Phase I Report for
Carroll County Resource Recovery Park
Northern Landfill Expansion
Westminster, Maryland

Prepared for

Carroll County Bureau of Solid Waste
225 North Center Street
Westminster, Maryland 21157

Under contract to

Northeast Maryland Waste Disposal Authority
Tower II – Suite 402
100 South Charles Street
Baltimore, Maryland 21201-2705

Prepared by

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410-584-7000

May 2026
EA Project No. 1636201

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07/14/2026

Mark Gutberlet, P.E., BCEE — Date
Senior Project Manager

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. 23402, Expiration Date: 25 August 2026

May 2026
EA Project No. 1636201

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Regulatory Checklist

Phase I Report for
Carroll County Resource Recovery Park
Northern Landfill
Westminster, Maryland

COMAR 26.04.07.	Regulation	Report Location(s)	for use by MDE (✓ or ×)
.06 (A)	Twelve copies of a preliminary (Phase I) report shall be prepared and submitted along with the request for a permit		
.06 (B)(1)	Completed and signed application form referenced in Regulation .05B of this chapter	Appendix A	
.06 (B)(2)	Current USGS 7.5-minute quadrangle map with proposed site outlined	Figure 1-1	
.06 (B)(3)	Current topographic map, which is an accurate depiction of the site at the time of application, at a scale not smaller than 1 inch equals 200 feet, which depicts the property boundaries, on-site buildings and structures, and pertinent surficial features including but not limited to: • Springs • Seeps • Streams • Rock outcrops • Sink holes • Surface impoundments • Water wells • Forested areas • The location of any buried or overhead power transmission lines, utility pipelines, or storage tanks on the property	Figures 2-1, 2-2, and 2-3	
.06 (B)(4)	Map, which depicts the surrounding zoning and land use within 1/2 mile of the site boundaries	Figure 2-4; Report Section 2.2	
.06 (B)(5)	Map showing the distribution of the soils at the site	Figure 2-5 Table 2-1	
.06 (B)(6)	Narrative description of the soils at the site	Report Section 2.3	
.06 (B)(7)	Map showing the geology at the site based on available data	Figure 2-6	
.06 (B)(8)	Narrative description of the geology at the site based on available data	Report Section 2.4	
.06 (B)(9)	Description of the proposed activity including: • Type of facility • Area served • Capacity • Types of waste accepted	Report Sections 3.1–3.4	

Notes:
COMAR = Code of Maryland Regulations
MDE = Maryland Department of the Environment
USGS = U.S. Geological Survey

Code of Federal Regulations Part 258, Subpart B Location Restrictions (40 CFR§258)	Regulation	Report Location(s)	for use by MDE (✓ or ×)
.10 (A)	Owners or operators proposing to site new MSWLF units and lateral expansions within a five-mile radius of any airport runway end used by turbojet or piston-type aircraft must notify the affected airport and the Federal Aviation Administration.	To be included in the Phase II Report	
.11 (A)	Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in 100-year floodplains must demonstrate that the unit will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste so as to pose a hazard to human health and the environment.	To be included in the Phase II Report	
.12 (A)	New MSWLF units and lateral expansions shall not be located in wetlands, unless demonstrations related to wetland impacts and water quality are made.	Report Section 2.6	
.13 (A)	New MSWLF units and lateral expansions shall not be located within 200 feet (60 meters) of a fault that has had displacement in Holocene time unless the owner or operator demonstrates to the Director of an approved State that an alternative setback distance of less than 200 feet (60 meters) will prevent damage to the structural integrity of the MSWLF unit and will be protective of human health and the environment.	Report Section 2.8	
.14 (A)	New MSWLF units and lateral expansions shall not be located in seismic impact zones, unless the owner or operator demonstrates to the Director of an approved State/Tribe that all containment structures, including liners, leachate collection systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.	Report Section 2.8	

Code of Federal Regulations Part 258, Subpart B Location Restrictions (40 CFR§258)	Regulation	Report Location(s)	for use by MDE (✓ or ×)
.15 (A)	Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in an unstable area must demonstrate that engineering measures have been incorporated into the MSWLF unit's design to ensure that the integrity of the structural components of the MSWLF unit will not be disrupted. The owner or operator must place the demonstration in the operating record and notify the State Director that it has been placed in the operating record. The owner or operator must consider the following factors, at a minimum, when determining whether an area is unstable: • On-site or local soil conditions that may result in significant differential settling; • On-site or local geologic or geomorphologic features; and • On-site or local human-made features or events (both surface and subsurface).	To be included in the Phase II Report	

Notes:
MSWLF = Municipal solid waste landfill facilities

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LIST OF ACRONYMS AND ABBREVIATIONS

BCEE	Board Certified Environmental Engineer
Century Engineering	Century Engineering, Inc.
CFR	Code of Federal Regulations
COMAR	Code of Maryland Regulations
County	Carroll County Bureau of Solid Waste
CCRRP	Carroll County Resource Recovery Park
CY	Cubic yard(s)
EA	EA Engineering, Science, and Technology, Inc., PBC
Edwards	Jonathan Edwards, Jr.
FSD	Forest Stand Delineation
HDPE	High-density polyethylene
I-1	Light Industrial District
I-2	Heavy Industrial District
Landfill	Northern Landfill
MDE	Maryland Department of the Environment
MSW	Municipal solid waste
NA	Not applicable
NAVD88	North American Vertical Datum of 1988
NWI	National Wetlands Inventory
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

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EXECUTIVE SUMMARY

This Phase I Report, prepared in accordance with the guidelines established under the Code of Maryland Regulations 26.04.07.06, constitutes the initial site evaluation of the suitability of the Northern Landfill for expansion.

The Northern Landfill (Landfill) is a municipal solid waste (MSW) landfill located at the Carroll County Resource Recovery Park (CCRRP) at 1400 Baltimore Boulevard, Westminster, Carroll County, Maryland. The CCRRP and Northern Landfill is Carroll County's primary in-county location for solid waste management and recycling activities. The CCRRP is located on a 220-acre parcel (Map 46, Parcel 47) on Baltimore Boulevard (Maryland Route 140). In 2021, the County purchased an adjoining 326 acres (Map 46, Parcel 64). The new parcel expands the existing CCRRP footprint to the west, east, and north, providing opportunity for a reorganization and optimization of the CCRRP. The new property provides area for a landfill expansion, replacement and upgrade of existing support infrastructure, relocation of the existing transfer station, and expansion and relocation of the existing residential use areas. The new property may also potentially house co-located waste recycling and diversions operations which may include yard waste/organics, construction/demolition recycling, and other beneficial operations. This Phase I Report concerns the Northern Landfill expansion and ancillary infrastructure only.

The Landfill is the only active MSW landfill in the county and is owned by the Commissioners of Carroll County and operated by the County Bureau of Solid Waste under the State of Maryland Refuse Disposal Permit No. 2020-WMF-0066 issued on 5 January 2021. Operation of the Landfill began in 1988.

The Phase I Report provides an initial site evaluation and includes an overview of site topography, zoning, land use, soils, geology, and wetlands. The proposed activity at the site consists of a redesign of the existing permitted Landfill including a horizontal and vertical expansion.

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1. INTRODUCTION

The Northern Landfill (Landfill) is a municipal solid waste (MSW) landfill located at the Carroll County Resource Recovery Park (CCRRP) at 1400 Baltimore Boulevard, Westminster, Carroll County, Maryland. EA Engineering, Science, and Technology, Inc., PBC (EA) has been retained by the Northeast Maryland Waste Disposal Authority on behalf of the Carroll County Bureau of Solid Waste (County) to complete planning, design, permitting, and other associated services to support the expansion of the Landfill and development of a Master Plan for the CCRRP (Carroll County 2020). This Phase I Report is intended to satisfy the requirements of Code of Maryland Regulations (COMAR) 26.04.07.06 in order to provide an initial site evaluation for the suitability for a landfill expansion.

The CCRRP and Northern Landfill is the County's primary in-county location for solid waste management and recycling activities. The CCRRP is located on a 220-acre parcel (Map 46, Parcel 47) on Baltimore Boulevard (Maryland Route 140). Existing infrastructure includes the Northern Landfill, scale facility, waste and recyclables transfer station, homeowner use areas for waste and recyclables drop-off, and other related features. In 2021, the County purchased an adjoining 326 acres (Map 46, Parcel 64). The new parcel expands the existing CCRRP footprint to the west, east, and north, providing opportunity for a reorganization and optimization of the CCRRP. The new property provides area for a landfill expansion, replacement and upgrade of existing support infrastructure, relocation of the existing transfer station, and expansion and relocation of the existing residential use areas. The new property may also potentially house co-located waste recycling and diversions operations which may include yard waste/organics, construction/demolition recycling, and other beneficial operations. This Phase I Report concerns the Northern Landfill expansion and ancillary infrastructure only.

The Landfill is the only active MSW landfill in the County and is owned by the Commissioners of Carroll County and operated by the County under the State of Maryland Refuse Disposal Permit No. 2020-WMF-0066 issued on 5 January 2021. Operation of the Landfill began in 1988.

1.1 SITE LOCATION

The existing and planned expansion of the site consists of approximately 546 acres located at 1400 Baltimore Boulevard in Westminster, Maryland. The site location is shown on Figure 1-1.

1.2 SITE DESCRIPTION

Entry to the CCRRP is provided off the westbound lanes of Baltimore Boulevard, Maryland Route 140 (a four-lane divided highway). The CCRRP includes the following facilities:

- A residential use recycling center
- Yard trim processing area
- CCRRP offices
- Landfill
- Computerized landfill scales

- Transfer station
- Hap Baker Firearms Facility (gun range)

The existing Landfill consists of five permitted waste disposal cells. Cells 1, 2, and 3 are constructed with a double 60-mil high-density polyethylene (HDPE) liner system. Cells 1 and 2 have reached capacity and are no longer receiving waste. Cell 3 is the current active cell receiving waste. Cell 4 is unconstructed but is designed and permitted to lie to the east of Cell 3 in the area currently occupied by the transfer station. The final permitted cell, Cell 5, would lie over Cells 1 through 4. The slopes of Cells 1 and 2 have been closed with a final cover system consisting of a geomembrane cap and landfill gas venting system.

Paved and gravel roads provide access around the Landfill perimeter and to the facilities identified above. The primary road, named Rubble Road, provides access to the majority of facilities and to the perimeter of the Landfill. Seven Springs Road travels to the north off Rubble Road and provides access to the gun range.

The immediate vicinity of the CCRRP and its proposed expansion area is undeveloped agricultural fields or forested lands. Residential areas lie to the east (part of the Carrolton Census-designated place) and to the south across Baltimore Boulevard. The West Branch North Branch Patapsco River crosses the parcel from northwest to southeast near the Maryland Midland Railway, also bisecting the parcel from northwest to southeast. The railway lies within a narrow parcel (approximately 70 feet wide) that splits the parcel. The remaining parcel to the north is forested undeveloped land.

The proposed activity at the site consists of a redesign of the existing permitted Landfill including a horizontal and vertical expansion.

1.3 SITE HISTORY

Prior to construction of the Landfill, the area was either forested or used for agriculture with minimal structures consisting of farmhouses and barns. In the late 1980s, the site was developed with the construction of the first solid waste disposal cell (Cell 1) and the first rubble disposal cell (Cell R-1). Construction included access roads, fencing, stormwater management controls, sediment basins, and other support structures. Cell 1 was constructed with a primary and secondary liner system each consisting of a 60-mil HDPE liner and primary and secondary leachate collection system. A second solid waste disposal cell (Cell 2) and a second rubble cell (Cell R-2) was constructed in the early 1990s to the north of Cell 1. Cell R-2 began accepting rubble waste in 1992 and Cell 2 began accepting solid waste in 1993. In 1996, both rubble cells had reached their capacity (93,350 cubic yards [CY]) and these cells were closed with a 40-mil very low-density polyethylene liner. Rubble waste received since 1996 has been placed into the solid waste cells or diverted to other permitted landfills. A third solid waste cell (Cell 3) was constructed in 2007 to the east of Cells 1 and 2. A fourth and fifth cell are currently permitted but have not been constructed.

2. SITE CHARACTERISTICS

2.1 TOPOGRAPHY

The developed portions of the parcel, including the Landfill, transfer station, and other support structures, sit on a north-south ridge situated between unnamed tributaries of the West Branch North Branch Patapsco River. Support structures include an administrative building, homeowner drop-off recyclables and waste areas, scale house, blower flare station, scrap metal drop-off and storage area, a transfer station, and a maintenance facility. The entrance to the CCRRP is located near the local high point at approximately 880 feet referenced to the North American Vertical Datum of 1988 (NAVD88). From this local high point, the parcel drops in elevation to the north, east, and west. To the west, drainage flows downgradient to an unnamed stream flowing from south to north, eventually flowing into the West Branch North Branch Patapsco River. Similarly, to the east, drainage flows into valleys and intermittent then perennial streams that ultimately travel north to the river. Within the parcel as you travel north, there is a gradual decline along the top of the ridge until a steeper drop towards the river. The West Branch North Branch Patapsco River flows from the northwest to the southeast through the site. To the north of the river, the site includes another ridge with a local high point of approximately 780 feet NAVD88. Similar to the south portion of the site, this ridge drains to the east or west into unnamed tributaries, or directly to the south to the river. The topography is shown on Figure 2-1, Figure 2-2, and Figure 2-3.

2.2 ZONING AND SURROUNDING LAND USE

The CCRRP sits on a 546-acre parcel, which is a combination of a 220-acre parcel (Map 46, Parcel 47), which is zoned as an Agricultural District, and a 326-acre parcel purchased in 2021 (Map 46, Parcel 64), which is mostly zoned as an Agricultural District with a small portion across the north end zoned Conservation (along the West Branch North Branch Patapsco River), and a section near Baltimore Boulevard zoned as a Light Industrial District (I-1) and Employment Campus. The areas within a half mile boundary outside of the parcel are zoned as Agricultural, Conservation, Commercial, Light Industrial, and Residential. The zoning map is shown on Figure 2-4.

Per County Code Chapter 158 (Zoning Regulations), Solid Waste Acceptance Facilities are permitted in Heavy Industrial Districts (I-2) and as a conditional use in I-1 districts. However, County Code Section 158.049 (County Public Buildings, Structures, and Uses) does permit County-owned facilities to be located in any zoning district as a principal primary use. The 2020 Master Plan indicates that the planned zoning for the site is intended to be I-2 for Parcel 47 and all newly acquired lands to the south, east, and west. The remainder of Parcel 46 to the north is intended to be I-1 with the swath of Conservation remaining. The County is pursuing re-zoning of the parcels to I-2 as of May 2026.

A map of the properties located within 1,000 feet of the site boundary and a table listing the names and addresses of the property owners is located in Appendix C.

2.3 SITE SOIL CHARACTERIZATION

The online Natural Resources Conservation Service's Web Soil Survey was reviewed for the site and identifies a total of 18 soil mapping units, which are identified in Table 2-1 and shown on Figure 2-5. According to the Soil Survey, four hydric soil units occur within the site boundary and correspond to the locations of the mapped U.S. Geological Survey (USGS) streams. The soils in the area are typically well drained with a pH range of 5.2 to 6.8. The most predominant soil series at the existing site is Udorthents with Glenelg and Glenville series type soils found mainly in the purchased expansion area.

2.4 SITE GEOLOGY AND HYDROGEOLOGY

2.4.1 Regional Geology

A regional geologic map of the subject site is shown on Figure 2-6.

This description of the regional geology draws largely on information in the initial Northern Sanitary Landfill Geologic Report completed by Century Engineering, Inc. (Century Engineering) for Carroll County, Maryland Department of Public Works in 1984 and a Geologic Map of the Westminster Quadrangle by Jonathan Edwards, Jr. (Edwards) in 1993.

The Westminster quadrangle's bedrock mostly consists of one large nappe known as the Linganore Nappe. The rocks of this structure have been metamorphosed to greenschist grade and have close folding, and pervasive foliation. Little of the primary sedimentary, or volcanic, structures remain in these rocks that are dated to be from the late Precambrian through the Early Ordovician. Metamorphism is presumed to be a result of Taconic deformation (Edwards 1993).

The oldest unit in the quadrangle is the Sams Creek Formation; it constitutes the basal formation of the Linganore Nappe. The Sams Creek Formation is rarely exposed and generally overridden by the large expanse of the Gillis Group that covers most of the quadrangle, including the subject site. An unconformity exists between the two units. The Pretty Boy Schist occurs locally and its stratigraphic relationship to other rocks of the Linganore Nappe is uncertain. Alluvium is present throughout the quadrangle as a thin veneer overlying channeled bedrock but is not commonly observed in smaller tributary streams (Edwards 1993).

The Sams Creek Formation is comprised of green, purple, and gray phyllite. Abundant dark green to gray-green, sheared, phyllitic metabasalt appear throughout as well as a few lenses of marble (Edwards 1993).

The Gillis Group is comprised of dark to light silvery-gray, tan, and greenish-gray quartz-chlorite-muscovite phyllite, interbedded with white to pale green quartz silts. Phyllites can also range from bluish-green to reddish-purple (Edwards 1993).

The Prettyboy Schist is comprised of fine to medium-grained plagioclase-chlorite-muscovite-quartz schist often with garnet, accessory epidote, magnetite and tourmaline. Stringers and knots of milky quartz (limbs and hinges of sheared-out isoclinal minor folds) are abundant. Medium-

grained schists are sparkly green-gray and weather to shades of brown and green (Edwards 1993).

Alluvium in this quadrangle is described as gray-brown to light brown, poorly sorted, coarse to fine sand, silt, and clay with sporadic lenses of subrounded quartz cobble gravel, which may include chips and cobbles of local bedrock (Edwards 1993).

Table 2-1. Mapped Soil Types at Carroll County Resource Recovery Park

Symbol	Description	Hydric	K-Factor	Hydrologic Soil Group	Drainage Class
BaB	Baile silt loam, 3 to 8 percent slopes	Yes	0.37	C/D	Poorly drained
BrD	Brinklow channery loam, 15 to 25 percent slopes	No	0.20	C	Well drained
BrE	Brinklow channery loam, 25 to 45 percent slopes	No	0.20	C	Well drained
CdA	Codorus silt loam, 0 to 3 percent slopes	Yes	0.32	C	Moderately well drained
GdB	Glenelg loam, 3 to 8 percent slopes	No	0.24	B	Well drained
GdC	Glenelg loam, 8 to 15 percent slopes	No	0.24	B	Well drained
GeB	Glenelg channery loam, 3 to 8 percent slopes	No	0.20	B	Well drained
GeC	Glenelg channery loam, 8 to 15 percent slopes	No	0.24	B	Well drained
GhB	Glenville silt loam, 3 to 8 percent slopes	Yes	0.37	C/D	Moderately well drained
GhC	Glenville silt loam, somewhat poorly drained, 8 to 15 percent slopes	Yes	0.37	C/D	Somewhat poorly drained
HaA	Hatboro silt loam, 0 to 3 percent slopes	Yes	0.43	B/D	Poorly drained
MaB	Manor loam, 3 to 8 percent slopes	No	0.24	B	Well drained
MaC	Manor loam, 8 to 15 percent slopes	No	0.28	B	Well drained
MaD	Manor loam, 15 to 25 percent slopes	No	0.28	B	Well drained
MaF	Manor loam, 25 to 45 percent slopes	No	0.24	B	Well drained
McF	Manor-Brinklow complex, 45 to 65 percent slopes, very rocky	No	0.28	B	Well drained
UdE	Udorthents, refuse, 3 to 45 percent slopes	No	NA	NA	NA
UrB	Urban land-Udorthents complex, 0 to 8 percent slopes	No	NA	D	NA

Notes:
NA = Not applicable
Source: U.S. Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey. Accessed on 28 June 2023.

Precipitation is responsible for most of the groundwater in the eastern Piedmont area. Infiltration is stored in saprolite and open fractures of the bedrock after percolating through soil. The piezometric surface of groundwater at the site generally mirrors the ground surface of the site and generally is moving down hillslopes toward valleys. With the exception of the south of the site where groundwater is flowing southwest due to local topography, groundwater has been observed moving generally to the north-northeast. Groundwater primarily occurs on-site in weathered rock (saprolite) and fractures in bedrock. Occasionally groundwater will be encountered in residual soil particularly in the vicinity of low-lying areas near streams (Century Engineering 1984).

2.4.2 Historical Site Geology and Hydrogeology

A site investigation was performed by Century Engineering in 1983 during the initial design of the Landfill. The Northern Sanitary Landfill Geologic Report prepared by Century Engineering (1983 Century Engineering Report) is included in Appendix D. The 1983 Century Engineering Report includes discussion on regulatory requirements, background, geology and soils, water quality, floodplains, water balance, and preliminary design. The report also contains geologic cross sections for the landfill area. The following sections summarize the report.

Background
The purpose of the report was to determine a suitable location that could serve as a solid waste disposal site for a 20-year period and to satisfy the regulatory requirements for a Phase I, Preliminarily Investigation. Two sites were considered for this investigation, and both were zoned Agricultural and Transitional at the time of writing.

Geology and Soils
Data for the report was obtained from USGS and the Maryland Geological Survey. Site-specific data was acquired from field mapping, installation of observation wells, groundwater monitoring, soil sampling, and laboratory tests. This section referenced the geologic map of Carroll County published in 1928. The site is underlain entirely by a low-grade metamorphic schist (the Prettyboy Schist) which weathered to micaceous saprolite. Thirty-four dry sample borings were drilled, sampled, and logged for soil initially. Each borehole was installed with a 2-inch riser and screen for observation. Three additional observation wells and four monitoring wells were installed to better define groundwater elevations, but these wells were not sampled or logged for soil properties. Monitoring wells had 4-inch risers and screens installed.

Surface material was generally characterized into three zones on site: Zone 1, unconsolidated soils; Zone 2, decomposed rock (saprolite); and Zone 3, bedrock. Zone 1 soils are located at the surface and are described in boring logs as moist brown to gray clay and silt, with trace rock fragments and sand with a thickness ranging from 0 to 18 feet. Zone 2 material underlies Zone 1 material and has a mean thickness of 17 feet. Zone 2 material is described as brown-gray moist rock fragments (weathered rock) and silt. Zone 2 material was reported to have a thickness of 0 to 43 feet with an average thickness of 17 feet. Rock core descriptions and rock quality data indicate that Zone 3 (bedrock) was encountered at depths ranging from 0 to 46 feet below ground

surface. Most consolidated rock encountered during drilling is described as green-gray mica shist with quartzite lenses with red to tan iron staining at joints and planar foliation.

Fracture analysis was performed for the Northern Landfill by reviewing stereographic aerial photographs encompassing a 1.4-square-mile area surrounding the site and comparing them against field observations. Frequency and direction of fracture traces were presented in a fracture frequency rosette which indicated that fracture traces were primarily to the north and north-northeast. Fracture analysis methodology was based on Development of Fracture Analysis as Exploration Method by P.H. Blanchet (1957) and Photogeologic Fracture-Trace Mapping in Appalachian Plateau by L.H. Lattman, and R.P. Nichelsen (1958).

Groundwater occurrence discussion is included in the 1983 Century Engineering Report. Additionally, it should be noted that records of over 3,000 wells and springs withing a mile radius of the site were included in this report. Depths of wells ranged from 21 to 425 below ground surface with reported yields that ranged from 2 to 22 gallons per minute with an average of 9.8 gallons per minute. There was no correlation observed between depth of well and yield. The primary use for surveyed wells was domestic and agricultural purposes. Field permeability tests were conducted in on-site borings and indicated that permeability ranges from 1.6 to 88 feet per day. The highest permeabilities were related to noticeable spring activity and oriented along major fracture traces in the vicinity of boring D-17 A (current M-9S). The average velocity of groundwater on site was reported to be 9 feet per day for a hydraulic gradient of unity.

Water Quality

Utilizing the Carroll County groundwater information for well records, spring records, and chemical quality data as contained in the Maryland Geological Survey Basic Data Report from 1981, 17 wells and 2 springs were documented to exist within 1 mile of the Northern Landfill site. Only one well within the vicinity (1.5 mile) of the site had chemical analysis data for it. Assessment of chemical data from this well indicated that water in the well was soft with low alkalinity and small quantities of chlorides and nitrates. Groundwater sampling performed as part of the 1983 Century Engineering Report indicated that water quality was as expected for groundwaters of the Piedmont, with high heavy metals and calcium. No analytes tested for were found to be above U.S. Environmental Protection Agency drinking water standards. Samples were not analyzed for volatile organic compounds.

Surface water samples were collected from incoming and outgoing legs of an unnamed tributary of the West Branch Patapsco River which forms the northern border of the site. Additional samples were collected from surface flow from on-site springs. Chemical and water quality was compared to drinking water standards established by the U.S. Environmental Protection Agency, which included 29 water quality parameters. Generally, water quality was found to be acceptable for drinking. Testing for bacteriological quality was not performed.

Floodplain

The Northern Landfill is drained by an unnamed tributary of the West Branch of the Patapsco River. This stream forms the northern boundary of the site with its headwaters forming 1 mile to

the northwest of the Northern Landfill. It has a total drainage area of 616 acres as it leaves the site. The 100-year peak discharge was found to be approximately 780 cubic feet per second.

Water Balance
A water balance study performed during the 1983 Century Engineering Report indicated that the 89 acres of proposed landfill area would average 9.55 inches of water a year which will generate 23,335,105 gallons of leachate per year or 262,192 gallons per acre per year.

2.5 WILDLIFE

A detailed wildlife survey has not been conducted at the site; however, incidental observations were made as part of natural resource survey conducted by EA during Spring 2023. Field staff observed white-tailed deer, red fox, grey squirrel, chipmunk, and cottontail rabbit within the site, as well as numerous songbird species, turkey vulture, red tailed hawk, and other avian species. Various reptile and amphibian species such as eastern box turtle, green frog, northern leopard frog, black rat snake, garter snake, and two-lined salamanders were also observed throughout the site. Furthermore, a complement of mammals would be expected to utilize the study area, including (but not limited to) raccoon, opossum, skunk, mice, and shrews.

2.6 WETLANDS

Approximately 620 acres of developed and natural land were evaluated at the CCRRP in Carroll County for wetlands in June 2023 using the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (USACE 1987). The methods described in the manual were used as a guide for the field delineation of the wetland/upland boundary.

EA's environmental scientists reviewed wetland data from the U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) website (https://www.fws.gov/program/national- wetlands-inventory) to identify potential wetland areas. Within the site, the NWI map depicts six NWI wetlands, two freshwater ponds, and four riverine systems.

In May and June 2023, EA's wetland scientists performed a field delineation within the site to evaluate whether wetlands and/or waterways were present. The field delineation consisted of identifying the outer limits of the wetlands and waterways with pink and black flagging, which was numbered sequentially. Wetland flags were located in the field with a handheld Trimble® Geo7X GPS unit with sub-meter horizontal accuracy and collected in the North American Datum of 1983, Maryland State Plane Coordinate System. No wetlands will be impacted due to the Landfill expansion based on the potential Landfill expansion footprint depicted in Figure 3-1. The field-mapped wetland/stream boundaries are shown in Figures 2-7 through 2-12.

2.7 FORESTED AREAS

A Forest Stand Delineation (FSD) was conducted concurrently with the wetland delineation and was conducted in accordance with the Maryland Department of Natural Resources' 1991 Forest Conservation Act as well as Carroll County requirements. The FSD consisted of mapping four distinct forest cover types across the area of review, which included 242.6 acres of forest across the site. In addition to the mapped forest stands, EA also identified 22 specimen trees, which

should be avoided during the development of the site. The location of each specimen tree is included on the FSD map. EA's Forest Stand Delineation Report is included in Appendix B.

2.8 SEISMICITY

In accordance with 40 Code of Federal Regulations (CFR) 258.13, *Fault Areas*, the landfill "shall not be located within 200 ft (60 meters) of a fault that has had displacement in Holocene time" without designing the facility and liner system to withstand potential movement of the fault. There are no active faults within 200 feet of the landfill expansion site. According to the Maryland Geological Survey (Reger 2003), "In Maryland, for example, there are numerous faults, but none are known or suspected to be active."

According to 40 CFR 258.14, a seismic impact zone is identified as an area with a 10 percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as percentage of the earth's gravitational pull (g) will exceed 0.10 g in 250 years. Figure 2-13 shows that the peak ground acceleration value for the Landfill expansion is 0.08 g; therefore, the site is not located in a seismic impact zone.

3. PROPOSED ACTIVITY

This chapter presents a summary of the proposed activity, which includes a redesign of the existing permitted Landfill including a horizontal and vertical expansion to increase lifespan and capacity of the Northern Landfill. The following sections provide an overview of the type of facility, area served, expected capacity, and types of waste to be accepted. The completed application form is included in Appendix A. Per the Environmental Justice Screening Tool provided by the Maryland Department of the Environment (MDE), the Environmental Justice score is 23.41 (percent for the census tract) and 18.18 (percent for distribution across Maryland).

3.1 PROPOSED ACTIVITY

The site is currently an MSW landfill and this Landfill expansion will continue the same proposed activity. The Landfill will comply with current MSW landfill regulations (COMAR 26.04.07) and will include a double liner and leachate collection system to match the currently permitted design. In accordance with 40 CFR 258, Subpart B Location Restrictions, the proposed landfill expansion footprint does not impact floodplains in the area and is not located near a fault or in a seismic impact zone, both of which will be elaborated on in the Phase II Report. New Landfill cells will be designed with a series of subcells that will be filled progressively to reduce active Landfill area and leachate volumes. The existing Landfill has a maximum permitted elevation of 872 feet, and the proposed maximum elevation (top of waste with two feet final cover soil) for the expansion is approximately 973 feet. The maximum elevation is based on a conceptual design and will be determined during further design stages. The potential new landfill footprint is shown in Figure 3-1.

The site currently accepts a variety of recyclable materials and household waste from county residents and from commercial haulers who operate within the county. The site will continue to accept these types of materials in accordance with the County's current programs and Refuse Disposal Permit. This project includes a re-design of the site entrance off Baltimore Boulevard and internal traffic flows to better handle traffic volumes, reduce queuing time, improve customer experience, and improve safety.

The site currently includes a transfer station for municipal waste and recyclable materials, and the plan is to continue this operation at the site. A new transfer station will be constructed to replace the aging transfer station and increase capacity to match future needs.

3.2 SERVICE AREA

The Landfill currently accepts only county-generated wastes as indicated in Carroll County Code § 50.04 (A) accessed on 11 July 2023. Any change to the service area would require approval of the County Commissioners.

Carroll County has a population estimated at approximately 175,000 people and 63,000 households as of 1 July 2022 (U.S. Census 2020). In 2021, approximately 16,000 tons of waste were landfilled in the Northern Landfill and approximately 112,000 tons of waste were transferred out-of-county for disposal (MDE 2022). Another 6,638 tons of scrap metal, scrap

tires, yard waste, textiles, vinyl siding, batteries, and electronics collected at the site were diverted to off-site recycling centers.

3.3 ESTIMATED FACILITY CAPACITY

The estimated waste disposal capacity of the Landfill under the existing permit is 3,504,187 CY with approximately 989,953 CY landfilled to date as of Calendar Year 2021 (MDE 2022). MSW landfilled was 52,481 CY and 29,438 CY during Calendar Years 2020 and 2021, respectively (Carroll County 2021 and MDE 2022). The Landfill is projected to reach capacity in approximately Calendar Year 2070 (Carroll County 2021).

The Landfill expansion is projected to increase the facility's capacity by an additional 12 million to 15 million CY. The Landfill expansion project is in the early planning phases, and the capacity is subject to change based on additional planning and design efforts.

3.4 WASTE ACCEPTED

Wastes accepted at the Landfill will be consistent with the current Refuse Disposal Permit (MDE 2020) for the Landfill, which includes the following waste streams:

- Solid waste originating from domestic and commercial sources and municipal operations within the limits of Carroll County
- Dewatered sludge from Carroll County water and wastewater treatment plants
- Rubble waste (construction and demolition debris) generated within Carroll County, such as brick (excluding refractory type), cement, concrete, demolition and construction debris, drywall, floor and wall tile, insultation (excluding friable asbestos type), lumber, scrap roofing material and shingles, and wood (other than yard waste).

Per the Refuse Disposal Permit, unacceptable wastes include specifically prohibited items regardless of their origin or type, which include:

- Controlled hazardous substances
- Liquid waste or any waste containing free liquids
- Special medical waste
- Radioactive hazardous substances
- Automobiles
- Drums or tanks (unless emptied and flattened or crushed with ends removed)

- Animal carcasses resulting from medical research activities or destruction of diseased animals harboring diseases transmittable to humans
- Untreated liquid septage or sewage scavenger waste
- Chemical or petroleum cleanup material that has not been evaluated for acceptance
- Scrap tires

The County currently collects yard waste on top of the Landfill, and the yard waste is managed through a contract with a vendor. The County is in the process of evaluating concepts for a new organics/yard waste facility that is located off the Landfill and may accommodate food waste and other organic material for processing and composting.

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4. REFERENCES

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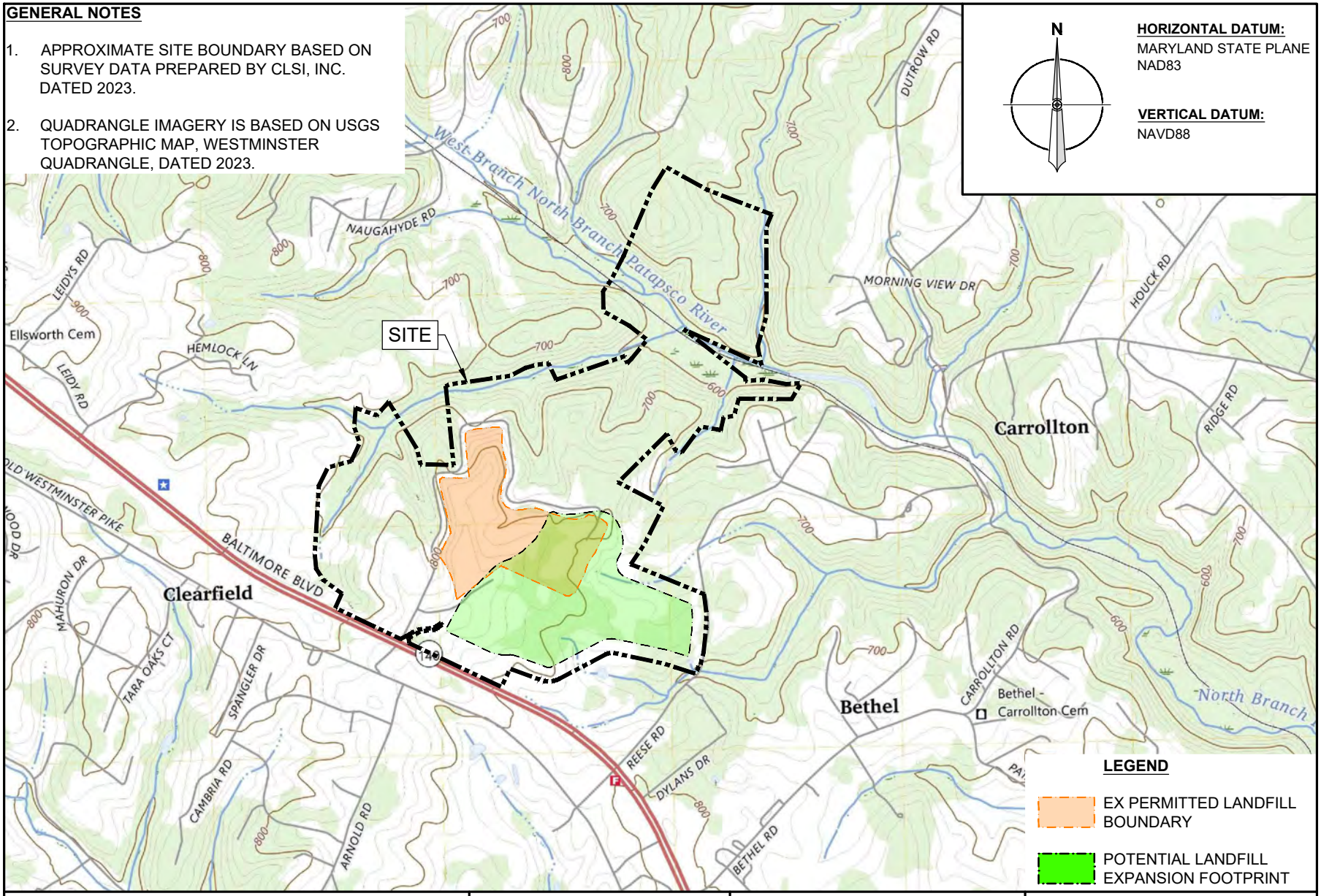
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Figures

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GENERAL NOTES

1. APPROXIMATE SITE BOUNDARY BASED ON SURVEY DATA PREPARED BY CLSI, INC. DATED 2023.
2. QUADRANGLE IMAGERY IS BASED ON USGS TOPOGRAPHIC MAP, WESTMINSTER QUADRANGLE, DATED 2023.



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0 1000 2000

GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 8.5" x 11"

PROJECT NAME

CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS

BALTIMORE BOULEVARD, CARROLL CO, MD

DRAWING TITLE

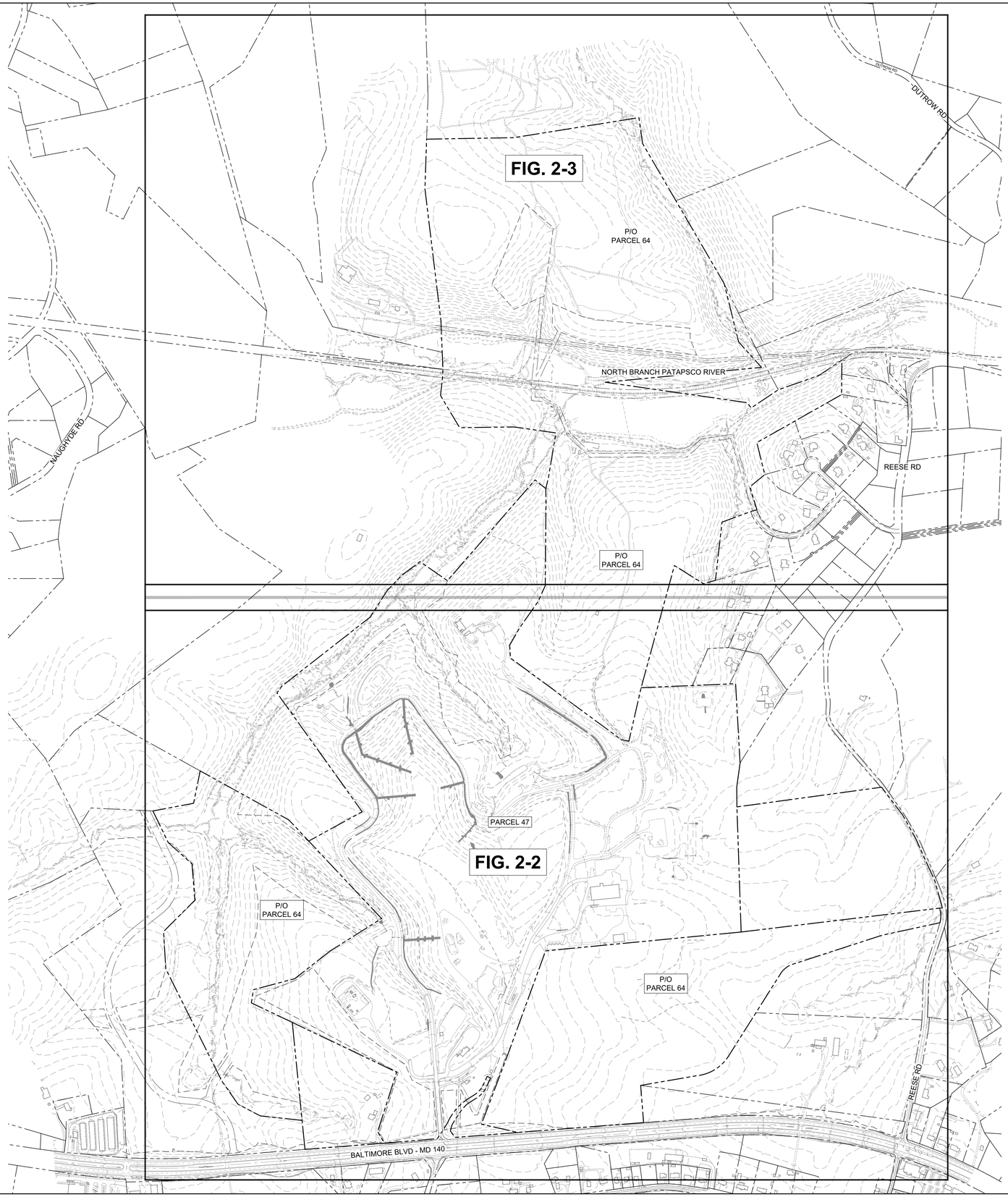
PHASE I REPORT
LOCATION MAP

FIGURE

1-1

DRAWING INFORMATION	DRAWN BY: JAP	DESIGNED BY: SMB	CHECKED BY: TLM	PROJECT MANAGER: MJG	DATE: MAY 2026	PROJECT NO: 1636201

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GENERAL NOTES

1. APPROXIMATE SITE BOUNDARY, EASEMENTS, AND RIGHTS-OF-WAYS BASED ON A SURVEY DATA PREPARED BY CLSI, INC. DATED 2023.
2. EXISTING SITE CONDITIONS AND TOPOGRAPHY ARE BASED ON AN AERIAL SURVEY BY AXIS GEOSPATIAL, DATED MARCH 2023.

LEGEND

- PROPERTY BOUNDARY
- PROPERTY BOUNDARY ADJOINER
- PROPERTY EASEMENT
- PROPERTY RIGHT-OF-WAY
- PROPERTY SETBACK
- SITE CONTOUR
- SITE FENCE
- SITE GRAVEL
- SITE TREE/BRUSH LINE
- SITE WETLAND
- SITE WETLAND BUFFER
- SITE WATERS OF THE U.S.
- STORM DRAIN UTILITY MARKING
- WATERWAY STREAM CHANNEL BUFFER
- OVERHEAD ELECTRIC

HORIZONTAL DATUM:
MARYLAND STATE PLANE
NAD83

VERTICAL DATUM:
NAVD88

FULL SIZE PLOT: 24" x 36"

0 200 400 800
GRAPHIC SCALE IN FEET

DATE: MAY 2026

PROJECT NAME
CARROLL COUNTY
RESOURCE RECOVERY PARK
AND NORTHERN LANDFILL
EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD,
CARROLL CO, MD

FIGURE TITLE
PHASE I REPORT
SITE TOPOGRAPHIC MAP -
KEY MAP

FIGURE NO. 2-1

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MATCH LINE - SEE FIGURE 2-3

GENERAL NOTES

1. APPROXIMATE SITE BOUNDARY, EASEMENTS, AND RIGHTS-OF-WAYS BASED ON A SURVEY DATA PREPARED BY CLSI, INC. DATED 2023.
2. EXISTING SITE CONDITIONS AND TOPOGRAPHY ARE BASED ON AN AERIAL SURVEY BY AXIS GEOSPATIAL, DATED MARCH 2023.

LEGEND

- PROPERTY BOUNDARY
- PROPERTY BOUNDARY ADJOINER
- PROPERTY EASEMENT
- PROPERTY RIGHT-OF-WAY
- PROPERTY SETBACK
- SITE CONTOUR
- SITE FENCE
- SITE GRAVEL
- SITE TREE/BRUSH LINE
- SITE WETLAND
- SITE WETLAND BUFFER
- SITE WATERS OF THE U.S.
- STORM DRAIN UTILITY MARKING
- WATERWAY STREAM CHANNEL BUFFER
- OVERHEAD ELECTRIC
- M-## EXISTING MONITORING WELL FOR ORIGINAL LANDFILL
- # LANDFILL GAS WELL

100-YEAR FLOODPLAIN

LEACHATE STORAGE POND 2

LEACHATE MW-BRAGE POND 1

SEDIMENT BASIN NO. 2

SEDIMENT BASIN NO. 3

HAP BAKER FIREARMS FACILITY

APPROXIMATE LIMIT OF RUBBLE CELL R-2 (UNLINED, DIGITIZED FROM RECORDS)

APPROXIMATE LIMIT OF RUBBLE CELL SW-2 (DIGITIZED FROM RECORDS)

MATERIALS STORAGE AREA

PARCEL 47

WATER RESOURCE PROTECTION EASEMENT L 6511, F 226

P/O PARCEL 64

TAX MAP 46, RECONFIGURED PARCEL 1643
TAX ACC. 04-430670
AREA AS SURVEYED
2,349,610 FT²
53.9396 ACRES

TAX MAP 47, PARCEL 75
TAX ACC. 04-024664
AREA AS SURVEYED
1,349,908 S.F.
30.9896 ACRES

APPROXIMATE LIMIT OF RUBBLE CELL SW-1 (DIGITIZED FROM RECORDS)

CELL 1 LEACHATE STORAGE TANK

TRANSFER STATION

HOMEOWNER DROP-OFF WASTE AREA

MAINTENANCE FACILITY

SEDIMENT BASIN NO. 1

NATURAL WOOD WASTE PROCESSING AREA

SCRAP METAL DROP-OFF AND STORAGE AREA

BLOWER / FLARE STATION

SCALE HOUSE

TAX MAP 46, PARCEL 47
TAX ACC. 04-006488
COUNTY COMMISSIONERS OF CARROLL COUNTY

TAX MAP 46, RECONFIGURED PARCEL 1601
TAX ACC. 04-075951
AREA AS SURVEYED
2,614,419 S.F.
60.0188 ACRES

ADMINISTRATIVE BUILDING

HOMEOWNER DROP-OFF RECYCLABLES AREA

TAX MAP 46, PARCEL 64
TAX ACC. 04-026829
AREA AS SURVEYED
524,015 SQ. FT.
12.0297 ACS

OVERHEAD ELECTRIC

SHA EASEMENT

FOREST CONSERVATION EASEMENT

BALTIMORE BLVD - MD 140

REESE RD

HORIZONTAL DATUM:
MARYLAND STATE PLANE
NAD83

VERTICAL DATUM:
NAVD88

FULL SIZE PLOT: 24" x 36"

0 100 200 400
GRAPHIC SCALE IN FEET

DATE: MAY 2026

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD, CARROLL CO, MD

FIGURE TITLE
PHASE I REPORT
SITE TOPOGRAPHIC MAP - SOUTHERN AREA

FIGURE NO. 2-2

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FILE PATH: Q:\PROJECTS\183001 - CORR\PUA\PRODUCTION\FIGURES\PHASE I REPORT\183001 - PHASE I REPORT - EXISTING CONDITIONS.DWG | FIGURE 2-2 | BISSETT, STEVEN 8/12/2026 8:06 AM

GENERAL NOTES

1. APPROXIMATE SITE BOUNDARY, EASEMENTS, AND RIGHTS-OF-WAYS BASED ON A SURVEY DATA PREPARED BY CLSI, INC. DATED 2023.
2. EXISTING SITE CONDITIONS AND TOPOGRAPHY ARE BASED ON AN AERIAL SURVEY BY AXIS GEOSPATIAL, DATED MARCH 2023.

DUTROW RD

P/O
PARCEL 64

FOREST CONSERVAITON EASEMENT
L 3989, F 390

R.O.W
L 3989, F 390

30' R.O.W
L 159, F 141

RELOCATED FOREST
CONSERVATION EASEMENT
L 5554, F 362

R.O.W
L 5554, F 362

30' R.O.W
L 159, F 141

NORTH BRANCH PATAPSCO RIVER

FOREST CONSERVATION
EASEMENT
L 3067, F 240
(RELOCATED AND
SUPERSEDED
BY L 5554, F 362)

R.O.W
L 3067, F 240

R.O.W
L 3067, F 240

REESE RD

50' INGRESS & EGRESS
TO REMAINING PORTION
IN PLAT BOOK 48, PAGE 111
ALSO IN LIBER 2869, FOLIO 503,
LIBER 2869, FOLIO 509 &
30' IN LIBER 3067, FOLIO 240

30' R.O.W.
LIBER 3067, FOLIO 240

P/O
PARCEL 64

M-15

M-14

MATCH LINE - SEE FIGURE 2-2

LEGEND

- PROPERTY BOUNDARY
- PROPERTY BOUNDARY ADJOINER
- PROPERTY EASEMENT
- PROPERTY RIGHT-OF-WAY
- PROPERTY SETBACK
- SITE CONTOUR
- SITE FENCE
- SITE GRAVEL
- SITE TREE/BRUSH LINE
- SITE WETLAND
- SITE WETLAND BUFFER
- SITE WATERS OF THE U.S.
- STORM DRAIN UTILITY MARKING
- WATERWAY STREAM CHANNEL BUFFER
- OVERHEAD ELECTRIC
- ⊙ M-## EXISTING MONITORING WELL FOR ORIGINAL LANDFILL
- ■ # LANDFILL GAS WELL

HORIZONTAL DATUM:
MARYLAND STATE PLANE
NAD83

VERTICAL DATUM:
NAVD88

FULL SIZE PLOT: 24" x 36"

0 100 200 400
GRAPHIC SCALE IN FEET

DATE: MAY 2026

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD, CARROLL CO, MD

FIGURE TITLE
PHASE I REPORT
SITE TOPOGRAPHIC MAP - NORTHERN AREA

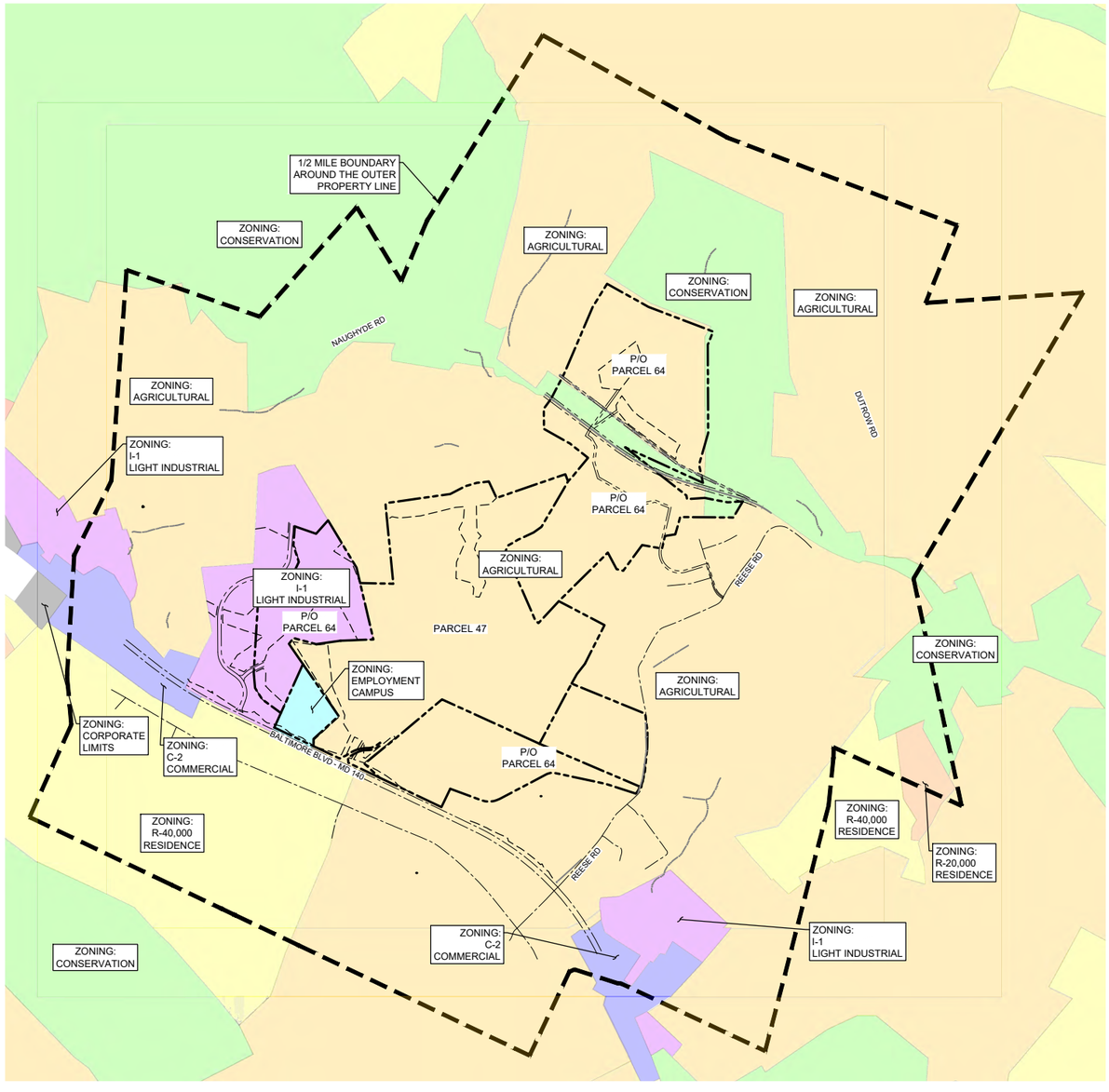
FIGURE NO. 2-3

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N

HORIZONTAL DATUM:
MARYLAND STATE PLANE
NAD83

VERTICAL DATUM:
N/A

GENERAL NOTES

1. APPROXIMATE SITE BOUNDARY BASED ON SURVEY DATA PREPARED BY CLSI, INC. DATED 2023.
2. ZONING DESIGNATIONS BASED ON CARROLL COUNTY COUNTYWIDE ZONING MAP, DATED 02/22/2022.

