**34**	**14**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 17359-0 GUDE LANDFILL - PURPLE LINE STOCKPILE.GPJ MTA REDLINE.GDT 10/29/20

Purple Line Stockpile
Bulk #6 Lab Results

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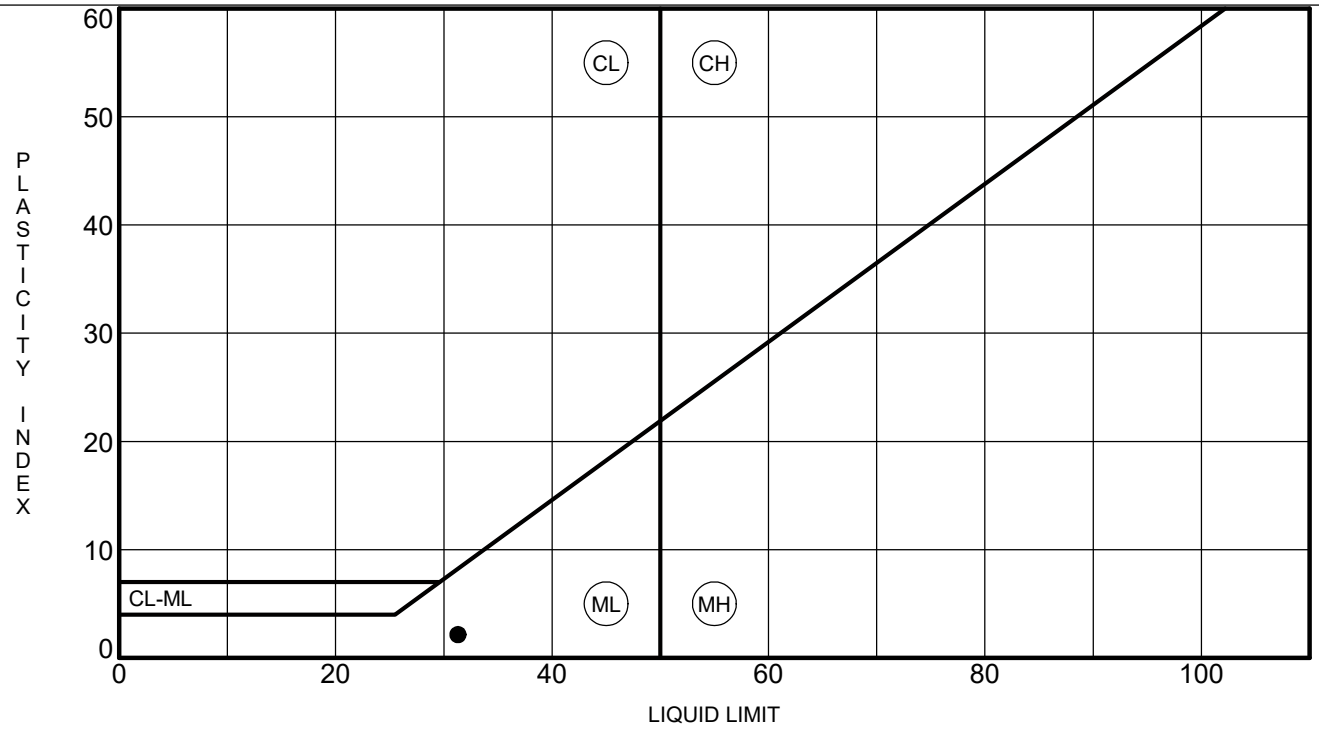
ATTERBERG LIMITS' RESULTS

TEST METHOD ASTM D4318

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

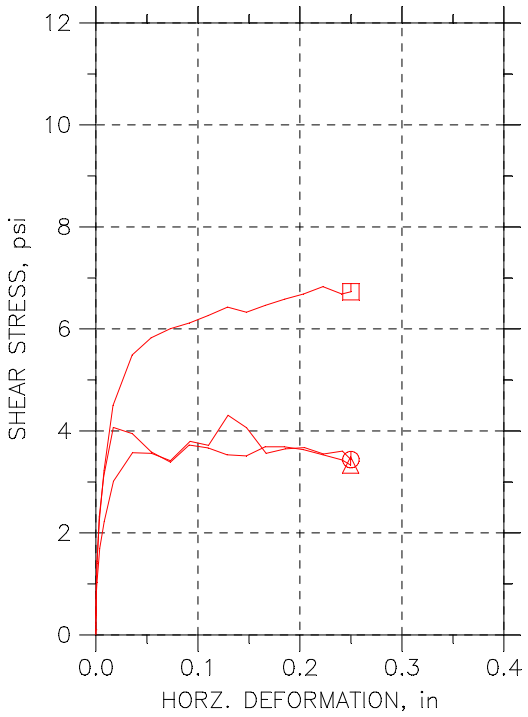
PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**

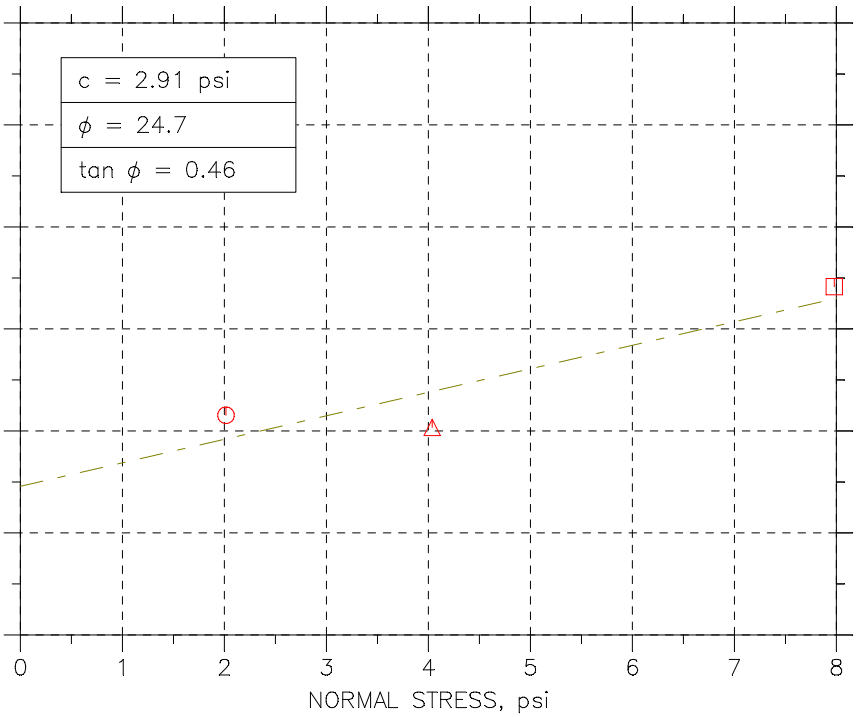


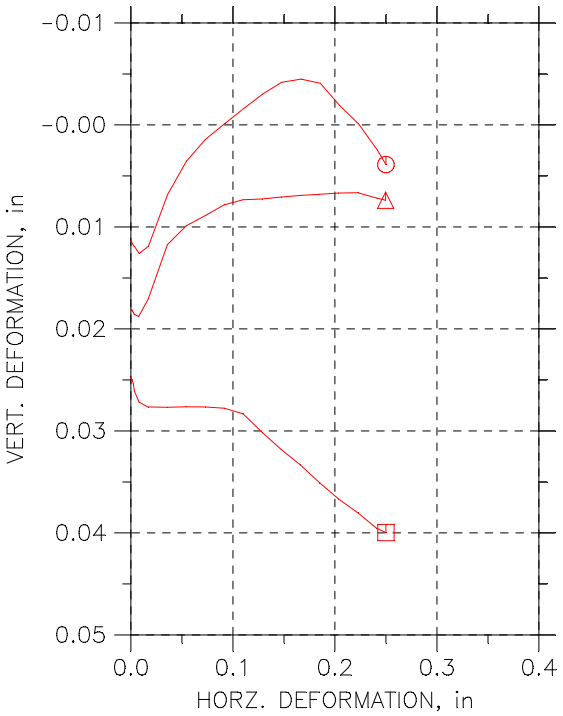
	Specimen Identification	LL	PL	PI	Fines	Classification
●	**Purple Line - Bulk 6, Bulk @ 0.0' - 5.0',**	**31**	**29**	**2**	**37**	**Light Brown SILTY SAND(SM)**

ATTERBERG LIMITS 17359-0 GUDE LANDFILL - PURPLE LINE STOCKPILE.GPJ MTA REDLINE.GDT 11/23/20

DIRECT SHEAR TEST REPORT







Symbol		○	△	□	
Test No.		1	2	3	
Sample No.		Bulk	Bulk	Bulk	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.493	2.491	2.493	
	Area, in^2	4.8813	4.8735	4.8813	
	Height, in	0.989	0.979	0.989	
	Water Content, %	18.69	17.24	18.15	
	Dry Density, pcf	103.19	105.57	103.66	
	Saturation, %	76.60	74.83	75.23	
	Void Ratio	0.67586	0.63809	0.6682	
Consol. Height, in		0.97782	0.96211	0.96494	
Consol. Void Ratio		0.65691	0.60982	0.62762	
Final	Water Content, %	21.69	22.96	22.06	
	Dry Density, pcf	103.59	106.37	108.02	
	Saturation, %	89.77	101.65	101.72	
	Void Ratio	0.66927	0.62574	0.60079	
Normal Stress, psi		2.0155	4.0374	7.9789	
Max. Shear Stress, psi		4.3076	4.0686	6.8296	
Ult. Shear Stress, psi		3.4371	3.3309	6.7292	
Time to Failure, min		14.003	2.0039	24.002	
Disp. Rate, in/min		0.02	0.02	0.02	
Estimated Specific Gravity		2.77	2.77	2.77	
Liquid Limit		26	26	26	
Plastic Limit		22	22	22	
Plasticity Index		4	4	4	

Project: Gude Landfill

Location:

Project No.: 17359-0

Boring No.: B-6

Sample Type: Remolded

Description: USCS Classification: SILTY SAND (SM)

Remarks:

Thu, 12-NOV-2020 08:47:50

Client:	Robert B. Balter Company		
Project Name:	Gude Landfill		
Project Location:	Maryland		
GTX #:	312644		
Start Date:	11/12/2020	Tested By:	jlw
End Date:	11/18/2020	Checked By:	emm
Boring #:	---		
Sample #:	Bulk 6		
Depth:	0.0-5.0 ft		
Visual Description:	Light Brown Silty Sand		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D5084
Constant Gradient

Sample Type:	Remolded	Permeant Fluid:	De-aired Distilled water
Orientation:	Vertical	Cell #:	---

Sample Preparation: Target Compaction: 95% of 110.8 pcf at 15.0%. Values specified by client. Material > 3/8-inch screened out of sample prior to testing (0%). Trimmings moisture content = 15.2%

Assumed Specific Gravity: 2.70

Parameter	Initial	Final
Height, in	2.00	2.00
Diameter, in	2.86	2.83
Area, in^2	6.42	6.29
Volume, in^3	12.8	12.6
Mass, g	409.0	430.3
Bulk Density, pcf	121.0	130.0
Moisture Content, %	15.2	21.2
Dry Density, pcf	105.1	107.3
Degree of Saturation, %	68	100

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	89.98	Increased Cell Pressure, psi:	95.01	Cell Pressure Increment, ps	5.03
Sample Pressure, psi:	85.03	Corresponding Sample Pressure, psi:	89.20	Sample Pressure Increment	4.17
				B Coefficient:	0.83

B-value did not increase with increase in pressure.
Final degree of saturation >95%.

FLOW DATA

Date	Time, sec	Pressure, psi Cell	Inlet	Outlet	Gradient	Flow Volume, cc In	Out	Δ In	Δ Out	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
11/13	---	90.0	85.5	84.5	13.8	7.00	14.00	---	---	---	---	---
11/13	61	90.0	85.5	84.5	13.8	7.10	13.90	0.10	0.10	19.5	1.013	3.0E-06
11/13	----	90.0	85.5	84.5	13.8	7.00	14.00	---	---	---	---	---
11/13	64	90.0	85.5	84.5	13.8	7.10	13.90	0.10	0.10	19.5	1.013	2.8E-06
11/13	----	90.0	85.5	84.5	13.8	7.00	14.00	---	---	---	---	---
11/13	56	90.0	85.5	84.5	13.8	7.10	13.90	0.10	0.10	19.5	1.013	3.2E-06
11/13	----	90.0	85.5	84.5	13.8	7.00	14.00	---	---	---	---	---
11/13	57	90.0	85.5	84.5	13.8	7.10	13.90	0.10	0.10	19.5	1.013	3.2E-06

PERMEABILITY AT 20° C: 3.0 x 10^{-6} cm/sec (@ 5 psi effective stress)

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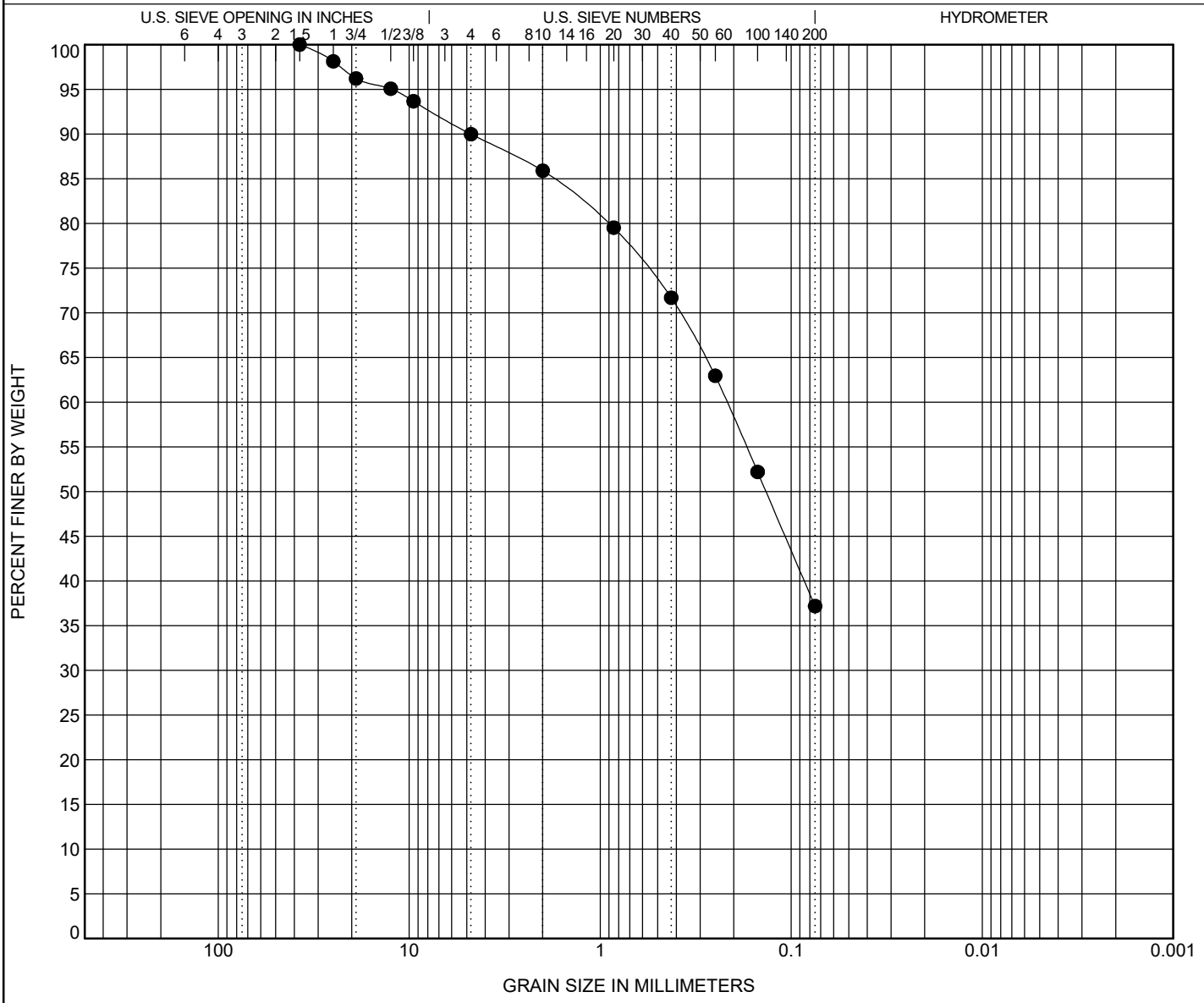
GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**Purple Line - Bulk 6, Bulk @ 0.0' - 5.0',**	**Light Brown SILTY SAND(SM)**	**31**	**29**	**2**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**Purple Line - Bulk 6, Bulk @ 0.0' - 5.0',**	**37.5**	**0.217**			**10.0**	**52.8**	**37.2**	

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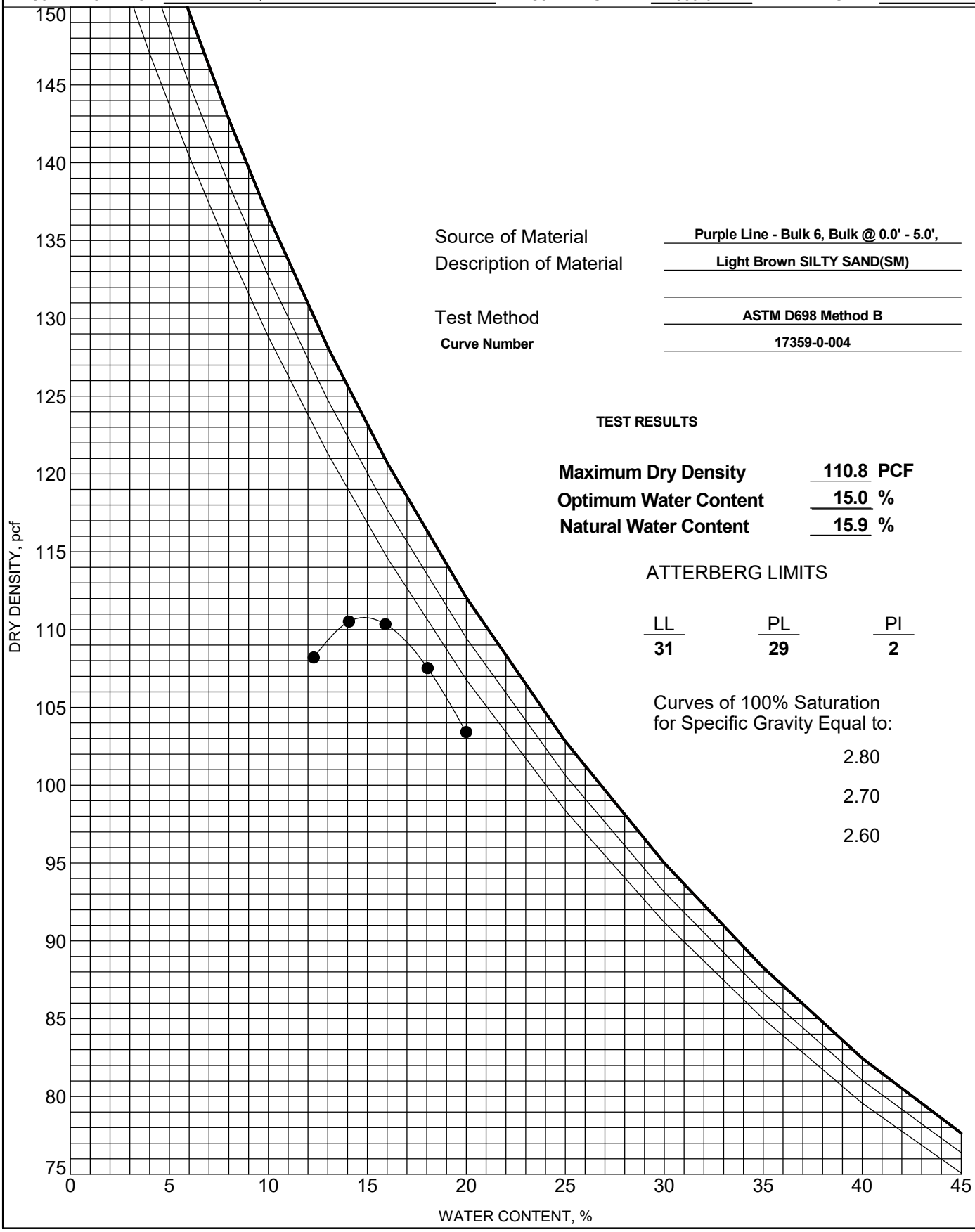
MOISTURE-DENSITY RELATIONSHIP

CLIENT EA Engineering **PROJECT NAME** Gude Landfill

PROJECT LOCATION Rockville, MD **PROJECT NUMBER** 17359-0 **DATE TESTED**



Source of Material: **Purple Line - Bulk 6, Bulk @ 0.0' - 5.0',**

Description of Material: **Light Brown SILTY SAND(SM)**

Test Method: **ASTM D698 Method B**

Curve Number **17359-0-004**

TEST RESULTS

Maximum Dry Density	**110.8**	**PCF**
Optimum Water Content	**15.0**	**%**
Natural Water Content	**15.9**	**%**

ATTERBERG LIMITS

LL	PL	PI
31	**29**	**2**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 17359-0 GUDE LANDFILL - PURPLE LINE STOCKPILE.GPJ MTA REDLINE.GDT 10/23/20

Attachment D

Forest Stand Delineation Report and Wetland Delineation Report

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Gude Landfill Remediation Project
Design Engineer Contract

Natural Resources Inventory/
Forest Stand Delineation Report

Prepared for

Department of Environmental Protection
Division of Solid Waste Services
Montgomery County, Maryland

Prepared by
EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031

March 2019
Version: FINAL
EA Project No. 15646.01

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Gude Landfill Remediation Project
Design Engineer Contract

Natural Resources Inventory/
Forest Stand Delineation Report

Prepared for

Department of Environmental Protection
Division of Solid Waste Services
Montgomery County, Maryland

Prepared by
EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle
Hunt Valley, Maryland 21031

March 2019
Version: FINAL
EA Project No. 15646.01

3/13/2019

Thomas M. King **Date**
Maryland Department of Natural Resources Qualified Professional

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TABLE OF CONTENTS

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LIST OF APPENDICES

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LIST OF ACRONYMS AND ABBREVIATIONS

the County	Montgomery County Department of Environmental Protection, Division of Solid Waste Services
dbh	Diameter at breast height
EA	EA Engineering, Science, and Technology, Inc., PBC
FEMA	Federal Emergency Management Agency
FSD	Forest Stand Delineation
the Landfill	Gude Landfill
MDNR	Maryland Department of Natural Resources
M-NCPPC	Maryland-National Capital Park and Planning Commission
NRCS	National Resources Conservation Service
NRI	Natural Resources Inventory
PRA	Priority Retention Area
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

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1. INTRODUCTION

This Natural Resources Inventory (NRI) and Forest Stand Delineation (FSD) Report was prepared for the Engineering, Bid Preparation, and Support Services for the Gude Landfill (the Landfill) Remediation Project for Montgomery County, Maryland (the Remediation Design), under the Northeast Maryland Waste Disposal Authority and the Montgomery County Department of Environmental Protection, Division of Solid Waste Services (the County).

The Landfill Remediation Design is for the recommended Corrective Measure Alternative, Toupee Capping and Additional Landfill Gas Collection, as approved by the Maryland Department of the Environment on July 8, 2016.

1.1 PURPOSE

The purpose of this NRI/FSD Report is to review, identify, and/or delineate natural resources and forest stands located on and within the vicinity of the Landfill (the project site). The Landfill consists of approximately one hundred sixty-two and seven-tenths (162.7) acres, located at 600 East Gude Drive in Rockville, Maryland (**Appendix A, Figure 1**).

As part of the design effort, EA Engineering, Science, and Technology, Inc., PBC (EA) performed an NRI of the site, including a full FSD and a Wetland Delineation. Wetlands delineated at the site are discussed in the *Gude Landfill Remediation Project, Design Engineer Contract, Wetland Delineation Report* (EA 2018). This report provides information on the Forest Stand Delineation conducted at the site. The FSD was conducted in accordance with the guidelines of the *State Forest Conservation Technical Manual* (Maryland Department of Natural Resources [MDNR] 1997) and in accordance with the regulations in the Montgomery County *Trees: Approved Technical Manual* (Maryland-National Capital Park and Planning Commission [M-NCPPC] 1994).

As part of the development of the FSD Report, an NRI/FSD Plan was prepared to the specifications and methodologies outlined in the Montgomery County *Trees: Approved Technical Manual* (M-NCPPC 1994), including delineated stands, wetlands, streams, buffers, steep slopes, and erodible soils. This plan figure is provided as sheet F-1 in **Appendix B**.

2. SITE DESCRIPTION

2.1 SITE LOCATION

At the time of EA's FSD on April 30 and May 1, 2018, the project site consisted of approximately one hundred six-two and seven-tenths (162.7) acres of land predominantly comprised of open grass and vegetative covered fields (**Appendix A, Figure 2**). The border of the project site consisted of undeveloped forested land. Major site features included an extensive landfill gas collection piping system throughout the property, a paved open area in the southeastern portion of the Landfill, a model airplane flying area in the northern portion of the Landfill, and a landfill gas to energy flare station and shelter in the southwest corner of the property.

The site is bordered to the south by industrial operations, to the west/northwest by the community of Derwood Station South, and to the north and east by M-NCPPC property. The surrounding area was mixed use with the Derwood residential community to the northwest, commercial and industrial properties to the south, and predominantly undeveloped wooded areas to the north and east. The approximate latitude/longitude of the property is 39° 06' 29" N and 77° 08' 16" W, respectively. The Landfill is located at 600 East Gude Drive in Rockville, Maryland (**Appendix A, Figure 1**). The property is identified as Parcels 151, 230, and 240 on Montgomery County Tax Maps. The area of review for the FSD is provided on **Figure 2** (**Appendix A**).

2.2 TOPOGRAPHY

The site is located in the upland section of the Piedmont Plateau Physiographic Province. The general topography of the site consists of moderate slopes with steeper slopes along the south and east edge of the Landfill property. Elevation of the site ranges from three hundred thirty (330) to four hundred seventy-five (475) feet above mean sea level (**Appendix A, Figure 3**). The underlying geology of the site is metamorphic and igneous rock formations of the Paleozoic and Precambrian Age. These formations consist of phyllite, slate, marble, schist, gneiss, and gabbro formations.

The U.S. Geological Survey (USGS) topographic map for the area (*Rockville Quadrangle*, **Figure 3** in **Appendix A**) was also used as a reference to identify possible wetlands and waterways on the property. Topographic maps identify elevations, forested areas, streams, ponds, roads, and structures. The USGS map identified multiple buildings and roads within the project site and depicted the majority of the site as being non-forested. Three (3) blue-line stream channels were depicted within the vicinity of the project site on the USGS map, including Crabbs Creek, Rock Creek, and an unnamed channel. Crabbs Creek was identified as being located on the northeastern corner of the project site. Crabbs Creek flowed in a southeasterly direction where it contributed to Rock Creek. Rock Creek was depicted to the east of the project site. Rock Creek was not located within the area of review. The third blue-line stream channel (unnamed) was located along the southern property line and conveyed flow in an easterly direction to Rock Creek. The streams discussed above are listed in the Code of Maryland Regulations stream use classification index as Use IV (Recreational Trout Waters), with an in-stream restriction during the period of March 1 through May 31.

The site topography was plateau-like and consisted of gentle relief along the top of the plateau and sharp relief along the entirety of the Landfill boundary. The elevation along the top of the plateau gently sloped to the south, with localized mounds and depressions throughout. The topography around the edges of the waste layer fell sharply from the plateau to elevations ranging from sixty (60) to ninety (90) feet below the plateau.

2.3 SOIL CHARACTERISTICS

The online U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey for Montgomery County was reviewed for the area of review prior to the field visit (**Appendix A, Figure 4**). Ten (10) soil types were identified within the project site (USDA NRCS 2018a). According to the NRCS hydric soils list by state (USDA NRCS 2018b), seven (7) of the soil units within the project site were listed as a hydric soil. In addition, all but two (2) of the soil types within the area of review are considered erodible soils, or soils with a K factor value greater than thirty-five one-hundredths (0.35). Soil types found within the project site are identified in **Table 1**.

Table 1 Mapped Soil Types

Soil Mapping Unit	Symbol	Hydric Soil	Erosion (K factor)	Drainage Class	Prime Agricultural
Gaila silt loam, 3 to 8 percent slopes	1B	Yes	0.43	Well drained	Prime Farmland
Glenelg silt loam, 3 to 8 percent slopes	2B	No	0.37	Well drained	Prime Farmland
Elioak silt loam, 3 to 8 percent slopes	4B	No	0.37	Well drained	Prime Farmland
Glenville silt loam, 3 to 8 percent slopes	5B	Yes	0.37	Moderately well drained	Prime Farmland
Brinklow-Blocktown channery silt loams, 15 to 25 percent slopes	16D	Yes	0.37	Well drained	Not Prime Farmland
Occoquan loam, 8 to 15 percent slopes	17C	Yes	0.37	Well drained	Farmland of Statewide Importance
Hatboro silt loam, 0-3% slopes, frequently flooded	54A	Yes	--	Poorly drained	Not Prime Farmland
Dump, refuse	100	No	--	--	Not Prime Farmland
Blocktown channery silt loam, 15-25 percent slopes, very rocky	116D	Yes	0.49	Well drained	Not Prime Farmland
Blocktown channery silt loam, 25-45 percent slopes, very rocky	116E	Yes	0.49	Well drained	Not Prime Farmland

Source: Adapted from U.S. Department of Agriculture, Natural Resources Conservation Service 1995, 2018a, 2018b.

2.4 WETLANDS, WATERS OF THE U.S., AND FLOODPLAINS

Wetlands and Waters of the U.S. at the Landfill were delineated as part of the Natural Resource Inventory, and are provided in the *Wetland Delineation Report* (EA 2018). Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps were consulted prior to the field visit to identify floodplain areas at the site. The Landfill falls within the Flood Insurance Rate Map identified as Map ID 24031C03320D, dated September 29, 2006. A review of the Flood Insurance

Rate Map generated by FEMA's online Map Service Center indicates that portions of the unnamed tributary to Rock Creek, Rock Creek, and Crabbs Creek are located within the one hundred (100)-year floodplain. The remainder of the subject site is identified within an area of minimal flood hazard.

3. METHODOLOGY

A standard FSD was conducted on April 30 and May 1, 2018, in accordance with the guidelines of the *State Forest Conservation Technical Manual* (MDNR 1997) and in accordance with the regulations in the Montgomery County *Trees: Approved Technical Manual* (M-NCPPC 1994).

A one-tenth (1/10) acre fixed plot sampling technique was used to assess forest stand conditions and forest structure. Sampling plots were selected so as to be evenly distributed throughout each stand. A stick flag was placed in the center of each plot and along the perimeter of the circular plot in each of the four (4) cardinal directions. The plot center was marked in the field with orange flagging and the stand and plot number labeled with a black marker. The forest stand and forest structure procedures used for data collection followed guidelines of the *State Forest Conservation Technical Manual* (MDNR 1997). The priorities of the stands were assigned according to the guidelines in the Technical Manual.

The priorities of the stands and sensitive features mapped within each stand are determined according to the guidelines in the *State Forest Conservation Technical Manual* and the *Trees: Approved Technical Manual*. Priority Retention Areas (PRA) are specific vegetated and sensitive environmental areas identified including: steep slopes (greater than twenty-five [25] percent); erodible soils on slopes of fifteen (15) percent or greater; one hundred (100)-year floodplains; intermittent and perennial streams; nontidal wetlands; fifty (50) foot buffers to intermittent/perennial streams and nontidal wetlands (which are expanded by four [4] feet for every one [1] percent of adjacent slope or extend to the top of contiguous steep slopes twenty-five [25] percent or greater); tidal wetlands and their one hundred (100)-foot buffers; and habitats for rare, threatened, and endangered species. PRAs also include contiguous forests that connect the largest undeveloped or most vegetated tracts of land within and adjacent to the site, and trees having a diameter at breast height (dbh) of thirty (30) inches or greater (specimen trees), or that are seventy-five (75) percent or more of the dbh of the current state champion tree of that species.

Within Montgomery County, Priority (Retention) Areas are further described based on whether they are Priority 1 through Priority 4. These areas are defined in the *Trees: Approved Technical Manual* (M-NCPPC 1994) as follows:

- Priority Area 1 (High)—Area contains trees, shrubs, or herbaceous plants associated with intermittent and perennial streams and their buffers; slopes greater than twenty-five (25) percent; nontidal wetlands and their buffers; one hundred (100)-year floodplains; critical habitats of rare, threatened, or endangered species; contiguous forest connected to large undeveloped or most vegetated tracts of land. In addition, Priority Area 1 areas may also have trees that are part of a historic site or associated with a historic structure; designated as a champion tree at the local, state, or national level; have a dbh that is seventy-five (75) percent or more of the dbh of the designated state champion; or specimen trees (trees with a dbh of thirty (30) inches or greater).

- Priority Area 2 (Moderate)—Areas that contain stands or portions of stands with good forest structural diversity; forested areas providing a corridor three hundred (300) feet wide

or more of primarily native vegetation between two (2) larger forested tracts; forested stream buffers up to forest corridor width (three hundred [300] feet); trees which act as buffers between incompatible land uses and between dwellings and roads; and specific trees with a dbh of twenty-four (24) inches or greater on a site that will significantly enhance the site through their preservation.

- Priority Area 3 (Low)—Areas that contain stands or portions of stands with poor forest structural diversity or areas with none of the characteristics mentioned in the descriptions of the other Priority Area characterizations.

- Priority Area 4 (Disturbed)—Areas that have approximately forty (40) percent land cover of exotic or invasive species in the dominant canopy layer.

As noted in Section 2, topographic maps, the Montgomery County soil survey (USDA [NRCS] 2018a), and aerial photographs were reviewed prior to field investigations to identify probable forest stand boundaries. A field investigation of the project area was conducted in April and May 2018 to identify, delineate, and characterize forest stands. Forest stands were distinguished primarily by differences in species composition and successional stage. This report provides the results of this field delineation of forest stands.

4. SYSTEMS IDENTIFIED

Four (4) forest stands were identified within the area of review, predominantly along the perimeter of the Landfill. The cover types were chestnut oak/red oak, oak/hickory/maple, red maple, and green ash/box elder (**Appendix A, Figure 5**). Stand variations resulted from changes in topographic position, degree of slope, and amount and type of historical human disturbance. Forest stand conditions and forest structure were assessed at sample plots within the stand as detailed in the following stand description. Additional information on the stands is provided in the datasheets (**Appendix C**) and a summary of forest conditions within the stand is included in **Appendix D**.

The attached *Forest Stand Delineation Plan* (drawing F-1, provided in **Appendix B**) depicts the approximate location of the sampling plots and boundary of forest cover type. Brief descriptions of the forest stands are included in this section. A photographic record is provided in **Appendix E**.

4.1 FOREST STAND 1

Stand 1 is located on the northeastern side of the project site and is dominated by chestnut oak (*Quercus prinus*) and red oak (*Quercus rubra*) in the dominant size class of six (6) to eleven and nine-tenths (11.9) inches dbh. The average basal area of this stand is one hundred thirteen (113) square feet per acre. Stand 1 has an average canopy closure of sixty-six (66) percent. Other species found in the canopy include black gum (*Nyssa sylvatica*) and mockernut hickory (*Carya tomentosa*). A portion of stand 1 appears to have been recently burned in a leaf-litter fire. As a result, there is little to no vegetation, including herbaceous vegetation in the three (3) to twenty (20) foot understory or the zero (0) to three (3) foot understory. The portion of stand 1 that does not appear to have been recently burned appears to have been previously burned, and also has little to no understory growth. In this area, black cherry (*Prunus serotina*) and striped wintergreen (*Chimaphila maculata*) are present in the understory from zero (0) to three (3) feet, but do not provide appreciable understory coverage.

Environmental features present in stand 1 include steep slopes, and a portion of the stand was recently burned. The stand continues offsite, and adjacent land uses include undeveloped forested land. Stand 1 is within the one hundred (100)-year floodplain of an offsite stream, Crabbe Creek, and has high wildlife value, as it provides cover and food sources for wildlife species. No specimen trees were identified in stand 1.

Stand 1 is rated as a Priority Area 1 due to the presence of steep slopes. Additional summary details of stand 1 are provided in **Table 2**.

Table 2 Stand 1 Summary

Sample Plots	3
Successional Stage	Mid-Successional
Priority Area	1
Cover Type	Chestnut Oak/Red Oak
Size within AOR	3.21 acres

4.2 FOREST STAND 2

Stand 2 is located along the eastern, southern, and southeastern edge of the area of review, and continues offsite. Stand 2 is dominated by mixed oak (*Quercus* spp.) and mockernut hickory of an average size class of twelve (12) to nineteen and nine-tenths (19.9) inches dbh, with eighty-four (84) percent canopy closure. Stand plots on the slopes tend to be dominated by oak species, while those in the bottomland near streams are more dominated by red maple (*Acer rubrum*). The average basal area of stand 2 is one hundred eighteen (118) square feet per acre. Oak species found within stand 2 include white oak (*Quercus alba*), chestnut oak, and northern red oak. Species found in the canopy within the plots include mockernut hickory, black gum, black cherry, tulip poplar (*Liriodendron tulipifera*), American sycamore (*Platanus occidentalis*), black haw (*Viburnum prunifolium*), and mountain laurel (*Kalmia latifolia*). The understory from three (3) to twenty (20) feet tall averages sixty-eight (68) percent coverage, and includes red maple, mockernut hickory, black gum, chestnut oak, black cherry, northern red oak, mountain laurel, and common privet (*Ligustrum vulgare*). Common herbaceous and woody species zero (0) to three (3) feet tall consisted of striped wintergreen, partridge berry (*Mitchella repens*), bush honeysuckle (*Lonicera tartarica*), Asiatic bittersweet (*Celastrus orbiculatus*), garlic mustard (*Alliaria petiolata*), Japanese honeysuckle (*Lonicera japonica*), American holly (*Ilex opaca*), Japanese stiltgrass (*Microstegium vimineum*), common privet, poison ivy (*Toxicodendron radicans*), and soft rush (*Juncus effusus*). Coverage of understory herbaceous plants during the forest stand delineation was twenty-four (24) percent. Invasive species observed in the sample plots included Japanese honeysuckle, garlic mustard, Asiatic bittersweet, bush honeysuckle, Japanese stiltgrass, and common privet.

Environmental features within stand 2 include a forested wetland, a stream (an unnamed tributary to Rock Creek), steep slopes, and several specimen trees. The wildlife value of the stand is high due to the presence of cover, food, and water. The stand continues offsite, and adjacent land uses include industrial property and M-NCPPC owned land. EA identified seven (7) specimen trees (white oak, scarlet oak, red oak, silver maple [*Acer saccharinum*], and several tulip poplars) within stand 2 as described in Section 4.5.

The stand is a Priority Area 1 because of the presence of specimen trees, steep slopes, a stream, and wetlands. Additional summary details of stand 2 are provided in **Table 3**.

Table 3 Stand 2 Summary

Sample Plots	5
Successional Stage	Mature
Priority Area	1
Cover Type	Oak/Hickory/Red Maple
Size within AOR	16.10 acres

4.3 FOREST STAND 3

Stand 3 is located on the southwest and southeast corners of the project site upslope of stand 2. Stand 3 is dominated by red maple of size class six (6) to eleven and nine-tenths (11.9) inches dbh, with eighty (80) percent canopy closure. Other species in the canopy are red cedar (*Juniperus*

virginiana), black cherry, Virginia pine (*Pinus virginiana*), silver maple, black locust (*Robinia pseudo-acacia*), and black gum. The average basal area in stand 3 is seventy (70) square feet per acre. The understory from three (3) to twenty (20) feet tall averages forty (40) percent coverage, and includes red maple, black gum, red cedar, Asiatic bittersweet, and Japanese barberry (*Berberis thunbergii*). Common herbaceous and woody species zero (0) to three (3) feet tall consist of American holly, Japanese barberry, Chinese silvergrass (*Miscanthus sinensis*), Japanese stiltgrass, poison ivy, Asiatic tearthumb (*Polygonum perfoliatum*), Indian strawberry (*Duchesnea indica*), red maple, red cedar, and common reed (*Phragmites australis*). Cover of herbaceous understory species averages sixty (60) percent for the understory zero (0) to three (3) feet tall. Several invasive species are present and were observed in the sample plots including Japanese barberry, Japanese stiltgrass, Japanese silvergrass, Asiatic bittersweet, Asiatic tearthumb, and common reed.

Environmental features found within stand 3 include steep slopes and relatively high invasive plant species cover. Adjacent land uses include M-NCPPC owned land. The stand provides moderate wildlife value, due to the presence of cover and food. Stand 3 does not provide water for wildlife. No specimen trees were identified in stand 1.

The stand was rated as a Priority Area 1 due of the presence of steep slopes, but the stand also has a higher percentage of invasive coverage than other stands onsite. Additional summary details of stand 3 are provided in **Table 4**.

Table 4 Stand 3 Summary

Sample Plots	2
Successional Stage	Mid-Successional
Priority Area	1
Cover Type	Red Maple
Size within AOR	19.12 acres

4.4 FOREST STAND 4

Stand 4 is located on the northeast portion of the project site and is dominated by green ash (*Fraxinus pennsylvanica*) and box elder (*Acer negundo*). Other canopy species present are black cherry, black locust, apple (*Malus* spp.), bush honeysuckle, silver maple, red maple, and red cedar. The overstory in stand 4 has an average canopy closure of fifty (50) percent, with dominant trees of size class six (6) to eleven and nine-tenths (11.9) inches dbh. The average basal area in stand 4 is seventy-five (75) square feet per acre. The understory from three (3) to twenty (20) feet tall also averages fifty (50) percent coverage, and includes bush honeysuckle and Japanese barberry. Common herbaceous and woody species zero (0) to three (3) feet tall consist of horse balm (*Collinsonia canadensis*), Japanese stiltgrass, Japanese honeysuckle, Japanese barberry, bush honeysuckle, wineberry (*Rubus phoenicolasius*), poison ivy, and oniongrass (*Allium vineale*) with one hundred (100) percent coverage. Invasive species observed in the sample plots include Japanese stiltgrass, wineberry, bush honeysuckle, Japanese honeysuckle, and Japanese barberry.

Environmental features within stand 4 include an emergent wetland, a stream (Crabbs Creek), steep slopes, and one (1) specimen tree, as noted in Section 4.5. Stand 4 contains steep slopes and

relatively high invasive cover. Adjacent land uses include M-NCPPC-owned land. The wildlife value of the stand is high due to the presence of cover and food, with water along the boundary.

The stand was rated as Priority Area 1 due to the presence of steep slopes, but the stand also has a higher percentage of invasive coverage than other stands onsite. Additional summary details of stand 4 are provided in **Table 5**.

Table 5. Stand 4 Summary

Sample Plots	2
Successional Stage	Early-Successional
Priority Area	1
Cover Type	Red Cedar/Box Elder/Bush Honeysuckle
Size within AOR	9.97 acres

4.5 SPECIMEN TREES

As part of the FSD site visit, specimen trees were identified in the project area. Specimen trees are trees that have a dbh greater than thirty (30) inches or have a dbh that is seventy-five (75) percent or more of the state champion tree dbh for that species. Champion trees are also considered specimen trees. Ten (10) specimen trees representing five (5) species were identified in the project area. Several of these specimen trees are within stands in the area of review for the FSD, but are located outside the Landfill property. Specimen trees within the Landfill property line include two (2) silver maples (T-4 and T-5). **Table 6** outlines the species, dbh, and condition of specimen trees identified in the area of review.

Table 6. Specimen Trees

Tree Number	Stand Location	DBH (inches)	Common Name	Scientific Name	Condition
T-1	2	38.8	White oak	*Quercus alba*	Good
T-2	2	32.7	Tulip poplar	*Liriodendron tulipifera*	Double trunk with included bark
T-3	2	38.0	White oak	*Quercus alba*	Good
T-4	4	59.0	Silver maple	*Acer saccharinum*	Fair multi-trunk with many dead limbs
T-5	2	59.3	Silver maple	*Acer saccharinum*	Fair multi-trunk in pond
T-6	2	35.1	Tulip poplar	*Liriodendron tulipifera*	Good, double trunk
T-7	2	33.2	Tulip poplar	*Liriodendron tulipifera*	Good
T-8	2	31.5	Tulip poplar	*Liriodendron tulipifera*	Good
T-9	2	35.2	Scarlet oak	*Quercus coccinea*	Fair with many dead limbs
T-10	2	34.3	Red oak	*Quercus rubra*	Good

5. AGENCY REVIEW STATEMENTS

In addition to the FSD, EA completed written inquiries to USFWS and MDNR in 2009 as part of an original field delineation effort. These written inquiries were regarding whether the agencies are aware of any records of rare, threatened, or endangered species present within the project boundary. EA also completed a written inquiry to the Office of Preservation and Compliance, Maryland Historical Trust to determine whether there are known occurrences of historical, cultural, and/or archaeological sites/features present at the site. EA has received responses associated with these inquiries and they are included in **Appendix F** of this report.

USFWS and MDNR have determined that no state or federal records exist for rare, threatened, or endangered species within the project area that could be impacted by the project. Furthermore, the Maryland Historical Trust has determined that there are no records regarding the presence of cultural, archaeological, or historic resources within the project area that may be affected by remedial activities.

6. CONCLUSION

Four (4) forest stands were delineated and assessed within the area of review within and bordering the Landfill site. The cover types were chestnut oak/red oak, oak/hickory/maple, red maple, and green ash/box elder. Ten (10) specimen trees (white oak [two (2)], scarlet oak [one (1)], red oak [one (1)], tulip poplar [four (4), and silver maple [two (2)]) were located within the area of review, specifically within Forest Stands 2 and 4. Two (2) of these ten (10) trees (T-4 and T-5) are located on the Landfill property. The site contains wetlands, streams, and steep slopes. Invasive plant species were present in each of the delineated stands except for Stand 1, which was recently burned and had little to no understory cover. Invasive species occurred at higher percent coverage in disturbed or regrowth stands (Forest Stands 3 and 4) located on the Landfill. Due to the presence of steep slopes within the project area, all stands were ranked as Priority 1 PRAs. As stated previously, Priority 1 PRAs "contain slopes greater than twenty-five (25) percent" (M-NCPPC 1994).

This FSD Report and Plan should be submitted to the M-NCPPC for approval. Once the FSD Report and Plan has been approved by M-NCPPC, the proposed site design plan will be used to create a Forest Conservation Plan or exemption in an effort to determine impacts to forest resources within the proposed limit of disturbance. The Forest Conservation Plan will then be submitted to M-NCPPC for agreement and approval.