FILE PATH: Q:\PROJECTS\1636201 - CCRRP\CAD\PRODUCTION\FIGURES\PHASE I REPORT\1636201 - PHASE I REPORT - ZONING AND LAND USE MAP.DWG [FIGURE 2-4] BISSETT, STEVEN 5/12/2026 8:06 AM

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GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 11" x 17"

DRAWING INFORMATION

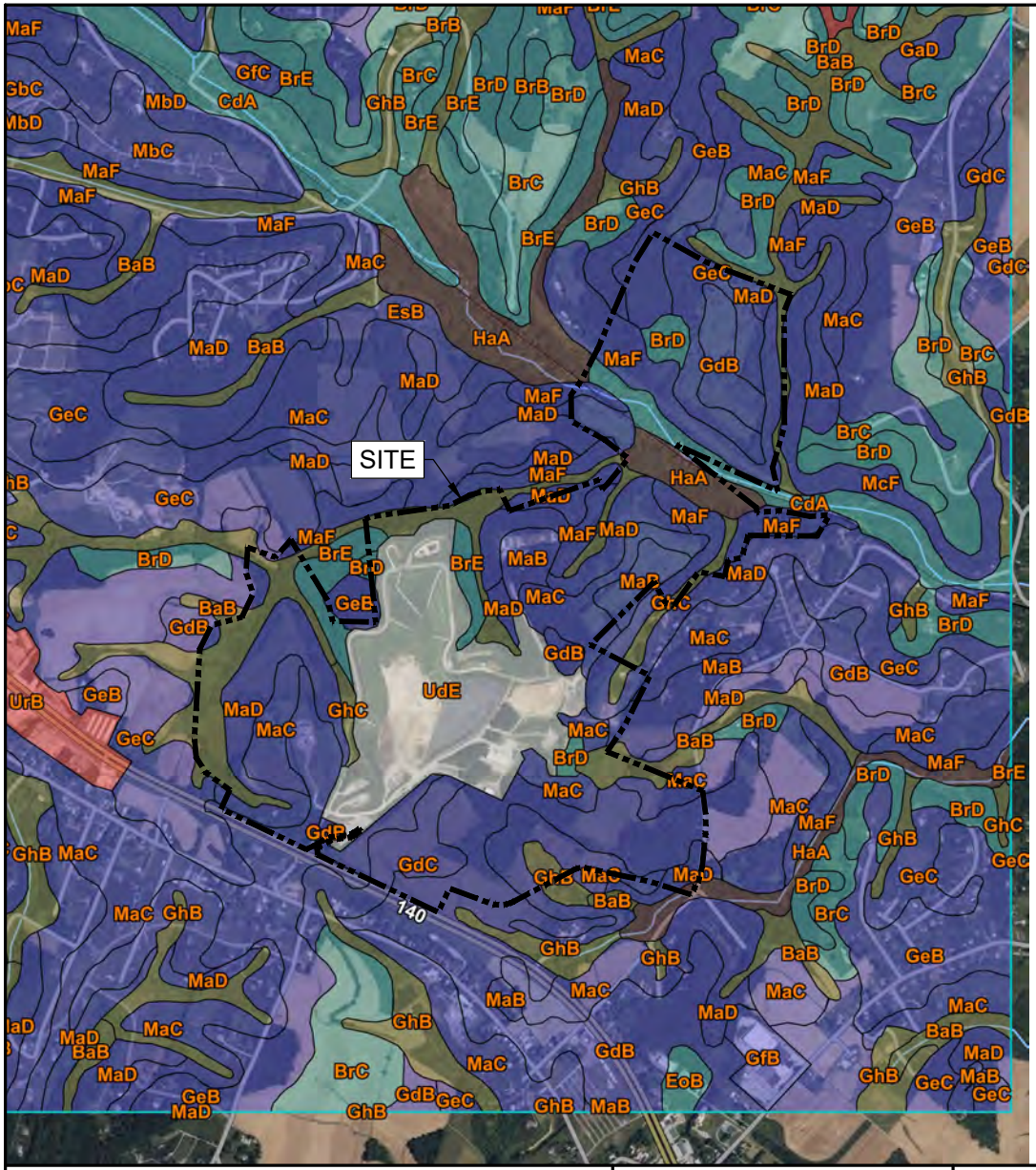
DRAWN BY: JAP	DESIGNED BY: SMB
CHECKED BY: TLM	PROJECT MANAGER: MJG
DATE: MAY 2026	PROJECT NUMBER: 1636201

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD, CARROLL CO, MD

DRAWING TITLE
PHASE I REPORT
ZONING MAP

DRAWING NO.
2-4



N

HORIZONTAL DATUM:
MARYLAND STATE PLANE
NAD83

VERTICAL DATUM:
N/A

GENERAL NOTES

1. APPROXIMATE SITE BOUNDARY BASED ON SURVEY DATA PREPARED BY CLSI, INC. DATED 2023.
2. SOIL BOUNDARIES AND DESIGNATIONS ARE BASED ON USDA NRCS WEB SOIL SURVEY DATA, ACCESSED 06/23/2023.

SOILS TABLE

SYMBOL	MAP UNIT NAME	HYDRIC	HSG	K FACTOR
BaB	BAILE SILT LOAM, 3-8% SLOPES	YES	C/D	.37
BrC	BRINKLOW CHANNERY LOAM, 8-15% SLOPES	NO	C	.20
BrD	BRINKLOW CHANNERY LOAM, 15-25% SLOPES	NO	C	.20
BrE	BRINKLOW CHANNERY LOAM, 25-45% SLOPES	NO	C	.20
CdA	CODORUS SILT LOAM, 0-3% SLOPES	YES	C	.32
GdB	GLENELG LOAM, 3-8% SLOPES	NO	B	.24
GdC	GLENELG LOAM, 8-15% SLOPES	NO	B	.24
GeB	GLENELG CHANNERY LOAM, 3-8% SLOPES	NO	B	.20
GeC	GLENELG CHANNERY LOAM, 8-15% SLOPES	NO	B	.24
GhB	GLENVILLE SILT LOAM, 3-8% SLOPES	YES	C/D	.37
GhC	GLENVILLE SILT LOAM, SOMEWHAT POORLY DRAINED, 8-15% SLOPES	YES	C/D	.37
HaA	HATBORO SILT LOAM, 0-3% SLOPES	YES	B/D	.43
MaB	MANOR LOAM, 3-8% SLOPES	NO	B	.24
MaC	MANOR LOAM, 8-15% SLOPES	NO	B	.28
MaD	MANOR LOAM, 15-25% SLOPES	NO	B	.28
MaF	MANOR LOAM, 25-45% SLOPES	NO	B	.24
McF	MANOR-BRINKLOW COMPLEX, 45-65% SLOPES, VERY ROCKY	NO	B	.28
UdE	UDORTHENTS, REFUSE, 3-45% SLOPES	NO	-	-

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0 1000 2000
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 8.5" x 11"

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

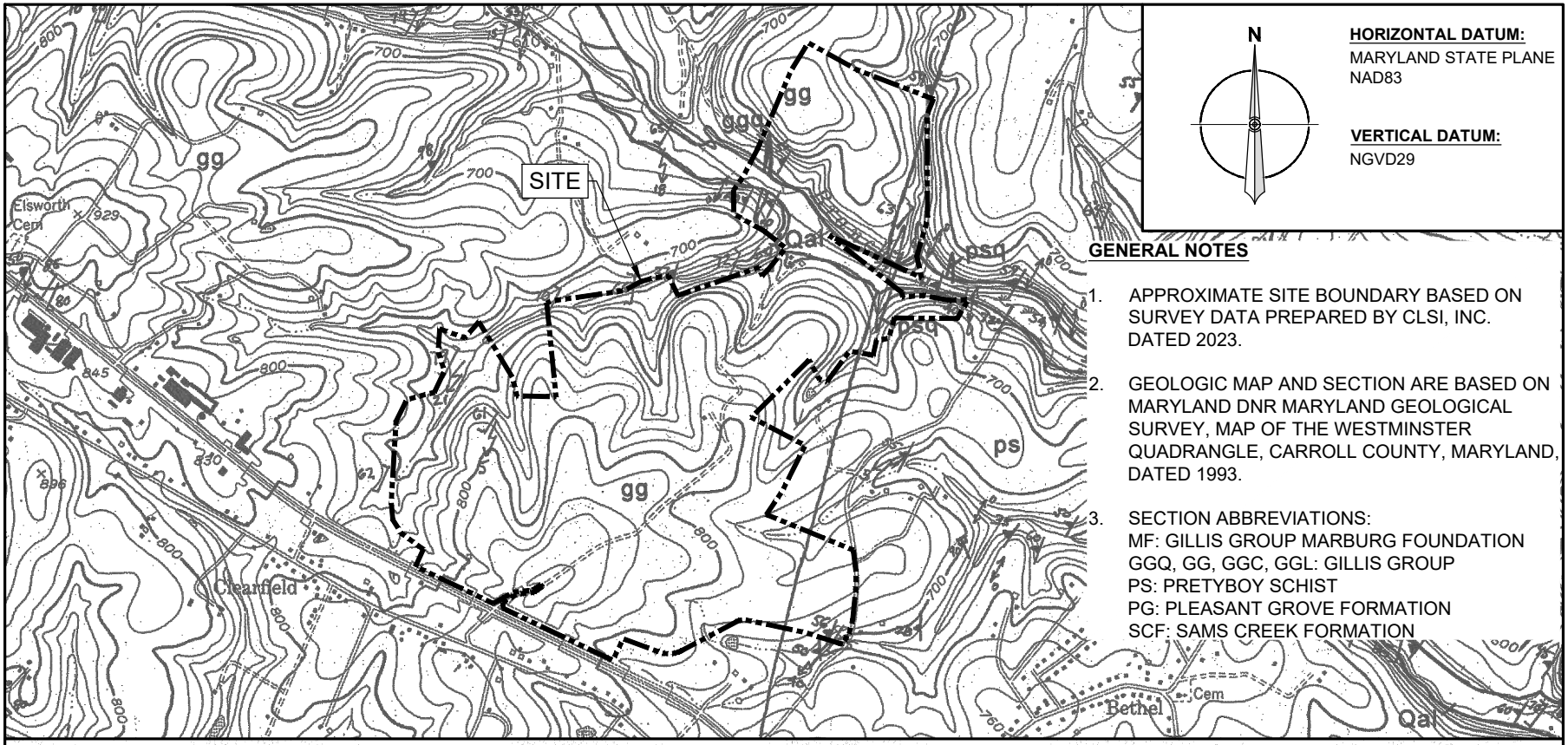
PROJECT ADDRESS
BALTIMORE BOULEVARD, CARROLL CO, MD

DRAWING TITLE
PHASE I REPORT
SOIL SERIES MAP

FIGURE
2-5

DRAWING INFORMATION | DRAWN BY: JAP | DESIGNED BY: SMB | CHECKED BY: TLM | PROJECT MANAGER: MJG | DATE: MAY 2026 | PROJECT NO: 1636201

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FILE PATH: Q:\PROJECTS\1636201 - CCRRP\CAD\PRODUCTION\FIGURES\PHASE I REPORT\1636201 - PHASE I REPORT - SOIL DISTRIBUTION MAP.DWG [FIGURE 2-5]



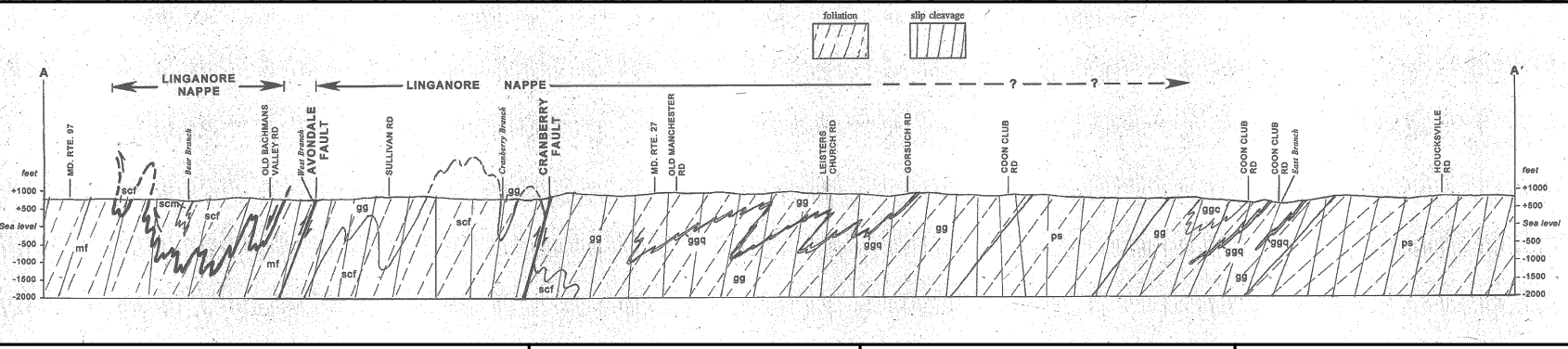
N

HORIZONTAL DATUM:
MARYLAND STATE PLANE
NAD83

VERTICAL DATUM:
NGVD29

GENERAL NOTES

1. APPROXIMATE SITE BOUNDARY BASED ON SURVEY DATA PREPARED BY CLSI, INC. DATED 2023.
2. GEOLOGIC MAP AND SECTION ARE BASED ON MARYLAND DNR MARYLAND GEOLOGICAL SURVEY, MAP OF THE WESTMINSTER QUADRANGLE, CARROLL COUNTY, MARYLAND, DATED 1993.
3. SECTION ABBREVIATIONS:
   MF: GILLIS GROUP MARBURG FOUNDATION
   GGQ, GG, GGC, GGL: GILLIS GROUP
   PS: PRETYBOY SCHIST
   PG: PLEASANT GROVE FORMATION
   SCF: SAMS CREEK FORMATION



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Hunt Valley, Maryland 21031
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0 1000 2000
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 8.5" x 11"

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD, CARROLL CO, MD

DRAWING TITLE
PHASE I REPORT
REGIONAL GEOLOGIC MAP

FIGURE
2-6

DRAWING INFORMATION | DRAWN BY: JAP | DESIGNED BY: SMB | CHECKED BY: TLM | PROJECT MANAGER: MJG | DATE: MAY 2026 | PROJECT NO: 1636201

PLOTTED: BISSETT, STEVEN 5/12/2026 8:07 AM
FILE PATH: Q:\PROJECTS\1636201 - CCRRP\CAD\PRODUCTION\FIGURES\PHASE I REPORT\1636201 - PHASE I REPORT - GEOLOGY MAP.DWG [FIGURE 2-6]

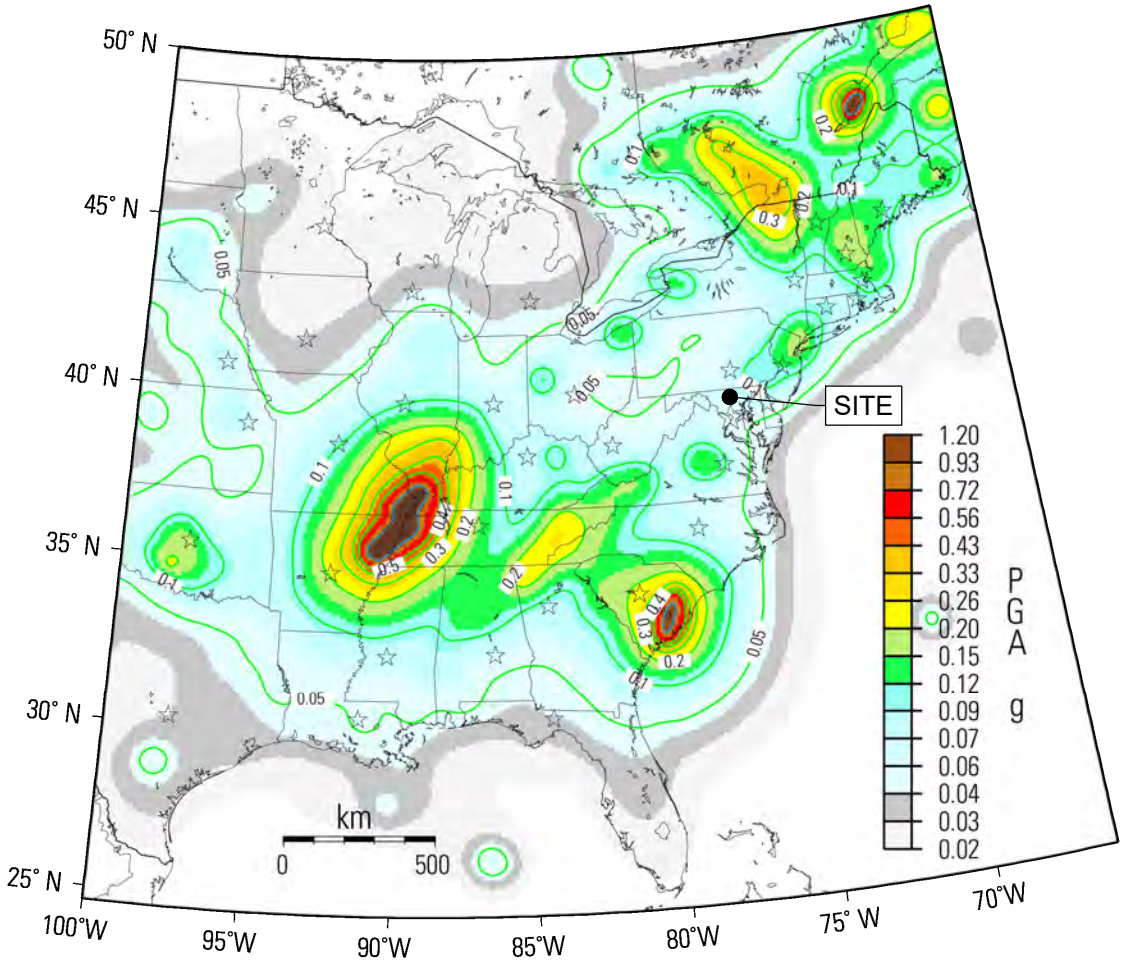


Figure 3. Map of peak ground acceleration (PGA) for 2-percent probability of exceedance in 50 years in the Central and Eastern United States in standard gravity (g).

N

HORIZONTAL DATUM:
MARYLAND STATE PLANE
NAD83

VERTICAL DATUM:
N/A

GENERAL NOTES

1. SOURCE: PETERSEN, M.D., ET AL 2008. DOCUMENTATION FOR THE 2008 UPDATE OF THE UNITED STATES NATIONAL SEISMIC HAZARD MAPS: U.S. GEOLOGICAL SURVEY OPEN-FILE REPORT 2008-1128, 61 P.

EA Engineering, Science, and Technology, Inc., PBC

225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

www.eaest.com

SCALE AS SHOWN

FULL SIZE PLOT: 8.5" x 11"

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

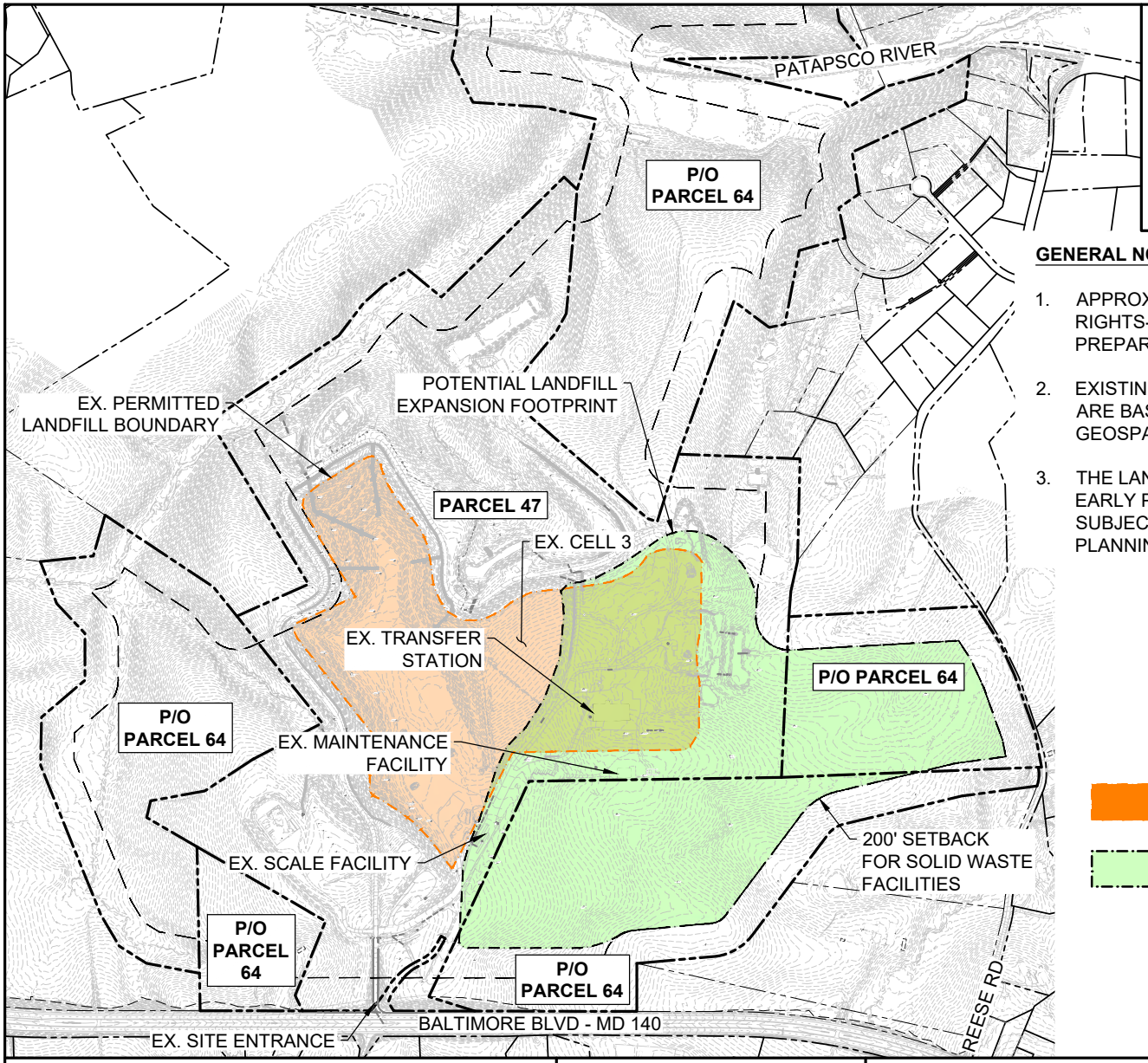
PROJECT ADDRESS
BALTIMORE BOULEVARD, CARROLL CO, MD

DRAWING TITLE
PHASE I REPORT
PEAK GROUND ACCELERATION MAP

FIGURE
2-13

DRAWING INFORMATION | DRAWN BY: JAP | DESIGNED BY: SMB | CHECKED BY: GAT | PROJECT MANAGER: MJG | DATE: MAY 2026 | PROJECT NO: 1636201

PLOTTED: BISSETT, STEVEN 5/12/2026 8:07 AM
FILE PATH: Q:\PROJECTS\1636201 - CCRRP\CAD\PRODUCTION\FIGURES\PHASE I REPORT\1636201 - PHASE I REPORT - PEAK GROUND ACCELERATION MAP.DWG [FIGURE 2-13]



HORIZONTAL DATUM:
MARYLAND STATE PLANE
NAD83

VERTICAL DATUM:
NAVD88

GENERAL NOTES

1. APPROXIMATE SITE BOUNDARY, EASEMENTS, AND RIGHTS-OF-WAYS BASED ON A SURVEY DATA PREPARED BY CLSI, INC. DATED 2023.
2. EXISTING SITE CONDITIONS AND TOPOGRAPHY ARE BASED ON AN AERIAL SURVEY BY AXIS GEOSPATIAL, DATED MARCH 2023.
3. THE LANDFILL EXPANSION PROJECT IS IN THE EARLY PLANNING PHASES, AND THE FOOTPRINT IS SUBJECT TO CHANGE BASED ON ADDITIONAL PLANNING AND DESIGN EFFORTS.

LEGEND

- EX PERMITTED LANDFILL BOUNDARY
- POTENTIAL LANDFILL EXPANSION FOOTPRINT

EA Engineering, Science, and Technology, Inc., PBC

225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

www.eaest.com

0 500 1,000
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 8.5" x 11"

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD, CARROLL CO, MD

DRAWING TITLE
PHASE I REPORT
POTENTIAL LANDFILL FOOTPRINT

FIGURE
3-1

DRAWING INFORMATION | DRAWN BY: SMB | DESIGNED BY: SMB | CHECKED BY: TLM | PROJECT MANAGER: MJG | DATE: MAY 2026 | PROJECT NO: 1636201

PLOTTED: BISSETT, STEVEN 5/12/2026 8:08 AM
FILE PATH: Q:\PROJECTS\1636201 - CCRRP\CAD\PRODUCTION\FIGURES\PHASE I REPORT\1636201 - PHASE I REPORT - POTENTIAL LANDFILL FOOTPRINT.DWG [FIGURE 3-1]

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Appendix A

Refuse Disposal Permit Application

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MARYLAND DEPARTMENT OF THE ENVIRONMENT

Land and Materials Administration ● Solid Waste Program
1800 Washington Boulevard ● Suite 605 ● Baltimore Maryland 21230-1719
410-537-3315 ● 800-633-6101 x3315 ● www.mde.maryland.gov

Refuse Disposal Permit Application

Authority: Title 9, Environment Article, Annotated Code of Maryland, and Code of Maryland Regulations (COMAR) 26.04.07
Municipal landfills also see 40 CFR Part 258 and EPA guidance for additional requirements.

Application for: ☑ **New Permit** ☐ **Renewal Permit**

Existing Permit No. 2020 - WMF - 0066 ***Issued Date:*** 01 / 05 / 2021 ***Expiration Date:*** 01 / 04 / 2026

Applicant's Legal Name: The Comissioners of Carroll County

Applicant's Status: ☐ *Individual* ☐ *Corporation* ☑ *Government* ☐ *Other:*

Federal Employer Identification No.: 52-6000910

Maryland State Department of Assessments and Taxation (SDAT) ID No.: 0704006488

Please note that a business/entity must be registered to do business in Maryland before a permit can be issued. The business or entity's information provided in this application must match the information in the SDAT register.

Proof of workers' compensation coverage is required under § 1-202 of the Environment Article. Please provide one of the following:
(1) A copy of a Certificate of Compliance issued by the Maryland Workers' Compensation Commission; or
(2) Workers' Compensation Insurance Policy/Binder Number: SP 4066941

Applicant's Mailing Address: 225 North Center Street ***City:*** Westminister ***State:*** MD ***Zip Code:*** 21157

Applicant's Telephone No. (410) 386 - 2520 ***Facsimile No.:*** ( ) -

Emergency Contact Name & Title: Clifford J. Engle, Chief of the Bu ***Telephone No.:*** ( ) -

Facility/Site Name: Northern Municipal Landfill

Facility/Site Address: 1400 Baltimore Bvld. ***City:*** Westminister ***State:*** MD ***Zip Code:*** 21157

County: Carroll ***Maryland Grid Coordinates:*** 685 , 870 *N* / 1,328 , 338 *E*

County Zoning Map No.: N/A ***Lot/Parcel No.:*** 0047 ***Deed/Liber/Folio No.:*** /00000/00000

State Legislative District: 42C ***Local Council / Election District:*** 3

Bay Tributary Watershed Code: 02130907 ***Latitude/Longitude (Deg/Min/Sec):*** 39 - 33 - 6.93 / -76 - 56 - 33.10

Site Acreage: 546 Acre ***Facility Acreage (Estimated):*** 80 Acre

Type of Solid Waste Acceptance Facility

☑ ***Municipal Landfill*** [1,4] ☐ ***Rubble Landfill*** [1,3,4] ☐ ***Industrial Landfill*** [1,4] ☐ ***Land Clearing Debris Landfill*** [1]
☐ ***Incinerator*** [1,2,4] ☐ ***Transfer Station*** [1] ☐ ***Processing Facility*** [2] ☐ ***Processing Facility & Transfer Station*** [1,2]

Notes: 1. Financial Security is required for a privately owned facility. 2. Air Quality Permit may be required. 3. Groundwater Discharge Permit may be required.
4. Environmental Justice Score Required refer to https://mdewin64.mde.state.md.us/EJ/

Proposed Days & Hours of Operation: Between 7:00 a.m. and 5:00 p.m. Monday through Saturday

Provide a brief description of solid waste handling and other activities to be conducted at this facility:
Mixed solid waste landfilling, transfer station, and citizen's drop-off center

If available, attach the following documentation required for permit issuance:

☐ ***A written statement from the County in which the proposed facility is to be located, demonstrating that the proposed facility meets all applicable County zoning and land use requirements and is in conformity with the County Solid Waste Management Plan, in accordance with §9- 210(a)(3) of the Environment Article.***

☐ ***For an incinerator, a written statement from the County where the proposed facility is to be located, demonstrating that the County has an approved Recycling Plan in accordance with §9-204.1 and §9-505 of the Environment Article.***

☐ ***For a rubble landfill, a written statement from the County in which the proposed facility is to be located, demonstrating that the County has specified in the County Solid Waste Plan the types of waste that may be disposed of in the facility, in accordance with §9-210(c) of the Environment Article.***

Provide the estimated amount of solid waste to be accepted in Tons (T) or Cubic Yards (CY) from the following facilities and sources:

A. Intermediate Facilities:
Processing Facilities _____
Transfer Stations _____
Incinerators _____

B. Origin Of Waste By Region:
Within Jurisdiction 132,190 tons
Out-of-County in Maryland _____
Out-of-State (Specify Name) _____

Please indicate the estimated amount of solid waste in Tons (T) or Cubic Yards (CY) to be accepted at this facility. This list will be used to determine the type of permit and the list of acceptable materials that will be allowed under the permit for which you are applying.

Type of Waste	1st Year (units)	5th Year (units)
Residential *(household refuse, domestic waste, garbage, etc.)*	71,000 tons	73,000 tons
Commercial *(waste from businesses, stores, offices, etc.)*	30,000 tons	30,600 tons
Industrial *(non-hazardous sludge, dust, off-spec products, etc. from industrial or manufacturing operations or processes)*		
Construction and Demolition *(lumber, masonry, drywall, etc.)*	30,000 tons	30,600 tons
Land Clearing Debris *(stumps, limbs, leaves, earthen material, etc.)*		
Agricultural *(crop residue, manure, unprocessed materials, etc.)*		
Institutional *(non-hazardous waste from schools, hospitals, etc.)*	500 tons	510 tons
Special Medical Waste *(infectious waste from hospitals, doctor's offices, research labs, etc.)*		
Animal Carcasses *(road kills, farm animals, etc.)*		
Bulky Waste *(appliances, furniture, etc.)*		
Litter *(street sweepings, municipal wastebaskets, etc.)*		
Scrap Tires *(automobiles, trucks, etc.)* - *Requires a separate license for handling or managing tires.*	660 tons	680 tons
Sewage Sludge or Septage - *Requires separate permit for sewage sludge utilization.*	25 tons	26 tons
Water Treatment Plant Sludge *(alum precipitate, etc).*		
Hazardous Waste *(from chemical plants, gas stations, etc.)*		
Asbestos *(shingles, insulation, etc.)* - *Requires special training and handling*	5 tons	6 tons
Incinerator Ash *(from incinerators, waste-to-energy incinerators, special medical waste incinerators, boilers, etc.)*		
Fly Ash *(pollution abatement equipment dusts & bottom ash from coal fired electric generating plants)*		
Other *(list):*		
Total	132,190 tons	135,422 tons

By signing this form, I the applicant or duly authorized representative, do solemnly affirm under the penalties of perjury that the contents of this application are true to the best of my knowledge, information, and belief. I hereby authorize the representatives of MDE to have access to the site of the proposed facility for inspection and to records relating to this application at any reasonable time.
I acknowledge that depending on the type of facility applied for, other permits or approvals may be required.

Signature of Applicant

12/20/2023
Date

CLIFFORD J. ENGLE
Applicant's Name (Print)

BUREAU CHIEF
Title

This Notice is provided pursuant to §10-624 of the State Government Article of the Maryland Code. The personal information requested on this form is intended to be used in processing your application. Failure to provide the information requested may result in your application not being processed. You have the right to inspect, amend, or correct this form. The Maryland Department of the Environment ("MDE") is a public agency and subject to the Maryland Public Information Act. This form may be made available on the Internet via MDE's website and is subject to inspection or copying, in whole or in part, by the public and other governmental agencies, if not protected by Federal or State law.

Privacy Act Notice: This Notice is provided pursuant to the Federal Privacy Act of 1974, 5 U.S.C. §552.a. Disclosure of your Social Security Number or Federal Employer Identification Number on this application is mandatory pursuant to the provisions of §1-203 (2003), Environment Article, Annotated Code of Maryland, which requires the MDE to verify that an applicant for a permit has paid all undisputed taxes and unemployment insurance. Social Security or Federal Employer Identification Numbers will not be used for any purposes other than those described in this Notice.

For questions regarding this application form, please contact MDE at (410) 537-3315

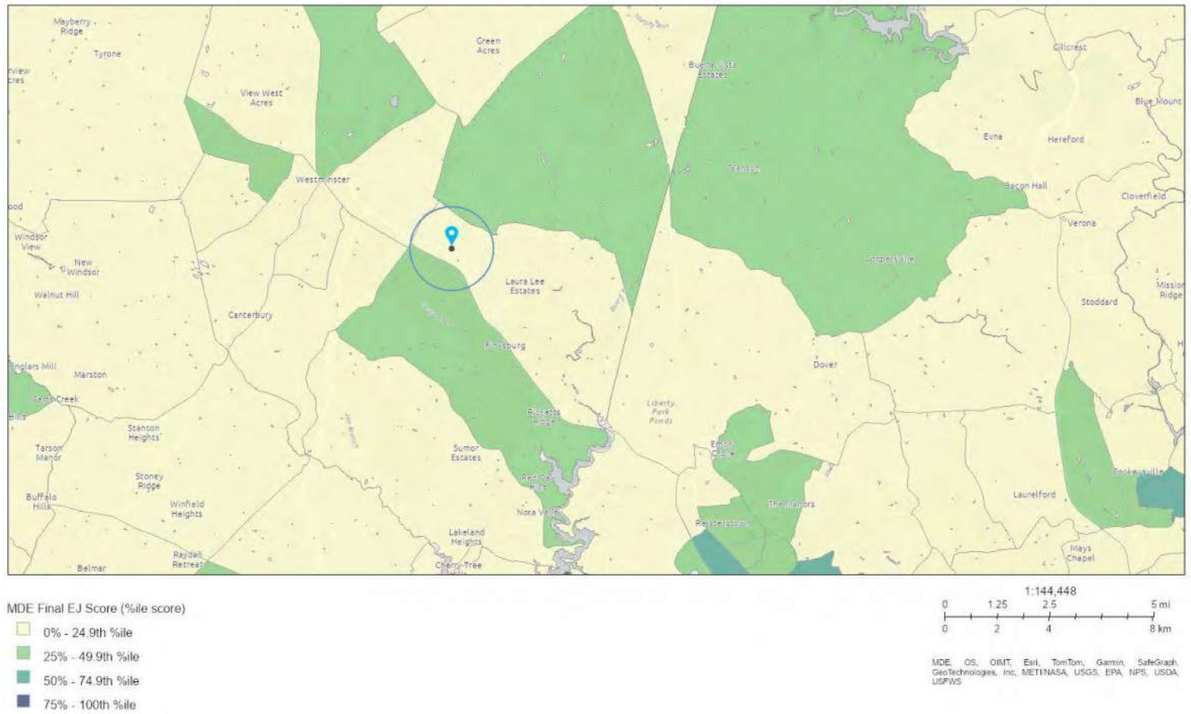
MDE Screening Report - Carroll County Resource Recovery Park

Area of Interest (AOI) Information

Area : 3.14 mi²

Mar 12 2024 8:48:15 Eastern Daylight Time

Tabloid ANSI B Landscape



Name	Count	Area(mi²)	Length(mi)
MDE Final EJ Score (%ile score)	4	3.14	N/A
Overburdened Communities Combined Score	4	3.14	N/A
Overburdened Pollution Environmental Score (%ile score)	4	3.14	N/A
Overburdened Exposure Score (%ile score)	4	3.14	N/A
Overburdened Sensitive Population (%ile score)	4	3.14	N/A
Socioeconomic/Demographic Score 2020 (Percentile score) (Underserved Community)	4	3.14	N/A
Air Emissions Facilities	1	N/A	N/A
Sulfur Dioxide (2010)	0	0	N/A
Ozone (2015)	1	3.14	N/A
Fine Particles (2012)	1	3.14	N/A
Biosolids FY 2020 and Current Permit Details	0	N/A	N/A
Biosolids FY2010 - 2014 Permit Details	0	N/A	N/A
Biosolids FY2009 Expired Permit Details	0	N/A	N/A
Biosolids FY 2020 and Current Permits Distribution By Acreage	1	3.14	N/A
Biosolids FY2015 - 2019 Permits Distribution By Acreage	1	3.14	N/A
Biosolids FY2010 - 2014 Permits Distribution By Acreage	1	3.14	N/A
Biosolids FY2009 Permits Expired Distribution By Acreage	1	3.14	N/A
Biosolids FY 2020 and Current Permit Distribution By Percent Coverage	1	3.14	N/A
Biosolids FY2015 - 2019 Permit Distribution By Percent Coverage	1	3.14	N/A
Biosolids FY2010 - 2014 Permit Distribution By Percent Coverage	1	3.14	N/A
Biosolids FY2009 Expired Permit Distribution By Percent Coverage	1	3.14	N/A
Concentrated Animal Feeding Operations (CAFOs)	0	N/A	N/A
Composting Facilities	0	N/A	N/A
Food Scrap Acceptors	0	N/A	N/A
Landfills	2	N/A	N/A
Correctional Facilities	0	N/A	N/A
Industrial Food Suppliers	0	N/A	N/A
Residential Colleges	0	N/A	N/A

Non-Residential Colleges	0	N/A	N/A
Hospitals	0	N/A	N/A
High Schools	0	N/A	N/A
Grocery Stores	0	N/A	N/A
10 Miles from Landfill	3	9.42	N/A
10 Miles from Composting Facility	1	3.14	N/A
General Composting Facilities Tier 2 (MD)	0	N/A	N/A
Commercial Anaerobic Digester (MD)	0	N/A	N/A
Out of State Facilities	0	N/A	N/A
30 mile buffer (Maryland)	3	9.42	N/A
30 Mile Buffer (Out of State)	0	0	N/A
Land Restoration Facilities	0	N/A	N/A
Determinations (points)	0	N/A	N/A
Determinations (areas)	0	0	N/A
Entities	0	N/A	N/A
Active Coal Mine Sites	0	N/A	N/A
Historic Mine Facilities	0	N/A	N/A
All Permitted Solid Waste Acceptance Facilities	2	N/A	N/A
Municipal Solid Waste Acceptance Facilities	0	N/A	N/A
Maryland Dam Locations	0	N/A	N/A
Maryland Pond Locations	7	N/A	N/A
Surface Water Intakes	0	N/A	N/A
Wastewater Discharge Facilities	0	N/A	N/A
Drinking Water	0	N/A	N/A
Clean Water	0	N/A	N/A

MDE Final EJ Score (%ile score)

#	Census tract identifier	Geographic Area Name	Total Population	Final EJ Score Percent (for this tract)	Final EJ Score Percentile (Distribution across Maryland)	Area(mi²)
1	24013504100	Census Tract 5041, Carroll County, Maryland	4844	23.41	18.18	2.11
2	24013504201	Census Tract 5042.01, Carroll County, Maryland	5873	27.62	37.25	0.79
3	24013508200	Census Tract 5082, Carroll County, Maryland	6659	26.28	29.46	0.21
4	24013507602	Census Tract 5076.02, Carroll County, Maryland	4553	23.19	17.22	0.02

Overburdened Communities Combined Score

#	GEOID20	Geographic_Area_Name	TotalPop	Overburd_Exposure_Percent	Overburd_Exposure_Percentile	Overburd_Poll_Enviro_Percent	Overburd_Poll_Enviro_Percentile	Sensitive_Population_Percent
1	24013504100	Census Tract 5041, Carroll County, Maryland	4,844	47.18	60.49	0.91	1.44	59.35
2	24013504201	Census Tract 5042.01, Carroll County, Maryland	5,873	43.25	31.99	1.34	4.03	79.51
3	24013508200	Census Tract 5082, Carroll County, Maryland	6,659	41.25	19.82	2.13	10.80	75.44
4	24013507602	Census Tract 5076.02, Carroll County, Maryland	4,553	41.67	23.24	4.08	25.84	49.02

#	Sensitive_Population_Percentile	OverburdenedAllPercent	OverburdenedAllPercentile	Area(mi²)
1	48.60	35.82	41.90	2.11
2	91.59	70.06	64.18	0.79
3	84.21	56.19	79.49	0.21
4	25.50	29.46	31.44	0.02

Overburdened Pollution Environmental Score (%ile score)

#	GEOID20	Geographic_Area_Name	RentalsOccupiedPre79Percent	Percentile	PercentRMP	PercentRMPEJ	PercentHazWaste	PercentHazWasteEJ
1	24013504100	Census Tract 5041, Carroll County, Maryland	3.78	24.13	1.05	1.13	0.51	2.30
2	24013504201	Census Tract 5042.01, Carroll County, Maryland	7.10	43.81	1.27	1.57	0.89	3.58
3	24013508200	Census Tract 5082, Carroll County, Maryland	11.09	61.31	0.94	1.34	0.95	4.71
4	24013507602	Census Tract 5076.02, Carroll County, Maryland	19.21	70.13	2.18	4.16	11.24	10.80

#	PercentSuperFundNPL	PercentSuperFundNPLEJ	PercentHazWW	PercentHazWWEJ	BrownFPercent	Percentile_1	PercentPowerPlants	Percentile_12
1	2.88	3.73	0.00	0.00	0.00	0.00	0.00	0.00
2	2.81	4.03	0.00	0.00	0.00	0.00	0.00	0.00
3	3.56	6.31	0.00	0.00	0.42	93.44	0.00	0.00
4	4.08	7.26	0.00	0.00	0.00	0.00	0.00	0.00

#	PercentCAFOS	Percentile_12_13	PercentActiveMines	Percentile_12_13_14	PollutionEnvironmentalPercent	PollnEnvironmentalPercentile	Area(mi²)
1	0.00	0.00	0.00	0.00	0.91	1.44	2.11
2	0.00	0.00	0.00	0.00	1.34	4.03	0.80
3	0.00	0.00	0.00	0.00	2.13	10.80	0.21
4	0.00	0.00	0.00	0.00	4.08	25.84	0.02

Overburdened Exposure Score (%ile score)

#	GEOID20	Geographic_Area_Name	Total_Pop	PercentNATA_Cancer	Percentile_NATA_Cancer	PercentNATA_Resp_HI	Percentile_NATA_Resp_HI	PercentNATA_Diesel
1	24013504100	Census Tract 5041, Carroll County, Maryland	4,844.00	60.00	7.97	60.00	5.27	18.28
2	24013504201	Census Tract 5042.01, Carroll County, Maryland	5,873.00	60.00	8.85	60.00	5.85	18.89
3	24013508200	Census Tract 5082, Carroll County, Maryland	6,659.00	60.00	11.32	60.00	7.48	15.89
4	24013507602	Census Tract 5076.02, Carroll County, Maryland	4,553.00	60.00	11.70	60.00	7.73	18.96

#	Percentile_NATA_Diesel	PercentNATA_PM25	PercentileNATA_PM25	PercentOzone	PercentileOzone	PercentTraffic	PercentileTraffic	PercentTRI
1	3.76	95.09	7.01	93.67	6.92	1.31	3.32	15.79
2	4.41	95.33	7.79	93.91	7.81	1.20	3.47	0.00
3	4.48	94.64	9.73	92.90	9.38	1.30	4.72	5.26
4	5.82	94.93	10.30	92.75	9.54	6.72	10.32	0.00

#	PercentileTRI	PercentHazWasteLF	Percentile_HazWasteLF	PollutionExposurePercent	PollutionExposurePercentile	Area(mi²)
1	94.87	33.33	98.97	47.18	60.49	2.11
2	0.00	16.67	95.49	43.25	31.99	0.80
3	80.18	0.00	0.00	41.25	19.82	0.21
4	0.00	0.00	0.00	41.67	23.24	0.02

Overburdened Sensitive Population (%ile score)

#	GEOID20	Geographic_Area_Name	PerAstma	PercentileAst	PerMyo	PercentileMyo	PerLow	PercentileLow
1	24013504100	Census Tract 5041, Carroll County, Maryland	68.70	78.13	79.60	82.64	0.00	0.00
2	24013504201	Census Tract 5042.01, Carroll County, Maryland	72.30	88.93	80.30	91.05	76.10	93.37
3	24013508200	Census Tract 5082, Carroll County, Maryland	70.00	92.62	81.60	95.90	58.30	88.65
4	24013507602	Census Tract 5076.02, Carroll County, Maryland	30.20	38.69	74.20	76.08	21.20	26.93

#	PercentBroad	PercentileBroad	PercentSens	PercentileSens	Area(mi²)
1	10.89	66.37	39.80	56.80	2.11
2	10.16	71.50	59.71	86.21	0.80
3	6.47	55.71	54.09	83.22	0.21
4	29.54	97.81	38.78	59.88	0.02

Socioeconomic/Demographic Score 2020 (Percentile score) (Underserved Community)

#	Census tract identifier	Geographic Area Name	Total Population	Percent Poverty	Percent Minority	Percent Limited English Proficiency	Demographic Score (Percent for this tract)	Demographic Score (Percentile Distribution acoss Maryland)	Area(mi²)
1	24013504100	Census Tract 5041, Carroll County, Maryland	4,844	6.74	9.39	1.11	5.75	3.77	2.11
2	24013504201	Census Tract 5042.01, Carroll County, Maryland	5,873	7.75	10.18	0.61	6.18	4.66	0.79
3	24013508200	Census Tract 5082, Carroll County, Maryland	6,659	15.26	7.67	0.00	7.64	9.25	0.21
4	24013507602	Census Tract 5076.02, Carroll County, Maryland	4,553	15.26	8.43	1.00	8.23	10.97	0.02

Air Emissions Facilities

#	Agency Interest ID	Facilty Name	Agency Interest Alt Name	Premises ID	Emission Year	Air Code	NAIC Code	NAIC Description
1	9442	Northern Municipal Landfill	Northern Municipal Landfill-9442	013-0242	2021	Title V	562,219	Other Nonhazardous Waste Treatment and Disposal

#	Physical Address	Physical City	Physical State	Physical Zip Code	County	Carbon Monoxide (CO)	Nitrous Oxide	Particulate Matter (PT)
1	1400 Baltimore Blvd	Westminster	MD	21,157	Carroll	80.87	26.31	152.17

#	Particulate Matter (10 Filterable)	Particulate Matter (2.5 Filterable)	PM Condensables	Volatile Organic Compounds (VOC)	Sulphur Dioxide (SOx)	Carbon Dioxide	Mercury	Methane
1	39.19	6.37	1.23	7.19	4.16	51,891.40	0.00	16,140.96

#	Billable Criteria Pollutants (BCRI)	Billiable Hazardous Pollutants (BHAP)	Total Billable and Non-Bilable Hazardous Air Pollutant Emissions (HAPS)	Count
1	78.09	7.40	8.38	1

Ozone (2015)

#	STATEFP10	COUNTYFP10	COUNTYNS10	GEOID10	NAME10	Ozone NAA Area	8-Hr Ozone (2015) Designation	8-HR Ozone (2015) Classification	8-Hr Ozone (2015) Status	Area(mi²)
1	24	013	01696228	24013	Carroll	Baltimore, MD	Nonattainment	Moderate	*No Data*	3.14

Fine Particles (2012)

#	STATEFP10	COUNTYFP10	COUNTYNS10	GEOID10	NAME10	PM2.5 (2012) Status	Area(mi²)
1	24	013	01696228	24013	Carroll	Attainment/Unclassifiable	3.14

Biosolids FY 2020 and Current Permits Distribution By Acreage

#	County Name	FY2020andAfter	Area(mi²)
1	Carroll	1,645.40	3.14

Biosolids FY2015 - 2019 Permits Distribution By Acreage

#	County Name	FY2015to2019	Area(mi²)
1	Carroll	1,305.90	3.14

Biosolids FY2010 - 2014 Permits Distribution By Acreage

#	County Name	FY2010to2014	Area(mi²)
1	Carroll	856.30	3.14

Biosolids FY2009 Permits Expired Distribution By Acreage

#	County Name	FY2009	Area(mi²)
1	Carroll	*No Data*	3.14

Biosolids FY 2020 and Current Permit Distribution By Percent Coverage

#	County Name	FY2020andAfter	Area(mi²)
1	Carroll	1,645.40	3.14

Biosolids FY2015 - 2019 Permit Distribution By Percent Coverage

#	County Name	FY2015to2019	Area(mi²)
1	Carroll	1,305.90	3.14

Biosolids FY2010 - 2014 Permit Distribution By Percent Coverage

#	County Name	FY2010to2014	Area(mi²)
1	Carroll	856.30	3.14

Biosolids FY2009 Expired Permit Distribution By Percent Coverage

#	County Name	FY2009	Area(mi²)
1	Carroll	*No Data*	3.14

Landfills

#	County	Type	Facility_N	ADDRESS	SITE__ACRE	AI_No_	Owner_Type	PERMITNUMB	EXPIRATION	Count
1	CARROLL	WPT	Northern LandfillPF&TS	1400 Baltimore Blvd., Westminster MD 21157.	220.00	9,442.00	CTY	2013-WPT-0541	3/8/2019, 7:00 PM	1
2	CARROLL	WMF	Northern MunicipalLF	1400 Baltimore Blvd., Westminster MD 21157.	220.00	9,442.00	CTY	2015-WMF-0066	10/11/2020, 8:00 PM	1

10 Miles from Landfill

#	County	Type	Facility_N	ADDRESS	FILL	SITE__ACRE	AI_No_	Owner_Type
1	CARROLL	WPT	Northern LandfillPF&TS	1400 Baltimore Blvd., Westminster MD 21157.	3	220.00	9,442.00	CTY
2	CARROLL	WMF	Northern MunicipalLF	1400 Baltimore Blvd., Westminster MD 21157.	80	220.00	9,442.00	CTY
3	CARROLL	WPF	Roll-Off ExpressPF	2900 Dede Road, Finksburg MD 21048.	-	6.80	118,023.00	PRI

#	MD_GRID__E	PERMITNUMB	EXPIRATION	Area(mi²)
1	816 /626	2013-WPT-0541	3/8/2019, 7:00 PM	3.14
2	816 /626	2015-WMF-0066	10/11/2020, 8:00 PM	3.14
3	832 /605	2012-WPF-0159	6/8/2018, 8:00 PM	3.14

10 Miles from Composting Facility

#	County	Facility	Address	Accepts_Fo	Location_o	Area(mi²)
1	*No Data*	Northern Municipal Landfill	1400 Baltimore Boulevard, Westminster, MD 21157	No	1400 Baltimore Blvd, Westminster, MD 21157	3.14

30 mile buffer (Maryland)

#	Facility_Name_1	Facility_Contact_1	Contact_Phone	Contact_Email_1	Contact_2	Contact_2_Phone	Contact_2_Email	URL	Area(mi²)
1	Bioenergy DEVCO - Maryland Organics Recycling Facility	Vinnie Bevivino	(202) 360-1805	Vbevivino@bioenergydevco.com	Mike Manna	(609) 744-2819	mmanna@bioenergydevco.com	https://www.bioenergydevco.com/maryland-organics-recycling-facility/	3.14
2	Composting Facility at Alpha Ridge Landfill	Bureau of Environmental Services	(410) 313-6444	*No Data*	*No Data*	*No Data*	*No Data*	https://www.howardcountymd.gov/public-works/composting-facility	3.14
3	Key City Compost at Utica Bridge Farm	Phil Westcott	(240) 608-0283	info@keycompost.com	*No Data*	*No Data*	*No Data*	https://www.keycompost.com/	3.14

All Permitted Solid Waste Acceptance Facilities

#	county	AI_ID	master_ai_name	Facility_Type	OwnerType	permit_number	ai_physical_address	permit_class	Count
1	Carroll	9,442	Northern Municipal Landfill	Municipal Solid Waste Landfill & Processing Facility & Transfer Station	County Government	2019-WPT-0541	1400 Baltimore Blvd., Westminster, MD 21157	Renew	1
2	Carroll	9,442	Northern Municipal Landfill	Municipal Solid Waste Landfill & Processing Facility & Transfer Station	County Government	2020-WMF-0066	1400 Baltimore Blvd., Westminster, MD 21157	Renew	1

Maryland Pond Locations

#	Facility Type	DAM HEIGHT	County	HAZARD CLASS	6 DIGIT WATERSHED	8 DIGIT WATERSHED	Count

© MDE

Appendix B

Forest Stand Delineation Report

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Forest Stand Delineation Report
Carroll County Resource Recovery Park and Northern Landfill Expansion

Prepared for

Carroll County Bureau of Solid Waste
225 North Center Street
Westminster, Maryland 21157

Under contract to

Northeast Maryland Waste Disposal Authority
Tower II – Suite 402
100 South Charles Street
Baltimore, Maryland 21201-2705

Prepared by

EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410)-584-7000

February 2025
Version: Final
EA Project No.: 1636201

02/28/2025

Thomas King, MD DNR Qualified Professional

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LIST OF ACRONYMS AND ABBREVIATIONS

Ac.	Acres
AOR	Area of Review
DBH	Diameter at Breast Height
EA	EA Engineering, Science, and Technology, Inc., PBC
FEMA	Federal Emergency Management Agency
FSD	Forest Stand Delineation
ft	Feet/Foot
in.	Inch(es)
MDNR	Maryland Department of Natural Resources
MHT	Maryland Historic Trust
msl	Mean Sea Level
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
RTE	Rare, threatened, or endangered
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 INTRODUCTION

EA Engineering, Science, and Technology, Inc., PBC (EA) was tasked with completing a Forest Stand Delineation Plan in support of the design of the proposed Northern Landfill expansion in Carroll County, Maryland. (Figure 1). Between June 14 and July 6, 2023, EA conducted review and delineation of the forest conditions at this site. The purpose of the Forest Stand Delineation (FSD) is to identify, describe, and evaluate forest vegetation and make a preliminary assessment of the natural site constraints and forest value. Using data collected during the FSD, EA completed a Forest Stand Delineation Plan to determine future Forest Conservation needs once the FSD is approved by Carroll County.

2.0 SITE DESCRIPTION

2.1 BACKGROUND INFORMATION

EA has completed an FSD within one established area of review (AOR) which consists of approximately 553 acres of developed and natural land (Appendix A - Figure 2).

At the time of EA's environmental review, the AOR consisted of approximately 553 acres at Northern Landfill Expansion Project site in Carroll County, Maryland. The AOR is accessed from Maryland State Route 140 southeast of the intersection with Maryland State Route 97.

- AOR Coordinates – 39°33'17.02"N and 76°56'18.19"W

2.2 UNITED STATES GEOLOGICAL SURVEY TOPOGRAPHIC MAPS

The United States Geological Survey (USGS) Topographic Map for the area (Westminster Quadrangle, Appendix A - Figure 3) was used as a reference to identify forest areas as well as other site features such as wetlands and waterways within the AORs. Topographic maps identify elevations, forested areas, streams, ponds, roads and structures. The USGS Map depicts a perennial stream channel, identified as the west branch of the Patapsco River within the northern portion of the north AOR. The west branch of the Patapsco River continues offsite to the southeast to the north branch of the Patapsco River and conveys flow to the southeast where it eventually conveys flow to the Chesapeake Bay.

2.3 SOIL SURVEY INFORMATION

The online National Resource Conservation Service's (NRCS) Web Soil Survey was reviewed for the AOR (Appendix A - Figure 4). The Soil Survey identifies a total of 18 soil mapping units within the project site and are identified in Table 1. According to the Soil Survey, four hydric

soil units occur within the AOR and correspond to the locations of the mapped USGS streams within the eastern portion of the north AOR.

Table 1. Mapped Soils Within the AORs

Soil Symbol	Soil – Mapping Unit	Hydric Soil
BaB	Baile silt loam, 3 to 8 percent slopes	Yes
BrD	Brinklow channery loam, 15 to 25 percent slopes	No
BRE	Brinklow channery loam, 25 to 45 percent slopes	No
CdA	Codorus silt loam, 0 to 3 percent slopes	Yes
GdB	Glenelg loam, 3 to 8 percent slopes	No
GdC	Glenelg loam, 8 to 15 percent slopes	No
GeB	Glenelg channery loam, 3 to 8 percent slopes	No
GeC	Glenelg channery loam, 8 to 15 percent slopes	No
GhB	Glenville silt loam, 3 to 8 percent slopes	Yes
GhC	Glenville silt loam, somewhat poorly drained, 8 to 15 percent slopes	Yes
HaA	Hatboro silt loam, 0 to 3 percent slopes	Yes
MaB	Manor loam, 3 to 8 percent slopes	No
MaC	Manor loam, 8 to 15 percent slopes	No
MaD	Manor loam, 15 to 25 percent slopes	No
MaF	Manor loam, 25 to 45 percent slopes	No
McF	Manor-Brinklow complex, 45 to 65 percent slopes, very rocky	No
UdE	Udorthents, refuse, 3 to 45 percent slopes	No
UrB	Urban land-Udorthents complex, 0 to 8 percent slopes	No

Source: Adapted from the United States Department of Agriculture (NRCS 2021)

2.4 OTHER ENVIRONMENTAL FEATURES

EA's environmental scientists reviewed wetland data from the United States Fish and Wildlife (USFWS) Service's National Wetlands Inventory (NWI) website http://wetlandsfws.er.usgs.gov) to identify potential wetland areas. The NWI Maps (Appendix A - Figure 5) identify types and locations of NWI wetlands within the AOR. Within the AOR, the NWI Map depicts six NWI wetlands, two freshwater ponds and four riverine systems.

NWI Code	Wetland Classification
PEM5A	Freshwater Emergent Wetland
PFO1/EM5A	Freshwater Forested/Shrub Wetland
PFO1A	Freshwater Forested/Shrub Wetland
PSS1/EM1A	Freshwater Forested/Shrub Wetland
PSS1/EM1E	Freshwater Forested/Shrub Wetland
PSS1/EM5A	Freshwater Forested/Shrub Wetland
PUBHh	Freshwater Pond
PUBHx	Freshwater Pond
R2UBH	Riverine
R3UBH	Riverine
R4SBC	Riverine
R5UBH	Riverine

3.0 METHODS

An FSD was conducted in June and July of 2023 in accordance with the Maryland Department of Natural Resources' Forest Conservation Act (MDNR 1991) as well as the Baltimore City requirements. The standard FSD method provides a preliminary assessment of the site constraints and forest value. Prior to conducting field investigations, topographic maps and digital aerial orthophotographs were reviewed to identify probable forest stand boundaries within the site. The site was then field investigated to identify, delineate, and characterize forest stands. A 1/10-ac. fixed plot sampling technique was used to assess forest stand conditions and forest structure following guidelines of the State Forest Conservation Technical Manual (Third Edition 1997). Orange flagging was used to identify each data point location. Forest stands were distinguished primarily by environmental features, differences in species composition, and successional stage. EA examined the entire forested section of the site to determine forest boundaries and identify the presence of any significant disruptions in forest stands. Trees within each sample plot location were identified and measured for diameter at breast height (DBH).

Additionally, any tree within the area of review that was identified as having a DBH of 20-inches (in.) or greater or having 75% or more of the diameter of the current state champion tree of that species was identified as a specimen documented as part of the FSD. Data forms completed as part of the standard FSD method are provided in Appendix B. Photographs of general site and forest stand conditions were taken in the field and are provided in Appendix C.

4.0 RESULTS

During the survey, the project site consisted of 4 forest stands across the AOR and the assessment was made of forest condition and forest structure in 24 1/10 hectare plots (2 per stand). A total of 20 specimen trees were observed within the AOR and are listed in Table 2. Descriptions of the forest stands are provided in Table 3. Appendix E includes the Forest Stand Delineation Map that depicts the boundary of the forest stands and cover type.

4.1 FOREST STANDS

Forest Stand 1

Forest Stand 1 consists of a 6.43 acre, early-successional stage transitional forest and woodland located near the southwest and southeast boundary of the AOR as well as near the West Branch of the Patapsco River where the forest composition is a mix of native and non-native species where formerly deforested agricultural fields are returning to forested cover. (Appendix D). EA scientists collected data at 3 plots in Stand 1 which has an average of 187 trees per acre and 2 to 4 tree species per plot. Stand 1 has an estimated total canopy closure of 65% dominated by black walnut (*Juglans cinerea*), Princess tree (*Paulownia tomentosa*), tree-of-heaven (*Ailanthus altissima*) sycamore (*Platanus occidentalis*), black cherry (*Prunus serotina*) and white mulberry (*Morus alba*). The majority of trees have a DBH of 12-19.9 inches. The understory cover was estimated to be 30% and the species observed is primarily dominated by non-native shrub and herbaceous species. Shrub species include multiflora rose (*Rosa multiflora*), wineberry (*Rubus phoenicolasius*), Chinese privet *(Ligustrum sinense*), and Amur honeysuckle (*Lonicera morrowii*). Herbaceous species include Japanese stilt grass (*Microstegium vimineum*), Kentucky bluegrass (Poa pratensis), Asian bittersweet (*Celastrus orbiculatus*), garlic mustard (*Alliaria petiolata*), Jack-in-the-pulpit (*Arisaema triphyllum*), mile-a-minute vine (*Persicaria perfoliata*), creeping smartweed (*Persicaria longiseta*).

Forest Stand 1 contained 6 specimen trees within the limit of the forest stand and contained 14 non-native plant species which covered approximately 50% of the forest stand.

Forest Stand 2

Forest Stand 2 consists of a 66.59 acre, early-successional stage forest located throughout the AOR typically on lower slopes. (Appendix D). EA scientists collected data at 7 plots in Stand 2 which has an average of 253 trees per acre and 1 to 9 tree species per plot. Stand 2 has an estimated total canopy closure of 60% dominated by black cherry (*Prunus serotina*), red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*) and sweet birch (*Betula lenta*) with lesser amounts of northern red oak (*Quercus rubra*) and mockernut hickory (*Carya tomentosa*). The majority of trees have a DBH of 6-11.9 inches. The understory cover was estimated to be 40% and the species observed is a mixture of native and non-native shrub and herbaceous species. Shrubs species include Japanese spiraea (*Spiraea japonica*), Japanese barberry (*Berberis thunbergii*), wineberry (*Rubus phoenicolasius*), spicebush (*Lindera benzoin*), multiflora rose (*Rosa multiflora*), Allegheny blackberry (*Rubus allegheniensis*) and catbriar (*Smilax glauca*). Herbaceous species include poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus virginiana*), Japanese stilt grass (*Microstegium vimineum*), wavyleaf basketgrass (*Oplismenus hirtellus*), garlic mustard (*Alliaria petiolata*), licorice bedstraw (*Galium circaezans*), maple-leaved viburnum (*Viburnum acerifolium*), late lowbush blueberry (*Vaccinum pallidum*), forked panicgrass (*Dichanthelium dichotomum*) wrinkle-leaf goldenrod (*Solidago rugosa*), Japanese stilt grass (*Microstegium vimineum*), multiflora rose (*Rosa multiflora*), spotted jewelweed (*Impatiens capensis*), deertounge grass (*Dichanthelium clandestinum*).

Forest Stand 2 contained 8 specimen trees within the limit of the forest stand and contained 13 non-native plant species which covered approximately 35% of the forest stand.

Forest Stand 3

Forest Stand 3 consists of a 99.96 acre, mid-successional stage forest located throughout the AOR typically on mid to upper slopes (Appendix D). EA scientists collected data at 9 plots in Stand 3 which has an average of 247 trees per acre and 4 to 9 tree species per plot. Stand 3 has an estimated total canopy closure of 75% dominated by mockernut hickory (*Carya alba*), black oak (*Quercus velutina*), white oak (*Quercus alba*) chestnut oak (*Quercus prinus*) and black gum (*Nyssa sylvatica*) with lesser amounts of red maple, flowering dogwood and black cherry. The majority of trees have a DBH of 12-19.9 inches. The understory cover was estimated to be 35% and the species observed is a mixture of native and non-native shrub and herbaceous species. Shrubs species include maple leaved viburnum (*Viburnum acerifolium*), wineberry (*Rubus phoenicolasius*), Asian bittersweet (*Celastris orbiculatus*) Japanese barberry, poison ivy, Allegheny blackberry, late lowbush blueberry, and multiflora rose.

Herbaceous species include Allegheny blackberry, Asian bittersweet, black cohosh (Cimicifuga racemosa), catbrier, deertounge grass, eastern woodland sedge (Carex blanda), enchanter's nightshade, four-leaved wild yam (*Dioscorea quaternata*), garlic mustard, hog peanut (*Amphicarpaea bracteata*), hooked crowfoot (*Ranunculus recurvatus*), intermediate shield fern

(Dryopteris intermedia), Japanese stilt grass, late lowbush blueberry (Vaccinium pallidum), licorice bedstraw, mock strawberry (*Duchesnea indica*), multiflora rose, poison ivy, pokeweed (*Phytolacca americana*), roundleaf greenbrier (*Smilax rotundifolia*), spotted jewelweed, Virginia creeper, wavy-leaved basketgrass, white avens (*Geum canadense*), wineberry, and wrinkleleaf goldenrod.

Forest Stand 3 contained 6 specimen trees within the limit of the forest stand and contained 12 non-native plant species which covered approximately 30% of the forest stand.

Forest Stand 4

Forest Stand 4 consists of a 69.63 acre, mid-successional stage forest located mid to upper slopes of the AOR (Appendix D). EA scientists collected data at 5 plots in Stand 4 which has an average of 240 trees per acre and 2 to 6 tree species per plot. Stand 4 has an estimated total canopy closure of 70% dominated by tuliptree, red maple and black cherry with lesser amounts of black gum, chestnut oak and mockernut hickory as canopy associates. The majority of trees have a DBH of 12-19.9 inches. The understory cover was estimated to be 40% and the species observed is a mixture of native and non-native shrub and herbaceous species. Shrub species include Allegheny blackberry, Asian bittersweet, Japanese barberry, late lowbush blueberry, maple leaved viburnum, multiflora rose, poison ivy and Chinese privet. Herbaceous species include Christmas fern (*Polystichum acrostichoides*), enchanter's nightshade, four-leaved wild yam, garlic mustard, hay-scented fern (*Dennstaedtia punctilobula*), intermediate shield fern, Japanese stilt grass, licorice bedstraw, mock strawberry, sensitive fern, Virginia creeper and white avens.

Forest Stand 4 contained no specimen trees within the limit of the forest stand and contained 10 non-native plant species which covered approximately 25% of the forest stand.

Table 2. Specimen Tree Species Observed within Area of Review

SPECIMEN TREE	COMMON NAME	SCIENTIFIC NAME	DBH (IN.)	CONDITION	STAND LOCATION
ST-01	Tuliptree	*Liriodendron tulipifera*	30.7	Good	3
ST-02	Tuliptree	*Liriodendron tulipifera*	35.5	Excellent	3
ST-03	Tuliptree	*Liriodendron tulipifera*	33.6	Good	3
ST-04	Tuliptree	*Liriodendron tulipifera*	43	Poor	3
ST-05	Tuliptree	*Liriodendron tulipifera*	33.5	Poor	3
ST-06	Tuliptree	*Liriodendron tulipifera*	34	Poor	3
ST-07	Red maple	*Acer rubrum*	46.5	Good	1
ST-08	Red maple	*Acer rubrum*	31	Good	1
ST-10	Red maple	*Acer rubrum*	31.3	Good	1
ST-11	Red maple	*Acer rubrum*	42.8	Good	2
ST-12	Red maple	*Acer rubrum*	46	Good	2
ST-13	Red maple	*Acer rubrum*	38.5	Good	1
ST-14	Black oak	*Quercus velutina*	33.4	Excellent	1
ST-15	Sycamore	*Platanus occidentalis*	60	Good	1
ST-16	Black oak	*Quercus velutina*	33.4	Good	2
ST-17	Red maple	*Acer rubrum*	37.5	Good	2
ST-19	Tuliptree	*Liriodendron tulipifera*	34	Excellent	2
ST-20	Northern red oak	*Quercus rubra*	32	Excellent	2
ST-21	Northern red oak	*Quercus rubra*	34.8	Excellent	2
ST-22	Black oak	*Quercus velutina*	38.5	Excellent	2

Table 3. Descriptions of Forest Stand

FOREST STAND	NUMBER OF PLOTS	SUCCESSIONAL STAGE	ACRES	PRIORITY	COVER TYPE
1	3	Early	6.43	1	Black Walnut
2	7	Early	66.59	1	Red Maple-Black Cherry
3	9	Mid	99.96	1	Oak/Hickory
4	5	Mid	69.63	1	Tuliptree

5.0 AGENCY REVIEW STATEMENTS

As a part of the FSD process, EA completed written inquiries to MDNR, requesting records of known RTE species within the two AORs. An online screening of RTE species was also conducted through the USFWS online tool and the results of the USFWS database are provided in Appendix C along with the response received from MDNR regarding the potential presence of RTE species within the AOR. The screening of the USFWS database showed that species that are potentially affected by activities in this location include the northern long-eared bat (*Myotis septentrionalis*) and monarch butterfly (*Danaus plexippus*). MDNR has indicated no known occurrences of state listed species within the project area.

EA also completed an online review of Maryland's Environmental Resources and Land Information Network (MERLIN) online database to conduct an inquiry of the Maryland Historic Trust information regarding the known occurrences of historical, cultural, and/or archeological sites/features present at the site. According to MERLIN, no historic places or properties and MHT preservation easements occur within the limits of the AOR.

6.0 CONCLUSIONS

The FSD completed across the AOR included 242.61 acres of forest stand across 553 acres of land. The forest stands within the AOR consists of mixed deciduous forests. The site offers moderate habitat value because, although it contains steep slopes streams, floodplains and some specimen trees throughout the AOR, the forest stands are fractured and segmented in a developed location and human activity has significantly disturbed the area of review and the nature forest community. Once the FSD is approved by Carroll County, the development of a forest conservation plan will be required in accordance with the Maryland FCA.

7.0 REFERENCES

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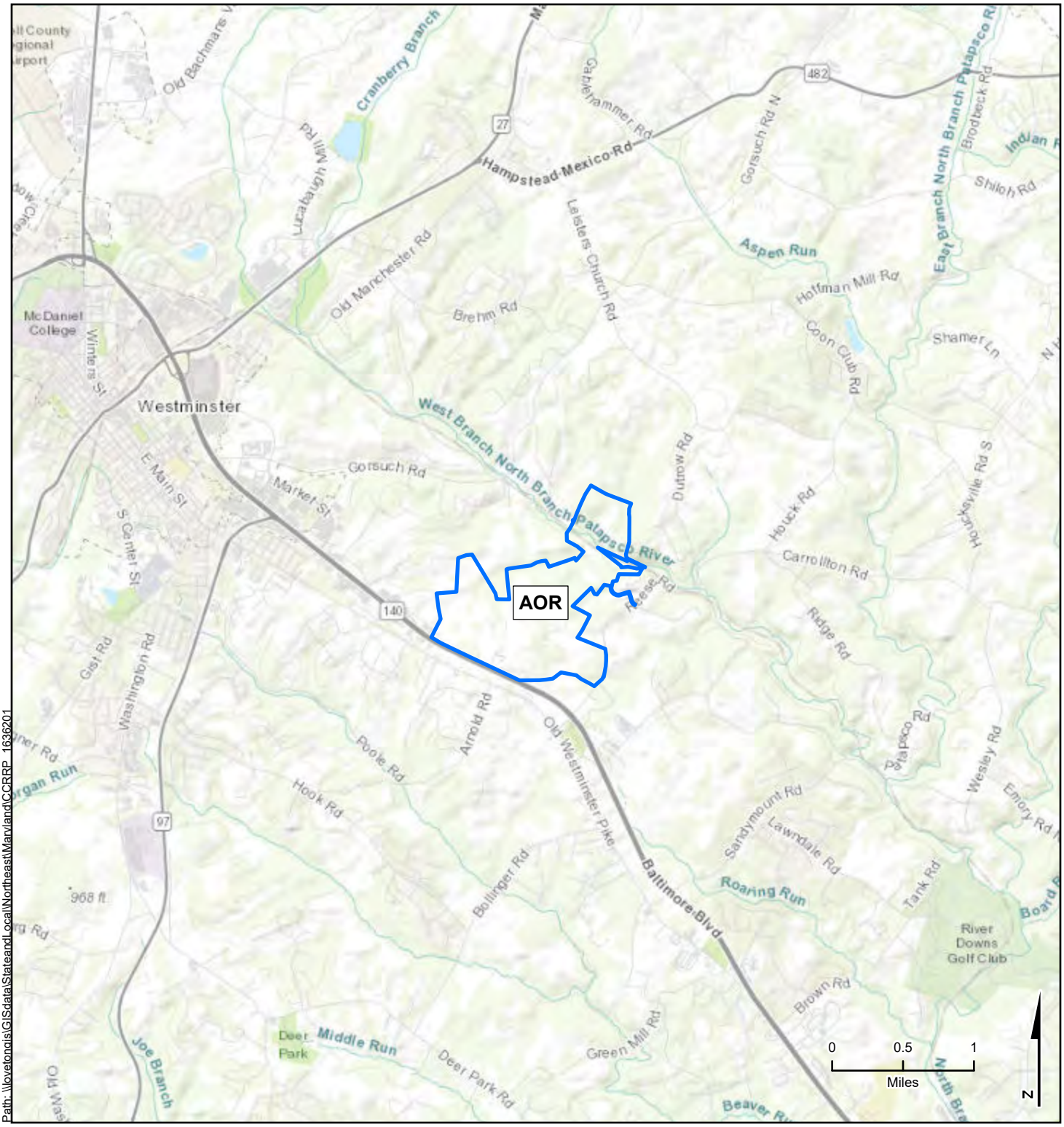
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Appendix A
Figures



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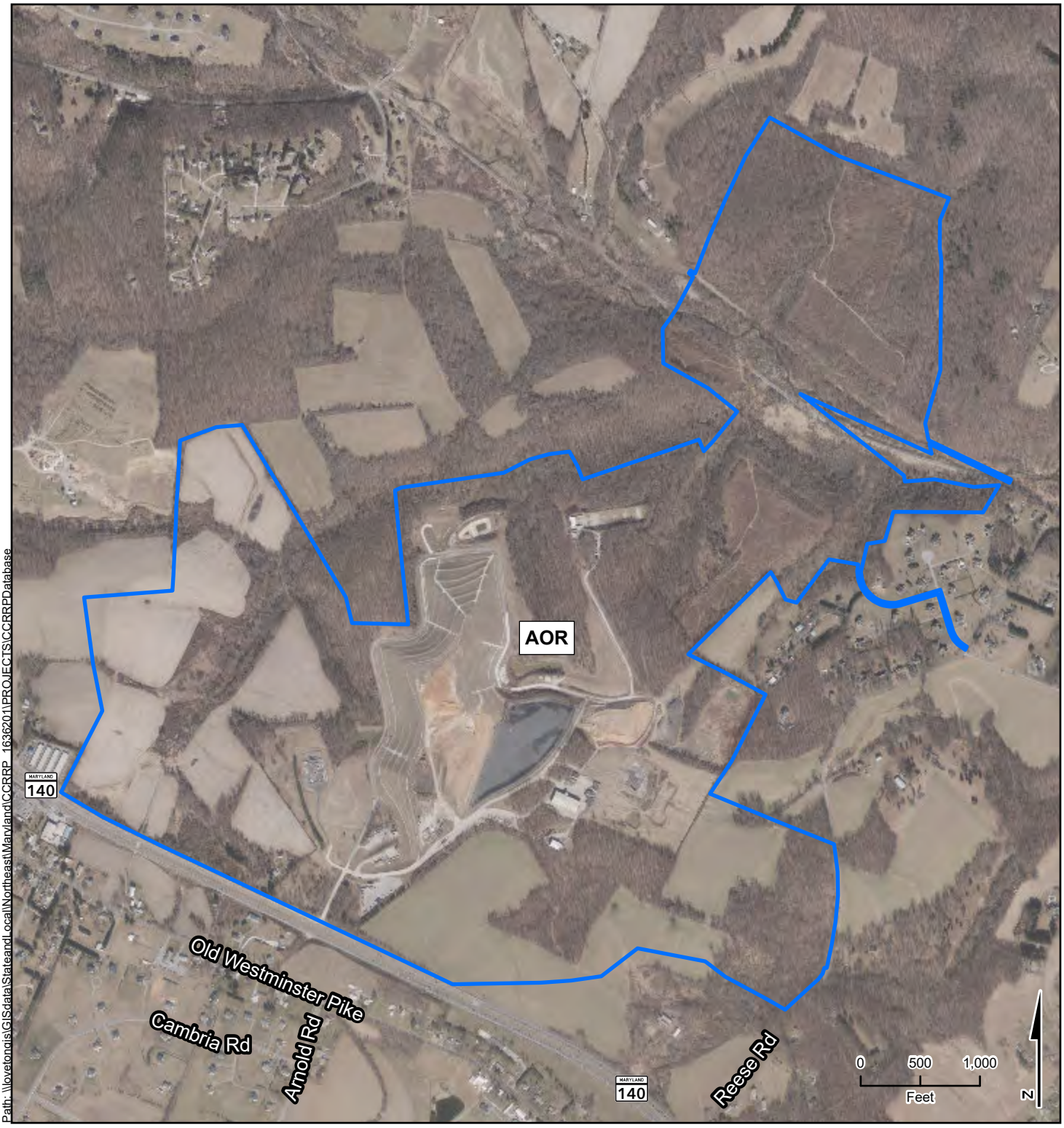


Legend

Area of Review (AOR)

Figure 1
Vicinity Map
Carroll County
Resource Recovery Park
Westminster, MD

Map Date: 6/6/2023
Data Source: ESRI Topographic Map
Projection: NAD 1983 State Plane
Maryland US Foot



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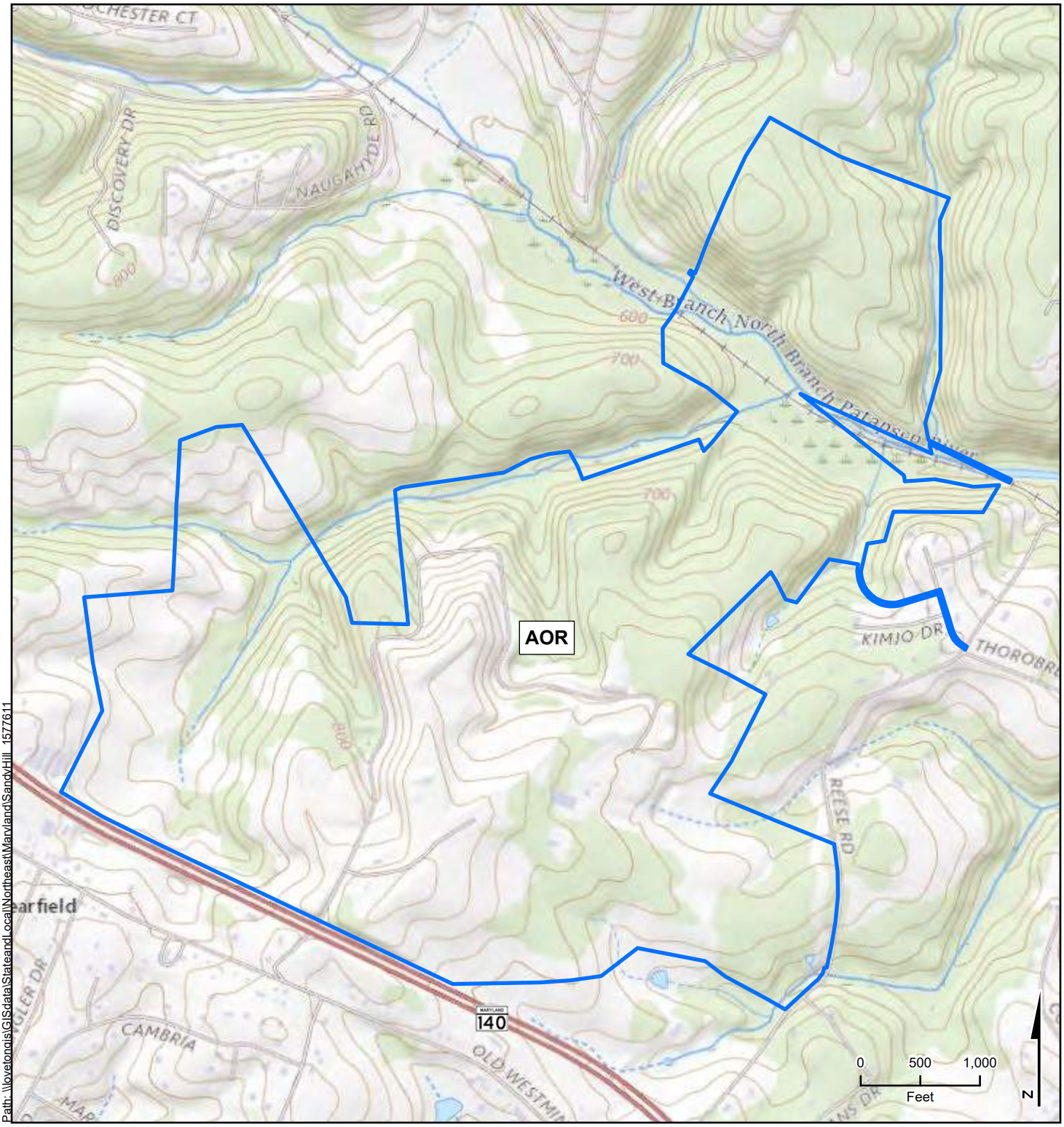


Legend

Area of Review (AOR)

Figure 2
Area of Review
Carroll County
Resource Recovery Park
Westminster, MD

Map Date: 6/6/2023
Data Source: MD iMap 2023
Projection: NAD 1983 State Plane
Maryland US Foot



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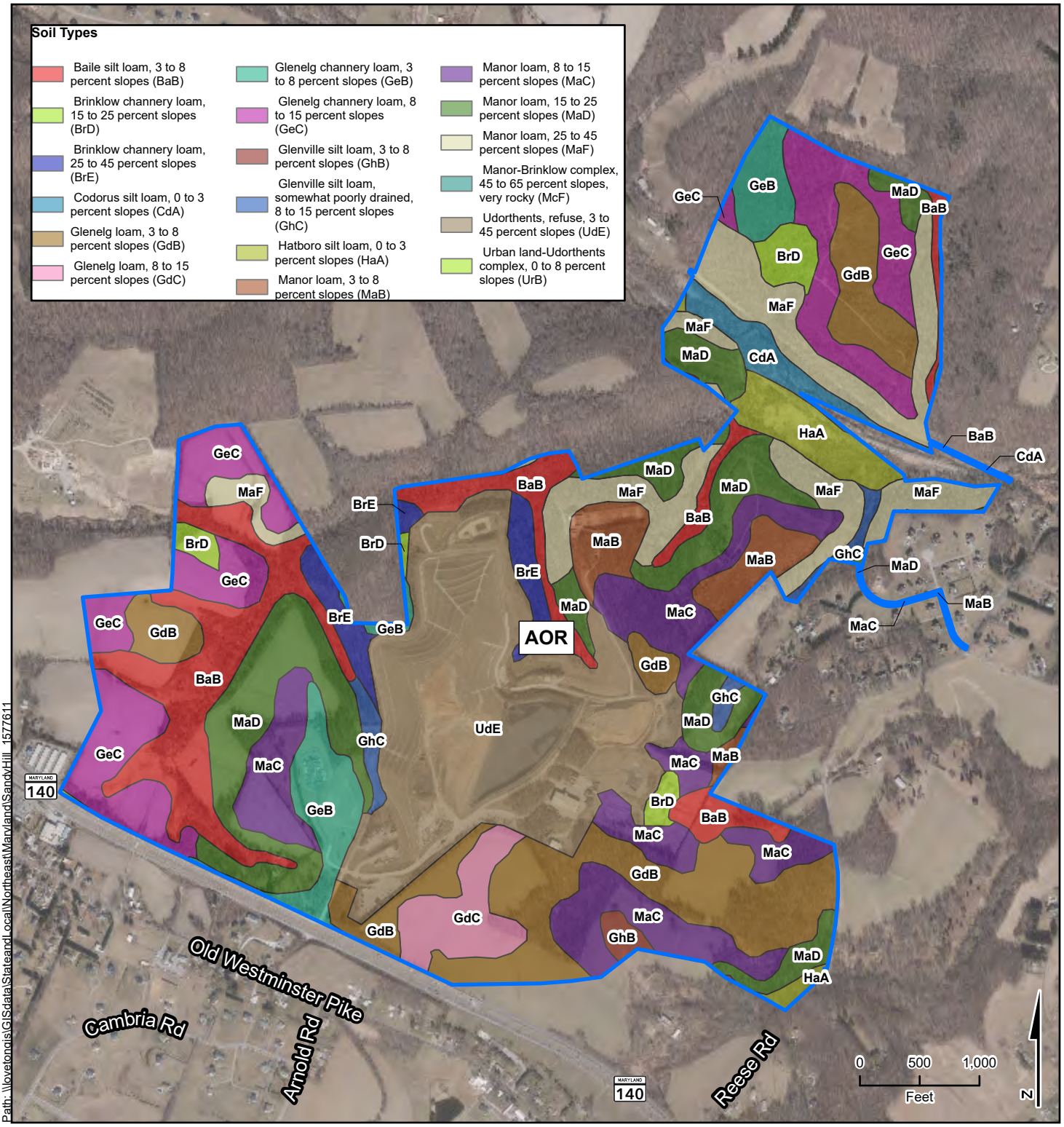


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Area of Review (AOR)

Figure 3
USGS Topographic
Carroll County
Resource Recovery Park
Westminster, MD

Map Date: 6/6/2023
Data Source: MD iMap 2023
Projection: NAD 1983 State Plane
Maryland US Foot



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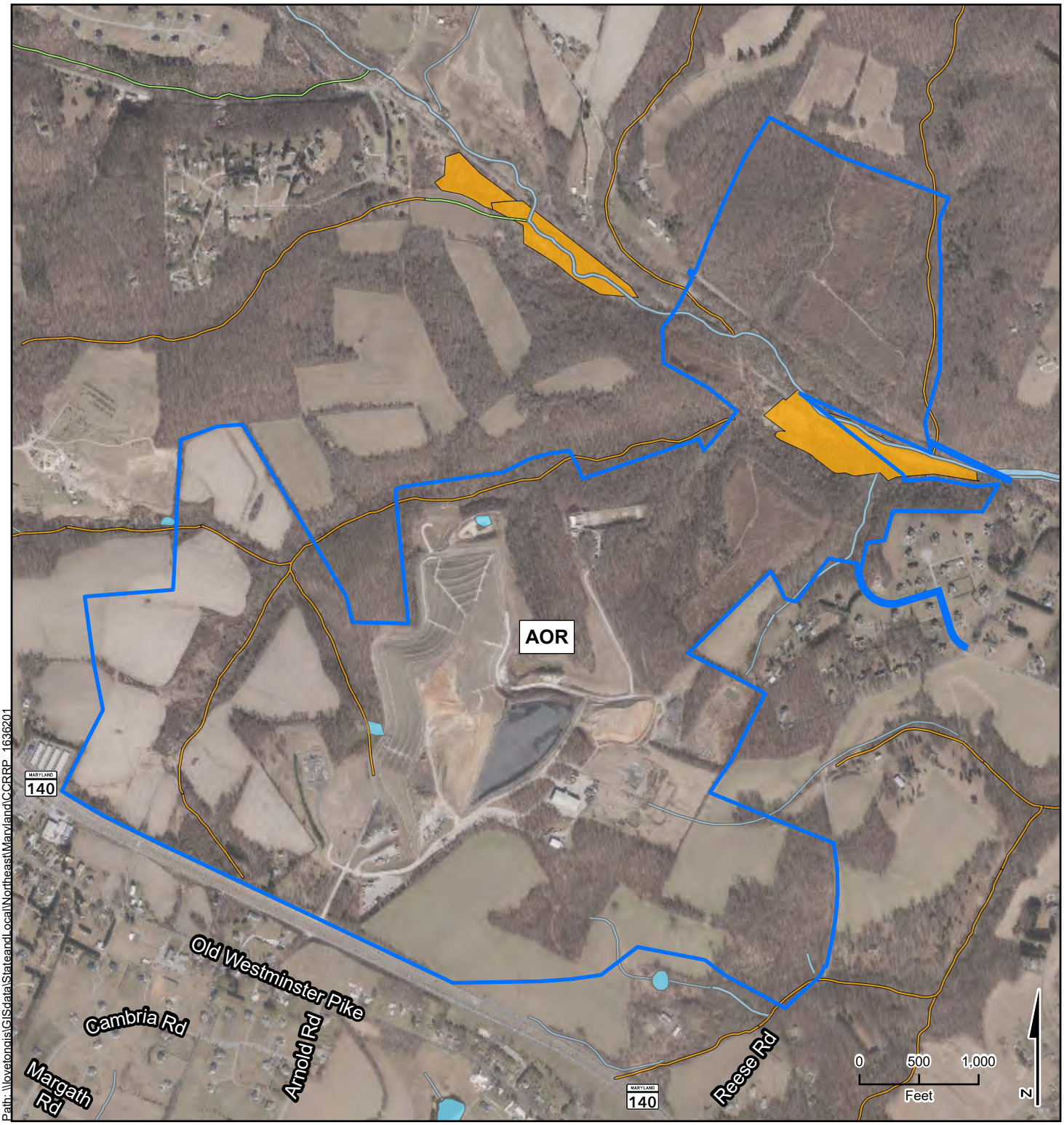


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Area of Review (AOR)

Figure 4
Soil Survey Map
Carroll County
Resource Recovery Park
Westminster, MD

Map Date: 6/6/2023
Data Source: USDA 2023
Projection: NAD 1983 State Plane
Maryland US Foot



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- Area of Review (AOR)

Wetland Type

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

Figure 5
NWI Wetlands
Carroll County
Resource Recovery Park
Westminster, MD

Map Date: 6/6/2023
Data Source: USFW 2023
Projection: NAD 1983 State Plane
Maryland US Foot

Appendix B
Forest Stand Data Forms

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**								
Project #: 1629201										**Stand #: 1**			**Plot #: 05**					
Forest Cover Type: Black Walnut										**Date: 6-14-23**								
Plot Size: 1/10 Acre (26.4' radius)																		
Basal Area in Square Feet per Acre: 90	**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 Black walnut						2	1	2								5		
2 White mulberry			2													2		
3 Sycamore										1						1		
4 Black cherry						1										1		
5																		
6																		
7																		
8																		
9																		
Total Number of Trees per Size Class			2			3	1	2		1					9	18		
Number & Size of Standing Dead Trees																		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Multiflora rose, spicebush, poison ivy.	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	60	70	60	60	20	54	90%	Early-mid

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Japanese stiltgrass, garlic mustard, Japanese honeysuckle, stickseed, English ivy	**C**	**N**	**E**	**S**	**W**	**%**	Multiflora rose, spicebush, poison ivy, Japanese stiltgrass, garlic mustard, Japanese honeysuckle, English ivy
	15	30	0	10	50	21	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No	75	70	90	90	90	83	**Habitat size, location, configuration:**
Historic Sites?	No							
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						Large, matrix. Near road.
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	10	0	5	15	5	7	
Downed woody debris:	light							**Stand corridor/patch?** Patch

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments: This is an early successional forest stand transitioning towards oak-hickory dominance and is near a field/edge with a lot of downed trees.

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**								
Project #: 1629201										**Stand #: 1**			**Plot #: 09**					
Forest Cover Type: Black Walnut										**Date: 6-16-23**								
Plot Size: 1/10 Acre (26.4' radius)																		
Basal Area in Square Feet per Acre: 90	**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 walnut	1	4			5		3	3								16	
2	Princess tree		1					1									2	
3	Tree of heaven	4	1														5	
4	White mulberry								3								3	
5																		
6																		
7																		
8																		
9																		
	Total Number of Trees per Size Class	5	6			5		4	6								26	
	Number & Size of Standing Dead Trees		0			0			0			0			0		0	

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Multiflora rose, wineberry, Chinese privet, Amur honeysuckle.	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	80	80	10	0	50	44	60%	Early

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Japanese stiltgrass, Kentucky bluegrass, Asian bittersweet, garlic mustard, Jack-in-the-pulpit, mile-a-minute vine, creeping smartweed.	**C**	**N**	**E**	**S**	**W**	**%**	Multiflora rose, wineberry, Chinese privet, Amur honeysuckle, Japanese stiltgrass, Kentucky bluegrass, Asian bittersweet, garlic mustard, mile-a-minute vine, creeping smartweed.
	0	5	50	50	50	31	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No							
Historic Sites?	No	90	80	90	60	80	80	**Habitat size, location, configuration:**
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						Medium patch succesional forest
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	5	5	0	0	40	10	
Downed woody debris:	light							**Stand corridor/patch?** Patch

FUNCTION: Where is stand in relation to sensitive areas on site?	No
Is stand a buffer to surface runoff or groundwater flow? How?	No
Leaf litter/soil eroding or increasing? How affected by stand structure?	Increasing
Nutrient uptake/loss affected by stand structure?	No

Comments: This area is a medium sized forest on what appears to be former agricultural land with a high density of black walnut trees in the canopy over a mostly herbaceous understory of non-native forbs and graminioids.

Property: Carroll County Resource Recovery Park												**Prepared By: Tom King**						
Project #: 1629201												**Stand #: 6**			**Plot #: 24**			
Forest Cover Type: Black Walnut												**Date: 7-6-23**						
Plot Size: 1/10 Acre (26.4' radius)																		
Basal Area in Square Feet per Acre: 90	**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 walnut					2		9									11		
2	White ash	1															1		
3																	0		
4																	0		
5																	0		
6																	0		
7																	0		
8																	0		
9																	0		
	Total Number of Trees per Size Class		1			2			9			0			0		12		
	Number & Size of Standing Dead Trees					1											1		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Multiflora rose, spicebush, round-leaf greenbriar, Asian bittersweet, black cherry.	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	50	30	30	20	40	34	10%	Early

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Virgin's bower, wood-nettle, wrinkleleaf goldenrod, reed canary grass	**C**	**N**	**E**	**S**	**W**	**%**	Multiflora rose, Asian bittersweet, reed canary grass
	90	90	90	90	90	90	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No	50	40	50	30	50	44	**Habitat size, location, configuration:**
Historic Sites?	No							
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	5	10	10	0	0	5	
Downed woody debris:	light							**Stand corridor/patch?** Patch

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments:

Property: Carroll County Resource Recovery Park													**Prepared By: Tom King**						
Project #: 1629201													**Stand #: 2**			**Plot #: 03**			
Forest Cover Type: Red Maple – Black Cherry – Black Locust													**Date: 6-14-23**						
Plot Size: 1/10 Acre (26.4' radius)																			
	Basal Area in Square Feet per Acre: 90	**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					4	1	1	2		1						9		
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
	Total Number of Trees per Size Class					5			3			1					9		
	Number & Size of Standing Dead Trees																		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Spicebush, Japanese barberry	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	30	80	60	60	40	54	80%	Early

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Garlic mustard, Japanese barberry, skunk cabbage, multiflora rose, Japanese honeysuckle, mayapple	**C**	**N**	**E**	**S**	**W**	**%**	Garlic mustard, Japanese barberry, multiflora rose, Japanese honeysuckle
	60	50	50	60	90	62	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No	20	80	90	70	70	66	**Habitat size, location, configuration:**
Historic Sites?	No							
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	40	0	5	5	5	11	
Downed woody debris:	light							**Stand corridor/patch?**

FUNCTION: Where is stand in relation to sensitive areas on site?
Is stand a buffer to surface runoff or groundwater flow? How?
Leaf litter/soil eroding or increasing? How affected by stand structure?
Nutrient uptake/loss affected by stand structure?
Comments:

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**								
Project #: 1629201										**Stand #: 2**			**Plot #: 11**					
Forest Cover Type: Red Maple – Black Cherry – Black Locust										**Date: 6-16-23**								
Plot Size: 1/10 Acre (26.4' radius)																		
Basal Area in Square Feet per Acre: 90	**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 Black cherry		3		1	6		3	1								14		
2 Black gum	1				2			3								6		
3 Sassafras		4														4		
4 Red maple		1			2											3		
5 Mockernut hickory				1			2									3		
6 Tuliptree		2						1								3		
7 Chestnut oak								2								2		
8 Princess tree					1											1		
9 White oak							1									1		
Total Number of Trees per Size Class		11			13			13			0			0		37		
Number & Size of Standing Dead Trees		4			1											5		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Wineberry	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot**	**Stage:**
	70	50	50	60	70	60	**(All Layers)** 15	Mid

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species**
Hayscented fern, Asian bittersweet, multiflora rose, Japanese stiltgrass, wineberry, Japanese spiraea, pokeweed, four-leaved wild yam, licorice bedstraw, catbrier	**C**	**N**	**E**	**S**	**W**	**%**	**per Plot (All Layers):**
	0	90	5	50	50	39	Asian bittersweet, multiflora rose, Japanese stiltgrass, wineberry, Japanese spiraea

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No	10	40	90	80	90	62	**Habitat size, location, configuration:**
Historic Sites?	No							
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						Patch
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	0	5	5	0	0	2	
Downed woody debris:	light							**Stand corridor/patch?**

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments:

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**								
Project #: 1629201										**Stand #: 2**			**Plot #: 14**					
Forest Cover Type: Red Maple – Black Cherry – Black Locust										**Date: 6-19-23**								
Plot Size: 1/10 Acre (26.4' radius)																		
	Basal Area in Square Feet per Acre: 90	**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	1	1		1	8	2	1									14	
2	Red maple		3			3											6	
3	Black gum		1	1	1	1											4	
4	Chestnut oak			3		1											4	
5	Sassafras		3														3	
6	Tuliptree			1				1			1						3	
7	White oak		1			1											2	
8	Mockernut hickory			1													1	
9																		
	Total Number of Trees per Size Class	1	9	6	2	14	2	2			1						37	
	Number & Size of Standing Dead Trees		4			3											7	

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Japanese spiraea, Japanese barberry, wineberry, spicebush.	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	95	70	50	60	70	69	60%	Early

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Japanese stiltgrass, Virginia creeper, poison ivy, roundleaf greenbriar, late lowbush blueberry	**C**	**N**	**E**	**S**	**W**	**%**	Japanese stiltgrass, Japanese spiraea, Japanese barberry, wineberry
	0	70	30	15	15	26	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No	20	10	60	10	20	24	**Habitat size, location, configuration:**
Historic Sites?	No							
Disease?	No							Matrix forest near road
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	20	5	20	20	10	15	
Downed woody debris:	light							**Stand corridor/patch?** Patch

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments: This stand is a successional forest progressing towards oak-hickory forest composition.

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**								
Project #: 1629201										**Stand #: 2**			**Plot #: 16**					
Forest Cover Type: Red Maple – Black Cherry – Black Locust										**Date: 6-19-23**								
Plot Size: 1/10 Acre (26.4' radius)																		
	Basal Area in Square Feet per Acre: 90	**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			1	1	4		2	1								9	
2	Sassafras										2	4					6	
3	Black cherry			1		2		1									4	
4	Northern red oak													2			2	
5	Sweet birch								2								2	
6	Mockernut hickory			1		1											2	
7																		
8																		
9																		
	Total Number of Trees per Size Class			3	1	7		3	3		2	4		2			25	
	Number & Size of Standing Dead Trees		3			1											4	

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Spicebush, black cherry	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot**	**Stage:**
	90	60	90	80	80	80	**(All Layers):** 5%	Mid

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species**
Allegheny blackberry, wavyleaf basketgrass, Virginia creeper, tuliptree.	**C**	**N**	**E**	**S**	**W**	**%**	**per Plot (All Layers):**
	0	10	0	60	50	24	Wavyleaf basketgrass

		Herbaceous & Woody Cover 0'-3						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	Yes							
Historic Sites?	No	10	20	60	60	80	46	**Habitat size, location, configuration:**
Disease?	No							Matrix forest in the north central section of property near boundary.
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	5	10	5	5	40	13	
Downed woody debris:	light							**Stand corridor/patch?** Patch

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments: This stand is a successional forest progressing towards oak-hickory forest composition.

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**								
Project #: 1629201										**Stand #: 2**			**Plot #: 17**					
Forest Cover Type: Red Maple – Black Cherry – Black Locust										**Date: 6-19-23**								
Plot Size: 1/10 Acre (26.4' radius)																		
Basal Area in Square Feet per Acre: 90	**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	Black cherry		4			1	1										6	
2	Mockernut hickory		1	1	1	1											4	
3	Red maple					1		1									2	
4	Sweet birch		2														2	
5	Pignut hickory		1	1													2	
6	Black oak													1			1	
7																		
8																		
9																		
	Total Number of Trees per Size Class		8	2	1	3	1	1						1			17	
	Number & Size of Standing Dead Trees		2														2	

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Spicebush, multiflora rose, Allegheny blackberry, catbriar	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	75	80	60	70	90	75	10%	Mid

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Poison ivy, Virginia creeper, Japanese stiltgrass, wavyleaf basketgrass, garlic mustard	**C**	**N**	**E**	**S**	**W**	**%**	Multiflora rose, Japanese stiltgrass, wavyleaf basketgrass, garlic mustard
	5	70	70	20	0	33	

		Herbaceous & Woody Cover 0'-3						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No	15	30	50	10	10	23	**Habitat size, location, configuration:**
Historic Sites?	No							Large patch, matrix, successional forest near perrenial stream
Disease?	No	**Downed Woody Debris:**						
Insects/Infestation?	No	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Exotic Plants?	Yes	20	5	5	5	10	9	
Leaf litter?	light							**Stand corridor/patch?** Patch
Downed woody debris:	light							

FUNCTION: Where is stand in relation to sensitive areas on site? Near perrenial stream

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments: Mid-successional forest transitioning to oak-hickory composition.