7. REFERENCES

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Appendix A

Figures

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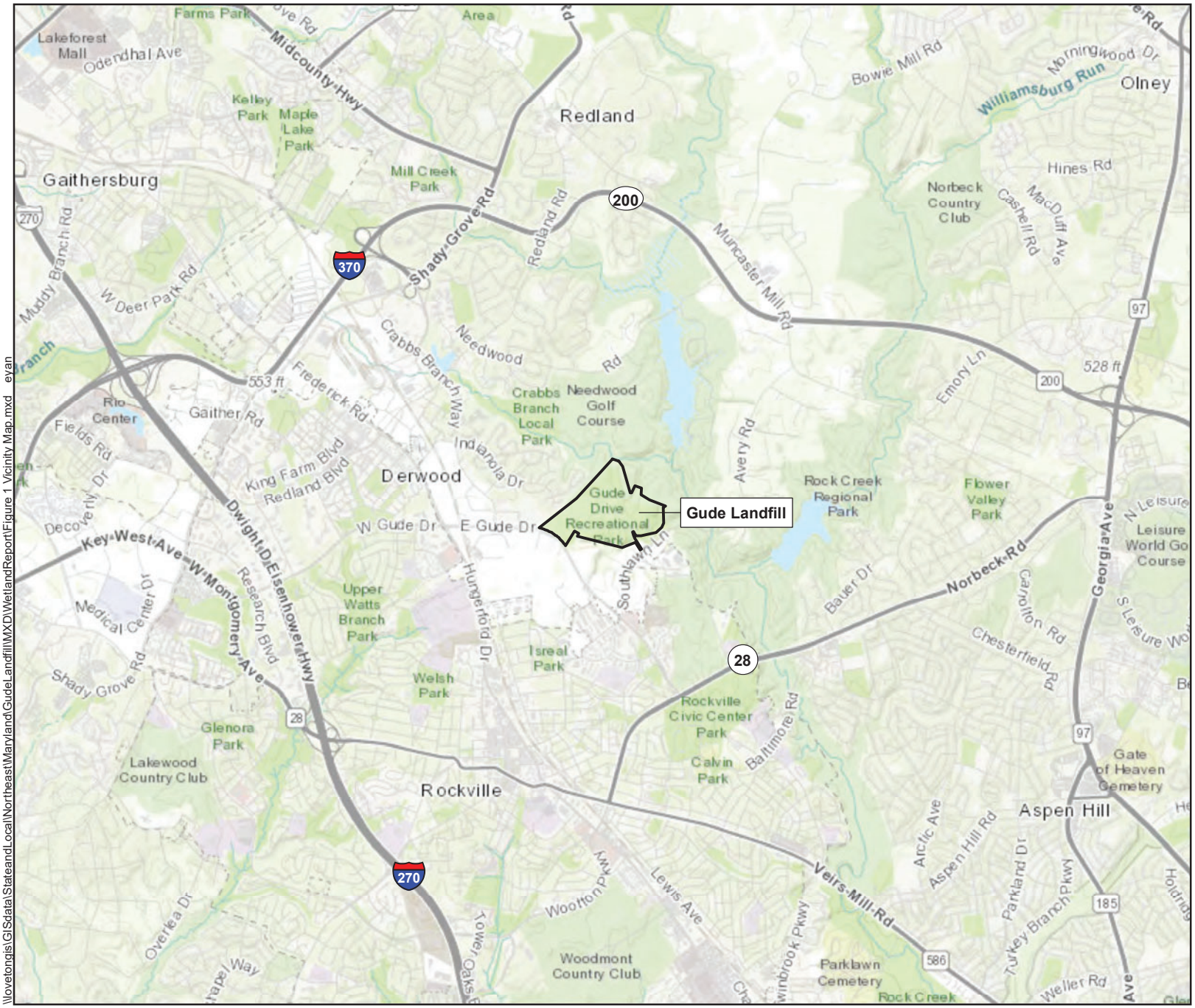

Legend

Property Boundary

Map Date: 5/17/2018
Source: ESRI 2016
Projection: NAD 1983 State Plane Maryland US Feet

N

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Miles

Figure 1
Vicinity Map
Gude Landfill
Rockville, Maryland

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VICINITY MAP

Legend

Property Boundary

Map Date: 5/17/2018
Source: ESRI 2015
Projection: NAD 1983 State Plane Maryland US Feet

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Figure 2
Area of Review Map
Gude Landfill
Rockville, Maryland

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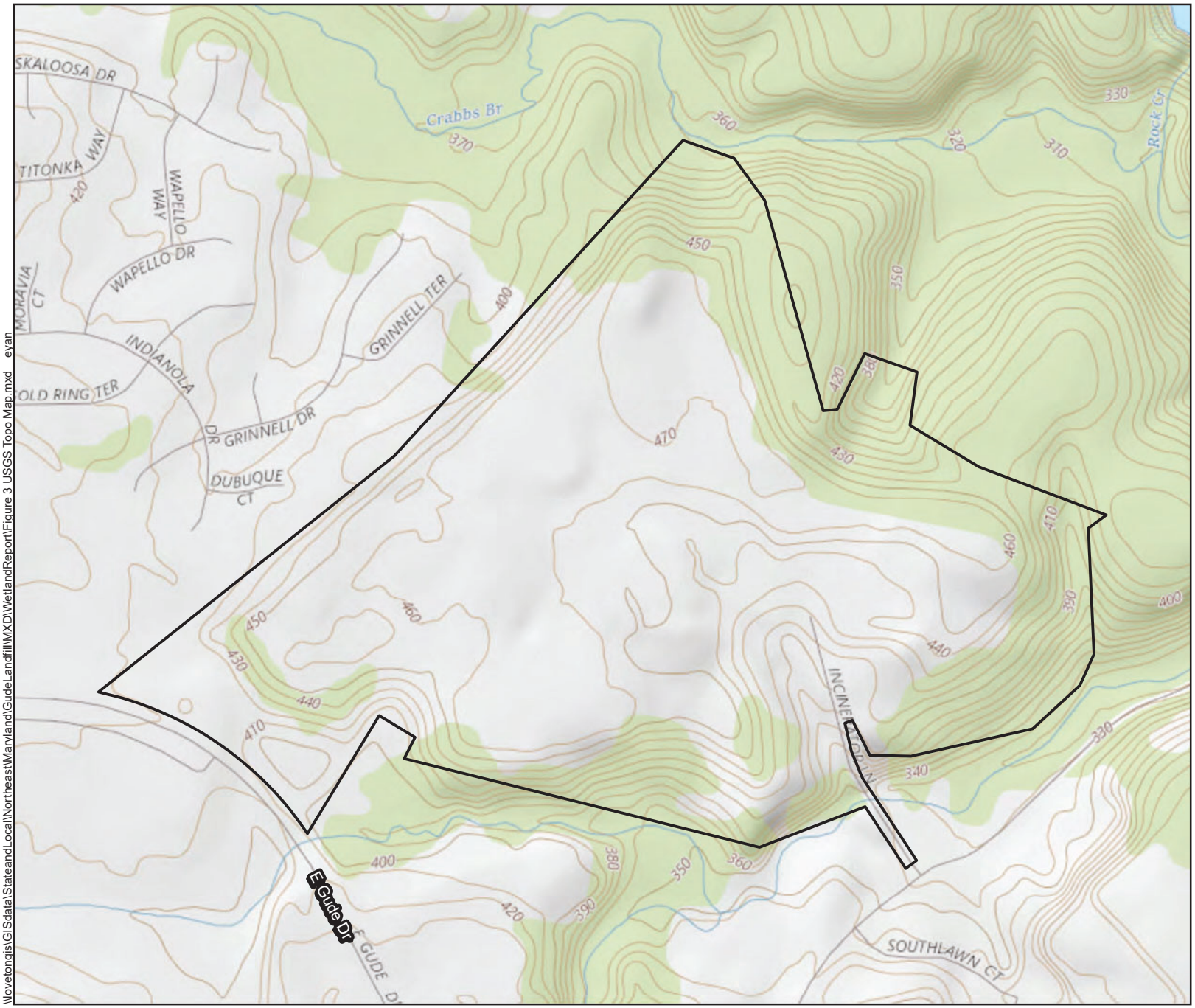

VICINITY MAP

Legend

Property Boundary

Map Date: 5/17/2018
Source: USGS 2016
Projection: NAD 1983 State Plane Maryland US Feet

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Figure 3
USGS Topo Map
Gude Landfill
Rockville, Maryland

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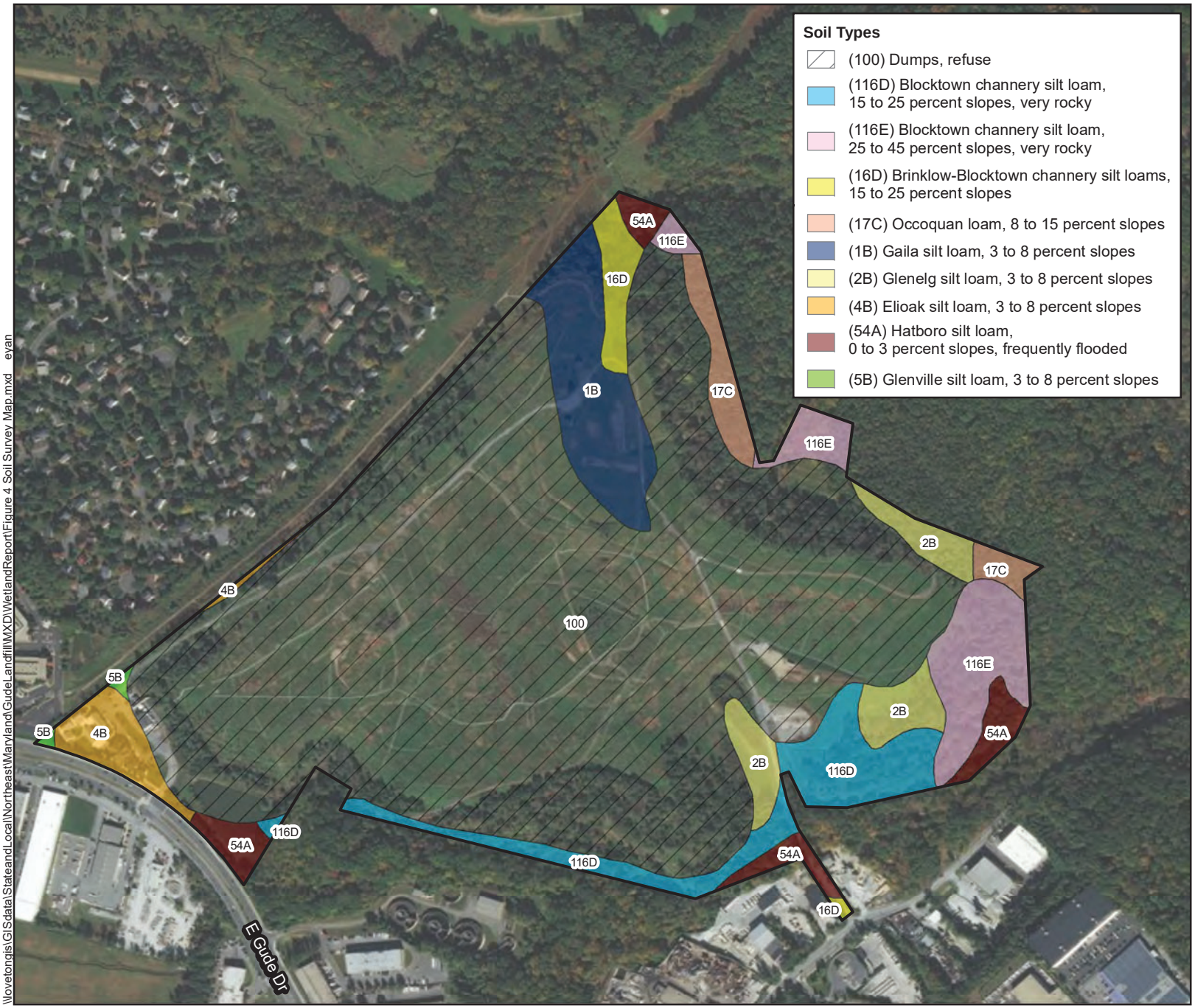

Legend

Property Boundary

Map Date: 5/17/2018
Source: ESRI 2015, USDA 2013
Projection: NAD 1983 State Plane Maryland US Feet

N

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Feet

Figure 4
Soil Survey Map
Gude Landfill
Rockville, Maryland

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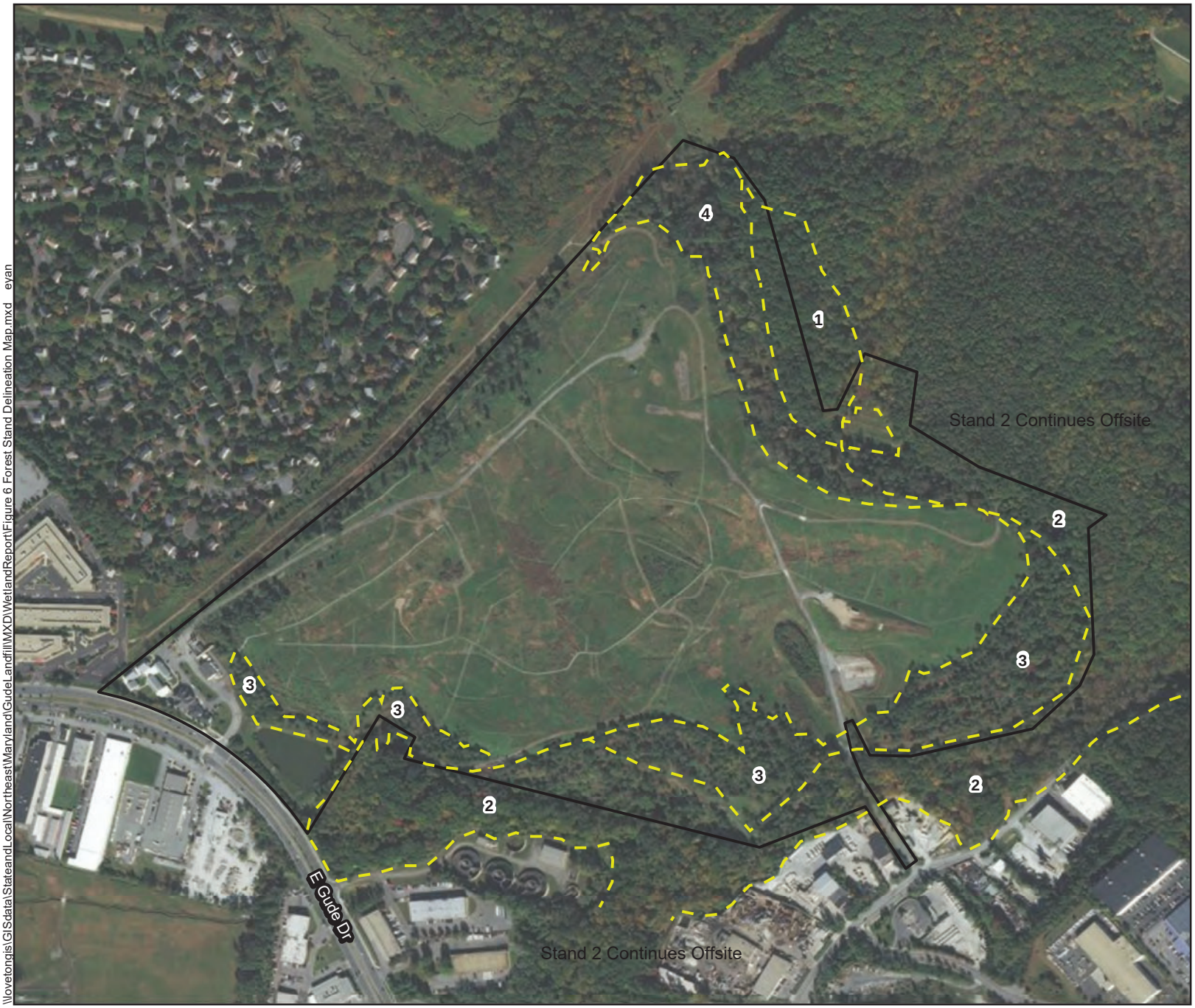

VICINITY MAP

Legend

- Forest Stand Boundary
- Property Boundary

Map Date: 5/18/2018
Source: ESRI 2015
Projection: NAD 1983 State Plane Maryland US Feet

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Feet

Figure 5
Forest Stand Delineation Map
Gude Landfill
Rockville, Maryland

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Appendix B

Forest Stand Delineation Plan

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NOTES

1. PROJECT NAME: GUDE LANDFILL
2. LOCATION: 600 EAST GUDE DRIVE, ROCKVILLE, MARYLAND
3. OWNER: MONTGOMERY COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF SOLID WASTER SERVICES (DEP/DSWS)
4. PLAN PREPARED BY: EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC 225 SCHILLING CIRCLE, SUITE 400, HUNT VALLEY, MARYLAND
5. TOTAL AREA OF REVIEW: 162.7 ACRES±
6. PROPERTY BOUNDARIES AND OWNER INFORMATION ARE BASED ON BASED ON A DRAWING ENTITLED "GUDE LANDFILL - PROPERTY EXCHANGE WITH M-NCPPC" PREPARED BY C.C. JOHNSON & MALHOTRA, P.C., DATED 05/23/2012.
7. FOR SOIL CLASSIFICATIONS AND INFORMATION REFER TO NRI/FSD NARRATIVE REPORT.
8. FOR FLOOD PLAIN INFORMATION REFER TO NRI/FSD NARRATIVE REPORT.
9. ALL STANDS ARE CONSIDERED PRIORITY 1 AREAS.

LEGEND

DESCRIPTION	EXISTING	PROPOSED
PROPERTY BOUNDARY AND AREA OF REVIEW		NA
ADJOINER BOUNDARY		NA
CONTOUR		NA
TREE LINE		NA
FENCE LINE		NA
DIRT ROAD		NA
APPROXIMATE STREAM CENTER LINE		NA
NONTIDAL WETLAND		NA
POND		NA
STAND (S: STAND, P: PLOT)	S# P#	NA
STAND BOUNDARY		NA
SPECIMEN TREE	+3	NA
STREAM BUFFER		NA
WETLAND BUFFER		NA
STEEP SLOPES 15%> IN HIGHLY ERODIBLE SOILS		NA
STEEP SLOPES 25%>		NA

THOMAS M. KING
MD DNR QUALIFIED PROFESSIONAL

1-8-19
DATE

FOREST STAND	SIZE WITHIN AREA OF REVIEW
1	139,666 SQ. FT. (3.21 AC.)
2	701,383 SQ. FT. (16.10 AC.)
3	832,963 SQ. FT. (19.12 AC.)
4	434,280 SQ. FT. (9.97 AC.)

TREE NUMBER	DBH (IN.)	COMMON NAME	SCIENTIFIC NAME	CONDITION
T-1	38.8	WHITE OAK	QUERCUS ALBA	GOOD
T-2	32.7	TULIP POPLAR	LIRIODENDRON TULIPIFERA	DOUBLE TRUNK WITH INCLUDED BARK
T-3	38.0	WHITE OAK	QUERCUS ALBA	GOOD
T-4	59.0	SILVER MAPLE	ACER SACCHARINUM	FAIR MULTI-TRUNK WITH MANY DEAD LIMBS
T-5	59.3	SILVER MAPLE	ACER SACCHARINUM	FAIR MULTI-TRUNK IN POND
T-6	35.1	TULIP POPLAR	LIRODENDRON TULIPIFERA	GOOD, DOUBLE TRUNK
T-7	33.2	TULIP POPLAR	LIRODENDRON TULIPIFERA	GOOD
T-8	31.5	TULIP POPLAR	LIRODENDRON TULIPIFERA	GOOD
T-9	35.2	SCARLET OAK	QUERCUS COCCINEA	FAIR WITH MANY DEAD LIMBS
T-10	34.3	RED OAK	QUERCUS RUBRA	GOOD

SPECIES COMMON IN TREE ROWS/REGROWTH ON LANDFILL:
PITCH PINE, BLACK LOCUST, RED CEDAR, HONEY LOCUST, WHITE PINE

0 100 200 400
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: TK
DRAWN BY: SMB
CHECKED BY: TK
PROJECT MANAGER: LJO

SEAL

GUDE LANDFILL REMEDIATION DESIGN

MONTGOMERY COUNTY, MARYLAND

NATURAL RESOURCE INVENTORY / FOREST STAND DELINEATION PLAN

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

DATE: MAY 2018

PROJECT NUMBER: 1564601

F-1

SHEET: 1 OF 1

Attachment D

Forest Stand Delineation Report and Wetland Delineation Report

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Gude Landfill Remediation Project
Design Engineer Contract

Natural Resources Inventory/
Forest Stand Delineation Report

Prepared for

Department of Environmental Protection
Division of Solid Waste Services
Montgomery County, Maryland

Prepared by
EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031

March 2019
Version: FINAL
EA Project No. 15646.01

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Gude Landfill Remediation Project
Design Engineer Contract

Natural Resources Inventory/
Forest Stand Delineation Report

Prepared for

Department of Environmental Protection
Division of Solid Waste Services
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Prepared by
EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle
Hunt Valley, Maryland 21031

March 2019
Version: FINAL
EA Project No. 15646.01

3/13/2019

Thomas M. King **Date**
Maryland Department of Natural Resources Qualified Professional

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TABLE OF CONTENTS

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LIST OF APPENDICES

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LIST OF ACRONYMS AND ABBREVIATIONS

the County	Montgomery County Department of Environmental Protection, Division of Solid Waste Services
dbh	Diameter at breast height
EA	EA Engineering, Science, and Technology, Inc., PBC
FEMA	Federal Emergency Management Agency
FSD	Forest Stand Delineation
the Landfill	Gude Landfill
MDNR	Maryland Department of Natural Resources
M-NCPPC	Maryland-National Capital Park and Planning Commission
NRCS	National Resources Conservation Service
NRI	Natural Resources Inventory
PRA	Priority Retention Area
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

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1. INTRODUCTION

This Natural Resources Inventory (NRI) and Forest Stand Delineation (FSD) Report was prepared for the Engineering, Bid Preparation, and Support Services for the Gude Landfill (the Landfill) Remediation Project for Montgomery County, Maryland (the Remediation Design), under the Northeast Maryland Waste Disposal Authority and the Montgomery County Department of Environmental Protection, Division of Solid Waste Services (the County).

The Landfill Remediation Design is for the recommended Corrective Measure Alternative, Toupee Capping and Additional Landfill Gas Collection, as approved by the Maryland Department of the Environment on July 8, 2016.

1.1 PURPOSE

The purpose of this NRI/FSD Report is to review, identify, and/or delineate natural resources and forest stands located on and within the vicinity of the Landfill (the project site). The Landfill consists of approximately one hundred sixty-two and seven-tenths (162.7) acres, located at 600 East Gude Drive in Rockville, Maryland (**Appendix A, Figure 1**).

As part of the design effort, EA Engineering, Science, and Technology, Inc., PBC (EA) performed an NRI of the site, including a full FSD and a Wetland Delineation. Wetlands delineated at the site are discussed in the *Gude Landfill Remediation Project, Design Engineer Contract, Wetland Delineation Report* (EA 2018). This report provides information on the Forest Stand Delineation conducted at the site. The FSD was conducted in accordance with the guidelines of the *State Forest Conservation Technical Manual* (Maryland Department of Natural Resources [MDNR] 1997) and in accordance with the regulations in the Montgomery County *Trees: Approved Technical Manual* (Maryland-National Capital Park and Planning Commission [M-NCPPC] 1994).

As part of the development of the FSD Report, an NRI/FSD Plan was prepared to the specifications and methodologies outlined in the Montgomery County *Trees: Approved Technical Manual* (M-NCPPC 1994), including delineated stands, wetlands, streams, buffers, steep slopes, and erodible soils. This plan figure is provided as sheet F-1 in **Appendix B**.

2. SITE DESCRIPTION

2.1 SITE LOCATION

At the time of EA's FSD on April 30 and May 1, 2018, the project site consisted of approximately one hundred six-two and seven-tenths (162.7) acres of land predominantly comprised of open grass and vegetative covered fields (**Appendix A, Figure 2**). The border of the project site consisted of undeveloped forested land. Major site features included an extensive landfill gas collection piping system throughout the property, a paved open area in the southeastern portion of the Landfill, a model airplane flying area in the northern portion of the Landfill, and a landfill gas to energy flare station and shelter in the southwest corner of the property.

The site is bordered to the south by industrial operations, to the west/northwest by the community of Derwood Station South, and to the north and east by M-NCPPC property. The surrounding area was mixed use with the Derwood residential community to the northwest, commercial and industrial properties to the south, and predominantly undeveloped wooded areas to the north and east. The approximate latitude/longitude of the property is 39° 06' 29" N and 77° 08' 16" W, respectively. The Landfill is located at 600 East Gude Drive in Rockville, Maryland (**Appendix A, Figure 1**). The property is identified as Parcels 151, 230, and 240 on Montgomery County Tax Maps. The area of review for the FSD is provided on **Figure 2** (**Appendix A**).

2.2 TOPOGRAPHY

The site is located in the upland section of the Piedmont Plateau Physiographic Province. The general topography of the site consists of moderate slopes with steeper slopes along the south and east edge of the Landfill property. Elevation of the site ranges from three hundred thirty (330) to four hundred seventy-five (475) feet above mean sea level (**Appendix A, Figure 3**). The underlying geology of the site is metamorphic and igneous rock formations of the Paleozoic and Precambrian Age. These formations consist of phyllite, slate, marble, schist, gneiss, and gabbro formations.

The U.S. Geological Survey (USGS) topographic map for the area (*Rockville Quadrangle*, **Figure 3** in **Appendix A**) was also used as a reference to identify possible wetlands and waterways on the property. Topographic maps identify elevations, forested areas, streams, ponds, roads, and structures. The USGS map identified multiple buildings and roads within the project site and depicted the majority of the site as being non-forested. Three (3) blue-line stream channels were depicted within the vicinity of the project site on the USGS map, including Crabbs Creek, Rock Creek, and an unnamed channel. Crabbs Creek was identified as being located on the northeastern corner of the project site. Crabbs Creek flowed in a southeasterly direction where it contributed to Rock Creek. Rock Creek was depicted to the east of the project site. Rock Creek was not located within the area of review. The third blue-line stream channel (unnamed) was located along the southern property line and conveyed flow in an easterly direction to Rock Creek. The streams discussed above are listed in the Code of Maryland Regulations stream use classification index as Use IV (Recreational Trout Waters), with an in-stream restriction during the period of March 1 through May 31.

The site topography was plateau-like and consisted of gentle relief along the top of the plateau and sharp relief along the entirety of the Landfill boundary. The elevation along the top of the plateau gently sloped to the south, with localized mounds and depressions throughout. The topography around the edges of the waste layer fell sharply from the plateau to elevations ranging from sixty (60) to ninety (90) feet below the plateau.

2.3 SOIL CHARACTERISTICS

The online U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey for Montgomery County was reviewed for the area of review prior to the field visit (**Appendix A, Figure 4**). Ten (10) soil types were identified within the project site (USDA NRCS 2018a). According to the NRCS hydric soils list by state (USDA NRCS 2018b), seven (7) of the soil units within the project site were listed as a hydric soil. In addition, all but two (2) of the soil types within the area of review are considered erodible soils, or soils with a K factor value greater than thirty-five one-hundredths (0.35). Soil types found within the project site are identified in **Table 1**.

Table 1 Mapped Soil Types

Soil Mapping Unit	Symbol	Hydric Soil	Erosion (K factor)	Drainage Class	Prime Agricultural
Gaila silt loam, 3 to 8 percent slopes	1B	Yes	0.43	Well drained	Prime Farmland
Glenelg silt loam, 3 to 8 percent slopes	2B	No	0.37	Well drained	Prime Farmland
Elioak silt loam, 3 to 8 percent slopes	4B	No	0.37	Well drained	Prime Farmland
Glenville silt loam, 3 to 8 percent slopes	5B	Yes	0.37	Moderately well drained	Prime Farmland
Brinklow-Blocktown channery silt loams, 15 to 25 percent slopes	16D	Yes	0.37	Well drained	Not Prime Farmland
Occoquan loam, 8 to 15 percent slopes	17C	Yes	0.37	Well drained	Farmland of Statewide Importance
Hatboro silt loam, 0-3% slopes, frequently flooded	54A	Yes	--	Poorly drained	Not Prime Farmland
Dump, refuse	100	No	--	--	Not Prime Farmland
Blocktown channery silt loam, 15-25 percent slopes, very rocky	116D	Yes	0.49	Well drained	Not Prime Farmland
Blocktown channery silt loam, 25-45 percent slopes, very rocky	116E	Yes	0.49	Well drained	Not Prime Farmland

Source: Adapted from U.S. Department of Agriculture, Natural Resources Conservation Service 1995, 2018a, 2018b.

2.4 WETLANDS, WATERS OF THE U.S., AND FLOODPLAINS

Wetlands and Waters of the U.S. at the Landfill were delineated as part of the Natural Resource Inventory, and are provided in the *Wetland Delineation Report* (EA 2018). Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps were consulted prior to the field visit to identify floodplain areas at the site. The Landfill falls within the Flood Insurance Rate Map identified as Map ID 24031C03320D, dated September 29, 2006. A review of the Flood Insurance

Rate Map generated by FEMA's online Map Service Center indicates that portions of the unnamed tributary to Rock Creek, Rock Creek, and Crabbs Creek are located within the one hundred (100)-year floodplain. The remainder of the subject site is identified within an area of minimal flood hazard.

3. METHODOLOGY

A standard FSD was conducted on April 30 and May 1, 2018, in accordance with the guidelines of the *State Forest Conservation Technical Manual* (MDNR 1997) and in accordance with the regulations in the Montgomery County *Trees: Approved Technical Manual* (M-NCPPC 1994).

A one-tenth (1/10) acre fixed plot sampling technique was used to assess forest stand conditions and forest structure. Sampling plots were selected so as to be evenly distributed throughout each stand. A stick flag was placed in the center of each plot and along the perimeter of the circular plot in each of the four (4) cardinal directions. The plot center was marked in the field with orange flagging and the stand and plot number labeled with a black marker. The forest stand and forest structure procedures used for data collection followed guidelines of the *State Forest Conservation Technical Manual* (MDNR 1997). The priorities of the stands were assigned according to the guidelines in the Technical Manual.

The priorities of the stands and sensitive features mapped within each stand are determined according to the guidelines in the *State Forest Conservation Technical Manual* and the *Trees: Approved Technical Manual*. Priority Retention Areas (PRA) are specific vegetated and sensitive environmental areas identified including: steep slopes (greater than twenty-five [25] percent); erodible soils on slopes of fifteen (15) percent or greater; one hundred (100)-year floodplains; intermittent and perennial streams; nontidal wetlands; fifty (50) foot buffers to intermittent/perennial streams and nontidal wetlands (which are expanded by four [4] feet for every one [1] percent of adjacent slope or extend to the top of contiguous steep slopes twenty-five [25] percent or greater); tidal wetlands and their one hundred (100)-foot buffers; and habitats for rare, threatened, and endangered species. PRAs also include contiguous forests that connect the largest undeveloped or most vegetated tracts of land within and adjacent to the site, and trees having a diameter at breast height (dbh) of thirty (30) inches or greater (specimen trees), or that are seventy-five (75) percent or more of the dbh of the current state champion tree of that species.

Within Montgomery County, Priority (Retention) Areas are further described based on whether they are Priority 1 through Priority 4. These areas are defined in the *Trees: Approved Technical Manual* (M-NCPPC 1994) as follows:

- Priority Area 1 (High)—Area contains trees, shrubs, or herbaceous plants associated with intermittent and perennial streams and their buffers; slopes greater than twenty-five (25) percent; nontidal wetlands and their buffers; one hundred (100)-year floodplains; critical habitats of rare, threatened, or endangered species; contiguous forest connected to large undeveloped or most vegetated tracts of land. In addition, Priority Area 1 areas may also have trees that are part of a historic site or associated with a historic structure; designated as a champion tree at the local, state, or national level; have a dbh that is seventy-five (75) percent or more of the dbh of the designated state champion; or specimen trees (trees with a dbh of thirty (30) inches or greater).

- Priority Area 2 (Moderate)—Areas that contain stands or portions of stands with good forest structural diversity; forested areas providing a corridor three hundred (300) feet wide

or more of primarily native vegetation between two (2) larger forested tracts; forested stream buffers up to forest corridor width (three hundred [300] feet); trees which act as buffers between incompatible land uses and between dwellings and roads; and specific trees with a dbh of twenty-four (24) inches or greater on a site that will significantly enhance the site through their preservation.

- Priority Area 3 (Low)—Areas that contain stands or portions of stands with poor forest structural diversity or areas with none of the characteristics mentioned in the descriptions of the other Priority Area characterizations.

- Priority Area 4 (Disturbed)—Areas that have approximately forty (40) percent land cover of exotic or invasive species in the dominant canopy layer.

As noted in Section 2, topographic maps, the Montgomery County soil survey (USDA [NRCS] 2018a), and aerial photographs were reviewed prior to field investigations to identify probable forest stand boundaries. A field investigation of the project area was conducted in April and May 2018 to identify, delineate, and characterize forest stands. Forest stands were distinguished primarily by differences in species composition and successional stage. This report provides the results of this field delineation of forest stands.

4. SYSTEMS IDENTIFIED

Four (4) forest stands were identified within the area of review, predominantly along the perimeter of the Landfill. The cover types were chestnut oak/red oak, oak/hickory/maple, red maple, and green ash/box elder (**Appendix A, Figure 5**). Stand variations resulted from changes in topographic position, degree of slope, and amount and type of historical human disturbance. Forest stand conditions and forest structure were assessed at sample plots within the stand as detailed in the following stand description. Additional information on the stands is provided in the datasheets (**Appendix C**) and a summary of forest conditions within the stand is included in **Appendix D**.

The attached *Forest Stand Delineation Plan* (drawing F-1, provided in **Appendix B**) depicts the approximate location of the sampling plots and boundary of forest cover type. Brief descriptions of the forest stands are included in this section. A photographic record is provided in **Appendix E**.

4.1 FOREST STAND 1

Stand 1 is located on the northeastern side of the project site and is dominated by chestnut oak (*Quercus prinus*) and red oak (*Quercus rubra*) in the dominant size class of six (6) to eleven and nine-tenths (11.9) inches dbh. The average basal area of this stand is one hundred thirteen (113) square feet per acre. Stand 1 has an average canopy closure of sixty-six (66) percent. Other species found in the canopy include black gum (*Nyssa sylvatica*) and mockernut hickory (*Carya tomentosa*). A portion of stand 1 appears to have been recently burned in a leaf-litter fire. As a result, there is little to no vegetation, including herbaceous vegetation in the three (3) to twenty (20) foot understory or the zero (0) to three (3) foot understory. The portion of stand 1 that does not appear to have been recently burned appears to have been previously burned, and also has little to no understory growth. In this area, black cherry (*Prunus serotina*) and striped wintergreen (*Chimaphila maculata*) are present in the understory from zero (0) to three (3) feet, but do not provide appreciable understory coverage.

Environmental features present in stand 1 include steep slopes, and a portion of the stand was recently burned. The stand continues offsite, and adjacent land uses include undeveloped forested land. Stand 1 is within the one hundred (100)-year floodplain of an offsite stream, Crabbe Creek, and has high wildlife value, as it provides cover and food sources for wildlife species. No specimen trees were identified in stand 1.

Stand 1 is rated as a Priority Area 1 due to the presence of steep slopes. Additional summary details of stand 1 are provided in **Table 2**.

Table 2 Stand 1 Summary

Sample Plots	3
Successional Stage	Mid-Successional
Priority Area	1
Cover Type	Chestnut Oak/Red Oak
Size within AOR	3.21 acres

4.2 FOREST STAND 2

Stand 2 is located along the eastern, southern, and southeastern edge of the area of review, and continues offsite. Stand 2 is dominated by mixed oak (*Quercus* spp.) and mockernut hickory of an average size class of twelve (12) to nineteen and nine-tenths (19.9) inches dbh, with eighty-four (84) percent canopy closure. Stand plots on the slopes tend to be dominated by oak species, while those in the bottomland near streams are more dominated by red maple (*Acer rubrum*). The average basal area of stand 2 is one hundred eighteen (118) square feet per acre. Oak species found within stand 2 include white oak (*Quercus alba*), chestnut oak, and northern red oak. Species found in the canopy within the plots include mockernut hickory, black gum, black cherry, tulip poplar (*Liriodendron tulipifera*), American sycamore (*Platanus occidentalis*), black haw (*Viburnum prunifolium*), and mountain laurel (*Kalmia latifolia*). The understory from three (3) to twenty (20) feet tall averages sixty-eight (68) percent coverage, and includes red maple, mockernut hickory, black gum, chestnut oak, black cherry, northern red oak, mountain laurel, and common privet (*Ligustrum vulgare*). Common herbaceous and woody species zero (0) to three (3) feet tall consisted of striped wintergreen, partridge berry (*Mitchella repens*), bush honeysuckle (*Lonicera tartarica*), Asiatic bittersweet (*Celastrus orbiculatus*), garlic mustard (*Alliaria petiolata*), Japanese honeysuckle (*Lonicera japonica*), American holly (*Ilex opaca*), Japanese stiltgrass (*Microstegium vimineum*), common privet, poison ivy (*Toxicodendron radicans*), and soft rush (*Juncus effusus*). Coverage of understory herbaceous plants during the forest stand delineation was twenty-four (24) percent. Invasive species observed in the sample plots included Japanese honeysuckle, garlic mustard, Asiatic bittersweet, bush honeysuckle, Japanese stiltgrass, and common privet.

Environmental features within stand 2 include a forested wetland, a stream (an unnamed tributary to Rock Creek), steep slopes, and several specimen trees. The wildlife value of the stand is high due to the presence of cover, food, and water. The stand continues offsite, and adjacent land uses include industrial property and M-NCPPC owned land. EA identified seven (7) specimen trees (white oak, scarlet oak, red oak, silver maple [*Acer saccharinum*], and several tulip poplars) within stand 2 as described in Section 4.5.

The stand is a Priority Area 1 because of the presence of specimen trees, steep slopes, a stream, and wetlands. Additional summary details of stand 2 are provided in **Table 3**.

Table 3 Stand 2 Summary

Sample Plots	5
Successional Stage	Mature
Priority Area	1
Cover Type	Oak/Hickory/Red Maple
Size within AOR	16.10 acres

4.3 FOREST STAND 3

Stand 3 is located on the southwest and southeast corners of the project site upslope of stand 2. Stand 3 is dominated by red maple of size class six (6) to eleven and nine-tenths (11.9) inches dbh, with eighty (80) percent canopy closure. Other species in the canopy are red cedar (*Juniperus*

virginiana), black cherry, Virginia pine (*Pinus virginiana*), silver maple, black locust (*Robinia pseudo-acacia*), and black gum. The average basal area in stand 3 is seventy (70) square feet per acre. The understory from three (3) to twenty (20) feet tall averages forty (40) percent coverage, and includes red maple, black gum, red cedar, Asiatic bittersweet, and Japanese barberry (*Berberis thunbergii*). Common herbaceous and woody species zero (0) to three (3) feet tall consist of American holly, Japanese barberry, Chinese silvergrass (*Miscanthus sinensis*), Japanese stiltgrass, poison ivy, Asiatic tearthumb (*Polygonum perfoliatum*), Indian strawberry (*Duchesnea indica*), red maple, red cedar, and common reed (*Phragmites australis*). Cover of herbaceous understory species averages sixty (60) percent for the understory zero (0) to three (3) feet tall. Several invasive species are present and were observed in the sample plots including Japanese barberry, Japanese stiltgrass, Japanese silvergrass, Asiatic bittersweet, Asiatic tearthumb, and common reed.

Environmental features found within stand 3 include steep slopes and relatively high invasive plant species cover. Adjacent land uses include M-NCPPC owned land. The stand provides moderate wildlife value, due to the presence of cover and food. Stand 3 does not provide water for wildlife. No specimen trees were identified in stand 1.

The stand was rated as a Priority Area 1 due of the presence of steep slopes, but the stand also has a higher percentage of invasive coverage than other stands onsite. Additional summary details of stand 3 are provided in **Table 4**.

Table 4 Stand 3 Summary

Sample Plots	2
Successional Stage	Mid-Successional
Priority Area	1
Cover Type	Red Maple
Size within AOR	19.12 acres

4.4 FOREST STAND 4

Stand 4 is located on the northeast portion of the project site and is dominated by green ash (*Fraxinus pennsylvanica*) and box elder (*Acer negundo*). Other canopy species present are black cherry, black locust, apple (*Malus* spp.), bush honeysuckle, silver maple, red maple, and red cedar. The overstory in stand 4 has an average canopy closure of fifty (50) percent, with dominant trees of size class six (6) to eleven and nine-tenths (11.9) inches dbh. The average basal area in stand 4 is seventy-five (75) square feet per acre. The understory from three (3) to twenty (20) feet tall also averages fifty (50) percent coverage, and includes bush honeysuckle and Japanese barberry. Common herbaceous and woody species zero (0) to three (3) feet tall consist of horse balm (*Collinsonia canadensis*), Japanese stiltgrass, Japanese honeysuckle, Japanese barberry, bush honeysuckle, wineberry (*Rubus phoenicolasius*), poison ivy, and oniongrass (*Allium vineale*) with one hundred (100) percent coverage. Invasive species observed in the sample plots include Japanese stiltgrass, wineberry, bush honeysuckle, Japanese honeysuckle, and Japanese barberry.

Environmental features within stand 4 include an emergent wetland, a stream (Crabbs Creek), steep slopes, and one (1) specimen tree, as noted in Section 4.5. Stand 4 contains steep slopes and

relatively high invasive cover. Adjacent land uses include M-NCPPC-owned land. The wildlife value of the stand is high due to the presence of cover and food, with water along the boundary.

The stand was rated as Priority Area 1 due to the presence of steep slopes, but the stand also has a higher percentage of invasive coverage than other stands onsite. Additional summary details of stand 4 are provided in **Table 5**.

Table 5. Stand 4 Summary

Sample Plots	2
Successional Stage	Early-Successional
Priority Area	1
Cover Type	Red Cedar/Box Elder/Bush Honeysuckle
Size within AOR	9.97 acres

4.5 SPECIMEN TREES

As part of the FSD site visit, specimen trees were identified in the project area. Specimen trees are trees that have a dbh greater than thirty (30) inches or have a dbh that is seventy-five (75) percent or more of the state champion tree dbh for that species. Champion trees are also considered specimen trees. Ten (10) specimen trees representing five (5) species were identified in the project area. Several of these specimen trees are within stands in the area of review for the FSD, but are located outside the Landfill property. Specimen trees within the Landfill property line include two (2) silver maples (T-4 and T-5). **Table 6** outlines the species, dbh, and condition of specimen trees identified in the area of review.

Table 6. Specimen Trees

Tree Number	Stand Location	DBH (inches)	Common Name	Scientific Name	Condition
T-1	2	38.8	White oak	*Quercus alba*	Good
T-2	2	32.7	Tulip poplar	*Liriodendron tulipifera*	Double trunk with included bark
T-3	2	38.0	White oak	*Quercus alba*	Good
T-4	4	59.0	Silver maple	*Acer saccharinum*	Fair multi-trunk with many dead limbs
T-5	2	59.3	Silver maple	*Acer saccharinum*	Fair multi-trunk in pond
T-6	2	35.1	Tulip poplar	*Liriodendron tulipifera*	Good, double trunk
T-7	2	33.2	Tulip poplar	*Liriodendron tulipifera*	Good
T-8	2	31.5	Tulip poplar	*Liriodendron tulipifera*	Good
T-9	2	35.2	Scarlet oak	*Quercus coccinea*	Fair with many dead limbs
T-10	2	34.3	Red oak	*Quercus rubra*	Good

5. AGENCY REVIEW STATEMENTS

In addition to the FSD, EA completed written inquiries to USFWS and MDNR in 2009 as part of an original field delineation effort. These written inquiries were regarding whether the agencies are aware of any records of rare, threatened, or endangered species present within the project boundary. EA also completed a written inquiry to the Office of Preservation and Compliance, Maryland Historical Trust to determine whether there are known occurrences of historical, cultural, and/or archaeological sites/features present at the site. EA has received responses associated with these inquiries and they are included in **Appendix F** of this report.

USFWS and MDNR have determined that no state or federal records exist for rare, threatened, or endangered species within the project area that could be impacted by the project. Furthermore, the Maryland Historical Trust has determined that there are no records regarding the presence of cultural, archaeological, or historic resources within the project area that may be affected by remedial activities.

6. CONCLUSION

Four (4) forest stands were delineated and assessed within the area of review within and bordering the Landfill site. The cover types were chestnut oak/red oak, oak/hickory/maple, red maple, and green ash/box elder. Ten (10) specimen trees (white oak [two (2)], scarlet oak [one (1)], red oak [one (1)], tulip poplar [four (4), and silver maple [two (2)]) were located within the area of review, specifically within Forest Stands 2 and 4. Two (2) of these ten (10) trees (T-4 and T-5) are located on the Landfill property. The site contains wetlands, streams, and steep slopes. Invasive plant species were present in each of the delineated stands except for Stand 1, which was recently burned and had little to no understory cover. Invasive species occurred at higher percent coverage in disturbed or regrowth stands (Forest Stands 3 and 4) located on the Landfill. Due to the presence of steep slopes within the project area, all stands were ranked as Priority 1 PRAs. As stated previously, Priority 1 PRAs "contain slopes greater than twenty-five (25) percent" (M-NCPPC 1994).

This FSD Report and Plan should be submitted to the M-NCPPC for approval. Once the FSD Report and Plan has been approved by M-NCPPC, the proposed site design plan will be used to create a Forest Conservation Plan or exemption in an effort to determine impacts to forest resources within the proposed limit of disturbance. The Forest Conservation Plan will then be submitted to M-NCPPC for agreement and approval.

7. REFERENCES

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Appendix A

Figures

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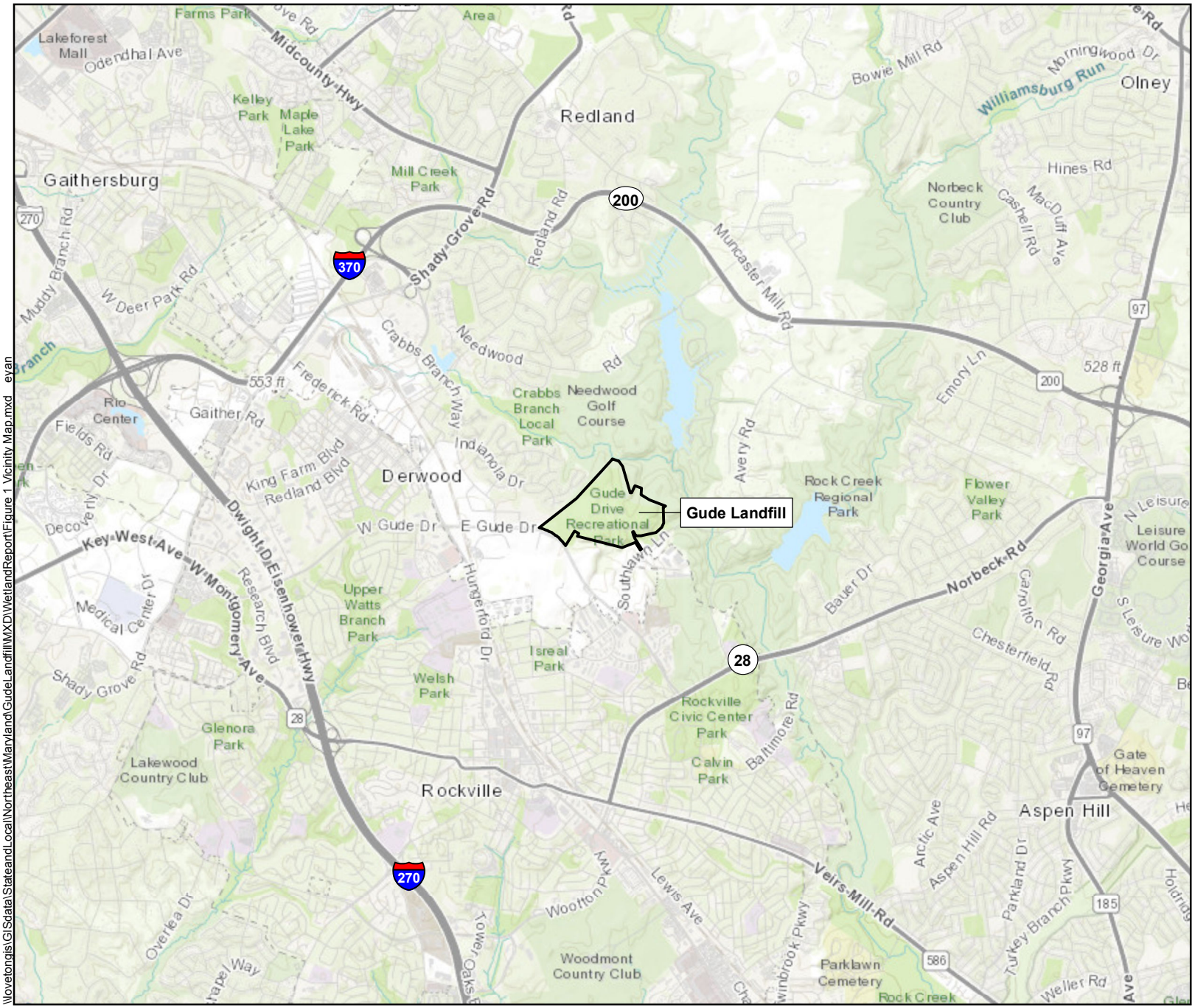

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Property Boundary

Map Date: 5/17/2018
Source: ESRI 2016
Projection: NAD 1983 State Plane Maryland US Feet

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Figure 1
Vicinity Map
Gude Landfill
Rockville, Maryland

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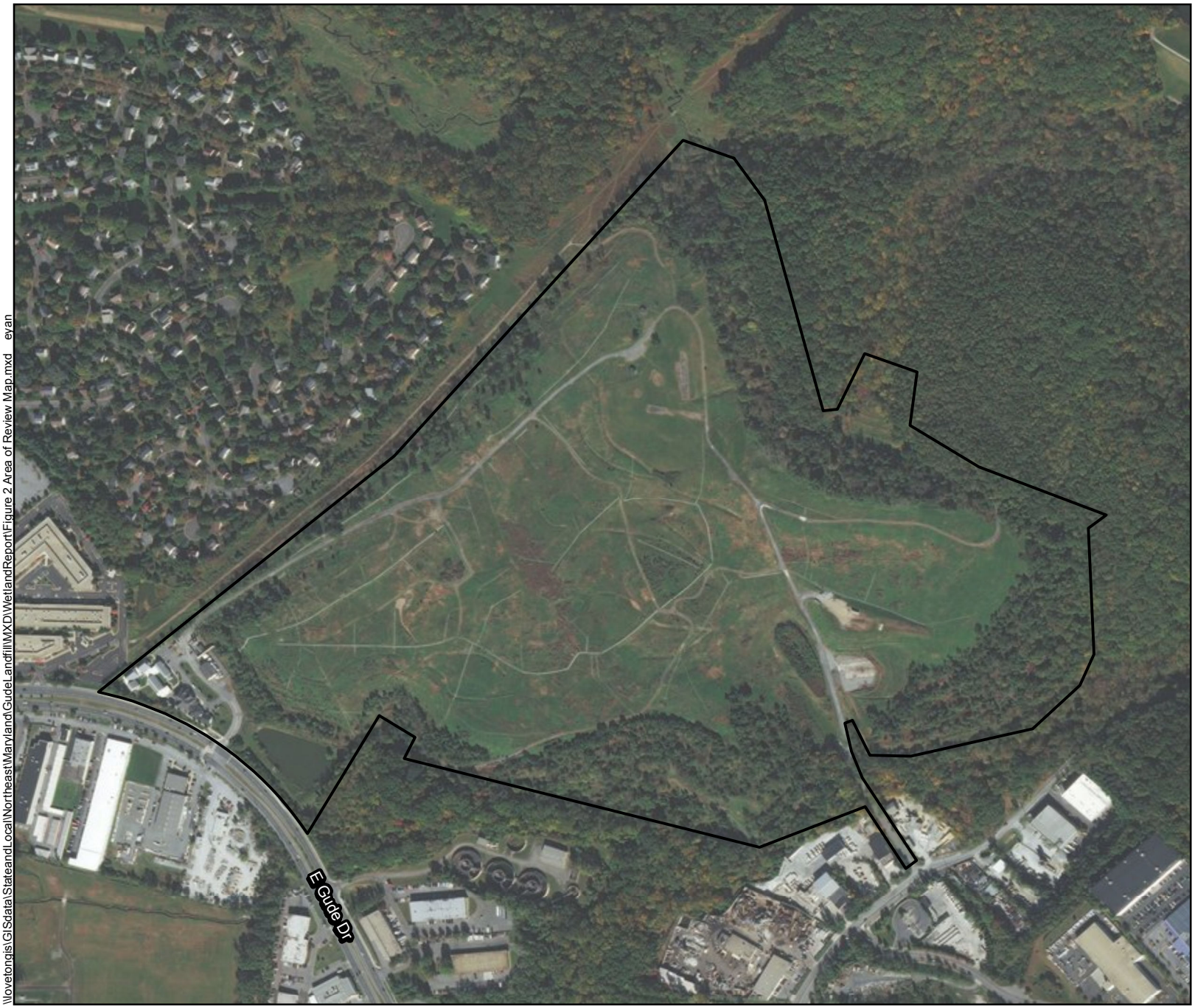

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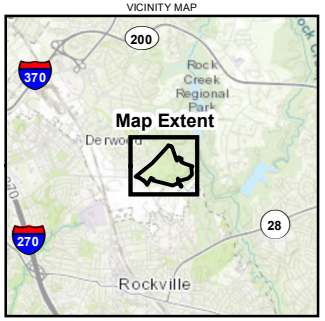

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Property Boundary

Map Date: 5/17/2018
Source: ESRI 2015
Projection: NAD 1983 State Plane Maryland US Feet

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Figure 2
Area of Review Map
Gude Landfill
Rockville, Maryland

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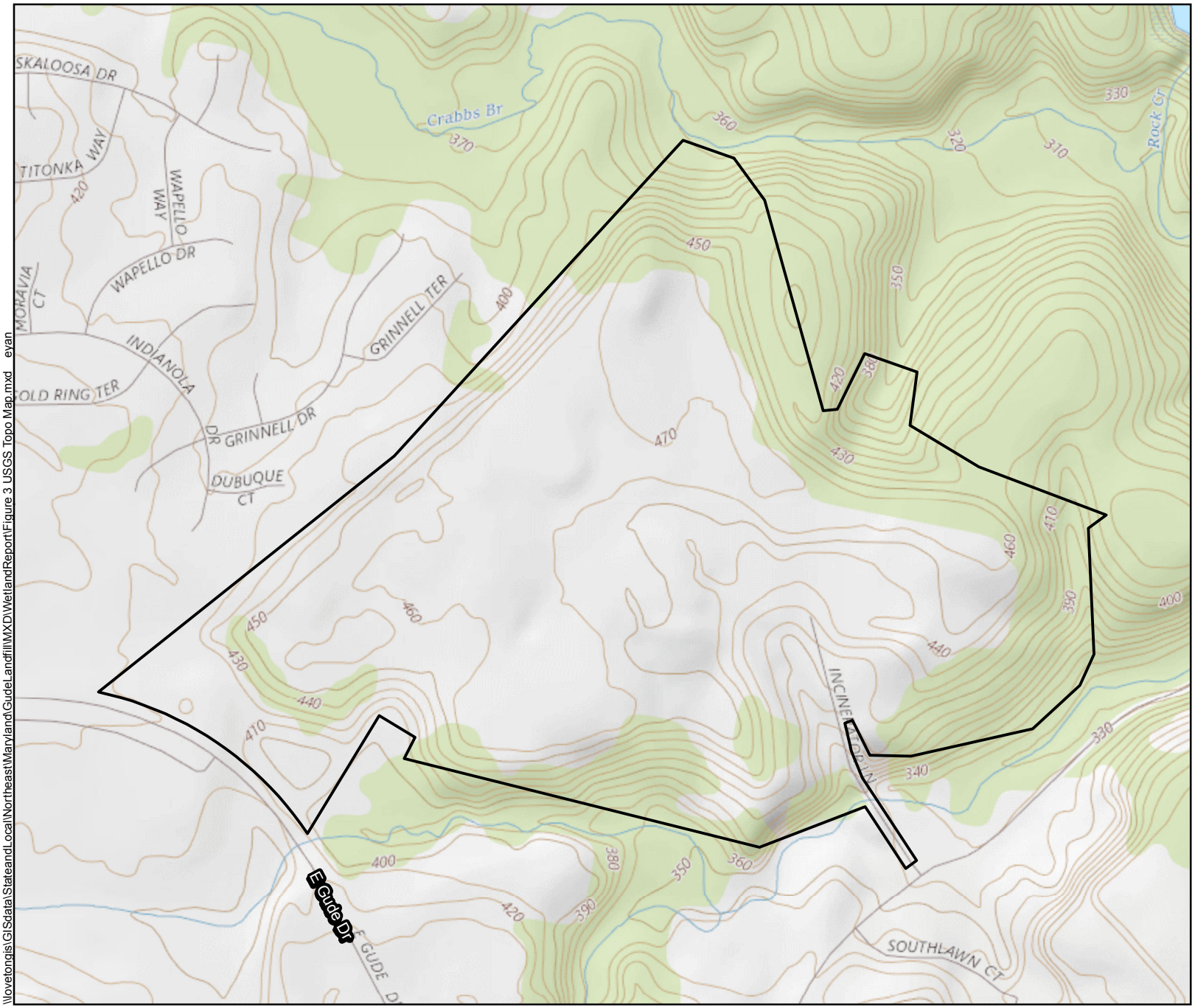

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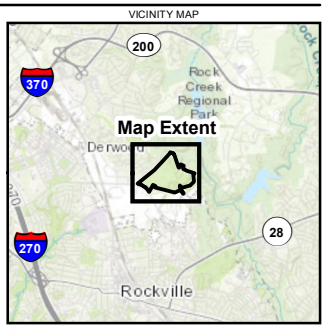

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Property Boundary

Map Date: 5/17/2018
Source: USGS 2016
Projection: NAD 1983 State Plane Maryland US Feet

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Figure 3
USGS Topo Map
Gude Landfill
Rockville, Maryland

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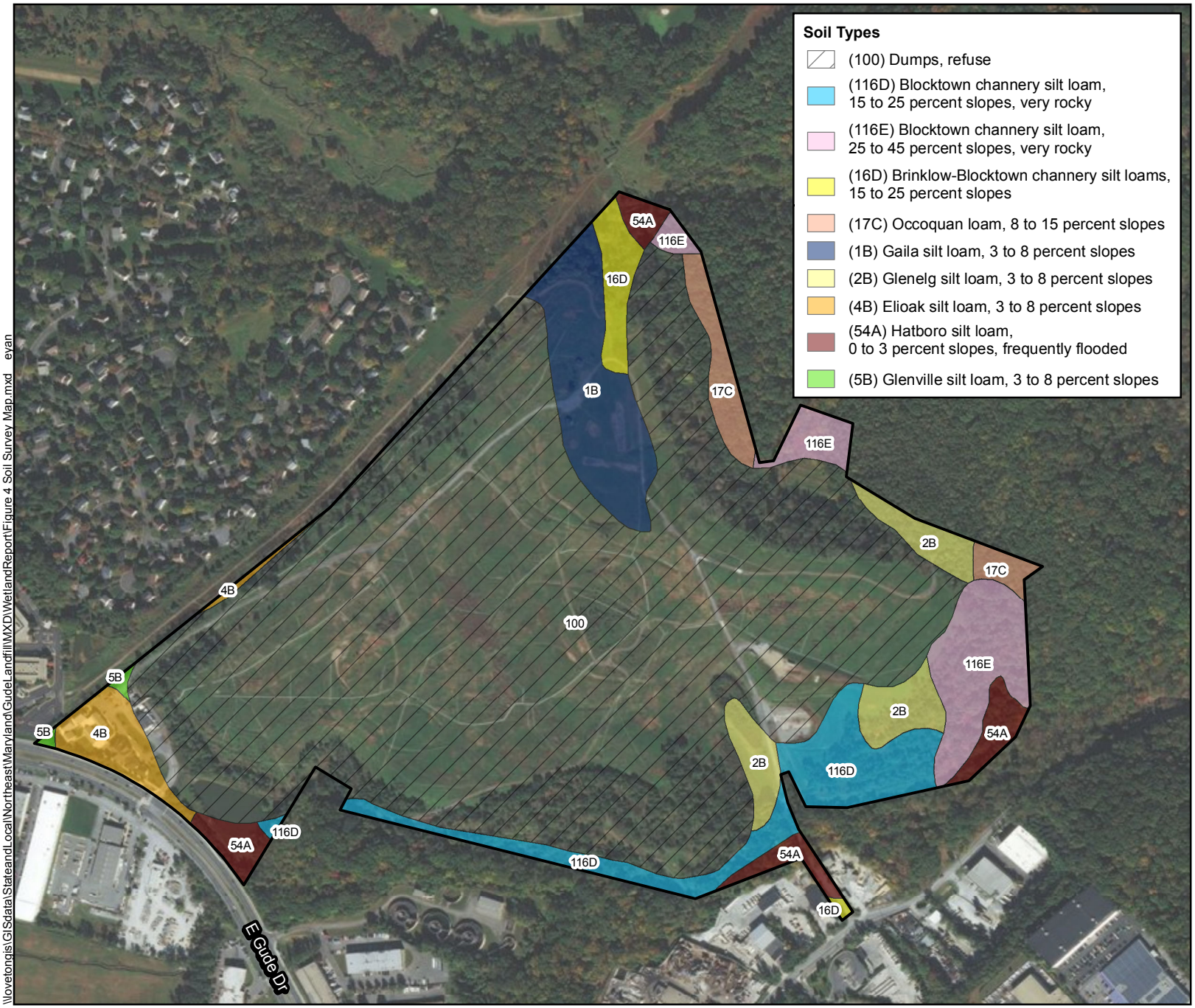

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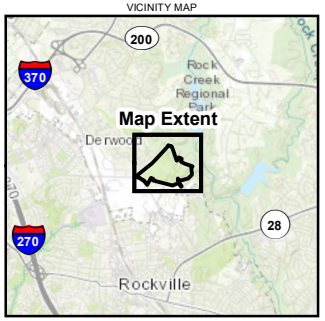

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Property Boundary

Map Date: 5/17/2018
Source: ESRI 2015, USDA 2013
Projection: NAD 1983 State Plane Maryland US Feet

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Feet

Figure 4
Soil Survey Map
Gude Landfill
Rockville, Maryland

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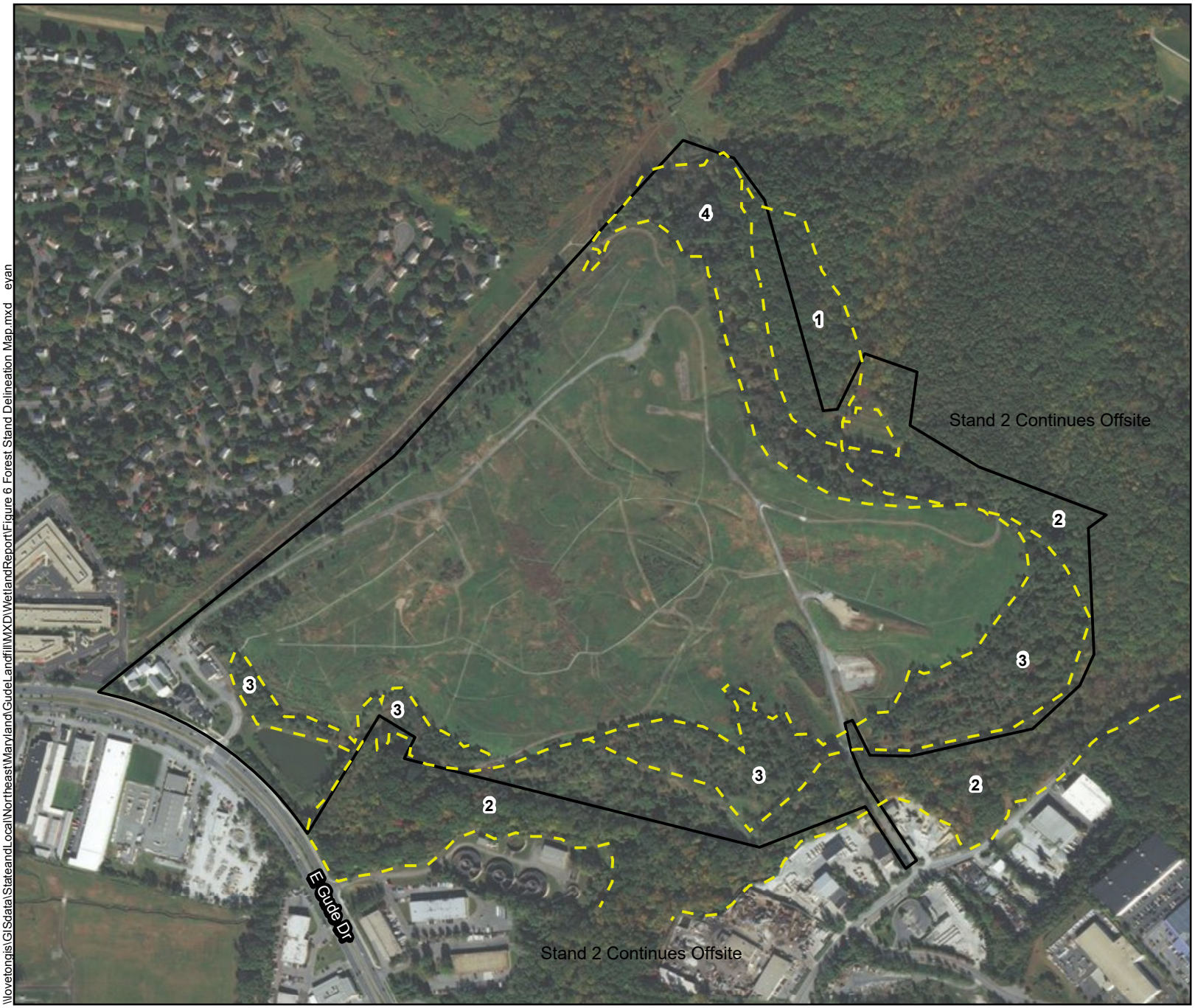

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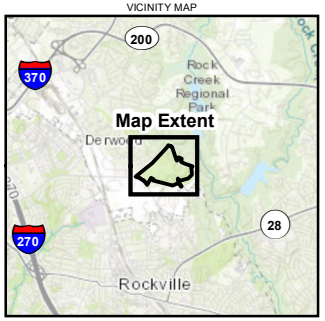

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- Forest Stand Boundary
- Property Boundary

Map Date: 5/18/2018
Source: ESRI 2015
Projection: NAD 1983 State Plane Maryland US Feet

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Figure 5
Forest Stand Delineation Map
Gude Landfill
Rockville, Maryland

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Appendix B

Forest Stand Delineation Plan

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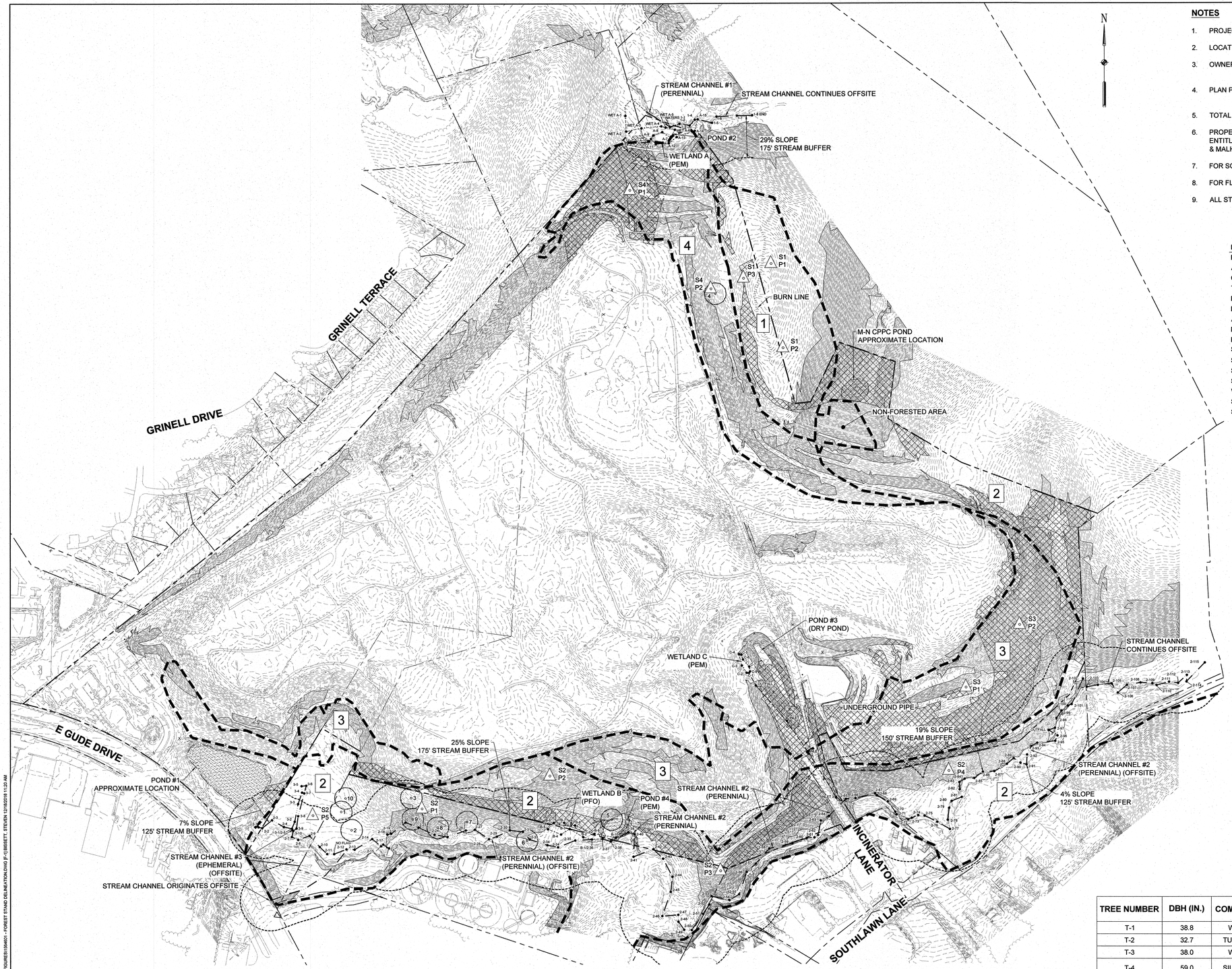

NOTES

1. PROJECT NAME: GUDE LANDFILL
2. LOCATION: 600 EAST GUDE DRIVE, ROCKVILLE, MARYLAND
3. OWNER: MONTGOMERY COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF SOLID WASTER SERVICES (DEP/DSWS)
4. PLAN PREPARED BY: EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC 225 SCHILLING CIRCLE, SUITE 400, HUNT VALLEY, MARYLAND
5. TOTAL AREA OF REVIEW: 162.7 ACRES±
6. PROPERTY BOUNDARIES AND OWNER INFORMATION ARE BASED ON BASED ON A DRAWING ENTITLED "GUDE LANDFILL - PROPERTY EXCHANGE WITH M-NCPPC" PREPARED BY C.C. JOHNSON & MALHOTRA, P.C., DATED 05/23/2012.
7. FOR SOIL CLASSIFICATIONS AND INFORMATION REFER TO NRI/FSD NARRATIVE REPORT.
8. FOR FLOOD PLAIN INFORMATION REFER TO NRI/FSD NARRATIVE REPORT.
9. ALL STANDS ARE CONSIDERED PRIORITY 1 AREAS.

LEGEND

DESCRIPTION	EXISTING	PROPOSED
PROPERTY BOUNDARY AND AREA OF REVIEW		NA
ADJOINER BOUNDARY		NA
CONTOUR		NA
TREE LINE		NA
FENCE LINE		NA
DIRT ROAD		NA
APPROXIMATE STREAM CENTER LINE		NA
NONTIDAL WETLAND		NA
POND		NA
STAND (S: STAND, P: PLOT)	S# P#	NA
STAND BOUNDARY		NA
SPECIMEN TREE	×3	NA
STREAM BUFFER		NA
WETLAND BUFFER		NA
STEEP SLOPES 15%> IN HIGHLY ERODIBLE SOILS		NA
STEEP SLOPES 25%>		NA

THOMAS M. KING
MD DNR QUALIFIED PROFESSIONAL

1-8-19
DATE

FOREST STAND	SIZE WITHIN AREA OF REVIEW
1	139,666 SQ. FT. (3.21 AC.)
2	701,383 SQ. FT. (16.10 AC.)
3	832,963 SQ. FT. (19.12 AC.)
4	434,280 SQ. FT. (9.97 AC.)

TREE NUMBER	DBH (IN.)	COMMON NAME	SCIENTIFIC NAME	CONDITION
T-1	38.8	WHITE OAK	QUERCUS ALBA	GOOD
T-2	32.7	TULIP POPLAR	LIRIODENDRON TULIPIFERA	DOUBLE TRUNK WITH INCLUDED BARK
T-3	38.0	WHITE OAK	QUERCUS ALBA	GOOD
T-4	59.0	SILVER MAPLE	ACER SACCHARINUM	FAIR MULTI-TRUNK WITH MANY DEAD LIMBS
T-5	59.3	SILVER MAPLE	ACER SACCHARINUM	FAIR MULTI-TRUNK IN POND
T-6	35.1	TULIP POPLAR	LIRODENDRON TULIPIFERA	GOOD, DOUBLE TRUNK
T-7	33.2	TULIP POPLAR	LIRODENDRON TULIPIFERA	GOOD
T-8	31.5	TULIP POPLAR	LIRODENDRON TULIPIFERA	GOOD
T-9	35.2	SCARLET OAK	QUERCUS COCCINEA	FAIR WITH MANY DEAD LIMBS
T-10	34.3	RED OAK	QUERCUS RUBRA	GOOD

SPECIES COMMON IN TREE ROWS/REGROWTH ON LANDFILL:

PITCH PINE, BLACK LOCUST, RED CEDAR, HONEY LOCUST, WHITE PINE

0 100 200 400
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: TK
DRAWN BY: SMB
CHECKED BY: TK
PROJECT MANAGER: LJO

SEAL

GUDE LANDFILL REMEDIATION DESIGN

MONTGOMERY COUNTY, MARYLAND

NATURAL RESOURCE INVENTORY / FOREST STAND DELINEATION PLAN

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

DATE: MAY 2018

PROJECT NUMBER: 1564601

F-1

SHEET: 1 OF 1

Appendix C

Field Sampling Datasheets

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FOREST STAND DELINEATION
Field Sampling Data Sheet

Property: Gude Landfill | **Prepared By: Tom King**

Project #: 15646.01 | **Stand #: 1** | **Plot #: 1**

Forest Cover Type: Chestnut/Red Oak | **Date:** 5/1/18

Plot Size: 1/10 Acre (37.5' radius)

	Basal Area in Square Feet per Acre: 120	SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT															
	TREE SPECIES	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees >30" dbh			
	Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
1	Chestnut oak			5		3		4			3						15
2	Mockernut hickory			2			3			1							6
3	Black gum			3			2										5
4	Red oak			4			4										8
5																	0
6																	0
7																	0
8																	0
9																	0
	Total Number of Trees per Size Class	14			12			5			3			0			34
	Number & Size of Standing Dead Trees	2			0			0			0			0			2

List of Woody Plant Species 3'-20':

none

Canopy Closure:

C	N	E	S	W	%
Yes	Yes	Yes	Yes	No	80

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Mature/Burn

List of Understory Species 0'-3':

none

Understory Cover 3'-20':

C	N	E	S	W	%
No	No	No	No	No	0

List of Major Invasive Species per Plot (All Layers): None

Rare, etc. Species? No
Specimen Trees? No
Historic Sites? No
Disease? No
Insects/Infestation? No
Exotic Plants? No
Leaf litter? No - burn
Downed woody debris: No - burn

Herbaceous & Woody Cover 0'-3'

C	N	E	S	W	%
No	No	No	No	No	0

Downed Woody Debris:

C	N	E	S	W	%
No	No	No	No	No	0

HABITAT: What species present? White-tailed deer, squirrel

Habitat size, location, configuration: Upslope of floodplain

Wildlife cover/food/water? Food/cover

Stand corridor/patch? patch

FUNCTION: Where is stand in relation to sensitive areas on site? Upslope over 200 ft from stream

Is stand a buffer to surface runoff or groundwater flow? How? Yes

Leaf litter/soil eroding or increasing? How affected by stand structure? No

Nutrient uptake/loss affected by stand structure? No

Comments: Recent Burn Area, no understory or herbaceous species. Fire was a leaf-litter burn.

FOREST STAND DELINEATION
Field Sampling Data Sheet

Property: Gude Landfill | **Prepared By: Tom King**

Project #: 15646.01 | **Stand #: 1** | **Plot #: 2**

Forest Cover Type: Chestnut/Red Oak | **Date:** 5/1/18

Plot Size: 1/10 Acre (37.5' radius)

	Basal Area in Square Feet per Acre: 110	SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT															
	TREE SPECIES	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees >30" dbh			
	Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
1	Chestnut oak			3		4			2			2					11
2	Red oak			5		1			1								7
3	Mockernut hickory						1										1
4																	0
5																	0
6																	0
7																	0
8																	0
9																	0
	Total Number of Trees per Size Class	8			6			3			2			0			19
	Number & Size of Standing Dead Trees	1			2												3

List of Woody Plant Species 3'-20':	Canopy Closure:						Percent of Invasive Cover per Plot (All Layers):	Plot Successional Stage:
none	C	N	E	S	W	%	0%	Mature/Burn
	Yes	Yes	Yes	Yes	No	80		

List of Understory Species 0'-3':	Understory Cover 3'-20':						List of Major Invasive Species per Plot (All Layers):
none	C	N	E	S	W	%	None
	No	No	No	No	No	0	

		Herbaceous & Woody Cover 0'-3'						HABITAT: What species present?
Rare, etc. Species?	No	C	N	E	S	W	%	White-tailed deer, squirrel
Specimen Trees?	No	No	No	No	No	No	0	Habitat size, location, configuration:
Historic Sites?	No							
Disease?	No							
Insects/Infestation?	No	Downed Woody Debris:						Upslope of floodplain
Exotic Plants?	No	C	N	E	S	W	%	Wildlife cover/food/water?
Leaf litter?	No - burn	No	No	No	No	No	0	Food/cover
Downed woody debris:	No - burn							Stand corridor/patch? patch

FUNCTION: Where is stand in relation to sensitive areas on site?	Upslope over 200 ft from stream
Is stand a buffer to surface runoff or groundwater flow? How?	Yes
Leaf litter/soil eroding or increasing? How affected by stand structure?	No
Nutrient uptake/loss affected by stand structure?	No

Comments: Recent Burn Area, no understory or herbaceous species. Fire was a leaf-litter burn.

FOREST STAND DELINEATION
Field Sampling Data Sheet

Property: Gude Landfill | **Prepared By: Tom King**

Project #: 15646.01 | **Stand #: 1** | **Plot #: 3**

Forest Cover Type: Chestnut/Red Oak | **Date:** 5/1/18

Plot Size: 1/10 Acre (37.5' radius)

	Basal Area in Square Feet per Acre: 110	SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT															
	TREE SPECIES	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees >30" dbh			
	Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
1	Chestnut oak			3		4			2			3					12
2	Red oak			2		2			1								5
3	Mockernut hickory			5			3			1							9
4																	0
5																	0
6																	0
7																	0
8																	0
9																	0
	Total Number of Trees per Size Class	10			9			4			3			0			26
	Number & Size of Standing Dead Trees	3			0			0			0			0			3

List of Woody Plant Species 3'-20':

none

Canopy Closure:

C	N	E	S	W	%
Yes	No	No	No	Yes	40

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Mature

List of Understory Species 0'-3':

Black cherry, striped wintergreen

Understory Cover 3'-20':

C	N	E	S	W	%
No	No	No	No	No	0

List of Major Invasive Species per Plot (All Layers): None

Rare, etc. Species? No
Specimen Trees? No
Historic Sites? No
Disease? No
Insects/Infestation? No
Exotic Plants? No
Leaf litter? Medium
Downed woody debris: No - burn

Herbaceous & Woody Cover 0'-3'

C	N	E	S	W	%
No	No	No	No	No	0

Downed Woody Debris:

C	N	E	S	W	%
No	No	Yes	Yes	Yes	60

HABITAT: What species present? White-tailed deer, squirrel

Habitat size, location, configuration: Upslope of floodplain

Wildlife cover/food/water? Food/cover

Stand corridor/patch? patch

FUNCTION: Where is stand in relation to sensitive areas on site? Upslope over 200 ft from stream

Is stand a buffer to surface runoff or groundwater flow? How? Yes

Leaf litter/soil eroding or increasing? How affected by stand structure? No

Nutrient uptake/loss affected by stand structure? No

Comments: No understory with little herbaceous cover. May have been an old controlled burn.

FOREST STAND DELINEATION
Field Sampling Data Sheet

Property: Gude Landfill | **Prepared By: Tom King**

Project #: 15646.01 | **Stand #: 2** | **Plot #: 1**

Forest Cover Type: Oak/Hickory/Maple | **Date:** 5/1/18

Plot Size: 1/10 Acre (37.5' radius)

	Basal Area in Square Feet per Acre: 120	SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT															
	TREE SPECIES	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees >30" dbh			
	Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
1	Chestnut oak								2			1					3
2	White oak			1		2			2								5
3	Black gum			8			4										12
4	Red maple			3													3
5	Mockernut hickory			2			1			1							4
6																	0
7																	0
8																	0
9																	0
	Total Number of Trees per Size Class	14			7			5			1			0			27
	Number & Size of Standing Dead Trees	0			2			0			0			0			2

List of Woody Plant Species 3'-20':
black gum, mockernut hickory, red maple

Canopy Closure:

C	N	E	S	W	%
Yes	No	Yes	Yes	Yes	80

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Mature

List of Understory Species 0'-3':
partridge berry, striped wintergreen

Understory Cover 3'-20':

C	N	E	S	W	%
Yes	Yes	No	Yes	Yes	80

List of Major Invasive Species per Plot (All Layers):

Rare, etc. Species? No
Specimen Trees? T-3 near plot
Historic Sites? No
Disease? No
Insects/Infestation? No
Exotic Plants? No
Leaf litter? moderate
Downed woody debris: heavy

Herbaceous & Woody Cover 0'-3'

C	N	E	S	W	%
No	Yes	No	No	No	20

Downed Woody Debris:

C	N	E	S	W	%
Yes	Yes	Yes	Yes	Yes	100

HABITAT: What species present?
Am. crow, w. tailed deer, red-shoulder hawk

Habitat size, location, configuration:
upslope from floodplain and contiguous to off-site forest

Wildlife cover/food/water?
cover/water/food

Stand corridor/patch? patch

FUNCTION: Where is stand in relation to sensitive areas on site? on steep slopes above floodplain and stream

Is stand a buffer to surface runoff or groundwater flow? How? yes

Leaf litter/soil eroding or increasing? How affected by stand structure? increasing

Nutrient uptake/loss affected by stand structure?

Comments: Mature oak/hickory stand with much downed woody debris and very sparse groundcover. There are several large dead oaks in stand.

FOREST STAND DELINEATION
Field Sampling Data Sheet

Property: Gude Landfill | **Prepared By: Tom King**

Project #: 15646.01 | **Stand #: 2** | **Plot #: 2**

Forest Cover Type: Oak/Hickory/Maple | **Date:** 5/1/18

Plot Size: 1/10 Acre (37.5' radius)

	Basal Area in Square Feet per Acre: 110	SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT															
	TREE SPECIES	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees >30" dbh			
	Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
1	Chestnut oak					1			1			2					4
2	White oak			1		2			1								4
3	Black gum			4													4
4	Black cherry			2													2
5	Tulip poplar						3										3
6	Mockernut hickory			3			1										4
7	Red maple			2			1										3
8																	0
9																	0
	Total Number of Trees per Size Class	12			8			2			2			0			24
	Number & Size of Standing Dead Trees	0			1			2			0			0			3

List of Woody Plant Species 3'-20':
Chestnut oak, mockernut hickory, black cherry, northern red oak, red maple

Canopy Closure:

C	N	E	S	W	%
Yes	No	Yes	Yes	Yes	80

Percent of Invasive Cover per Plot (All Layers): 5%

Plot Successional Stage: Mature

List of Understory Species 0'-3':
Garlic mustard, Japanese honeysuckle

Understory Cover 3'-20':

C	N	E	S	W	%
Yes	Yes	Yes	Yes	No	80

List of Major Invasive Species per Plot (All Layers):
Garlic mustard, Japanese honeysuckle

Rare, etc. Species?	No
Specimen Trees?	No
Historic Sites?	No
Disease?	No
Insects/Infestation?	No
Exotic Plants?	No
Leaf litter?	moderate
Downed woody debris:	moderate

Herbaceous & Woody Cover 0'-3'

C	N	E	S	W	%
No	No	No	Yes	No	20

Downed Woody Debris:

C	N	E	S	W	%
Yes	Yes	No	No	Yes	60

HABITAT: What species present?
White-tailed deer

Habitat size, location, configuration:
upslope from floodplain and contiguous to off-site forest

Wildlife cover/food/water?
cover/water/food

Stand corridor/patch? patch

FUNCTION: Where is stand in relation to sensitive areas on site? on steep slopes above floodplain and stream

Is stand a buffer to surface runoff or groundwater flow? How? yes

Leaf litter/soil eroding or increasing? How affected by stand structure? increasing

Nutrient uptake/loss affected by stand structure?

Comments: Mature oak/hickory stand with much downed woody debris and very sparse groundcover.

FOREST STAND DELINEATION
Field Sampling Data Sheet

Property: Gude Landfill | **Prepared By: Tom King**

Project #: 15646.01 | **Stand #: 2** | **Plot #: 3**

Forest Cover Type: Oak/Hickory/Maple | **Date:** 5/1/18

Plot Size: 1/10 Acre (37.5' radius)

	Basal Area in Square Feet per Acre: 130	SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT															
	TREE SPECIES	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees >30" dbh			
	Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
1	Chestnut oak			2			1		2								5
2	Tulip poplar			2			1		3								6
3	Black gum			4													4
4	Mountain laurel						1										1
5	Red maple			6			3										9
6	White oak			2						2							4
7																	0
8																	0
9																	0
	Total Number of Trees per Size Class	16			6			7			0			0			29
	Number & Size of Standing Dead Trees	0			1			0			0			0			1

List of Woody Plant Species 3'-20':
black gum, red maple

Canopy Closure:

C	N	E	S	W	%
Yes	Yes	Yes	Yes	Yes	100

Percent of Invasive Cover per Plot (All Layers): 1%

Plot Successional Stage: Mature

List of Understory Species 0'-3':
bush honeysuckle

Understory Cover 3'-20':

C	N	E	S	W	%
Yes	Yes	No	No	Yes	60

List of Major Invasive Species per Plot (All Layers):
bush honeysuckle

Rare, etc. Species?	No
Specimen Trees?	No
Historic Sites?	No
Disease?	No
Insects/Infestation?	No
Exotic Plants?	Yes
Leaf litter?	moderate
Downed woody debris:	moderate

Herbaceous & Woody Cover 0'-3'

C	N	E	S	W	%
No	No	No	No	No	0

Downed Woody Debris:

C	N	E	S	W	%
No	No	Yes	Yes	No	40

HABITAT: What species present?
White-tailed deer

Habitat size, location, configuration:
upslope from floodplain and contiguous to off-site forest

Wildlife cover/food/water?
cover/water/food

Stand corridor/patch? patch

FUNCTION: Where is stand in relation to sensitive areas on site? on steep slopes above floodplain and stream

Is stand a buffer to surface runoff or groundwater flow? How? yes

Leaf litter/soil eroding or increasing? How affected by stand structure? increasing

Nutrient uptake/loss affected by stand structure?

Comments: Mature oak/hickory stand with much downed woody debris and very sparse groundcover.

FOREST STAND DELINEATION
Field Sampling Data Sheet

Property: Gude Landfill | **Prepared By: Tom King**

Project #: 15646.01 | **Stand #: 2** | **Plot #: 4**

Forest Cover Type: Oak/Hickory/Maple | **Date:** 5/1/18

Plot Size: 1/10 Acre (37.5' radius)

	Basal Area in Square Feet per Acre: 130	SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT															
	TREE SPECIES	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees >30" dbh			
	Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
1	Chestnut oak			1		2			3								6
2	White oak					1											1
3	Red oak			3		4			1								8
4	Black gum			4			2										6
5	Red maple			1			1			1							3
6	Mockernut hickory						2										2
7	Sycamore					1			1								2
8																	0
9																	0
	Total Number of Trees per Size Class	9			13			6			0			0			28
	Number & Size of Standing Dead Trees	0			2			1			0			0			3

List of Woody Plant Species 3'-20':
mountain laurel, chestnut oak, black gum, red maple, mockernut hickory

Canopy Closure:

C	N	E	S	W	%
Yes	No	Yes	Yes	Yes	80

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Mature

List of Understory Species 0'-3':
striped wintergreen

Understory Cover 3'-20':

C	N	E	S	W	%
Yes	Yes	No	Yes	Yes	80

List of Major Invasive Species per Plot (All Layers): None

Rare, etc. Species?	No
Specimen Trees?	No
Historic Sites?	No
Disease?	No
Insects/Infestation?	No
Exotic Plants?	No
Leaf litter?	moderate
Downed woody debris:	heavy

Herbaceous & Woody Cover 0'-3'

C	N	E	S	W	%
No	Yes	No	No	No	20

Downed Woody Debris:

C	N	E	S	W	%
Yes	Yes	No	Yes	Yes	80

HABITAT: What species present? white-tailed deer,

Habitat size, location, configuration: upslope from floodplain and contiguous to off-site forest

Wildlife cover/food/water? cover/water/food

Stand corridor/patch? patch

FUNCTION: Where is stand in relation to sensitive areas on site? on steep slopes above floodplain and stream

Is stand a buffer to surface runoff or groundwater flow? How? yes

Leaf litter/soil eroding or increasing? How affected by stand structure? increasing

Nutrient uptake/loss affected by stand structure?

Comments: Mature oak/hickory stand with much downed woody debris and very sparse groundcover.

FOREST STAND DELINEATION
Field Sampling Data Sheet

Property: Gude Landfill | **Prepared By: Tom King**

Project #: 15646.01 | **Stand #: 2** | **Plot #: 5**

Forest Cover Type: Oak/Hickory/Maple | **Date:** 5/1/18

Plot Size: 1/10 Acre (37.5' radius)

	Basal Area in Square Feet per Acre: 100	SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT															
	TREE SPECIES	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees >30" dbh			
	Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
1	Tulip poplar			1		2			4			1					8
2	Red maple			7		6			3								16
3	Black gum			3			1										4
4	Black cherry			2													2
5	Black haw			1													1
6																	0
7																	0
8																	0
9																	0
	Total Number of Trees per Size Class	14			9			7			1			0			31
	Number & Size of Standing Dead Trees	0			1			0			0			0			1

List of Woody Plant Species 3'-20':
Black gum, red maple, common privet

Canopy Closure:

C	N	E	S	W	%
Yes	Yes	Yes	Yes	No	80

Percent of Invasive Cover per Plot (All Layers): 10%

Plot Successional Stage: Mature

List of Understory Species 0'-3':
American holly, Japanese honeysuckle, Japanese stiltgrass, common privet, poison ivy, Asiatic bittersweet, soft rush, Japanese barberry

Understory Cover 3'-20':

C	N	E	S	W	%
Yes	No	No	Yes	No	40

List of Major Invasive Species per Plot (All Layers):
Japanese honeysuckle,stiltgrass, common privet, Asiatic bittersweet

Rare, etc. Species? No
Specimen Trees? No
Historic Sites? No
Disease? No
Insects/Infestation? No
Exotic Plants? Yes
Leaf litter? moderate
Downed woody debris: moderate

Herbaceous & Woody Cover 0'-3'

C	N	E	S	W	%
Yes	Yes	No	No	Yes	60

Downed Woody Debris:

C	N	E	S	W	%
Yes	No	No	Yes	Yes	60

HABITAT: What species present?
white-tailed deer, box turtle

Habitat size, location, configuration:
located in floodplain and contiguous to off-site forest

Wildlife cover/food/water?
cover/water/food

Stand corridor/patch? patch

FUNCTION: Where is stand in relation to sensitive areas on site? located on floodplain

Is stand a buffer to surface runoff or groundwater flow? How? yes

Leaf litter/soil eroding or increasing? How affected by stand structure? increasing

Nutrient uptake/loss affected by stand structure?

Comments: Mature bottomland hardwood stand located on floodplain of stream, thin understory, low occurrence of invasives.

FOREST STAND DELINEATION
Field Sampling Data Sheet

Property: Gude Landfill | **Prepared By: Tom King**

Project #: 15646.01 | **Stand #: 3** | **Plot #: 1**

Forest Cover Type: Red Maple | **Date:** 5/1/18

Plot Size: 1/10 Acre (37.5' radius)

	Basal Area in Square Feet per Acre: 80	SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT															
	TREE SPECIES	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees >30" dbh			
	Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
1	Silver maple			3	5			1									9
2	Black locust			3			3										6
3	Red cedar			6													6
4	Black gum			5			3										8
5	Black cherry						1										1
6	Virginia pine			2			3										5
7																	0
8																	0
9																	0
	Total Number of Trees per Size Class	19			15			1			0			0			35
	Number & Size of Standing Dead Trees	0			1			0			0			0			1

List of Woody Plant Species 3'-20':
Black gum, red cedar, Japanese barberry

Canopy Closure:

C	N	E	S	W	%
Yes	Yes	Yes	Yes	Yes	100

Percent of Invasive Cover per Plot (All Layers): 50%

Plot Successional Stage: Mid

List of Understory Species 0'-3':
American holly, Japanese barberry, Japanese silver grass, poison ivy, Japanese stiltgrass, Asiatic tearthumb, Indian strawberry

Understory Cover 3'-20':

C	N	E	S	W	%
No	Yes	No	No	Yes	40

List of Major Invasive Species per Plot (All Layers):
Japanese barberry, Japanese stiltgrass, Japanese silver grass, Asiatic tearthumb

Rare, etc. Species? No
Specimen Trees? No
Historic Sites? No
Disease? No
Insects/Infestation? No
Exotic Plants? Yes
Leaf litter? light
Downed woody debris: moderate

Herbaceous & Woody Cover 0'-3'

C	N	E	S	W	%
No	No	Yes	No	Yes	40

Downed Woody Debris:

C	N	E	S	W	%
No	No	No	No	No	0

HABITAT: What species present?
white-tailed deer, gray squirrel

Habitat size, location, configuration:
upslope from floodplain and contiguous to off-site forest

Wildlife cover/food/water?
cover/food/water

Stand corridor/patch? patch

FUNCTION: Where is stand in relation to sensitive areas on site? on steep slopes above floodplain and stream

Is stand a buffer to surface runoff or groundwater flow? How? yes

Leaf litter/soil eroding or increasing? How affected by stand structure? eroding on slope

Nutrient uptake/loss affected by stand structure?

Comments: Mid successional stand dominated by red maple on the slopes of the landfill

FOREST STAND DELINEATION
Field Sampling Data Sheet

Property: Gude Landfill | **Prepared By: Tom King**

Project #: 15646.01 | **Stand #: 3** | **Plot #: 2**

Forest Cover Type: Red Maple | **Date:** 5/1/18

Plot Size: 1/10 Acre (37.5' radius)

Basal Area in Square Feet per Acre: 60	SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT															
TREE SPECIES	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees >30" dbh			
Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
1 Red maple			2		1		1	2								6
2 Red cedar			1			1										2
3 Black cherry						1										1
4 Virginia pine			2		1			1								4
5																0
6																0
7																0
8																0
9																0
Total Number of Trees per Size Class	5			4			4			0			0			13
Number & Size of Standing Dead Trees	0			1			0			0			0			1

List of Woody Plant Species 3'-20':
Asiatic bittersweet, red maple, red cedar

Canopy Closure:

C	N	E	S	W	%
Yes	No	Yes	No	Yes	60

Percent of Invasive Cover per Plot (All Layers): 10%

Plot Successional Stage: Mid

List of Understory Species 0'-3':
red maple , red cedar, Japanese stiltgrass, common reed

Understory Cover 3'-20':

C	N	E	S	W	%
No	No	No	Yes	Yes	40

List of Major Invasive Species per Plot (All Layers):
Asiatic bittersweet, common reed

Rare, etc. Species? No
Specimen Trees? No
Historic Sites? No
Disease? No
Insects/Infestation? No
Exotic Plants? Yes
Leaf litter? light
Downed woody debris: moderate to heavy

Herbaceous & Woody Cover 0'-3'

C	N	E	S	W	%
No	Yes	Yes	Yes	Yes	80

Downed Woody Debris:

C	N	E	S	W	%
Yes	No	Yes	No	Yes	60

HABITAT: What species present?
white-tailed deer, gray squirrel

Habitat size, location, configuration:
upslope from floodplain and contiguous to off-site forest

Wildlife cover/food/water?
cover/food/water

Stand corridor/patch? patch

FUNCTION: Where is stand in relation to sensitive areas on site? on steep slopes above floodplain and stream

Is stand a buffer to surface runoff or groundwater flow? How? yes

Leaf litter/soil eroding or increasing? How affected by stand structure? eroding on slope

Nutrient uptake/loss affected by stand structure?

Comments: Mid successional stand dominated by red maple on the slopes of the landfill.