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**								
Project #: 1629201										**Stand #: 2**			**Plot #: 19**					
Forest Cover Type: Red Maple – Black Cherry – Black Locust										**Date: 7-6-23**								
Plot Size: 1/10 Acre (26.4' radius)																		
	Basal Area in Square Feet per Acre: 90	**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		3		2	5		4			1						15	
2	Black locust	1			5	4											10	
3	Red maple		1			4											5	
4	Basswood		1														1	
5	Tree of heaven				1												1	
6	Tuliptree					1											1	
7																	0	
8																	0	
9																	0	
	Total Number of Trees per Size Class		6			22			4			1					33	
	Number & Size of Standing Dead Trees					2											2	

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successiona**
White ash, multiflora rose, Asian bittersweet, southern arrowwood	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	80	80	80	30	70	68	70%	Early

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Japanese stiltgrass, autumn olive, Canada goldenrod, multiflora rose, Virginia creeper, wild rye, Allegheny blackberry, poison ivy, hooked crowfoot, mile-a-minute vine, garlic mustard, black locust, red clover	**C**	**N**	**E**	**S**	**W**	**%**	Multiflora rose, Asian bittersweet, Japanese stiltgrass, autumn olive, mile-a-minute vine, garlic mustard, black locust, red clover
	30	20	30	90	90	52	

		Herbaceous & Woody Cover 0'-3						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No	80	90	80	90	80	84	**Habitat size, location, configuration:**
Historic Sites?	No							
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	0	0	5	5	10	4	
Downed woody debris:	light							**Stand corridor/patch?** Patch

FUNCTION: Where is stand in relation to sensitive areas on site?
Is stand a buffer to surface runoff or groundwater flow? How?
Leaf litter/soil eroding or increasing? How affected by stand structure?
Nutrient uptake/loss affected by stand structure?
Comments:

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**								
Project #: 1629201										**Stand #: 2**			**Plot #: 25**					
Forest Cover Type: Red Maple – Black Cherry – Black Locust										**Date: 7-6-23**								
Plot Size: 1/10 Acre (26.4' radius)																		
	Basal Area in Square Feet per Acre: 90	**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	1	8		6	2											17	
2	Black willow	1						1									2	
3																	0	
4																	0	
5																	0	
6																	0	
7																	0	
8																	0	
9																	0	
	Total Number of Trees per Size Class		10			8			1			0			0		19	
	Number & Size of Standing Dead Trees																0	

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successiona**
Southern arrowwood, black willow, spicebush, poison ivy, black alder, northern highbush blueberry, poison sumac, multiflora rose	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	40	30	10	40	20	28	5%	Early

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Sensitive fern, virgin's bower, tall meadow-rue, spotted touch-me-not, arrowvine, broadleaf arrowhead, fowl mannagrass, weeping lovegrass, ironweed, marsh bedstraw, swamp rose, showy tick-	**C**	**N**	**E**	**S**	**W**	**%**	Multiflora rose
	10	80	70	80	80	64	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No							**Habitat size, location, configuration:**
Historic Sites?	No	90	90	90	80	80	86	
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	0	0	0	0	0	0	
Downed woody debris:	light							**Stand corridor/patch?** Patch

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments:

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**								
Project #: 1629201										**Stand #: 3**			**Plot #: 2**					
Forest Cover Type: Oak-Hickory										**Date: 6/14/2023**								
Plot Size: 1/10 Acre (26.4' radius)																		
Basal Area in Square Feet per Acre: 90	**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	2		1						8		
2 Red maple			4													4		
3 Black cherry			1													1		
4 Black oak			1													1		
5																		
6																		
7																		
8																		
9																		
Total Number of Trees per Size Class			8		1		2	2		1						0		
Number & Size of Standing Dead Trees		0														0		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Wineberry, spicebush, chestnut oak, Japanese barberry, flowering dogwood, Japanese spiraea	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	80	70	70	60	80	72	40%	Mid-late

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Japanese stiltgrass, Japanese honeysuckle, hooked crowfoot, garlic mustard, Asian bittersweet, licorice bedstraw, maple-leaved viburnum, Virginia creeper, late lowbush blueberry, forked rosette-panicgrass, red maple	**C**	**N**	**E**	**S**	**W**	**%**	Wineberry, Japanese barberry, Japanese stiltgrass, Japanese honeysuckle, garlic mustard, Asian bittersw eet, Japanese spiraea
	15	80	80	50	15	48	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No							
Historic Sites?	No	15	20	15	40	5	19	**Habitat size, location, configuration:**
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	10	0	5	10	10	7	
Downed woody debris:	light							**Stand corridor/patch?** Patch

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments:

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**								
Project #: 1629201										**Stand #: 3**			**Plot #: 4**					
Forest Cover Type: Oak-Hickory										**Date: 6-14-23**								
Plot Size: 1/10 Acre (26.4' radius)																		
Basal Area in Square Feet per Acre: 90	**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 gum			1		1	1		1								4		
2 Mockernut hickory		1				1	1									3		
3 Black oak										1						1		
4 Flowering dogwood			1													1		
5 Red maple			1													1		
6 Black cherry									1							1		
7																		
8																		
9																		
Total Number of Trees per Size Class		1	3		1	2	1	1	1	1						0		
Number & Size of Standing Dead Trees					1											1		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Japanese barberry, Japanese honeysuckle, sassafras, black cherry, red maple, spicebush, black gum	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	90	50	80	90	90	80	10%	Mid

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Virginia creeper, eastern woodland sedge, roundleaf greenbrier, wrinkleleaf goldenrod, Japanese stiltgrass, multiflora rose, spotted jewelweed, deertounge grass	**C**	**N**	**E**	**S**	**W**	**%**	Japanese barberry, Japanese honeysuckle, Japanese stiltgrass, multiflora rose
	0	100	5	90	50	49	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	Deer
Specimen Trees?	Yes	95	70	70	5	90	66	**Habitat size, location, configuration:**
Historic Sites?	No							
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	15	15	30	10	10	16	
Downed woody debris:	light							**Stand corridor/patch?** Corridor

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments:

Property: Carroll County Resource Recovery Park													**Prepared By: Tom King**					
Project #: 1629201													**Stand #: 3**			**Plot #: 6**		
Forest Cover Type: Oak-Hickory													**Date: 6-16-23**					
Plot Size: 1/10 Acre (26.4' radius)																		
Basal Area in Square Feet per Acre: 90	**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		6	4		1						14		
2 Black cherry	3	2			2											7		
3 Black gum		4						1								5		
4 Sassafras	1			1												2		
5 Tuliptree										1						1		
6 Sweet birch					1											1		
7 Red maple					1											1		
8 Bird cherry					1											1		
9 Black oak							1									1		
Total Number of Trees per Size Class		10			9			12			2			0		33		
Number & Size of Standing Dead Trees											3					3		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Chestnut oak, maple leaved viburnum, black cherry, black oak	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	90	90	80	90	80	86	20%	Mid-late

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Virginia creeper, Asian bittersweet, licorice bedstraw, garlic mustard, wineberry, Allegheny raspberry, multiflora rose, enchanter's nightshade, four-leaved wild yam, pokeweed, Japanese stiltgrass, poison ivy,	**C**	**N**	**E**	**S**	**W**	**%**	
	50	5	30	90	60	47	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	Deer
Specimen Trees?	No	15	5	5	20	10	11	**Habitat size, location, configuration:**
Historic Sites?	No							
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	5	20	5	5	15	10	
Downed woody debris:	light							**Stand corridor/patch?**

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments:

Property: Carroll County Resource Recovery Park												**Prepared By: Tom King**						
Project #: 1629201												**Stand #: 3**			**Plot #: 7**			
Forest Cover Type: Oak-Hickory												**Date: 6-16-23**						
Plot Size: 1/10 Acre (26.4' radius)																		
	Basal Area in Square Feet per Acre: 90	**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	Mockernut Hickory		1		2	2		7	3								15	
2	Black gum	3				1			1								5	
3	Black cherry	2	2			1											5	
4	Red maple		3					1									4	
5	Chestnut oak							1									1	
6	Tuliptree							1									1	
7	White oak							1									1	
8																		
9																		
	Total Number of Trees per Size Class	5	6		2	4		11	4								32	
	Number & Size of Standing Dead Trees					1											1	

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
	C	**N**	**E**	**S**	**W**	**%**	**Cover per Plot**	**Stage:**
Sweet birch, spicebush, Allegheny blackberry, black gum, red maple, mockernut hickory, white oak, Chinese privet	60	80	80	90	70	76	**(All Layers):** 15%	Mid-late

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species**
	C	**N**	**E**	**S**	**W**	**%**	**per Plot (All Layers):**
Allegheny blackberry, Virginia creeper, Asian bittersweet, white oak, tuliptree, hog peanut, catbrier, late lowbush blueberry, enchanter's nightshade, Japanese stiltgrass, four-leaved wild yam	5	10	50	20	50	27	Chinese privet, Asian bittersweet, Japanese stiltgrass

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	Yes							
Historic Sites?	No	70	80	10	10	40	42	**Habitat size, location, configuration:**
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						Matrix forest at the edge of the property between two agricultural fields.
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light							
Downed woody debris:	light	5	10	5	5	2	5.4	**Stand corridor/patch?** Patch

FUNCTION: Where is stand in relation to sensitive areas on site?
Is stand a buffer to surface runoff or groundwater flow? How?
Leaf litter/soil eroding or increasing? How affected by stand structure?
Nutrient uptake/loss affected by stand structure?
Comments:

Property: Carroll County Resource Recovery Park												**Prepared By: Tom King**						
Project #: 1629201												**Stand #: 3**			**Plot #: 10**			
Forest Cover Type: Oak-Hickory												**Date: 6-16-23**						
Plot Size: 1/10 Acre (26.4' radius)																		
Basal Area in Square Feet per Acre: 90	**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 Black cherry	1	2					10									13		
2 Mockernut hickory				5	2		4									11		
3 Chestnut oak				1			2									3		
4 Norway maple					1		2									3		
5 Tuliptree					1		1									2		
6 White oak					1											1		
7 Sweet birch							1									1		
8																0		
9																0		
Total Number of Trees per Size Class		3			11			20			0			0		34		
Number & Size of Standing Dead Trees					2											2		
List of Woody Plant Species 3'-20':							**Canopy Closure:**									**Percent of Invasiv**	**Plot Successional**	
Wineberry, Asian bittersweet							**C**	**N**	**E**	**S**	**W**	**%**				**Cover per Plot (All Layers):**	**Stage:**	
							90	80	50	50	10	56				5%	Mid	
List of Understory Species 0'-3':							**Understory Cover 3'-20':**									**List of Major Invasive Species per Plot (All Layers):**		
Wineberry, Asian bittersweet, enchanter's nightshade, black cohosh, licorice bedstraw, mock strawberry							**C**	**N**	**E**	**S**	**W**	**%**				Wineberry, Asian bittersweet, mock strawberry		
							30	50	40	40	60	44						
Rare, etc. Species?	No						**Herbaceous & Woody Cover 0'-3'**									**HABITAT: What species present?**		
Specimen Trees?	No						**C**	**N**	**E**	**S**	**W**	**%**						
Historic Sites?	No						80	5	0	80	50	43				**Habitat size, location, configuration:**		
Disease?	No															Matrix forest between two agricultural fields		
Insects/Infestation?	No						**Downed Woody Debris:**											
Exotic Plants?	Yes						**C**	**N**	**E**	**S**	**W**	**%**				**Wildlife cover/food/water?**		
Leaf litter?	light						10	5	15	10	5	9						
Downed woody debris:	light															**Stand corridor/patch?**	Patch	
FUNCTION: Where is stand in relation to sensitive areas on site?																		
Is stand a buffer to surface runoff or groundwater flow? How?																		
Leaf litter/soil eroding or increasing? How affected by stand structure?																		
Nutrient uptake/loss affected by stand structure?																		
Comments:																		

Property: Carroll County Resource Recovery Park												**Prepared By: Tom King**							
Project #: 1629201												**Stand #: 3**			**Plot #: 13**				
Forest Cover Type: Oak-Hickory												**Date: 6-19-23**							
Plot Size: 1/10 Acre (26.4' radius)																			
	Basal Area in Square Feet per Acre: 90	**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	Northern red oak								2		3	1					6		
2	Mockernut hickory		1	4													5		
3	Tuliptree								1		1						2		
4	Red maple			1													1		
5	Norway maple			1													1		
6																	0		
7																	0		
8																	0		
9																	0		
	Total Number of Trees per Size Class		7			0			3			5			0		15		
	Number & Size of Standing Dead Trees								1								1		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Japanese barberry, wineberry, poison ivy, multiflora rose	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	80	80	70	60	80	74	40%	Mid

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Japanese spiraea, enchanter's nightshade, Japanese stiltgrass, wavy-leaved basketgrass, licorice bedstraw, white avens	**C**	**N**	**E**	**S**	**W**	**%**	Japanese barberry, wineberry, multiflora rose, Japanese spiraea, Japanese stiltgrass, wavy-leaved basketgrass
	10	10	5	80	80	37	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	Deer
Specimen Trees?	No	20	20	80	90	40	50	**Habitat size, location, configuration:**
Historic Sites?	No							
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	5	5	50	5	10	15	
Downed woody debris:	light							**Stand corridor/patch?**

FUNCTION: Where is stand in relation to sensitive areas on site?
Is stand a buffer to surface runoff or groundwater flow? How?
Leaf litter/soil eroding or increasing? How affected by stand structure?
Nutrient uptake/loss affected by stand structure?
Comments:

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**							
Project #: 1629201										**Stand #: 3**			**Plot #: 18**				
Forest Cover Type: Oak-Hickory										**Date: 6-19-23**							
Plot Size: 1/10 Acre (26.4' radius)																	
Basal Area in Square Feet per Acre: 90	**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	Red maple		1	2		2	1	2									8
2	Chestnut oak			1				3			1						5
3	Black gum			3													3
4	Northern red oak				1												1
5	Flowering dogwood			1													1
6	Black cherry			1													1
7	Scarlet oak							1									1
8																	0
9																	0
	Total Number of Trees per Size Class		9			4			6			1			0		20
	Number & Size of Standing Dead Trees		3														3

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Spicebush, wineberry	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	60	80	85	90	80	79	30%	Mid

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Virginia creeper, Japanese stiltgrass, Allegheny blackberry, late lowbush blueberry, intermediate shield fern, wavy-leaved basketgrass	**C**	**N**	**E**	**S**	**W**	**%**	Japanese stiltgrass, wavy-leaved basketgrass, wineberry
	10	0	0	0	0	2	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No	15	20	80	30	80	45	**Habitat size, location, configuration:**
Historic Sites?	No							
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	15	20	630	30	30	2	
Downed woody debris:	light							**Stand corridor/patch?**

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments:

Property: Carroll County Resource Recovery Park												**Prepared By: Tom King**						
Project #: 1629201												**Stand #: 3**			**Plot #: 20**			
Forest Cover Type: Oak-Hickory												**Date: 7-6-23**						
Plot Size: 1/10 Acre (26.4' radius)																		
Basal Area in Square Feet per Acre: 90	**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 Mockernut hickory	2	5		1	5		1	2								16		
2 Northern red oak		1			2		1	1		1						6		
3 Red maple		1			2											3		
4 White oak					1			1		1						3		
5 Black walnut				1												1		
6 Black cherry				1	1			1								3		
7																0		
8																0		
9																0		
Total Number of Trees per Size Class		9			14			7			2			0		32		
Number & Size of Standing Dead Trees																0		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Spicebush, multiflora rose	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	70	80	80	80	70	76	50%	Mid

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Virginia creeper, multiflora rose, wrinkleleaf goldenrod, Asian bittersweet, Japanese stiltgrass, Asian lady's thumb, Allegheny blackberry, Christmas fern, yellow woodsorrel, Japanese honeysuckle.	**C**	**N**	**E**	**S**	**W**	**%**	Multiflora rose, Asian bittersw eet, Japanese stiltgrass, Asian lady's thumb, Japanese honeysuckle,
	5	80	20	10	90	41	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No	90	50	60	90	10	60	**Habitat size, location, configuration:**
Historic Sites?	No							
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						Patch
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	5	5	10	5	5	6	
Downed woody debris:	light							**Stand corridor/patch? Patch**

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments:

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**							
Project #: 1629201										**Stand #: 3**			**Plot #: 23**				
Forest Cover Type: Oak-Hickory										**Date: 7-6-23**							
Plot Size: 1/10 Acre (26.4' radius)																	
	Basal Area in Square Feet per Acre: 90	**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	Northern red oak		3		1	4		1			1						10
2	Chestnut oak		2			2		4									8
3	Pignut hickory		2			1											3
4	Red hickory		2			1											3
5	Black gum					2											2
6	Black oak					2											2
7	Black cherry		1														1
8	Scarlet oak							1									1
9	Sweetgum					1											1
	Total Number of Trees per Size Class		10			14			6			1			0		31
	Number & Size of Standing Dead Trees								1								1

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**	
Spicebush, wineberry	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**	
	70	80	60	80	80	74	40%	Mid	
List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**		
Japanese stiltgrass, sassafras, Allegheny blackberry, northern red oak, pokeweed, round-leaved greenbriar, enchanter's nightshade, Virginia creeper, catbriar, false Solomon's seal	**C**	**N**	**E**	**S**	**W**	**%**	Wineberry, Japanese stiltgrass		
	10	60	30	10	20	26			
Rare, etc. Species? No	**Herbaceous & Woody Cover 0'-3'**						**HABITAT: What species present?**		
Specimen Trees? No	**C**	**N**	**E**	**S**	**W**	**%**			
Historic Sites? No	50	30	20	5	20	25	**Habitat size, location, configuration:**		
Disease? No									
Insects/Infestation? No	**Downed Woody Debris:**								
Exotic Plants? Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**		
Leaf litter? light	10	5	5	5	5	6			
Downed woody debris: light							**Stand corridor/patch? Patch**		

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments:

Property: Carroll County Resource Recovery Park										**Prepared By: Tom King**								
Project #: 1629201										**Stand # 4**			**Plot #: 1**					
Forest Cover Type: Tuliptree										**Date: 6-14-23**								
Plot Size: 1/10 Acre (26.4' radius)																		
	Basal Area in Square Feet per Acre: 90	**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			4			4										8	
2	Tuliptree								1		1	1		2			5	
3	Black cherry			3													3	
4	Sweet birch			1													1	
5																		
6																		
7																		
8																		
9																		
	Total Number of Trees per Size Class		8			4			1			2			5		20	
	Number & Size of Standing Dead Trees		6														6	

List of Woody Plant Species 3'-20':		**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**		
Allegheny blackberry, Asian bittersweet, Japanese barberry.		**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**		
		85	80	90	70	90	83	30%	Early		
List of Understory Species 0'-3':		**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**			
Japanese stiltgrass, poison ivy, multiflora rose, Japanese honeysuckle, Virginia creeper, wineberry, Allegheny blackberry.		**C**	**N**	**E**	**S**	**W**	**%**	Asian bittersweet, Japanese barberry, Japanese stiltgrass, multiflora rose, Japanese honeysuckle, wineberry,			
		0	0	10	0	0	2				
Rare, etc. Species?	No	**Herbaceous & Woody Cover 0'-3':**						**HABITAT: What species present?**			
Specimen Trees?	Yes	**C**	**N**	**E**	**S**	**W**	**%**				
Historic Sites?	No	75	90	70	70	50	71	**Habitat size, location, configuration:**			
Disease?	No										
Insects/Infestation?	No	**Downed Woody Debris:**						Large patch, matrix forest			
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**			
Leaf litter?	light	15	5	10	25	10	13				
Downed woody debris:	light							**Stand corridor/patch?**	Patch		

FUNCTION: Where is stand in relation to sensitive areas on site?
Is stand a buffer to surface runoff or groundwater flow? How?
Leaf litter/soil eroding or increasing? How affected by stand structure?
Nutrient uptake/loss affected by stand structure?
Comments:

Property: Carroll County Resource Recovery Park												**Prepared By: Tom King**						
Project #: 1629201												**Stand #: 4**			**Plot #: 8**			
Forest Cover Type: Tuliptree												**Date: 6-16-23**						
Plot Size: 1/10 Acre (26.4' radius)																		
Basal Area in Square Feet per Acre: 90	**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	3	6		2	1			2								14		
2 Tuliptree		2			4		5	2								13		
3 Black cherry		4			2											6		
4 Black gum		1		1	2		1	1								6		
5 Chestnut oak		1					2									3		
6 Mockernut hickory							1	1								2		
7																		
8																		
9																		
Total Number of Trees per Size Class		17			15			15								44		
Number & Size of Standing Dead Trees		1														1		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Tuliptree, chestnut oak, mockernut hickory	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	70	50	70	60	10	52	5%	Mid

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Tuliptree, Asian bittersweet, Allegheny blackberry, Virginia creeper, poison ivy, wineberry, late lowbush blueberry, four-leaved wild yam, maple leaved viburnum, multiflora rose, hay-scented fern, enchanter's nightshade, Japanese honeysuckle, Japanese barberry, Japanese stiltgrass	**C**	**N**	**E**	**S**	**W**	**%**	Asian bittersweet, wineberry, multiflora rose, Japanese honeysuckle, Japanese barberry, Japanese stiltgrass
	40	80	90	5	80	59	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No							
Historic Sites?	No	5	80	5	70	80	48	**Habitat size, location, configuration:**
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	20	5	30	5	50	22	
Downed woody debris:	light							**Stand corridor/patch?**

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments:

Property: Carroll County Resource Recovery Park												**Prepared By: Tom King**						
Project #: 1629201												**Stand #: 4**			**Plot #: 12**			
Forest Cover Type: Tuliptree												**Date: 6-19-23**						
Plot Size: 1/10 Acre (26.4' radius)																		
Basal Area in Square Feet per Acre: 90	**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 Tuliptree				1	2			1		2						6		
2 Black cherry					1											1		
3 Red maple			1													1		
4 Black gum					1											1		
5																0		
6																0		
7																0		
8																0		
9																0		
Total Number of Trees per Size Class		1			5			1			2			0		9		
Number & Size of Standing Dead Trees																0		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**		
Spicebush, wineberry, Asian bittersweet, Japanese barberry, mockernut hickory	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**		
	90	90	80	50	70	76	50%	Early-mid		
List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**			
White avens, Christmas fern, enchanter's nightshade, licorice bedstraw, multiflora rose, poison ivy, Japanese spiraea	**C**	**N**	**E**	**S**	**W**	**%**	Wineberry, Asian bittersweet, Japanese barberry, multiflora rose, Japanese spiraea			
	75	90	30	5	50	50				
Rare, etc. Species? No	**Herbaceous & Woody Cover 0'-3'**						**HABITAT: What species present?**			
Specimen Trees? No	**C**	**N**	**E**	**S**	**W**	**%**				
Historic Sites? No	50	80	50	90	60	66	**Habitat size, location, configuration:**			
Disease? No							Large patch forest at the edge of property			
Insects/Infestation? No	**Downed Woody Debris:**									
Exotic Plants? Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**			
Leaf litter? light	30	10	2	20	30	18.4				
Downed woody debris: light							**Stand corridor/patch?** Patch			

FUNCTION: Where is stand in relation to sensitive areas on site? Just south of perennial stream

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments:

Property: Carroll County Resource Recovery Park													**Prepared By: Tom King**						
Project #: 1629201													**Stand #: 4**			**Plot #: 15**			
Forest Cover Type: Tuliptree													**Date: 6-19-23**						
Plot Size: 1/10 Acre (26.4' radius)																			
	Basal Area in Square Feet per Acre: 90	**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	Tuliptree					3			3		1						7		
2	Red maple				1				1								2		
3																	0		
4																	0		
5																	0		
6																	0		
7																	0		
8																	0		
9																	0		
	Total Number of Trees per Size Class		0			4			4			1			0		9		
	Number & Size of Standing Dead Trees		1														1		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Spicebush, Japanese barberry, multiflora rose, Chinese privet	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	90	95	50	80	80	79	10%	Mid

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Enchanter's nightshade, garlic mustard, licorice bedstraw, Asian bittersweet, sensitive fern, mock strawberry, intermediate shield fern, Japanese stiltgrass	**C**	**N**	**E**	**S**	**W**	**%**	Japanese barberry, multiflora rose, Chinese privet, garlic mustard, mock straw berry, Japanese stiltgrass
	75	85	90	90	75	83	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No							
Historic Sites?	No	30	10	25	10	60	27	**Habitat size, location, configuration:**
Disease?	No							Large patch, matrix forest northw est of successional shrubland.
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	15	20	50	20	30	27	
Downed woody debris:	light							**Stand corridor/patch?** Patch

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

Comments:

Property: Carroll County Resource Recovery Park													**Prepared By: Tom King**						
Project #: 1629201													**Stand #: 5**			**Plot #: 22**			
Forest Cover Type: Tuliptree													**Date: 7-6-23**						
Plot Size: 1/10 Acre (26.4' radius)																			
	Basal Area in Square Feet per Acre: 90	**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	Tuliptree					1		2	6		7	3					19		
2	Red maple	3	1		2	3											9		
3	Mockernut hickory		1			2		1									4		
4	Black gum	4	1			1											6		
5																	0		
6																	0		
7																	0		
8																	0		
9																	0		
	Total Number of Trees per Size Class		10			9			9			10			0		38		
	Number & Size of Standing Dead Trees		1						1								2		

List of Woody Plant Species 3'-20':	**Canopy Closure:**						**Percent of Invasiv**	**Plot Successional**
Japanese barberry, red maple, spicebush, Allegheny blackberry, wineberry	**C**	**N**	**E**	**S**	**W**	**%**	**Cover per Plot (All Layers):**	**Stage:**
	60	70	80	70	70	70	30%	Mid

List of Understory Species 0'-3':	**Understory Cover 3'-20':**						**List of Major Invasive Species per Plot (All Layers):**
Black cherry, multiflora rose, Virginia creeper, poison ivy, Japanese honeysuckle, hooked crowfoot	**C**	**N**	**E**	**S**	**W**	**%**	Japanese barberry, wineberry, multiflora rose, Japanese honeysuckle
	70	80	5	20	10	37	

		Herbaceous & Woody Cover 0'-3'						**HABITAT: What species present?**
Rare, etc. Species?	No	**C**	**N**	**E**	**S**	**W**	**%**	
Specimen Trees?	No	70	30	60	20	80	52	**Habitat size, location, configuration:**
Historic Sites?	No							
Disease?	No							
Insects/Infestation?	No	**Downed Woody Debris:**						
Exotic Plants?	Yes	**C**	**N**	**E**	**S**	**W**	**%**	**Wildlife cover/food/water?**
Leaf litter?	light	70	10	5	5	10	20	
Downed woody debris:	light							**Stand corridor/patch? Patch**

FUNCTION: Where is stand in relation to sensitive areas on site?

Is stand a buffer to surface runoff or groundwater flow? How?

Leaf litter/soil eroding or increasing? How affected by stand structure?

Nutrient uptake/loss affected by stand structure?

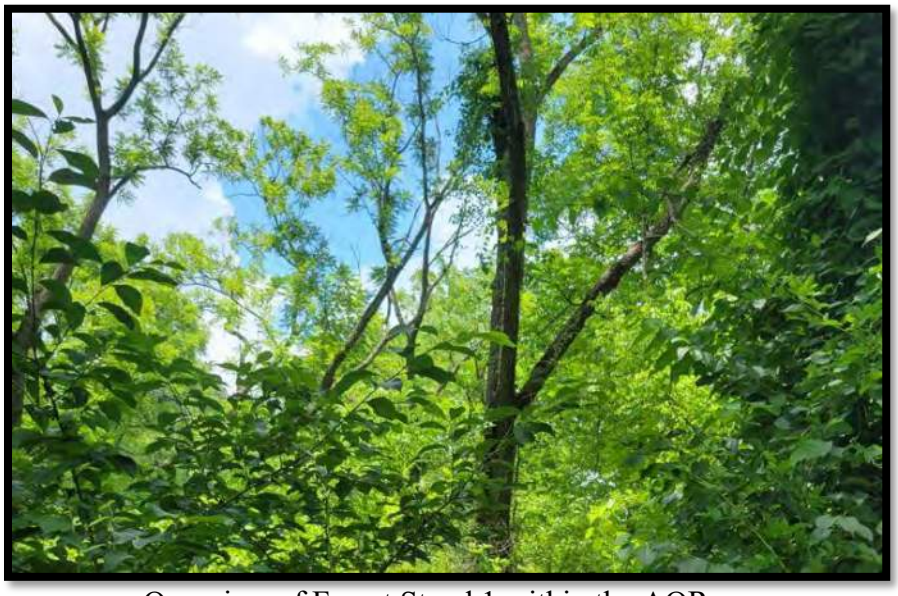
Comments:

Appendix C
Photographic Record

EA Engineering, Science, and Technology, Inc.

Photographic Record

Carroll County Resource Recovery Park and Northern Landfill Expansion Forest Stand Delineation - Onsite Photographs
Taken June 14 and July 6, 2023



Overview of Forest Stand 1 within the AOR.



Overview of Forest Stand 1 within the AOR.

EA Engineering, Science, and Technology, Inc.

Photographic Record

Carroll County Resource Recovery Park and Northern Landfill Expansion Forest Stand Delineation - Onsite Photographs
Taken June 14 and July 6, 2023



Overview of Forest Stand 2 within the AOR.



Overview of Forest Stand 2 within the AOR.

EA Engineering, Science, and Technology, Inc.

Photographic Record

Carroll County Resource Recovery Park and Northern Landfill Expansion Forest Stand Delineation - Onsite Photographs
Taken June 14 and July 6, 2023



Overview of Forest Stand 3 within the AOR.



Overview of Forest Stand 3 within the AOR.

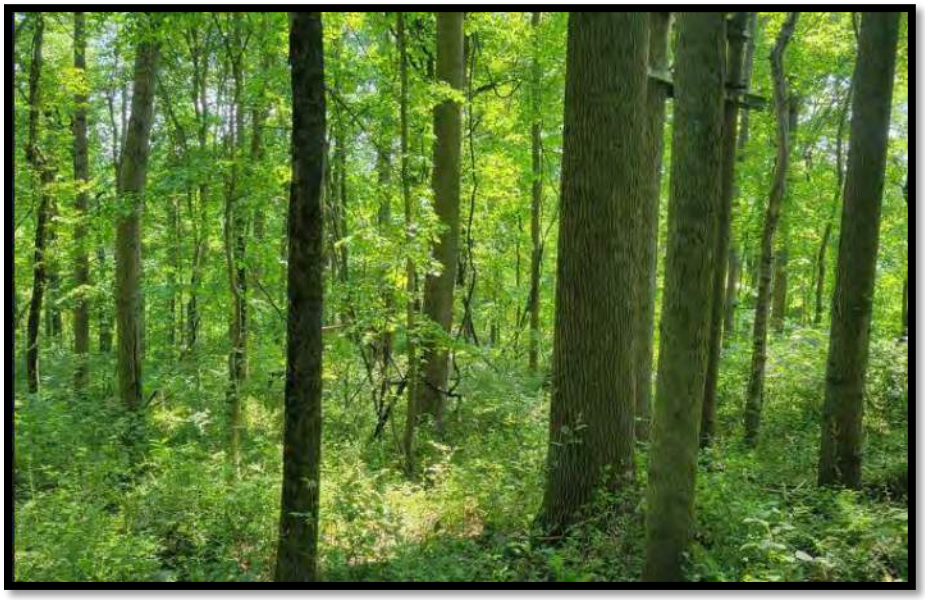
EA Engineering, Science, and Technology, Inc.

Photographic Record

Carroll County Resource Recovery Park and Northern Landfill Expansion Forest Stand Delineation - Onsite Photographs
Taken June 14 and July 6, 2023



Overview of Forest Stand 4 within the AOR.



Overview of Forest Stand 4 within the AOR.

Appendix D
Agency Consultation

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Wes Moore, Governor
Aruna Miller, Lt. Governor
Josh Kurtz, Secretary
David Goshorn, Deputy Secretary

August 16, 2023

Mr. Mark Hall
EA Engineering, Science and Technology, Inc.
225 Schilling Circle
Suite 400
Hunt Valley, MD 21031

RE: Environmental Review for Carroll County Resource Recovery Park and Northern Landfill Expansion, Northeast Maryland Waste Disposal Authority, Carroll County, Maryland.

Dear Mr. Hall:

The Wildlife and Heritage Service has determined that there are no official State or Federal records for listed plant or animal species within the delineated area shown on the map provided. We would like to point out, however, that our remote analysis suggests that the forested area on this property contains Forest Interior Dwelling Bird habitat. Populations of many bird species which depend on this type of forested habitat are declining in Maryland and throughout the eastern United States. Interested landowners can contact us for further voluntary guidelines to help conserve this important habitat.

Please be sure to let us know if the limits of proposed disturbance or overall site boundaries change and we will provide you with an updated evaluation. 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 lori.byrne@maryland.gov or at (410) 260-8573.

Sincerely,

Lori A. Byrne

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2023.1100.cl

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

Carroll County, Maryland



Local office

Chesapeake Bay Ecological Services Field Office

(410) 573-4599
(410) 266-9127

177 Admiral Cochrane Drive

Annapolis, MD 21401-7307

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Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

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2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found This species only needs to be considered if the following condition applies: • The monarch is a candidate species and not yet listed or proposed for listing. There are generally no section 7 requirements for candidate species (FAQ found here: https://www.fws.gov/savethemonarch/FAQ-Section7.html). No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

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Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

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For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31

Cerulean Warbler Dendroica cerulea — Breeds Apr 28 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/2974

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Eastern Whip-poor-will Antrostomus vociferus — Breeds May 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Kentucky Warbler Oporornis formosus — Breeds Apr 20 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

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Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and

understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (▪)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

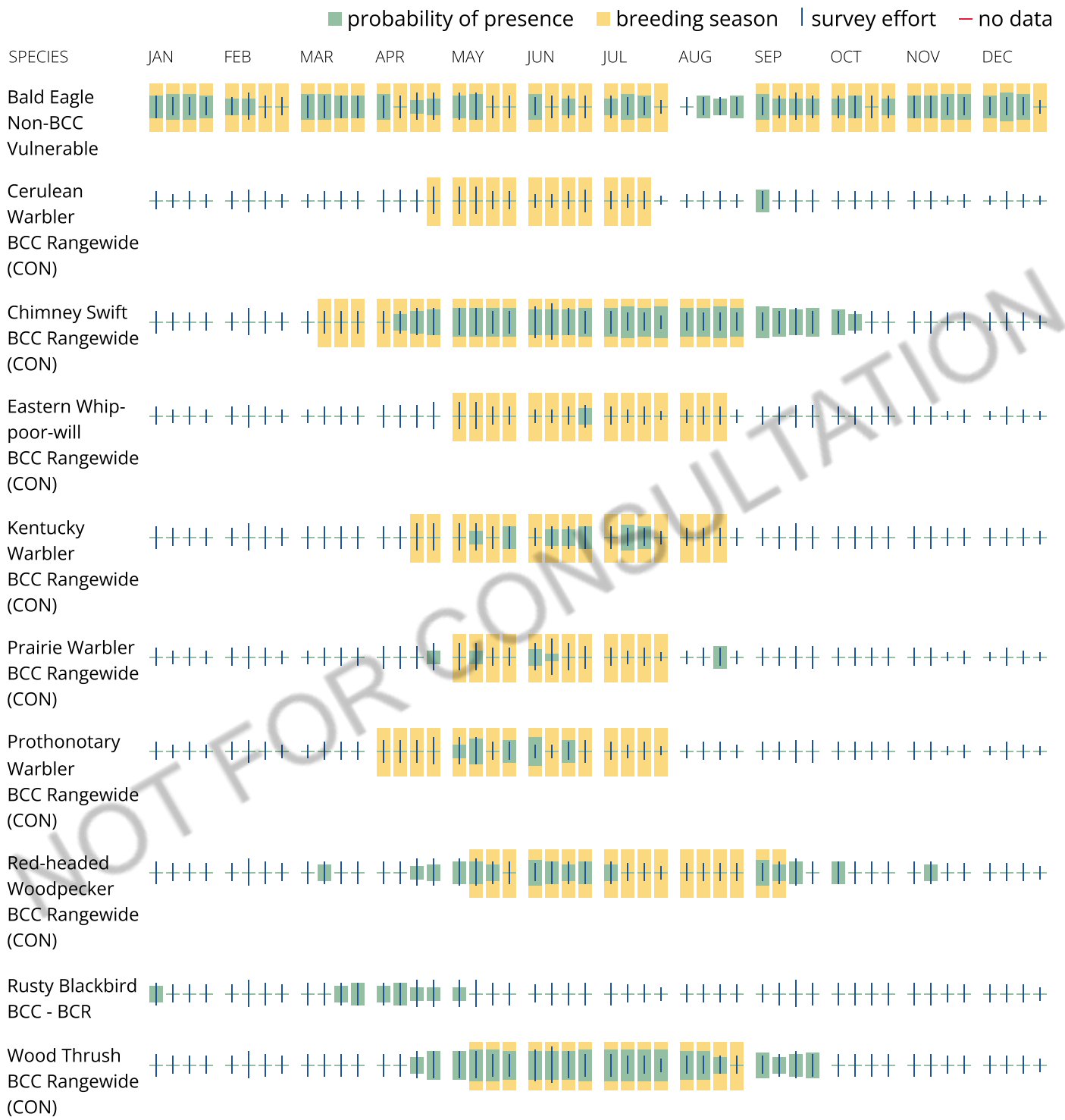
No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

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Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the

locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and

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3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

- PSS1/EM1E
- PFO1A
- PFO1/EM5A
- PSS1/EM5A

FRESHWATER POND

- PUBHh

NOT FOR CONSULTATION

PUBHx

RIVERINE

R3UBH
R4SBC
R2UBH
R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should

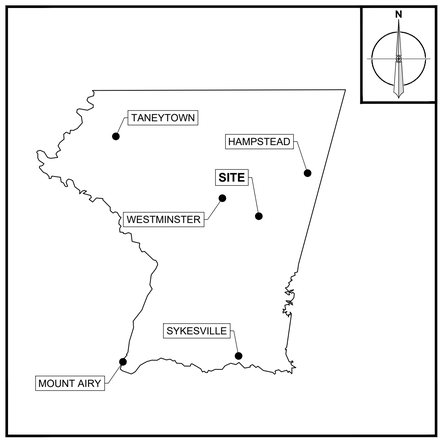
NOT FOR CONSULTATION

seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

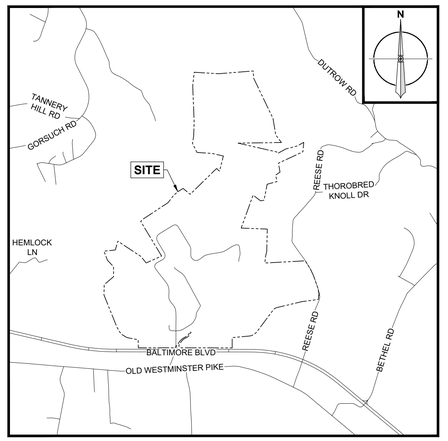
NOT FOR CONSULTATION

Appendix E
Forest Stand Delineation Map

CARROLL COUNTY
RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION
FOREST STAND DELINEATION
CARROLL COUNTY, MARYLAND



VICINITY MAP - CARROLL COUNTY
SCALE: NOT TO SCALE



SITE LOCATION MAP
SCALE: 1" = X'

GENERAL NOTES

1. PROPERTY LINES ARE BASED ON BOUNDARY SURVEYS AND PARCEL RECONFIGURATION WORKSHEETS PREPARED BY CLSI IN AUGUST 2022.
2. EXISTING CONDITIONS SITE LOCATION AND TOPOGRAPHY ARE BASED ON AN AERIAL SURVEY PREPARED BY AXIS GEOSPATIAL, LLC IN MARCH 2023.
3. WETLANDS DELINEATION WAS CONDUCTED BY EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC IN MARCH 2023.
4. FOREST STAND DELINEATION AND FIELD ASSESSMENT WAS CONDUCTED BY EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC IN MARCH 2023.
5. WEST BRANCH NORTH BRANCH PATAPSCO RIVER USE CLASS DESIGNATION IS IV-P: RECREATIONAL TROUT WATERS AND PUBLIC WATER SUPPLY, 8-DIGIT HUC CODE: 0206003.
6. ALL UNNAMED STREAMS ARE TRIBUTARIES TO THE WEST BRANCH NORTH BRANCH PATPASCO RIVER AND USE CLASS DESIGNATION IS I-P: WATER CONTACT RECREATION, PROTECTION OF AQUATIC LIFE, AND PUBLIC WATER SUPPLY.
7. LIBERTY RESERVOIR WATERSHED 8-DIGIT HUC CODE: 02130907
8. FEMA FLOODPLAINS ARE BASED ON FIRM MAPS 24013C0204D, 24013C0210D, 24013C0215D, AND 24013C0220D, DATA ACCESSED MAY 24, 2023. ALL INDICATED MAPS HAVE AN EFFECTIVE DATE OF OCTOBER 2, 2015.
9. SOIL CLASSIFICATIONS AND BOUNDARIES ARE BASED ON USDA WEB SOILS SURVEY DATA ACCESSED JUNE 23, 2023.
10. NO PART OF THE SITE IS ON THE LOCATIONAL ATLAS OR INDEX OF HISTORIC SITES.
11. ALL STANDS ARE CONSIDERED PRIORITY 1 AREAS.
12. TREE DIAMETERS WERE MEASURED USING A FORESTRY DIAMETER TAPE.
13. NO STATE OR FEDERALLY-LISTED SPECIES ARE KNOWN TO OCCUR AT THE SITE (FSD REPORT, APPENDIX F).
14. ALL INDIVIDUAL TREES WITH DBH OF 30-INCHES OR GREATER HAVE BEEN SURVEYED AND SHOWN ON THE FSD PLANS.

ABBREVIATIONS

AC	ACRES
APPROX	APPROXIMATELY
BLDG	BUILDING
CONC	CONCRETE
DIA	DIAMETER
DOT	DEPARTMENT OF TRANSPORTATION
EX - EXST	EXISTING
FT	FEET
FEMA	FEDERAL EMERGENCY MANAGEMENT AGENCY
NA	NOT APPLICABLE
NO.	NUMBER
NAD 83	NORTH AMERICAN DATUM OF 1983
NGS	NATIONAL GEODETIC SURVEY
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
NRCS	NATIONAL RESOURCE CONSERVATION SERVICE
SF - SQ FT	SQUARE FEET
TYP	TYPICAL
U.S.	UNITED STATES
USDA	U.S. DEPARTMENT OF AGRICULTURE
W/	WITH
WSEL	WATER SURFACE ELEVATION

LEGEND

DESCRIPTION	SYMBOL
PROPERTY BOUNDARY	
PROPERTY BOUNDARY ADJOINER	
STAND (S: STAND, P: PLOT)	S# P#
AREA OF REVIEW	
STAND NUMBER	1
SPECIMEN TREE	+ #
SITE CONTOUR	
SITE CONCRETE	
SITE EDGE OF WATER	
SITE FEMA FLOODPLAIN	
SITE POND	
SITE GRAVEL	
SITE STEEP SLOPE AREA (15-25%)	
SITE STEEP SLOPE AREA (>25%)	
SITE SOIL BOUNDARY	
SITE SOIL CLASSIFICATION	SfB HSG B
SITE STREAM CHANNEL	WUS
SITE STREAM BUFFER	SB
SITE TREE/BRUSH LINE	
SITE WETLAND	
SITE WETLAND BUFFER	WB
PLAN NORTH ARROW	

PROJECT INFORMATION

SITE LOCATION:
CARROLL COUNTY RESOURCE RECOVERY PARK
AND NORTHERN LANDFILL
1400 BALTIMORE BOULEVARD
WESTMINSTER, MARYLAND 21157

TAX MAP 46, GRID 24, PARCEL 47
TAX ID # 04-006488

TAX MAP 46, GRID 23, PARCEL 64
TAX ID # 04-026829

CLIENT:
NORTHEAST MARYLAND WASTE DISPOSAL AUTHORITY
TOWER II, SUITE 402, 100 S. CHARLES STREET
BALTIMORE, MARYLAND 21201

ENGINEER:
EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC
225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031
410-584-7000

DATUM:
HORIZONTAL: MARYLAND STATE PLANE NAD83
VERTICAL: NAVD88

SHEET LIST

DRAWING NO.	SHEET NO.	DRAWING TITLE
FSD-01	1	TITLE SHEET
FSD-02	2	ENVIRONMENTAL FEATURES MAP - KEY SHEET
FSD-03	3	ENVIRONMENTAL FEATURES MAP
FSD-04	4	ENVIRONMENTAL FEATURES MAP
FSD-05	5	ENVIRONMENTAL FEATURES MAP
FSD-06	6	ENVIRONMENTAL FEATURES MAP
FSD-07	7	ENVIRONMENTAL FEATURES MAP
FSD-08	8	ENVIRONMENTAL FEATURES MAP
FSD-09	9	ENVIRONMENTAL FEATURES MAP

EA Engineering, Science, and Technology, Inc., PBC

225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

www.eaest.com

HORIZONTAL DATUM:
MD STATE PLANE
NAD83

VERTICAL DATUM:
NAVD88

SCALE AS SHOWN

FULL SIZE PLOT: 24" x 36"

REVISIONS

SEAL

02/28/25

THOMAS M. KING
MD DNR QUALIFIED PROFESSIONAL

DATE

225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD
CARROLL COUNTY
MARYLAND

DRAWING TITLE
FOREST STAND DELINEATION
TITLE SHEET

DRAWING INFORMATION

DRAWN BY: SMB/DPA | DESIGNED BY: TK
CHECKED BY: TK | PROJECT MANAGER: MJG
PROJECT NUMBER: 1636201

DRAWING NO.
FSD-01

DATE: FEBRUARY 2025 | SHEET: 1 OF 9

CONCEPT DESIGN PLANS - NOT FOR CONSTRUCTION

FILE PATH: Q:\PROJECTS\1636201 - CORPORATE\PRODUCTION\FIGURES\FOREST STAND DELINEATION\1636201 - FSD - 00.00 - TITLE SHEET.DWG [FSD-01] ALLEN, DANIEL 2/26/2025 12:26 PM



SOILS TABLE

MAP UNIT SYMBOL	MAP UNIT NAME	HSG RATING	K FACTOR (WHOLE SOIL)	DRAINAGE CLASS	PRIME AGRICULTURAL
BaB	BAILE SILT LOAM, 3-8% SLOPES	C/D	.37	POORLY DRAINED	NOT PRIME FARMLAND
BrC	BRINKLOW CHANNERY LOAM, 8-15% SLOPES	C	.20	WELL DRAINED	FARMLAND OF STATEWIDE IMPORTANCE
BrD	BRINKLOW CHANNERY LOAM, 15-25% SLOPES	C	.20	WELL DRAINED	NOT PRIME FARMLAND
BrE	BRINKLOW CHANNERY LOAM, 25-45% SLOPES	C	.20	WELL DRAINED	NOT PRIME FARMLAND
CdA	CODORUS SILT LOAM, 0-3% SLOPES	C	.32	MODERATELY WELL DRAINED	PRIME FARMLAND IF PROTECTED FROM FLOODING
GdB	GLENELG LOAM, 3-8% SLOPES	B	.24	WELL DRAINED	ALL AREAS ARE PRIME FARMLAND
GdC	GLENELG LOAM, 8-15% SLOPES	B	.24	WELL DRAINED	FARMLAND OF STATEWIDE IMPORTANCE
GeB	GLENELG CHANNERY LOAM, 3-8% SLOPES	B	.20	WELL DRAINED	ALL AREAS ARE PRIME FARMLAND
GeC	GLENELG CHANNERY LOAM, 8-15% SLOPES	B	.24	WELL DRAINED	FARMLAND OF STATEWIDE IMPORTANCE
GhB	GLENVILLE SILT LOAM, 3-8% SLOPES	C/D	.37	MODERATELY WELL DRAINED	ALL AREAS ARE PRIME FARMLAND
GhC	GLENVILLE SILT LOAM, SOMEWHAT POORLY DRAINED, 8-15% SLOPES	C/D	.37	SOMEWHAT POORLY DRAINED	FARMLAND OF STATEWIDE IMPORTANCE
HaA	HATBORO SILT LOAM, 0-3% SLOPES	B/D	.43	POORLY DRAINED	NOT PRIME FARMLAND
MaB	MANOR LOAM, 3-8% SLOPES	B	.24	WELL DRAINED	ALL AREAS ARE PRIME FARMLAND
MaC	MANOR LOAM, 8-15% SLOPES	B	.28	WELL DRAINED	FARMLAND OF STATEWIDE IMPORTANCE
MaD	MANOR LOAM, 15-25% SLOPES	B	.28	WELL DRAINED	NOT PRIME FARMLAND
MaF	MANOR LOAM, 25-45% SLOPES	B	.24	WELL DRAINED	NOT PRIME FARMLAND
McF	MANOR-BRINKLOW COMPLEX, 45-65% SLOPES, VERY ROCKY	B	.28	WELL DRAINED	NOT PRIME FARMLAND
UdE	UDORTHENTS, REFUSE, 3-45% SLOPES	-	-	-	NOT PRIME FARMLAND

SPECIMEN TREES

TREE NUMBER	DBH (IN.)	COMMON NAME	SCIENTIFIC NAME	CONDITION	STAND
ST-1	30.7	TULIPTREE	LIRIODENDRON TULIPIFERA	GOOD	3
ST-2	35.5	TULIPTREE	LIRIODENDRON TULIPIFERA	EXCELLENT	3
ST-3	33.6	TULIPTREE	LIRIODENDRON TULIPIFERA	GOOD	3
ST-4	43	TULIPTREE	LIRIODENDRON TULIPIFERA	POOR	3
ST-5	33.5	TULIPTREE	LIRIODENDRON TULIPIFERA	POOR	3
ST-6	34	TULIPTREE	LIRIODENDRON TULIPIFERA	POOR	3
ST-7	46.5	RED MAPLE	ACER RUBRUM	GOOD	1
ST-8	31	RED MAPLE	ACER RUBRUM	GOOD	1
ST-10	31.3	RED MAPLE	ACER RUBRUM	GOOD	1
ST-11	42.8	RED MAPLE	ACER RUBRUM	GOOD	2
ST-12	46	RED MAPLE	ACER RUBRUM	GOOD	2
ST-13	38.5	RED MAPLE	ACER RUBRUM	GOOD	1
ST-14	33.4	BLACK OAK	QUERCUS VELUTINA	EXCELLENT	1
ST-15	60	SYCAMORE	PLATANUS OCCIDENTALIS	GOOD	1
ST-16	33.4	BLACK OAK	QUERCUS VELUTINA	GOOD	2
ST-17	37.5	RED MAPLE	ACER RUBRUM	GOOD	2
ST-19	34	TULIPTREE	LIRIODENDRON TULIPIFERA	EXCELLENT	2
ST-20	32	NORTHERN RED OAK	QUERCUS RUBRA	EXCELLENT	2
ST-21	34.8	NORTHERN RED OAK	QUERCUS RUBRA	EXCELLENT	2
ST-22	38.5	BLACK OAK	QUERCUS VELUTINA	EXCELLENT	2

DESCRIPTION OF FOREST STANDS

STAND	NUMBER OF PLOTS	ACRES IN TRACT	SUCCESSIONAL STAGE	PRIORITY	DOMINANT COVER TYPE
1	3	6.43	EARLY	1	BLACK WALNUT
2	7	66.59	EARLY	1	RED MAPLE-BLACK CHERRY
3	9	99.96	MID	1	OAK/HICKORY
4	5	69.63	MID	1	TULIPTREE

STAND RESOURCES	SIZE WITHIN AREA OF REVIEW
FLOODPLAIN IN AOR BOUNDARY	1,202,573 SQ. FT. (27.61 AC.)
WETLAND IN AOR BOUNDARY	641,593 SQ. FT. (14.73 AC.)
STREAM BUFFER IN AOR BOUNDARY	5,676,082 SQ. FT. (130.30 AC.)
FOREST IN AOR BOUNDARY	10,567,887 SQ. FT. (242.61 AC.)

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HORIZONTAL DATUM:
MD STATE PLANE
NAD83

VERTICAL DATUM:
NAVD88

0 200 400 800
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 24" x 36"

REVISIONS

SEAL

02/28/25
DATE

THOMAS M. KING
MD DNR QUALIFIED PROFESSIONAL

225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD
CARROLL COUNTY
MARYLAND

DRAWING TITLE
FOREST STAND DELINEATION
ENVIRONMENTAL FEATURES
MAP - KEY SHEET

DRAWING INFORMATION

DRAWN BY: SMB/DPA DESIGNED BY: TK

CHECKED BY: TK PROJECT MANAGER: MJG

PROJECT NUMBER: 1636201

DRAWING NO.