FOREST STAND DELINEATION
Field Sampling Data Sheet

Property: Gude Landfill | **Prepared By: Tom King**

Project #: 15646.01 | **Stand #: 4** | **Plot #: 1**

Forest Cover Type: Green Ash/Box Elder | **Date:** 5/1/18

Plot Size: 1/10 Acre (37.5' radius)

	Basal Area in Square Feet per Acre: 70	SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT															
	TREE SPECIES	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees >30" dbh			
	Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
1	Black cherry			2													2
2	Green ash			4			5										9
3	Black locust					2											2
4	Apple			1													1
5	Bush honeysuckle			5													5
6	Box elder										1						1
7																	0
8																	0
9																	0
	Total Number of Trees per Size Class	12			7			0			1			0			20
	Number & Size of Standing Dead Trees	2			2			0			0			0			4

List of Woody Plant Species 3'-20':
bush honeysuckle, Japanese barberry

Canopy Closure:

C	N	E	S	W	%
No	Yes	Yes	Yes	Yes	80

Percent of Invasive Cover per Plot (All Layers): >60%

Plot Successional Stage: Early

List of Understory Species 0'-3':
Japanese stilt grass, horse balm, Japanese honeysuckle, barberry, bush honeysuckle, wineberry, poison ivy

Understory Cover 3'-20':

C	N	E	S	W	%
Yes	Yes	Yes	Yes	Yes	100

List of Major Invasive Species per Plot (All Layers):
Japanese stiltgrass and honeysuckle, bush honeysuckle,wineberry, barberry

Rare, etc. Species?	No
Specimen Trees?	No
Historic Sites?	No
Disease?	No
Insects/Infestation?	No
Exotic Plants?	Yes
Leaf litter?	very light
Downed woody debris:	high

Herbaceous & Woody Cover 0'-3'

C	N	E	S	W	%
Yes	Yes	Yes	Yes	Yes	100

Downed Woody Debris:

C	N	E	S	W	%
Yes	Yes	Yes	Yes	Yes	100

HABITAT: What species present?

Habitat size, location, configuration:
upslope from floodplain and contiguous to off-site forest

Wildlife cover/food/water?
food/cover, water nearby

Stand corridor/patch? patch

FUNCTION: Where is stand in relation to sensitive areas on site? on steep slopes above floodplain and stream

Is stand a buffer to surface runoff or groundwater flow? How? yes

Leaf litter/soil eroding or increasing? How affected by stand structure? eroding on slope

Nutrient uptake/loss affected by stand structure?

Comments: Early successional stand dominated by box elder and bush honeysuckle on the slopes of the landfill

FOREST STAND DELINEATION
Field Sampling Data Sheet

Property: Gude Landfill | **Prepared By: Tom King**
Project #: 15646.01 | **Stand #: 4** | **Plot #: 2**
Forest Cover Type: Green Ash/Box Elder | **Date:** 5/1/18
Plot Size: 1/10 Acre (37.5' radius)

Basal Area in Square Feet per Acre: 80	SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT															
	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees >30" dbh			
TREE SPECIES																
Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
1 Green ash						4										4
2 Silver maple						1								1		2
3 Red cedar			1													1
4 Box elder									2							2
5 Red maple					1			2								3
6																0
7																0
8																0
9																0
Total Number of Trees per Size Class	1			6			4			0			1			12
Number & Size of Standing Dead Trees	6			0			0			0			0			6

List of Woody Plant Species 3'-20':
Bush honeysuckle

Canopy Closure:

C	N	E	S	W	%
No	No	Yes	No	No	20

Percent of Invasive Cover per Plot (All Layers): 75%

Plot Successional Stage: Early

List of Understory Species 0'-3':
Japanese stiltgrass, horse balm, Japanese honeysuckle, wineberry, oniongrass

Understory Cover 3'-20':

C	N	E	S	W	%
No	No	No	No	No	0

List of Major Invasive Species per Plot (All Layers):
Japanese stiltgrass and bush honeysuckle

Rare, etc. Species?	No
Specimen Trees?	No
Historic Sites?	No
Disease?	No
Insects/Infestation?	No
Exotic Plants?	Yes
Leaf litter?	light
Downed woody debris:	moderate

Herbaceous & Woody Cover 0'-3'

C	N	E	S	W	%
Yes	Yes	Yes	Yes	Yes	100

Downed Woody Debris:

C	N	E	S	W	%
Yes	No	Yes	No	Yes	60

HABITAT: What species present?

Habitat size, location, configuration:
Contiguous to off-site forest

Wildlife cover/food/water?
food/cover, water nearby

Stand corridor/patch? patch

FUNCTION: Where is stand in relation to sensitive areas on site? on steep slopes above floodplain and stream

Is stand a buffer to surface runoff or groundwater flow? How? yes

Leaf litter/soil eroding or increasing? How affected by stand structure? eroding on slope

Nutrient uptake/loss affected by stand structure?

Comments: Early successional stand on the slopes of the landfill.

Appendix D

Forest Stand Summary Sheets

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FOREST STAND DELINEATION - FOREST STAND SUMMARY SHEET

Project Name: Gude Landfill **Prepared By: Tom King**

Project #: 15646.01

Location: Rockville, Montgomery County **Date: 05/01/18**

Stand Variable	Stand # 1	Stand # 2
1. Dominant species/ Codominant species	Chestnut Oak/Red Oak	Oak/Hickory/Maple
2. Successional stage	Mature/Burn	Mature
3. Basal area in s.f. per acre	113	118
4. Size class of dominant species	6-11.9" dbh	12-19.9" dbh
5. Percent of canopy closure	40-80%	80-100%
6. Average number of tree species per plot	3	6
7. Common understory species 3' to 20' tall	none	black gum, mockernut hickory, red maple, chestnut oak, black cherry, northern red oak, mountain laurel, common privet
8. Percent of understory cover 3' to 20' tall	0%	68%
9. Number of woody plant species 3' to 20' tall	0	8
10. Common understory species 0' to 3' tall	none in burned areas, black cherry, striped wintergreen	partridge berry, striped wintergreen, garlic mustard, Japanese honeysuckle, bush honeysuckle, American holly, Japanese stiltgrass, common privet, poison ivy, Asiatic bittersweet, soft rush
11. Percent of herbaceous & woody plant cover 0' to 3' tall	0%	24%
12. List of major invasive plant species & percent of cover	none	garlic mustard. Japanese honesuckle, bush honeysuckle, Japanese stiltgrass, common privet, Asiatic bittersweet
13. Number of standing dead trees ≥6" dbh per acre	50	100
14. Comments	Mature stand located on floodplain of off-site stream. Stand had areas of recent and older leaf-litter burn that has resulted in low invasives and little understory or herbaceous	Mature oak/hickory stand located on steep slopes surrounding the off-site stream, moving into bottomlands. Stand has downed wood and sparse groundcover, with several specimen trees.
15. Priority (1,2,3,4)	1	1

FOREST STAND DELINEATION - FOREST STAND SUMMARY SHEET

Project Name: Gude Landfill **Prepared By: Tom King**

Project #: 15646.01

Location: Rockville, Montgomery County **Date: 05/01/18**

Stand Variable	Stand # 3	Stand # 4
1. Dominant species/ Codominant species	Red Maple	Green Ash/Box Elder
2. Successional stage	Mid	Early
3. Basal area in s.f. per acre	70	75
4. Size class of dominant species	6-11.9" dbh	6-11.9" dbh
5. Percent of canopy closure	60-100%	20-80%
6. Average number of tree species per plot	5	5
7. Common understory species 3' to 20' tall	black gum, red cedar, Japanese barberry, Asiatic bittersweet, red maple	bush honeysuckle, Japanese barberry
8. Percent of understory cover 3' to 20' tall	40%	50%
9. Number of woody plant species 3' to 20' tall	5	2
10. Common understory species 0' to 3' tall	American holly, Japanese barberry, silvergrass, poison ivy, Japanese stiltgrass, Asiatic tearthumb, indian strawberry, red maple, red cedar, common reed	Japanese stiltgrass, horse balm, Japanese honeysuckle, Japanese barberry, bush honeysuckle, wineberry, poison ivy, oniongrass
11. Percent of herbaceous & woody plant cover 0' to 3' tall	60%	100%
12. List of major invasive plant species & percent of cover	Japanese barberry, Japanese stiltgrass, Japanese silvergrass, Asiatic tearthumb, Asiatic bittersweet, common reed	Japanese stiltgrass, bush honeysuckle, Japanese honeysuckle, wineberry, Japanese barberry
13. Number of standing dead trees ≥6" dbh per acre	20	100
14. Comments	Mid-successional red maple stand located on the slopes of the landfill upslope from the fooldplain and contiguous to off-site forest. Moderate invasive coverage.	Early successional stand on the slopes of the landfill above the floodplain and stream. Stand is contiguous to off-site forest.
15. Priority (1,2,3,4)	1	1

Appendix E

Forest Stand Delineation Photographs

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Forest Stand Delineation Photographs
Gude Landfill
Photos Taken: April 30 and May 1, 2018

Photograph 1: Forest Stand 1 in recently burned area.

Photograph 2: Forest Stand 1 in potential older burn area.

Photograph 3: Forest Stand 2, near plot 5.

Photograph 4: Forest Stand 2, specimen silver maple (T-5) found in retention pond area.

Forest Stand Delineation Photographs
Gude Landfill
Photos Taken: April 30 and May 1, 2018

Photograph 5: Forest Stand 3, near plot 1.

Photograph 6: Forest Stand 4, near plot 1.

Photograph 7: Non-forested landfill area.

Photograph 8: Non-forested landfill area.

Appendix F

Agency Review Statements

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DLH

EA Engineering, Science, and Technology

Woodbridge Office Center
1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
Telephone: 410-538-8202
Fax: 410-538-8207
www.eaest.com

November 20, 2009

Ms. Elizabeth Cole
Project Review and Compliance, Office of Preservation Services
Maryland Historical Trust
100 Community Place
Crownsville, MD 21032

Re: Gude Landfill
600 East Gude Drive, Rockville
Montgomery County, Maryland

Dear Ms. Cole:

On behalf of the Montgomery County Department of Environmental Protection – Division of Solid Waste Services (DEP/DSWS), EA Engineering, Science & Technology has been tasked to perform a characterization of the nature and extent of potential ground and surface water impacts from the landfill leachate.

Federal and/or State involvement for this project is Federal USACE Section 404 CWA permitting. No readily visible historic structures, ruins or other cultural resources are identified in the project area. Adjacent property use consists of state roads, county roads, residential, commercial and industrial property and contiguous forest.

As required by the State/Federal involvement, we are requesting any information or records regarding the presence of cultural, archaeological, or historic resources within the project area. Thank you for your assistance. We look forward to working with your agency to successfully complete this needed project. Should you require additional information, please contact me at (410) 538-8202 ext. 1405.

Rockville

Sincerely,

EA Engineering, Science & Technology

Daniel Cockerham
Environmental Scientist
Enclosures: Site Location Map

The Maryland Historical Trust has determined that there are no historic properties affected by this undertaking.
Divid Henry Date 1/5/10

Archeo DLH 1/5/10 (a)

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Martin O'Malley, Governor
Anthony G. Brown, Lt. Governor
John R. Griffin, Secretary
Eric Schwaab, Deputy Secretary

December 14, 2009

Daniel Cockerham
EA Engineering, Science and Technology
1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040

RE: Environmental Review for Gude Landfill, 600 East Gude Dr. Rockville – study of potential ground and surface water impacts from leachate, Montgomery County, MD.

Dear Mr. Cockerham:

The Wildlife and Heritage Service has determined that there are no State or Federal records for rare, threatened or endangered species within the boundaries of the project site as delineated. As a result, we have no specific comments or requirements pertaining to protection measures at this time. This statement should not be interpreted however as meaning that rare, threatened or endangered species are not in fact present. If appropriate habitat is available, certain species could be present without documentation because adequate surveys have not been conducted.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

Lori A. Byrne

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2009.1992

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401
410/573-4575

January 12, 2010

EA Engineering, Science and Technology
1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040

RE: Gude Landfill 600 East Gude Drive, Rockville Montgomery County MD

Dear: Daniel Cockerham

This responds to your letter, received November 23, 2009, requesting information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the vicinity of the above reference project area. We have reviewed the information you enclosed and are providing comments in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project impact area. Therefore, no Biological Assessment or further section 7 Consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife and Heritage Division at (410) 260-8573.

Effective August 8, 2007, under the authority of the Endangered Species Act of 1973, as amended, the U.S. Fish and Wildlife Service (Service) removed (delist) the bald eagle in the lower 48 States of the United States from the Federal List of Endangered and Threatened Wildlife. However, the bald eagle will still be protected by the Bald and Golden Eagle Protection Act, Lacey Act and the Migratory Bird Treaty Act. As a result, starting on August 8, 2007, if your project may cause "disturbance" to the bald eagle, please consult the "National Bald Eagle Management Guidelines" dated May 2007.

If any planned or ongoing activities cannot be conducted in compliance with the National Bald Eagle Management Guidelines (Eagle Management Guidelines), please contact the Chesapeake Bay Ecological Services Field Office at 410-573-4573 for technical assistance. The Eagle Management Guidelines can be found at:

http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf.

In the future, if your project can not avoid disturbance to the bald eagle by complying with the Eagle Management Guidelines, you will be able to apply for a permit that authorizes the take of bald and golden eagles under the Bald and Golden Eagle Protection Act, generally where the take to be authorized is associated with otherwise lawful activities. This proposed permit process will not be available until the Service issues a final rule for the issuance of these take permits under the Bald and Golden Eagle Protection Act.

An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the Basin's remaining wetlands, and the long term goal of increasing the quality and quantity of the Basin's wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands within the project area should be identified, and if construction in wetlands is proposed, the U.S. Army Corps of Engineers, Baltimore District, should be contacted for permit requirements. They can be reached at (410) 962-3670.

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interests in these resources. If you have any questions or need further assistance, please contact Devin Ray at (410) 573-4531.

Sincerely,

Leopoldo Miranda
Field Supervisor

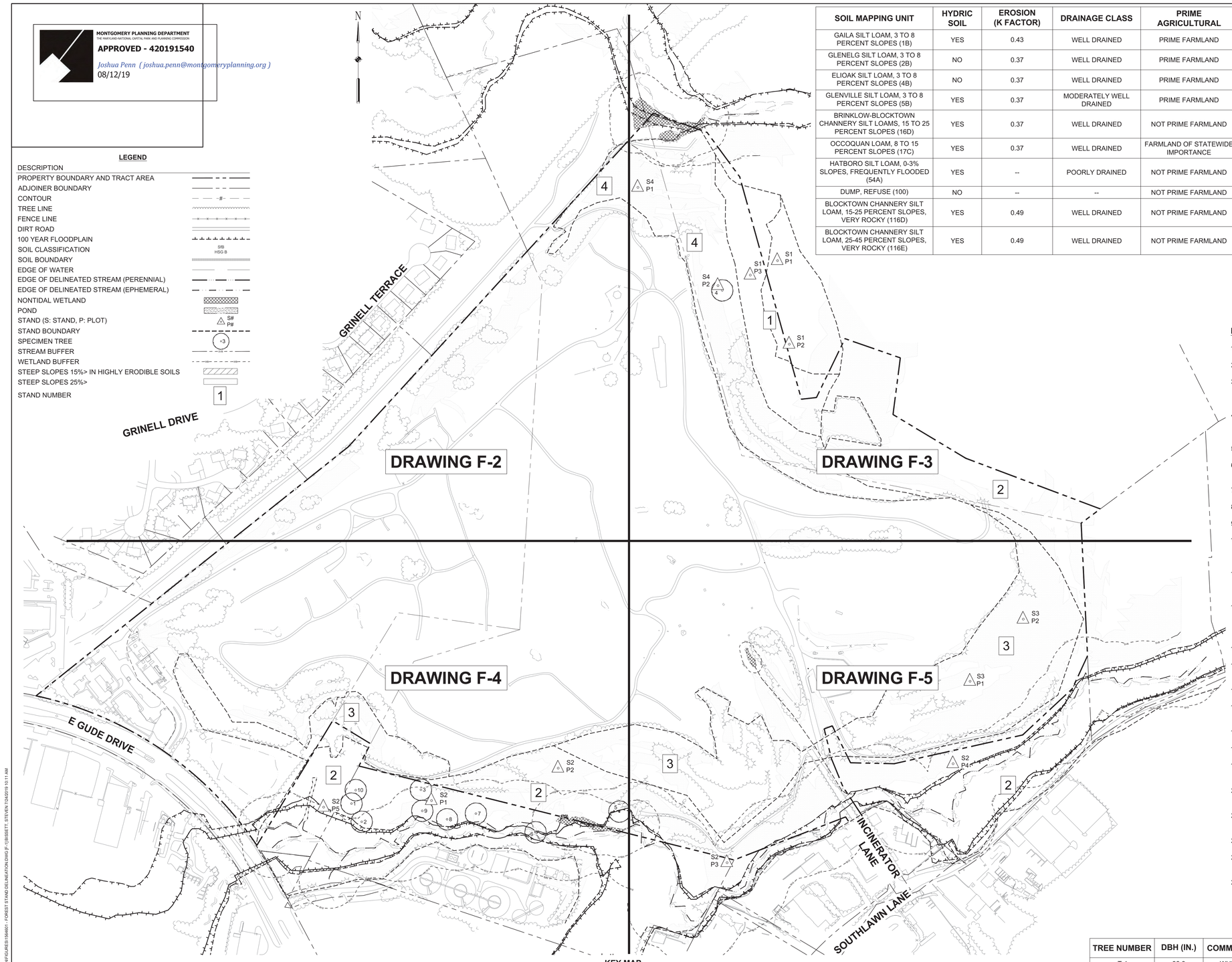
MONTGOMERY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

APPROVED - 420191540

Joshua Penn (joshua.penn@montgomeryplanning.org)
08/12/19

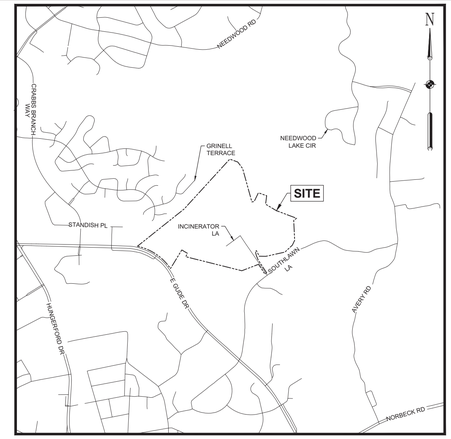
LEGEND

DESCRIPTION	
PROPERTY BOUNDARY AND TRACT AREA	
ADJOINER BOUNDARY	
CONTOUR	#'
TREE LINE	
FENCE LINE	
DIRT ROAD	
100 YEAR FLOODPLAIN	
SOIL CLASSIFICATION	SrB HSG B
SOIL BOUNDARY	
EDGE OF WATER	
EDGE OF DELINEATED STREAM (PERENNIAL)	
EDGE OF DELINEATED STREAM (EPHEMERAL)	
NONTIDAL WETLAND	
POND	
STAND (S: STAND, P: PLOT)	S# P#
STAND BOUNDARY	
SPECIMEN TREE	#3
STREAM BUFFER	25ft
WETLAND BUFFER	25ft
STEEP SLOPES 15%> IN HIGHLY ERODIBLE SOILS	
STEEP SLOPES 25%>	
STAND NUMBER	1



KEY MAP
1" = 200'

SOIL MAPPING UNIT	HYDRIC SOIL	EROSION (K FACTOR)	DRAINAGE CLASS	PRIME AGRICULTURAL
GAILA SILT LOAM, 3 TO 8 PERCENT SLOPES (1B)	YES	0.43	WELL DRAINED	PRIME FARMLAND
GLENELG SILT LOAM, 3 TO 8 PERCENT SLOPES (2B)	NO	0.37	WELL DRAINED	PRIME FARMLAND
ELIOAK SILT LOAM, 3 TO 8 PERCENT SLOPES (4B)	NO	0.37	WELL DRAINED	PRIME FARMLAND
GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES (5B)	YES	0.37	MODERATELY WELL DRAINED	PRIME FARMLAND
BRINKLOW-BLOCKTOWN CHANNERY SILT LOAMS, 15 TO 25 PERCENT SLOPES (16D)	YES	0.37	WELL DRAINED	NOT PRIME FARMLAND
OCCOQUAN LOAM, 8 TO 15 PERCENT SLOPES (17C)	YES	0.37	WELL DRAINED	FARMLAND OF STATEWIDE IMPORTANCE
HATBORO SILT LOAM, 0-3% SLOPES, FREQUENTLY FLOODED (54A)	YES	--	POORLY DRAINED	NOT PRIME FARMLAND
DUMP, REFUSE (100)	NO	--	--	NOT PRIME FARMLAND
BLOCKTOWN CHANNERY SILT LOAM, 15-25 PERCENT SLOPES, VERY ROCKY (116D)	YES	0.49	WELL DRAINED	NOT PRIME FARMLAND
BLOCKTOWN CHANNERY SILT LOAM, 25-45 PERCENT SLOPES, VERY ROCKY (116E)	YES	0.49	WELL DRAINED	NOT PRIME FARMLAND



VICINITY MAP
SCALE: 1" = 2,000'

NOTES

1. PROJECT NAME: GUDE LANDFILL
2. LOCATION: 600 EAST GUDE DRIVE, ROCKVILLE, MARYLAND
3. OWNER / APPLICANT: MONTGOMERY COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF SOLID WASTER SERVICES (DEP/DSWS)
4. PLAN PREPARED BY: EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC 225 SCHILLING CIRCLE, SUITE 400, HUNT VALLEY, MARYLAND PHONE NO.: 410-584-7000
5. TOTAL TRACT AREA: 162.5 ACRES±
6. PROPERTY TAX IDENTIFICATION NUMBERS: 01691633, 01823475, 00052446, 03743374
7. WSSC MAP GRIDS: 220NW06, 220NW07, 221NW06, 221NW07
8. TAX GRID NUMBER: GS41, GS52
9. WATERSHED: 021402060837 - UPPER ROCK CREEK
10. PROPERTY BOUNDARIES AND OWNER INFORMATION ARE BASED ON A DRAWING ENTITLED "GUDE LANDFILL - PROPERTY EXCHANGE WITH M-NCPPC" PREPARED BY C.C. JOHNSON & MALHOTRA, P.C., DATED 05/23/2012.
11. THE FLOODPLAIN SHOWN HEREON WAS TAKEN FROM THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION WEBPAGE, MONTGOMERY COUNTY, MD - MONTGOMERY PLANNING. FLOODPLAIN BOUNDARY IS FROM DFIRM 2011.
12. EDGE OF WATER IS BASED ON AN AERIAL TOPOGRAPHIC SURVEY, EDGE OF DELINEATED STREAM IS BASED ON A WETLAND DELINEATION EFFORT ON SITE AND INCLUDES UNVEGETATED GRAVEL BAR AREAS OUTSIDE THE NORMAL FLOW CHANNEL BOUNDARY.
13. ALL STANDS ARE CONSIDERED PRIORITY 1 AREAS.
14. RANKINGS WERE DETERMINED BASED ON THE MONTGOMERY COUNTY TREES: APPROVED TECHNICAL MANUAL (1994).
15. TREE DIAMETERS WERE MEASURED USING A FORESTRY DIAMETER TAPE.
16. FIELDWORK WAS CONDUCTED BY THOMAS KING AND KATHRYN CERNY-CHIPMAN ON APRIL 30 AND MAY 1, 2018.
17. ALL STREAMS DESIGNATED AS USE CLASS IV, RECREATIONAL TROUT WATERS.
18. WETLANDS WERE TAKEN FROM THE 2018 WETLAND DELINEATION SURVEY (EA 2019).
19. NO STATE OR FEDERALLY-LISTED SPECIES ARE KNOWN TO OCCUR AT THE SITE (FSD REPORT, APPENDIX F).
20. NO PART OF THE PROJECT TRACT IS ON THE LOCATIONAL ATLAS OR INDEX OF HISTORIC SITES.
21. NO NATIONAL, STATE, OR COUNTY CHAMPION TREES OR TREES AT LEAST 75% OF THE CURRENT STATE CHAMPION ARE PRESENT ON THE PROPERTY.
22. FLOODPLAIN BUFFER IS CAPTURED WITHIN THE STREAM BUFFER FOR STEEP SLOPES.
23. ALL TREES 24 INCHES AND GREATER ARE WITHIN STAND BOUNDARIES AND ARE NOT LOCATED ON THE PLAN UNLESS IDENTIFIED AS A SPECIMEN TREE.
24. STANDS ARE NOT WITHIN A SPECIAL PROTECTION AREA (SPA) OR THE PATUXENT PRIMARY MANAGEMENT AREA (PMA).

THOMAS M. KING — 07/24/2019
MD DNR QUALIFIED PROFESSIONAL — DATE

HUNT VALLEY CENTER
225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

RESOURCE	SIZE WITHIN TRACT
FLOODPLAIN IN PROPERTY BOUNDARY	32,465.36 SQ. FT. (0.75 AC.)
WETLAND IN PROPERTY BOUNDARY	14,009.80 SQ. FT. (0.32 AC.)
STREAM BUFFER IN PROPERTY BOUNDARY	442,532.52 SQ. FT. (10.16 AC.)
FOREST IN PROPERTY BOUNDARY	2,108,293.25 SQ. FT. (48.40 AC.)
FOREST IN FLOODPLAIN	27,659.76 SQ. FT. (0.64 AC.)
FOREST IN WETLAND	3,951.51 SQ. FT. (0.09 AC.)
FOREST IN STREAM BUFFER	288,201.27 SQ. FT. (6.62 AC.)

STAND	ACRES IN TRACT	SUCCESSIONAL STAGE	DOMINANT COVER TYPE	DOMINANT SIZE CLASS	BASAL AREA (FT^2/ACRE)	CANOPY CLOSURE (%)
1	3.21	MID-SUCCESSIONAL	CHESTNUT OAK/RED OAK	6-11.9" DBH	113	40-80
2	16.10	MATURE	OAK/HICKORY/RED MAPLE	12-19.9" DBH	118	80-100
3	19.12	MID-SUCCESSIONAL	RED MAPLE	6-11.9" DBH	70	60-100
4	9.97	EARLY-SUCCESSIONAL	RED CEDAR/BOX ELDER/ BUSH HONEYSUCKLE	6-11.9" DBH	75	20-80

TREE NUMBER	DBH (IN.)	COMMON NAME	SCIENTIFIC NAME	CONDITION
T-1	38.8	WHITE OAK	QUERCUS ALBA	GOOD
T-2	32.7	TULIP POPLAR	LIRIODENDRON TULIPIFERA	DOUBLE TRUNK WITH INCLUDED BARK
T-3	38.0	WHITE OAK	QUERCUS ALBA	GOOD
T-4	59.0	SILVER MAPLE	ACER SACCHARINUM	FAIR MULTI-TRUNK WITH MANY DEAD LIMBS
T-5	59.3	SILVER MAPLE	ACER SACCHARINUM	FAIR MULTI-TRUNK IN POND
T-6	35.1	TULIP POPLAR	LIRODENDRON TULIPIFERA	GOOD, DOUBLE TRUNK
T-7	33.2	TULIP POPLAR	LIRODENDRON TULIPIFERA	GOOD
T-8	31.5	TULIP POPLAR	LIRODENDRON TULIPIFERA	GOOD
T-9	35.2	SCARLET OAK	QUERCUS COCCINEA	FAIR WITH MANY DEAD LIMBS
T-10	34.3	RED OAK	QUERCUS RUBRA	GOOD

SPECIES COMMON IN TREE ROWS/REGROWTH ON LANDFILL:
PITCH PINE, BLACK LOCUST, RED CEDAR, HONEY LOCUST, WHITE PINE

0 100 200 400
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: TK
DRAWN BY: SMB
CHECKED BY: TK
PROJECT MANAGER: LJO

SEAL

NATURAL RESOURCE INVENTORY / FOREST STAND DELINEATION PLAN & KEY MAP

GUDE LANDFILL
REMEDIATION DESIGN
MNCPPC PROJECT: 420191540
MONTGOMERY COUNTY, MARYLAND

APPLICANT:
MONTGOMERY COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION

WSSC MAP GRIDS:
220NW06, 220NW07, 221NW06, 221NW07

TAX GRID NUMBERS:
GS41, GS52

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

DATE: JULY 2019

PROJECT NUMBER: 1564601

F-1

SHEET: 1 OF 5

MONTGOMERY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

APPROVED - 420191540

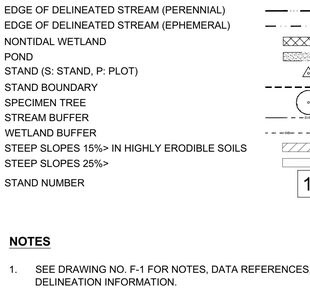
Joshua Penn { joshua.penn@montgomeryplanning.org }
08/12/19

LEGEND

DESCRIPTION	
PROPERTY BOUNDARY AND TRACT AREA	
ADJOINER BOUNDARY	
CONTOUR	#-
TREE LINE	
FENCE LINE	
DIRT ROAD	
100 YEAR FLOODPLAIN	
SOIL CLASSIFICATION	SrB HSG B
SOIL BOUNDARY	
EDGE OF WATER	
EDGE OF DELINEATED STREAM (PERENNIAL)	
EDGE OF DELINEATED STREAM (EPHEMERAL)	
NONTIDAL WETLAND	
POND	
STAND (S: STAND, P: PLOT)	S# P#
STAND BOUNDARY	
SPECIMEN TREE	×3
STREAM BUFFER	
WETLAND BUFFER	
STEEP SLOPES 15%> IN HIGHLY ERODIBLE SOILS	
STEEP SLOPES 25%>	
STAND NUMBER	1

NOTES

1. SEE DRAWING NO. F-1 FOR NOTES, DATA REFERENCES, AND FOREST STAND DELINEATION INFORMATION.
2. EDGE OF WATER IS BASED ON AN AERIAL TOPOGRAPHIC SURVEY, EDGE OF DELINEATED STREAM IS BASED ON A WETLAND DELINEATION EFFORT ON SITE AND INCLUDES UNVEGETATED GRAVEL BAR AREAS OUTSIDE THE NORMAL FLOW CHANNEL BOUNDARY.



KEY MAP
NOT TO SCALE

07/24/2019
THOMAS M. KING — DATE
MD DNR QUALIFIED PROFESSIONAL

HUNT VALLEY CENTER
225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

0 50 100 200
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: TK
DRAWN BY: SMB
CHECKED BY: TK
PROJECT MANAGER: LJO

SEAL

NATURAL RESOURCE INVENTORY / FOREST STAND DELINEATION PLAN I

GUDE LANDFILL
REMEDIATION DESIGN
MNCPPC PROJECT: 420191540
MONTGOMERY COUNTY, MARYLAND

APPLICANT:
MONTGOMERY COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION

WSSC MAP GRIDS:
220NW06, 220NW07, 221NW06, 221NW07

TAX GRID NUMBERS:
GS41, GS52

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

DATE: JULY 2019

PROJECT NUMBER: 1564601

F-2

SHEET: 2 OF 5

MONTGOMERY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

APPROVED - 420191540

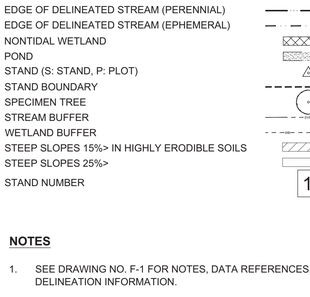
Joshua Penn (joshua.penn@montgomeryplanning.org)
08/12/19

LEGEND

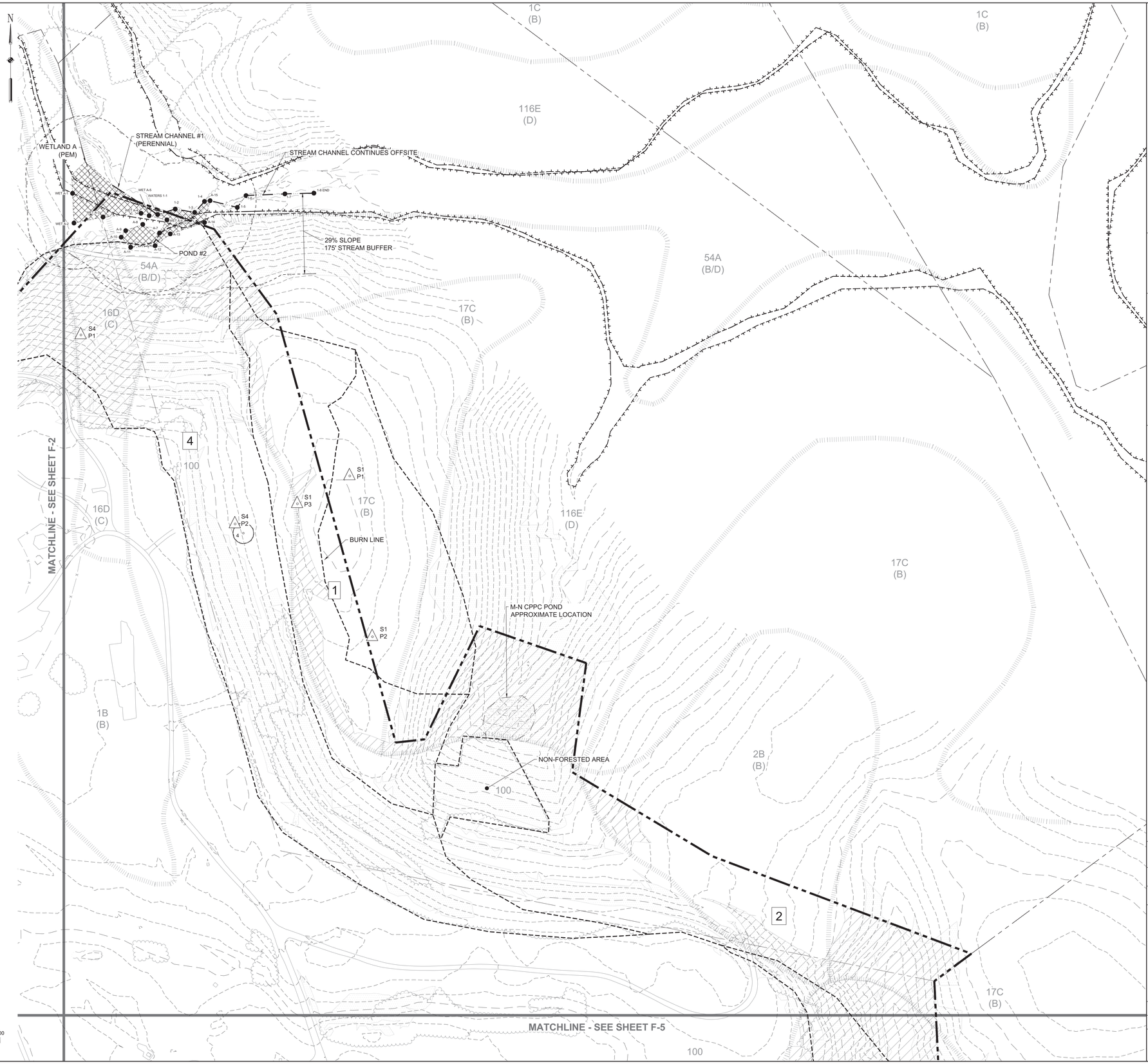
DESCRIPTION	
PROPERTY BOUNDARY AND TRACT AREA	
ADJOINER BOUNDARY	
CONTOUR	#-
TREE LINE	
FENCE LINE	
DIRT ROAD	
100 YEAR FLOODPLAIN	
SOIL CLASSIFICATION	SfB HSG B
SOIL BOUNDARY	
EDGE OF WATER	
EDGE OF DELINEATED STREAM (PERENNIAL)	
EDGE OF DELINEATED STREAM (EPHEMERAL)	
NONTIDAL WETLAND	
POND	
STAND (S: STAND, P: PLOT)	S# P#
STAND BOUNDARY	
SPECIMEN TREE	×3
STREAM BUFFER	
WETLAND BUFFER	
STEEP SLOPES 15%> IN HIGHLY ERODIBLE SOILS	
STEEP SLOPES 25%>	
STAND NUMBER	1

NOTES

1. SEE DRAWING NO. F-1 FOR NOTES, DATA REFERENCES, AND FOREST STAND DELINEATION INFORMATION.
2. EDGE OF WATER IS BASED ON AN AERIAL TOPOGRAPHIC SURVEY, EDGE OF DELINEATED STREAM IS BASED ON A WETLAND DELINEATION EFFORT ON SITE AND INCLUDES UNVEGETATED GRAVEL BAR AREAS OUTSIDE THE NORMAL FLOW CHANNEL BOUNDARY.



KEY MAP
NOT TO SCALE



0 50 100 200
GRAPHIC SCALE IN FEET

07/24/2019
DATE

THOMAS M. KING
MD DNR QUALIFIED PROFESSIONAL

HUNT VALLEY CENTER
225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: TK
DRAWN BY: SMB
CHECKED BY: TK
PROJECT MANAGER: LJO

SEAL

GUDE LANDFILL
REMEDIATION DESIGN
MNCPPC PROJECT: 420191540
MONTGOMERY COUNTY, MARYLAND

NATURAL RESOURCE INVENTORY / FOREST STAND DELINEATION PLAN II

APPLICANT:
MONTGOMERY COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION

WSSC MAP GRIDS:
220NW06, 220NW07, 221NW06, 221NW07

TAX GRID NUMBERS:
GS41, GS52

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

DATE: JULY 2019

PROJECT NUMBER: 1564601

F-3

SHEET: 3 OF 5

MONTGOMERY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

APPROVED - 420191540

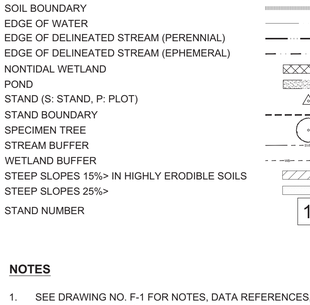
Joshua Penn (joshua.penn@montgomeryplanning.org)
08/12/19

LEGEND

DESCRIPTION	
PROPERTY BOUNDARY AND TRACT AREA	
ADJOINER BOUNDARY	
CONTOUR	#-
TREE LINE	
FENCE LINE	
DIRT ROAD	
100 YEAR FLOODPLAIN	
SOIL CLASSIFICATION	SfB HSG B
SOIL BOUNDARY	
EDGE OF WATER	
EDGE OF DELINEATED STREAM (PERENNIAL)	
EDGE OF DELINEATED STREAM (EPHEMERAL)	
NONTIDAL WETLAND	
POND	
STAND (S: STAND, P: PLOT)	S# P#
STAND BOUNDARY	
SPECIMEN TREE	×3
STREAM BUFFER	125'
WETLAND BUFFER	25'
STEEP SLOPES 15%> IN HIGHLY ERODIBLE SOILS	
STEEP SLOPES 25%>	
STAND NUMBER	1

NOTES

1. SEE DRAWING NO. F-1 FOR NOTES, DATA REFERENCES, AND FOREST STAND DELINEATION INFORMATION.
2. EDGE OF WATER IS BASED ON AN AERIAL TOPOGRAPHIC SURVEY, EDGE OF DELINEATED STREAM IS BASED ON A WETLAND DELINEATION EFFORT ON SITE AND INCLUDES UNVEGETATED GRAVEL BAR AREAS OUTSIDE THE NORMAL FLOW CHANNEL BOUNDARY.



KEY MAP
NOT TO SCALE

07/24/2019
THOMAS M. KING — DATE
MD DNR QUALIFIED PROFESSIONAL

HUNT VALLEY CENTER
225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

0 50 100 200
GRAPHIC SCALE IN FEET

MATCHLINE - SEE SHEET F-3
MATCHLINE - SEE SHEET F-4
MATCHLINE - SEE SHEET F-5

POND #3 (DRY POND)
WETLAND C (PEM)
POND #4 (PEM)
STREAM CHANNEL #2 (PERENNIAL)
STREAM CHANNEL CONTINUES OFFSITE
STREAM CHANNEL #2 (PERENNIAL) (OFFSITE)
UNDERGROUND PIPE
19% SLOPE 150' STREAM BUFFER
4% SLOPE 125' STREAM BUFFER
INCINERATOR LANE
SOUTHLAWN LANE
S2 P3
S2 P4
S3 P1
S3 P2
17C (B)
116E (D)
116D (D)
54A (B/D)
2B (B)
1B (B)
16D (C)
100

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: TK
DRAWN BY: SMB
CHECKED BY: TK
PROJECT MANAGER: LJO

SEAL

GUDE LANDFILL REMEDIATION DESIGN MNCPPC PROJECT: 420191540

MONTGOMERY COUNTY, MARYLAND

NATURAL RESOURCE INVENTORY / FOREST STAND DELINEATION PLAN IV

APPLICANT:
MONTGOMERY COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION

WSSC MAP GRIDS:
220NW06, 220NW07, 221NW06, 221NW07

TAX GRID NUMBERS:
GS41, GS52

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

DATE: JULY 2019

PROJECT NUMBER: 1564601

F-5

SHEET: 5 OF 5

MONTGOMERY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

APPROVED - 420191540

Joshua Penn (joshua.penn@montgomeryplanning.org)
08/12/19

LEGEND

DESCRIPTION	
PROPERTY BOUNDARY AND TRACT AREA	
ADJOINER BOUNDARY	
CONTOUR	#-
TREE LINE	
FENCE LINE	
DIRT ROAD	
100 YEAR FLOODPLAIN	
SOIL CLASSIFICATION	SrB HSG B
SOIL BOUNDARY	
EDGE OF WATER	
EDGE OF DELINEATED STREAM (PERENNIAL)	
EDGE OF DELINEATED STREAM (EPHEMERAL)	
NONTIDAL WETLAND	
POND	
STAND (S: STAND, P: PLOT)	S# P#
STAND BOUNDARY	
SPECIMEN TREE	×3
STREAM BUFFER	
WETLAND BUFFER	
STEEP SLOPES 15%> IN HIGHLY ERODIBLE SOILS	
STEEP SLOPES 25%>	
STAND NUMBER	1

NOTES

1. SEE DRAWING NO. F-1 FOR NOTES, DATA REFERENCES, AND FOREST STAND DELINEATION INFORMATION.
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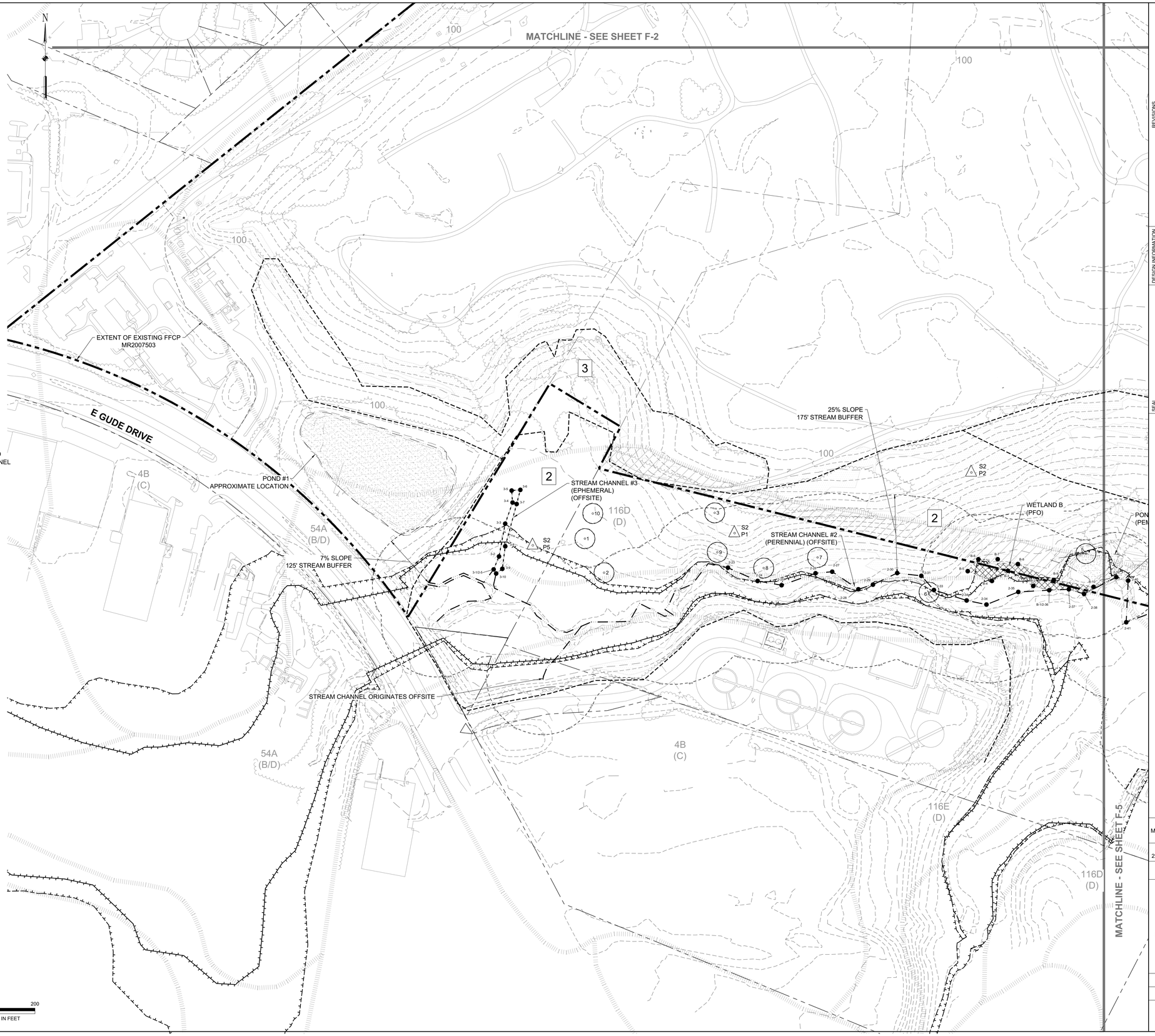

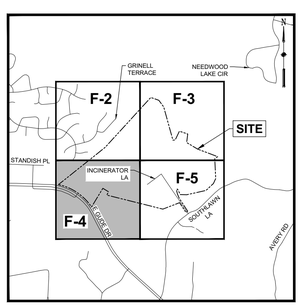

KEY MAP
NOT TO SCALE

07/24/2019
THOMAS M. KING — DATE
MD DNR QUALIFIED PROFESSIONAL

HUNT VALLEY CENTER
225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

0 50 100 200
GRAPHIC SCALE IN FEET

REVISIONS			
NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: TK
DRAWN BY: SMB
CHECKED BY: TK
PROJECT MANAGER: LJO

SEAL

NATURAL RESOURCE INVENTORY / FOREST STAND DELINEATION PLAN I

GUDE LANDFILL
REMEDIATION DESIGN
MNCPPC PROJECT: 420191540
MONTGOMERY COUNTY, MARYLAND

APPLICANT:
MONTGOMERY COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION

WSSC MAP GRIDS:
220NW06, 220NW07, 221NW06, 221NW07

TAX GRID NUMBERS:
GS41, GS52

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

DATE: JULY 2019

PROJECT NUMBER: 1564601

F-4

Gude Landfill Remediation Project
Design Engineer Contract

Wetland Delineation Report

Prepared for

Department of Environmental Protection
Division of Solid Waste Services
Montgomery County, Maryland

Prepared by
EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031

January 2019
Version: FINAL
EA Project No. 15646.01

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Gude Landfill Remediation Project
Design Engineer Contract

Wetland Delineation Report

Prepared for

Department of Environmental Protection
Division of Solid Waste Services
Montgomery County, Maryland

Prepared by

EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

January 2019
Version: FINAL
EA Project No. 15646.01

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TABLE OF CONTENTS

Page

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

the County	Montgomery County Department of Environmental Protection, Division of Solid Waste Services
EA	EA Engineering, Science, and Technology, Inc., PBC
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
the Landfill	Gude Landfill
LF	Linear feet
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
OHWM	Ordinary high water mark
RPW	Relatively Permanent Water
UPL	Upland
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WUS	Waters of the United States

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1. INTRODUCTION

This Wetland Delineation Report was prepared for the Engineering, Bid Preparation, and Support Services for the Gude Landfill (the Landfill) Remediation Project for Montgomery County, Maryland (the Remediation Design), under the Northeast Maryland Waste Disposal Authority and the Montgomery County Department of Environmental Protection, Division of Solid Waste Services (the County).

The Landfill Remediation Design is for the recommended Corrective Measure Alternative, Toupee Capping and Additional Landfill Gas Collection, as approved by the Maryland Department of the Environment on July 8, 2016.

1.1 PURPOSE

The purpose of this Wetland Delineation Report is to review and delineate the wetlands and/or Waters of the United States (WUS) located on and within the vicinity of the Gude Landfill (the Landfill) project site. The Landfill consists of approximately one hundred sixty-two and seven-tenths (162.7) acres, located at 600 East Gude Drive in Montgomery County in Rockville, Maryland (**Appendix A, Figure 1**).

In November 2009, EA Engineering, Science, and Technology, Inc. (EA) conducted an initial wetland delineation of the proposed project site. In order to complete a thorough review of the wetlands/WUS that could potentially be impacted, EA established an area of review to extend outside of the property boundary and include portions of the surrounding properties. In April 2018, EA was tasked with re-evaluating the project site for wetlands and waterways. The area of review for the 2018 wetland delineation effort is depicted on **Figure 2** in **Appendix A**.

2. RESEARCH OF AVAILABLE DOCUMENTS

2.1 BACKGROUND INFORMATION

At the time of EA's environmental review in April 2018, the project site consisted of approximately one hundred sixty-two and seven-tenths (162.7) acres of land predominantly comprised of open grass and vegetative covered fields (**Appendix A, Figure 2**). The outer portions of the project site consisted of undeveloped forested land. Major site features included an extensive landfill gas collection piping system throughout the property, a paved open area in the southeastern portion of the Landfill, a model airplane flying area in the northern portion of the Landfill, and a landfill gas-to-energy flare station and shelter in the southwest corner of the property.

The site is bordered to the south by industrial operations, to the west/northwest by the community of Derwood Station South, and to the north and east by Maryland-National Capital Park and Planning Commission property. The surrounding area was mixed use with the Derwood residential community to the northwest, commercial and industrial properties to the south, and predominantly undeveloped wooded areas to the north and east. The approximate latitude/longitude of the property is 39° 06' 29" N and 77° 08' 16" W, respectively.

Prior to conducting the wetland delineation in the field, relevant site-specific data for the area of review was reviewed to identify the likely location of potential wetlands and streams.

2.2 UNITED STATES GEOLOGICAL SURVEY TOPOGRAPHIC MAP

The U.S. Geological Survey (USGS) topographic map for the area (*Rockville Quadrangle*, **Figure 3 in Appendix A**) was also used as a reference to identify possible wetlands and waterways on the property. Topographic maps identify elevations, forested areas, streams, ponds, roads, and structures. The USGS map identified multiple buildings and roads within the project site and depicted the majority of the site as being non-forested. Three (3) blue-line stream channels were depicted within the vicinity of the project site on the USGS map, including Crabbs Creek, Rock Creek, and an unnamed channel. Crabbs Creek was identified as being located on the northeastern corner of the project site. Crabbs Creek flowed in a southeasterly direction where it contributed to Rock Creek. Rock Creek was depicted to the east of the project site. Rock Creek was not located within the area of review. The third blue-line stream channel (unnamed) was located along the southern property line and conveyed flow in an easterly direction to Rock Creek. The streams discussed above are listed in the Code of Maryland Regulations stream use classification index as Use IV (Recreational Trout Waters), with an in-stream restriction during the period of March 1 through May 31.

The site topography was plateau-like and consisted of gentle relief along the top of the plateau and sharp relief along the entirety of the Landfill boundary. The elevation along the top of the plateau gently sloped to the south, with localized mounds and depressions throughout. The topography around the edges of the waste layer fell sharply from the plateau to elevations ranging from sixty (60) to ninety (90) feet below the plateau.

2.3 SOIL SURVEY INFORMATION

The online Natural Resources Conservation Service (NRCS) Web Soil Survey for Montgomery County was reviewed for the area of review (**Appendix A, Figure 4**). Ten soil types were identified within the project site (U.S. Department of Agriculture [USDA] NRCS 2018a). According to the USDA NRCS hydric soils list by state (NRCS 2018b), seven (7) of the soil units within the project site were listed as a hydric soil. Soil types found within the project site are identified in **Table 1**.

Table 1 Mapped Soil Types

Soil Mapping Unit	Symbol	Hydric Soil	Drainage Class
Gaila silt loam, 3 to 8 percent slopes	1B	Yes	Well drained
Glenelg silt loam, 3 to 8 percent slopes	2B	No	Well drained
Elioak silt loam, 3 to 8 percent slopes	4B	No	Well drained
Glenville silt loam, 3 to 8 percent slopes	5B	Yes	Moderately well drained
Brinklow-Blocktown channery silt loams, 15 to 25 percent slopes	16D	Yes	Well drained
Occoquan loam, 8 to 15 percent slopes	17C	Yes	Well drained
Hatboro silt loam, 0 to 3% slopes, frequently flooded	54A	Yes	Poorly drained
Dump, refuse	100	No	--
Blocktown channery silt loam, 15 to 25 percent slopes, very rocky	116D	Yes	Well drained
Blocktown channery silt loam, 25 to 45 percent slopes, very rocky	116E	Yes	Well drained
Source: Adapted from U.S. Department of Agriculture Natural Resources Conservation Service 2018a, 2018b.			

2.4 NATIONAL WETLAND INVENTORY MAP

EA's environmental scientists reviewed wetland data from the U.S. Fish and Wildlife Service's (USFWS) National Wetlands Inventory (NWI) (USFWS 2018). The NWI map (**Appendix A, Figure 5**) identified NWI wetlands and streams within the general vicinity of the blue-line streams, identified on the USGS map (**Appendix A, Figure 3**). More specifically, the NWI map identified one (1) wetland system on the northeastern corner of the site, one (1) pond adjacent to the southwestern corner, and two (2) wetlands along the southeastern portion of the site. Each wetland system was classified with a Cowardin designation (Cowardin et al. 1979). The system to the northeast was designated as PEM1A (Palustrine Emergent Persistent, Temporarily Flooded). The two (2) wetlands identified along the southeastern side of the site were classified as PFO1A (Palustrine Forested Deciduous, Temporarily Flooded). The large pond located to the southwest was identified as PUBHh (Palustrine Unconsolidated Bottom, Permanently Flooded, Diked/Impounded). A riverine system was also identified in the NWI maps as R5UBH (Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded) flowing adjacent to the southwestern side of the area of review. NWI wetlands and riverine systems within and adjacent to the area of review are presented in **Table 2**. It is important to note that not all NWI wetlands identified in the mapper may currently exist, hence the need for a wetland investigation to ground-truth all potential wetlands, as described in the following sections of this report.

Table 2 NWI Wetlands

Wetland Types	Description	Location in Project Area
PEM1A	Palustrine, Emergent Persistent, Temporarily Flooded	Northeastern boundary
PFO1A	Palustrine, Forested Deciduous, Temporarily Flooded	Adjacent to southeastern boundary; outside area of review
PUBHh	Palustrine, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded	Southwestern boundary
R5UBH	Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded	Adjacent to southwestern boundary; largely outside area of review

Source: Adapted from USFWS 2018.

3. METHODOLOGY

The wetland delineation was conducted in accordance with the Routine Determination procedures outlined in the *Corps of Engineers Wetland Delineation Manual* (U.S. Army Corps of Engineers [USACE] 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (Version 2.0) (USACE 2012). This approach is based on the presence of three (3) parameters (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology) including indicators, delineation guidance, and other information that is specific to the region. The USACE technical guidance for identifying wetlands requires that a positive wetland indicator be present for each of the three (3) identified parameters except in limited instances identified as an atypical situation.

3.1 HYDROPHYTIC VEGETATION

Hydrophytic vegetation is defined in the USACE manual as a community of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to influence plant occurrence. A plant-community approach to evaluate vegetation is used and, therefore, hydrophytic vegetation decisions are based on the community of plant species growing in a particular area rather than the presence or absence of particular indicator species. Common wetland plant species have been categorized regionally by USACE in the 2016 National Wetland Plant List, Version 3.3 (USACE 2016). Each plant is classified into one (1) of five (5) categories as follows:

- Obligate (OBL) = Greater than ninety-nine (99) percent estimated probability of occurring in wetlands.
- Facultative Wetland (FACW) = sixty-seven (67) to ninety-nine (99) percent estimated probability of occurring in wetlands.
- Facultative (FAC) = thirty-four (34) to sixty-six (66) percent estimated probability of occurring in wetlands.
- Facultative Upland (FACU) = one (1) to thirty-three (33) percent estimated probability of occurring in wetlands.
- Upland (UPL) = less than one (1) percent estimated probability of occurring in wetlands.

Plants that have an indicator status of OBL, FACW, or FAC are considered to be typically adapted for life in anaerobic soil conditions. When the dominant species in a plant community are typically adapted for life in anaerobic soil conditions, hydrophytic vegetation is present. Several indicators may be used to determine whether hydrophytic vegetation is present on a site; however, the presence of a single individual of a hydrophytic species does not mean that hydrophytic vegetation is present.

Evaluation of the vegetation begins with a rapid field test for hydrophytic vegetation to determine if there is a need to collect more detailed vegetation data. If the area is not dominated solely by OBL and FACW species, the standard dominance test is performed to determine if more than fifty (50) percent of the dominant species are OBL, FACW, or FAC. Some wetland plant communities may not be considered hydrophytic based only on dominant species. Therefore, in those cases where indicators of hydric soil and wetland hydrology are present, the vegetation would be reevaluated with the prevalence index taking into account non-dominant plant species as well. A plant community is considered hydrophytic if any one of these tests are passed.

3.2 HYDRIC SOILS

Hydric soils are soils that are saturated, ponded, or flooded long enough during the growing season to develop anaerobic conditions in the upper portion of the soil column (typically within the upper eighteen (18) inches). The prolonged presence of water results in the chemical reduction of elements, particularly iron and manganese. Reduced soils often exhibit a gray (or gleyed) color that reflects either the leaching of elements or the presence of reduced elements.

Hydric soils are often characterized by bright mottles, sometimes called redoximorphic features. Mottles are an indication of incomplete saturation. They typically represent isolated pockets where elements (mainly iron) have remained oxidized. Another feature of hydric soils is a low matrix chroma in the diagnostic zone, which is typically identified as the upper eighteen (18) inches of the soil layer, but may vary. For mineral hydric soils, the diagnostic zone typically must have a matrix chroma of two (2) or less for soils with mottles, or a matrix chroma of one (1) or less for soils without mottles. To make this determination, soil cores are collected in the field in suspected wetland areas and the soil colors are compared to a Munsell Soil Color Chart (Kollmorgen Instruments Corporation 1988). Other examples of field indicators for hydric soils include, but are not limited to, high organic content, histic epipedons, concretions, sandy redox, and/or a sulfidic odor and are defined in the Regional Supplement to the Wetland Delineation Manual (USACE 2012).

3.3 WETLAND HYDROLOGY

Wetland hydrology supplies the moisture required to support wetland vegetation and also creates the conditions necessary for the formation of hydric soils. Primary indicators of wetland hydrology include, but are not limited to, observed inundation or saturation, water marks, drift deposits, sediment deposits, aquatic fauna, oxidized rhizospheres on living roots, and water-stained leaves. Secondary indicators of wetland hydrology include, but are not limited to, drainage patterns, surface soil cracks, crayfish burrows, and the FAC-Neutral test. The FAC-Neutral test involves comparing the number of OBL and FACW plant species to the number of FACU and UPL plant species, with FAC species being neutral. If fifty (50) percent or more of the plant species are OBL or FACW, the FAC-Neutral test is considered a secondary indicator of wetland hydrology. An area must contain at least one (1) primary indicator or two (2) secondary indicators of wetland hydrology for the criterion of wetland hydrology to be met.

3.4 STREAM CHANNELS

In addition to identifying wetlands, stream channels were flagged that would likely be considered jurisdictional WUS. Stream channels were identified by the presence of a defined bed and bank, as well as a defined ordinary high water mark (OHWM). Furthermore, identified stream channels were classified into one (1) of three (3) categories: perennial stream channels that typically flow year-round, intermittent stream channels that only flow seasonally, and ephemeral stream channels that typically flow less than seasonally. Ephemeral channels receive hydrology from surficial sources such as runoff from surrounding uplands during and immediately following precipitation events and/or snow melt (i.e., do not have a direct connection to groundwater and are not hydraulically connected to wetlands). Desktop information such as USGS maps, soil surveys, NWI maps, and other materials were used to assist in classifying stream channels in addition to observations made during the site visits.

3.5 FIELD DATA COLLECTION

Locations for collection of data were established onsite to evaluate the presence or absence of jurisdictional wetlands/waterways, and to demonstrate the typical characteristics of uplands and wetlands along the line of delineation. Surrounding vegetative species and hydrologic indicators were observed at the sample locations. EA personnel collected soil to a depth of approximately eighteen (18) inches or until refusal was encountered to observe soil conditions and classify the soil as either hydric or non-hydric. The sample plot within the wetland boundary was marked and surveyed with a Trimble Geo 7x – sub-meter accurate global positioning system. Routine wetland determination data sheets were used to summarize observations on vegetation, soils, and hydrology for both the wetland and upland sample plots. Copies of these wetland determination data forms are included in **Appendix B**.

Photographs of the wetlands and streams identified in the area of review were taken and are included in **Appendix C** of this report.

3.6 FIELD DELINEATION

A field review to evaluate whether wetlands and/or waterways were present within the area of review was originally performed in October 2009. The field delineation of wetlands and WUS consisted of identifying the limits of the wetlands and waterways with pink and black flags, which were numbered sequentially. Wetland flag locations were located in the field using a handheld Trimble Geo 7x global positioning system with sub-meter horizontal accuracy and collected in the North American Datum of 1983, Maryland State Plane South Coordinate System.

On May 1, 2018, EA's wetland scientists re-visited the site to re-evaluate the wetland and stream boundaries and confirmed very little change to these resources. Slight variations in the wetland and stream boundaries that were observed were re-surveyed and included on the attached Wetland Delineation Map (**Appendix D**).

4. SYSTEMS IDENTIFIED

On May 1, 2018, EA's wetland scientists conducted onsite investigations of the project site and identified four (4) potentially jurisdictional wetlands and three (3) defined WUS within the project site. Additionally, a series of ponds, drainage swales, outfalls, and pipes were identified throughout the project site, but have not been identified as jurisdictional since these features are part of the stormwater management system and were created in previously upland habitat. The four (4) wetlands and three (3) WUS, as well as the non-jurisdictional features, are described in the following sections of this report and are provided on the figure found in **Appendix D**.

4.1 STREAM CHANNEL #1 (CRABBS BRANCH)

Stream Channel #1 consisted of one (1) perennial stream channel referred to on the USGS map as Crabbs Branch (**Appendix A, Figure 3**). Stream Channel #1 originated offsite to the north and entered the area of review through the existing utility right-of-way (**Appendix D**). Stream Channel #1 generally flowed in the area of review in a southeasterly direction for approximately sixty-eight (68) feet and adjacent to Wetland A before exiting the area of review. Outside of the project site, Crabbs Branch continued in an easterly direction for over two thousand one hundred (2,100) feet to the confluence with Rock Creek. EA's wetland scientists observed a defined bed and bank and an OHWM within the limits of the stream channel. Based on observations made during the wetland delineation effort and subsequent site visits, it has been determined that Crabbs Branch is a perennial stream channel with relatively permanent flow throughout the year. This stream channel has been classified as a Relatively Permanent Water (RPW) with directly abutting wetlands (Wetland A).

4.2 WETLAND A / POND #2 (EMERGENT WETLAND)

Wetland A was predominately located within the utility right-of-way on the northeast portion of the site (**Appendix D**). This wetland was identified as an emergent wetland encompassing a small open water pond and directly abutting Stream Channel #1. The source of hydrology for Wetland A appeared to be groundwater, as well as runoff from the surrounding land.

Wetland A contained predominantly hydrophytic vegetation consisting of red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*) saplings, and black willow (*Salix nigra*) saplings, as well as skunk cabbage (*Symplocarpus foetidus*) false nettle (*Boehmeria cylindrica*), sensitive fern (*Onoclea sensibilis*), soft rush (*Juncus effusus*), sedge species (*Carex* spp.), and arrowleaf tearthumb (*Polygonum sagittatum*). The soil matrix within the wetland area had a chroma value of two (2) or less with mottling of the matrix. Redox features and depletions were observed in soil samples throughout the wetland. Wetland hydrology indicators included saturation in the upper twelve (12) inches, water-stained leaves, and drainage patterns.

This wetland extended from the right-of-way into the forested edge of the Landfill and included a small pond that appears to have been a sediment basin for the existing landfill (referred to as Pond #2 by the County). Although Pond #2 was surrounded by a chain-link fence, it was evident that

Wetland A included the surrounding area outside of the fence; therefore, the entire fenced area was included in the delineation.

4.3 STREAM CHANNEL #2 (UNNAMED TRIBUTARY TO ROCK CREEK)

Stream Channel #2 consisted of a perennial stream channel depicted on the USGS map as an unnamed tributary to Rock Creek (**Appendix A, Figure 3**). Stream Channel #2 originated offsite to the west and entered the area of review from a box culvert located beneath East Gude Drive (**Appendix D**). Additionally, a second channel originates from the large pond (referred to as Pond #1 by the County and considered a non-jurisdictional feature) located offsite to the west that outfalls onto the project site and contributes to Stream Channel #2. Stream Channel #2 generally flowed onsite in an easterly direction for approximately four hundred fifty-two (452) feet and adjacent to Wetland B before exiting the area of review. The majority of this stream channel is located outside of the project site to the south. From the southeastern corner of the project site, Steam Channel #2 flows in an easterly direction for approximately one thousand six hundred (1,600) feet to the confluence with Rock Creek. EA personnel observed a defined bed and bank and OHWM within the limits of the stream channel. Based on observations made during the wetland delineation effort and subsequent site visits, it has been determined that this unnamed tributary to Rock Creek is a perennial stream channel with relatively permanent flow throughout the year. Stream Channel #2 has been classified as an RPW with directly abutting wetlands (Wetland B) and adjacent wetlands (Wetland C).

4.4 WETLAND B (PALUSTRINE FORESTED WETLAND)

Wetland B was located along Stream Channel #2 on the south-central portion of the site (**Appendix D**). This wetland was classified as a forested wetland directly abutting Stream Channel #2. The source of hydrology for Wetland B appeared to be groundwater, as well as runoff from the surrounding land.

Wetland B contained predominantly hydrophytic vegetation consisting of red maple, sweetgum, and willow oak (*Quercus phellos*), soft rush, sedge species, and arrowleaf tearthumb. The soil matrix within the wetland area had a chroma value of two (2) or less with mottling of the matrix. Redox features and depletions were observed in soil samples throughout the wetland. Wetland hydrology indicators included saturation in the upper twelve (12) inches, water-stained leaves, and drainage patterns.

Within the areas outside of the wetland boundaries, EA personnel observed predominantly non-hydrophytic vegetation species, including tulip poplar (*Liriodendron tulipifera*), white oak (*Quercus alba*), and Christmas fern (*Polystichum acrostichoides*). No evidence of wetland hydrology was observed in the adjacent upland areas during the site visit.

4.5 WETLAND C (PALUSTRINE EMERGENT WETLAND)

Wetland C was located upslope from Stream Channel #2 within the cleared area for the Landfill on the central portion of the site (**Appendix D**). This wetland was classified as an emergent

wetland that has developed within a depression adjacent to a large basin (referred to as Pond #3 by the County, and considered a non-jurisdictional feature). Wetland C does not directly abut any stream channel onsite. However, EA personnel identified a series of inlets, outfalls, pipes, and drainage swales that convey flow from this wetland down to Stream Channel #2.

Within the limits of the wetland, EA personnel observed predominantly hydrophytic vegetation species, including soft rush, softstem bullrush (*Schoenoplectus tabernaemontani*), blunt spikerush (*Eleocharis obtusa*), and sedge species. Evidence of observed wetland hydrology included saturated soil within twelve (12) inches of the ground surface and inundation. EA personnel excavated test pits to depths of approximately eighteen (18) inches and observed gleyed or low-chroma soils.

Within the areas outside of the wetland boundaries, EA personnel observed predominantly non-hydrophytic vegetation species, including multiflora rose (*Rosa multiflora*), red cedar (*Juniperus virginiana*), barnyardgrass (*Echinochloa crus-galli*), and black locust (*Robinia pseudoacacia*). No evidence of wetland hydrology was observed in the upland areas during the site visit, and the soils sample predominately consisted of fill material.

4.6 POND #4 (PALUSTRINE EMERGENT WETLAND)

EA personnel identified a fenced pond (referred to as Pond #4 by the County) associated with the stream/wetland system located on the south side of the project site (**Appendix D**). Pond #4 appeared to be a historical sediment basin, and classified as a potential emergent wetland. This pond was located adjacent to Wetland B but appeared to be hydrologically separated by an earthen berm. A deteriorated eighteen (18)-inch corrugated metal pipe was identified at this location and directly connects the pond to Stream Channel #2. This pond was identified as a potentially jurisdictional feature due to its location, directly adjacent to Stream Channel #2, and its location within the floodplain. Furthermore, groundwater was observed in the soil pit during the field effort; the presence of hydrophytic emergent vegetation within the pond as well as larger hydrophytic trees was documented along the pond boundary. Unlike other ponds identified onsite this pond does not appear to have been constructed solely in uplands and, therefore, this pond has potential to be considered jurisdictional.

Pond #4 contained predominantly hydrophytic vegetation consisting of red maple, silver maple (*Acer saccharinum*), and black willow along the edge of the pond, and sensitive fern, soft rush, and sedge species within the central portion of the pond. The soil matrix within the wetland area had a chroma value of two (2) or less with mottling of the matrix. Redox features were observed in soil samples throughout the wetland. Wetland hydrology indicators included inundation and saturation in the upper twelve (12) inches, along with water-stained leaves, and water marks.

4.7 WATERS OF THE U.S. #3 (EPHEMERAL CHANNEL)

Stream Channel #3 consisted of an ephemeral stream channel just offsite of the southeast corner of the project site (**Appendix D**). This ephemeral channel originated near the toe of the steep slopes surrounding the Landfill and flowed in a southerly direction for approximately one hundred eighty-

eight (188) linear feet before contributing to Stream Channel #2 near the outfall of Pond #1. Although this stream channel is located outside of the project site, it was flagged due to its proximity to the project site. EA personnel observed a defined bed and bank and OHWM within the limits of the stream channel; however, no evidence of recent flow was observed at the time of the site visit. Based on observations made during the wetland delineation effort and subsequent site visits, it has been determined that this channel is an ephemeral stream channel. This channel appeared to have been formed from surficial runoff from the Landfill. Within the forested area along the ephemeral channel, EA personnel observed predominantly non-hydrophytic vegetation species, including tulip poplar, white oak, American beech (*Fagus grandifolia*), and Japanese honeysuckle (*Lonicera japonica*). Stream Channel #3 has been classified as a Non-Relatively Permanent Water (Non-RPW) with no adjacent or abutting wetlands that contributed surface flow directly to an RPW.

A description of the wetlands and stream channels with a list of dimensions is provided in **Table 3**, with a preliminary significant nexus determination for each feature.

Table 3 Delineated Features Identified

Delineated Feature	Resource	Significant Nexus Determination	Dimensions within the Project Site	Location within the Area of Review
Wetland A	Forested Wetland	Abutting an RPW	0.22 acre	Northeastern corner of area of review
Wetland B	Forested Wetland	Abutting an RPW	0.06 acre	Along southwestern boundary of area of review
Wetland C	Emergent Wetland	Isolated	0.03 acre	Central area of review
Pond #4	Perennial Stream	Year-Round RPW	0.15 acre	Along south boundary of area of review
Stream Channel #1	Perennial Stream	Year-Round RPW	68 LF	Northern corner of area of review
Stream Channel #2	Perennial Stream	Year-Round RPW	452 LF	Adjacent to the southern boundary of the area of review
Stream Channel #3	Ephemeral Stream	Non-RPW	188 LF[(a)]	Southeastern corner of area of review

(a) Dimension includes feature located outside of the project site.

Notes: LF = Linear feet.
RPW = Relatively Permanent Water.

4.8 NON-JURISDICTIONAL STORMWATER MANAGEMENT FEATURES

EA wetland scientists identified multiple locations throughout the area of review as part of the existing landfill, including stormwater management infrastructure, that are not typical of natural wetland systems. EA reviewed these areas and, with the exception of Ponds #2 and #4, did not identify any other stormwater management infrastructure as a potentially jurisdictional feature. Although most ponds are designed to outfall to an existing stream channel, and therefore could be seen as contributing to waters of the U.S., it is EA's professional experience that stormwater management infrastructure is typically only regulated as wetlands or streams if it is believed to be

constructed in previous wetland or stream areas or is considered to be an in-line feature. For example:

- In-line ponds, where a likely jurisdictional stream channel was identified to flow into a pond and then continued below the pond—In this situation, the pond would likely be considered jurisdictional.

- Located within floodplains—If a pond appears to be located within a floodplain of an existing stream channel and the pond banks are surrounded with wetland vegetation, it would be difficult to determine whether or not the pond was originally constructed in uplands. These areas would typically be flagged as an abutting or adjacent wetland.

Ponds #1, #3, and the M-NCPPC, as well as swales identified throughout the site, appeared to be maintained features that were constructed completely in uplands with no wetlands or streams contributing to them from upslope locations. Since no natural stream or wetland feature was identified upslope from these ponds, EA believes that jurisdictional status will begin immediately below the pond outfall.

Many of the riprap swales throughout the facility were identified along existing roads and throughout the upland portion of the Landfill and were viewed as stormwater management drainage swales. These riprap and grass swales receive surficial runoff from the roads and other impervious or unvegetated surfaces and do not receive hydrology from natural stream channels or wetlands. Furthermore, these areas are underlain by fill material and refuse of the landfill.

5. CONCLUSION

The four (4) potentially jurisdictional wetlands and three (3) stream channels identified within the area of review either exhibited characteristics of regulated WUS (such as a defined bed and bank and presence of an OHWM) or all three (3) wetland parameters (hydrophytic vegetation, hydric soils, and wetland hydrology) as defined in the Regional Supplement (USACE 2012). Therefore, these areas were identified in the field and mapped on the wetland delineation map provided in **Appendix D**.

It is important to note that USACE is the federal agency that determines the official jurisdictional status of wetlands/waterways. Furthermore, the Maryland Department of the Environment can regulate wetlands/waterways considered non-jurisdictional by USACE. To determine whether USACE or the Maryland Department of the Environment will take jurisdiction over any areas of the subject property, a Jurisdictional Determination request should be submitted jointly to these agencies.

6. REFERENCES

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Appendix A

Figures

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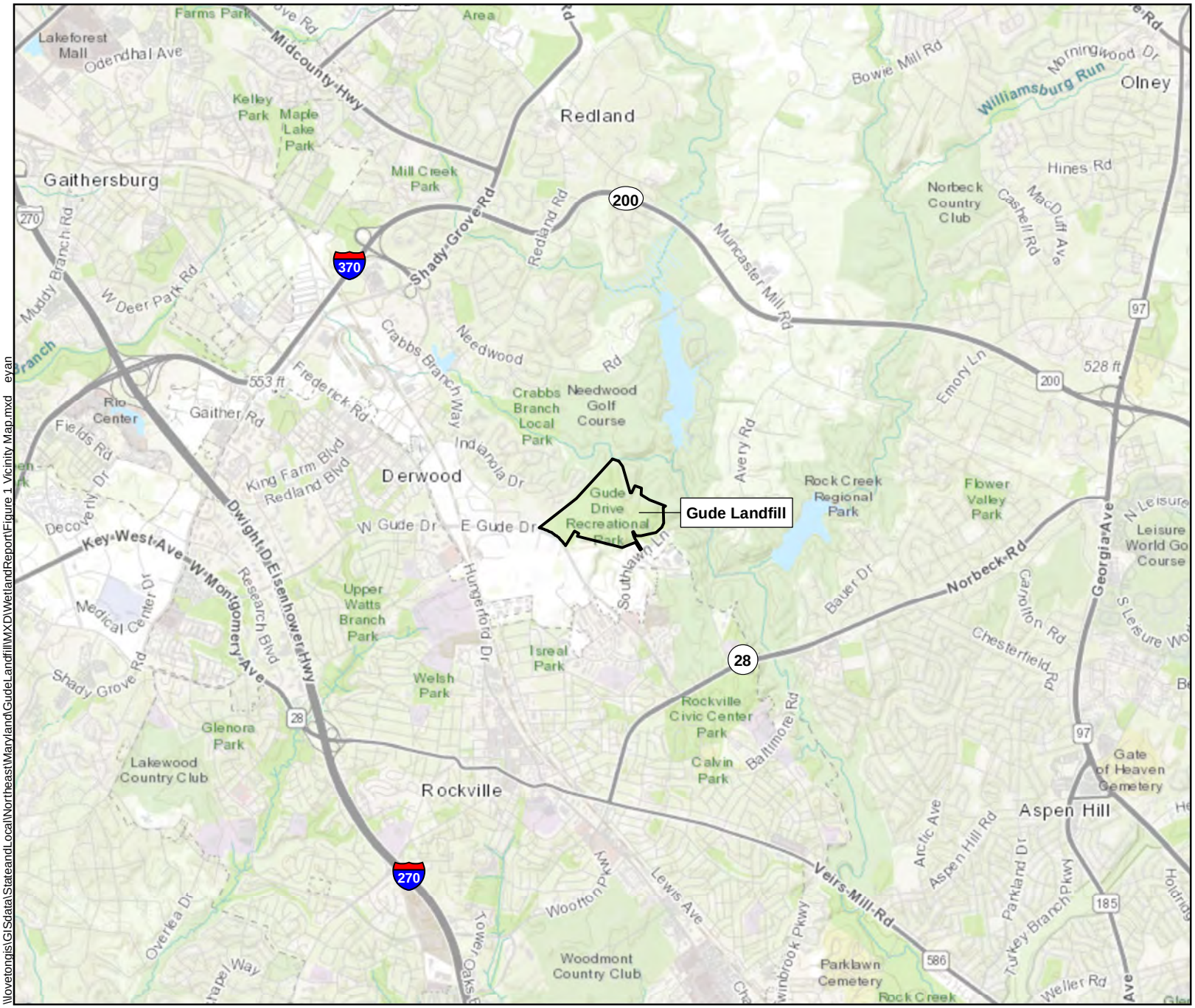


Legend

Property Boundary

Map Date: 5/17/2018
Source: ESRI 2016
Projection: NAD 1983 State Plane Maryland US Feet

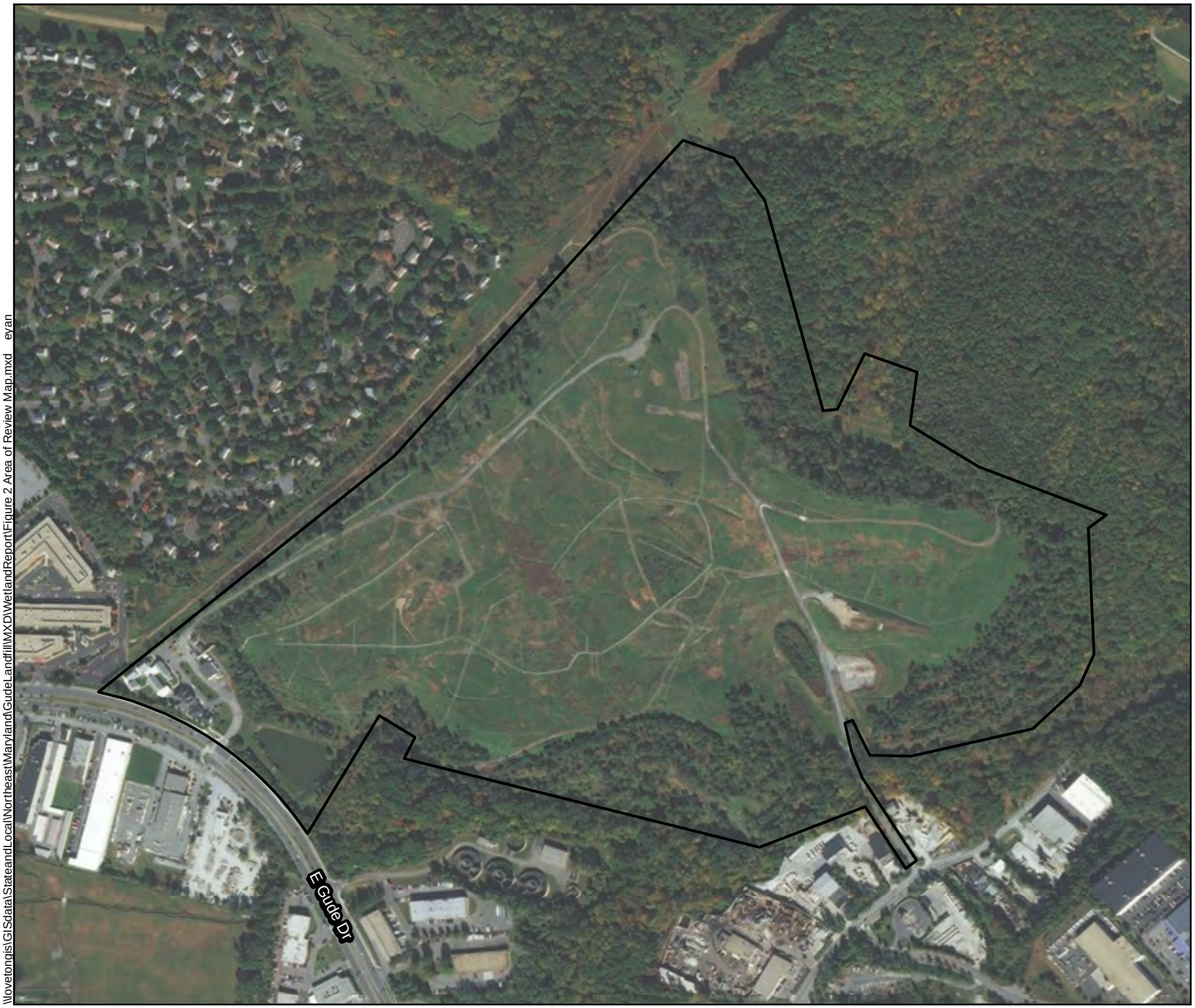
N

0 0.5 1

Miles

Figure 1
Vicinity Map
Gude Landfill
Rockville, Maryland

\\lovetongis\GIS\data\StateandLocal\Northeast\Maryland\GudeLandfill\MXD\WetlandReport\Figure 1 Vicinity Map.mxd eyan



VICINITY MAP

Legend

Property Boundary

Map Date: 5/17/2018
Source: ESRI 2015
Projection: NAD 1983 State Plane Maryland US Feet

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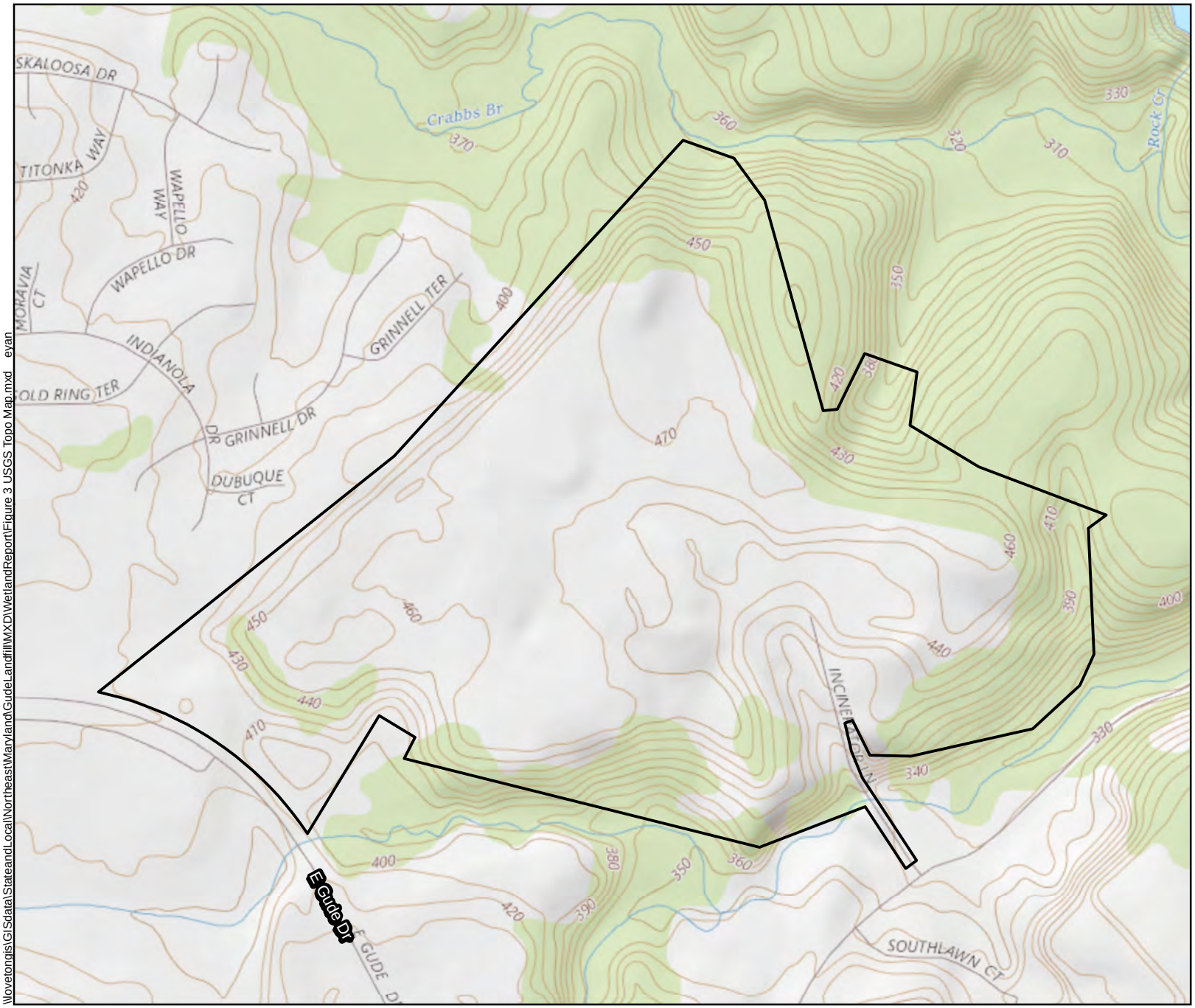
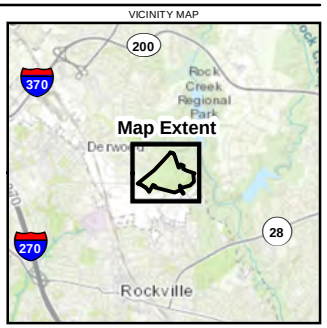
Feet

Figure 2
Area of Review Map
Gude Landfill
Rockville, Maryland

\\lovetongis\GIStata\StateandLocal\Northeast\Maryland\GudeLandfill\MXD\WetlandReport\Figure 2 Area of Review Map.mxd evan





Legend

Property Boundary

Map Date: 5/17/2018
Source: USGS 2016
Projection: NAD 1983 State Plane Maryland US Feet

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0 200 400

Feet

Figure 3
USGS Topographic Map
Gude Landfill Rockville, Maryland

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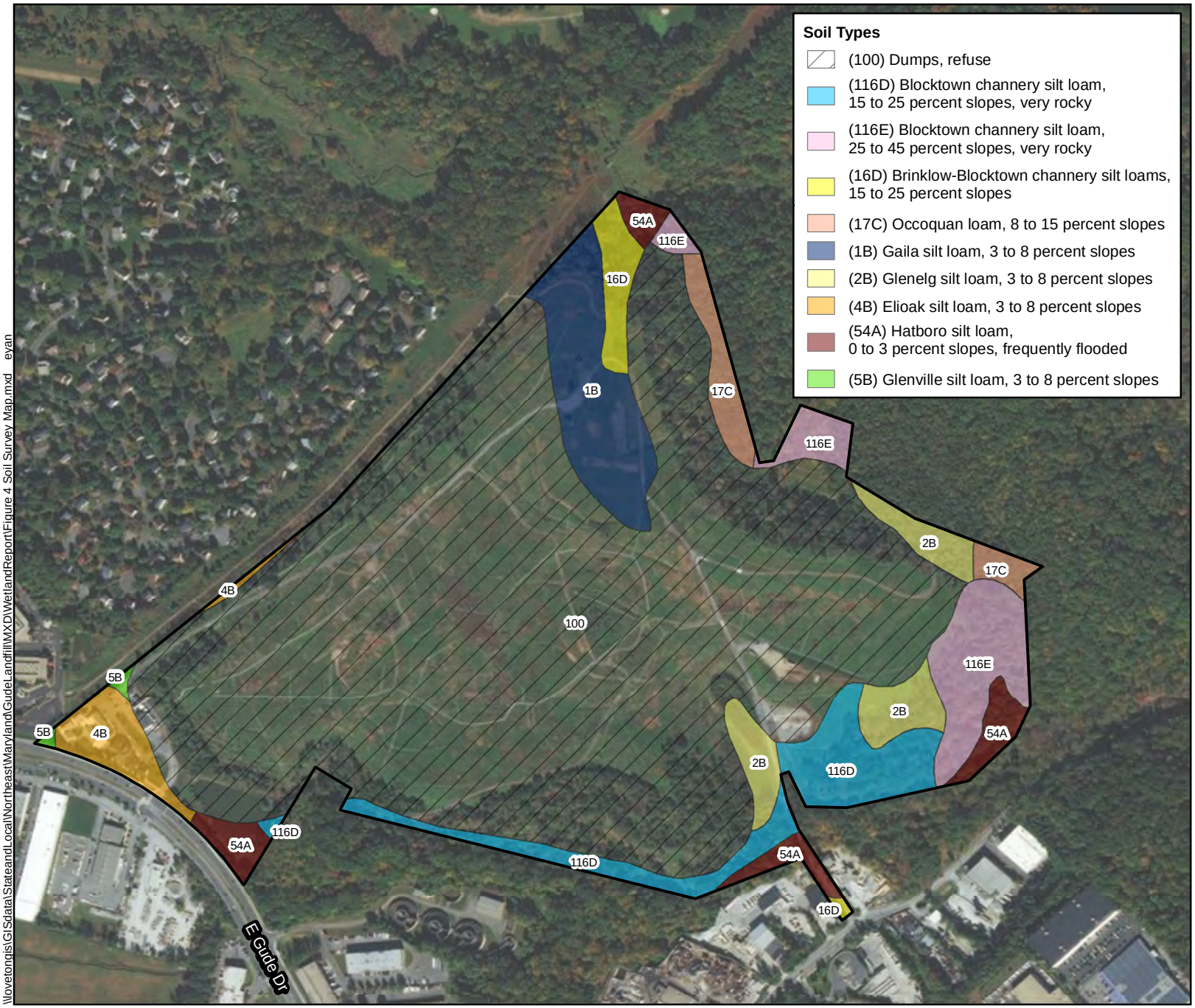

Legend

Property Boundary

Map Date: 5/17/2018
Source: ESRI 2015, USDA 2013
Projection: NAD 1983 State Plane Maryland US Feet

N

0 200 400

Feet

Figure 4
Soil Survey Map
Gude Landfill
Rockville, Maryland

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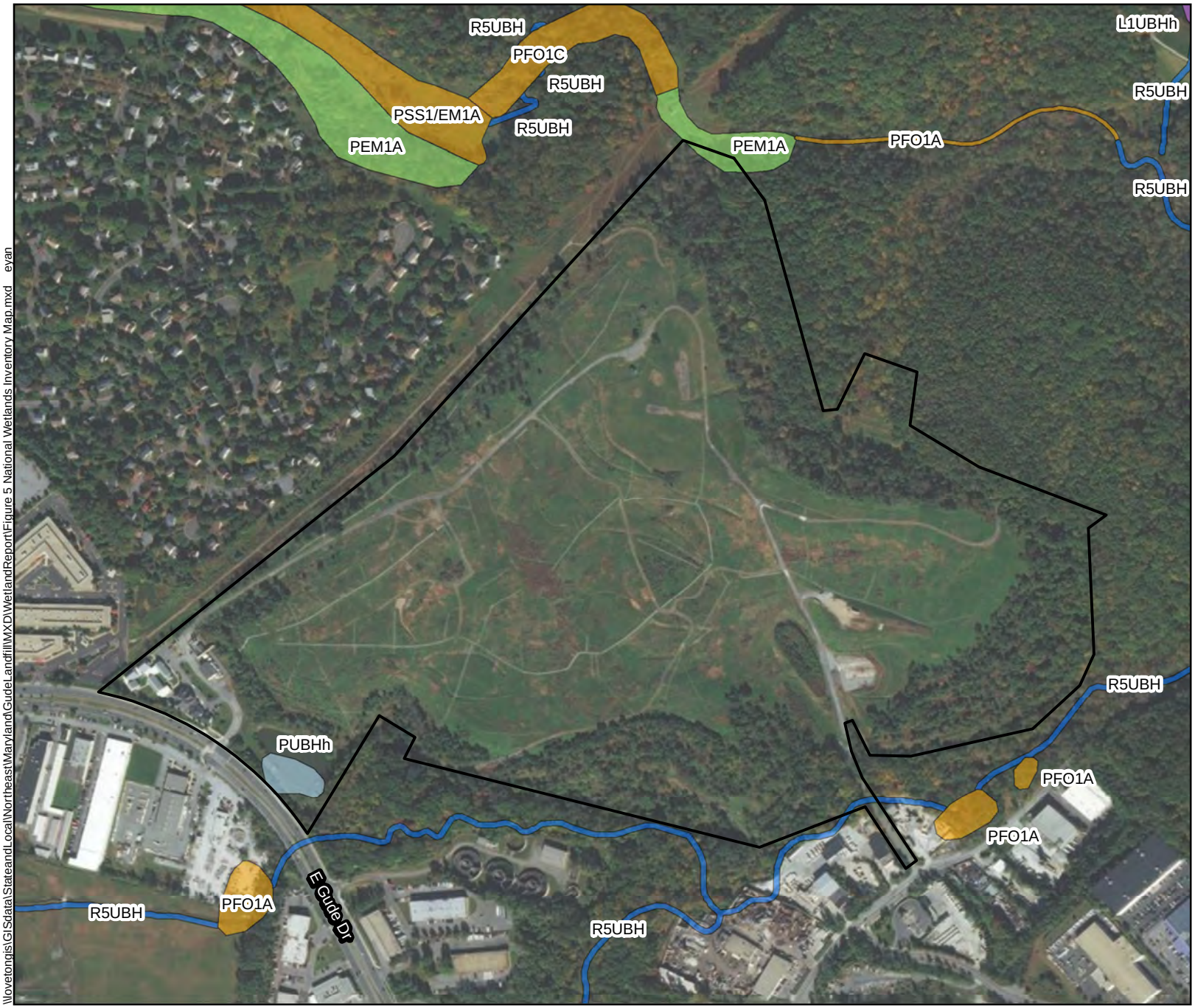

VICINITY MAP

Legend

- Property Boundary
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

Map Date: 12/10/2018
Source: ESRI 2015, USFWS 2017
Projection: NAD 1983 State Plane Maryland US Feet

N

0 200 400

Feet

Figure 5
National Wetlands Inventory Map
Gude Landfill
Rockville, Maryland

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Appendix B

Wetland Delineation Data Forms

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WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region - Interim Version

Project/Site: Gude Landfill | City/County: Montgomery County | Sampling Date: 5/1/18

Applicant/Owner: DEP/DSWS | State: MD | Sampling Point: WETA

Investigator(s): TMK | Section, Township, Range:

Landform (hillslope, terrace, etc.): floodplain | Local Relief (concave, convex, none): concave

Slope %: <5% | Latitude: 39° 06' 29" N | Longitude: 77° 08' 16" W | Datum: NAD83 state plane

Soil Map Unit Name: Hatboro silt loam, 0-3% slopes | NWI Classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐ , Soil ☐ , or hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or hydrology ☐ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☑ No ☐ **Is the Sampled Area within a Wetland?** **Yes** ☑ **No** ☐

Hydric Soil Present? Yes ☑ No ☐

Wetland Hydrology Present? Yes ☑ No ☐ If yes, optional Wetland Site ID: Wetland A

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of 2)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Veg. Concave Surface(B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☑ No ☐ Depth (inches): 4 inches

Saturation Present? Yes ☑ No ☐ Depth (inches): surface

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ☑ **No** ☐

Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use Scientific Names of Plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1 *Acer rubrum*	15	YES	FAC
2			
3			
4			
5			
6			
7			
	15 = Total cover		
	7.5 = 50%	3 = 20%	
Sapling/Shrub Stratum (Plot size: 30 ft)			
1 *Acer rubrum*	15	YES	FAC
2 *Liquidamber styraciflua*	10	YES	FAC
3 *Salix nigra*	15	YES	FACW
4			
5			
6			
7			
	40 = Total Cover		
	20 = 50%	8 = 20%	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1
FACW species	x 2
FAC species	x 3
FACU species	x 4
UPL Species	x 5
Column Totals: (A)	(B)

Prevalance Index = B/A =

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region - Interim Version

Vegetation (continued)

Sampling Point: WETA

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1 *Polystichun acrostichoides*	5	NO	FACU
2 *Symplocarpus foetidus*	25	YES	OBL
3 *Boehmeria cylindrica*	10	YES	FACW
4 *Juncus effusus*	10	YES	FACW
5 *Polygonum sagittatum*	10	YES	FACW
6			
7			
	60	= Total Cover	
	30	= 50% 12	= 20%

Woody Vine Stratum (Plot size: 30 ft)			
1			
2			
3			
4			
5			
6			
7			
	0	= Total Cover	
	0	= 50% 0	= 20%

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide Supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree: Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub: Woody plants less than 3 in. DBH and greater then 3.28 ft (1m) tall.