FSD-02

DATE: FEBRUARY 2025 SHEET: 2 OF 9

CONCEPT DESIGN PLANS - NOT FOR CONSTRUCTION

FILE PATH: Q:\PROJECTS\1636201 - CORP\CAD\PRODUCTION\FIGURES\FOREST STAND DELINEATION\1636201 - FSD - 01.00 - ENVIRONMENTAL FEATURES MAP - KEY SHEET.DWG | FSD-02 | ALLEN, DANIEL, 2/28/2025 12:06 PM

MATCH LINE - SEE DRAWING FSD-05

MATCH LINE - SEE DRAWING FSD-04

TAX MAP 46, RECONFIGURED PARCEL 1643
TAX ACC. 04-430670
AREA AS SURVEYED
2,349,610 FT²±
53.9396 ACRES

TAX MAP 46, PARCEL 64
TAX ACC. 04-035829
AREA AS SURVEYED
524,615.920 FT²±
12.0397 ACRES

TAX MAP 46, PARCEL 47
TAX ACC. 04-006468
COUNTY COMMISSIONERS OF CARROLL COUNTY

K & P RESOURCE RECOVERY, LLC
TAX MAP 46, RECONFIGURED PARCEL 527
TAX ACC. 04-013031

L. 6511, F. 226

50' R.O.W SUBJECT TO CHANGE WITH FUTURE DEVELOPMENT FOR INGRESS, EGRESS, A PUBLIC UTILITIES. L. 7457, F. 190

WATER RESOURCE PROTECTION EASEMENT L. 6511, F. 226

FOREST CONSERVATION EASEMENT "A" L. 5244, F. 311

FOREST CONSERVATION EASEMENT "B" L. 5244, F. 311

FOREST CONSERVATION EASEMENT "C" L. 5244, F. 311

SHA EASEMENT PLAT NOS. 7315-7311

SHA EASEMENT PLAT NOS. 9040-9042

APPROXIMATE LIMIT OF CELL SW-1 (DIGITIZED FROM RECORDS)

APPROXIMATE LIMIT OF CELL SW-3 (DIGITIZED FROM RECORDS)

APPROXIMATE LIMIT OF RUBBLE CELL R-1 (UNLINED, DIGITIZED FROM RECORDS)

CELL UNDERGROUND STORAGE TANK

STORMWATER MANAGEMENT POND 1

NATURAL WOOD WASTE PROCESSING AREA

HOMEOWNER DROP-OFF RECYCLABLES AREA

HOMEOWNER DROP-OFF WASTE AREA

SCRAP METAL DROP-OFF AND STORAGE AREA

SCALE HOUSE

BLOWER/FLARE STATION

ENTRANCE

WETLAND

DENSE TREES

DENSE VEGETATION

STOCKPILE

DEBRIS

T001 30.7" T. POPLAR
T002 35.5" T. POPLAR
T003 33.6" RED MAPLE
T004 41" T. POPLAR
T005 33.5" T. POPLAR
T006 34" T. POPLAR
T007 31.5" RED MAPLE
T008 31" RED MAPLE
T009
T010
T010 31.3" RED MAPLE
T011 42.8" RED MAPLE
T012
T013 38.5" RED MAPLE
T014
T014 41" BLACK OAK
T015 60" SYCAMORE

ST-01

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VERTICAL DATUM:
NAVD88

0 50 100 200
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 24" x 36"

REVISIONS

SEAL

02/28/25
THOMAS M. KING DATE
MD DNR QUALIFIED PROFESSIONAL

225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD
CARROLL COUNTY
MARYLAND

DRAWING TITLE
FOREST STAND DELINEATION
ENVIRONMENTAL FEATURES MAP

DRAWING INFORMATION

DRAWN BY: SMB/DPA	DESIGNED BY: TK
CHECKED BY: TK	PROJECT MANAGER: MJG

PROJECT NUMBER: 1636201

DRAWING NO.
FSD-03

DATE: FEBRUARY 2025 SHEET: 3 OF 9

CONCEPT DESIGN PLANS - NOT FOR CONSTRUCTION

FILE PATH: Q:\PROJECTS\1636301 - CORP\CAD\PRODUCTION\FIGURES\FOREST STAND DELINEATION\1636301 - FSD - 02.DD - ENVIRONMENTAL FEATURES MAP.DWG [FSD-03] ALLEN, DANIEL 2/28/2025 12:07 PM

MATCH LINE - SEE DRAWING FSD-06

MATCH LINE - SEE DRAWING FSD-03

TAX MAP 47, PARCEL 75
TAX ACC. 04-024664
AREA AS SURVEYED
1,349,806 S.F.
30.9896 ACRES

TAX MAP 46, RECONFIGURED PARCEL 1601
TAX ACC. 04-075051
AREA AS SURVEYED
62,614,419 S.F.
60.0188 ACRES

TAX MAP 47, RECONFIGURED PARCEL 534
TAX ACC. 04-075043
AREA AS SURVEYED
657,617 S.F.
15.1014 ACRES

TAX MAP 53, RECONFIGURED PARCEL 1003
TAX ACC. 04-073535
AREA AS SURVEYED
1,084,899 S.F.
24.9039 ACRES

K & P RESOURCE RECOVERY, LLC
TAX MAP 46, RECONFIGURED PARCEL 73
TAX ACC. 04-026648
AREA AS SURVEYED
275,284 FT²
6.3196 ACRES

T017 37.5" RED MAPLE

T016 33.4" BLACK OAK

TRANSFER STATION

EASEMENT FOR CONSTRUCTION AND MAINTENANCE OF ELECTRIC UTILITIES AND APPURTENANCES
L. 781 F. 175

S.W.M. EASEMENT PLAT NOS. 9040-9042

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NAD83

VERTICAL DATUM:
NAVD88

0 50 100 200
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 24" x 36"

REVISIONS

SEAL

02/28/25

THOMAS M. KING — DATE
MD DNR QUALIFIED PROFESSIONAL

225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD
CARROLL COUNTY
MARYLAND

DRAWING TITLE
FOREST STAND DELINEATION ENVIRONMENTAL FEATURES MAP

DRAWING INFORMATION

DRAWN BY: SMB/DPA — DESIGNED BY: TK
CHECKED BY: TK — PROJECT MANAGER: MJG
PROJECT NUMBER: 1636201

DRAWING NO.

FSD-04

DATE: FEBRUARY 2025 — SHEET: 4 OF 9

CONCEPT DESIGN PLANS - NOT FOR CONSTRUCTION

FILE PATH: Q:\PROJECTS\1636001 - CCRRP\CAD\PRODUCTION\FIGURES\FOREST STAND DELINEATION\1636001 - FSD - 02.DI - ENVIRONMENTAL FEATURES MAP.DWG [FSD-04] ALLEN, DANIEL 2/26/2025 12:07 PM

MATCH LINE - SEE DRAWING FSD-07

MATCH LINE - SEE DRAWING FSD-03

MATCH LINE - SEE DRAWING FSD-06

BARBARA A. NELSON, SHIRLEY L. BARRICK & KATHERINE F. SHAW
TAX MAP 46, PARCEL 597
TAX ACC. 04-008606
LIBER 4883, FOLIO 603
ESC AT LIBER 94, FOLIO 377

FORESTED WATER RESOURCE PROTECTION EASEMENT L. 6364, F. 467

WATER RESOURCE PROTECTION EASEMENT L. 6811, F. 226

WETLAND

2302
648.77
HDWL52 CL

2300
650.67 ST

2281
2283 91.12
691.86 HWL51 ST
HDWL51

2276 92.08
693.55 WL50 ST
HDWL50 CL

2326
744.26
GUY

2249
772.47
GUY

1338
760.40
HDWL33 CL
HDWL33

1336
759.98
HDWL33 ST

1326 1323
780.30 30.74
HGWL

226
773
CL END SECTION INV OUT

1380 1378 1382
744.02 8.09 37.7
WEIR 2 INLET
INLET HWL37
INLET 1 31 740.04
HL 37 ST

T007 40.0" RED MAPLE
T007

T019 34.7" POPLAR

STOCKPILE

WETLAND

HORIZONTAL DATUM:
MD STATE PLANE
NAD83

VERTICAL DATUM:
NAVD88

0 50 100 200
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 24" x 36"

REVISIONS

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02/28/25

THOMAS M. KING
MD DNR QUALIFIED PROFESSIONAL
DATE

225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD
CARROLL COUNTY
MARYLAND

DRAWING TITLE
FOREST STAND DELINEATION
ENVIRONMENTAL FEATURES MAP

DRAWING INFORMATION

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CHECKED BY: TK PROJECT MANAGER: MJG
PROJECT NUMBER: 1636201

DRAWING NO.

FSD-05

DATE: FEBRUARY 2025 SHEET: 5 OF 9

CONCEPT DESIGN PLANS - NOT FOR CONSTRUCTION

FILE PATH: Q:\PROJECTS\1636301 - CORP\CAD\PRODUCTION\FIGURES\FOREST STAND DELINEATION\1636301 - FSD - 02.00 - ENVIRONMENTAL FEATURES MAP.DWG [FSD-05] ALLEN, DANIEL, 2/28/2025 12:07 PM

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MATCH LINE - SEE DRAWING FSD-07

MATCH LINE - SEE DRAWING FSD-08

MATCH LINE - SEE DRAWING FSD-05

MATCH LINE - SEE DRAWING FSD-04

JAMES E. GRAVES & TAMMY J. GRAVES
TAX MAP 47, PARCEL 539
TAX ACC. 04-077407
LIBER 8624, FOLIO 356

TAX MAP 47, PARCEL 539
TAX ACC. 04-077407
LIBER 8624, FOLIO 356

RICHARD J. DREER & LINDA L. NOLAN
TAX MAP 47, PARCEL 49
TAX ACC. 04-006879
LIBER 2256, FOLIO 522

PAUL D. RILL
TAX MAP 47, PARCEL 52
TAX ACC. 04-015606
LIBER 10405, FOLIO 119
DEDIC 41
LIBER 826, FOLIO 944

T022
T022 38.5" BLACK OAK

OLD STRUCTURE

APPROXIMATE LIMIT OF RUBBLE CELL R-2 (UNLINED, DIGITIZED FROM RECORDS)

2269 787.03 GUY
2253 788.15 GUY
2266 768.95 GUY
2252 790.24 GUY
2249 772.47 GUY
2234 808.87 GUY
2221 775.83 GRATE
2223 775.83 GRATE
2224 775.81 GRATE
2189 749.76 HDWL11 CL
2203 754.21
2193

24" HDPE INV: 778.86
24" HDPE INV: 779.36
24" CMP INV: 766.31
18" CMP INV: 769.80
18" CMP INV: 769.30
24" RCP INV: 771.26
24" RCP INV: 771.76
24" RCP INV: 778.91
(E) 36" RCP INV: 747.12
(W) 36" RCP INV: 758.05
BOTTOM STRUC: 744.12

W.L. 672.94
W.L. 677.34
W.L. 714.02

STOCKPILE
DENSE TREES
DENSE VEGETATION
ELECTRIC LINE

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NAD83

VERTICAL DATUM:
NAVD88

0 50 100 200
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 24" x 36"

REVISIONS

SEAL

02/28/25
DATE

THOMAS M. KING
MD DNR QUALIFIED PROFESSIONAL

225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD
CARROLL COUNTY
MARYLAND

DRAWING TITLE
FOREST STAND DELINEATION
ENVIRONMENTAL FEATURES MAP

DRAWING INFORMATION

DRAWN BY: SMB/DPA DESIGNED BY: TK

CHECKED BY: TK PROJECT MANAGER: MJG

PROJECT NUMBER: 1636201

DRAWING NO.

FSD-06

DATE: FEBRUARY 2025 SHEET: 6 OF 9

CONCEPT DESIGN PLANS - NOT FOR CONSTRUCTION

FILE PATH: Q:\PROJECTS\1636201 - CCSWP\CADPRODUCTION\FIGURES\FOREST STAND DELINEATION\1636201 - FSD - 02.05 - ENVIRONMENTAL FEATURES MAP.DWG [FSD-06] ALLEN, DANIEL 2/26/2025 12:08 PM



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HORIZONTAL DATUM:
MD STATE PLANE
NAD83

VERTICAL DATUM:
NAVD88

0 50 100 200
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 24" x 36"

REVISIONS

SEAL

02/28/25
THOMAS M. KING DATE
MD DNR QUALIFIED PROFESSIONAL

225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD
CARROLL COUNTY
MARYLAND

DRAWING TITLE
FOREST STAND DELINEATION ENVIRONMENTAL FEATURES MAP

DRAWING INFORMATION

DRAWN BY: SMB/DPA DESIGNED BY: TK
CHECKED BY: TK PROJECT MANAGER: MJG
PROJECT NUMBER: 1636201

DRAWING NO.

FSD-07

DATE: FEBRUARY 2025 SHEET: 7 OF 9

CONCEPT DESIGN PLANS - NOT FOR CONSTRUCTION

MATCH LINE - SEE DRAWING FSD-09

MATCH LINE - SEE DRAWING FSD-07

MATCH LINE - SEE DRAWING FSD-06

RELOCATED FOREST CONSERVATION EASEMENT L. 5554, F. 362

WARREN T. FERGUSON & EVELYN. FERGUSON
TAX MAP 47, PARCEL 380
TAX ACC. 04-036454
LIBER 834, FOLIO 282

H. EUGENE PARRY & KAREN L. PARRY
TAX MAP 47, PARCEL 55
TAX ACC. 04-010022
LIBER 834, FOLIO 240

MDSHA
L. 159, F. 141

66' MARYLAND MIDLAND R.O.W.

BARBARA ANNE NELSON,
SHIRLEY LOUISE BARRICK,
THOMAS E. FISHER,
KATHERINE ESTELLE MOWERS &
LINDA MARIE FRITZ FISHER
TAX MAP 47, PARCEL 300
TAX ACC. 04-002251
LIBER 805, FOLIO 787
DESC. AT LIBER 92, FOLIO 67

MICHAEL S. CAPUT
TAX MAP 47, PARCEL 489
TAX ACC. 04-063619
LIBER 5562, FOLIO 483

H. JEREMY BENJAMIN SALLOW
& JENNIFER E. SALLOW
TAX MAP 47, PARCEL 488
TAX ACC. 04-063627
LIBER 8004, FOLIO 395

CRAIG S. WILLIAMS &
LUANITA R. WILLIAMS
TAX MAP 47, PARCEL538
TAX ACC. 04-077393
LIBER 8772, FOLIO 387

50' INGRESS & EGRESS
TO REMAINING PORTION
IN PLAT BOOK 48, PAGE 111
ALSO IN LIBER 2805, FOLIO 503,
LIBER 2805, FOLIO 509 &
30' IN LIBER 3067, FOLIO 240

30' R.O.W.
LIBER 3067, FOLIO 240

JAMES E. GRAVES &
TAMMY J. GRAVES
TAX MAP 47, PARCEL 539
TAX ACC. 04-077407

TAX MAP 47, PARCEL 539
TAX ACC. 04-077407
LIBER 8024, FOLIO 356

WETLAND

DENSE VEGETATION

DENSE TREES

WEST BRANCH NORTH BRANCH PATAPSCO RIVER

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NAD83

VERTICAL DATUM:
NAVD88

0 50 100 200
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 24" x 36"

REVISIONS

SEAL

02/28/25

THOMAS M. KING — DATE
MD DNR QUALIFIED PROFESSIONAL

225 SCHILLING CIRCLE, SUITE 400
HUNT VALLEY, MARYLAND 21031

PROJECT NAME
CARROLL COUNTY RESOURCE RECOVERY PARK AND NORTHERN LANDFILL EXPANSION

PROJECT ADDRESS
BALTIMORE BOULEVARD
CARROLL COUNTY
MARYLAND

DRAWING TITLE
FOREST STAND DELINEATION ENVIRONMENTAL FEATURES MAP

DRAWING INFORMATION

DRAWN BY: SMB/DPA — DESIGNED BY: TK
CHECKED BY: TK — PROJECT MANAGER: MJG

PROJECT NUMBER: 1636201

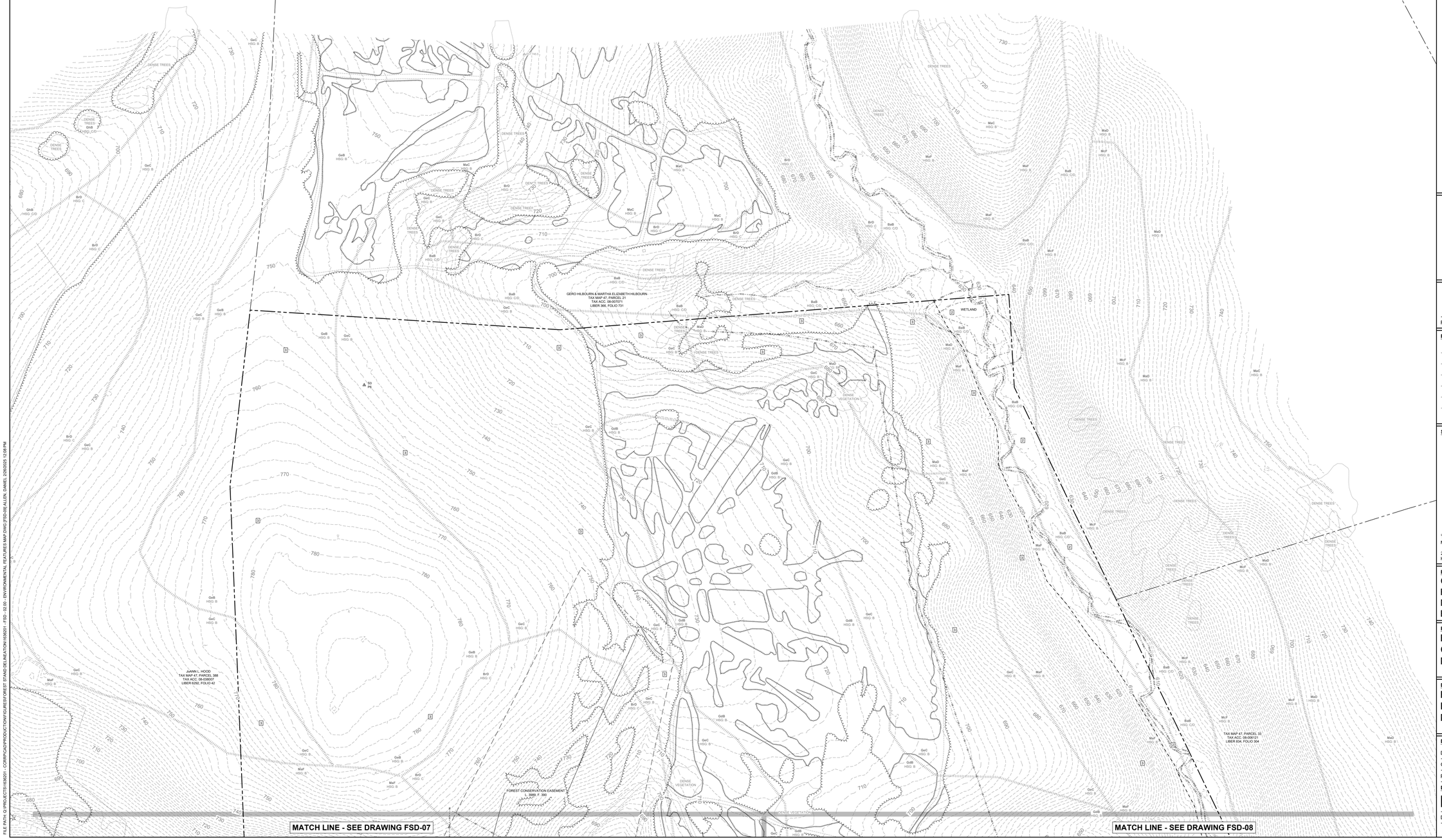
DRAWING NO.

FSD-08

DATE: FEBRUARY 2025 — SHEET: 8 OF 9

CONCEPT DESIGN PLANS - NOT FOR CONSTRUCTION

FILE PATH: O:\PROJECTS\1636201 - CCSWP\CADD\PRODUCTION\FIGURES\FOREST STAND DELINEATION\1636201 - FSD - 02.DGN - ENVIRONMENTAL FEATURES MAP.DWG [FSD-08] ALLEN, DANIEL 2/26/2025 12:08 PM



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0 50 100 200
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 24" x 36"

REVISIONS

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MD DNR QUALIFIED PROFESSIONAL

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CARROLL COUNTY
MARYLAND

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ENVIRONMENTAL FEATURES MAP

DRAWING INFORMATION

DRAWN BY: SMB/DPA DESIGNED BY: TK

CHECKED BY: TK PROJECT MANAGER: MJG

PROJECT NUMBER: 1636201

DRAWING NO.

FSD-09

DATE: FEBRUARY 2025 SHEET: 9 OF 9

CONCEPT DESIGN PLANS - NOT FOR CONSTRUCTION

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Appendix C

Adjacent Property Owner Information

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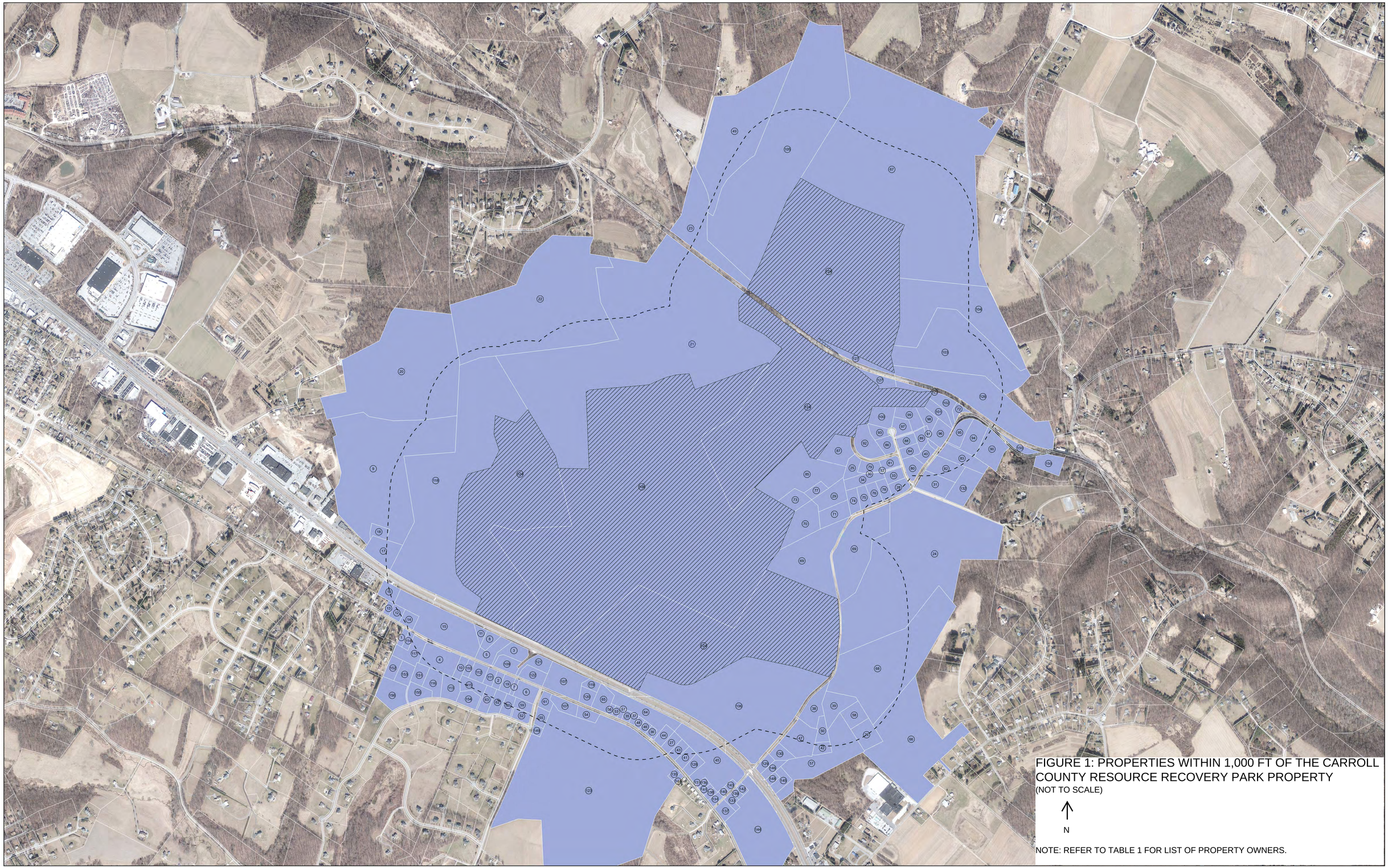


FIGURE 1: PROPERTIES WITHIN 1,000 FT OF THE CARROLL COUNTY RESOURCE RECOVERY PARK PROPERTY
(NOT TO SCALE)

N

NOTE: REFER TO TABLE 1 FOR LIST OF PROPERTY OWNERS.

TABLE 1: PROPERTY OWNERS WITHIN 1,000 FT

PROPERTY IDENTIFIER	OWNER NAME 1	OWNER NAME 2	STREET ADDRESS	CITY	STATE	ZIP CODE
1	FORTNA SAMUEL L	WEI JIAHUAN	1245 OLD WESTMINSTER PK	WESTMINSTER	MD	21157
2	VAN HOOSE RICHARD LEE JR	VAN HOOSE SANDRA DIANE	1335 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
3	RYAN STEVEN M	RYAN MARIETTE L	1324 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
4	CLEARFIELD BIBLE CHURCH OF GOD		1303 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
5	CAROPRESO MARK	CAROPRESO ANDREE	1320 OLD WESTMINSTER RD	WESTMINSTER	MD	21157
6	HOOK CHARLES W	HOOK JAMES R	1405 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
7	GRIFFIN SHANAE		1401 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
8	LAPP CHARLES ALLAN	LAPP RACHEL LEE	1316 WESTMINSTER PIKE	WESTMINSTER	MD	21157
9	ZENTZ MARY J DRECHSLER TRT	DRECHSLER VICTOR E TRT ETAL	3238 MURRAY RD	FINKSBURG	MD	21048
10	HOLLAND RICHARD C		1311 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
11	HOBBS SHEILA ANN	HOBBS BRIAN WADE	1331 BALTIMORE BLVD	WESTMINSTER	MD	21157
12	KABLE SHARON L SPENCER	KABLE PHILIP THOMAS	1210 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
13	KABLE PHILIP T	SPENCER-KABLE SHARON L	1202 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
14	DRECHSLER WALTER WALKER JR	DRECHSLER TRUDY ANN	1218 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
15	DRECHSLER CLOTILDE C		1190 BALTIMORE BLVD	WESTMINSTER	MD	21157
16	GJR LLC		9114 PHILADELPHIA RD STE 308	BALTIMORE	MD	21237
17	PS ATLANTIC COAST 2021B LLC		701 WESTERN AVE; ATTN: JIM WEBER	GLENDALE	CA	91021
18	DRECHSLER VICTOR EDWARD	DRECHSLER ANNE STEWART	1190 BALTIMORE BLVD	WESTMINSTER	MD	21157
19	SEIDLICH WILLIAM WAYNE	SEIDLICH SALLY ANN	1345 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
20	HEMLOCK GROUP LLC		4321 BARTHOLOW RD	SYKESVILLE	MD	21784
21	NELSON BARBARA A	BARRICK SHIRLEY L ETAL	C/O KATHERINE F SHAW; 425 CLEAR RIDGE RD	UNION BRIDGE	MD	21791
22	NELSON BARBARA A	BARRICK SHIRLEY L ETAL	C/O KATHERINE F SHAW; 425 CLEAR RIDGE RD	UNION BRIDGE	MD	21791
23	MAY CINDY R	WEST DON H	139 N GORSUCH RD	WESTMINSTER	MD	21157
24	RILL PAUL DAVID		218 DUTROW RD	WESTMINSTER	MD	21157
25	WILSON JOSEPH A	WILSON KUM S	2052 KIMJO DR	WESTMINSTER	MD	21157
26	PERRY JAMES M III	ENSOR MARY HELEN	1045 DYLAN DR	WESTMINSTER	MD	21157
27	LAPP MEGAN M	LAPP JORDAN A	1558 OLD WESTMINSTER PK	WESTMINSTER	MD	21157
28	STEWART TROY D	STEWART ERICA M	790 NADINES CT	WESTMINSTER	MD	21157
29	HALL STEPHEN G	POPOWICH JILL P	2022 REESE RD	WESTMINSTER	MD	21157
30	COUNTY COMMISSIONERS OF CC		225 N CENTER ST	WESTMINSTER	MD	21157
31	MARTIN JAMES V	PARKS MELISSA S	725 THOROBRED KNOLL DR	WESTMINSTER	MD	21157
32	COUNTY COMMISSIONERS OF CC		225 N CENTER ST	WESTMINSTER	MD	21157
33	BURGOS FRANCISCO JR	BURGOS CHRYSSA BENDER	788 NADINES CT	WESTMINSTER	MD	21157
34	WHITE MAURICE L JR	BURNETT WHITE LATEISHA S	2053 KIMJO DR	WESTMINSTER	MD	21157
35	ESWORTHY LEE M SR	ESWORTHY LINDA L	1532 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
36	METZBOWER CONNOR E	FERGUSON JOLIE L	1542 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
37	POOL ROY		1545B OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
38	PRIOR CHRISTOPHER	PRIOR LINAYA	1800 EVELYN DR	WESTMINSTER	MD	21157
39	MARFIAK CHRISTINE SHIPLEY		2110 WARREN WAY DR	WESTMINSTER	MD	21157
40	FESMIRE ERIK CRAIG	FESMIRE AMY	2078 REESE RD	WESTMINSTER	MD	21157
41	LAPP SHERIA A	LAPP JEFFERY A	1610 WESTMINSTER PK	WESTMINSTER	MD	21157

42	HERGET KELLY RAE	HERGET THOMAS NORMAN	1818 EVELYNS DR	WESTMINSTER	MD	21157
43	KESTER ROSEMARIE ANN	GIBBS BILLY R	1600 OLD WESTMINSTER PK	WESTMINSTER	MD	21157
44	FOLEY NICOLE C	FOLEY RYAN T	1554 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
45	REESE VOLUNTEER FIRE COMPANY		1745 BALTIMORE BLVD	WESTMINSTER	MD	21157
46	WHITE CATHERINE EILEEN ETAL		52 RIDGE ROAD	WESTMINSTER	MD	21157
47	SMITH BRIAN PAUL	SMITH HEATHER ANN	1807 REESE ROAD	WESTMINSTER	MD	21157
48	LIPPY DONNA LEE		1536 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
49	HANLEY KIMBERLY HUGHES	SMITH VALERIE HUGHES ETAL	6030 DAYBREAK CIR A150	CLARKSVILLE	MD	21029
50	FAITH MARGARET M		1810 EVELYNS DR	WESTMINSTER	MD	21157
51	REGESTER PATRICK G		1522 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
52	LEE GREGORY K TRUSTEE	LEE CAROL A TRUSTEE	10205 WESLEIGH DR	COLUMBIA	MD	21046
53	MARKLINE RONALD L	MARKLINE BEVERLY A	1518 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
54	POOL ROY D		1545 B OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
55	JORDAN LINDA		1431 ARNOLD RD	WESTMINSTER	MD	21157
56	DONOVAN ELIZABETH L		1514 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
57	PERRY JAMES M III	PERRY MARY	1045 DYLAN DR	WESTMINSTER	MD	21157
58	PERRY JAMES M JR	PERRY JAMES M III	1045 DYLAN DR	WESTMINSTER	MD	21157
59	SCHEFFEL NICHOLAS A	SCHEFFEL SARAH E	1292 CAMBRIA RD	WESTMINSTER	MD	21157
60	LEMON ROBERT P	LEMON CARLEEN J	1288 CAMBRIA RD	WESTMINSTER	MD	21157
61	ROBERTS JOSHUA	ROBERTS RHIANNA	1441 ARNOLD RD	WESTMINSTER	MD	21157
62	FENG EUGENE YUE		1284 CAMBRIA ROAD	WESTMINSTER	MD	21157
63	GERVIE ROBERT B		1280 CAMBRIA RD	WESTMINSTER	MD	21157
64	PLAYTIME CORPORATION		541 W 27TH ST	BALTIMORE	MD	21211
65	POOL REESE ROBIN	REESE THOMAS LEE	1510 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
66	MUSE DEBORAH A		2058 BETHEL RD	FINKSBURG	MD	21048
67	HILBOURN GERO	HILBOURN MARTHA E	112 DUTROW RD	WESTMINSTER	MD	21157
68	RILL PAUL DAVID		218 DUTROW RD	WESTMINSTER	MD	21157
69	RILL PAUL D		218 DUTROW RD	WESTMINSTER	MD	21157
70	KNOTT WILLIAM T III	KNOTT MONICA MARIE	2002 REESE RD	WESTMINSTER	MD	21157
71	HALLER JOHN S	HALLER TAMMY L	2020 REESE RD	WESTMINSTER	MD	21157
72	GRIFFIN CHRISTOPHER B	GRIFFIN GLENN T	2128 REESE RD	WESTMINSTER	MD	21157
73	SCHMIDT JOHN F		2004 REESE RD	WESTMINSTER	MD	21157
74	REISLER PAUL M	REISLER TAMMY L	2024 REESE RD	WESTMINSTER	MD	21157
75	PERI JOSEPH S	VARNER STACEY L	2026 REESE RD	WESTMINSTER	MD	21157
76	LORD CINDY A	LORD ROBERT E	2028 REESE RD	WESTMINSTER	MD	21157
77	UNITED STATES SECRETARY OF HOUSING		451 SEVENTH ST SW	WASHINGTON	DC	20410
78	SHAFER TIMOTHY BYRON	METER CHARLES VAN	2030 REESE RD	WESTMINSTER	MD	21157
79	EDELEN CHARLES S	EDELEN JILLIAN A	2054 KIMJO DR	WESTMINSTER	MD	21157
80	JONES MATTHEW L	JONES MAXINE J	787 NADINES CT	WESTMINSTER	MD	21157
81	STARK CHRISTOPHER N	STARK VICTORIA S	786 NADINES CT	WESTMINSTER	MD	21157
82	WEST FRED M	WEST NORMA E HANDY	2085 REESE RD	WESTMINSTER	MD	21157
83	MCQUEEN KRISTOPHER	MCQUEEN AMANDA W	2089 REESE RD	WESTMINSTER	MD	21157
84	VITAGLIANO DAVID H	VITAGLIANO MARY JO J	785 NADINES CT	WESTMINSTER	MD	21157
85	DREER RICHARD J	NOLAN LINDA L	2000 REESE RD	WESTMINSTER	MD	21157

86	VITO CLINT C		780 NADINES CT	WESTMINSTER	MD	21157
87	GRAVES JAMES E	GRAVES TAMMY J	784 NADINES CT	WESTMINSTER	MD	21157
88	LLOYD ROBERT D	LLOYD MICHELLE L	783 NADINES CT	WESTMINSTER	MD	21157
89	STOHRER KAREN		2095 LAVINDA DR	WESTMINSTER	MD	21157
90	GRUSS JOSEPH F	GRUSS DOMINICA A	2161 REESE ROAD	WESTMINSTER	MD	21157
91	COUNTY COMMISSIONERS OF CC		225 N CENTER ST	WESTMINSTER	MD	21157
92	WILLIAMS CRAIG S SR	WILLIAMS LUANITIA R	782 NADINES CT	WESTMINSTER	MD	21157
93	MORSBERGER SCOTT D	MORSBERGER LINDSAY E	778 NADINES COURT	WESTMINSTER	MD	21157
94	MUSTAPHA OLUSOLA	MUSTAPHA NICOLA	2095 REESE RD	WESTMINSTER	MD	21157
95	MAR-JA LIMITED		16221 TRENTON ROAD	UPPERCO	MD	21155
96	LANGAN JASON	LANGAN KELSEY	2100 REESE ROAD	WESTMINSTER	MD	21157
97	CAIN AARON SR	GRAY CAIN SHONDA	775 NADINES CT	WESTMINSTER	MD	21157
98	DODGE JAMES ANDREW	DODGE LYNN ELAINE	2098 LAVINDA DR	WESTMINSTER	MD	21157
99	WALKER MAURICE DEJUAN	WALKER KIMBERLY NICOLE	2096 LAVINDA DR	WESTMINSTER	MD	21157
100	PFEIFER MEGHAN ANN	PFEIFER JOSEPH W III	776 NADINES CT	WESTMINSTER	MD	21157
101	SALLOW H JEREMY BENJAMIN	SALLOW JENNIFER E	2114 REESE RD	WESTMINSTER	MD	21157
102	CAPUT MICHAEL S		2120 REESE RD	WESTMINSTER	MD	21157
103	FERGUSON WARREN T	FERGUSON EVE R	2025 MORNING VIEW DR	WESTMINSTER	MD	21157
104	ROBERSON DAVID L	ROBERSON SUSAN A	2020 MORNING VIEW DR	WESTMINSTER	MD	21157
105	HOOD JOANN L		143 N GORSUCH RD	WESTMINSTER	MD	21157
106	KENNELL WALTER H		6200 CANDLE CT	SYKESVILLE	MD	21784
107	MASKOWITZ JOEL		5236 JEFFERSON PIKE	FREDERICK	MD	21703
108	COUNTY COMMISSIONERS OF CC		225 N CENTER ST	WESTMINSTER	MD	21157
109	BROOKS MATTHEW THOMAS		1326 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
110	DELLOSPEDALE MICHAEL L	DELLOSPEDALE MARJORY D	1317 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
111	CREDLE MALIK R	IACOVINO LILLIAN R	1329 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
112	GREEN WALTER A	GREEN KELLY ANN	1321 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
113	OWENS KARL	OWENS BRIDGET	1270 CAMBRIA RD	WESTMINSTER	MD	21157
114	YANCICH DAVID MATTHEW II	BROWN PATRICIA	1251 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
115	LADIC AUSTIN C	LADIC EUGENIE C	1278 CAMBRIA RD	WESTMINSTER	MD	21157
116	KOONS JOSEPH ZECK	KOONS TRICIA R	1264 CAMBRIA RD	WESTMINSTER	MD	21157
117	MILLER RYAN LEE	MILLER PAMELA LEATHA	1255 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
118	KENNELL JULIE		6200 CANDLE CT	SYKESVILLE	MD	21784
119	BARRICK WILLIAM S	BARRICK SHIRLEY F	2731 PATAPSCO RD	FINKSBURG	MD	21048
120	FISHER THOMAS J JR	FISHER STEPHANIE A	1444 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
121	GALLAGHER RENEE CROWL		1693 MALIBU CT	HAMPSTEAD	MD	21074
122	HUTCHINS PATRICK S JR	HUTCHINS AUTUMN R	1402 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
123	POOL ROY D		1545 B OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
124	COUNTY COMMISSIONERS OF	CARROLL COUNTY	225 N CENTER ST	WESTMINSTER	MD	21157
125	PARRY H EUGENE	PARRY KAREN L	2208 CARROLLTON ROAD	WESTMINSTER	MD	21157
126	PARRY H EUGENE	PARRY KAREN L	2208 CARROLLTON ROAD	WESTMINSTER	MD	21157
127	BARRICK SHIRLEY L	SHAW KATHERINE F ETAL	2731 PATAPSCO RD	FINKSBURG	MD	21048
128	RICHMOND MICHAEL D	RICHMOND JENNIFER L	1620 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
129	MADAR LOUIS S III		1732 BALTIMORE BLVD	WESTMINSTER	MD	21157

130	BAUERLINE LESLIE		1805 REESE RD	WESTMINSTER	MD	21157
131	ROBEY GARY LOREN		1634 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
132	WOOLFORD JENNIFER		735 THOROBRED KNOLL DR	WESTMINSTER	MD	21157
133	TEGGES NICHOLAS N	GEYER JESSICA N	1715 REESE RD	WESTMINSTER	MD	21157
134	WALTER ANTHONY T		1648 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
135	VELEZ JOSE E		1621 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
136	THORN PHILLIP C		1638 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
137	REESE VOLUNTEER FIRE CO		1745 BALTIMORE BLVD	WESTMINSTER	MD	21157
138	STEWART DAVID P	BURTON TOBIE	1644 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
139	DMEZA DAYANERIS	KING RICHARD	1723 REESE RD	WESTMINSTER	MD	21157
140	CAPERTON BRETT	CAPERTON MELISSA A	1718 REESE RD	WESTMINSTER	MD	21157
141	STEWART DAVID P	BURTON TOBIE	1642 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
142	REESE & COMMUNITY	VOLUNTEER FIRE CO	1745 BALTIMORE BLVD	WESTMINSTER	MD	21157
143	CAPERTON BRETT	CAPERTON MELISSA A	1718 REESE RD	WESTMINSTER	MD	21157
144	REESE COMMUNITY FIRE CO		1745 BALTIMORE BLVD	WESTMINSTER	MD	21157
145	SHAUCK DONALD JARRETT	SHAUCK JUNE FISHER	1744 BALTIMORE BLVD	WESTMINSTER	MD	21157
146	WHITMORE LU RAY MARIE		1736 BALTIMORE BLVD	WESTMINSTER	MD	21157
147	PIPER CRAIG W	PIPER KIMBERLY A	1623 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
148	SHAUCK JUNE F	SHAUCK DONALD JARRETT	1744 BALTIMORE BLVD	WESTMINSTER	MD	21157
149	COALE CHARLES W	COALE AUSTIN C	1419 ARNOLD RD	WESTMINSTER	MD	21157
150	MOSES DON W SR	MOSES DORIS V	2184 REESE RD	WESTMINSTER	MD	21157
151	KOON ROBERT P JR	KOON STEPHANIE M	900 DARRIAN DR	WESTMINSTER	MD	21157
152	GALLAGHER CECELIA	GALLAGHER EAMON	1253 OLD WESTMINSTER PIKE	WESTMINSTER	MD	21157
153	STETLER GEOFFREY M	STETLER KATRINA M	901 DARRIAN DR	WESTMINSTER	MD	21157
154	HEPLER NATHANIEL E	HEPLER DAYNA K	1276 CAMBRIA RD	WESTMINSTER	MD	21157
155	BURGER JOHN M	BURGER MARY R	1260 CAMBRIA RD	WESTMINSTER	MD	21157
156	EDWARDS STEWART	EDWARDS ANN	1256 CAMBRIA RD	WESTMINSTER	MD	21157

Appendix D

Northern Sanitary Landfill Geologic Report (Century Engineering)

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CARROLL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS

NORTHERN SANITARY LANDFILL
GEOLOGIC REPORT

RECEIVED

JUN 1 1984

MUNICIPAL WASTE
DIVISION

PREPARED BY:

CENTURY ENGINEERING, INC.
CONSULTING ENGINEERS - PLANNERS
TOWSON, MARYLAND 21204

NOVEMBER 1983
(REVISED MAY 1984)

RECEIVED

JUN 29 1984

CARROLL SOIL
CONSERVATION DISTRICT

CENTURY ENGINEERING, INC. CONSULTING ENGINEERS • PLANNERS

May 30, 1984

Mr. James J. Pittman, III
Head, Public Facilities Section
Waste Management Administration
Office of Environmental Programs
Department of Health & Mental Hygiene
201 West Preston Street
Baltimore, Maryland 21201

Reference: Carroll County, Maryland
Northern Sanitary Landfill
Geologic Report
CEI Contract No. 81-3181

Dear Mr. Pittman:

Attached are eight copies of the final Northern Sanitary Landfill Geologic Report for your review and approval. This report has been revised in accordance with the list of comments formulated by the Department of Health and Mental Hygiene and transmitted in their letters of December 23, 1983 and January 30, 1984. Responses to each comment are as follows:

1. The groundwater contour map, Drawing 12 of 15, Piezometric Contour Map has been revised to reflect additional groundwater level data. At the time the initial report was submitted, water levels in observation and monitoring wells which encountered groundwater at relatively great depths were apparently not in equilibrium. The additional data gathered from December, 1983 through May, 1984 resulted in several significantly higher groundwater levels yielding more uniform piezometric surface contours.

2. The direction of groundwater flow has been shown on Drawings 4 through 7, Geologic Profiles. In addition, groundwater seepage directions are shown on Drawing 13 of 15, Fence Diagram.

3. The Isopach Map, Drawing 8 of 15, has been revised to be consistent with the drilling logs, Drawing 9 of 15, Auger Refusal Contours, and Drawing 12 of 15, Piezometric Contour Map.

4. Potential paths of pollutants are vertical through unsaturated material beneath the landfill area until interception of the groundwater table. At this point, pollutants, if they occur, will follow the direction of the groundwater movement as defined in the revised report.

32 WEST ROAD | TOWSON, MARYLAND 21204 | 301 823-8070 | TELEX 8-7491

5. The grain size distribution curves have been included in APPENDIX F, Results of Laboratory Tests.

6. Well Completion Reports for domestic wells surrounding the site were requested of the Maryland Water Resources Administration. The information received consisted of well data summaries which are contained in APPENDIX G and several well completion forms, none of which are located within the area defined on Drawing 14 of 15. The available published well records contain very few wells installed prior to approximately 1940.

7. The methodology of fracture trace analysis is explained in Section 3 of the report. All known fracture traces have been reported.

8. Each drawing has been designed and/or checked by a qualified professional engineer with education and experience in earth sciences including geology, groundwater hydrology and geotechnical engineering.

9. Well Completion Reports for wells installed during the field investigation are contained in APPENDIX B. The completion form for OWD-33 was not available from the driller. All wells have been developed.

10. The letter designation of basins has been deleted. Landfill operations in the area below elevation 760 in the vicinity of OWD 12, 13, 15 and 17A will be avoided in the final design.

11. The landfill area in the northeast corner of the site has been investigated with additional test holes and monitoring wells which are included in this revision.

12. The concerns of the Water Resources Administration are addressed as follows:

    a. Protection of Non-Tidal Wetlands - Actual construction and disturbance of existing vegetative cover will take place in the ridge areas of the site and should not affect potential upland wetlands. Sedimentation from the disturbed areas will be controlled by standard sediment control measures and settling ponds to be incorporated in the final design. Leachate will be controlled by impervious cell liners and a leacheate collection system.

    b. Well Records - Review of all published sources (References 6 and 7 of the Report) and supplemental data supplied by WRA indicate that 17 existing wells and 2 springs are located in the area surrounding the site shown on Drawing 14 of 15. The available records are included in APPENDIX G.

May 30, 1984

Department of Health & Mental Hygiene/James J. Pittman

Re: Carroll County, Maryland
Northern Sanitary Landfill Geologic Report
CEI Contract No. 81-3181

c. Encroachment of 100 Year Flood Plain - According to the letter of January 27, 1984, WRA has indicated that landfill activities will not encroach on the flood plain.

We would be happy to provide assistance during the final review. If you have any questions please do not hesitate to call.

Very truly yours,

CENTURY ENGINEERING, INC.

James P. Krawczyk
Director
Environmental Sciences Division

Thomas J. Moynahan
Chief Geotechnical Engineer

JPK/TJM/mfm

Enclosures

cc: Mr. John T. Sterling, Jr.
Mr. Andrew Daneker

CARROLL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
NORTHERN SANITARY LANDFILL
GEOLOGIC REPORT

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SECTION 1
REQUIREMENTS

General

This report has been prepared in accordance with the requirements of

10.17.11 Installation and Operation of
Systems of Refuse Disposal for Public Use
Authority: Health-Environmental Article 9-204 and 9-210
Annotated Code of Maryland

Effective Date: July 25, 1980

This submission consists of an 8-1/2" x 11" report and fifteen (15) 24" x 36" drawings and is intended to fulfill the requirements for a geologic report as outlined by the State of Maryland Department of Health and Mental Hygiene. Additional information considered relevant to the landfill design has been included.

Requirements

The applicant shall prepare and submit to the approving authority eight copies of a report describing the soils, geology and hydrology of the proposed site. The report shall contain:

(A) A site specific topography map using a contour interval which is practical for that site. Streams and natural drainage features shall be shown. The map scale shall be between 1 inch = 40 feet and 1 inch = 200 feet.

(B) A discussion of the geologic formations directly involved, the present and projected use of these formations as a groundwater source, and their relationship to underlying formations.

(C) Groundwater contour maps and geologic cross sections to show the direction of groundwater flow under the site.

(D) A rock contour map (except in the coastal plain).

(E) An isopach (thickness) map showing thickness of soil above groundwater or rock.

(F) A discussion of the quality of water in aquifers which lie under the proposed site.

(G) A discussion of the potential for the movement of pollutants to ground and surface waters.

(H) Test boring logs and piezometer readings.

Drawings Accompanying Report

No.	Description
1	Title Sheet
2	Boring Location & Property Boundary
3	Geologic Sections
4	Geologic Profiles
5	Geologic Profiles
6	Geologic Profiles
7	Geologic Profiles
8	Isopach Map
9	Auger Refusal Contours
10	Groundwater Readings
11	Groundwater Readings
12	Piezometric Contour Map
13	Fence Diagram
14	Surface Water, Groundwater and Existing Well Data
15	Underdrain Plan and Details

SECTION 2
BACKGROUND

Purpose

A site selection study for a Northern Landfill was completed for Carroll County in August 1981 by Century Engineering, Inc. The purpose of the report was twofold; first to recommend a site that could serve the northern part of Carroll County as a solid waste disposal facility for a 20 year period and secondly, to provide information that satisfies the regulatory requirements for a Phase I, Preliminary Investigation submittal.

Approvals

Carroll County accepted the report and approved submission to the Municipal Waste Division, Office of Environmental Programs for review on November 20, 1981. A site inspection was conducted on January 20, 1982 and on January 22, 1982 the report was accepted as a Phase I document by the Municipal Waste Division.

Zoning

Two sites were considered in the Phase I report; Site No. 1 (Crowl) and Site No. 3 (Talbert) both are presently zoned Agricultural and Transitional. On August 16, 1982 a hearing was held by the Board of Zoning Appeals pursuant to a request by the County Commissioners of Carroll County for conditional use of Site No. 1 (Crowl) for a sanitary landfill.

On September 17, 1982 the Zoning Board approved the request. A similar hearing was held for Site No. 3 (Talbert) on March 18, 1983, and on March 31, 1983 the board rejected the application in a written decision.

Selected Site

The site included herein is referred to as Site No. 1 (Crowl) in the Phase I report. A location map, Figure 1, is included in this section. The property comprises 223 acres of land and is located on the north side of MD Rte. 140 approximately 3600 feet northwest of Reese Road.



CARROLL COUNTY, MARYLAND
GEOLOGIC REPORT FOR PROPOSED
NORTHERN SANITARY LANDFILL

LOCATION MAP

Scale: 1" = 6 Miles.

CENTURY ENGINEERING, INC. J.O. 3181

FIGURE 1

SECTION 3
GEOLOGY AND SOILS

Methods of Evaluation

Subsurface conditions were evaluated from information obtained from data and reports published by U.S. Department of the Interior Geologic Survey (USGS) and the Maryland Geological Survey (MGS), references 3,4,5,6 and 7. Additional site specific data was obtained from the following:

- Field Reconnaissance
- Field Mapping
- Soil Samples from Borings
- Rock Cores
- Installation of Groundwater Observation Wells
- Groundwater Monitoring Wells
- Analysis of Fracture Traces
- Field and Laboratory Tests

Geologic Setting

Carroll County is located in Central Maryland between Baltimore and Frederick Counties and is situated in the Piedmont Uplands of the Piedmont physiographic province. The topographic features and land forms of Carroll County have been formed by a process of erosion on a rising land. Since the Triassic period, this part of the continent has stood above sea level and has been subject to erosion. Rocks have been slowly weathered and decomposed, with the harder rocks, which have resisted erosion, remaining to form ridges and hills at elevations from 1000 to 1100 feet and are believed to be remnants of the Schooley peneplain situated further to the west in Frederick County at elevation 1800 feet. These primary ridges form a major drainage divide for Carroll County with the streams east of the divide draining to the

North and South Branches of the Patapsco River and the streams to the west of the divide flowing to the Monocacy and Potomac Rivers.

The proposed landfill site lies within the uplands of the eastern division of the Piedmont Physiographic Province. The rocks in the eastern division are characterized by schists thought to be Precambrian or possibly Cambrian age. The crystalline schists of the eastern Piedmont area are underlain by the Baltimore gneiss. The contact between the two lithologies is unconformable. Heat and pressure, produced during folding, have recrystallized and intensely metamorphosed the schist formations.

According to the geologic map of Carroll County published by the Maryland Geologic Survey in 1928, the Northern Landfill Site is entirely underlain by the Wissahickon formation consisting of low grade metamorphic schist which is dominated by an albite chlorite minerology. This formation, which is currently mapped as the Prettyboy Schist, weathers to a micaceous saprolite.

Field Investigation, Borings and Wells

Initially, thirty-four (34) ordinary dry sample borings were drilled at the distribution shown on the Boring Location Plan, Drawing 2 of 15. After the initial borings were performed, three (3) additional observation wells and four (4) monitoring wells were installed to further define the groundwater at the higher topographic elevations. Sampling was

not conducted during the installation of the supplemental wells. Boring logs for the ordinary dry sample borings are contained in APPENDIX A, Records of Subsurface Exploration, and records for the well installations are included in APPENDIX B, Well Completion Forms. Graphical details of well construction are presented in APPENDIX C, Observation and Monitoring Well Details. Each borehole drilled received a plastic stand pipe and slotted well screen of 2-inch inside diameter for observation wells and 4-inch inside diameter for monitoring wells.