Herb: All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vines: All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR32/2	100					organic	
2-10	10YR 4/2	90	7.5YR 4/6	10	C	M	Silt loam	
10-20	10YR 5/1	80	10YR 4/6	20	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydron Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prarie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophtic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region - Interim Version

Project/Site: Gude Landfill | City/County: Montgomery County | Sampling Date: 5/1/18

Applicant/Owner: DEP/DSWS | State: MD | Sampling Point: WETB

Investigator(s): TMK | Section, Township, Range:

Landform (hillslope, terrace, etc.): floodplain | Local Relief (concave, convex, none): concave

Slope %: <5% | Latitude: 39° 06' 29" N | Longitude: 77° 08' 16" W | Datum: NAD83 state plane

Soil Map Unit Name: Blocktown channery silt loam, 15-25% slopes | NWI Classification: PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐ , Soil ☐ , or hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or hydrology ☐ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☑ No ☐ **Is the Sampled Area within a Wetland? Yes ☑ No ☐**

Hydric Soil Present? Yes ☑ No ☐

Wetland Hydrology Present? Yes ☑ No ☐ If yes, optional Wetland Site ID: WETLAND B

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of 2)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Veg. Concave Surface(B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? Yes ☑ No ☐ Depth (inches): surface

(includes capillary fringe)

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use Scientific Names of Plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1 *Acer rubrum*	15	YES	FAC
2 *Liquidambar styraciflua*	15	YES	FAC
3 *Quercus phellos*	10	YES	FACW
4			
5			
6			
7			
	40 = Total cover		
	20 = 50%	8 = 20%	
Sapling/Shrub Stratum (Plot size: 30 ft)			
1 *Acer rubrum*	15	YES	FAC
2			
3			
4			
5			
6			
7			
	15 = Total Cover		
	7.5 = 50%	3 = 20%	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1
FACW species	x 2
FAC species	x 3
FACU species	x 4
UPL Species	x 5
Column Totals: (A)	(B)

Prevalance Index = B/A =

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region - Interim Version

Vegetation (continued)

Sampling Point: WETB

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1 *Juncus effusus*	10	YES	FACW
2 *Polygonum sagittatum*	10	YES	FACW
3			
4			
5			
6			
7			
	20 = Total Cover		
	10 = 50%	4 = 20%	
Woody Vine Stratum (Plot size: 30 ft)			
1			
2			
3			
4			
5			
6			
7			
	0 = Total Cover		
	0 = 50%	0 = 20%	

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide Supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree: Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub: Woody plants less than 3 in. DBH and greater then 3.28 ft (1m) tall.

Herb: All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vines: All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	97	10YR 4/4	3	C	M	fine sandy loam	
6-20	10YR 5/1	90	10YR 4/6	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydron Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prarie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophtic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region - Interim Version

Project/Site: Gude Landfill | City/County: Montgomery County | Sampling Date: 5/1/18

Applicant/Owner: DEP/DSWS | State: MD | Sampling Point: WETC

Investigator(s): TMK | Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope - drainage swale | Local Relief (concave, convex, none): concave

Slope %: 5% | Latitude: 39° 06' 29" N | Longitude: 77° 08' 16" W | Datum: NAD83 state plane

Soil Map Unit Name: Dump,refuse | NWI Classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐ , Soil ☐ , or hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or hydrology ☐ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☑ No ☐ **Is the Sampled Area within a Wetland? Yes ☑ No ☐**

Hydric Soil Present? Yes ☑ No ☐

Wetland Hydrology Present? Yes ☑ No ☐ If yes, optional Wetland Site ID: Wetland C

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of 2)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Veg. Concave Surface(B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? Yes ☑ No ☐ Depth (inches): surface

(includes capillary fringe)

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use Scientific Names of Plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
3			
4			
5			
6			
7			
	0 = Total cover		
	0 = 50%	0 = 20%	
Sapling/Shrub Stratum (Plot size: 30 ft)			
1			
2			
3			
4			
5			
6			
7			
	0 = Total Cover		
	0 = 50%	0 = 20%	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1
FACW species	x 2
FAC species	x 3
FACU species	x 4
UPL Species	x 5
Column Totals: (A)	(B)

Prevalance Index = B/A =

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region - Interim Version

Vegetation (continued)

Sampling Point: WETC

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1 *schoenoplectus tabernaemontani*	25	YES	OBL
2 *Eleocharis obtusa*	35	YES	OBL
3			
4			
5			
6			
7			
	60 = Total Cover		
	30 = 50%	12	= 20%

Woody Vine Stratum (Plot size: 30 ft)			
1			
2			
3			
4			
5			
6			
7			
	0 = Total Cover		
	0 = 50%	0	= 20%

Hydrophytic Vegetation Indicators:

- ☑ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide Supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree: Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub: Woody plants less than 3 in. DBH and greater then 3.28 ft (1m) tall.

Herb: All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vines: All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					organic	
2-5	2.5Y 5/2	95	7.5YR 4/6	5	C	PL	Silt loam	
5-12	10YR 4/1	85	10YR 6/8	15	C	M	Silt loam	fill material present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydron Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prarie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophtic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region - Interim Version

Project/Site: Gude Landfill | City/County: Montgomery County | Sampling Date: 5/1/18

Applicant/Owner: DEP/DSWS | State: MD | Sampling Point: UPL1

Investigator(s): TMK | Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope | Local Relief (concave, convex, none): convex

Slope %: 5% -10% | Latitude: 39° 06' 29" N | Longitude: 77° 08' 16" W | Datum: NAD83 state plane

Soil Map Unit Name: dump, refuse | NWI Classification: upland

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐ , Soil ☐ , or hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or hydrology ☐ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Hydric Soil Present? Yes ☐ No ☑

Wetland Hydrology Present? Yes ☐ No ☑

Is the Sampled Area within a Wetland? Yes ☐ No ☑

If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

on upland slope adjacent to wetland A

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of 2)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Veg. Concave Surface(B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? Yes ☐ No ☑ Depth (inches):

(includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use Scientific Names of Plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1 *Acer rubrum*	10	YES	FAC
2 *Liquidambar styraciflua*	5	NO	FAC
3 *Quercus alba*	15	YES	FACU
4 *Liriodendron tulipfera*	20	YES	FACU
5			
6			
7			
	50 = Total cover		
	25 = 50%	10 = 20%	
Sapling/Shrub Stratum (Plot size: 30 ft)			
1 *Ilex opaca*	10	YES	FAC
2 *Kalmia latifolia*	10	YES	FACU
3			
4			
5			
6			
7			
	20 = Total Cover		
	10 = 50%	4 = 20%	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1
FACW species	x 2
FAC species	x 3
FACU species	x 4
UPL Species	x 5
Column Totals: (A)	(B)

Prevalance Index = B/A =

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region - Interim Version

Vegetation (continued)

Sampling Point: UPL1

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
3			
4			
5			
6			
7			
	0 = Total Cover		
	0 = 50%	0 = 20%	

Woody Vine Stratum (Plot size: 30 ft)			
1			
2			
3			
4			
5			
6			
7			
	0 = Total Cover		
	0 = 50%	0 = 20%	

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide Supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree: Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub: Woody plants less than 3 in. DBH and greater then 3.28 ft (1m) tall.

Herb: All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vines: All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	100					silt loam	
4-18	10YR 6/3	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydron Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prarie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophtic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Remarks:

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region - Interim Version

Project/Site: Gude Landfill | City/County: Montgomery County | Sampling Date: 5/1/18

Applicant/Owner: DEP/DSWS | State: MD | Sampling Point: UPL2

Investigator(s): TMK | Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope | Local Relief (concave, convex, none): convex

Slope %: 5% -10% | Latitude: 39° 06' 29" N | Longitude: 77° 08' 16" W | Datum: NAD83 state plane

Soil Map Unit Name: dump, refuse | NWI Classification: upland

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐ , Soil ☐ , or hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or hydrology ☐ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Hydric Soil Present? Yes ☐ No ☑

Wetland Hydrology Present? Yes ☐ No ☑

Is the Sampled Area within a Wetland? Yes ☐ No ☑

If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

Upland slope located adjacent to Wetland B and Pond #4

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of 2)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Veg. Concave Surface(B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? Yes ☐ No ☑ Depth (inches):

(includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use Scientific Names of Plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1 *Acer rubrum*	5	NO	FAC
2 *Liquidambar styraciflua*	5	NO	FAC
3 *Quercus alba*	15	YES	FACU
4 *Liriodendron tulipfera*	20	YES	FACU
5 *Fagus grandifolia*	2	NO	FACU
6			
7			
	47 = Total cover		
	23.5 = 50%	9.4 = 20%	
Sapling/Shrub Stratum (Plot size: 30 ft)			
1 *Liriodendron tulipfera*	15	YES	FACU
2 *Nyssa sylvatica*	10	YES	FAC
3			
4			
5			
6			
7			
	25 = Total Cover		
	12.5 = 50%	5 = 20%	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1
FACW species	x 2
FAC species	x 3
FACU species	x 4
UPL Species	x 5
Column Totals: (A)	(B)

Prevalance Index = B/A =

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region - Interim Version

Vegetation (continued)

Sampling Point: UPL2

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1 *Polystichum acrostichoid*	10	YES	FACU
2			
3			
4			
5			
6			
7			
	10 = Total Cover		
	5 = 50%	2	= 20%
Woody Vine Stratum (Plot size: 30 ft)			
1 *Lonicera japonica*	15	YES	FAC
2			
3			
4			
5			
6			
7			
	15 = Total Cover		
	7.5 = 50%	3	= 20%

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide Supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree: Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub: Woody plants less than 3 in. DBH and greater then 3.28 ft (1m) tall.

Herb: All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vines: All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/3	100					silt loam	
4-12	10YR 4/4	100					silt loam	
12+	rock refusal							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydron Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prarie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophtic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Remarks:

Appendix C

Site Photographs

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Wetland Delineation Photographs
Gude Landfill
Photos Taken: October 2009 and April 2018

Photograph 1: Stream Channel #1 on the northeast corner of the project site.

Photograph 2: Upstream portion of Stream Channel #2.

Photograph 3: Hydric Soils within Wetland A.

Photograph 4: Overview of Wetland A.

Wetland Delineation Photographs
Gude Landfill
Photos Taken: October 2009 and April 2018

Photograph 5: Overview of Wetland B.

Photograph 6: Overview of Pond #4.

Photograph 7: Overview of Wetland C.

Photograph 8: Wetland C, soil sample.

Wetland Delineation Photographs
Gude Landfill
Photos Taken: October 2009 and April 2018

Photograph 9: Upland soil sample typically observed throughout the upland forest slopes.

Photograph 10: Overview of Gude Landfill, cleared plateau.

Photograph 11: M-NCPPC Pond located offsite to the east.

Photograph 12: Pond #1 located offsite to the southwest.

Appendix D

Wetland Delineation Map

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NOTES

1. PROJECT NAME: GUDE LANDFILL
2. LOCATION: 600 EAST GUDE DRIVE, ROCKVILLE, MARYLAND
3. OWNER: MONTGOMERY COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF SOLID WASTER SERVICES (DEP/DSWS)
4. PLAN PREPARED BY: EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC 225 SCHILLING CIRCLE, SUITE 400, HUNT VALLEY, MARYLAND
5. TOTAL AREA OF REVIEW:
6. PROPERTY BOUNDARIES AND OWNER INFORMATION ARE BASED ON BASED ON A DRAWING ENTITLED "GUDE LANDFILL - PROPERTY EXCHANGE WITH M-NCPPC" PREPARED BY C.C. JOHNSON & MALHOTRA, P.C., DATED 05/23/2012.
7. THIS WETLAND DELINEATION PLAN WAS PREPARED FROM A BASE PLAN TITLED GUDE LANDFILL BOUNDARY COMPOSITE, DATED OCTOBER 8, 2009 PREPARED BY CCJM ENGINEERING INFRASTRUCTURE SOLUTIONS (CCJM).
8. THE WATERS OF THE U.S. INCLUDING FEDERALLY REGULATED WETLANDS WERE DELINEATED BY EA ENGINEERING ON OCTOBER 28TH, 30TH, AND NOVEMBER 2, 2009. FLAGS WERE LOCATED USING A TRIMBLE GEO XH GLOBAL POSITIONING SYSTEM INSTRUMENT. EA RE-VISITED THE SITE ON MAY 1, 2018 TO VERIFY THE BOUNDARIES AND CONDITIONS OF THE WATERWAYS. SLIGHT REVISIONS TO THE WETLAND BOUNDARIES WERE MADE AND RE-LOCATED USING A TRIMBLE GEO7X GLOBAL POSITIONING SYSTEM INSTRUMENT.
9. THE WATERS OF THE U.S. INCLUDING FEDERALLY REGULATED WETLANDS IDENTIFIED CONTRIBUTE TO ROCK CREEK. ALL TRIBUTARIES OF ROCK CREEK IN THIS AREA ARE LISTED IN THE CODE OF MARYLAND REGULATIONS (COMAR) STREAM USE CLASSIFICATION INDEX AS USE IV (RECREATIONAL TROUT WATERS).
10. CONDITIONS, PROFESSIONAL EXPERIENCE IN THE AREA WITH SIMILAR PROJECTS, AND GENERALLY ACCEPTED PROFESSIONAL ENVIRONMENTAL PRACTICE UNDER SIMILAR CIRCUMSTANCES. SEASONAL FLUCTUATIONS IN PRECIPITATION OR WEATHER CONDITIONS CAN RESULT IN DIFFERENCES IN THE PERCEPTION OF HYDROLOGIC CONDITIONS, WHICH CAN ALTER
11. IT IS IMPORTANT TO NOTE THE USACE IS THE FEDERAL AGENCY THAT DETERMINES THE OFFICIAL JURISDICTIONAL STATUS OF WETLANDS/WATERWAYS. FURTHERMORE, THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) CAN REGULATE WETLANDS/WATERWAYS CONSIDERED NON-JURISDICTIONAL BY THE USACE. TO DETERMINE WHETHER THE USACE OR THE MDE WILL TAKE JURISDICTION OVER ANY AREAS OF THE SUBJECT PROPERTY, AN APPLICATION FOR A PERMIT OR JURISDICTIONAL DETERMINATION REQUEST SHOULD BE SUBMITTED JOINTLY TO THESE AGENCIES.

LEGEND

DESCRIPTION	EXISTING	PROPOSED
PROPERTY BOUNDARY AND AREA OF REVIEW		NA
ADJOINER BOUNDARY		NA
CONTOUR		NA
TREE LINE		NA
FENCE LINE		NA
DIRT ROAD		NA
APPROXIMATE STREAM CENTER LINE		NA
NONTIDAL WETLAND		NA
POND		NA

AREA OF WETLANDS/WATERS

DELINEATED FEATURE	RESOURCE	SIGNIFICANT NEXUS DETERMINATION	DIMENSIONS WITHIN PROJECT SITE
STREAM CHANNEL #1	PERENNIAL STREAM	RPW (YEAR ROUND)	67.43 L.F.
STREAM CHANNEL #2	PERENNIAL STREAM	RPW (YEAR ROUND)	452.21 L.F.
*STREAM CHANNEL #3	EPHEMERAL STREAM	NON-RPW	187.71 L.F.
WETLAND SYSTEM A	EMERGENT WETLAND	ABUTTING RPW	9,702.28 S.F. / 0.22 AC.
WETLAND SYSTEM B	FORESTED WETLAND	ABUTTING RPW	2,965.06 S.F. / 0.06 AC.
WETLAND SYSTEM C	EMERGENT WETLAND	ADJACENT RPW	1,342.46 S.F. / 0.03 AC.
POND #4	OPEN WATER POND W/ EMERGENT WETLAND	ADJACENT RPW	6,303.30 S.F. / 0.15 AC.**

* LOCATED OUTSIDE PROJECT SITE

** APPROXIMATE AREA DETERMINED FROM TOPOGRAPHY AND AERIAL PHOTOGRAPHY

0 100 200 400
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: TK
DRAWN BY: SMB
CHECKED BY: TK
PROJECT MANAGER: LJO

SEAL

GUDE LANDFILL
REMEDIATION DESIGN

MONTGOMERY COUNTY, MARYLAND

WETLAND DELINEATION PLAN

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

DATE: MAY 2018

PROJECT NUMBER: 1564601

W-1

SHEET: 1 OF 1

Attachment E

Traffic Impact Study

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FINAL
TRAFFIC IMPACT STUDY
for
GUDE LANDFILL REMEDIATION PROJECT

ROCKVILLE, MARYLAND

Prepared for

Montgomery County Department of Environmental Protection

Division of Solid Waste Services

In Association With

EA Engineering Science and Technology, Inc., PBC

Prepared by:

T3 Design Corporation
10340 Democracy Lane, Suite 305
Fairfax, VA 22030
Phone: (703) 359-5861
Fax: (703) 359-5863

June 2019

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LIST OF ACRONYMS AND ABBREVIATIONS

1. AADT – Average Annual Daily Traffic
2. CLV – Critical Lane Volume
3. DEP – Department of Environmental Protection
4. LOS – Level of Service
5. MNCPPC – Maryland National Capital Park and Planning Commission
6. v/c – volume/capacity
7. WSSC – Washington Suburban Sanitary Commission

Introduction

This study evaluates traffic impacts from the Gude Landfill Remediation Project in Rockville, Maryland. The landfill is currently owned by Montgomery County, Maryland, and maintained by the Montgomery County Department of Environmental Protection (DEP). The landfill property currently encompasses 162 acres, of which approximately 140 acres is used for waste disposal.

The County performed a land exchange of 17 acres of land with the Maryland-National Capital Park and Planning Commission (MNCPPC) in 2014. The County plans to construct a toupee landfill capping system with a potential recreational land use component. This study determines the additional traffic generated during the construction of the proposed landfill capping system and its impacts on the adjacent roadways and intersections.

The scope of this study involves analyzing impacts of construction traffic at the following intersections adjacent to the landfill site:

1. East Gude Drive and Landfill Access (North)
2. East Gude Drive and Dover Road
3. East Gude Drive and Southlawn Lane
4. Southlawn Lane and Incinerator Lane (Landfill Access)

Figure 1 illustrates the location of Gude Landfill and the study intersections.

Construction for the project is expected to begin in 2020 and be completed in 2023. The traffic impact study follows the three-step process as required by MNCPPC for intersection analysis for the following traffic conditions:

- Existing traffic conditions (2018)
- Background traffic conditions (2022) – Traffic projection due to other developments in the vicinity of the project area
- Total traffic conditions (background plus trips generated by the construction traffic)

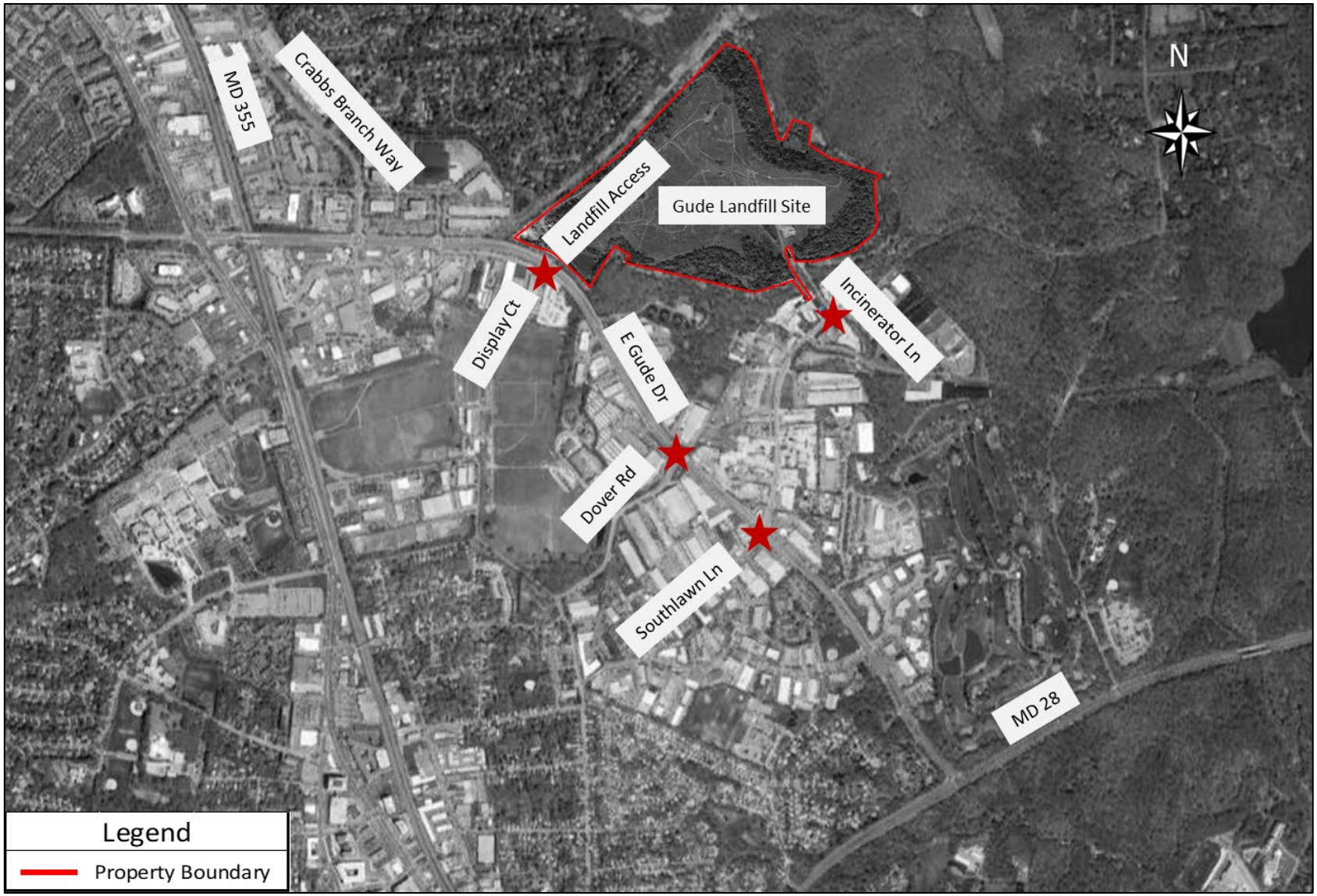
Although construction is expected to last for about four years (beginning in 2020 and finishing sometime in 2023) the background and total conditions analyses were conducted for 2022 when the background traffic is expected to be at maximum.

Capacity was analyzed using Maryland State Highway Critical Lane Volume (CLV) methodology. Results were as follows:

- **Existing conditions** - All intersections currently operate at level of service (LOS) C or better
- **Background traffic conditions** – All intersections operate at LOS C or better
- **Total traffic conditions** – All intersections operate at LOS C or better. The East Gude Drive at Landfill Access intersection drops from LOS B to C in the AM peak hour, but this is still within acceptable service levels.

The results of the capacity analyses indicate that there are no significant impacts of the construction traffic at the study intersections. Therefore, no roadway improvements are required due to the additional generated traffic.

Figure 1: Site Location and Study Intersections



Existing Conditions

Site Access and Adjacent Development

There are two entrances to the landfill site:

1. From East Gude Drive, opposite from Display Court
2. From Southlawn Lane at Incinerator Lane

The traffic generated during construction will access the site via the intersection of Southlawn Lane and Incinerator Lane. Land use surrounding the project site consists of light industrial and residential developments, including the following specific properties:

- M-NCPPC land and Crabbs Branch Stream, located to the northeast of Gude Landfill site
- Asphalt and cement production facilities, equipment storage yards, scrap recycling facilities to the southeast of the site
- Washington Suburban Sanitary Commission (WSSC) property and Southlawn Branch stream to the south
- Williams Gas Pipeline Transco/Columbia Gas natural gas pipeline right-of-way and the community of Derwood Station residential development to the west

Study Intersections

Four study intersections are located adjacent to the Gude Landfill site and are expected to be impacted by the construction traffic.

1. East Gude Drive at Landfill Access North – is a four-legged stop-controlled intersection. The north entrance to the Gude Landfill site intersects East Gude Drive opposite from Display Court. Traffic flows freely on East Gude Drive, and both the landfill site entrance and Display Court are stop-controlled. There is a signalized pedestrian crosswalk on the west sides of the intersection.

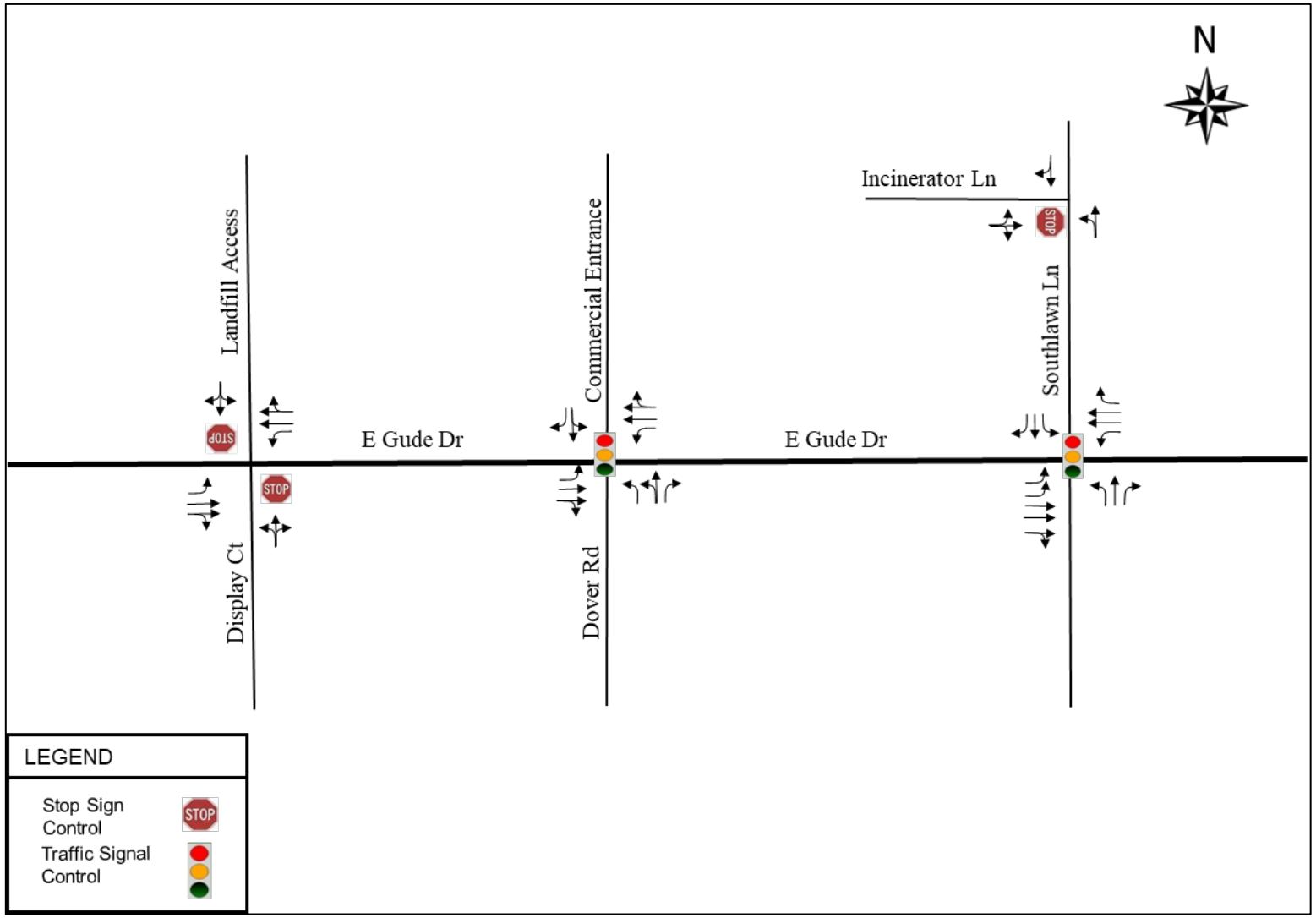
2. East Gude Drive at Dover Road – is a four-legged signalized intersection. The northbound and southbound approaches on Dover Road operate with "split" phases. There are marked pedestrian crosswalks on the east, west, and south sides of the intersection with pedestrian signal heads.

3. East Gude Drive at Southlawn Lane – is a four-legged signalized intersection. There are marked pedestrian crosswalks on the east, west, and north sides of the intersection with pedestrian signal indications.

4. Southlawn Lane and Incinerator Lane – is a T-intersection where Southlawn Lane flows freely and Incinerator Lane is the stop-controlled side street. There are no dedicated turn lanes at this intersection.

Figure 2 shows the lane configuration at each the study intersections, along with the type of traffic control.

Figure 2: Study Intersection Lane Configuration and Traffic Control



(2018) Existing Volume

The 3-hour AM and PM peak period turning movement counts were collected by T3 Design on Wednesday, May 30, 2018, at the following intersections:

1. East Gude Drive and Landfill Access (North)
2. East Gude Drive and Dover Road
3. East Gude Drive and Southlawn Lane
4. Southlawn Lane and Incinerator Lane (Landfill Entrance)

A review of the counts indicates the AM peak hour is from 7:30 a.m. to 8:30 a.m. and the PM peak hour is from 4:45 to 5:45 p.m. Figure 3 presents AM and PM peak hour turning movement counts at the study intersections. The raw count data is provided in Appendix A.

Figure 3: Existing Year (2018) AM and PM Peak Hour Volume

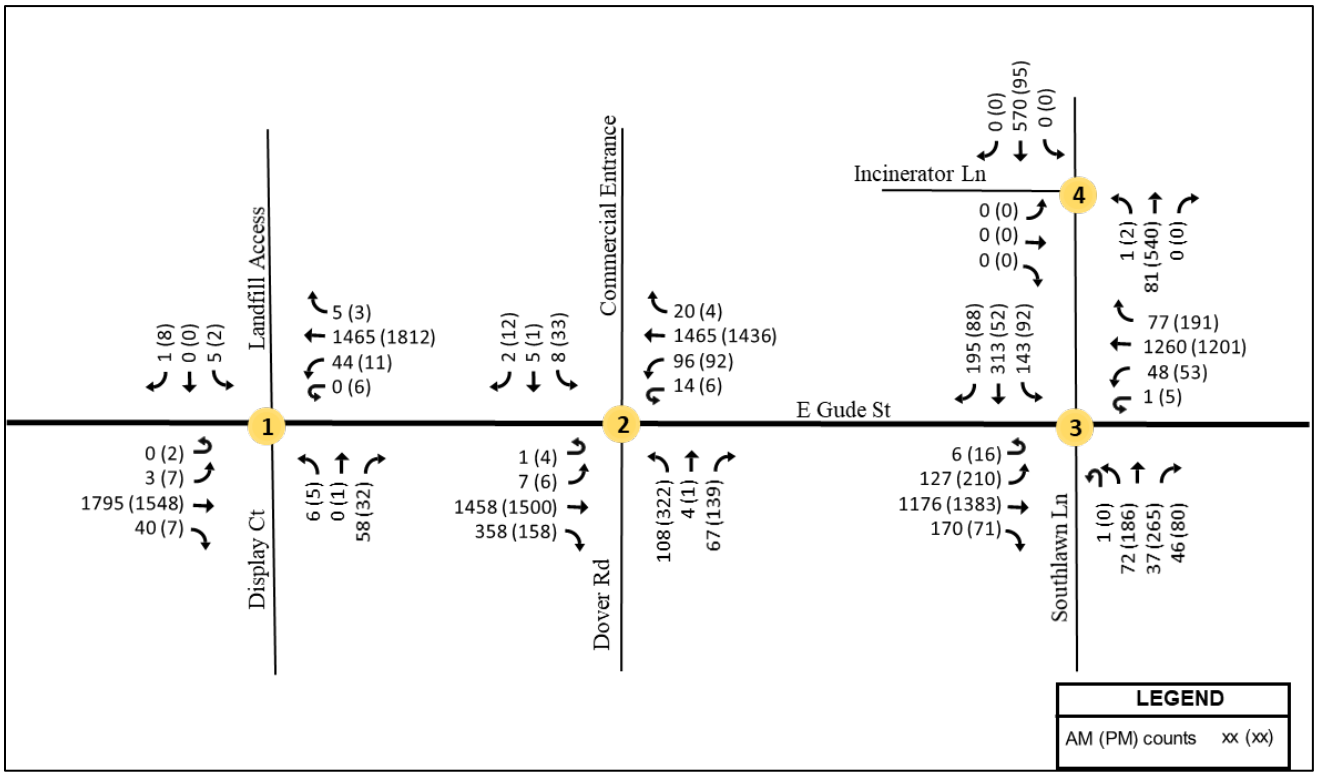


Table 1 displays the 2017 average annual daily traffic (AADT) volumes published by State Highway Administration (SHA) for roadways adjacent to the study site.

Table 1: 2017 AADT

Roadway	Vehicles per Day (vpd)
East Gude Drive	33,300
Dover Road	5,814
Southlawn Lane	8,065

The vehicle classification report published by SHA indicates that the daily heavy vehicle percentage for East Gude Road is 7.46 percent.

As part of the classified counts, the pedestrian volumes were recorded during both AM and PM peak periods. However, the counts during the peak period do not present a considerable demand for pedestrian along the study corridor.

Capacity Analysis: Existing Conditions

The study intersections were analyzed using SHA Critical Lane Volume (CLV) methodology. In this methodology, critical lane volumes at an intersection are calculated and added. The sum of the critical lane volume is then compared with the established maximum values for each level of service, LOS A through F, to evaluate the performance of each intersection.

The volume/capacity (v/c) ratio represents the sufficiency of an intersection to accommodate vehicular demand. It is calculated as the CLV divided by 1,600 vehicles/hour/lane. A v/c ratio greater than 0.91 is the threshold at which the intersection is considered to operate at an oversaturated condition.

Table 2 displays the CLV level of service criteria.

Table 2: CLV Level of Service (LOS) Criteria

LOS		CLV	v/c
A	≤	1000	0.63
B	≤	1150	0.72
C	≤	1300	0.81
D	≤	1450	0.91
E	≤	1600	1
F	>	1600	1

The CLV level of service results are presented in Table 3.

Table 3: LOS – Existing Conditions

Intersection #	Intersections	Existing Condition (2018)	
		AM LOS (CLV) (v/c)	PM LOS (CLV) (v/c)
1	E. Gude Drive at Landfill Access	B (1124) (0.70)	B (1055) (0.66)
2	E. Gude Drive at Dover Road	C (1190) (0.74)	C (1195) (0.75)
3	E. Gude Drive at Southlawn Lane	B (1132) (0.71)	B (1167) (0.73)
4	Southlawn Lane at Incinerator Lane	A (572) (0.36)	A (542) (0.34)

The results show that all intersections currently operate at LOS C or better during both peak hours. The CLV calculation sheets are provided in Appendix B.

Future Traffic Conditions (2022)

Background Traffic Volume

The construction for the Gude Landfill Remediation project is expected to begin in 2020 and be completed by 2023. With or without the landfill project, traffic volumes are expected to increase along East Gude Road and roadways adjacent to the site. This increase in traffic volume is known as background traffic growth. It does not include trips generated by construction at the Gude Landfill site that are accounted for separately.

A 0.5 percent annual traffic growth rate was used to prepare future traffic volumes projections for 2022. The year 2022 was selected to evaluate the worst-case scenario, since most of the construction at the Gude Landfill site will be completed, and the potential development in the vicinity of the site is also expected to be built by then. The traffic growth rate was based on review of historical traffic volumes on East Gude Road, planned developments adjacent to the study site, engineering judgement, and coordination with the County and EA Engineering, as detailed below.

Annual Traffic Growth Rate

A review of the historical AADT along East Gude Road (from 2007 through 2016) indicates a decrease in daily traffic volume along the road over that period. The Montgomery County land use database did not indicate any future development planned in the proximity of the construction site that may directly impact the study intersections.

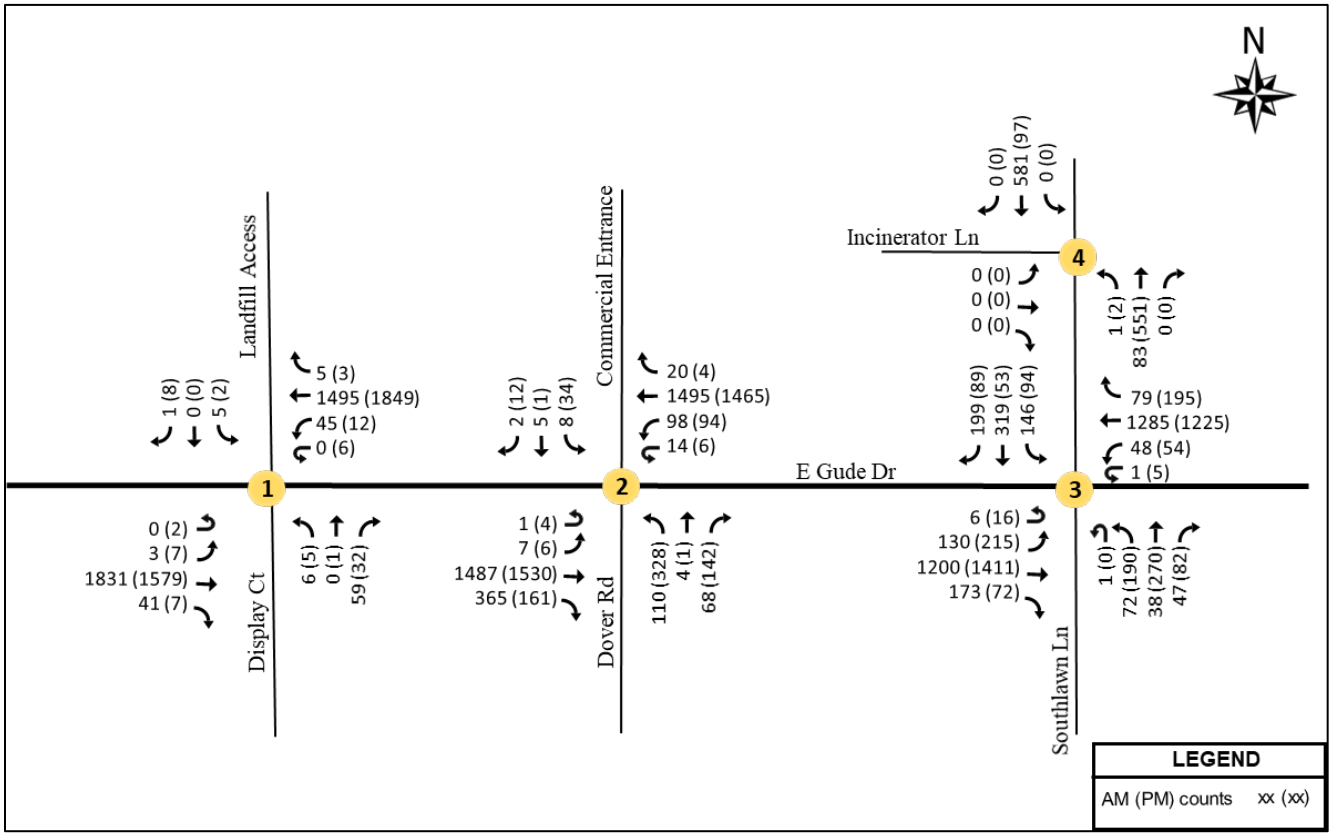
For long-range traffic improvements, the County indicated a future improvement planned at the intersection of East Gude Road at Crabbs Branch Way that is not likely to generate additional traffic impacting the study intersections.

The Washington Suburban Sanitary Commission (WSSC) has proposed construction of a Septage Discharge Facility adjacent to the Gude Landfill site that may overlap with the construction at the Gude Landfill site. A letter submitted by the WSSC Project Manager to the County dated February 20, 2018, indicates that the construction at the WSSC site is expected to generate less than 50 new trips during either the AM or PM peak hour. Construction vehicles for the WSSC site are not expected to cause queueing onto East Gude Drive, so no traffic impact study was prepared for that project.

Based on the review of all available resources and coordination with the County and EA Engineering, it is expected that projecting the existing peak hour traffic volumes by 0.5 percent annual growth rate over the 4-year period (2018 through 2022) will encompass increases in traffic volume due to any potential local and regional developments in the vicinity of the study area.

The resulting 2022 background traffic projections are presented in Figure 4. Appendix C includes calculations of the annual growth rate along East Gude Drive based on historical traffic volumes, a copy of letter from WSSC and a copy of the correspondence with the County for the improvements at the Gude Drive and Crabbs Branch.

Figure 4: 2022 Background Traffic Volume Projections



Total Future Traffic Volumes

The total traffic volumes expected in 2022 are composed of two components added together:

1. Background traffic volume projections
2. Trips generated by construction during the Gude Landfill Remediation project

Based on the information provided by EA Engineering, about 50 construction trucks are expected to deliver the material at the site during the AM peak hour, with a 50/50 percent split between inbound and outbound trips. There is no expected truck traffic at the construction site in the PM peak hour. Additionally, 20 workers are expected to work at the site every day. To account for the workers, 20 additional trips were considered accessing the site during both AM and PM peak hours.

The inbound and outbound split for the workers' trips during each peak hour were estimated using the ITE Trip Generation Manual (9th Edition) for Light Industrial Land Use (LU 110). For this land use, 83 percent inbound and 13 percent outbound trips are expected in the AM peak hour, and 21 percent inbound and 79 percent outbound trips are expected in the PM peak hour. Table 5 itemizes trip estimates due to construction vehicle and worker commute traffic during both peak hours.

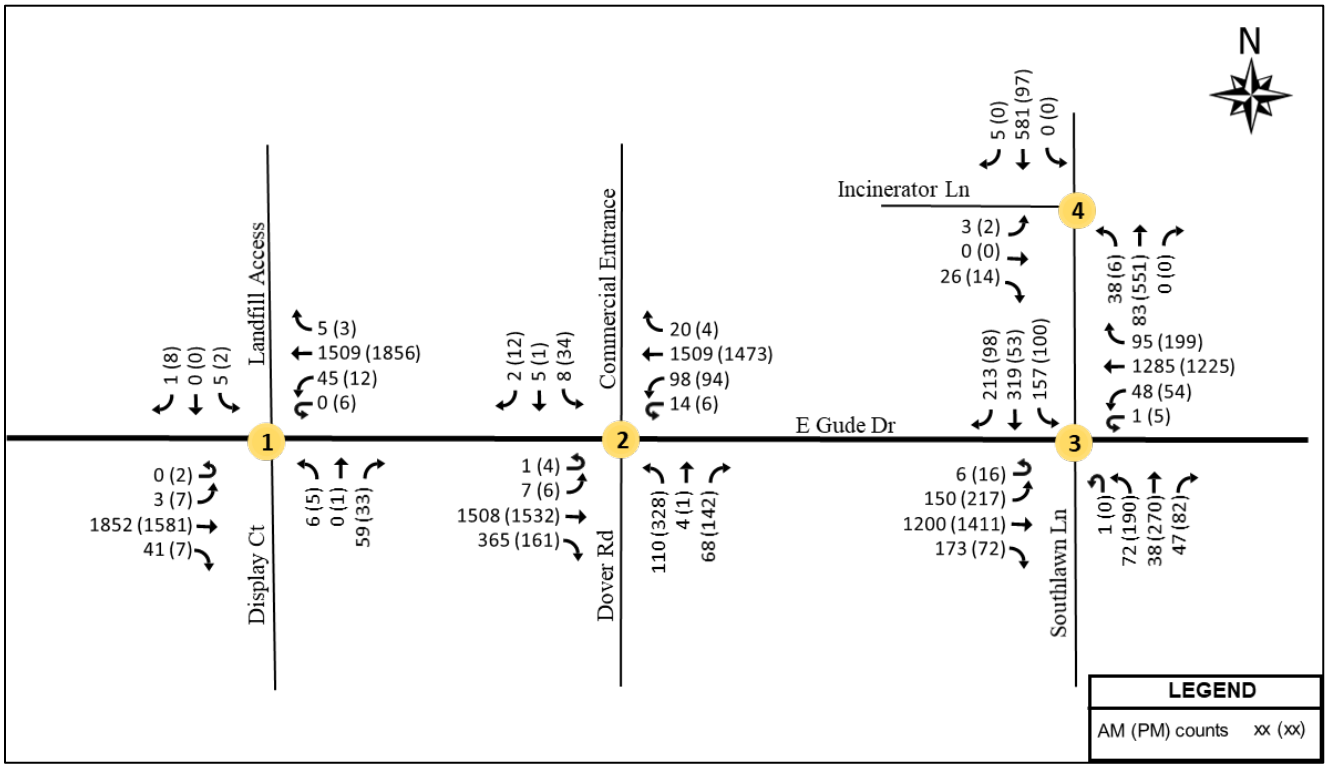
Table 4: Construction-Related Vehicle Trips Generated

Type	AM			PM		
	Total	Inbound	Outbound	Total	Inbound	Outbound
Truck Trips	50	25	25	0	0	0
Workers Trips	20	17	3	20	4	16
Total	**70**	**42**	**28**	**20**	**4**	**16**

All trips will enter and exit the site via the intersection of Southlawn Lane and Incinerator Lane. Trips are distributed to the adjacent roadways and intersections based on existing traffic patterns. Since East Gude Drive is connected with MD 28 (Norbeck Road) to the east and MD 355 (Frederick Road) to the west, 50 percent of the new trips were distributed to the west of the East Gude Drive and Southlawn Lane intersection, 40 percent to the east of the intersection, and 10 percent to Southlawn Lane north.

Figure 5 shows the total AM and PM peak period traffic volumes, including background traffic growth, plus the trips generated by construction.

Figure 5: 2022 Projected Total Peak Hour Traffic Volumes



Future Conditions: Capacity Analysis

CLV results were compared at the study intersections for background growth only and for total traffic conditions in order to determine the impacts of construction. The LOS results are compared in Table 5. The analysis report sheets are provided in Appendix D.

Table 5: LOS – Background vs. Total Traffic Conditions

Intersection #	Intersections	2022 Analysis with Background Traffic		2022 Analysis with Total Traffic	
		AM LOS (CLV) (v/c)	PM LOS (CLV) (v/c)	AM LOS (CLV)	PM LOS (CLV)
1	E. Gude Drive at Landfill Access	B (1147) (0.72)	B (1076) (0.67)	C (1158) (0.72)	B (1080) (0.68)
2	E. Gude Drive at Dover Road	C (1214) (0.76)	C (1220) (0.76)	C (1225) (0.77)	C (1221) (0.76)
3	E. Gude Drive at Southlawn Lane	C (1154) (0.72)	C (1191) (0.74)	C (1177) (0.74)	C (1204) (0.75)
4	Southlawn Lane at Incinerator Lane	A (583) (0.36)	A (553) (0.35)	A (653) (0.41)	A (574) (0.36)

The results indicate that all intersections continue to operate at LOS C or better for both background and total (construction) traffic conditions. The only change in overall intersection service levels is at the intersection of East Gude Drive and the Landfill Access, where there is a decrease in the AM peak hour from LOS B to C. However, LOS C is still well within acceptable service levels.

The overall capacity analysis results indicate that despite the additional trips generated during construction, all intersections are expected to operate at LOS C or better during both peak hours for the existing lane configuration and traffic control type. Therefore, no additional improvements are required due to anticipated construction traffic.

Conclusions

Traffic impacts were analyzed for the Gude Landfill Remediation Project. The construction is expected to begin in 2020 and be completed by 2023. The analyses were conducted for the existing (2018), background (2022) and total traffic conditions using Critical Lane Volume methodology for the following intersections:

1. East Gude Drive and Landfill Access (North)
2. East Gude Drive and Dover Road
3. East Gude Drive and Southlawn Lane
4. Southlawn Lane and Incinerator Lane (Landfill Access)

The results indicate that all intersections operate at LOS C or better during both AM and PM peak hours for all traffic scenarios, existing, background, and construction conditions. The impacts of the construction traffic at the study intersections are minimal, with no change in level of service or significant impact on the critical lane volume. Therefore, no improvements are proposed at the study intersection as a part of the Gude Landfill Remediation project.

Appendix A – Turning Movement Counts

Maryland State Highway Administration
Data Services Engineering Division
Turning Movement Counts - Field Sheet

Job No.:

Location: Display Court at E Gude Drive
Date: 5/30/2018 Wednesday
Recorder: T3D
Interval (dd) : 15 (In Minutes)

County: Montgomery
Town: Rockville
Weather: Clear

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Start	End	Volume	LOS	V/C	PM PERIOD 12:00PM-7:00PM	Start	End	Volume	LOS	V/C
		07:30	08:30	3422				16:45	17:45	3444		

Street Name-->	Landfill Entrance					Display Court					E Gude Drive					E Gude Drive					GRAND
HOUR	From North					From South					From East					From West					
ENDING	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	TOTAL
00:15					0					0					0					0	0
00:30					0					0					0					0	0
00:45					0					0					0					0	0
01:00					0					0					0					0	0
01:15					0					0					0					0	0
01:30					0					0					0					0	0
01:45					0					0					0					0	0
02:00					0					0					0					0	0
02:15					0					0					0					0	0
02:30					0					0					0					0	0
02:45					0					0					0					0	0
03:00					0					0					0					0	0
03:15					0					0					0					0	0
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03:45					0					0					0					0	0
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04:45					0					0					0					0	0
05:00					0					0					0					0	0
05:15					0					0					0					0	0
05:30					0					0					0					0	0
05:45					0					0					0					0	0
06:00					0					0					0					0	0
06:15	0	0	0	0	0	0	0	0	6	6	0	8	147	0	155	0	0	139	3	142	303
06:30	0	0	0	0	0	0	0	0	5	5	0	10	171	0	181	1	0	176	8	185	371
06:45	0	0	0	0	0	0	0	0	5	5	0	14	187	0	201	0	1	233	6	240	446
07:00	0	0	0	0	0	0	1	0	11	12	0	11	243	0	254	0	1	333	9	343	609
07:15	0	0	0	0	0	0	2	0	7	9	0	10	229	0	239	0	0	317	2	319	567
07:30	0	0	0	0	0	0	0	0	15	15	0	11	316	1	328	2	0	367	6	375	718
07:45	**0**	**1**	**0**	**1**	**2**	**0**	**3**	**0**	**8**	**11**	**0**	**12**	**331**	**2**	**345**	**0**	**1**	**441**	**13**	**455**	**813**
08:00	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**18**	**20**	**0**	**10**	**403**	**2**	**415**	**0**	**1**	**505**	**8**	**514**	**949**
08:15	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**23**	**23**	**0**	**11**	**384**	**1**	**396**	**0**	**1**	**440**	**12**	**453**	**873**
08:30	**0**	**3**	**0**	**0**	**3**	**0**	**1**	**0**	**9**	**10**	**0**	**11**	**347**	**0**	**358**	**0**	**0**	**409**	**7**	**416**	**787**
08:45	0	1	0	1	2	0	3	0	7	10	0	11	349	0	360	3	4	398	13	418	790
09:00	0	0	0	0	0	0	0	0	9	9	2	12	310	2	326	0	2	388	11	401	736
09:15					0					0					0					0	0
09:30					0					0					0					0	0
09:45					0					0					0					0	0
10:00					0					0					0					0	0
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15:15	0	0	0	1	1	0	5	0	5	10	0	5	360	3	368	1	2	321	5	329	708
15:30	0	1	0	0	1	0	2	0	4	6	0	4	367	0	371	0	0	284	6	290	668
15:45	0	1	0	2	3	0	2	0	8	10	1	12	352	1	366	0	0	317	5	322	701
16:00	0	1	0	1	2	0	3	0	8	11	0	3	318	4	325	3	1	360	3	367	705
16:15	0	4	0	2	6	0	1	0	9	10	1	5	418	1	425	3	2	374	1	380	821
16:30	0	0	0	3	3	0	4	0	8	12	0	3	395	3	401	0	2	325	2	329	745
16:45	0	0	0	4	4	0	2	0	9	11	1	2	445	0	448	0	1	365	2	368	831
17:00	**0**	**0**	**0**	**4**	**4**	**0**	**3**	**1**	**4**	**8**	**3**	**0**	**404**	**1**	**408**	**1**	**5**	**397**	**1**	**404**	**824**
17:15	**0**	**1**	**0**	**2**	**3**	**0**	**1**	**0**	**17**	**18**	**1**	**8**	**483**	**0**	**492**	**0**	**0**	**414**	**4**	**418**	**931**
17:30	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**8**	**8**	**2**	**1**	**440**	**1**	**444**	**0**	**1**	**366**	**1**	**368**	**821**
17:45	**0**	**1**	**0**	**1**	**2**	**0**	**1**	**0**	**3**	**4**	**0**	**2**	**485**	**1**	**488**	**1**	**1**	**371**	**1**	**374**	**868**
18:00	0	0	0	1	1	0	2	0	5	7	0	8	388	0	396	2	0	373	4	379	783
18:15					0					0					0					0	0
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23:30					0					0					0					0	0
23:45					0					0					0					0	0
00:00					0					0					0					0	0
TOTAL	**0**	**15**	**0**	**24**	**39**	**0**	**38**	**1**	**211**	**250**	**11**	**184**	**8272**	**23**	**8490**	**17**	**26**	**8413**	**133**	**8589**	**17368**
AM Peak Vol	0	5	0	1	6	0	6	0	58	64	0	44	1465	5	1514	0	3	1795	40	1838	3422
PM Peak Vol	0	2	0	8	10	0	5	1	32	38	6	11	1812	3	1832	2	7	1548	7	1564	3444

Maryland State Highway Administration
Data Services Engineering Division
Turning Movement Counts - Field Sheet

Job No.:

Location: Display Court at E Gude Drive
Date: 5/30/2018 Wednesday
Recorder: T3D
Interval (dd) : 15
(In Minutes)

County: Montgomery
Town: Rockville
Weather: Clear

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Start	End	Volume	LOS	V/C	PM PERIOD 12:00PM-7:00PM	Start	End	Volume	LOS	V/C
		07:30	08:30	3422				16:45	17:45	3444		

SCHOOL CHILDREN, PEDESTRIANS & BICYCLES

Hour	North Leg Landfill Entrance			South Leg Display Court			East Leg E Gude Drive			West Leg E Gude Drive		
Ending	School Children	Pedestrians	Bicycles	School Children	Pedestrians	Bicycles	School Children	Pedestrians	Bicycles	School Children	Pedestrians	Bicycles
00:15												
00:30												
00:45												
01:00												
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06:45	0	0	1	0	0	0	0	0	0	0	1	0
07:00	0	0	0	0	1	0	0	0	0	0	2	0
07:15	0	1	0	0	0	0	0	0	0	0	3	0
07:30	0	0	0	0	2	1	0	0	0	0	1	0
07:45	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**
08:00	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**4**	**0**
08:15	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**
08:30	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**0**
08:45	0	0	0	0	0	0	0	0	0	0	1	0
09:00	0	0	0	0	0	0	0	0	0	0	2	0
09:15												
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15:30	0	1	0	0	0	1	0	0	0	0	2	0
15:45	0	0	0	0	0	0	0	0	0	0	3	0
16:00	0	0	0	0	0	1	0	0	0	0	2	0
16:15	0	0	0	0	1	0	0	0	0	0	5	0
16:30	0	0	0	0	0	2	0	0	0	0	2	0
16:45	0	0	0	0	1	0	0	0	0	0	2	0
17:00	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**
17:15	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
17:30	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
17:45	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18:00	0	0	0	0	0	0	0	0	0	0	2	0
18:15												
18:30												
18:45												
19:00												
19:15												
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22:15												
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22:45												
23:00												
23:15												
23:30												
23:45												
00:00												
TOTAL	**0**	**2**	**3**	**0**	**7**	**10**	**0**	**0**	**0**	**0**	**42**	**0**
AM Peak Vol	0	0	0	0	2	1	0	0	0	0	8	0
PM Peak Vol	0	0	1	0	0	2	0	0	0	0	2	0

Maryland State Highway Administration
Data Services Engineering Division
Turning Movement Counts - Field Sheet

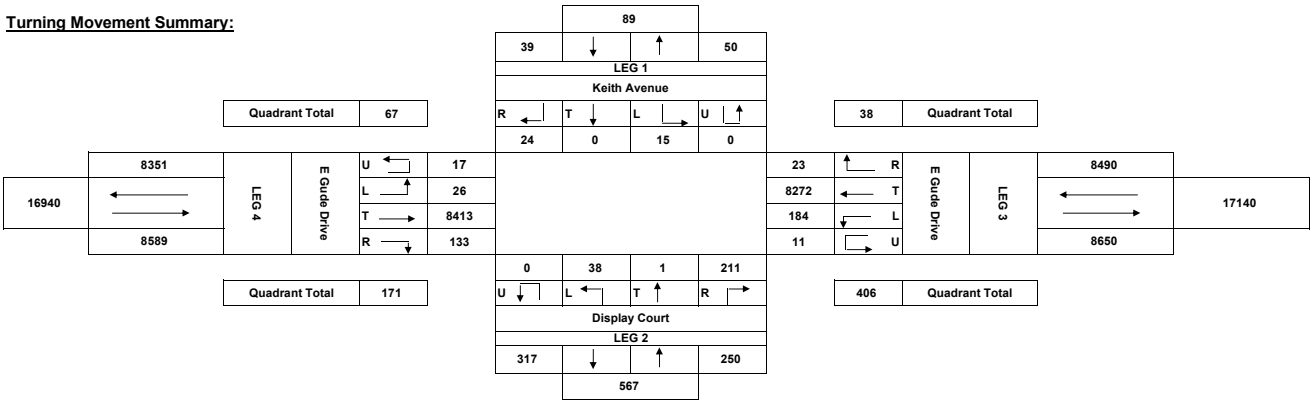
Job No.:

Location: Display Court at E Gude Drive
Date: 5/30/2018 Wednesday
Recorder: T3D
Interval (dd) : 15 (In Minutes)

County: Montgomery
Town: Rockville
Weather: Clear

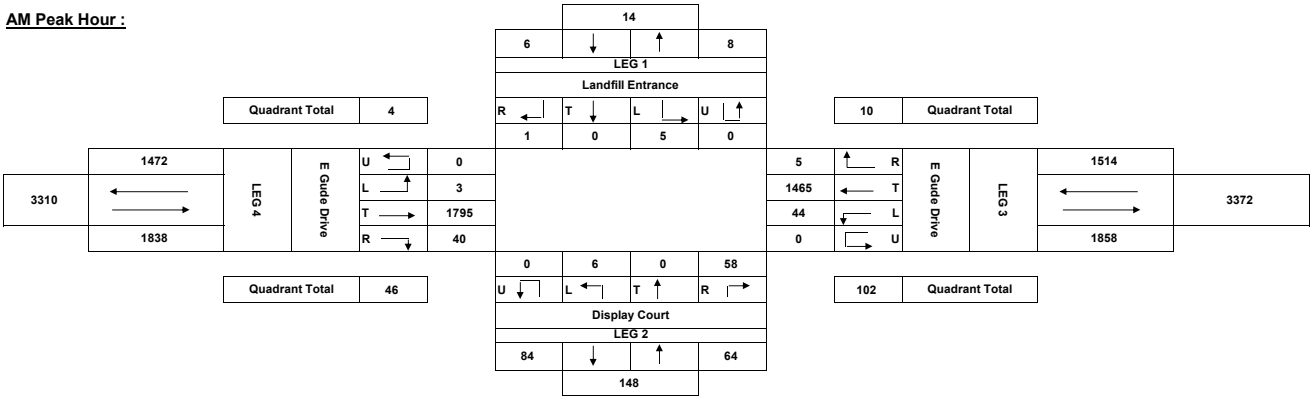
PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Start	End	Volume	LOS	V/C	PM PERIOD 12:00PM-7:00PM	Start	End	Volume	LOS	V/C
		07:30	08:30	3422				16:45	17:45	3444		

Turning Movement Summary:

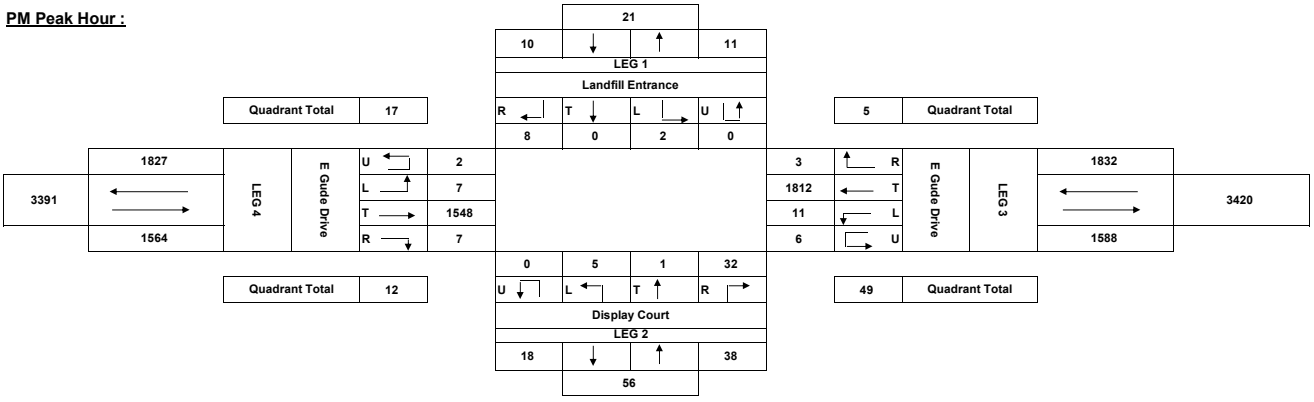


Comments:

AM Peak Hour :



PM Peak Hour :



Maryland State Highway Administration
Data Services Engineering Division
Turning Movement Counts - Field Sheet

Job No.:

Location: Dover Road at E Gude Drive
Date: 5/30/2018 Wednesday
Recorder: T3D
Interval (dd) : 15 (In Minutes)

County: Montgomery
Town: Rockville
Weather: Clear

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Start	End	Volume	LOS	V/C	PM PERIOD 12:00PM-7:00PM	Start	End	Volume	LOS	V/C
		07:30	08:30	3613				16:45	17:45	3714		

Street Name-->	Unnamed Road					Dover Road					E Gude Drive					E Gude Drive					GRAND TOTAL
HOUR	From North					From South					From East					From West					
ENDING	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	
00:15					0					0					0					0	0
00:30					0					0					0					0	0
00:45					0					0					0					0	0
01:00					0					0					0					0	0
01:15					0					0					0					0	0
01:30					0					0					0					0	0
01:45					0					0					0					0	0
02:00					0					0					0					0	0
02:15					0					0					0					0	0
02:30					0					0					0					0	0
02:45					0					0					0					0	0
03:00					0					0					0					0	0
03:15					0					0					0					0	0
03:30					0					0					0					0	0
03:45					0					0					0					0	0
04:00					0					0					0					0	0
04:15					0					0					0					0	0
04:30					0					0					0					0	0
04:45					0					0					0					0	0
05:00					0					0					0					0	0
05:15					0					0					0					0	0
05:30					0					0					0					0	0
05:45					0					0					0					0	0
06:00					0					0					0					0	0
06:15	0	0	0	2	2	0	5	0	11	16	4	10	146	1	161	1	6	115	18	140	319
06:30	0	1	0	0	1	0	9	2	10	21	5	14	174	0	193	0	2	140	26	168	383
06:45	0	1	0	1	2	2	20	1	6	29	0	25	195	0	220	0	2	188	33	223	474
07:00	0	0	0	0	0	0	16	0	10	26	2	20	241	1	264	0	2	256	49	307	597
07:15	0	1	0	0	1	0	20	1	19	40	1	22	238	0	261	1	2	253	49	305	607
07:30	0	1	1	3	5	0	31	3	23	57	5	13	297	5	320	0	1	295	54	350	732
07:45	**0**	**2**	**1**	**0**	**3**	**0**	**24**	**1**	**18**	**43**	**6**	**28**	**326**	**2**	**362**	**0**	**3**	**353**	**84**	**440**	**848**
08:00	**0**	**3**	**1**	**1**	**5**	**0**	**26**	**2**	**14**	**42**	**5**	**20**	**395**	**4**	**424**	**0**	**3**	**381**	**87**	**471**	**942**
08:15	**0**	**1**	**1**	**1**	**3**	**0**	**27**	**1**	**14**	**42**	**3**	**23**	**412**	**11**	**449**	**0**	**1**	**386**	**76**	**463**	**957**
08:30	**0**	**2**	**2**	**0**	**4**	**0**	**31**	**0**	**21**	**52**	**0**	**25**	**332**	**3**	**360**	**1**	**0**	**338**	**111**	**450**	**866**
08:45	0	5	0	1	6	0	38	2	14	54	6	20	337	6	369	0	0	318	89	407	836
09:00	0	4	3	3	10	0	26	0	28	54	4	16	309	12	341	0	2	320	67	389	794
09:15					0					0					0					0	0
09:30					0					0					0					0	0
09:45					0					0					0					0	0
10:00					0					0					0					0	0
10:15					0					0					0					0	0
10:30					0					0					0					0	0
10:45					0					0					0					0	0
11:00					0					0					0					0	0
11:15					0					0					0					0	0
11:30					0					0					0					0	0
11:45					0					0					0					0	0
12:00					0					0					0					0	0
12:15					0					0					0					0	0
12:30					0					0					0					0	0
12:45					0					0					0					0	0
13:00					0					0					0					0	0
13:15					0					0					0					0	0
13:30					0					0					0					0	0
13:45					0					0					0					0	0
14:00					0					0					0					0	0
14:15					0					0					0					0	0
14:30					0					0					0					0	0
14:45					0					0					0					0	0
15:00					0					0					0					0	0
15:15	0	5	0	0	5	0	51	0	22	73	3	12	315	3	333	0	0	286	30	316	727
15:30	0	2	0	2	4	0	50	1	13	64	2	15	313	4	334	1	1	271	26	299	701
15:45	0	8	2	0	10	0	38	2	25	65	3	16	329	3	351	0	1	291	39	331	757
16:00	0	5	1	0	6	0	53	0	22	75	4	19	274	3	300	1	5	323	36	365	746
16:15	0	8	4	4	16	0	68	0	14	82	6	17	398	5	426	2	1	336	23	362	886
16:30	0	6	1	3	10	0	33	1	12	46	8	29	360	3	400	5	2	325	38	370	826
16:45	0	5	1	4	10	0	80	0	14	94	3	10	380	5	398	2	0	328	30	360	862
17:00	**0**	**6**	**0**	**4**	**10**	**0**	**64**	**0**	**36**	**100**	**1**	**29**	**318**	**0**	**348**	**1**	**5**	**385**	**38**	**429**	**887**
17:15	**0**	**10**	**0**	**5**	**15**	**0**	**96**	**0**	**38**	**134**	**2**	**21**	**387**	**1**	**411**	**2**	**1**	**402**	**32**	**437**	**997**
17:30	**0**	**7**	**1**	**1**	**9**	**0**	**89**	**1**	**35**	**125**	**1**	**25**	**334**	**3**	**363**	**0**	**0**	**364**	**41**	**405**	**902**
17:45	**0**	**10**	**0**	**2**	**12**	**0**	**73**	**0**	**30**	**103**	**2**	**17**	**397**	**0**	**416**	**1**	**0**	**349**	**47**	**397**	**928**
18:00	0	7	0	0	7	0	86	1	21	108	1	19	311	0	331	0	2	350	34	386	832
18:15					0					0					0					0	0
18:30					0					0					0					0	0
18:45					0					0					0					0	0
19:00					0					0					0					0	0
19:15					0					0					0					0	0
19:30					0					0					0					0	0
19:45					0					0					0					0	0
20:00					0					0					0					0	0
20:15					0					0					0					0	0
20:30					0					0					0					0	0
20:45					0					0					0					0	0
21:00					0					0					0					0	0
21:15					0					0					0					0	0
21:30					0					0					0					0	0
21:45					0					0					0					0	0
22:00					0					0					0					0	0
22:15					0					0					0					0	0
22:30					0					0					0					0	0
22:45					0					0					0					0	0
23:00					0					0					0					0	0
23:15					0					0					0					0	0
23:30					0					0					0					0	0
23:45					0					0					0					0	0
00:00					0					0					0					0	0
TOTAL	**0**	**100**	**19**	**37**	**156**	**2**	**1054**	**19**	**470**	**1545**	**77**	**465**	**7518**	**75**	**8135**	**18**	**42**	**7353**	**1157**	**8570**	**18406**
AM Peak Vol	0	8	5	2	15	0	108	4	67	179	14	96	1465	20	1595	1	7	1458	358	1824	3613
PM Peak Vol	0	33	1	12	46	0	322	1	139	462	6	92	1436	4	1538	4	6	1500	158	1668	3714

Maryland State Highway Administration
Data Services Engineering Division
Turning Movement Counts - Field Sheet

Job No.:

Location: Dover Road at E Gude Drive
Date: 5/30/2018 Wednesday
Recorder: T3D
Interval (dd) : 15
(In Minutes)

County: Montgomery
Town: Rockville
Weather: Clear

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Start	End	Volume	LOS	V/C	PM PERIOD 12:00PM-7:00PM	Start	End	Volume	LOS	V/C
		07:30	08:30	**3613**				16:45	17:45	**3714**		

SCHOOL CHILDREN, PEDESTRIANS & BICYCLES

Hour	North Leg Unnamed Road			South Leg Dover Road			East Leg E Gude Drive			West Leg E Gude Drive		
Ending	School Children	Pedestrians	Bicycles	School Children	Pedestrians	Bicycles	School Children	Pedestrians	Bicycles	School Children	Pedestrians	Bicycles
00:15												
00:30												
00:45												
01:00												
01:15												
01:30												
01:45												
02:00												
02:15												
02:30												
02:45												
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04:00												
04:15												
04:30												
04:45												
05:00												
05:15												
05:30												
05:45												
06:00												
06:15	0	0	0	0	0	2	0	0	0	0	0	0
06:30	0	0	2	0	1	0	0	0	0	0	0	0
06:45	0	0	0	0	1	1	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	1	0	0	0	0	0	0	0
07:30	0	0	0	0	2	0	0	0	0	0	1	0
07:45	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**
08:00	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:15	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:30	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
08:45	0	1	0	0	2	0	0	0	0	0	1	0
09:00	0	1	1	0	0	0	0	1	2	0	0	0
09:15												
09:30												
09:45												
10:00												
10:15												
10:30												
10:45												
11:00												
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13:30												
13:45												
14:00												
14:15												
14:30												
14:45												
15:00												
15:15	0	0	0	0	0	0	0	0	0	0	1	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	4	0	0	4	0	0	0	0
16:00	0	0	0	0	2	1	0	0	0	0	0	0
16:15	0	2	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	3	2	0	1	0	0	0	0
16:45	0	0	0	0	2	0	0	1	0	0	0	0
17:00	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:15	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:45	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18:00	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0	0	0
19:15												
19:30												
19:45												
20:00												
20:15												
20:30												
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22:00												
22:15												
22:30												
22:45												
23:00												
23:15												
23:30												
23:45												
00:00												
TOTAL	**0**	**4**	**4**	**0**	**21**	**7**	**0**	**7**	**2**	**0**	**4**	**0**
AM Peak Vol	0	0	0	0	3	1	0	0	0	0	1	0
PM Peak Vol	0	0	1	0	0	0	0	0	0	0	0	0

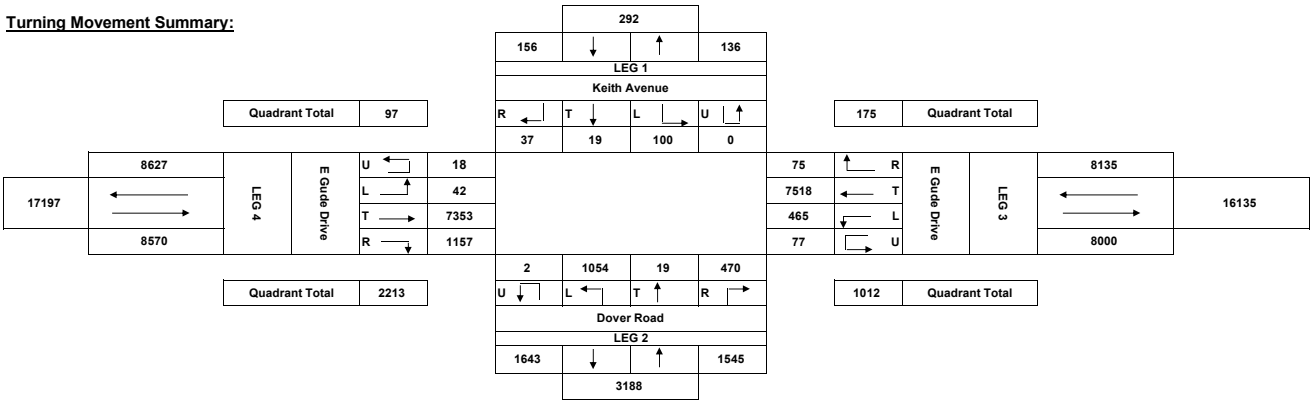
Maryland State Highway Administration
Data Services Engineering Division
Turning Movement Counts - Field Sheet

Job No.:

Location:	Dover Road at E Gude Drive	**County:**	Montgomery
Date:	5/30/2018 Wednesday	**Town:**	Rockville
Recorder:	T3D	**Weather:**	Clear
Interval (dd) : (In Minutes)	15		

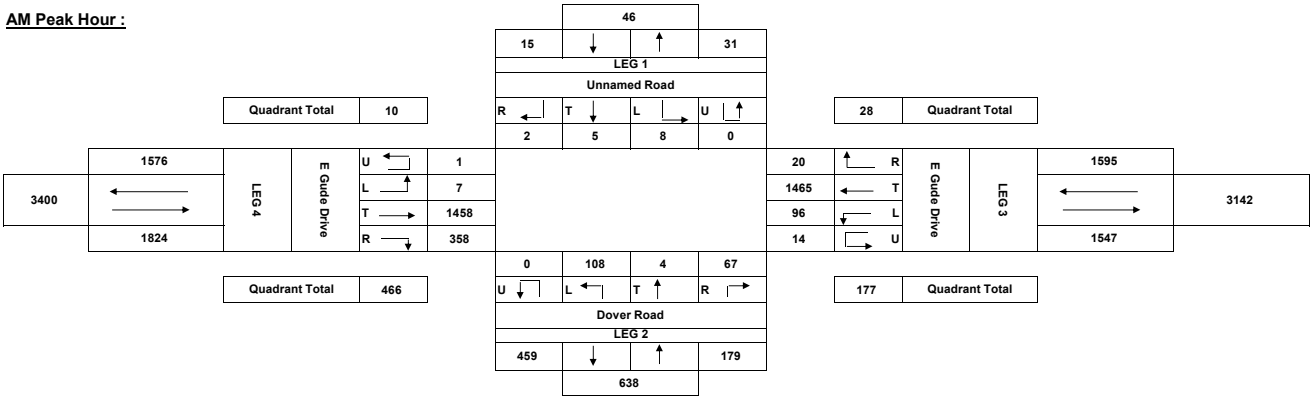
PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Start	End	Volume	LOS	V/C	PM PERIOD 12:00PM-7:00PM	Start	End	Volume	LOS	V/C
		07:30	08:30	**3613**				16:45	17:45	**3714**		

Turning Movement Summary:

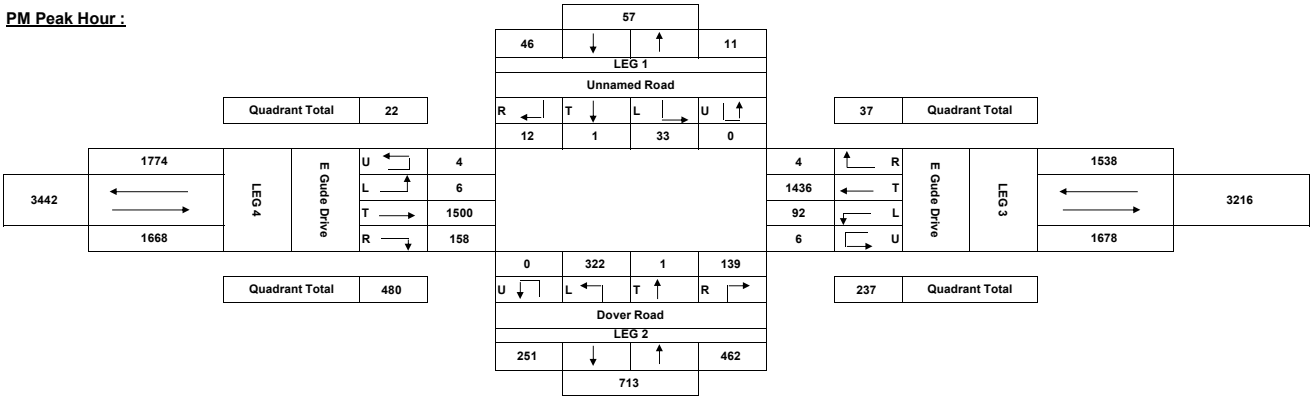


Comments:

AM Peak Hour :



PM Peak Hour :



Maryland State Highway Administration
Data Services Engineering Division
Turning Movement Counts - Field Sheet

Job No.:

Location: Southlawn Lane at Incerator Lane
Date: 5/30/2018 Wednesday
Recorder: T3D
Interval (dd) : 15 (In Minutes)

County: Montgomery
Town: Rockville
Weather: Clear

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Start	End	Volume	LOS	V/C	PM PERIOD 12:00PM-7:00PM	Start	End	Volume	LOS	V/C
		07:45	08:45	**652**				17:00	18:00	**637**		

Street Name-->	Southlawn Lane					Southlawn Lane					N/A					Incerator Lane					GRAND TOTAL
HOUR	From North					From South					From East					From West					
ENDING	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	
00:15					0					0					0					0	0
00:30					0					0					0					0	0
00:45					0					0					0					0	0
01:00					0					0					0					0	0
01:15					0					0					0					0	0
01:30					0					0					0					0	0
01:45					0					0					0					0	0
02:00					0					0					0					0	0
02:15					0					0					0					0	0
02:30					0					0					0					0	0
02:45					0					0					0					0	0
03:00					0					0					0					0	0
03:15					0					0					0					0	0
03:30					0					0					0					0	0
03:45					0					0					0					0	0
04:00					0					0					0					0	0
04:15					0					0					0					0	0
04:30					0					0					0					0	0
04:45					0					0					0					0	0
05:00					0					0					0					0	0
05:15					0					0					0					0	0
05:30					0					0					0					0	0
05:45					0					0					0					0	0
06:00					0					0					0					0	0
06:15	0	0	21	0	21	0	0	5	0	5					0	0	0	0	0	0	26
06:30	0	0	48	0	48	0	0	13	0	13					0	0	0	0	0	0	61
06:45	0	0	49	0	49	0	0	13	0	13					0	0	0	0	0	0	62
07:00	0	0	77	0	77	0	0	14	0	14					0	0	0	0	0	0	91
07:15	0	0	82	0	82	0	0	12	0	12					0	0	0	0	0	0	94
07:30	0	0	116	0	116	0	0	13	0	13					0	0	0	0	0	0	129
07:45	0	0	143	0	143	0	0	10	0	10					0	0	0	0	0	0	153
08:00	**0**	**0**	**156**	**0**	**156**	**0**	**0**	**23**	**0**	**23**					**0**	**0**	**0**	**0**	**0**	**0**	**179**
08:15	**0**	**0**	**138**	**0**	**138**	**1**	**0**	**19**	**0**	**20**					**0**	**0**	**0**	**0**	**0**	**0**	**158**
08:30	**0**	**0**	**136**	**0**	**136**	**0**	**0**	**20**	**0**	**20**					**0**	**0**	**0**	**0**	**0**	**0**	**156**
08:45	**0**	**0**	**140**	**0**	**140**	**0**	**0**	**19**	**0**	**19**					**0**	**0**	**0**	**0**	**0**	**0**	**159**
09:00	0	0	136	0	136	0	0	15	0	15					0	0	0	0	0	0	151
09:15					0					0					0					0	0
09:30					0					0					0					0	0
09:45					0					0					0					0	0
10:00					0					0					0					0	0
10:15					0					0					0					0	0
10:30					0					0					0					0	0
10:45					0					0					0					0	0
11:00					0					0					0					0	0
11:15					0					0					0					0	0
11:30					0					0					0					0	0
11:45					0					0					0					0	0
12:00					0					0					0					0	0
12:15					0					0					0					0	0
12:30					0					0					0					0	0
12:45					0					0					0					0	0
13:00					0					0					0					0	0
13:15					0					0					0					0	0
13:30					0					0					0					0	0
13:45					0					0					0					0	0
14:00					0					0					0					0	0
14:15					0					0					0					0	0
14:30					0					0					0					0	0
14:45					0					0					0					0	0
15:00					0					0					0					0	0
15:15	0	0	23	0	23	0	0	51	0	51					0	0	0	0	0	0	74
15:30	0	0	27	0	27	0	0	46	0	46					0	0	0	0	0	0	73
15:45	0	0	30	0	30	0	0	62	0	62					0	0	0	0	0	0	92
16:00	0	0	25	0	25	0	0	46	0	46					0	0	0	0	0	0	71
16:15	0	0	26	0	26	0	0	74	0	74					0	0	0	0	0	0	100
16:30	0	0	20	0	20	0	0	106	0	106					0	0	0	0	0	0	126
16:45	0	0	23	0	23	0	0	92	0	92					0	0	0	0	0	0	115
17:00	0	0	34	0	34	0	0	97	0	97					0	0	0	0	0	0	131
17:15	**0**	**0**	**23**	**0**	**23**	**1**	**0**	**143**	**0**	**144**					**0**	**0**	**0**	**0**	**0**	**0**	**167**
17:30	**0**	**0**	**24**	**0**	**24**	**0**	**0**	**136**	**0**	**136**					**0**	**0**	**0**	**0**	**0**	**0**	**160**
17:45	**0**	**0**	**24**	**0**	**24**	**1**	**0**	**141**	**0**	**142**					**0**	**0**	**0**	**0**	**0**	**0**	**166**
18:00	**0**	**0**	**24**	**0**	**24**	**0**	**0**	**120**	**0**	**120**					**0**	**0**	**0**	**0**	**0**	**0**	**144**
18:15					0					0					0	0	0	0	0	0	0
18:30					0					0					0					0	0
18:45					0					0					0					0	0
19:00					0					0					0					0	0
19:15					0					0					0					0	0
19:30					0					0					0					0	0
19:45					0					0					0					0	0
20:00					0					0					0					0	0
20:15					0					0					0					0	0
20:30					0					0					0					0	0
20:45					0					0					0					0	0
21:00					0					0					0					0	0
21:15					0					0					0					0	0
21:30					0					0					0					0	0
21:45					0					0					0					0	0
22:00					0					0					0					0	0
22:15					0					0					0					0	0
22:30					0					0					0					0	0
22:45					0					0					0					0	0
23:00					0					0					0					0	0
23:15					0					0					0					0	0
23:30					0					0					0					0	0
23:45					0					0					0					0	0
00:00					0					0					0					0	0
TOTAL	**0**	**0**	**1545**	**0**	**1545**	**3**	**0**	**1290**	**0**	**1293**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2838**
AM Peak Vol	0	0	570	0	570	1	0	81	0	82	0	0	0	0	0	0	0	0	0	0	652
PM Peak Vol	0	0	95	0	95	2	0	540	0	542	0	0	0	0	0	0	0	0	0	0	637

Maryland State Highway Administration
Data Services Engineering Division
Turning Movement Counts - Field Sheet

Job No.:

Location: Southlawn Lane at Incerator Lane
Date: 5/30/2018 Wednesday
Recorder: T3D
Interval (dd) : 15
(In Minutes)

County: Montgomery
Town: Rockville
Weather: Clear

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Start	End	Volume	LOS	V/C	PM PERIOD 12:00PM-7:00PM	Start	End	Volume	LOS	V/C
		07:45	08:45	652				17:00	18:00	637		

SCHOOL CHILDREN, PEDESTRIANS & BICYCLES

Hour Ending	North Leg Southlawn Lane			South Leg Southlawn Lane			East Leg N/A			West Leg Incerator Lane		
	School Children	Pedestrians	Bicycles	School Children	Pedestrians	Bicycles	School Children	Pedestrians	Bicycles	School Children	Pedestrians	Bicycles
00:15												
00:30												
00:45												
01:00												
01:15												
01:30												
01:45												
02:00												
02:15												
02:30												
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04:15												
04:30												
04:45												
05:00												
05:15												
05:30												
05:45												
06:00												
06:15	0	0	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0
08:00	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:15	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:45	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
09:00	0	0	0	0	0	0	0	0	0	0	0	0
09:15												
09:30												
09:45												
10:00												
10:15												
10:30												
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13:45												
14:00												
14:15												
14:30												
14:45												
15:00												
15:15	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	1
15:45	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0
17:15	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:45	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18:00	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18:15	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0	0	0
19:15												
19:30												
19:45												
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22:15												
22:30												
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23:00												
23:15												
23:30												
23:45												
00:00												
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
AM Peak Vol	0	0	0	0	0	0	0	0	0	0	0	0
PM Peak Vol	0	0	0	0	0	0	0	0	0	0	0	0

Maryland State Highway Administration
Data Services Engineering Division
Turning Movement Counts - Field Sheet

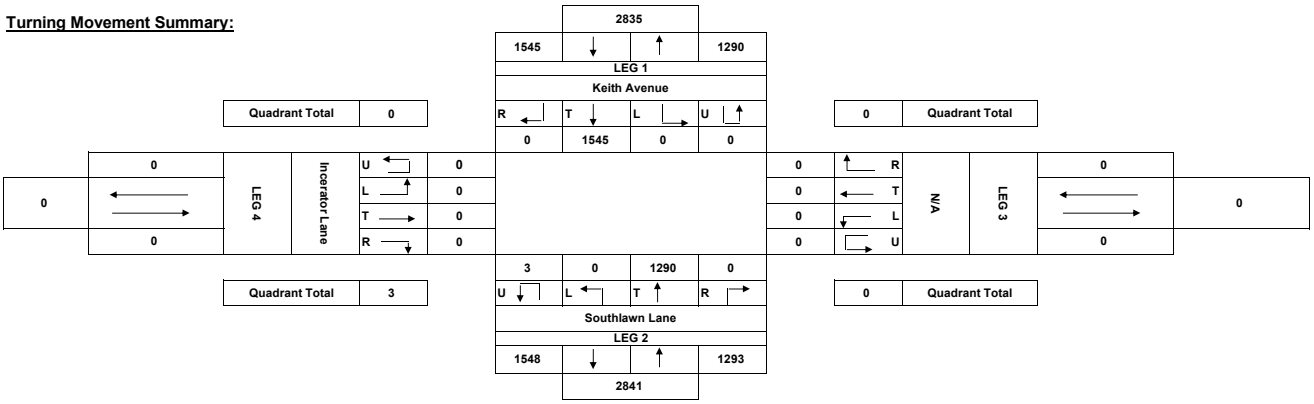
Job No.:

Location: Southlawn Lane at Incerator Lane
Date: 5/30/2018 Wednesday
Recorder: T3D
Interval (dd) : 15
(In Minutes)

County: Montgomery
Town: Rockville
Weather: Clear

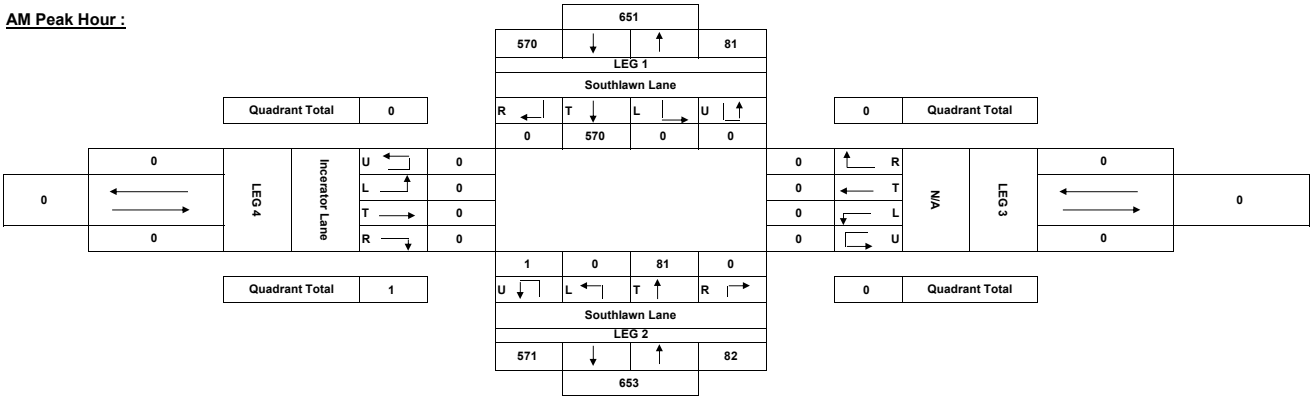
PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Start	End	Volume	LOS	V/C	PM PERIOD 12:00PM-7:00PM	Start	End	Volume	LOS	V/C
		07:45	08:45	652				17:00	18:00	637		

Turning Movement Summary:

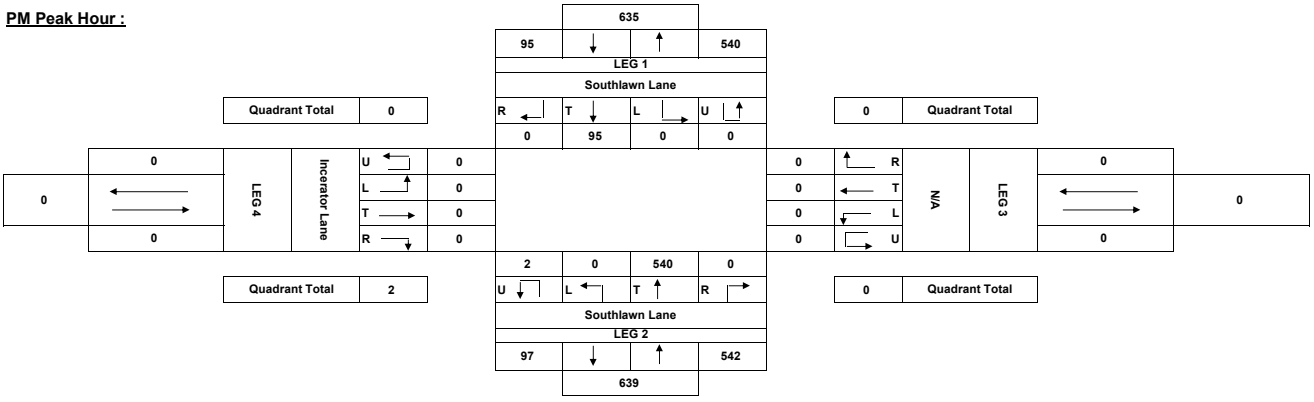


Comments:

AM Peak Hour :



PM Peak Hour :



Maryland State Highway Administration
Data Services Engineering Division
Turning Movement Counts - Field Sheet

Job No.:

Location: Southlawn Lane at E Gude Drive
Date: 5/30/2018 Wednesday
Recorder: T3D
Interval (dd) : 15 (In Minutes)

County: Montgomery
Town: Rockville
Weather: Clear

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Start	End	Volume	LOS	V/C	PM PERIOD 12:00PM-7:00PM	Start	End	Volume	LOS	V/C
		07:30	08:30	3671				16:45	17:45	3893		

Street Name-->	Southlawn Lane					Southlawn Lane					E Gude Drive					E Gude Drive					GRAND TOTAL
HOUR	From North					From South					From East					From West					
ENDING	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	
00:15					0					0					0					0	0
00:30					0					0					0					0	0
00:45					0					0					0					0	0
01:00					0					0					0					0	0
01:15					0					0					0					0	0
01:30					0					0					0					0	0
01:45					0					0					0					0	0
02:00					0					0					0					0	0
02:15					0					0					0					0	0
02:30					0					0					0					0	0
02:45					0					0					0					0	0
03:00					0					0					0					0	0
03:15					0					0					0					0	0
03:30					0					0					0					0	0
03:45					0					0					0					0	0
04:00					0					0					0					0	0
04:15					0					0					0					0	0
04:30					0					0					0					0	0
04:45					0					0					0					0	0
05:00					0					0					0					0	0
05:15					0					0					0					0	0
05:30					0					0					0					0	0
05:45					0					0					0					0	0
06:00					0					0					0					0	0
06:15	0	18	9	16	43	0	5	4	3	12	0	3	131	30	164	0	23	84	18	125	344
06:30	0	18	27	15	60	0	6	10	1	17	0	1	149	29	179	0	31	99	21	151	407
06:45	1	26	25	15	67	0	11	3	8	22	0	4	171	38	213	0	25	160	22	207	509
07:00	0	21	30	25	76	0	11	9	9	29	0	10	226	24	260	1	37	200	41	279	644
07:15	0	43	41	32	116	0	8	10	12	30	0	6	199	32	237	0	29	214	31	274	657
07:30	0	37	80	43	160	0	7	12	12	31	0	14	261	18	293	6	32	259	17	314	798
07:45	**0**	**36**	**76**	**53**	**165**	**0**	**19**	**10**	**16**	**45**	**1**	**12**	**296**	**24**	**333**	**3**	**27**	**299**	**37**	**366**	**909**
08:00	**0**	**33**	**84**	**58**	**175**	**0**	**17**	**13**	**9**	**39**	**0**	**10**	**313**	**15**	**338**	**1**	**32**	**303**	**63**	**399**	**951**
08:15	**0**	**38**	**75**	**49**	**162**	**1**	**18**	**7**	**10**	**36**	**0**	**12**	**339**	**21**	**372**	**2**	**38**	**287**	**41**	**368**	**938**
08:30	**0**	**36**	**78**	**35**	**149**	**0**	**18**	**7**	**11**	**36**	**0**	**13**	**312**	**17**	**342**	**0**	**30**	**287**	**29**	**346**	**873**
08:45	1	35	75	43	154	0	21	9	9	39	0	5	297	24	326	2	28	278	25	333	852
09:00	0	30	64	37	131	0	12	7	12	31	2	14	272	20	308	5	32	287	30	354	824
09:15					0					0					0					0	0
09:30					0					0					0					0	0
09:45					0					0					0					0	0
10:00					0					0					0					0	0
10:15					0					0					0					0	0
10:30					0					0					0					0	0
10:45					0					0					0					0	0
11:00					0					0					0					0	0
11:15					0					0					0					0	0
11:30					0					0					0					0	0
11:45					0					0					0					0	0
12:00					0					0					0					0	0
12:15					0					0					0					0	0
12:30					0					0					0					0	0
12:45					0					0					0					0	0
13:00					0					0					0					0	0
13:15					0					0					0					0	0
13:30					0					0					0					0	0
13:45					0					0					0					0	0
14:00					0					0					0					0	0
14:15					0					0					0					0	0
14:30					0					0					0					0	0
14:45					0					0					0					0	0
15:00					0					0					0					0	0
15:15	1	23	11	23	58	0	26	21	10	57	1	16	249	34	300	7	39	236	33	315	730
15:30	0	19	8	25	52	0	26	22	16	64	2	8	273	33	316	2	38	224	16	280	712
15:45	0	27	14	21	62	0	40	21	13	74	1	11	262	31	305	2	38	252	20	312	753
16:00	0	25	12	29	66	0	26	20	14	60	2	12	234	25	273	9	41	308	19	377	776
16:15	1	25	12	29	67	0	34	33	15	82	2	11	316	43	372	8	43	313	16	380	901
16:30	0	16	9	21	46	0	37	42	21	100	5	15	312	31	363	5	42	267	17	331	840
16:45	0	15	11	33	59	0	52	46	17	115	1	13	305	45	364	2	43	300	24	369	907
17:00	**0**	**23**	**12**	**27**	**62**	**0**	**42**	**43**	**25**	**110**	**0**	**16**	**260**	**40**	**316**	**1**	**47**	**343**	**29**	**420**	**908**
17:15	**0**	**22**	**13**	**24**	**59**	**0**	**42**	**66**	**20**	**128**	**3**	**12**	**312**	**51**	**378**	**5**	**58**	**397**	**14**	**474**	**1039**
17:30	**0**	**22**	**13**	**24**	**59**	**0**	**51**	**75**	**15**	**141**	**1**	**11**	**303**	**54**	**369**	**6**	**56**	**308**	**18**	**388**	**957**
17:45	**0**	**25**	**14**	**13**	**52**	**0**	**51**	**81**	**20**	**152**	**1**	**14**	**326**	**46**	**387**	**4**	**49**	**335**	**10**	**398**	**989**
18:00	0	16	13	14	43	0	26	64	13	103	0	8	261	42	311	3	42	306	13	364	821
18:15					0					0					0					0	0
18:30					0					0					0					0	0
18:45					0					0					0					0	0
19:00					0					0					0					0	0
19:15					0					0					0					0	0
19:30					0					0					0					0	0
19:45					0					0					0					0	0
20:00					0					0					0					0	0
20:15					0					0					0					0	0
20:30					0					0					0					0	0
20:45					0					0					0					0	0
21:00					0					0					0					0	0
21:15					0					0					0					0	0
21:30					0					0					0					0	0
21:45					0					0					0					0	0
22:00					0					0					0					0	0
22:15					0					0					0					0	0
22:30					0					0					0					0	0
22:45					0					0					0					0	0
23:00					0					0					0					0	0
23:15					0					0					0					0	0
23:30					0					0					0					0	0
23:45					0					0					0					0	0
00:00					0					0					0					0	0
TOTAL	**4**	**629**	**806**	**704**	**2143**	**1**	**606**	**635**	**311**	**1553**	**22**	**251**	**6379**	**767**	**7419**	**74**	**900**	**6346**	**604**	**7924**	**19039**
AM Peak Vol	0	143	313	195	651	1	72	37	46	156	1	47	1260	77	1385	6	127	1176	170	1479	3671
PM Peak Vol	0	92	52	88	232	0	186	265	80	531	5	53	1201	191	1450	16	210	1383	71	1680	3893