As the boreholes advanced, Standard Penetration Tests were obtained at the ground surface and at intervals of five (5) feet thereafter. Soil samples obtained during the penetration tests were retained in jars and classified under laboratory conditions. In twenty-six (26) boreholes, nominal 1.75 inch diameter rock cores were obtained by advancing NQ core barrels. Descriptions of the rock cores and presentation of Rock Quality Data (RQD) are included in APPENDIX D.

In boreholes D-5, 10, 15, 16, 17A, 20, 26 and 32, falling head permeability tests were performed at several levels. Results of the borehole permeability tests are presented in APPENDIX E, Summary of Borehole Permeability Tests.

Laboratory Tests

Atterberg limits and grain size distribution tests were determined for several representative soil samples. These samples were utilized as standards for the visual classification of all jar samples. The results of the laboratory tests are presented in APPENDIX F.

Soils

The soils at the Northern Landfill site consist of residual soil derived through in-place weathering and decomposition of the underlying metamorphic Prettyboy Schist. Subsurface horizons may be characterized by three major zones consisting of:

ZONE I: Residual soil consisting of clayey silt and silt with minor weathered rock fragments content. In most samples, the weathered rock fragments disaggregate by hand to silt and sand.

ZONE II: Highly weathered rock comprised predominantly of weathered rock fragments with major soil constituents of clayey silt and silt. Relict structure is generally visible and these materials are termed "decomposed rock". Rock fragments disaggregate by hand to silt and hard rock fragments.

ZONE III: Weathered to slightly weathered rock described in detail in the following section.

The subsurface data obtained during the field drilling program is presented graphically on Drawings 4 through 7 of 15, Geologic Profiles for the sections shown on Drawing 3 of 15.

Zones I, II and III are delineated on the geologic profiles with Zone I overlying Zone II with a thickness ranging between 0 and 18 feet and a mean thickness of 5.5 feet. Zone II material underlies Zone I with a thickness ranging between 0 and 43 feet and a mean thickness of 17 feet.

It should be noted that the changes between Zones I, II and III are gradational and the demarcation lines on the boring logs and geologic profiles occur within the zone of change, but the exact location is arbitrary. The estimated thickness of soil and soil-like decomposed rock of Zones I and II is shown on Drawing 8 of 15, Isopach Map. Auger refusal was utilized as the indicator of transition between Zone II and Zone III and the levels of occurrence are plotted on Drawing 9 of 15, Auger Refusal Contours.

Landfill excavations for cell preparation will occur through Zone I and partially into Zone II materials. Zone I and II materials can generally be removed by normal earth excavation techniques except that occasional ripping may be necessary in pockets of dense, less weathered rock in Zone II. The soils and decomposed rock should disaggregate upon excavation and provide suitable cover materials. Due to the non-plastic consistency and relatively high rock fragment content of the excavated soils, the majority of this material is not suitable for construction of impervious cell floor liners.

Rock

The site of the Northern Landfill is entirely underlain by the albite-chlorite facies of the Wissahickon formation also called the Prettyboy Schist, which consists of fine to medium grained low grade metamorphic schist. The principle mineral constituents are chlorite, muscovite, biotite, albite, and quartz. Structurally, the bedding (foliation planes of the schist) strike between N16°E and N24°E and dip steeply to

the northwest between 45° and 85°. Regional jointing is prominent as evidenced by the rectangular stream system in this section of Carroll County.

Rock cores obtained from the upper fifteen feet of the formation during the drilling program reveal a fine to medium grained mica schist. The dip of partings parallel to foliation are relatively steep with schistosity generally dipping between 45° and 80°. The rock exhibits a very broken condition as indicated by observation of the cores and the relatively low RQD values of APPENDIX D which range between 0 and 73 and average 20. Many partings are coated with iron oxide stains indicative of hydraulically open joints.

The estimated rock (Zone III) horizon, as indicated by auger refusal, is depicted on the geologic profiles of Drawings 4 through 7 and on Drawing No. 9, Auger Refusal Contours. Auger refusal occurred below existing ground surface between 3.5 feet at boring D-14 and 46 feet at boring D-31.

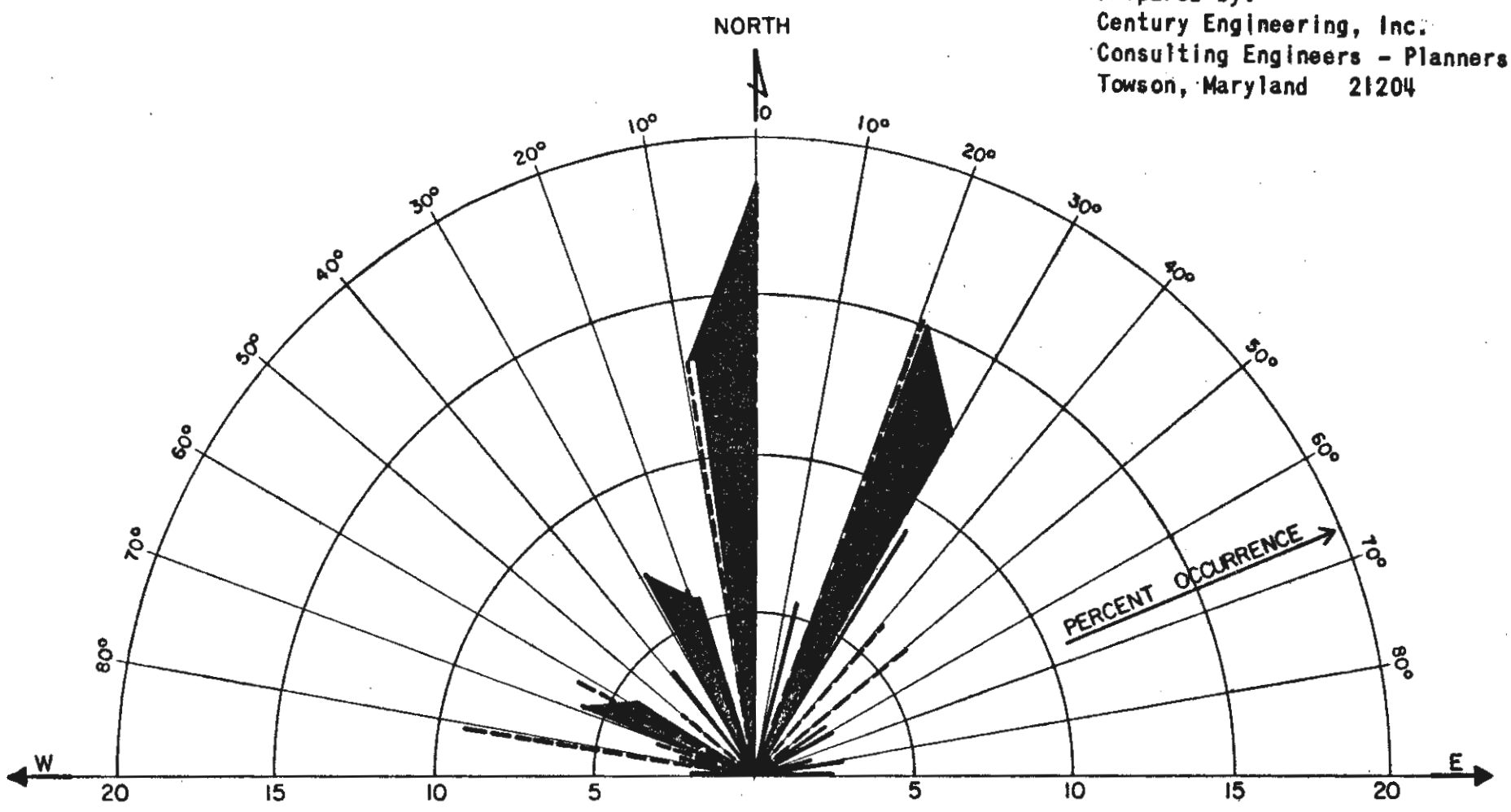
Fracture Trace Analysis

A site specific fracture analysis for the Northern Landfill was performed by reviewing four stereographic aerial photographs encompassing a 1.4 square mile area surrounding the site. The method of analysis followed the recommendations of P.H. Blanchet (1) and L.H. Lattman and R.P. Nichelsen (2). In general, these references define fracture traces as thin, relatively straight vegetation alignments, soil tonal lines, and more obvious straight segments of stream channels as they may appear

on aerial photographs. Care was exercised to disregard linear features which may have been affected by man, such as abondoned roadbeds, fence lines and field furrows. Utilizing a 3-power lens stereoscope, fracture traces observed on the stereographs were marked directly on the photographs. These fracture traces were then transfer-traced on a grid overlay and directional measurements were obtained. The frequency of direction of the fracture traces observed on the aerial photographs are presented on the following page, FRACTURE FREQUENCY ROSETTE. The rosette was constructed in accordance with the recommendations of Lattman and Nickelsen (2) for radial histograms.

In addition to the fracture trace analysis, field measurements of joint strike and dip of the limited number of rock outcrops available on the site were obtained. The rock outcrops known to exist on the site are shown on Drawing 8 of 15, Isopach Map. The frequency of direction of the joints observed in the field are superimposed on the frequency rosette as dashed lines. Although the number of observed bedrock fractures represents a relatively small population, the field data compares favorably with the results of the fracture trace analysis. The findings of this site specific study also compare favorably with the orientation of regional fracture traces reported by Otton (3) for the Westminster Quadrangle.

Inspection of the rosette indicates two predominant trends, one in the



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CARROLL CO. DEPT. OF PUBLIC WORKS
NORTHERN LANDFILL

GEOLOGIC REPORT
FRACTURE FREQUENCY ROSETTE

CEI NO. 81-3181

FIGURE 2

region bounded by due North and N10°W and the other between N20°E and N30°E. Two other trends occur between the region N20°W and N30°W and the region N55°W and N70°W which appear significant and may be an indication of conjugate fractures. The predominant fracture trends at the Northern Landfill site are interpreted to occur within the shaded areas on the rosette diagram.

Groundwater Occurrence

Precipitation is the primary source of groundwater in the Piedmont Region. A portion of infiltration percolates through the soil, enters the saprolite and is stored within the open fracture system of the bedrock. A generalized depiction of groundwater within weathered rock and fracture systems of crystaline rock similar to conditions at the landfill site is given by Otton (3) and reproduced on Drawing 14 of 15, Surface water, Groundwater and Existing Well Data.

A listing of groundwater resource data in Carroll County is contained in the Maryland Geological Survey Basic Data Report No. 12 "Carroll County Groundwater Information: Well Records, Spring Records and Chemical Quality Data", 1981 (6). Records of over 3,000 wells and springs, and chemical analyses of 159 groundwater samples are included in this report covering a period from about 1940 to 1979. Additional records of wells not included in the report were obtained from the Maryland Water Resources Administration for the period 1969 to 1981. The wells located within an approximate 1-mile radius of the site are plotted on Drawing 14 of 15 and the records are summarized in APPENDIX G,

Adjacent Well Records. It should be noted that records for wells constructed prior to 1940 are not available.

The depths of wells range from 21 to 425 feet with an average depth of 182 feet. Reported yields range from 2gpm to 22 gpm with an average of 9.8gpm. There appears to be no correlation between depth of well and individual yield.

The existing well records indicate that the majority of wells close to the proposed landfill site have penetrated the Prettyboy Schist. The primary use of groundwater from the Prettyboy Schist aquifer is for domestic and agricultural purposes. Other than the periodic addition of domestic wells, plans for extensive development of the auifer in this vicinity are unknown at this time.

Groundwater levels were measured and recorded during the subsurface drilling program and for a period of approximately one (1) year after the initial installation of wells. The record of groundwater levels is listed on Drawings 10 and 11 of 15. Groundwater levels at the site vary considerably, ranging between elevation +620 at well OW D-4 to elevation +838 at well OW D-25. Water level variations within each well range from less than (1) foot in most wells to as much as thirteen (13) feet in well OW D-24. In drill holes for M-1, M-2, M-3 and M-4, groundwater was encountered during drilling at depths from 10 to 80 feet below the eventual piezometric surface measured in monitoring

wells installed at these locations. Groundwater was not encountered in wells OW D-5, 7, 8, 11, 12, 14, 15, 16, 18, 21, 22, 26, 29, 30 and 32.

Considering the groundwater level data, the fracture trace analysis and the surface topography, groundwater occurrence at this site may be characterized by Drawing 12 of 15, Piezometric Contour Map and Drawing 13 of 15, Fence Diagram. The highest measured groundwater levels were utilized to formulate the contour map. Groundwater occurs primarily in the weathered rock of Zone II and the fractured rock of Zone III. Occasionally, groundwater is encountered within residual soil (Zone I) at relatively shallow depths below existing grade in observation wells situated in low lying areas adjacent to streams and surface drainage outfalls.

The piezometric surface of groundwater generally mirrors the surface topography of the site. The topography is characteristic of a terminating ridge with a central ridge striking approximately N20°E, the same orientation as the bedrock foliation strike. Erosion has occurred radially around the circumference of the central ridge along fracture systems susceptible to weathering, forming swales and small valleys with definite orientations corresponding to aizmuth and frequency trends of the fracture trace rosette.

The remaining ridges are indicative of less fractured, less weathered, resistant rock as evidenced by many test holes which did not encounter

groundwater. During installation of monitoring wells, M-1, M-2, M-3 and M-4, which were located in ridge areas, groundwater was not encountered until hydraulically open fractures were intercepted at relatively great depths.

Groundwater Movement

Considering the Piezometric Surface Contour Map, groundwater movement is anticipated to occur in the direction of the gradients shown by the arrows on Drawing 13, Fence Diagram, and Drawings 4 through 7, Geologic Profiles. The lengths of the arrows are arbitrary and do not indicate magnitudes of flow. In the ridge areas where fewer hydraulically open fractures were found, groundwater movement will be dictated by the relict structure orientation within the weathered rock of Zone II and the fracture orientation within the rock of Zone III. Considering the steep dip of partings observed in the rock cores and the steep regional dip toward the northwest, groundwater recharge and circulation within the fracture system of less weathered ridge areas should be highly localized trending toward the northwest.

The rate of groundwater seepage, as indicated by the field permeability tests of APPENDIX E, ranges between 1.6 and 88 feet per day for a unit hydraulic gradient. Boring D-17A exhibits the highest permeability value and field observation in this drainage area of the site indicates noticeable spring activity. This basin is oriented along a major fracture trace as indicated by the frequency rosette and the occurrence of highly fractured rock with associated rapid seepage of groundwater

appears likely in this drainage area. Groundwater movement in the remaining basins appears moderate at an average of 9 feet per day for a hydraulic gradient of unity.

Conclusions and Recommendations

Based upon the findings of the subsurface explorations, the following design features should be implemented at the North Area Landfill:

1. Highly broken rock and relatively rapid seepage rates are anticipated in the basin associated with OW D-17A. This area should be avoided by landfilling activities. The areal extent of the residential/ commercial sanitary landfill should not encroach beyond the elevation +760 ground surface contour line within this drainage area.
2. The residual soil and weathered rock over the entire site is moderately pervious and the landfill floor should be treated to control leachate migration. The liner and leachate control system on Drawing No. 15 should be adopted in the final design. The subgrade of the liner system should be scarified to a depth of one foot and recompacted to destroy and seal relict structure remaining within Zone I or Zone II materials.
3. The data of the Piezometric Contour Map, Drawing 12, and the Auger Refusal Contour Map, Drawing 9, have been utilized to establish the "Minimum Design Elevations" of APPENDIX H.

4. Groundwater movements are anticipated to occur along the paths indicated on Drawing 13, Fence Diagram, and Drawings 4 through 7, Geologic Profiles. All groundwater seepage beneath the proposed landfill area is anticipated to emerge from the site through one of the five surface drainage basins and these areas should be monitored by wells to determine the effectiveness of the leachate control system during the landfill operation.

5. Monitoring wells should be installed at the locations shown on Drawing 12, Piezometric Contour Map. The depths of the Monitoring Wells should be sufficient to penetrate the groundwater table or water bearing fractures in rock.

SECTION 4
WATER QUALITY

Existing Information

The most comprehensive and recent study on groundwater resources in Carroll County is contained in the Maryland Geological Survey Basic Data Report No. 12 "Carroll County Ground Water Information: Well Records, Spring Records, and Chemical Quality Data", 1981 (6). In this report, records of over 3,000 wells and springs and chemical analyses of 159 groundwater samples are included, covering a period from 1974 to 1979.

Seventeen existing wells and two springs are documented to lie within one mile of the Northern Landfill site, generally along the Route 140 corridor. The well locations are shown on Drawing 14 of 15. The only well in the vicinity of the Northern Landfill on which chemical analyses has been performed is located approximately 1.5 miles north of the site. A tabulation of the parameters determined in 1975 for the Basic Data Report follows:

Calcium (dissolved)	mg/1	4.9
Magnesium (dissolved)	mg/1	6.2
Bicarbonate	mg/1	22.0
Chlorides (dissolved)	mg/1	4.6
Nitrogen (NO_2+NO_3)	mg/1	8.1

The relatively small quantities of chlorides and nitrates indicate that no organic contamination of the groundwater is occurring at that site. The bicarbonate level indicates a relatively low alkalinity, and the calcium and magnesium levels show the water to be quite "soft".

Recent Sampling and Testing

During the field studies performed in preparation of this report, four surface water and three goundwater samples were obtained and analyzed by Martel Laboratory Services, Inc., to document the existing water quality. Location of the sampling sites is shown on Drawing 2 of 15. Copies of the laboratory analyses and summary of test results performed by Martel Laboratory Services are included in APPENDIX I, Water Quality.

Surface Water

Two of the samples obtained represent incoming and outgoing flow of the unnamed tributary to the W. Branch Patapsco River which forms the northern border of the landfill site, while two other samples represent surface flow from on-site springs.

The chemical and water quality data are compared to drinking water quality standards established by the World Health Organization and the U.S.E.P.A. on the summary sheets of APPENDIX I in order to give an overall perspective on the quality of the water. Data for 29 different water quality parameters for each sample along with the recommended drinking water standards are included.

In general, the water is shown to be of very high chemical quality, and with one minor exception, each of the sampling locations has water acceptable for use as a drinking water supply. It should be noted that testing for bacteriological quality was not performed.

The only exception to compliance with water quality standards occurs at surface water Location "B" where the existing pH of 6.2 is below the minimum allowable pH of 6.5. Waters of this pH are not especially unusual, and it does not necessarily indicate a low water quality but simply means that pH adjustment would be required before acceptability for drinking.

The water at each location is shown to be quite soft, and no heavy metals occur in quantities at the detectable limits of analysis. The Chemical Oxygen Demand (COD) of the water is quite high and although no correlation factor was estabablished for Biochemical Oxygen Demand (BOD), a rather common factor of 1.5 would indicate a BOD range of for 35 to 50 mg/1. This, in combination with relatively high nitrogen data, indicates a heavy loading of organics in the water. Since no known waste waters enter these streams (and certainly not the spring) these organics can be attributed to natural runoff from the watershed.

Although there are no limits for drinking water for sulfides and ammonia, there are recommended limits not to be exceeded for propagation of fresh water aquatic life. The ammonia level at all four sites and the sulfide level at two sites exceed these limits.

No significant water quality changes occur in the stream forming the northern boundary of the site as it passes through the site.

Groundwater

Groundwater quality, as determined by analyses of three on-site wells, is quite similar to that of surface water and in general is of high quality.

SECTION 4
WATER QUALITY

The tests are summarized in APPENDIX I. Water quality is within acceptable levels for drinking water supplies for all but three of the tested parameters.

As with the on-site surface water, pH is slightly acidic for use as a water supply and pH adjustment would be required. In addition, at two of the wells, (D-10, D-20), turbidity and total solids data are well above acceptable drinking water quality standards.

Description of Surface Drainage

The surface water drainage pattern of Carroll County is dominated by Dug Hill Ridge and Parr's Ridge, roughly bisecting the County in two parts. Streams to the west of these ridges, including Big Pipe and Little Pipe Creeks, are tributary to the Monocacy River. East of Dug Hill and Parr's Ridge the Piedmont upland is drained by the South Branch and the North Branch of the Patapsco River and their tributaries.

The Northern Landfill site is immediately drained by an unnamed tributary to the West Branch of the Patapsco River, which is itself a tributary to the North Branch of the Patapsco. This stream forms the northern boundary of the site. Headwaters of this unnamed tributary begin approximately one mile northwesterly of the landfill site. The total drainage area of this stream is approximately 450 acres at the time it enters the landfill site and approximately 616 acres as it leaves the site. A flood plain analysis, contained in APPENDIX J, Floodplain Determination, and the 100 year peak discharge is approximately 780 cfs. The drainage area map, 100 year flood sections and a 100 year flood profile are presented on Drawing 14 of 15. Refer to Drawing 2 of 15 for a plan location of the 100 year flood plain.

Effect on Landfill Design

The 100 year flood plain will not interfere with proposed landfill design or operations.

SECTION 6
WATER BALANCE

Water Balance and Leachate Production

A water balance analysis was performed to determine potential leachate production from the proposed landfill. The analysis and the climatological data utilized in the analysis are presented in APPENDIX K, Water Balance Computations. The water balance indicates that the 89± acres proposed for landfill operations will have an infiltration of 9.55 inches of rainfall per year which will generate 23,335,105 gallons of leachate per year or 262,192 gallons per acre per year. Leachate quantities will be refined when precise cell locations and dimensions have been determined during the final design.

Landfill Floor and Leachate Collection (Residential/Commercial/Sludge Wastes)

The landfill floor will be located from 5 feet to 6.5 feet above refusal or the highest recorded ground water surface. A clay liner will be placed over the floor and a stone underdrain will be placed over the clay.

Leachate will be collected at low points by underdrain pipe located in a clay lined underdrain collection trench. Over the clay will be a 30 mil pvc liner overlain with a 6-inch depth of sand. The trench will be backfilled with No. 2 aggregate and overlain by the landfill floor stone underdrain.

The data contained in APPENDIX H, "Minimum Design Elevation" will be observed in establishing final design elevations. A preliminary design of the landfill floor and collection trench is shown on Drawing 15 of 15 "Underdrain Plan and Details".

Leachate Ponds

Leachate will be collected by an underdrain system at low points in the landfill and conveyed to storage ponds. Leachate remaining in the ponds after evaporation, will be applied to a portion of the finished landfill surface or removed by tank truck to a sewage treatment plant. Leachate ponds will be lined with a 1 foot thickness of saline seal and covered with 6-inches of stone.

Sediment Control

During operation of the landfill, surface water runoff in each large drainage area will be directed into a sediment pond. Detention in the

pond will allow settlement of soil particles prior to release of the runoff into natural drainage swales.

Between the solid waste placing area(s) and the sediment pond there will be at least one line of straw bales or a silt screen which will act as a back-up system for containment of sediments.

Solid Waste Placing

Solid waste will be placed in 8-foot lifts and contained in the landfill by compaction, cover and earth dikes. Cover will be applied daily and in accordance with regulatory requirements.

Cover

In the site selection study (August 1981, Century Engineering, Inc.) it was determined that approximately 1,635,383 cubic yards of cover material would be required for the projected 20 year solid waste quantity of 6,541,520 cubic yards. A preliminary quantity take-off based on the elevations of APPENDIX H indicates that a total volume of 1,721,186 sy of cover is available. If needed, additional cover is available from the areas excluded from solid waste placing, particularly at the eastern and western boundaries.

Final cover will be placed over solid waste as design grades are reached. A clay seal will be included in the final cover to minimize the production of leachate. Refer to the "Final Cover Detail" on Drawing 15 of 15.

Ground Water Monitoring

In accordance with the recommendations of Section 3 of this report and prior to commencing landfill operations, groundwater monitoring wells will be installed upstream and downstream of the solid waste placing areas.

Waste Stream

The following waste will be accepted at the Northern Sanitary Landfill:

- Solid waste from residential and commercial sources located within Carroll County
- Dewatered sludge from wastewater treatment plants located within Carroll County. Sludge will be placed with residential and commercial solid wastes.
- Rubble waste. This waste will be placed apart from residential and commercial wastes at tentative locations shown on the accompanying drawings. Placing areas for rubble waste will not be lined nor will leachate be collected.

References:

(1) Blanchet, P.H. 1957. Development of Fracture Analysis as Exploration Method. Bull. Amer. Assoc. Petrol. Geol., 41, pp 1748 - 1759.

(2) Lattman, L.H., and R.P. Nickelson, 1958. Photogeologic Fracture-Trace Mapping in Appalachian Plateau. Bull. Amer. Assoc. Petrol. Geol., 42, pp. 2238 - 2245.

(3) Otton, E.G., and J.T. Hilleary. 1979. Hydrogeologic Atlas, Westminster Quadrangle, Carroll County, Maryland. Maryland Geologic Survey Publication Q.A. 9.

(4) Richardson, C.A. 1980. Ground Water in the Piedmont Upland of Central Maryland. USGS Water-Resources Investigations. 80-18.

(5) Nutter, L.J. and E.G. Otton. 1969. Ground-Water Occurance in the Maryland Piedmont. Maryland Geological Survey Report of Investigations No. 10.

(6) Hilleary, J.T., and J.M. Weigle, 1981. Water Resources Basic Data Report No. 12, Carroll County Ground-Water Information: Well Records, Spring Records, and Chemical Quality Data; Department of Natural Resources; Maryland Geological Survey.

(7) Meyer; Gerald, and Robert M. Beall, 1958. The Water Resources of Carroll and Frederick Counties. Department of Geology, Mines and Water Resources, State of Maryland, Bulletin 22.

APPENDIX A RECORDS OF SUBSURFACE EXPLORATION

BURMEISTER SOIL CLASSIFICATION SYSTEM - NON-COHESIVE SOILS
(Silt, Sand, Rock Fragments and Combinations)

DENSITY

Very Loose - 4 blows/ft. or less
Loose - 5 to 10 blows/ft.
Medium Dense - 11 to 30 blows/ft.
Dense - 31 to 50 blows/ft.
Very Dense - 51 blows/ft. or more

PARTICLE SIZE IDENTIFICATION

Rock Fragments - Coarse - 1 to 3 inch
Medium - 1/2 to 1 inch
Fine - 1/4 to 1/2 inch

Sand - Coarse - 0.6mm to 1/4 inch (Dia. of pencil lead)
Medium - 0.2mm to 0.6mm (Dia. of broom straw)
Fine - 0.05mm to 0.2mm (Dia. of human hair)
- 0.06mm to 0.002mm (Cannot see particles)

RELATIVE PROPORTIONS

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

COHESIVE SOILS
(Clay, Silt and Combinations)

CONSISTENCY

Very Soft - 0-2 blows/ft. or less
Soft - 2 to 4 blows/ft.
Medium Stiff - 4 to 8 blows/ft.
Stiff - 8 to 15 blows/ft.
Very Stiff - 16 to 30 blows/ft.
Hard - 31 blows/ft. or more

PLASTICITY

Degree of Plasticity	Plasticity Index
None to slight	0 - 4
Slight	5 - 10
Medium	11 - 20
High to Very High	Over 20

CLASSIFICATION on logs are made by visual inspection and limited laboratory tests.

STANDARD PENETRATION TEST - Driving a 2.0" O.D., 1 3/8" I.D., sampler a distance of 18 inches into undisturbed soil with a 140 pound hammer free falling a distance of 30.0 inches. The initial 6-inch drive is utilized to seat the spoon into undisturbed soil. The number of hammer blows for each 6.0 inch increment of penetration is recorded on the drill log. The Standard Penetration Test result can be obtained by adding the last two figures (i.e. 8 + 9 = 17 blows/ft.).

STRATA CHANGES - In the column "Soil Descriptions" on the drill log the horizontal lines represent strata changes.

GROUNDWATER observations were made at the times indicated. Hydraulic conductivity weather conditions, site topography, etc., may affect the water levels indicated on the logs.

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-1
Projects Name: Northern Sanitary Landfill, Phase II — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: Bob Friess
Surf. Elev.: +663.0 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: G. Bennett
Date Started: 6/9/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/9/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
663.0	SURFACE	0.0	0						
661.0	Brown SILT, some rock fragments	2.0		I	6-8-8	S-1	DS	0.8	
	Brown SILT & gray-green rock fragments, tr. cf sand (decomposed rock)		5	I	6-14-14	S-2	DS	1.5	
	Green Rock Fragments, little brown-green silt (decomposed rock)		10	I	10-26-36	S-3	DS	0.8	
	Brown SILT and brown-green rock fragments, tr. cf sand (decomposed rock)		15	I	37-17-21	S-4	DS	0.9	
	Brown-green ROCK FRAGMENTS, some brown-green silt, tr. cf sand (decomposed rock)		20	I	15-24-61	S-5	DS	1.0	Encountered water at 23.0'
	Same - Moist (decomposed rock)		25	I	100/0.3'	S-6	DS	0.3	
	Same & Moist								Bottom of well @ 28.0'
633.0	Auger Refusal	30.0	30	I	100/0.4'	S-7	DS	0.4	
	Bottom of Hole at 30.0'		35						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 24.0 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 19 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-2
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 3.25" — Foreman: D. Hannibal
Surf. Elev.: +635.9 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/4/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/5/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
635.9	SURFACE	0.0	0						
633.9	Brown moist SILT, little rock frags.tr. cf sand	2.0		I	1-3-4	S-1	DS	1.0	
	Brown-gray ROCK FRAGMENTS little silt (decomposed rock)			I	10-12-10	S-2	DS	1.5	
			5	I	6-18-100/0.2'	S-3	DS	1.2	
	Same (gray)			I	100/0.2'	S-4	DS	0.2	
	Same (gray)								
	Dk.Br. moist ROCK FRAGMENTS & SILT, tr. cf sand (decomposed rock)		10	I	21-80-100/0.2'	S-5	DS	1.2	Water @ 14.0'
	Tan moist ROCK FRAGMENTS & cf SAND, tr. clayey silt (decomposed rock)		15	I	36-72-15	S-6	DS	0.8	
	Dk.Br. moist ROCK FRAGMENTS & SILT, tr. cf sand (decomposed rock)		20	I	70-100/0.1'	S-7	DS	0.5	Bottom of well @ 20.0'
612.9	AUGER REFUSAL	23.0							
	Bottom of Hole @ 23.0'								

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 10.8 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 3.2 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-3
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: Bob Friess
Surf. Elev.: +633.9 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: G. Bennett
Date Started: 6/7/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/7/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
633.9	SURFACE	0.0	0						
631.9	Br. moist SILT, little br. rock frags., tr. c-f sand	2.0		I	2-3-5	S-1	DS	1.0	
	Gray SILT, some gray rock fragments, tr. cf sand (decomposed rock)		5	I	8-13-14	S-2	DS	1.5	
	Gray Rock FRAGMENTS some gray silt, tr. cf sand (decomposed rock)		10	I	6-10-22	S-3	DS	1.0	
	Same (but moist)		15	I	36-25-28	S-4	DS	1.2	Encountered water @ 13.0'
	Same (dry)		20	I	38-110/0.4'	S-5	DS	0.6	Bottom of well @ 20.5'
611.9	AUGER REFUSAL	22.0							
	Bottom of Hole @ 22.0'		25						
			30						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 7.0 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 7.5 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.

GEOTECHNICAL DIVISION

RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-4

Projects Name: Northern Sanitary Landfill — Job #: 81-3181

Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: Richard Sies

Surf. Elev.: 627.0 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: Gordon Bennett

Date Started: 6/2/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/2/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
627.0	SURFACE	0.0	0						
625.0	Br. moist clayey SILT, some br. & gr. rock frags., tr. cf sand	2.0		I	3-4-7	S-1	DS	1.2	
	Br. ROCK FRAGMENTS & Br. moist SILT, tr cf sand (decomposed rock)		5	I	7-11-40	S-2	DS	1.5	
	Gray ROCK FRAGMENTS, some gray silt (decomposed rock)		10	I	45-52-50	S-3	DS	1.5	Encountered water @ 13.0'
	Same		15	I	27-65/ 0.05'	S-4	DS	0.5	Bottom of well at 19.5'
606.0	AUGER REFUSAL	21.0	20						
	Bottom of Hole @ 21.0'		25						

SAMPLER TYPE

DS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS

D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH

AT COMPLETION 10 FT.

AFTER ____ HRS. ____ FT.

AFTER 24 HRS. 7.5 FT.

BORING METHOD

HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-5
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +720.6 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/9/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/10/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
720.6	SURFACE	0.0	0						
719.6	Br. moist SILT, some rock frags., tr. cf sand	1.0		I	1-2-7	S-1	DS	1.5	
	Br. moist SILT & ROCK FRAGMENTS, tr. cf sand (decomposed rock)			I	5-12-16	S-2	DS	1.0	
	Br. moist ROCK FRAGMENTS, little clayey silt (decomposed rock)		5	I	7-9-9	S-3	DS	1.5	
	Br. moist ROCK FRAGMENTS little silt (decomposed rock)		10	I	5-12-16	S-4	DS	1.0	Permeability Test @ 10.0'
	Same		15	I	27-36-100/0.2'	S-5	DS	1.0	Permeability Test @ 15.0'
	Gray ROCK FRAGMENTS, little silt (decomposed rock) AUGER REFUSAL 20.5'	20.5	20		100/0.3'	S-6	DS	0.3'	Roller Bit to 20.5'
				D	Cored	1st Run	RC	1.6'	Soft Mud Seam @ 24.0'
		25.5	25						
	Green mica schist with quartzite lenses	26.5		D	Cored	2nd Run	RC	0.4'	
			30	D	Cored	3rd Run	RC	1.0'	Bottom of Well at 28.0'
689.1		31.5							
	Bottom of hole at 31.5'		35						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 20.3 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 27.0 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-6
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: Richard Sies
Surf. Elev.: +737.8 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: 2" — Inspector: Gordon Bennett
Date Started: 6/7/83 — Pipe Size: 1-3/8 ID / 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/8/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
737.8	SURFACE	0.0	0						
	Br. moist SILT, some rock fragments, tr. cf sand.			I	3-3-5	S-1	DS	1.5	Bag sample taken 2.5'
731.8	Same	6.0	5	I	5-8-8	S-2	DS	1.5	
	Br. & gray moist ROCK FRAGMENTS & SILT, tr.cf sand (decomposed rock)		10	I	10-9-24	S-3	DS	1.5	
	Same		15	I	65-100/0.2'	S-4	DS	0.7	
	Same		20	I	29-100/0.4'	S-5	DS	0.9	
	Same		25	I	7-55-100/0.3'	S-6	DS	1.3	
	Same		30	I	6-12-34	S-7	DS	1.5	
703.3	AUGER REFUSAL Same	34.5		D	38-100/0.2'	S-8	DS	0.4	
	Silaceous Red Gray Mica Schist with Quartzite Lenses		35	D	Cored	1st Run	RC	2.7'	
		39.5							

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION Dry FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 43.0 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.

GEOTECHNICAL DIVISION

RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-6

Projects Name: Northern Sanitary Landfill — Job #: 81-3181

Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: Richard Sies

Surf. Elev.: +737.8 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: 2" — Inspector: Gordon Bennett

Date Started: 6/7/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/8/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
697.8	SURFACE	39.5	40						
	Silaceous Red Gray mica schist with quartzite lenses.	44.5		D	Cored	2nd Run	RC	3.8'	
			45	D	Cored	3rd Run	RC	3.5'	Bottom of well @ 47.5'
688.3		49.5							
	Bottom of Hole @ 49.5'		50						

SAMPLER TYPE

OS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS

D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH

AT COMPLETION Dry FT.

AFTER ____ HRS. ____ FT.

AFTER 24 HRS. 43.0 FT.

BORING METHOD

HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-7
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +743.7 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/24/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/24/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
743.7	SURFACE	0.0	0						
742.2	Brown moist SILT & ROCK FRAGS., tr. cf sand	1.5		I	1-2-3	S-1	DS	1.5	
	Orange and brown ROCK FRAGMENTS & SILT, tr. cf sand		5	I	20-20-20	S-2	DS	1.5	
733.2	Same Auger Refusal	10.5	10	I	100/0.4'	S-3	DS	0.4	Introduced water at 10.5 ft.
	Green mica schist with quartzite lenses	15.5	15	D	Cored	1st Run	RC	0.9	
		20.5	20	D	Cored	2nd Run	RC	3.2	
718.2		25.5	25	D	Cored	3rd Run	RC	4.2	Bottom of well at 23.0'
	Bottom of hole @ 25.5'								

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 18.5 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. Dry FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-8
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +707.0 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/26/83 — Pipe Size: 1-3/8 ID / 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/27/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
707.0	SURFACE	0.0	0						
	Br. moist SILT & ROCK FRAGMENTS, tr cf sand			I	1-1-4	S-1	DS	1.5	Boring site was leveled for drill rig setup.
			5						Cut 3.5-4.0 ft. below orig. ground.
700.0	Same	7.0		I	5-9-16	S-2	DS	1.5	
	Br. ROCK FRAGMENTS & SILT, tr. cf sand (decomposed rock)		10	I	47-100 / 0.3'	S-3	DS	0.8	
	Same		15	I	21-47-69	S-4	DS	1.5	
	Same								
686.5	AUGER REFUSAL	20.5	20	I	100 / 0.3'	S-5	DS	0.3	Tip of spoon wet.
		25.5	25	D	Cored	1st Run	RC	3.0	
	Silvery Gray green mica schist with quartzite lenses.	30.5	30		Cored	2nd Run	RC	3.1	
671.5		35.5	35		Cored	3rd Run	RC	3.2	Bottom of well at 32.5'
	Bottom of hole @ 35.5'								

SAMPLER TYPE
OS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 12.0 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 24.0 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.

GEOTECHNICAL DIVISION

RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-9

Projects Name: Northern Sanitary Landfill — Job #: 81-3181

Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies

Surf. Elev.: +691.0 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: G. Bennett

Date Started: 6/3/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/3/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
691.0	SURFACE	0.0	0						
	Br. moist clayey SILT, some rock fragments, tr. cf sand.			I	2-2-7	S-1	DS	1.5	Bag sample taken at 2'-7'
	Br. moist clayey SILT & ROCK FRAGMENTS, little cf sand		5	I	5-8-16	S-2	DS	1.5	
683.0		8.0							
	Br.moist SILT & ROCK FRAGMENTS, little cf sand		10	I	2-5-7	S-3	DS	1.5	Encountered water @ 10.0'
	Same		15	I	5-10-16	S-4	DS	1.5	
	Same		20						
669.0	AUGER REFUSAL	22.0		I	11-27-42	S-5	DS	1.0	
	Bottom of hole @ 22.0'		25						

SAMPLER TYPE

DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS

D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH

AT COMPLETION 14.0 FT.

AFTER 96 HRS. 9.5 FT.

AFTER 24 HRS. ____ FT.

BORING METHOD

HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-10
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +748.6 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/5/83 — Pipe Size: 1-3/8 ID / 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/6/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
708.6	SURFACE	0.0	40	D	Cored	2nd Run	RC	0.3	Broken layers some out of barrel.
	Green mica schist with quartzite lenses.	43.0	45	D	Cored	3rd Run	RC	0.8	Bottom of well @ 46.0 ft.
700.6	Bottom of hole @ 48.0'	48.0	50						

SAMPLER TYPE
OS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 46.5 FT.
AFTER 64 HRS. 31.5 FT.
AFTER 24 HRS. ____ FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-10
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +748.6 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/5/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/6/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
748.6	SURFACE	0.0	0						
	Brown, moist CLAY & SILT, little rock fragments, tr. cf sand			I	3-2-4	S-1	DS	1.5	
				I	4-7-12	S-2	DS	1.5	
	Brown moist SILT, some rock fragments, tr.cf sand		5	I	6-8-12	S-3	DS	1.5	
	Same								Introduce water @ 10.0 ft.
	Same		10	I	12-12-14	S-4	DS	1.5	10.0 ft. Permeability test.
735.6		13.0							
	Reddish br. moist ROCK FRAGMENTS & SILT, tr. cf sand (decomposed rock)		15	I	8-10-17	S-5	DS	1.5	15.0 ft. Permeability test.
	Same		20	I	18-12-18	S-6	DS	1.5	
	Brown gray ROCK FRAGMENTS some silt, tr cf sand (decomposed rock)		25	I	11-24-100	S-7	DS	1.5	
	Same		30	I	80-100/4"	S-8	DS	0.9	
715.6	AUGER REFUSAL	33.0							
	Green mica schist with quartzite lenses.		35	D	Cored	1st Run	RC	1.0	
		38.0							Soft @ 37.0 ft.
			40	D	Cored	2nd Run	RC	0.3	

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 46.5 FT.
AFTER 64 HRS. 31.5 FT.
AFTER 24 HRS. ____ FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-11
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +794.1 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/23/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/23/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
794.1	SURFACE	0.0	0						
	Br.moist clayey SILT, little rock frags.,tr. organics (roots),tr cf sand			I	1-2-5	S-1	DS	1.0	
				I	3-5-8	S-2	DS	1.0	
789.1	Br.moist clayey SILT,little rock frags.,tr.cf sand	5.0	5						
	Br.moist SILT & ROCK FRAGS tr.cf sand(decomposed rock)			I	9-11-14	S-3	DS	1.5	
	Br.to reddish-br.ROCK FRAGS & SILT,tr cf sand(decomp. rock).			I	30-40-20	S-4	DS	1.5	
	Same		10	I	5-11-9	S-5	DS	1.5	
	Same			I	28-38-42	S-6	DS	1.5	
	Same		15	I	100/0.5'	S-7	DS	0.5	
776.1	AUGER REFUSAL	18.0							Introduced water @ 18.0ft.
		21.5	20	D	Cored	1st Run	RC	3.2	
	Green-red Mica Schist w/Quartzite lenses.	26.0	25	D	Cored	2nd Run	RC	4.5	
		31.0	30	D	Cored	3rd Run	RC	4.6	
761.1		33.0		D	Cored	4th Run	RC	1.7	
	Bottom of hole @ 33.0'		35						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION Dry FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. ____ FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-12
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +757.8 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/25/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/26/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
757.8	SURFACE	0.0	0						
	Brown moist SILT, some br. rock frags., tr. cf sand			I	9-14-23	S-1	DS	1.0	Ground leveled for drill rig setup.
754.3	AUGER REFUSAL	3.5							
	Silvery red-brown (green increasing with depth) mica schist, with high iron accessory mineral content & quartzite lenses		5	D	Cored	1st Run	RC	1.5	Introduced water @ 3.5 ft. HARD
		8.5							
			10	D	Cored	2nd Run	RC	2.7	SOFT HARD
		13.5							
			15	D	Cored	3rd Run	RC	2.6	SOFT Bottom of well @ 17.0 ft.
739.3		18.5							
	Bottom of Hole @ 18.5 ft		20						

SAMPLER TYPE
OS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 15.0 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. Dry FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-13
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: Richard Sies
Surf. Elev.: +728.7 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: Gordon Bennett
Date Started: 6/2/83 — Pipe Size: 1-3/8 ID / 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/2/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
728.7	SURFACE	0.0	0						
	Br. moist SILT & ROCK FRAGMENTS, tr. cf sand			I	2-8-7	S-1	DS	0.5	Bag sample taken at 2'-7'
	Br. moist SILT, some rock fragments, tr. cf sand		5	I	10-10-15	S-2	DS	1.0	
720.7		8.0							Encountered Water @ 8.0'
	Br. moist ROCK FRAGMENTS & SILT, tr. cf sand (decomposed rock)		10	I	9-16-14	S-3	DS	1.0	
	Br. moist SILT & GRAY ROCK FRAGMENTS, tr. cf sand (decomposed rock)		15	I	4-3-4	S-4	DS	1.0	
	Same		20	I	WOH-11-9	S-5	DS	1.0	
	Br. moist ROCK FRAGMENTS & SILT, tr. cf sand (decomposed rock)				5/4' 195/0"				
703.3		25.4	25	I		S-6	DS	0.4	Bottom of well @ 24.0'
	Bottom of Hole @ 25.4'		30						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 9.7 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 3.5 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.

GEOTECHNICAL DIVISION

RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-14

Projects Name: Northern Sanitary Landfill — Job #: 81-3181

Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies

Surf. Elev.: +790.6 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis

Date Started: 5/25/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/25/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
790.6	SURFACE	0.0	0						
789.6	Red.-br. moist clayey SILT, lt. organics, tr. cf sand,	1.0		D	1-5-100/0.2'	S-1	DS	0.5	Introduced water @ 3.5'
787.1	Gray ROCK FRAGS, lit. sand AUGER REFUSAL	3.5							
			5	D	Cored	1st Run	RC	3.1	
		8.5							
	Green mica schist with quartzite lenses.		10	D	Cored	2nd Run	RC	3.2	Soft @ 11.5'
		13.5							Hard @ 14.5'
			15	D	Cored	3rd Run	RC	3.9	Bottom of well @ 15.0'
772.1		18.5							
	Bottom of Hole @ 18.5'		20						

SAMPLER TYPE

DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS

D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH

AT COMPLETION 3.6 FT.

AFTER ____ HRS. ____ FT.

AFTER 24 HRS. 12.5 FT.

BORING METHOD

HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

TANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.

GEOTECHNICAL DIVISION

RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-15

Projects Name: Northern Sanitary Landfill — Job #: 81-3181

Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies

Surf. Elev.: +774.1 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis

Date Started: 5/10/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/11/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
774.1	SURFACE	0.0	0						
773.1	Br. moist SILT, some rock frags., tr. cf sand	1.0		I	1-3-5	S-1	DS	1.0	
	Reddish-brown moist ROCK FRAGMENTS & SILT, tr. cf sand (decomposed rock)			I	5-9-6	S-2	DS	1.0	
	Same		5	I	10-20-23	S-3	DS	1.5	
	Reddish-brown moist ROCK FRAGMENTS, some silt, tr. cf sand (decomposed rock)		10	I	23-35-48	S-4	DS	1.0	Permeability @ 10.0'
	Same		15	I	100 / 0.3'	S-5	DS	0.3	Permeability @ 14.6'
755.6	AUGER REFUSAL	18.5							
			20	D	Cored	1st Run	RC	3.9	Soft layer from 23.5 to 24.5'
	Highly laminar green mica schist with quartzite lenses.	23.5	25	D	Cored	2nd Run	RC	2.9	
		28.5	30	D	Cored	3rd Run	RC	4.0	Bottom of well @ 32.0'
740.6		33.5							
	Bottom of Hole @ 33.5'		35						

SAMPLER TYPE

DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS

D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH

AT COMPLETION 25.0 FT.

AFTER ____ HRS. ____ FT.

AFTER 24 HRS. Dry FT.

BORING METHOD

HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring # D-16
Projects Name: Northern Sanitary Landfill — Job # 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt. 140 Lbs. — Hole Diameter 3.75" — Foreman R. Sies
Surf. Elev. +819.6 Ft. — Hammer Drop 30 In. — Rock Core Dia. NQ — Inspector H. Jarvis
Date Started 5/4/83 — Pipe Size 1-3/8 ID 1-3/4 OD In. — Boring Method HSA — Date Completed 5/5/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
819.6	SURFACE	0.0	0						
	Br.moist SILT, little rock frags.,tr. cf sand			I	1-2-3	S-1	DS	1.5	
	Br.moist SILT, some rock frags., tr.cf sand			I	3-5-7	S-2	DS	1.5	
	Same		5	I	12-15-16	S-3	DS	1.5	
810.6	Same	9.0		I	11-14-21	S-4	DS	1.5	
	Reddish-brown ROCK FRAGMENTS, some silt, tr. cf sand (decomposed rock)		10	I	100/0.3'	S-5	DS	0.3	Introduced water @ 13.0'
	Same		15	I	100/0.3'	S-6	DS	0.3	
800.6	Same AUGER REFUSAL	19.0		I	100/0.2'	S-7	DS	0.2	
	Mica schist turning from tan to green w/depth, with quartzite lenses.	24.0	20	D	Cored	1st Run	RC	1.8	Hard @ 24.0'
		29.0	25	D	Cored	2nd Run	RC	4.0	
785.6		34.0	30	D	Cored	3rd Run	RC	4.0	Bottom of well @ 32.5'
	Bottom of Hole @ 34.0'		35						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 10.0 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 28.1 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-17
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: 790.3 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/11/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/12/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
790.3	SURFACE	0.0	0						
788.3	Br. moist clayey SILT, lit. rock frags., tr. cf sand	2.0		I	3-3-4	S-1	DS	1.5	
	Greenish-gray ROCK FRAGMENTS, some silt (decomposed rock)			I	10-14-15	S-2	DS	1.5	
783.3	Same AUGER REFUSAL	7.0	5	I	37-17-33	S-3	DS	1.2	Introduced water @ 7.0'
	Green mica schist w/ quartzite lenses	10.5	10	D	Cored	1st Run	RC	1.4	
776.3		14.0		D	Cored	2nd Run	RC	3.5	
	Bottom of Hole @ 14.0'		15						No well installed.

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION _____ FT.
AFTER _____ HRS. _____ FT.
AFTER 24 HRS. _____ FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-17A
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +730.8 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/13/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/13/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
730.8	SURFACE	0.0	0						
	Br. moist clayey SILT, little rock fragments, tr. organics, (roots) tr. cf sand			I	1-2-4	S-1	DS	1.5	
				I	2-3-4	S-2	DS	1.5	
	Br. moist SILT & ROCK FRAGMENTS, tr. cf sand		5	I	7-8-14	S-3	DS	1.5	
	Br. moist SILT, some rock frags, tr.cf sand								Water @ 8.0' Permeability
	Same		10	I	5-5-7	S-4	DS	1.5	@ 10.0'
	Brown moist SILT & ROCK FRAGMENTS, tr. cf sand		15	I	7-6-8	S-5	DS	1.2	Permeability @ 15.0'
712.8		18.0							
	Brown moist ROCK FRAGMENTS & SILT, tr cf sand (decomposed rock)		20	I	8-16-16	S-6	DS	1.0	Bottom of well @ 23.0'
	Same								
704.8	AUGER REFUSAL	26.0		I	100/0.5'	S-7	DS	0.5	
	Bottom of Hole @ 26.0'								

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 6.0 FT.
AFTER 64 HRS. 6.5 FT.
AFTER 24 HRS. ____ FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-18
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +798.6 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: G. Bennett
Date Started: 5/31/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/31/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
798.6	SURFACE	0.0	0						
	Tan moist SILT & ROCK FRAGMENTS, tr. cf sand (decomposed rock)			I	1-3-6	S-1	DS	1.5	
	Same			I	12-12-21	S-2	DS	1.5	
	Tan ROCK FRAGMENTS, some silt, tr. cf sand (decomposed rock)		5	I	11-19-27	S-3	DS	1.5	
	Same			I	16-19-21	S-4	DS	1.5	
	Tan SILT & ROCK FRAGS. tr.cf sand (decomp.rock)		10	I	20-25-32	S-5	DS	1.5	
	Tan ROCK FRAGS. & SILT, tr.cf sand (decomp.rock)			I	12-35-47	S-6	DS	1.5	
	Same		15	I	9-25-51	S-7	DS	1.5	
	Same			I	19-25-65	S-8	DS	1.5	
	Same		20	D	100/0.4'	S-9	DS	0.4	
773.1	AUGER REFUSAL	25.5	25	D	100/0.2'	S-10	DS	0.2	
		30.5	30	D	Cored	1st Run	RC	5.0	
	Tan-gray mica schist with quartzite lenses.	35.5	35	D	Cored	2nd Run	RC	5.0	
	Bottom of Hole @ 40.5'		40.5	D	Cored	3rd Run	RC	5.0	Bottom of well at 38.5'

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 27.5 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 36.8 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

TANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-19
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 3.75" — Foreman: R. Sies
Surf. Elev.: +810.4 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 4/27/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 4/29/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
810.4	SURFACE	0.0	0						
	Reddish-br. moist CLAY & SILT & ROCK FRAGMENTS tr.org. (roots)			I	1-2-2	S-1	DS	0.9	
807.4		3.0							
	Reddish-br. moist SILT & ROCK FRAGMENTS, tr. cf sand (decomp.rock)		5	I	6-7-8	S-2	DS	1.5	
	Br.-gray ROCK FRAGMENTS, some Silt (decomposed rock)		10	I	55-100/0.2'	S-3	DS	0.7	
	Same		15	I	33-35-24	S-4	DS	1.5	
	Same		20	I	100/0.3'	S-5	DS	0.3	Hit soft spot @ 23.0'. Introduced water @ 25.6'
	Same								
784.4	AUGER REFUSAL	26.0	25	I	57-100/0.1'	S-6	DS	0.6	
		31.0	30	D	Cored	1st Run	RC	4.7	Used roller bit to 26.0' HARD Mud seam @ 31.5'
	Green mica schist with quartzite lenses.	36.0	35	D	Cored	2nd Run	RC	1.3	Soft from 32.0'
				D	Cored	3rd Run	RC	1.9	37.0' getting Hard again 39.0' Soft

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 20.0 FT.
AFTER 64.5 HRS. 26.3 FT.
AFTER 24 HRS. ____ FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.

GEOTECHNICAL DIVISION

RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-19

Projects Name: Northern Sanitary Landfill — Job #: 81-3181

Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 3.75" — Foreman: R. Sies

Surf. Elev.: +810.4 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis

Date Started: 4/27/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 4/29/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
770.4	~~SURFACE~~	0.0	40						
		41.0		D	Cored	3rd Run	RC	1.9	Bottom of well @ 41.0'
	Same			D	Cored	4th Run	RC	2.0	
766.9		43.5							
	Bottom of hole @ 43.5'		45						

SAMPLER TYPE

DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS

D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH

AT COMPLETION 20.0 FT.

AFTER 64.5 HRS. 26.3 FT.

AFTER 24 HRS. ____ FT.

BORING METHOD

HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-20
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 3.75" — Foreman: R. Sies
Surf. Elev.: +771.9 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/3/83 — Pipe Size: 1-3/8 ID 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/3/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
771.9	SURFACE	0.0	0						
	Brown moist CLAY & SILT, some rock frags. tr. cf sand			I	1-1-3	S-1	DS	1.5	
	Brown moist clayey SILT, some rock frags. tr. cf sand			I	2-3-5	S-2	DS	1.5	
764.9	Same	7.0	5	I	5-5-12	S-3	DS	1.5	
	Brown moist ROCK FRAGMENTS & clayey SILT, tr. cf sand (decomposed rock)			I	18-15-17	S-4	DS	1.5	Water @ 10.0'
			10	I	5-7-7	S-5	DS	1.5	
	Br. moist ROCK FRAGMENTS & SILT, tr cf sand (decomposed rock)			I	7-9-12	S-6	DS	1.0	
			15						
	Same		20	I	18-35-67	S-7	DS	1.5	
	Same		25	I	12-15-25	S-8	DS	1.0	
	Br. & gray ROCK FRAGS., some silt (decomp. rock)								
739.9	AUGER REFUSAL	32.0	30	I	18-33-70	S-9	DS	1.5	
	Bottom of Hole @ 32.0'		35						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 6.0 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 5.7 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-21
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +827.8 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/20/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/20/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
827.8	SURFACE	0.0	0						
	Br.moist SILT, little rock frags., tr. cf sand.			I	1-2-2	S-1	DS	1.5	
	Br.moist SILT, some rock frags. tr. cf sand.			I	2-2-4	S-2	DS	1.5	
	Br.moist SILT & ROCK FRAGMENTS, tr. cf sand.		5	I	12-12-14	S-3	DS	1.5	
818.8	Same	9.0		I	12-21-27	S-4	DS	1.5	
	Tan ROCK FRAGS. & SILT, tr.cf sand (decomposed rock)		10	I	21-35-62	S-5	DS	1.5	
	Same			I	8-14-29	S-6	DS	1.5	
	Tan ROCK FRAGMENTS, some silt, tr cf sand (decomposed rock)		15	I	7-18-19	S-7	DS	1.5	
	Same			I	26-30-67	S-8	DS	1.5	
	Same		20	I	43-100/0.9'	S-9	DS	0.9	Hard @ 21.0' Introduced water @ 23.0'
804.8	AUGER REFUSAL	23.0							
		28.0	25	D	Cored	1st Run	RC	2.0	(Soft for Rock Coring)
	Gold-brown & green mica schist w/quartzite lenses.	33.0	30	D	Cored	2nd Run	RC	3.3	
789.8		38.0	35	D	Cored	3rd Run	RC	2.5	Bottom of well @ 32.5'
	Bottom of Hole @ 38.0'								

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 21.0 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. Dry FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.

GEOTECHNICAL DIVISION

RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-22

Projects Name: Northern Sanitary Landfill — Job #: 81-3181

Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies

Surf. Elev.: +804.2 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis

Date Started: 5/19/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/20/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
804.2	SURFACE	0.0	0						
	Br.moist SILT, some rock frags., tr. cf sand			I	2-2-4	S-1	DS	1.5	
801.2		3.0		I	7-9-16	S-2	DS	1.5	
	Gray-br. ROCK FRAGS. & yellowish-br.SILT,tr. cf sand(decomposed rock)		5	I	17-26-37	S-3	DS	1.5	Bag sample @ 5 - 7.5'
	Same								
	Gray-br.ROCK FRAGS.,some br.silt,tr. cf sand (decomp.rock)			I	12-13-22	S-4	DS	1.0	
			10						
	Same			I	16-35-35	S-5	DS	1.5	
	Same			I	100/0.5'	S-6	DS	0.5	
			15						
	Same			I	100/0.2'	S-7	DS	0.2	
786.2	AUGER REFUSAL	18.0							Introduced water @ 18.0'
			20	D	Cored	1st Run	RC	2.3	
	Silvery-gray mica schist w/quartzite lenses.	23.0							
			25	D	Cored	2nd Run	RC	1.9	
		28.0							
			30	D	Cored	3rd Run	RC	2.4	Bottom of well @ 31.0'
771.2		33.0							
	Bottom of Hole @ 33.0'								

SAMPLER TYPE

DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS

D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH

AT COMPLETION 10.0 FT.

AFTER ____ HRS. ____ FT.

AFTER 24 HRS. Dry FT.

BORING METHOD

HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-23
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +763.8 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: G. Bennett
Date Started: 5/31/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/1/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
+763.8	SURFACE	0.0	0						
761.8	Br. moist SILT, some rock frags., tr. cf sand	2.0		I	1-1-3	S-1	DS	1.0	
	Br. & gray ROCK FRAGMENTS & SILT, tr. cf sand (decomposed rock)		5	I	5-7-10	S-2	DS	1.5	
	Same		10	I	12-12-19	S-3	DS	1.5	
	Br.-gray ROCK FRAGMENTS, some silt, tr. cf sand (decomposed rock)		15	I	16-21-29	S-4	DS	1.5	
	Same		20	I	25-33-42	S-5	DS	1.0	
	Br.-gray ROCK FRAGMENTS, little silt (decomposed rock)		25	I	21-36-69	S-6	DS	1.0	
	Same		30	I	12-100/0.4'	S-7	DS	0.2	
730.8	AUGER REFUSAL	33.0							
	Silvery-gray and tan mica schist w/ quartzite lenses.		35	D	Cored	1st Run	RC	0.7	
		38.0		D	Cored	2nd Run	RC	0.8	

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 25.3 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 35.7 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.

GEOTECHNICAL DIVISION

RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-23

Projects Name: Northern Sanitary Landfill — Job #: 81-3181

Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies

Surf. Elev.: +763.8 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: G. Bennett

Date Started: 5/31/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/1/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
723.8	SURFACE	0.0	40	D	Cored	2nd Run	RC	0.8	
	Same	43.0							
			45	D	Cored	3rd Run	RC	1.2	Bottom of well @ 45.0'
715.8		48.0							
	Bottom of Hole @ 48.0'		50						

SAMPLER TYPE

OS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS

D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH

AT COMPLETION 25.3 FT.

AFTER ____ HRS. ____ FT.

AFTER 24 HRS. 35.7 FT.

BORING METHOD

HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-24
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +818.3 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ (2") — Inspector: G. Bennett
Date Started: 6/10/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/14/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
818.3	SURFACE	0.0	0						
	Reddish-br. moist clayey SILT, little rock frags. tr. cf sand			I	6-12-7	S-1	DS	1.0	
			5	I	37-100/0.3'	S-2	DS	0.8	
812.3	Same	6.0							
	Reddish-br. ROCK FRAGMENTS, some reddish-br. silt, tr. cf sand (decomposed rock)		10	I	11-97	S-3	DS	0.5	
	Same		15	I	30-24-11	S-4	DS	1.5	
	Same	19.1	20	I	55-100/0.1'	S-5	DS	0.6	
	Same(but gray-brown)								
793.3	AUGER REFUSAL	25.0	25	I	60-100/0.4'	S-6	DS	0.9	
		30.0	30	D	Cored	1st Run	RC	4.4	
	Green mica schist w/ quartzite lenses.	35.0	35	D	Cored	2nd Run	RC	4.0	
		40.0		D	Cored	3rd Run	RC	0.4	

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION Dry FT. @ 25.0'
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. ____ FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-24
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +818.3 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ (2") — Inspector: G. Bennett
Date Started: 6/10/83 — Pipe Size: 1-3/8 ID 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/14/83

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Plasticity, Size, Proportions	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
778.3	SURFACE	0.0	40						
	Same	45.0	45	D	Cored	4th Run	RC	0.4	
		50.0	50	D	Cored	5th Run	RC	1.2	
763.3		55.0	55	D	Cored	6th Run	RC	2.0	
	Bottom of Hole @ 55.0'								

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION _____ FT.
AFTER _____ HRS. _____ FT.
AFTER 24 HRS. _____ FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-25
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +860.6 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/2/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/2/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
860.6	SURFACE	0.0	0						
	Br. moist clayey SILT, little rock frags., tr. cf sand			I	1-1-3	S-1	DS	1.5	
	Same			I	5-7-11	S-2	DS	1.5	
853.6	Same	7.0	5	I	5-5-9	S-3	DS	1.5	
	Br.-gray ROCK FRAGMENTS, some br.silt(decomp.rock)			I	12-32-46	S-4	DS	1.5	
	Reddish-br. ROCK FRAGS., some silt (decomp.rock)		10	I	36-75-100/0.3'	S-5	DS	1.3	
	Br.-gray ROCK FRAGMENTS, some silt(decomp. rock)			I	48-100/0.4	S-6	DS	0.9	
845.1	AUGER REFUSAL	15.5	15	I	100/0.2'	S-7	DS	0.2	
	Gray mica schist w/ quartzite lenses.	20.5	20	D	Cored	1st Run	RC	1.5	Soft
	Tan-gray mica schist w/ quartzite lenses	25.5	25	D	Cored	2nd Run	RC	1.5	
830.1		30.5	30	D	Cored	3rd Run	RC	1.8	Bottom of well @ 27.5'
	Bottom of Hole @ 30.5'		35						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 4.3 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 24.2 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-26
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +813.2 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/13/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/17/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
813.2	SURFACE	0.0	0						
	Br.moist clayey SILT, little rock frags.,tr. organics(roots)tr.cf sand			I	4-4-5	S-1	DS	1.5	
				I	2-5-7	S-2	DS	1.5	
	Br.moist SILT,little rock frags.,tr.organ.(roots), tr.cf sand.		5	I	3-3-7	S-3	DS	1.5	
	Br.moist SILT, tr. rock frags., tr. cf sand								Introduced water @ 10.0'
803.2		10.0	10						Permeability @ 10.0'
	Brown ROCK FRAGMENTS & SILT, tr cf sand (decomposed rock)			I	14-10-11	S-4	DS	0.5	
			15						Permeability @ 14.4'
	Same			I	15-23-27	S-5	DS	1.0	
	Same		20	I	12-12-15	S-6	DS	1.0	
	Same		25	I	26-21-27	S-7	DS	1.5	Hard @ 27.5'
									Used roller bit to 30.5'
782.7	Same	30.5	30	I	102/0.3'	S-8	DS	0.3	
	AUGER REFUSAL			D	Cored	1st Run	RC	2.5	
	Red-tan (green increasing w/depth) mica schist with quartzite lenses.	35.5	35						Soft @ 34.5'
				D	Cored	2nd Run	RC	2.7	Hard @ 37.5'
			40						

SAMPLER TYPE
DS — DRIVEN SPLIT SPOON
PT — PRESSED SHELBY TUBE
CA — CONTINUOUS FLIGHT AUGER
RC — ROCK CORE

SAMPLE CONDITIONS
D — DISINTEGRATED
I — INTACT
U — UNDISTURBED
L — LOST

GROUND WATER DEPTH
AT COMPLETION 5.0 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. ____ FT.

BORING METHOD
HSA — HOLLOW STEM AUGERS
CFA — CONTINUOUS FLIGHT AUGERS
DC — DRIVING CASING
MD — MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-26
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: 813.2 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/13/83 — Pipe Size: 1-3/8 ID 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/17/83

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Plasticity, Size, Proportions	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
773.2	~~SURFACE~~	0.0	40			2nd Run			
	Same	40.5		D	Cored	3rd Run	RC	4.4	Bottom of well @ 42.5'
767.7		45.5	45						
	Bottom of Hole @ 45.5'								

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 5.0 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 41 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

TANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-27
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 3.75" — Foreman: R. Sies
Surf. Elev.: +747.7 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 4/28/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 4/29/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
747.7	SURFACE	0.0	0						
	Brown CLAY & SILT, tr.cf sand			I	1-2-3	S-1	DS	1.5	
	Br.moist clayey SILT, some rock frags.,little cf sand.		5	I	3-10-10	S-2	DS	1.5	Water @ 5.0'
	Br.moist clayey SILT, some rock frags, tr. cf sand.		10	I	2-5-9	S-3	DS	1.5	
734.7		13.0							
	Brown-gray moist SILT, some rock frags., tr. cf sand (decomposed rock)		15	I	3-8-16	S-4	DS	1.5	
	Brown-gray moist ROCK FRAGS. & SILT (decomposed rock)		20	I	53-100/0.2'	S-5	DS	0.5	Bottom of well @ 20.0'
722.7	AUGER REFUSAL	25.0	25						
	Bottom of Hole @ 25.0'		30						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 4.5 FT.
AFTER 68 HRS. 1.5 FT.
AFTER 24 HRS. ____ FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-28
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 3.75" — Foreman: R. Sies
Surf. Elev.: +848.1 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 4/25/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 4/27/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
848.1	SURFACE	0.5	0						
847.6	Br.moist clayey SILT, little rock frags.,tr. cf sand			I	2-2-2	S-1	DS	1.5	
	Reddish-brown & gray moist ROCK FRAGMENTS & SILT, tr.cf sand (decomposed rock)		5	I	8-11-11	S-2	DS	1.0	
	Same		10	I	12-48-100/.3'	S-3	DS	1.5	
	Same		15	I	52-72-100/.2'	S-4	DS	1.2	
	Tan ROCK FRAGMENTS,some brown silt(decomposed rock)		20	I	75-100/.1'	S-5	DS	.6	Note:Introduced water @ 23.5' Roller bit to 24.0' to start RC
824.1	Tan ROCK FRAGS.,little silt (decomp. rock) AUGER REFUSAL	24.0		I	100/.1'	S-6	DS	.1	
		25.0	25	D	Cored	1st Run	RC	.7	
		28.5		D	Cored	2nd Run	RC	2.8	
	Tan-gray (some green) mica schist w/a concentration of weathered iron minerals, also w/ quartzite lenses.	33.5	30	D	Cored	3rd Run	RC	4.0	
		38.5	35	D	Cored	4th Run	RC	3.6	Lost water @ 36.0'
			40						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 40.5 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 42.5 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-28
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 3.75" — Foreman: R. Sies
Surf. Elev.: +848.1 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 4/25/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 4/27/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
808.1	SURFACE		40						Water @ 33.5'
		43.5		L	Cored	5th Run	RC	0.0	Water @ 43.0'
			45	L	Cored	6th Run	RC	0.0	
	Same	48.0							
			50	D	Cored	7th Run	RC	0.3	51.0' got hard for 1.0 '
		53.0							Water return @ 51.0'
			55	D	Cored	8th Run	RC	0.9	Bottom of well @ 55.0'
790.1		58.0							
	Bottom of Hole @ 58.0'		60						

SAMPLER TYPE
OS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 40.5 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 42.5 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-29
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +877.6 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ(2") — Inspector: G. Bennett
Date Started: 6/8/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/8/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
877.6	SURFACE	0.0	0						
875.6	Brown moist SILT & CLAY tr.rock frags.,tr. cf sand	2.0		I	1-2-3	S-1	DS	1.5	
	Br. SILT & ROCK FRAGS., tr. cf sand (decomp.rock)		5	I	5-12-12	S-2	DS	1.5	
	Same		10	I	8-8-11	S-3	DS	1.5	
	Br. & gray ROCK FRAGS., & SILT, tr. cf sand (decomposed rock)		15	I	47-100/0.2'	S-4	DS	0.7	
858.6	AUGER REFUSAL	19.0		I	100/0.2'	S-5	DS	0.2	
	Tan (greening w/depth) well weathered mica schist w/quartzite lenses.	24.0	20	D	Cored	1st Run	RC	2.1	
		29.0	25	D	Cored	2nd Run	RC	1.5	
843.6		34.0	30	D	Cored	3rd Run	RC	2.5	Bottom of well @ 32.5'
	Bottom of Hole @ 34.0'		35						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION *Dry FT. @19.0'
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 30.5 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-30
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +842.7 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ (2") — Inspector: G. Bennett
Date Started: 6/9/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/9/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
842.7	SURFACE	0.0	0						
	Br. moist SILT, tr.rock fragments, tr. cf sand			I	1-3-5	S-1	DS	1.5	
840.7		2.0							
	Yellowish-tan moist SILT (decomposed rock)		5	I	5-5-8	S-2	DS	1.5	
	Yellowish-tan moist SILT some rock fragments (decomposed rock)		10	I	8-12-16	S-3	DS	1.5	
	Same		15	I	5-16-16	S-4	DS	1.5	
	Same		20	I	20-23-32	S-5	DS	1.0	
	Tan SILT, tr. rock frags. (decomposed rock)		25	I	19-21-38	S-6	DS	1.5	
	Tan SILT,some rock frags. tr.cf sand(decomp.rock)								
813.2	AUGER REFUSAL	29.5		I	67- 100/0.3'	S-7	DS	0.7	
	Brown mica schist w/ quartzite lenses.		30	D	Cored	1st Run	RC	0.9	
		34.5							
			35	D	Cored	2nd Run	RC	0.5	
		39.5							

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION _____ FT.
AFTER _____ HRS. _____ FT.
AFTER 24 HRS. _____ FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.

GEOTECHNICAL DIVISION

RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-30

Projects Name: Northern Sanitary Landfill — Job #: 81-3181

Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies

Surf. Elev.: +842.7 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ(2") — Inspector: G. Bennett

Date Started: 6/9/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/9/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
802.7	SURFACE	39.5	40						
	Same			D	Cored	3rd Run	RC	1.3	Bottom of Well @ 42.0'
798.2		44.5							
	Bottom of Hole @ 44.5'		45						

SAMPLER TYPE

OS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS

D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH

AT COMPLETION Dry FT.
@ 1' of Soil Boring
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. ____ FT.

BORING METHOD

HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.

GEOTECHNICAL DIVISION

RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-31

Projects Name: Northern Sanitary Landfill — Job #: 81-3181

Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies

Surf. Elev.: +803.6 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: G. Bennett

Date Started: 6/3/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/6/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
803.6	SURFACE	0.0	0						
	Reddish-brown moist SILT little rock fragments, tr. cf sand			I	2-7-5	S-1	DS	1.5	
800.6		3.0							
	Br. moist SILT & red gray ROCK FRAGMENTS, tr. cf sand (decomposed rock)		5	I	5-5-9	S-2	DS	1.5	
	Same		10	I	9-18-17	S-3	DS	1.5	
	Brown ROCK FRAGMENTS, some brown silt (decomposed rock)		15	I	5-8-12	S-4	DS	1.5	
	Same		20	I	12-12-14	S-5	DS	1.5	
	Same		25	I	8-12-34	S-6	DS	1.5	
	Same		30	I	19-27-45	S-7	DS	1.5	
	Same		35	I	70 $\frac{100}{0.3}$'	S-8	DS	0.9	

SAMPLER TYPE

DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS

D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH

AT COMPLETION Dry FT.
*at completion of soil portion.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 53.0 FT.

BORING METHOD

HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-31
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +803.6 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: G. Bennett
Date Started: 6/3/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/6/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
763.6	SURFACE		40						
	Same (some gray rocks)			I	5-25-54	S-9	DS	1.0	
	Same		45						
757.6	AUGER REFUSAL	46.0		I	60-100/0.1'	S-10	DS	0.6	
	Tan-red with some green, mica schist w/quartzite lenses.		50	D	Cored	1st Run	RC	1.0	
		51.0							
		56.0	55	D	Cored	2nd Run	RC	4.0	
									Bottom of well @ 58.5'
742.6		61.0	60	D	Cored	3rd Run	RC	1.5	
	Bottom of Hole @ 61.0'		65						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION Dry* FT.
*After completion of Soil Portion
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. 54.0 FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-32
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER
Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +795.5 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: H. Jarvis
Date Started: 5/18/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 5/19/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
795.5	SURFACE	0.0	0						
	Br.moist clayey SILT,some rock frags.tr. cf sand			I	1-2-5	S-1	DS	1.5	Bag sample taken 3-8'
	Br.moist SILT,some rock fragments, tr.cf sand.		5	I	5-8-13	S-2	DS	1.5	
787.5		8.0							Introduced water @ 10.0'
	Br. moist SILT & ROCK FRAGMENTS, tr. cf sand (decomposed rock)		10	I	10-10-14	S-3	DS	1.5	Permeability @ 10.0'
	Reddish-br. moist ROCK FRAGS. & SILT,tr. cf sand(decomposed rock)		15	I	13-36-59	S-4	DS	1.0	Permeability @ 15.0'
777.5	AUGER REFUSAL	18.0							
	Green mica schist w/ quartzite lenses.	23.0	20	D	Cored	1st Run	RC	3.7	Mud seam 24.5 to 27.0'
		28.0	25	D	Cored	2nd Run	RC	1.5	
		33.0	30	D	Cored	3rd Run	RC	3.0	Bottom of well @ 32.0'
762.5	Bottom of Hole @ 33.0'		35						

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION 5.0 FT.
AFTER ____ HRS. ____ FT.
AFTER 24 HRS. N/A FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-33
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +836.2 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: G. Bennett
Date Started: 6/14/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/17/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
836.2	SURFACE	0.0	0						
	Br. moist SILT, little rock frags., tr. cf sand			D	5-11-25	S-1	DS	1.5	
832.2	Same	4.0		D	35- 100/0.2'	S-2	DS	0.5	
	Tan ROCK FRAGMENTS, little silt (decomposed rock)		5	D	100/0.3'	S-3	DS	0.2	
			10						
821.2	AUGER REFUSAL	15.0	15	L	100/0.5'	S-4	DS	0	
	Tan-gray mica schist with quartzite lenses.	20.0	20	D	Cored	1st Run	RC	1.5	
		25.0	25	L	Cored	2nd Run	RC	0	
		30.0	30	L	Cored	3rd Run	RC	0	
		35.0	35	L	Cored	4th Run	RC	0	
			40	L	Cored	5th Run	RC	0	

SAMPLER TYPE
DS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION _____ FT.
AFTER _____ HRS. _____ FT.
AFTER 24 HRS. _____ FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CENTURY ENGINEERING, INC.
GEOTECHNICAL DIVISION
RECORD OF SOIL EXPLORATION

Contracted With: Carroll County — Boring #: D-33
Projects Name: Northern Sanitary Landfill — Job #: 81-3181
Location: Carroll County Route 140

SAMPLER

Datum: USGS — Hammer Wt.: 140 Lbs. — Hole Diameter: 7" — Foreman: R. Sies
Surf. Elev.: +830.2 Ft. — Hammer Drop: 30 In. — Rock Core Dia.: NQ — Inspector: G. Bennett
Date Started: 6/14/83 — Pipe Size: 1-3/8 ID, 1-3/4 OD In. — Boring Method: HSA — Date Completed: 6/17/83

ELEV.	SOIL DESCRIPTION (Color, Moisture, Density, Plasticity, Size, Proportions)	STRA. DEPTH	DEPTH SCALE	COND	Blows/6"	NO.	TYPE	REC.	BORING & SAMPLING NOTES
796.2	SURFACE	0.0	40						
	Same	45.0	45	D	Cored	6th Run	RC	1.0	
788.2		48.0		D	Cored	7th Run	RC	1.8	
	Bottom of Hole @ 48.0'		50						

SAMPLER TYPE
OS – DRIVEN SPLIT SPOON
PT – PRESSED SHELBY TUBE
CA – CONTINUOUS FLIGHT AUGER
RC – ROCK CORE

SAMPLE CONDITIONS
D – DISINTEGRATED
I – INTACT
U – UNDISTURBED
L – LOST

GROUND WATER DEPTH
AT COMPLETION _____ FT.
AFTER _____ HRS. _____ FT.
AFTER 24 HRS. _____ FT.

BORING METHOD
HSA – HOLLOW STEM AUGERS
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140 # HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

APPENDIX B WELL COMPLETION FORMS

C 3841 SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 24 83

Depth of Well 30 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CT-81-0243

OWNER CARROLL COUNTY (last name) MARYLAND (first name)

STREET OR RFD TOWN WESTMINSTER, MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Decay Silt with Mica	0	30	✓

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. (TOP) to 3 ft. (BOTTOM) (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	19

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to
1			
2			

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN	TYPE	DEPTH (nearest ft.)	
1	PL	19	29
2			
3			

SLOT SIZE 1 010 2 3

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 1 to 29

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour) 0

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height) + above – below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER

A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 307

Richard O Rice

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

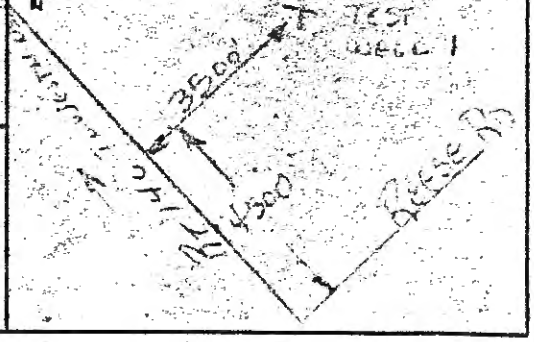
SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) WQ

TELESCOPE CASING LOG INDICATOR OTHER DATA

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



C1 3842 SEQUENCE NO. (OEP USE ONLY)

THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 05 83

Depth of Well 23 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" 81-0244

OWNER CARROLL COUNTY last name MARYLAND first name

STREET OR RFD TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells.

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING.

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
BROWN SILT	0	23	✓
WITH MICA			

CIRCLE APPROPRIATE LETTER

A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 3dr

Richard D Price

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. (TOP) to 3 ft. (BOTTOM) (enter 0 if from surface)

CASING RECORD
casing types — insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	10

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

EACH SCREEN		DEPTH (nearest ft.)	
1	PL	10	20
2			
3			

SLOT SIZE: 1 010 2 3

DIAMETER OF SCREEN 4 (NEAREST INCH)

GRAVEL PACK from 3 to 21

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) WQ

70 TELESCOPE CASING 72 LOG INDICATOR 74 75 76 OTHER DATA

C3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

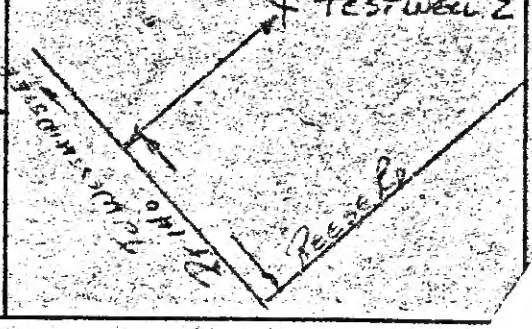
PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above – below LAND SURFACE (nearest foot) 11

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)

N



C 1 3843 SEQUENCE NO. (OEP USE ONLY)

THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

ATE Received

DATE WELL COMPLETED 05 05 83

Depth of Well 22 2 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0245

OWNER CARROLL COUNTY MD
last name first name

STREET OR RFD TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

SCRIPTION (Use ditional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
BROWN S.H.	0	22	W

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL
CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. TOP to 2 ft. BOTTOM (enter 0 if from surface)

CASING RECORD
casing types - insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	11

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole - insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN		DEPTH (nearest ft.)	
1	PL	10	20
2			
3			

SLOT SIZE 010

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 6 to 22

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED

PLACE (A,C,J,P,R,S,T,O) IN BOX-SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above / - below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

T TEST WELL CONVERTED TO PRODUCTION WELL

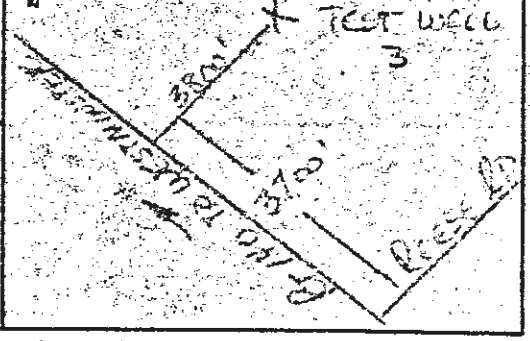
I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

E SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) WQ

TELESCOPE CASING LOG INDICATOR OTHER DATA

C 1 3844 SEQUENCE NO. (OEP USE ONLY)

(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 06 02 83

Depth of Well 21 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0245

OWNER CARROLL COUNTY MD.
last name first name

STREET OR RFD TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Pleasure Sand	0	21	✓

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. to 3 ft. (enter 0 if from surface)

CASING RECORD
casing types: Insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	4	10

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole: Insert appropriate code below

ST STEEL BR BRASS BRONZE PL PLASTIC HO OPEN HOLE OT OTHER

C 2

DEPTH (nearest ft.)

EACH SCREEN		from	to
1	PL	10	20
2			
3			

SLOT SIZE: .010

DIAMETER OF SCREEN 4 (NEAREST INCH)

GRAVEL PACK from 6 to 20

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above / − below LAND SURFACE 1 (nearest foot)

CIRCLE APPROPRIATE LETTER

A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

T TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

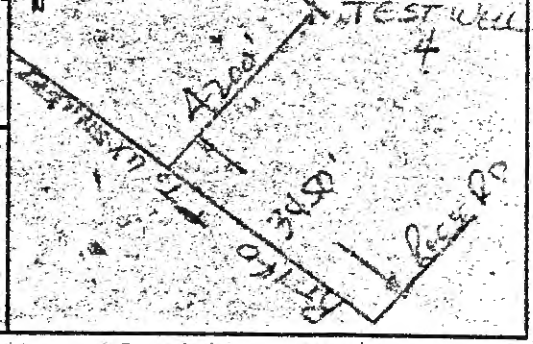
DRILLERS IDENT. NO. 267

Richard O. Fiel

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)
T (E.R.O.S.) W Q

TELESCOPE CASING | LOG INDICATOR | OTHER DATA

C 1 | 3845 | SEQUENCE NO. (OEP USE ONLY)

(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 06 82

Depth of Well 32 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0247

OWNER CARROLL COUNTY, MD (last name, first name)

STREET OR RFD

TOWN WESTMINSTER MD 2157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	21	
Rock	21	32	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 5

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. to 2 ft. (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	4	18

OTHER CASING (if used)

	diameter inch	depth (feet) from	to
EACH CASING			

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

		DEPTH (nearest ft.)	
EACH SCREEN 1	PL	19	28
2			
3			

SLOT SIZE .010

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 16 to 32

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES (NO)

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX: SEE ABOVE

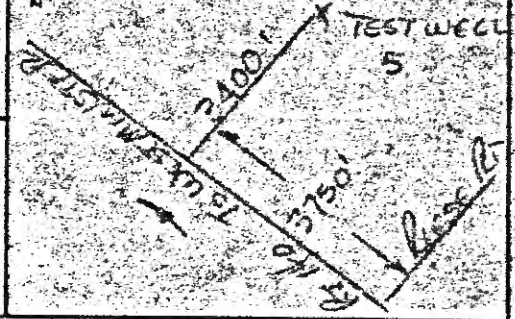
CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height) + above / − below LAND SURFACE (nearest foot)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



CIRCLE APPROPRIATE LETTER

A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

Richard P. Rice
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) WQ

TELESCOPE CASING LOG INDICATOR OTHER DATA

DRILLER

C 1 3846 — SEQUENCE NO. (OEP USE ONLY) (THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 06 08 83

Depth of Well 50 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0248

OWNER CARROLL COUNTY, MD.
last name first name

STREET OR RFD

TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	35	
Rock	35	50	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. TOP to 30 ft. BOTTOM

(enter 0 if from surface)

CASING RECORD
casing types — insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	39

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN		DEPTH (nearest ft.)	
1	PL	38	48
2			
3			

SLOT SIZE .020

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 33 to 50

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.) 1

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine

C centrifugal R rotary O other (describe below)

J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES (NO)

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above / − below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER

A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

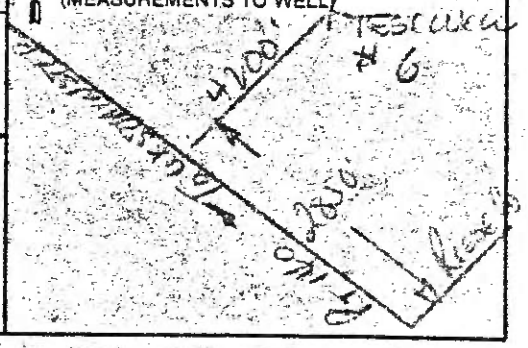
HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

Richard D. Fair
DRILLERS SIGNATURE MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY
(NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) W Q

TELESCOPE CASING — LOG INDICATOR — OTHER DATA

DRILLER

C 1 | 3847 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 24 83

Depth of Well 26 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0239

OWNER CARROLL COUNTY MD (last name / first name)

STREET OR RFD

TOWN WESTMINSTER, MD

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
BROWN SILT WITH MICA	0	10.5	
ROCK	10.5	25.5	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y / no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 1 NO. OF POUNDS

GALLONS OF WATER 13

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. to 9 ft. (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	4	14

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

EACH SCREEN	screen type	DEPTH (nearest ft.)	
1	PL	14	24
2			
3			

SLOT SIZE 010

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 9 to 26

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES / NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX-SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

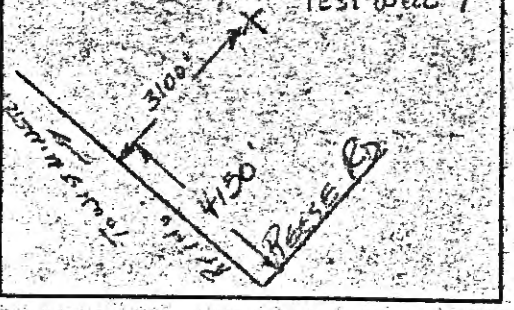
PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above / − below LAND SURFACE (nearest foot) 1

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



CIRCLE APPROPRIATE LETTER
- A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
- E ELECTRIC LOG OBTAINED
- P TEST WELL CONVERTED TO PRODUCTION WELL

HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 347

Richard D. Price
DRILLERS SIGNATURE
MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman esponsible for sitework if different from permittee)

OEP USE ONLY
(NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) WQ

TELESCOPE CASING | LOG INDICATOR | OTHER DATA

DRILLER

C 1 3848 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 27 83

Depth of Well 36 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0250

OWNER CARROLL COUNTY MARYLAND (last name / first name)

STREET OR RFD

TOWN WESTMINSTER MD. 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	21	
Rock	21	36	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y / no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. TOP to 3 ft. BOTTOM (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	23

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN	TYPE	DEPTH (nearest ft.)	
1	PL	13	33
2			
3			

SLOT SIZE .010

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 19 to 36

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX-SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above / − below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER

A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

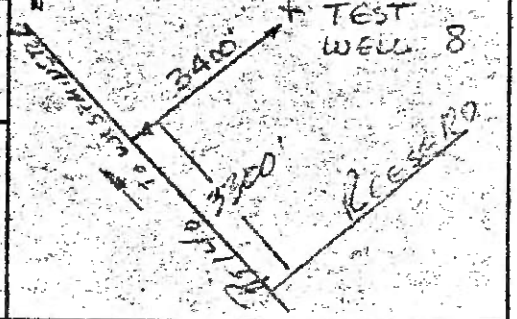
DRILLERS IDENT. NO. 262

Richard O. Orr

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY
(NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) WQ

TELESCOPE CASING — LOG INDICATOR — OTHER DATA

DRILLER

C 1 | 3849 | SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 03 83

Depth of Well 22 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CR-81-0251

OWNER CARROLL COUNTY MARYLAND (last name / first name)

STREET OR RFD TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
BROWN SH WITH MICA	0	22	✓

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y / no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 7 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. (TOP) to 3 ft. (BOTTOM) (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	10

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN	DEPTH (nearest ft.)	
1	PL 10	20
2		
3		

SLOT SIZE 1 010 2 3

DIAMETER OF SCREEN 4 (NEAREST INCH)

GRAVEL PACK from 6 to 20

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES / NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above / − below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER

A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

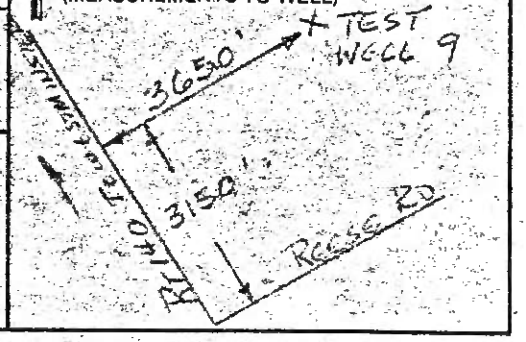
I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 347

DRILLERS SIGNATURE MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY
(NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) WQ

TELESCOPE CASING | LOG INDICATOR | OTHER DATA

DRILLER

C1 3850 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05/06/83

Depth of Well 48 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0252

OWNER
STREET OR RFD (last name, first name) TOWN
SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
BROWN SH WITH MICA	0	33	
ROCK	33	48	✓

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) YES (Y) NO (N)
TYPE OF GROUTING MATERIAL
CEMENT (CM) BENTONITE CLAY (BC)
NO. OF BAGS 1 NO. OF POUNDS
GALLONS OF WATER 15
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. TOP to 3 ft. BOTTOM (enter 0 if from surface)

CASING RECORD
casing types — Insert appropriate code below
ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	36

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below
ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C2

EACH SCREEN	TYPE	DEPTH (nearest ft.)	
1	PL	36	46
2			
3			

SLOT SIZE .010
DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 36 to 48
IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)
T (E.R.O.S.) WQ
70 TELESCOPE CASING 72 LOG INDICATOR OTHER DATA

C3

PUMPING TEST
HOURS PUMPED (nearest hour)
PUMPING RATE (gal. per min. to nearest gal.)
METHOD USED TO MEASURE PUMPING RATE
WATER LEVEL (distance from land surface)
BEFORE PUMPING
WHEN PUMPING
TYPE OF PUMP USED (for test)
A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

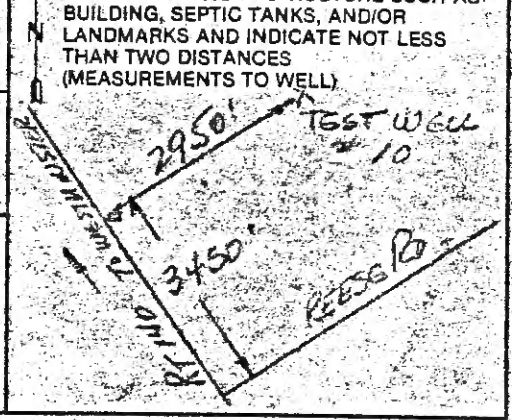
PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES (NO)
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX-SEE ABOVE:
CAPACITY: GALLONS PER MINUTE (to nearest gallon)
PUMP HORSE POWER
PUMP COLUMN LENGTH (nearest ft.)
CASING HEIGHT (circle appropriate box and enter casing height) + above / − below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)
SITE SUPERVISOR (sign, of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



DRILLER

C 1 | 3851 | SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 23 83

Depth of Well 33 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0253

OWNER CARROLL COUNTY, MD (last name / first name)

STREET OR RFD

TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG - Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	18	
Rock	18	33	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y / no N
TYPE OF GROUTING MATERIAL
CEMENT CM BENTONITE CLAY BC
NO. OF BAGS 2 NO. OF POUNDS
GALLONS OF WATER 15
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. TOP to 2 ft. BOTTOM (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below
ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	21

EACH CASING — OTHER CASING (if used)

diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below
ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN

	DEPTH (nearest ft.)	
1	PL 21	31
2		
3		

SLOT SIZE 010
DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 16 to 33
IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE-CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

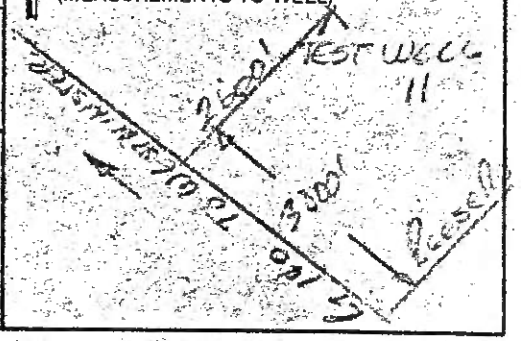
OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)
T (E.R.O.S.) WQ
TELESCOPE CASING | LOG INDICATOR | OTHER DATA

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)
PUMPING RATE (gal. per min. to nearest gal.)
METHOD USED TO MEASURE PUMPING RATE
WATER LEVEL (distance from land surface)
BEFORE PUMPING
WHEN PUMPING
TYPE OF PUMP USED (for test)
A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES (NO)
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:
CAPACITY: GALLONS PER MINUTE (to nearest gallon)
PUMP HORSE POWER
PUMP COLUMN LENGTH (nearest ft.)
CASING HEIGHT (circle appropriate box and enter casing height) + above / − below LAND SURFACE (nearest foot)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



DRILLER

C1 3852 — SEQUENCE NO. (OEP USE ONLY) — (THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 25 83

Depth of Well 19 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0254

OWNER CARROLL COUNTY, MD (last name) (first name) STREET OR RFD TOWN WESTMINSTER, MD. 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	35	
Rock	35	19	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. TOP to 3 ft. BOTTOM (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	4	8

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C2

EACH SCREEN		DEPTH (nearest ft.)	
1	PL	7	17
2			
3			

SLOT SIZE .010

DIAMETER OF SCREEN 4 (NEAREST INCH)

GRAVEL PACK from 5 to 19

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES (NO)

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

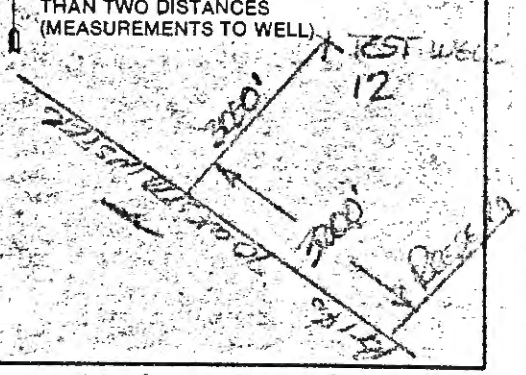
PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above − below LAND SURFACE (nearest foot)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



CIRCLE APPROPRIATE LETTER

A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) WQ

TELESCOPE CASING LOG INDICATOR OTHER DATA

DRILLER

C 1 | 3853 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER: n/a

DATE Received:

DATE WELL COMPLETED: 06 02 83

Depth of Well: 26 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL": CL-81-0255

OWNER: CARROLL COUNTY, MD (last name / first name)

STREET OR RFD:

TOWN: WESTMINSTER, MD. 21157

SUBDIVISION: SECTION: LOT:

WELL LOG — Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	26	✓

CIRCLE APPROPRIATE LETTER

A — A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E — ELECTRIC LOG OBTAINED

P — TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

DRILLERS SIGNATURE MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

GROUTING RECORD

WELL HAS BEEN GROUTED (Circle Appropriate Box): yes [Y] no [N]

TYPE OF GROUTING MATERIAL

CEMENT [CM] — BENTONITE CLAY [BC]

NO. OF BAGS: 2 NO. OF POUNDS:

GALLONS OF WATER: 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. (TOP) to 3 ft. (BOTTOM) (enter 0 if from surface)

CASING RECORD (casing types — insert appropriate code below)

[ST] STEEL [CO] CONCRETE [PL] PLASTIC [OT] OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	14

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD (screen type or open hole — insert appropriate code below)

[ST] STEEL [BR] BRASS BRONZE [HO] OPEN HOLE [PL] PLASTIC [OT] OTHER

C 2

EACH SCREEN	TYPE	DEPTH (nearest ft.)	
1	PL	14	24
2			
3			

SLOT SIZE: .010

DIAMETER OF SCREEN: 2 (NEAREST INCH)

GRAVEL PACK from 6 to 24

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T: (E.R.O.S.): WQ:

TELESCOPE CASING: LOG INDICATOR: OTHER DATA:

C 3

PUMPING TEST

HOURS PUMPED (nearest hour):

PUMPING RATE (gal. per min. to nearest gal.):

METHOD USED TO MEASURE PUMPING RATE:

WATER LEVEL (distance from land surface)

BEFORE PUMPING:

WHEN PUMPING:

TYPE OF PUMP USED (for test)

[A] air [P] piston [T] turbine

[C] centrifugal [R] rotary [O] other (describe below)

[J] jet [S] submersible

PUMP INSTALLED

DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO): YES (NO)

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon):

PUMP HORSE POWER:

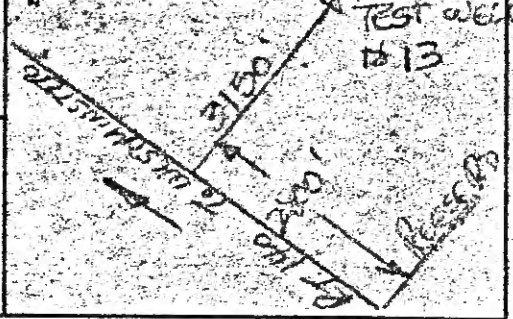
PUMP COLUMN LENGTH (nearest ft.):

CASING HEIGHT (circle appropriate box and enter casing height)

[+] above [-] below LAND SURFACE (nearest foot)

LOCATION OF WELL ON LOT

SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



DRILLER

C 1 3854 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 15 83

Depth of Well 19 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0256

OWNER CARROLL COUNTY, MD.
last name first name

STREET OR RFD TOWN WESTMINSTER, MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	4	
Rock	4	19	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N
TYPE OF GROUTING MATERIAL
CEMENT CM BENTONITE CLAY BC
NO. OF BAGS 2 NO. OF POUNDS
GALLONS OF WATER 15
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. to 3 ft.
TOP (enter 0 if from surface) BOTTOM

CASING RECORD
casing types insert appropriate code below
ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	4	5

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below
ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN	DEPTH (nearest ft.)	
1	PL 5	15
2		
3		

SLOT SIZE 010
DIAMETER OF SCREEN 4 (NEAREST INCH)

GRAVEL PACK from 4 to 19
IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)
PUMPING RATE (gal. per min. to nearest gal.)
METHOD USED TO MEASURE PUMPING RATE
WATER LEVEL (distance from land surface)
BEFORE PUMPING
WHEN PUMPING
TYPE OF PUMP USED (for test)
A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:
CAPACITY: GALLONS PER MINUTE (to nearest gallon)
PUMP HORSE POWER
PUMP COLUMN LENGTH (nearest ft.)
CASING HEIGHT (circle appropriate box and enter casing height)
+ above – below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

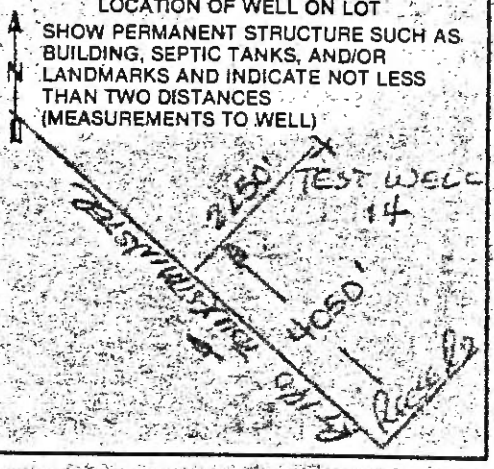
HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

Richard D. Price
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)
T (E.R.O.S.) WQ
TELESCOPE CASING LOG INDICATOR OTHER DATA

DRILLER

C 1 | 3855 | SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 11 83

Depth of Well 34 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CT-81-0257

OWNER CARROLL COUNTY, MD
last name first name

STREET OR RFD TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check If water bearing
Brown Silt	0	8	
Rock	19	34	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL
CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS
GALLONS OF WATER 12
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. to 3 ft.
(enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	23

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

EACH SCREEN	SCREEN TYPE	DEPTH (nearest ft.)	
1	PL	23	33
2			
3			

SLOT SIZE 020

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 16 to 34

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)
PUMPING RATE (gal. per min. to nearest gal.)
METHOD USED TO MEASURE PUMPING RATE
WATER LEVEL (distance from land surface)
BEFORE PUMPING
WHEN PUMPING

TYPE OF PUMP USED (for test)
A air P piston T turbine
C centrifugal R rotary O other (describe below)
J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:
CAPACITY: GALLONS PER MINUTE (to nearest gallon)
PUMP HORSE POWER
PUMP COLUMN LENGTH (nearest ft.)
CASING HEIGHT (circle appropriate box and enter casing height)
+ above / − below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

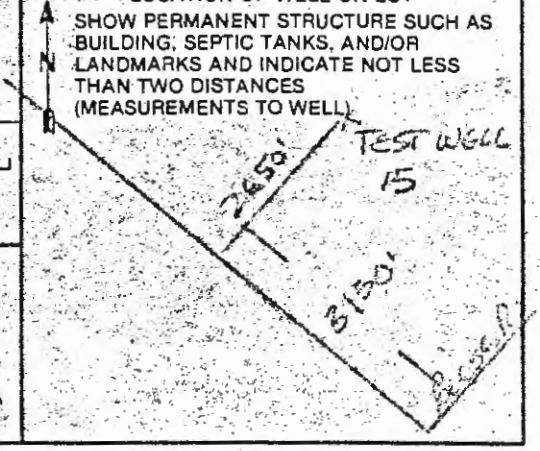
I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

DRILLERS SIGNATURE
MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)
T (E.R.O.S.) WQ
TELESCOPE CASING LOG INDICATOR OTHER DATA

DRILLER

C 1 3856 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 6 5 0 5 9 3

Depth of Well 34 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" C L - 8 1 - 0 2 5 8

OWNER CARROLL COUNTY, MD.
last name first name
STREET OR RFD TOWN WESTMINSTER MD 21157
SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	19	
Rock	19	34	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N
TYPE OF GROUTING MATERIAL
CEMENT C M BENTONITE CLAY B C
NO. OF BAGS 2 NO. OF POUNDS
GALLONS OF WATER 15
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. to 3 ft.
TOP BOTTOM (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below
S T STEEL C O CONCRETE P L PLASTIC O T OTHER

MAIN CASING TYPE: P L
Nominal diameter top (main) casing (nearest inch): 4
Total depth of main casing (nearest foot): 23

OTHER CASING (if used) EACH CASING
diameter (inch) depth (feet) from to

SCREEN RECORD
screen type or open hole insert appropriate code below
S T STEEL B R BRASS BRONZE P L PLASTIC H O OPEN HOLE O T OTHER

C 2

EACH SCREEN	TYPE	DEPTH (nearest ft.)	
1	P L	23	32
2			
3			

SLOT SIZE 1 010 2 3
DIAMETER OF SCREEN 4 (NEAREST INCH)
GRAVEL PACK from 18 to 34
IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)
PUMPING RATE (gal. per min. to nearest gal.)
METHOD USED TO MEASURE PUMPING RATE
WATER LEVEL (distance from land surface)
BEFORE PUMPING
WHEN PUMPING
TYPE OF PUMP USED (for test)
A air P piston T turbine
C centrifugal R rotary O other (describe below)
J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:
CAPACITY: GALLONS PER MINUTE (to nearest gallon)
PUMP HORSE POWER
PUMP COLUMN LENGTH (nearest ft.)
CASING HEIGHT (circle appropriate box and enter casing height)
+ above / - below LAND SURFACE
1 (nearest foot)

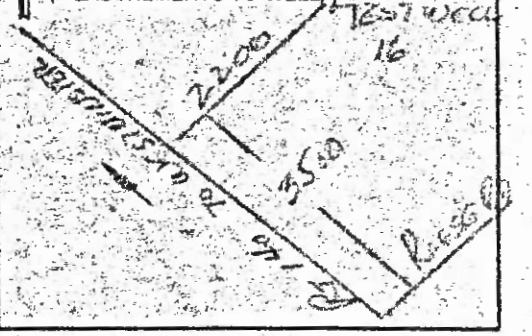
CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13, "WELL CONSTRUCTION", AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)
T (E.R.O.S.) WQ
TELESCOPE CASING LOG INDICATOR OTHER DATA

DRILLER

C1 3857 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 13 83

Depth of Well 26 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" d - 81-0259

OWNER CARROLL COUNTY, MD (last name) (first name)

STREET OR RFD

TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	26	✓

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y / no N
TYPE OF GROUTING MATERIAL
CEMENT CM BENTONITE CLAY BC
NO. OF BAGS 2 NO. OF POUNDS
GALLONS OF WATER 15
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. to 3 ft.
(enter 0 if from surface)

CASING RECORD
casing types — insert appropriate code below
ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	4	14

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below
ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C2

EACH SCREEN	DEPTH (nearest ft.)	
1	PL	14 to 24
2		
3		

SLOT SIZE 1 010 2 3
DIAMETER OF SCREEN 2 (NEAREST INCH)
GRAVEL PACK from 6 to 26
IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C3

PUMPING TEST
HOURS PUMPED (nearest hour)
PUMPING RATE (gal. per min. to nearest gal.)
METHOD USED TO MEASURE PUMPING RATE
WATER LEVEL (distance from land surface)
BEFORE PUMPING
WHEN PUMPING
TYPE OF PUMP USED (for test)
A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES (NO)
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE
TYPE OF PUMP INSTALLED
PLACE (A,C,J,P,R,S,T,O) IN BOX-SEE ABOVE:
CAPACITY: GALLONS PER MINUTE (to nearest gallon)
PUMP HORSE POWER
PUMP COLUMN LENGTH (nearest ft.)
CASING HEIGHT (circle appropriate box and enter casing height)
+ above / - below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

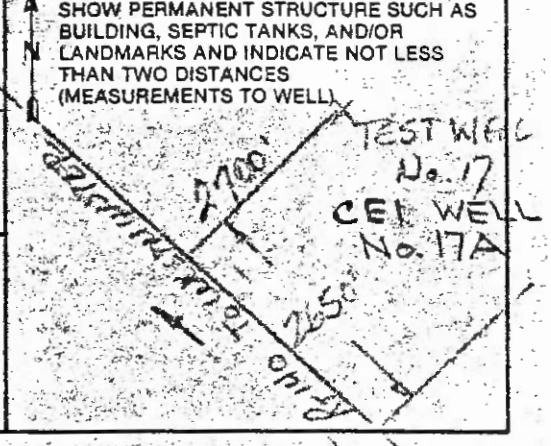
I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 347

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY
(NOT TO BE FILLED IN BY DRILLER)
T (E.R.O.S.) WQ
TELESCOPE CASING
LOG INDICATOR
OTHER DATA

DRILLER

1 3858 SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 31 83

Depth of Well 411 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0260

OWNER CARROLL COUNTY, MD.
last name first name

STREET OR RFD TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells.