Maryland State Highway Administration
Data Services Engineering Division
Turning Movement Counts - Field Sheet

Job No.:

Location: Southlawn Lane at E Gude Drive
Date: 5/30/2018 Wednesday
Recorder: T3D
Interval (dd) : 15
(In Minutes)

County: Montgomery
Town: Rockville
Weather: Clear

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Start	End	Volume	LOS	V/C	PM PERIOD 12:00PM-7:00PM	Start	End	Volume	LOS	V/C
		07:30	08:30	3671				16:45	17:45	3893		

SCHOOL CHILDREN, PEDESTRIANS & BICYCLES

Hour Ending	North Leg Southlawn Lane			South Leg Southlawn Lane			East Leg E Gude Drive			West Leg E Gude Drive		
	School Children	Pedestrians	Bicycles	School Children	Pedestrians	Bicycles	School Children	Pedestrians	Bicycles	School Children	Pedestrians	Bicycles
00:15												
00:30												
00:45												
01:00												
01:15												
01:30												
01:45												
02:00												
02:15												
02:30												
02:45												
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03:15												
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04:30												
04:45												
05:00												
05:15												
05:30												
05:45												
06:00												
06:15	0	0	0	0	0	1	0	3	0	0	0	0
06:30	0	2	1	0	1	0	0	4	0	0	0	0
06:45	0	1	0	0	2	0	0	0	0	0	0	0
07:00	0	2	0	0	0	0	0	3	0	0	1	0
07:15	0	1	0	0	1	0	0	0	0	0	0	0
07:30	0	1	0	0	1	0	0	1	0	0	0	0
07:45	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:00	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
08:15	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:30	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**
08:45	0	2	0	0	2	1	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0
09:15												
09:30												
09:45												
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15:00												
15:15	0	1	0	0	1	0	0	1	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	2	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	1	0	1	0	0	3	0
16:15	0	1	0	0	10	0	0	0	0	0	0	0
16:30	0	1	0	0	0	0	0	0	0	0	1	0
16:45	0	0	0	0	4	2	0	0	1	0	0	0
17:00	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**3**	**0**	**0**	**0**	**0**
17:15	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**
17:30	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**1**	**0**
17:45	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**
18:00	0	0	0	0	1	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0	0	0
19:15												
19:30												
19:45												
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22:45												
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23:15												
23:30												
23:45												
00:00												
TOTAL	**0**	**20**	**2**	**0**	**27**	**7**	**0**	**18**	**1**	**0**	**9**	**0**
AM Peak Vol	0	3	1	0	2	1	0	1	0	0	1	0
PM Peak Vol	0	3	0	0	2	1	0	4	0	0	3	0

Maryland State Highway Administration
Data Services Engineering Division
Turning Movement Counts - Field Sheet

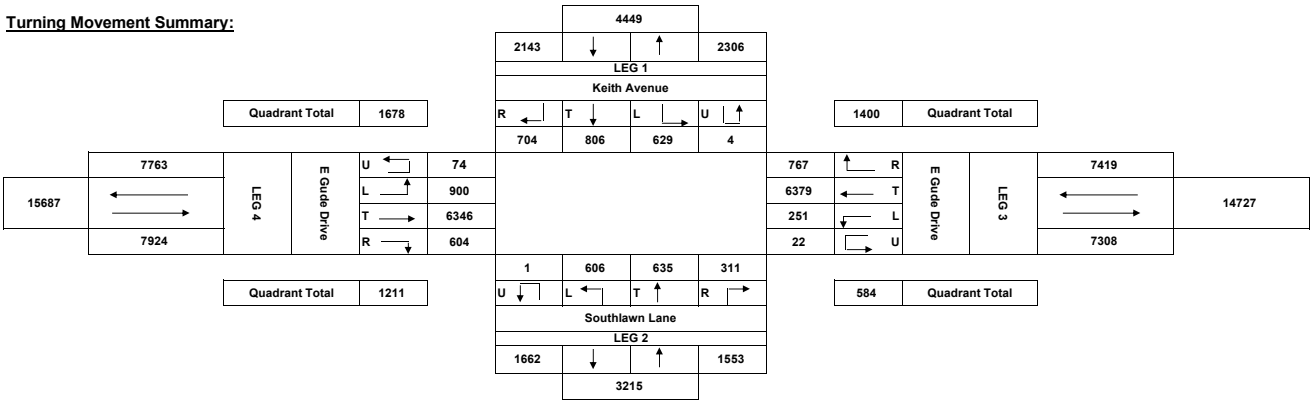
Job No.:

Location: Southlawn Lane at E Gude Drive
Date: 5/30/2018 Wednesday
Recorder: T3D
Interval (dd) : 15
(In Minutes)

County: Montgomery
Town: Rockville
Weather: Clear

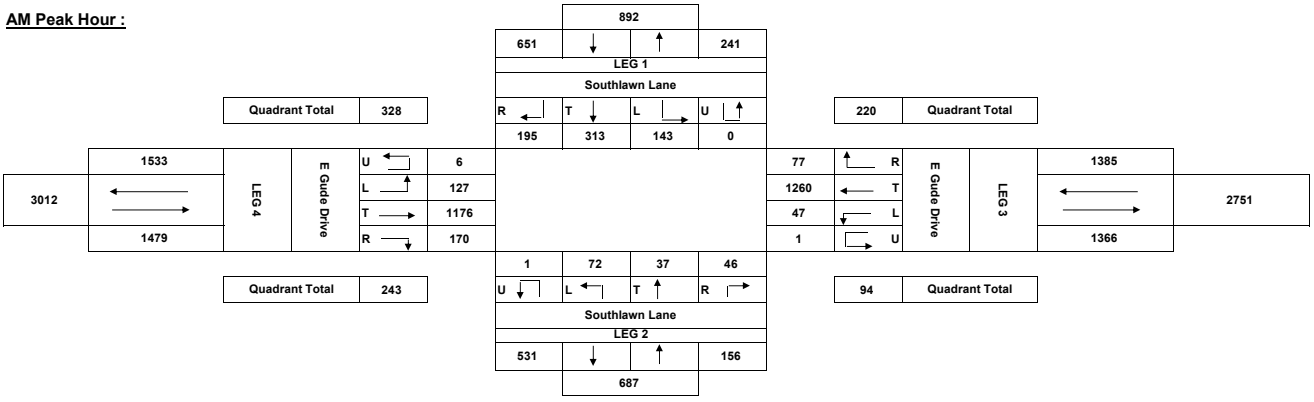
PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Start	End	Volume	LOS	V/C	PM PERIOD 12:00PM-7:00PM	Start	End	Volume	LOS	V/C
		07:30	08:30	3671				16:45	17:45	3893		

Turning Movement Summary:

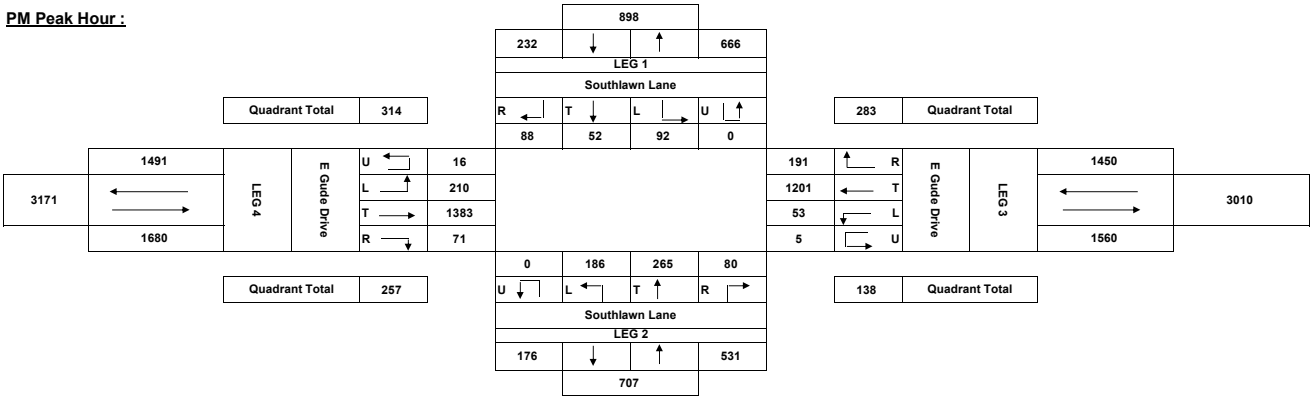


Comments:

AM Peak Hour :



PM Peak Hour :



Appendix B – CLV Results - Existing Conditions

T3 design
Fairfax, VA 22030

TURNING MOVEMENT & LEVEL OF SERVICE SUMMARY

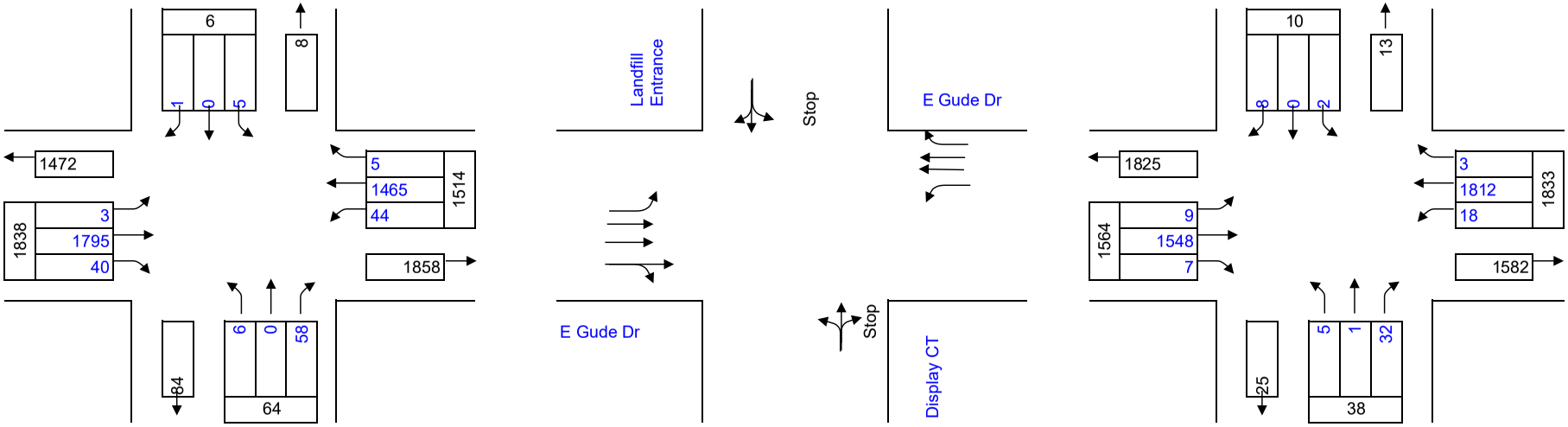
COUNT DATE:
CONDITIONS: Existing
DESIGN YEAR: 2018
COMPUTED BY: ASM DATE: 11/20/2018
CHECKED BY: AA DATE: 12/3/2018

LOCATION: E. Gude Dr / Landfill Entrance

AM PEAK HOUR: 7:30 - 8:30

LANE CONFIGURATION

PM PEAK HOUR: 4:45 - 5:45



Intersection Control:
Signal
Stop X Ways 1

No. of Lanes		Lane Use Factor
1	=	1.00
2	=	0.55
3	=	0.40
4	=	0.30
Dble. Left	=	0.60
Trpl. Left	=	0.45

Critical Lane Level of Service		Volumes Total
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
≤ 199		1.1
≤ 599		2.0
≤ 799		3.0
≤ 999		4.0
> 1000		5.0

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1835	0.55	1009	44	1.00	44	1053	*
	WB	1465	0.55	806	3	1.00	3	809	
	NB	65	1.00	65	0	1.00	0	65	*
	SB	7	1.00	7	0	1.00	0	7	*

REMARKS

* Critical Volume **AM TOTAL** **1124**

V/C = **0.70** **LEVEL OF SERVICE** **B**

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1555	0.55	855	18	1.00	18	873	
	WB	1812	0.55	997	9	1.00	9	1006	*
	NB	39	1.00	39	0	1.00	0	39	*
	SB	10	1.00	10	0	1.00	0	10	*

REMARKS
NBR is a free movement.

* Critical Volume **PM TOTAL** **1055**

V/C = **0.66** **LEVEL OF SERVICE** **B**

T3 design
Fairfax, VA 22030

TURNING MOVEMENT & LEVEL OF SERVICE SUMMARY

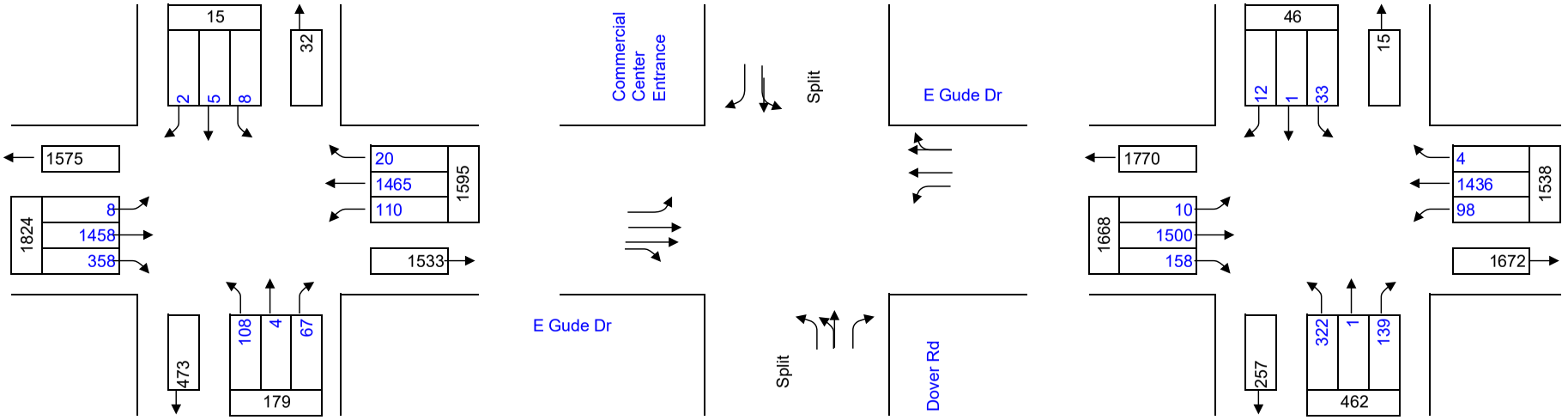
COUNT DATE:
CONDITIONS: Existing
DESIGN YEAR: 2018
COMPUTED BY: ASM DATE: 11/20/2018
CHECKED BY: AA DATE: 12/3/2018

LOCATION: E. Gude Dr at Dover Rd

AM PEAK HOUR: 7:30 - 8:30

LANE CONFIGURATION

PM PEAK HOUR: 4:45 - 5:45



	No. of Lanes		Lane Use Factor
1	=		1.00
2	=		0.55
3	=		0.40
4	=		0.30
Dble. Left	=		0.60
Trpl. Left	=		0.45

Critical Lane Volumes Level of Service		Total
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
≤ 199		1.1
≤ 599		2.0
≤ 799		3.0
≤ 999		4.0
> 1000		5.0

Intersection Control:
Signal x
Stop ____ Ways ____

Side street: split
LT: pt+pm

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1816	0.55	999	110	1.00	110	1109	*
	WB	1485	0.55	817	8	1.00	8	825	
	NB	123	0.55	68	0	1.00	0	68	*
	SB	14	1.00	14	0	1.00	0	14	*

REMARKS

* Critical Volume **AM TOTAL** 1190

V/C = **0.74** **LEVEL OF SERVICE** **C**

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1658	0.55	912	98	1.00	98	1010	*
	WB	1440	0.55	792	10	1.00	10	802	
	NB	355	0.40	142	0	1.00	0	142	*
	SB	79	0.55	43	0	1.00	0	43	*

REMARKS

* Critical Volume **PM TOTAL** 1195

V/C = **0.75** **LEVEL OF SERVICE** **C**

T3 design
Fairfax, VA 22030

TURNING MOVEMENT & LEVEL OF SERVICE SUMMARY

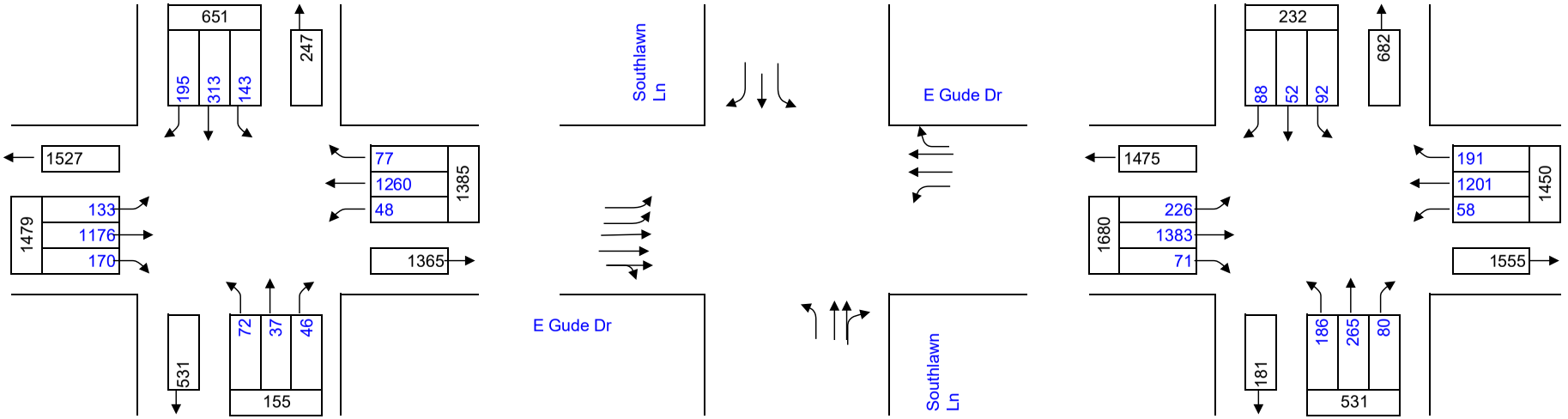
COUNT DATE:
CONDITIONS: EXISTING
DESIGN YEAR: 2018
COMPUTED BY: ASM DATE: 8/20/2018
CHECKED BY: AA DATE: 8/25/2018

LOCATION: E. Gude Dr
11
at Southlawn

AM PEAK HOUR: 7:30 - 8:30

LANE CONFIGURATION

PM PEAK HOUR: 4:45 - 5:45



NBL&SBL pm+pt
NBR & EBL OL
EB&WB exclusive LT

Intersection Control:
Signal x
Stop ____ Ways ____

	No. of Lanes		Lane Use Factor
	1	=	1.00
	2	=	0.55
	3	=	0.40
	4	=	0.30
	Dble. Left	=	0.60
	Trpl. Left	=	0.45

Critical Lane Level of Service		Volumes Total
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
≤ 199		1.1
≤ 599		2.0
≤ 799		3.0
≤ 999		4.0
> 1000		5.0

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1346	0.40	538	48	1.00	48	586	
	WB	1260	0.55	693	133	0.60	80	773	*
	NB	216	1.00	216	143	1.00	143	359	*
	SB	375	0.55	206	72	1.00	72	278	

REMARKS

* Critical Volume **AM TOTAL** 1132

V/C = **0.71** **LEVEL OF SERVICE** **B**

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1454	0.40	582	59	1.00	59	641	
	WB	1201	0.55	661	226	0.60	136	797	*
	NB	345	0.55	190	92	1.00	92	282	
	SB	184	1.00	184	186	1.00	186	370	*

REMARKS

* Critical Volume **PM TOTAL** 1167

V/C = **0.73** **LEVEL OF SERVICE** **C**

T3 design
Fairfax, VA 22030

TURNING MOVEMENT & LEVEL OF SERVICE SUMMARY

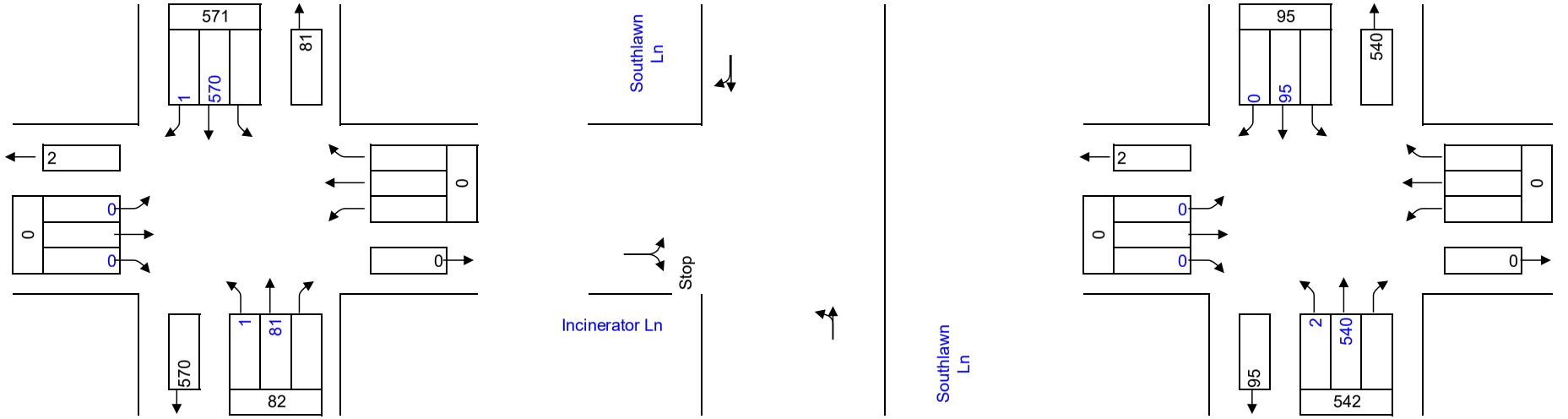
COUNT DATE:
CONDITIONS: EXISTING
DESIGN YEAR: 2018
COMPUTED BY: ASM DATE: 8/20/2018
CHECKED BY: AA DATE: 8/25/2018

LOCATION: Southlawn Ln
21 at Incinerator Ln

AM PEAK HOUR: 7:30 - 8:30

LANE CONFIGURATION

PM PEAK HOUR: 4:45 - 5:45



Intersection Control:
Signal
Stop X Ways 1

	No. of Lanes		Lane Use Factor
1	=		1.00
2	=		0.55
3	=		0.40
4	=		0.30
Dble. Left	=		0.60
Trpl. Left	=		0.45

Level of Service	Critical Lane Volumes Total		Opposing Volume (vph)	PCE
A	≤	1000	≤ 199	1.1
B	≤	1150	≤ 599	2.0
C	≤	1300	≤ 799	3.0
D	≤	1450	≤ 999	4.0
E	≤	1600	> 1000	5.0
F	>	1600		

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	NB	83	1.00	83	0	1.00	0	83	
	SB	571	1.00	571	1	1.00	1	572	*
	EB	0	1.00	0	0	1.00	0	0	*

REMARKS

* Critical Volume **AM TOTAL** 572

V/C = **0.36** **LEVEL OF SERVICE** **A**

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	NB	542	1.00	542	0	1.00	0	542	*
	SB	95	1.00	95	2	1.00	2	97	
	EB	0	1.00	0	0	1.00	0	0	*

REMARKS

* Critical Volume **PM TOTAL** 542

V/C = **0.34** **LEVEL OF SERVICE** **A**

Appendix C – Traffic Growth Rate Calculations

E Gude Dr From MD 28 to MD 355		
Year	**AADT**	**Traffic Growth Rate**
2017	33,300	-13.82%
2016	38,642	1.90%
2015	37,921	2.60%
2014	36,960	-7.28%
2013	39,862	0.20%
2012	39,781	-0.80%
2011	40,100	-6.51%
2010	42,892	0.61%
2009	42,631	0.00%
2008	42,630	1.62%
2007	41,952	
	Avg.	-2.15%

Asma Ali <aali@t3design.us>

FW: Gude Landfill Remediation Project - Traffic Data Request from Montgomery County DOT and City of Rockville

3 messages

Oakes, Laura Jo <loakes@eaest.com> Mon, Apr 30, 2018 at 11:28 AM
To: Asma Ali <aali@t3design.us>
Cc: Amy Morris <amorris@t3design.us>, "Gelder, Moriah" <mgelder@eaest.com>

Please let me know if this is enough information on this project or what specifics you would like me to request (see email chain below).

Thanks,
Laura

From: Mitchell, Michael [mailto:Michael.Mitchell@montgomerycountymd.gov]
Sent: Monday, April 30, 2018 11:26 AM
To: Oakes, Laura Jo <loakes@eaest.com>
Subject: RE: Gude Landfill Remediation Project - Traffic Data Request from Montgomery County DOT and City of Rockville

Laura,

I do not believe the improvements will generate new traffic or increase it. One turn lane (right turn lane) is on west-bound Gude onto Crabbs Branch. The other improvement is extending the merge lane on East Gude, east of Crabbs Branch. Finally a turn lane onto a business parking lot.

Michael F. Mitchell, P.E.

Senior Engineer

Montgomery County Department of Transportation

100 Edison Park Drive, 4th Floor

Gaithersburg, Maryland 20878

Ph: 240-777-7262

Fax: 240-777-7277

michael.mitchell@montgomerycountymd.gov

From: Oakes, Laura Jo [mailto:loakes@eaest.com]
Sent: Monday, April 30, 2018 11:23 AM
To: Mitchell, Michael <Michael.Mitchell@montgomerycountymd.gov>

WSSC
Where Water Matters

14501 Sweitzer Lane • Laurel, Maryland 20707-5901

February 20, 2018

Ms. Katherine Nelson
Montgomery County Planning Department
8787 Georgia Avenue
Silver Spring, Maryland 20910

Dear Ms. Nelson:

The Washington Suburban Sanitary Commission (WSSC) proposes to construct Septage and FOG (Fats, Oils, and Grease) Discharge Facilities at the abandoned Rock Creek WWTP located at 700 East Gude Drive, in Rockville, Maryland. The site is located in a mixed industrial, commercial, and residential area. The Septage Discharge Facility and the FOG Discharge Facility will have footprints of 900 sq. ft. and 5,428 sq. ft., respectively. The Facilities would be staffed by two WSSC employees.

The facility is accessible from Rockville Pike, Maryland Route 355 and then proceeding onto East Gude Drive. East Gude Drive serves as a commercial thoroughfare connecting I-270 to the City of Rockville and is designed for the size and weight of the vehicles entering and exiting the Septage and FOG Discharge Facility. WSSC estimates that 20 to 30 vehicles per day would enter the site based on septage hauling records at existing facilities and future projections. The additional traffic generated by these vehicles would not impact the traffic patterns along East Gude Drive. The site provides ample space for waiting vehicles, so the vehicles would not back up on to East Gude Drive. An additional 5 to 10 trucks per week are estimated to visit the site to remove trash or FOG by-products.

Per the Montgomery County's Local Area Transportation (LATR) test, the project will generate less than 50 peak hour person trips in either the morning or evening peak hours and will not require a traffic study. Therefore, we request an exemption to this requirement.

Sincerely,

Philip Hwang, P.E., PMP,
Project Manager, Facility Design & Construction Division

Appendix D – CLV Results - Background and Total Traffic Conditions

T3 design
Fairfax, VA 22030

TURNING MOVEMENT & LEVEL OF SERVICE SUMMARY

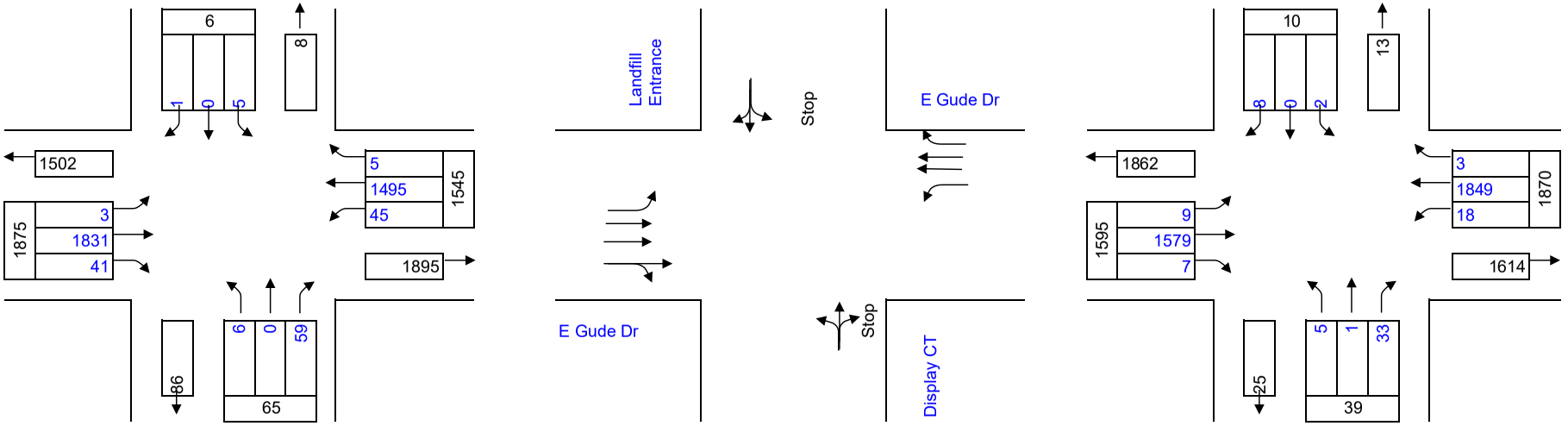
COUNT DATE:
CONDITIONS: Background
DESIGN YEAR: 2022
COMPUTED BY: ASM DATE: 11/20/2018
CHECKED BY: AA DATE: 12/3/2018

LOCATION: E. Gude Dr
24 Landfill Entrance

AM PEAK HOUR: 7:30 - 8:30

LANE CONFIGURATION

PM PEAK HOUR: 4:45 - 5:45



Intersection Control:
Signal
Stop X Ways 1

No. of Lanes		Lane Use Factor
1	=	1.00
2	=	0.55
3	=	0.40
4	=	0.30
Dble. Left	=	0.60
Trpl. Left	=	0.45

Level of Service	Critical Lane Volumes Total	Opposing Volume (vph)	PCE
A	≤ 1000	≤ 199	1.1
B	≤ 1150	≤ 599	2.0
C	≤ 1300	≤ 799	3.0
D	≤ 1450	≤ 999	4.0
E	≤ 1600	> 1000	5.0
F	> 1600		

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1872	0.55	1030	45	1.00	45	1075	*
	WB	1495	0.55	822	3	1.00	3	825	
	NB	66	1.00	66	0	1.00	0	66	*
	SB	7	1.00	7	0	1.00	0	7	*

REMARKS

* Critical Volume **AM TOTAL** **1147**

V/C = **0.72** **LEVEL OF SERVICE** **B**

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1586	0.55	872	18	1.00	18	890	
	WB	1849	0.55	1017	9	1.00	9	1026	*
	NB	40	1.00	40	0	1.00	0	40	*
	SB	10	1.00	10	0	1.00	0	10	*

REMARKS
NBR is a free movement.

* Critical Volume **PM TOTAL** **1076**

V/C = **0.67** **LEVEL OF SERVICE** **B**

T3 design
Fairfax, VA 22030

TURNING MOVEMENT & LEVEL OF SERVICE SUMMARY

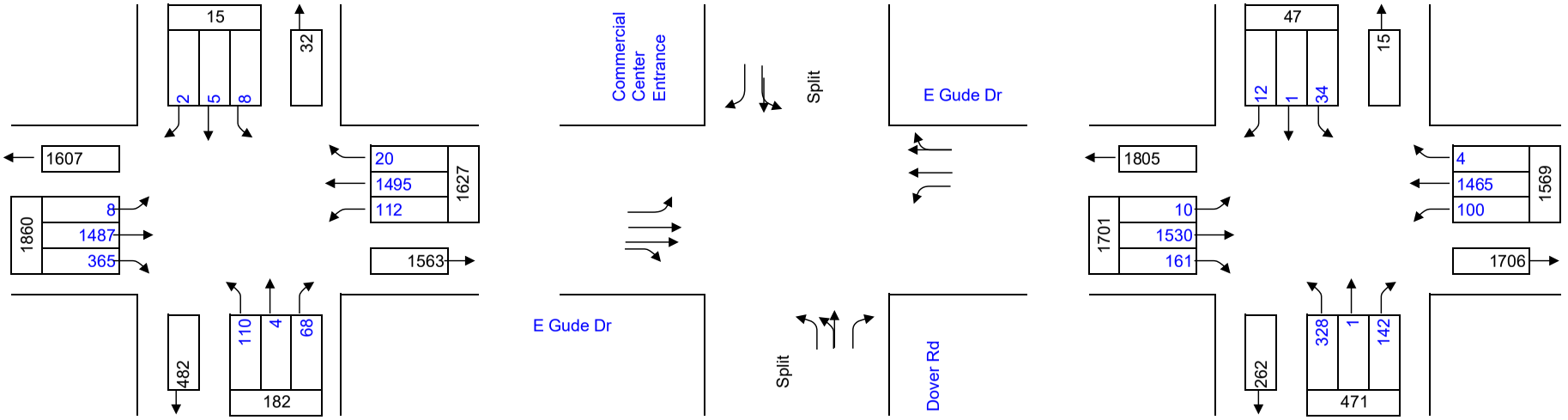
COUNT DATE:
CONDITIONS: Background
DESIGN YEAR: 2022
COMPUTED BY: ASM DATE: 11/20/2018
CHECKED BY: AA DATE: 12/3/2018

LOCATION: E. Gude Dr
11 at Dover Rd

AM PEAK HOUR: 7:30 - 8:30

LANE CONFIGURATION

PM PEAK HOUR: 4:45 - 5:45



	No. of Lanes		Lane Use Factor
1	=		1.00
2	=		0.55
3	=		0.40
4	=		0.30
Dble. Left	=		0.60
Trpl. Left	=		0.45

Critical Lane Volumes Level of Service		Total
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
≤ 199		1.1
≤ 599		2.0
≤ 799		3.0
≤ 999		4.0
> 1000		5.0

Intersection Control:
Signal x
Stop
Ways

Side street: split
LT: pt+pm

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1852	0.55	1019	112	1.00	112	1131	*
	WB	1515	0.55	833	8	1.00	8	841	
	NB	125	0.55	69	0	1.00	0	69	*
	SB	14	1.00	14	0	1.00	0	14	*

REMARKS

* Critical Volume **AM TOTAL** 1214

V/C = **0.76** **LEVEL OF SERVICE** **C**

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1691	0.55	930	100	1.00	100	1030	*
	WB	1469	0.55	808	10	1.00	10	818	
	NB	362	0.40	145	0	1.00	0	145	*
	SB	81	0.55	45	0	1.00	0	45	*

REMARKS

* Critical Volume **PM TOTAL** 1220

V/C = **0.76** **LEVEL OF SERVICE** **C**

T3 design
Fairfax, VA 22030

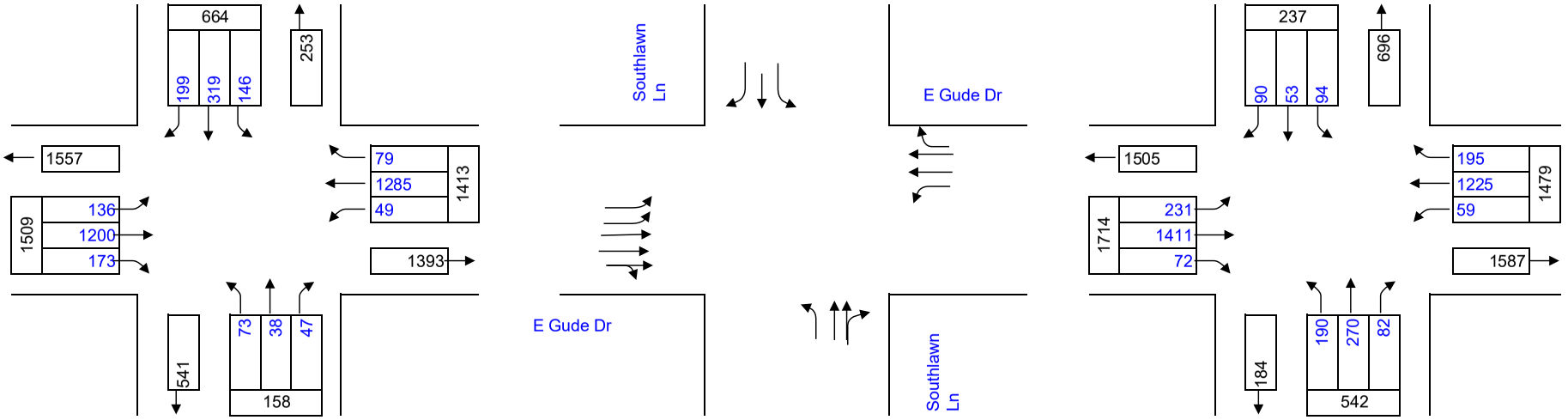
TURNING MOVEMENT & LEVEL OF SERVICE SUMMARY

COUNT DATE:		LOCATION:	E. Gude Dr
CONDITIONS:	Background	11	at Southlawn
DESIGN YEAR:	2022		
COMPUTED BY:	ASM	DATE:	11/20/2018
CHECKED BY:	AA	DATE:	12/3/2018

AM PEAK HOUR: 7:30 - 8:30

LANE CONFIGURATION

PM PEAK HOUR: 4:45 - 5:45



NBL&SBL pm+pt
NBR & EBL OL
EB&WB exclusive LT

Intersection Control:
Signal x
Stop ____ Ways ____

	No. of Lanes		Lane Use Factor	Level of Service	Critical Lane Volumes Total	Opposing Volume (vph)	PCE
	1	=	1.00	A	≤ 1000	≤ 199	1.1
	2	=	0.55	B	≤ 1150	≤ 599	2.0
	3	=	0.40	C	≤ 1300	≤ 799	3.0
	4	=	0.30	D	≤ 1450	≤ 999	4.0
	Dble. Left	=	0.60	E	≤ 1600	> 1000	5.0
	Trpl. Left	=	0.45	F	> 1600		

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1373	0.40	549	49	1.00	49	598	
	WB	1285	0.55	707	136	0.60	82	789	*
	NB	219	1.00	219	146	1.00	146	365	*
	SB	382	0.55	210	73	1.00	73	283	

REMARKS

* Critical Volume — **AM TOTAL** 1154

V/C = **0.72** — **LEVEL OF SERVICE** C

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1483	0.40	593	59	1.00	59	652	
	WB	1225	0.55	674	231	0.60	139	813	*
	NB	352	0.55	194	94	1.00	94	288	
	SB	188	1.00	188	190	1.00	190	378	*

REMARKS

* Critical Volume — **PM TOTAL** 1191

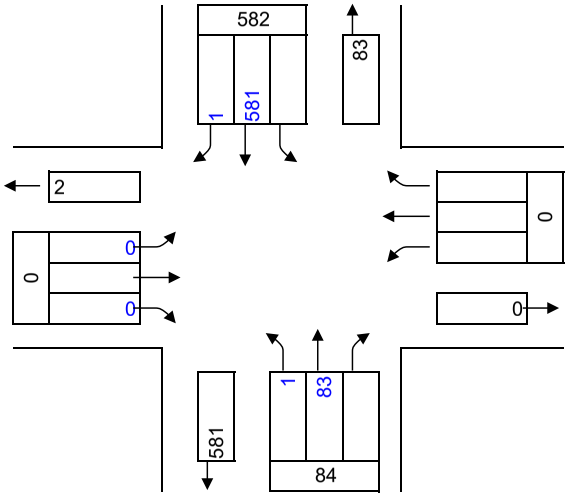
V/C = **0.74** — **LEVEL OF SERVICE** C

T3 design
Fairfax, VA 22030

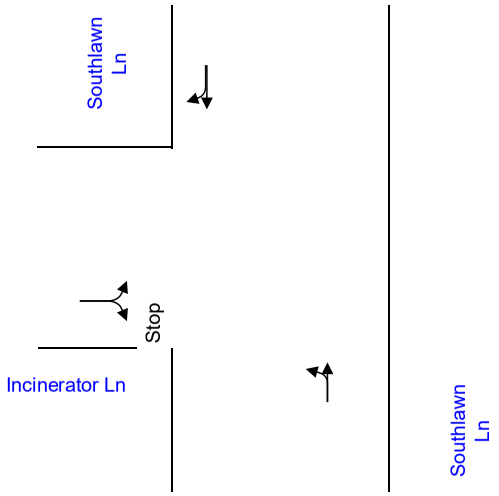
TURNING MOVEMENT & LEVEL OF SERVICE SUMMARY

COUNT DATE:		LOCATION:	Southlawn Ln
CONDITIONS:	Background		21 at Incinerator Ln
DESIGN YEAR:	2022		
COMPUTED BY:	ASM	DATE:	11/20/2018
CHECKED BY:	AA	DATE:	12/3/2018

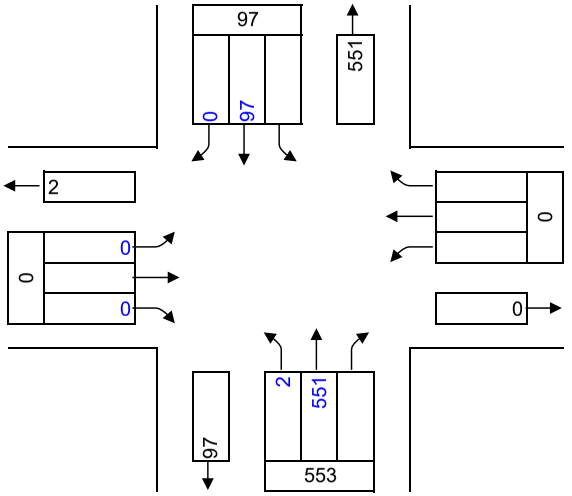
AM PEAK HOUR: 7:30 - 8:30



LANE CONFIGURATION



PM PEAK HOUR: 4:45 - 5:45



Intersection Control:
Signal
Stop X Ways 1

No. of Lanes		Lane Use Factor
1	=	1.00
2	=	0.55
3	=	0.40
4	=	0.30
Dble. Left	=	0.60
Trpl. Left	=	0.45

Level of Service	Critical Lane Volumes Total	Opposing Volume (vph)	PCE
A	≤ 1000	≤ 199	1.1
B	≤ 1150	≤ 599	2.0
C	≤ 1300	≤ 799	3.0
D	≤ 1450	≤ 999	4.0
E	≤ 1600	> 1000	5.0
F	> 1600		

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	NB	85	1.00	85	0	1.00	0	85	
	SB	582	1.00	582	1	1.00	1	583	*
	EB	0	1.00	0	0	1.00	0	0	*

REMARKS

* Critical Volume **AM TOTAL** 583

V/C = **0.36** **LEVEL OF SERVICE** **A**

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	NB	553	1.00	553	0	1.00	0	553	*
	SB	97	1.00	97	2	1.00	2	99	
	EB	0	1.00	0	0	1.00	0	0	*

REMARKS

* Critical Volume **PM TOTAL** 553

V/C = **0.35** **LEVEL OF SERVICE** **A**

T3 design
Fairfax, VA 22030

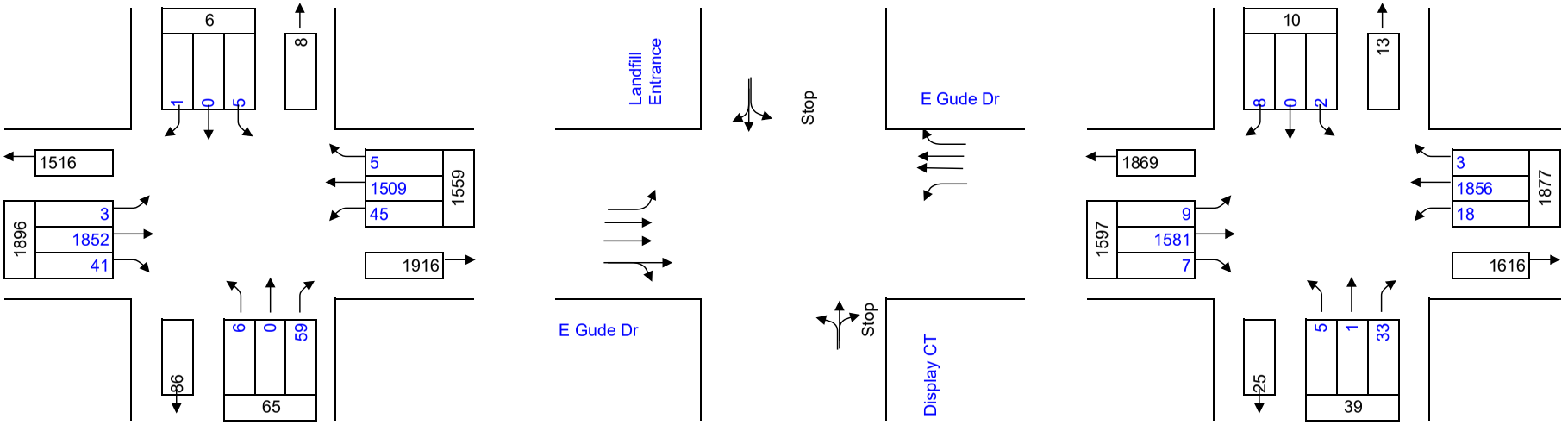
TURNING MOVEMENT & LEVEL OF SERVICE SUMMARY

COUNT DATE:		LOCATION:	E. Gude Dr
CONDITIONS:	Total	24	Landfill Entrance
DESIGN YEAR:	2022		
COMPUTED BY:	ASM	DATE:	11/30/2018
CHECKED BY:	AA	DATE:	12/3/2018

AM PEAK HOUR: 7:30 - 8:30

LANE CONFIGURATION

PM PEAK HOUR: 4:45 - 5:45



Intersection Control:
Signal
Stop X Ways 1

No. of Lanes		Lane Use Factor
1	=	1.00
2	=	0.55
3	=	0.40
4	=	0.30
Dble. Left	=	0.60
Trpl. Left	=	0.45

Level of Service	Critical Lane Volumes Total	Opposing Volume (vph)	PCE
A	≤ 1000	≤ 199	1.1
B	≤ 1150	≤ 599	2.0
C	≤ 1300	≤ 799	3.0
D	≤ 1450	≤ 999	4.0
E	≤ 1600	> 1000	5.0
F	> 1600		

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1893	0.55	1041	45	1.00	45	1086	*
	WB	1509	0.55	830	3	1.00	3	833	
	NB	66	1.00	66	0	1.00	0	66	*
	SB	7	1.00	7	0	1.00	0	7	*

REMARKS

* Critical Volume **AM TOTAL** **1158**

V/C = **0.72** **LEVEL OF SERVICE** **C**

Ø	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lane Use Factor (5)	Lane Volume (4)*(5)=(6)	CLV (3)+(6)	*
	EB	1588	0.55	873	18	1.00	18	891	
	WB	1856	0.55	1021	9	1.00	9	1030	*
	NB	40	1.00	40	0	1.00	0	40	*
	SB	10	1.00	10	0	1.00	0	10	*

REMARKS
NBR is a free movement.

* Critical Volume **PM TOTAL** **1080**

V/C = **0.68** **LEVEL OF SERVICE** **B**