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	26	
Rock	26	41	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL
CEMENT CM BENTONITE CLAY BC
NO. OF BAGS 2 NO. OF POUNDS
GALLONS OF WATER 15
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. to 3 ft. (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below
ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	29

OTHER CASING (If used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below
ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN		DEPTH (nearest ft.)	
1	FL	29	29
2			
3			

SLOT SIZE 1 010 2 3
DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 23 to 41
IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)
PUMPING RATE (gal. per min. to nearest gal.)
METHOD USED TO MEASURE PUMPING RATE
WATER LEVEL (distance from land surface)
BEFORE PUMPING
WHEN PUMPING
TYPE OF PUMP USED (for test)
A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:
CAPACITY: GALLONS PER MINUTE (to nearest gallon)
PUMP HORSE POWER
PUMP COLUMN LENGTH (nearest ft.)
CASING HEIGHT (circle appropriate box and enter casing height) + above – below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

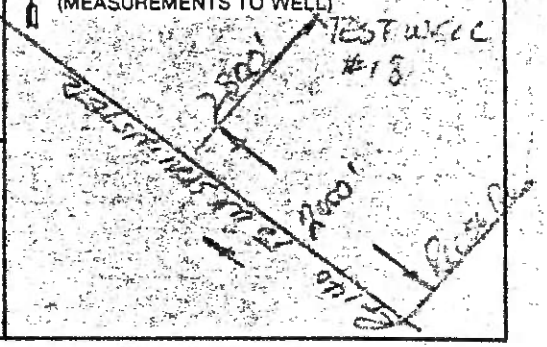
I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO.

Richard D. Dix
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)
T (E.R.O.S.) WQ
TELESCOPE CASING LOG INDICATOR OTHER DATA

DRILLER

C 1 **3859** SEQUENCE NO. (OEP USE ONLY)

(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 04 28 83

Depth of Well 44 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0261

OWNER CARROLL COUNTY, MD
last name first name

STREET OR RFD TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	26	
Rock	26	44	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y / no N

TYPE OF GROUTING MATERIAL:
CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS
GALLONS OF WATER 15
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. TOP to 3 ft. BOTTOM (enter 0 if from surface)

CASING RECORD
casing types Insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	31

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole Insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN	DEPTH (nearest ft.)	
1	PL 31	41
2		
3		

SLOT SIZE .010

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 26 to 44

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)
BEFORE PUMPING
WHEN PUMPING

TYPE OF PUMP USED (for test)
A air P piston T turbine
C centrifugal R rotary O other (describe below)
J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED
PLACE (A,C,J,P,R,S,T,O) IN BOX-SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)
+ above
− below
LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

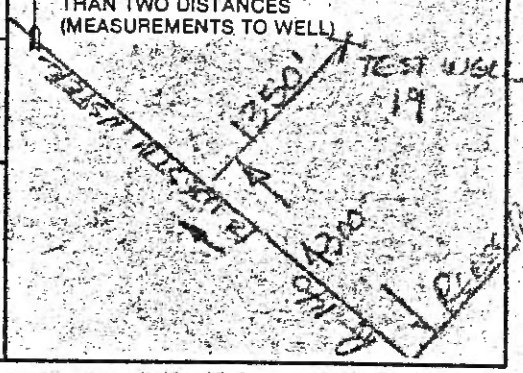
I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

Michael P Lee
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)
T (E.R.O.S.) WQ
TELESCOPE CASING LOG INDICATOR OTHER DATA

DRILLER

C 1 3860 SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 03 83

Depth of Well 32 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" 01-81-0262

OWNER Carroll County, MD (last name / first name)

STREET OR RFD

TOWN Westminster MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	32	✓

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. (TOP) to 3 ft. (BOTTOM)

(enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	7	14

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN	type	DEPTH (nearest ft.)	
1	PL	18	28
2			
3			

SLOT SIZE 1 010 2 3

DIAMETER OF SCREEN 7 (NEAREST INCH)

GRAVEL PACK from 6 to 30

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

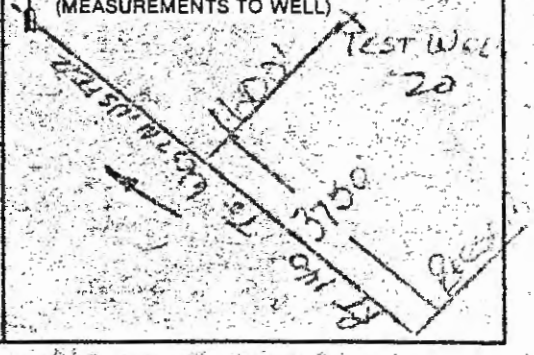
PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above – below LAND SURFACE (nearest foot)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



CIRCLE APPROPRIATE LETTER
- A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
- E ELECTRIC LOG OBTAINED
- P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (TELESCOPE CASING) (E.R.O.S.) (LOG INDICATOR) WQ (OTHER DATA)

DRILLER

C 1 | 3861 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER: n/a

DATE Received:

DATE WELL COMPLETED: 05 20 83

Depth of Well: 38 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL": CL-81-0263

OWNER: CARROLL COUNTY (MD) (last name / first name)

STREET OR RFD:

TOWN: WESTMINSTER MD 21157

SUBDIVISION: SECTION: LOT:

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	23	
Rock	23	38	

CIRCLE APPROPRIATE LETTER
- A — A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
- E — ELECTRIC LOG OBTAINED
- P — TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO.: 342

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION):

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee):

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box): yes Y / no N

TYPE OF GROUTING MATERIAL

CEMENT: C M — BENTONITE CLAY: B C

NO. OF BAGS: 2 NO. OF POUNDS:

GALLONS OF WATER: 15

DEPTH OF GROUT SEAL (to nearest foot): from 0 ft. (TOP) to 3 ft. (BOTTOM) (enter 0 if from surface)

CASING RECORD
casing types — Insert appropriate code below

S T STEEL — C O CONCRETE — P L PLASTIC — O T OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
P L	2	23

OTHER CASING (if used) — EACH CASING

diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — Insert appropriate code below

S T STEEL — B R BRASS BRONZE — H O OPEN HOLE — P L PLASTIC — O T OTHER

C 2

	TYPE	DEPTH (nearest ft.)	
EACH SCREEN 1	P L	23	33
2			
3			

SLOT SIZE: 010

DIAMETER OF SCREEN: 2 (NEAREST INCH)

GRAVEL PACK: from 20 to 38

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68:

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (TELESCOPE CASING) — (E.R.O.S.) (LOG INDICATOR) — WQ (OTHER DATA)

C 3

PUMPING TEST
HOURS PUMPED (nearest hour):

PUMPING RATE (gal. per min. to nearest gal.):

METHOD USED TO MEASURE PUMPING RATE:

WATER LEVEL (distance from land surface)

BEFORE PUMPING:

WHEN PUMPING:

TYPE OF PUMP USED (for test)
- A air
- P piston
- T turbine
- C centrifugal
- R rotary
- O other (describe below)
- J jet
- S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO): YES / NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon):

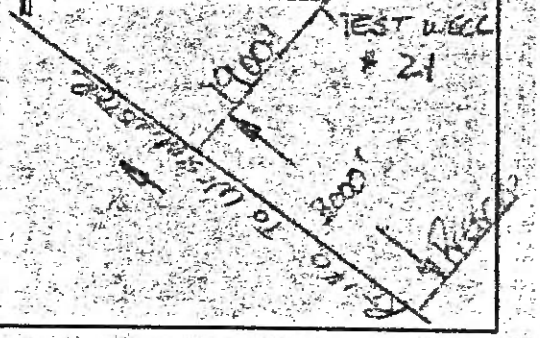
PUMP HORSE POWER:

PUMP COLUMN LENGTH (nearest ft.):

CASING HEIGHT (circle appropriate box and enter casing height)
- + above
- − below

LAND SURFACE (nearest foot): 1

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



DRILLER

C1 3862 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 20 83

Depth of Well 33 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" 07-81-0264

OWNER CARROLL COUNTY, (MD) (last name, first name)

STREET OR RFD TOWN WESTMINSTER MD. 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	18	
Rock	18	53	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y / no N

TYPE OF GROUTING MATERIAL
CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. (TOP) to 3 ft. (BOTTOM) (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	21

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

EACH SCREEN		DEPTH (nearest ft.)	
1	PL	21	31
2			
3			

SLOT SIZE .010

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 16 to 33

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES / NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX-SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height) + above / − below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

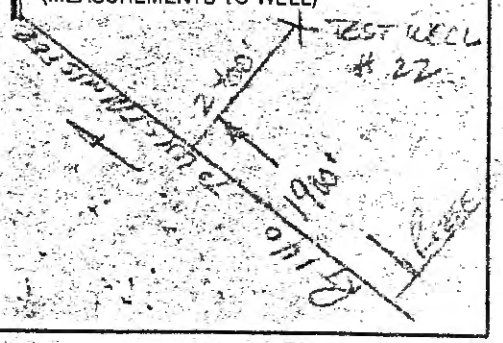
DRILLERS IDENT. NO. 342

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign.. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)
T (E.R.O.S.) WQ
TELESCOPE CASING — LOG INDICATOR — OTHER DATA

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



DRILLER

C 1 | 3863 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER 13/8

DATE Received

DATE WELL COMPLETED 06 06 83

Depth of Well 48 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0265

OWNER CARROLL COUNTY, MD.
last name first name

STREET OR RFD TOWN WESTMINSTER, MD. 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	33	
Rock	33	48	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y / no N
TYPE OF GROUTING MATERIAL
CEMENT CM BENTONITE CLAY BC
NO. OF BAGS 2 NO. OF POUNDS
GALLONS OF WATER 15
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. to 3 ft. (enter 0 if from surface)

CASING RECORD
casing types — insert appropriate code below
ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	7	25

OTHER CASING (if used)

	diameter inch	depth (feet) from	to
CASING			
CASING			

SCREEN RECORD
screen type or open hole — insert appropriate code below
ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

		DEPTH (nearest ft.)	
SCREEN	1	PL	35 to 45
SCREEN	2		
SCREEN	3		

SLOT SIZE .010
DIAMETER OF SCREEN 7 (NEAREST INCH)

GRAVEL PACK from 31 to 48
IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

PUMPING TEST C 3
HOURS PUMPED (nearest hour)
PUMPING RATE (gal. per min. to nearest gal.)
METHOD USED TO MEASURE PUMPING RATE
WATER LEVEL (distance from land surface)
BEFORE PUMPING
WHEN PUMPING
TYPE OF PUMP USED (for test)
A air P piston T turbine
C centrifugal R rotary O other (describe below)
J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES / NO
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:
CAPACITY: GALLONS PER MINUTE (to nearest gallon)
PUMP HORSE POWER
PUMP COLUMN LENGTH (nearest ft.)
CASING HEIGHT (circle appropriate box and enter casing height) + above / − below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

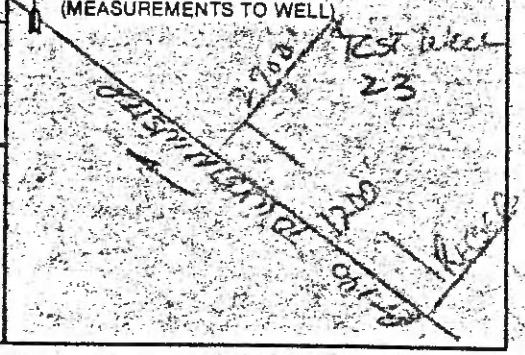
I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY
(NOT TO BE FILLED IN BY DRILLER)
I (E.R.O.S.) W Q
TELESCOPE CASING
LOG INDICATOR
OTHER DATA

DRILLER

C 1 3864 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 06 14 83

Depth of Well 55 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0266

OWNER CARROLL COUNTY - MD (last name / first name)

STREET OR RFD

TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
BROWN SILT	0	25	
ROCK	25	55	W

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. (TOP) to 3 ft. (BOTTOM) (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	4	42

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN	TYPE	DEPTH (nearest ft.)	
1	PL	42	52
2			
3			

SLOT SIZE 1 010 2 3

DIAMETER OF SCREEN 4 (NEAREST INCH)

GRAVEL PACK from 42 to 55

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

CIRCLE APPROPRIATE LETTER
A — A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E — ELECTRIC LOG OBTAINED

P — TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

Richard D. Dice

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) WQ

TELESCOPE CASING — LOG INDICATOR — OTHER DATA

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

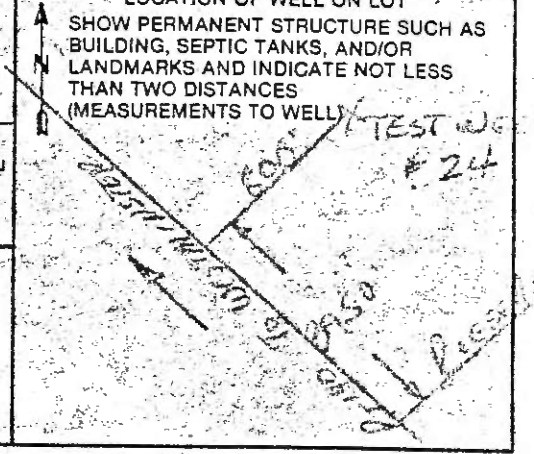
PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above / − below LAND SURFACE (nearest foot) 1

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



DRILLER

C 1 2650 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received: F

DATE WELL COMPLETED: 05 02 83

Depth of Well: 31 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL": CL-81-0267

OWNER: (CARROLL COUNTY MD) — last name / first name

STREET OR RFD:

TOWN: WESTMINSTER MD 21157

SUBDIVISION: SECTION: LOT:

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown silt	0	16	
Rock	16	31	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box): (yes) Y / no N

TYPE OF GROUTING MATERIAL

CEMENT: C M — BENTONITE CLAY: B C

NO. OF BAGS: 2 NO. OF POUNDS:

GALLONS OF WATER:

DEPTH OF GROUT SEAL (to nearest foot): from 0 ft. to ft.
(enter 0 if from surface)

CASING RECORD
casing types: insert appropriate code below

S T STEEL — C O CONCRETE — P L PLASTIC — O T OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	18

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole: insert appropriate code below

S T STEEL — B R BRASS BRONZE — H O OPEN HOLE — P L PLASTIC — O T OTHER

C 2

EACH SCREEN	DEPTH (nearest ft.)	
1	PL 18	26
2		
3		

SLOT SIZE: 010

DIAMETER OF SCREEN: 4 (NEAREST INCH)

GRAVEL PACK: from 15 to 31

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68:

C 3

PUMPING TEST
HOURS PUMPED (nearest hour):

PUMPING RATE (gal. per min. to nearest gal.):

METHOD USED TO MEASURE PUMPING RATE:

WATER LEVEL (distance from land surface)

BEFORE PUMPING:

WHEN PUMPING:

TYPE OF PUMP USED (for test)

A air — P piston — T turbine

C centrifugal — R rotary — O other (describe below)

J jet — S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO): YES (NO)

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

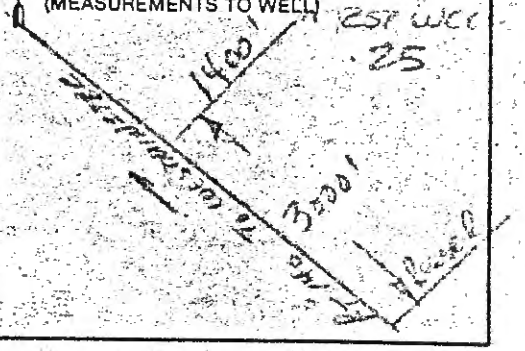
PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above / − below LAND SURFACE (nearest foot): 1

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



CIRCLE APPROPRIATE LETTER

A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 542

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T — (E.R.O.S.) — WQ

TELESCOPE CASING — LOG INDICATOR — OTHER DATA

DRILLER

C 1 | 2651 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-8 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 17 83

Depth of Well 46 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" C7-81-0268

OWNER CARROLL COUNTY, MD (last name, first name)

STREET OR RFD

TOWN WESTMINSTER, MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	31	
Rock	31	46	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y / no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. TOP to 3 ft. BOTTOM (enter 0 if from surface)

CASING RECORD
casing types — insert appropriate code below

ST STEEL | CO CONCRETE | PL PLASTIC | OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	4	33

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below

ST STEEL | BR BRASS BRONZE | HO OPEN HOLE | PL PLASTIC | OT OTHER

C 2

EACH SCREEN	DEPTH (nearest ft.)	
1	PL	33 43
2		
3		

SLOT SIZE 1 010 2 3

DIAMETER OF SCREEN 4 (NEAREST INCH)

GRAVEL PACK from 28 to 46

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air | P piston | T turbine | C centrifugal | R rotary | O other (describe below) | J jet | S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES / NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED

PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

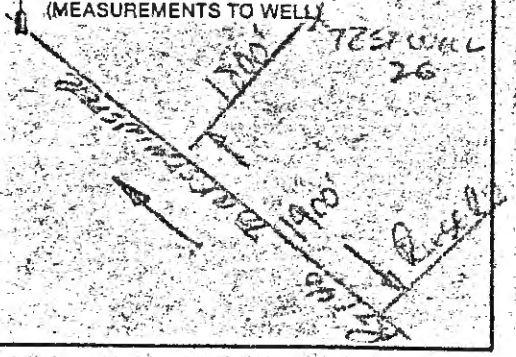
PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above / − below LAND SURFACE (nearest foot) 1

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



CIRCLE APPROPRIATE LETTER
- A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
- E ELECTRIC LOG OBTAINED
- P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 347

Richard D. Rice
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (TELESCOPE CASING) | (E.R.O.S.) LOG INDICATOR | W Q OTHER DATA

DRILLER

C 1 2652 SEQUENCE NO. (OEP USE ONLY)

(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 04 29 93

Depth of Well 45 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CT-81-0269

OWNER CARROLL COUNTY MD
last name / first name

STREET OR RFD TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	25	✓

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. to 3 ft.
TOP BOTTOM
(enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	10

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

EACH SCREEN	SCREEN TYPE	DEPTH (nearest ft.)	
1		40	20
2			
3			

SLOT SIZE .010

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 10 to 22

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX-SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

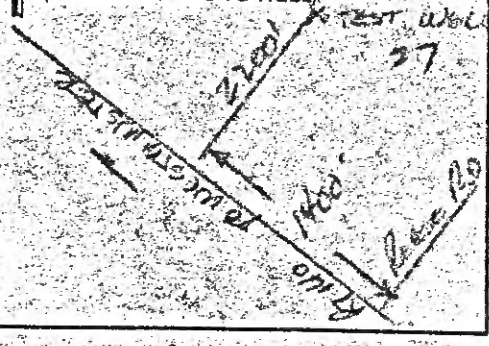
PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above − below LAND SURFACE 1 (nearest foot)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

Richard D. Sie
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) WQ

TELESCOPE CASING LOG INDICATOR OTHER DATA

DRILLER

C 1 2653 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 04 27 13

Depth of Well 58 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" 01-81-0270

OWNER CARROLL COUNTY, MD.
last name first name

STREET OR RFD TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	24	
Rock	24	58	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N
TYPE OF GROUTING MATERIAL
CEMENT CM BENTONITE CLAY BC
NO. OF BAGS 2 NO. OF POUNDS
GALLONS OF WATER 15
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. to 3 ft.
(enter 0 if from surface)

CASING RECORD (casing types — Insert appropriate code below)
ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	45

EACH CASING — OTHER CASING (if used)

diameter inch	depth (feet) from	to

SCREEN RECORD (screen type or open hole — Insert appropriate code below)
ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN	screen type	DEPTH (nearest ft.)
1	PL	43 to 58
2		
3		

SLOT SIZE 1 .02 2 3
DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 24 to 58
IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)
PUMPING RATE (gal. per min. to nearest gal.)
METHOD USED TO MEASURE PUMPING RATE
WATER LEVEL (distance from land surface)
BEFORE PUMPING
WHEN PUMPING
TYPE OF PUMP USED (for test)
A air P piston T turbine
C centrifugal R rotary O other (describe below)
J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:
CAPACITY: GALLONS PER MINUTE (to nearest gallon)
PUMP HORSE POWER
PUMP COLUMN LENGTH (nearest ft.)
CASING HEIGHT (circle appropriate box and enter casing height) + above − below LAND SURFACE (nearest foot)

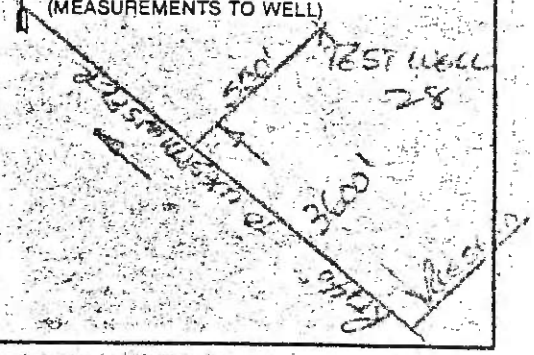
CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 447
Richard P. Fox
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)
T (E.R.O.S.) WQ
TELESCOPE CASING LOG INDICATOR OTHER DATA

DRILLER

C 1 | 2654 | SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 06 08 83

Depth of Well 24 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CT-81-0273

OWNER CARROLL COUNTY MD
last name first name

STREET OR RFD TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	19	
Rock	19	24	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL
CEMENT C M BENTONITE CLAY B C

NO. OF BAGS 2 NO. OF POUNDS
GALLONS OF WATER 15
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. to 3 ft.
(enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

S T STEEL C O CONCRETE P L PLASTIC O T OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
P L	7	23

OTHER CASING (If used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below

S T STEEL B R BRASS BRONZE H O OPEN HOLE P L PLASTIC O T OTHER

C 2

EACH SCREEN	DEPTH (nearest ft.)	
1	P L	13 to 23
2		
3		

SLOT SIZE 1 020 2 3

DIAMETER OF SCREEN 7 (NEAREST INCH)

GRAVEL PACK from 18 to 24

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

OEP USE ONLY
(NOT TO BE FILLED IN BY DRILLER)
T (E.R.O.S.) WO
TELESCOPE CASING — LOG INDICATOR — OTHER DATA

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)
PUMPING RATE (gal. per min. to nearest gal.)
METHOD USED TO MEASURE PUMPING RATE
WATER LEVEL (distance from land surface)
BEFORE PUMPING
WHEN PUMPING

TYPE OF PUMP USED (for test)
A air P piston T turbine
C centrifugal R rotary O other (describe below)
J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:
CAPACITY: GALLONS PER MINUTE (to nearest gallon)
PUMP HORSE POWER
PUMP COLUMN LENGTH (nearest ft.)
CASING HEIGHT (circle appropriate box and enter casing height)
+ above / - below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

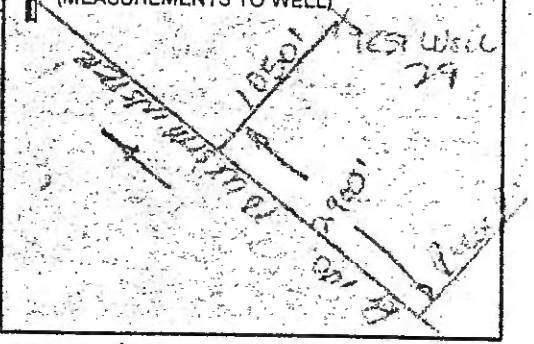
I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 542

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



DRILLER

C 1 | 2655 — SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 06 09 93

Depth of Well 45 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CT-81-0272

OWNER CARROLL COUNTY MD (last name / first name)

STREET OR RFD

TOWN WESTMINSTER MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check If water bearing
Brown Silt	0	30	
Rock	30	45	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes: Y / no: N

TYPE OF GROUTING MATERIAL

CEMENT CM — BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. (TOP) to 3 ft. (BOTTOM) (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL — CO CONCRETE — PL PLASTIC — OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	33

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL — BR BRASS BRONZE — HO OPEN HOLE — PL PLASTIC — OT OTHER

C 2

EACH SCREEN		DEPTH (nearest ft.)	
1	PL	33	43
2			
3			

SLOT SIZE: 1 .010 2 3

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 27 to 45

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air — P piston — T turbine — C centrifugal — R rotary — O other (describe below) — J jet — S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES / NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE.

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

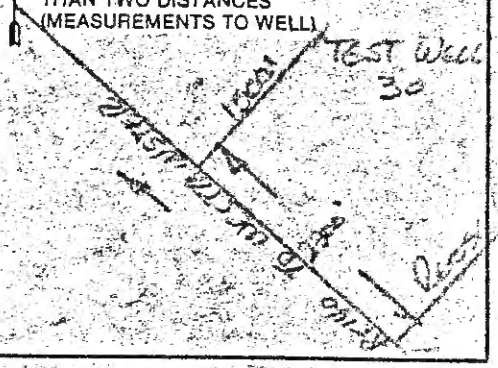
PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above / − below LAND SURFACE 1 (nearest foot)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



CIRCLE APPROPRIATE LETTER

A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

Richard D Cox
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T — (E.R.O.S.) — W Q

TELESCOPE CASING — LOG INDICATOR — OTHER DATA

DRILLER

C1 2656 — SEQUENCE NO. (OEP USE ONLY)

(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 06 06 83

Depth of Well 61 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0273

OWNER CARROLL COUNTY MD (last name / first name)

STREET OR RFD ____ TOWN WESTMINSTER MD 21157

SUBDIVISION ____ SECTION ____ LOT ____

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Brown Silt	0	46	
Rock	46	61	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) — yes (Y) / no (N)

TYPE OF GROUTING MATERIAL

CEMENT (CM) BENTONITE CLAY (BC)

NO. OF BAGS 2 NO. OF POUNDS ____

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. (TOP) to 3 ft. (BOTTOM) (enter 0 if from surface)

CASING RECORD
casing types — insert appropriate code below

ST STEEL; CO CONCRETE; PL PLASTIC; OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	7	49

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below

ST STEEL; BR BRASS BRONZE; HO OPEN HOLE; PL PLASTIC; OT OTHER

C2

EACH SCREEN	DEPTH (nearest ft.)		
1	PL	46	59
2			
3			

SLOT SIZE 1 010 2 ____ 3 ____

DIAMETER OF SCREEN 7 (NEAREST INCH)

GRAVEL PACK from 43 to 61

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

CIRCLE APPROPRIATE LETTER
A — A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E — ELECTRIC LOG OBTAINED

P — TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 342

Richard D. Lee

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T ____ (E.R.O.S.) ____ WQ ____

TELESCOPE CASING ____ LOG INDICATOR ____ OTHER DATA ____

C3

PUMPING TEST
HOURS PUMPED (nearest hour) ____

PUMPING RATE (gal. per min. to nearest gal.) ____

METHOD USED TO MEASURE PUMPING RATE ____

WATER LEVEL (distance from land surface)

BEFORE PUMPING ____ WHEN PUMPING ____

TYPE OF PUMP USED (for test)

A air; P piston; T turbine; C centrifugal; R rotary; O other (describe below); J jet; S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) — YES (NO)

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX. SEE ABOVE: ____

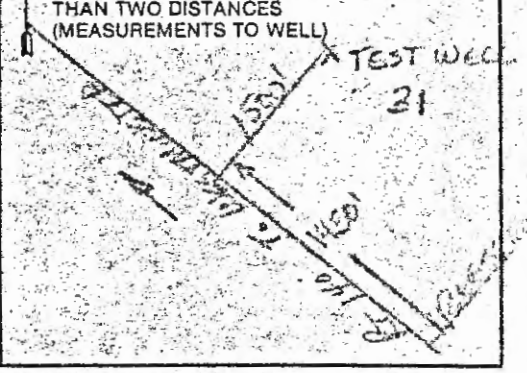
CAPACITY: GALLONS PER MINUTE (to nearest gallon) ____

PUMP HORSE POWER ____

PUMP COLUMN LENGTH (nearest ft.) ____

CASING HEIGHT (circle appropriate box and enter casing height) + above / − below LAND SURFACE ____ (nearest foot)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



DRILLER

C 1 | 2657 | SEQUENCE NO. (OEP USE ONLY)

(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 05 18 83

Depth of Well 23 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CR-81-0274

OWNER CARROLL COUNTY, MD
last name first name

STREET OR RFD

TOWN WESTMINSTER, MD 21157

SUBDIVISION SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
BROWN SILT	0	18	
ROCK	18	33	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 2 NO. OF POUNDS

GALLONS OF WATER 15

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. TOP to 3 ft. BOTTOM (enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	22

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN	DEPTH (nearest ft.)	
1	PL	22 to 32
2		
3		

SLOT SIZE .010

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 16 to 32

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine

C centrifugal R rotary O other (describe below)

J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES (NO)

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX-SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

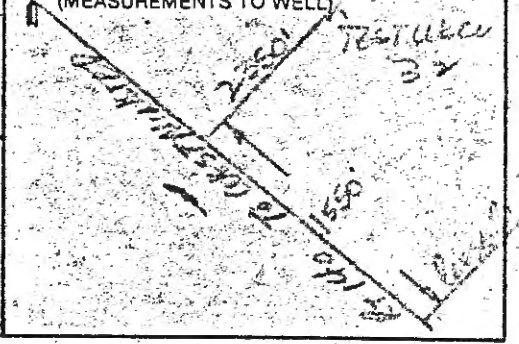
PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above / − below LAND SURFACE (nearest foot) 1

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



CIRCLE APPROPRIATE LETTER

A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 347

Richard P. Sine

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) WQ

TELESCOPE CASING LOG INDICATOR OTHER DATA

DRILLER

...ALL CARDS)

...FILL OUT THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 10/3/83

Depth of Well 145 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0588

OWNER County Commissioners of Carroll County

STREET OR RFD 225 North Center Street (last name / first name) TOWN Westminster, 21157

SUBDIVISION Northern Sanitary Landfill SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
MONITORING WELL #3			
Dirt	0	4	
ed Shale	4	12	
Brown Shale	12	15	
lue Shale	15	18	
Brown Shale	18	100	
rown Shale	100	101	
Blue & Brown Shale	101	121	
rown Shale	121	122	X
Blue Shale	122	145	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 7 NO. OF POUNDS 658

GALLONS OF WATER 42

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. (TOP) to 144 ft. (BOTTOM) (enter 0 if from surface)

CASING RECORD
casing types — Insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	146

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below

ST STEEL BR BRASS BRONZE PL PLASTIC HO OPEN HOLE OT OTHER

C2

EACH SCREEN		DEPTH (nearest ft.)	
1	PL	10	
2			
3			

SLOT SIZE 1 .030 2 3

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 145 to 125

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED

PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height) + above / - below LAND SURFACE 2 (nearest foot)

CIRCLE APPROPRIATE LETTER
A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 30

Dana Kyker
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign, if driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)

N

CEI #D-21A

Rt. 140

D21 D21A

OEP USE ONLY
(NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) WQ

TELESCOPE CASING LOG INDICATOR OTHER DATA

C 2601 SEQUENCE NO. (OEP USE ONLY)

(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

FILL IN THIS FORM PLEASE PRINT OR TYPE

DATE Received

DATE WELL COMPLETED 11 03 83

Depth of Well 157 (TO NEAREST FOOT)

FROM FILE NO. CL-81-0587

OWNER County Commissioners of Carroll County

STREET OR RFD 225 North Center Street (last name / first name) TOWN Westminster, 21157

SUBDIVISION Northern Sanitary Landfill SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
MONITORING WELL #4			
Fort	0	1	
Soft Brown Shale	1	16	
Hard Brown Shale	16	78	
Hard Blue & Brown Shale	78	108	
Soft Brown Shale	108	110	
Hard Brown & Blue Shale	110	135	
Blue Schist	135	140	
Hard Blue Schist	140	157	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N
TYPE OF GROUTING MATERIAL
CEMENT CM BENTONITE CLAY BC
NO. OF BAGS 11 NO. OF POUNDS 1034
GALLONS OF WATER 66
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. (TOP) to 156 ft. (BOTTOM)
(enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below
ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	4	158

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below
ST STEEL BR BRASS BRONZE PL PLASTIC HO OPEN HOLE OT OTHER

C 2

EACH SCREEN		DEPTH (nearest ft.)	
1	PL	15	
2			
3			

SLOT SIZE 1 030 2 3

DIAMETER OF SCREEN 4 (NEAREST INCH)

GRAVEL PACK from 157 to 137

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)
T (TELESCOPE CASING) (E.R.O.S.) (LOG INDICATOR) WQ (OTHER DATA)

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)
PUMPING RATE (gal. per min. to nearest gal.)
METHOD USED TO MEASURE PUMPING RATE
WATER LEVEL (distance from land surface)
BEFORE PUMPING
WHEN PUMPING
TYPE OF PUMP USED (for test)
A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:
CAPACITY: GALLONS PER MINUTE (to nearest gallon)
PUMP HORSE POWER
PUMP COLUMN LENGTH (nearest ft.)
CASING HEIGHT (circle appropriate box and enter casing height) + above / − below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
T TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 30

Dana Kyker

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

DRILLER SUPERVISOR (sign. of driller or journeyman) responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)

N

CET #M-1

NE 11

Ref. 140

M-1

(THIS NUMBER IS TO BE PUNCHED COLS. 3-6 ON ALL CARDS)

FILL IN THIS FORM COMPLETELY PLEASE PRINT OR TYPE

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 11 03 83

Depth of Well 115 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0590

OWNER County Commissioners of Carroll County

STREET OR RFD 225 North Center St. TOWN Westminster, 21157

SUBDIVISION Northern Sanitary Landfill SECTION LOT

WELL LOG

Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
MONITORING WELL #1			
Fill	0	5	
Brown Shale	5	50	
Blue Shale	50	55	
Blue & Brown Shale	55	85	
Brown Shale	85	86	X
Blue & Brown Shale	86	115	

GROUTING RECORD

WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y / no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 10 NO. OF POUNDS 940

GALLONS OF WATER 60

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. to 115 ft. (enter 0 if from surface)

CASING RECORD

casing types Insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	4	117

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD

screen type or open hole Insert appropriate code below

ST STEEL BR BRASS BRONZE PL PLASTIC HO OPEN HOLE OT OTHER

C2

EACH SCREEN	DEPTH (nearest ft.)		
1	PL	15	
2			
3			

SLOT SIZE 1 .030 2 3

DIAMETER OF SCREEN 4 (NEAREST INCH)

GRAVEL PACK from 115 to 95

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T TELESCOPE CASING (E.R.O.S.) LOG INDICATOR WQ OTHER DATA

C3

PUMPING TEST

HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED

DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above / - below LAND SURFACE

4 (nearest foot)

CIRCLE APPROPRIATE LETTER

A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

T TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRINTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 30

Dan Kyker

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT

SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)

CEI #M-2

Et. NE(1) R ↔ (1)

R+.140

N COLS. 3-6 ON ALL CARDS) | PLEASE PRINT OR TYPE | NUMBER n/a

TE Received | DATE WELL COMPLETED 1 1 0 3 8 3 | Depth of Well 75 (TO NEAREST FOOT) | PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-0538

OWNER County Commissioners of Carroll County

STREET OR RFD 225 (street) Center Street (first name) TOWN Westminster, 21157

SUBDIVISION Northern Sanitary Landfill SECTION LOT

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
MONITORING WELL #5			
Dirt	0	4	
Soft Brown Shale	4	40	
Blue & Brown Shale	40	54	
Brown Shale	54	55	X
Blue & Brown Shale	55	75	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 11 NO. OF POUNDS 1034

GALLONS OF WATER 66

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. (TOP) to 73 ft. (BOTTOM)

(enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	4	75

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C2

EACH SCREEN		DEPTH (nearest ft.)
1	PL	15
2		
3		

SLOT SIZE 1 .030 2 3

DIAMETER OF SCREEN 4 (NEAREST INCH)

GRAVEL PACK from 75 to 55

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine

C centrifugal R rotary O other (describe below)

J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above

− below

LAND SURFACE 2 (nearest foot)

CIRCLE APPROPRIATE LETTER

A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

C TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 30

Diana Kyker

DRILLER'S SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SUPERVISOR (sign. of driller, or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)

N

CEI #M-3

EX

NEW

R4.140

OEP USE ONLY
(NOT TO BE FILLED IN BY DRILLER)

T TELESCOPE CASING | (E.R.O.S.) LOG INDICATOR | W O OTHER DATA

COLS. 3-6 ON ALL CARDS)

TE Received [ ] (13)

DATE WELL COMPLETED 1 1 0 3 8 3 (15–20)

Depth of Well 22 9 5 26 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" C L - 8 1 - 0 5 8 9 (28–37)

VNER County Commissioners of Carroll County

RE [OR]RED 225 North Center Street (last name / first name) TOWN Westminster, 21157

BL.ISION Northern Sanitary Landfill SECTION LOT

WELL LOG
Not required for driven wells

TATE THE KIND OF FORMATIONS ENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

SCRIPTION (Use diti al sheets if needed)	FEET FROM	FEET TO	Check if water bearing
OI TORING WELL #2			
irt	0	3	
r n Shale	3	55	
ard Blue & B n Shale	55	71	
r n Shale	71	72	X
Blue & Brown S ale	72	73	
Brown Shale & Quartz	73	74	X
Bl e & Brown Shale	74	95	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y (44) no N (44)

TYPE OF GROUTING MATERIAL

CEMENT C M (45–46) BENTONITE CLAY B C (45–46)

NO. OF BAGS 7 NO. OF POUNDS 658

GALLONS OF WATER 42

DEPTH OF GROUT SEAL (to nearest foot)

from 0 (48–52) ft. to 9 3 (54–58) ft.

TOP BOTTOM

(enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

STEEL S T; CONCRETE C O; PLASTIC P L; OTHER O T

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
P L (60–61)	4 (63–64)	9 5 (66–70)

EACH CASING — OTHER CASING (if used)

diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below

STEEL S T; BRASS BRONZE B R; OPEN HOLE H O; PLASTIC P L; OTHER O T

C 2 (1–2)

EACH SCREEN

	DEPTH (nearest ft.)	
1	P L (8–9)	1 5 (11–15)
2		
3		

SLOT SIZE 1 .030 2 3

DIAMETER OF SCREEN 4 (56–60) (NEAREST INCH)

GRAVEL PACK from 95 to 75

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68 (68)

C 3 (1–2)

PUMPING TEST
HOURS PUMPED (nearest hour) (8–9)

PUMPING RATE (gal. per min. to nearest gal.) (11–15)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING (17–20)

WHEN PUMPING (22–25)

TYPE OF PUMP USED (for test)

A air (27); P piston (27); T turbine (27); C centrifugal (27); R rotary (27); O other (describe below) (27); J jet (27); S submersible (27)

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX-SEE ABOVE: (29)

CAPACITY: GALLONS PER MINUTE (to nearest gallon) (31–35)

PUMP HORSE POWER (37–41)

PUMP COLUMN LENGTH (nearest ft.) (43–47)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above (49); − below (49)

LAND SURFACE (50–51) (nearest foot)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)

CEI #M-4

NEW EX.

Rt. 140

CIRCLE APPROPRIATE LETTER

A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

D TEST WELL CONVERTED TO PRODUCTION WELL

IT EBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN AC IRDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OI Y KNOWLEDGE.

D..LLERS IDENT. NO. 30

Dana Kyker

D LLERS SIGNATURE (I ST MATCH SIGNATURE ON APPLICATION)

Dana Kyker

SITE SUPERVISOR (sign. of driller or journeyman r ponsible for sitework if different from permittee)

OEP USE ONLY
(NOT TO BE FILLED IN BY DRILLER)

T	(E.R.O.S.)	WQ
70	72	74 75 76
TELESCOPE CASING	LOG INDICATOR	OTHER DATA

DRILLER

D31 M4

C 1 | 3072 | SEQUENCE NO. (OEP USE ONLY)

(IS NUMBER IS TO BE PUNCHED
COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

DATE Received

DATE WELL COMPLETED 04 12 84

Depth of Well 89 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CI-81-0912

OWNER County Commissioners of Carroll County

STREET OR RFD 225 North Center Street (last name) (first name) TOWN Westminster, 21157

SUBDIVISION "Northern Landfill" SECTION LOT E-1

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
MONITORING WELL - E-1			
Dirt	0	2	
Brown Shale	2	40	
Blue & Brown Shale	40	67	
Brown Shale & QuaRTz	67	68	
Blue & Brown Shale	68	89	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y 44 / no N 44

TYPE OF GROUTING MATERIAL

CEMENT CM (45 46) BENTONITE CLAY BC (45 46)

NO. OF BAGS 10 NO. OF POUNDS 940

GALLONS OF WATER 60

DEPTH OF GROUT SEAL (to nearest foot)

from 0 (48 TOP 52) ft. to 20 (54 BOTTOM 58) ft.

(enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PLK PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL (60 61)	2 (63 64)	73 (66 70)

EACH CASING — OTHER CASING (if used)

diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

DEPTH (nearest ft.)

EACH SCREEN		
1 PL (6 9)	73 (11 15)	88 (17 21)
2 (23 24)	(26 30)	(32 36)
3 (38 39)	(41 45)	(47 51)

SLOT SIZE 1 .030 3

DIAMETER OF SCREEN 2 (56 60) (NEAREST INCH)

GRAVEL PACK from 20 to 89

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68 (68)

C 3

PUMPING TEST
HOURS PUMPED (nearest hour) (8 9)

PUMPING RATE (gal. per min. to nearest gal.) (11 15)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING (17 20)

WHEN PUMPING (22 25)

TYPE OF PUMP USED (for test) (27)

A air P piston T turbine

C centrifugal R rotary O other (describe below)

J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE: (29)

CAPACITY: GALLONS PER MINUTE (to nearest gallon) (31 35)

PUMP HORSE POWER (37 41)

PUMP COLUMN LENGTH (nearest ft.) (43 47)

CASING HEIGHT (circle appropriate box and enter casing height)

+ above (49) / − below (49) LAND SURFACE (50 51) (nearest foot)

CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND ... CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 256

Dana Kyker, Jr. II
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)

N

Rt. 140

OEP USE ONLY
(NOT TO BE FILLED IN BY DRILLER)

T (70) TELESCOPE CASING

(E.R.O.S.) (72) LOG INDICATOR

WQ (74 75 76) OTHER DATA

DRILLER

1 3071 SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER n/a

ATE Received

DATE WELL COMPLETED 04 12 84

Depth of Well 109 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" 01-81-0913

OWNER County Commissioners of Carroll County
(last name) (first name)

STREET OR RFD 225 North Center Street TOWN Westminster, 21157

SUBDIVISION "Northern Landfill" SECTION LOT E-2

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
MONITORING WELL 6-E-2			
Dirt	0	1	
Soft Brown Shale	1	18	
Hard, Soft, Brown & Blue Shale	18	40	
Red Clay	40	43	
Hard Brown & Blue Shale	43	86	
Hard Brown Shale, some Flint	86	88	
Hard Brown & Blue Shale	88	92	
Blue Schist	92	109	

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 6 NO. OF POUNDS 564

GALLONS OF WATER 36

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. to 10 ft.
(TOP / BOTTOM)
(enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
PL	2	93

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN		DEPTH (nearest ft.)	
1	PL	93	108
2			
3			

SLOT SIZE 1 030 3

DIAMETER OF SCREEN 2 (NEAREST INCH)

GRAVEL PACK from 10 to 109

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

C 3

PUMPING TEST
HOURS PUMPED (nearest hour)

PUMPING RATE (gal. per min. to nearest gal.)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING

WHEN PUMPING

TYPE OF PUMP USED (for test)

A air P piston T turbine
C centrifugal R rotary O other (describe below)
J jet S submersible

PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:

CAPACITY: GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)
+ above / − below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 256

Dana Kyker, Jr. II
DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T TELESCOPE CASING (E.R.O.S.) LOG INDICATOR WQ OTHER DATA

LOCATION OF WELL ON LOT, SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)

N

Rt. 140

APPENDIX C OBSERVATION AND MONITORING WELL DETAILS

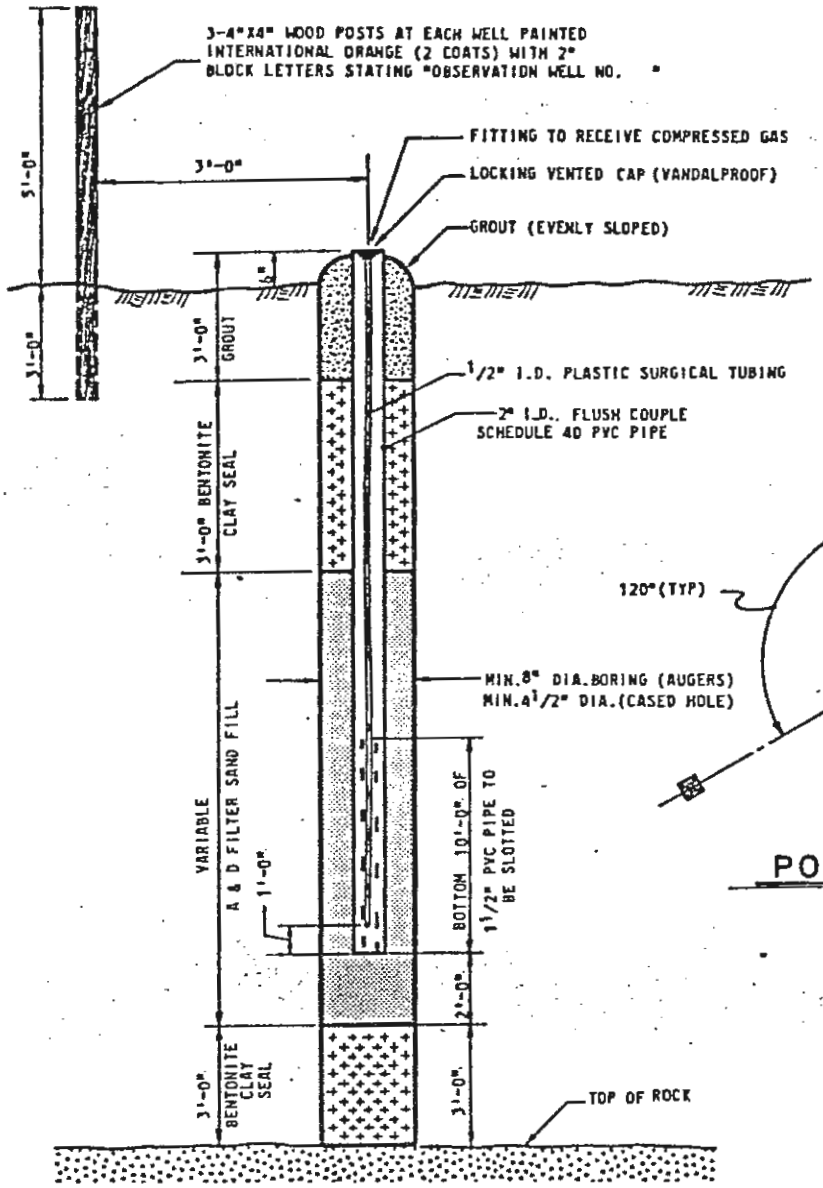
SUMMARY OF WELL INSTALLATION

WELL NO.	COMPLETION DATE	SURFACE ELEVATION	BOTTOM OF DRILLHOLE ELEVATION	BOTTOM OF WELL POINT ELEVATION	AUGER REFUSAL ELEVATION	ELEVATION OF HIGHEST GROUNDWATER	DATE	SCREEN ELEVATION TOP	SCREEN ELEVATION BOTTOM	SEAL ELEVATION LOWER SEAL TOP	SEAL ELEVATION UPPER SEAL TOP	SEAL ELEVATION UPPER SEAL BOTTOM
D-1	06/09/83	663.0	633.0	635.0	633.0	641.6	05/01/84	645.0	635.0	634.5	660.0	657.0
D-2	05/05/83	635.9	612.9	615.9	612.9	632.7	05/01/84	625.9	615.9	614.4	632.9	629.9
D-3	06/07/83	633.9	611.9	613.4	611.9	625.9	05/01/84	623.4	613.4	613.4	630.9	627.9
D-4	06/02/83	627.0	606.0	607.5	606.0	620.7	03/05/84	617.5	607.5	607.5	624.0	621.0
D-5	05/10/83	720.6	689.1	692.6	700.1	Dry		702.6	692.6	-	717.6	714.6
D-6	06/08/83	737.8	688.3	690.3	703.3	702.0	05/01/84	700.3	690.3	-	734.8	731.8
D-7	05/24/83	743.7	718.2	720.7	733.2	Dry		730.7	720.7	-	740.7	737.7
D-8	05/27/83	707.0	671.5	674.5	686.5	Dry		684.5	674.5	-	704.0	701.0
D-9	06/03/83	691.0	669.0	671.5	669.0	680.4	05/01/84	681.5	671.5	670.5	688.0	685.0
D-10	05/06/83	748.6	700.6	702.6	715.6	716.8	05/01/84	712.6	702.6	-	745.6	742.6
D-11	05/23/83	794.1	761.1	763.1	776.1	Dry		773.1	763.1	-	791.1	788.1
D-12	05/26/83	757.8	739.3	740.8	754.3	Dry		750.8	740.8	-	754.8	751.8
D-13	06/02/83	728.7	703.3	704.7	703.3	725.4	05/01/84	714.7	704.7	704.8	725.7	722.7
D-14	05/25/83	790.6	772.1	775.6	787.1	Dry		785.6	775.6	-	787.6	784.6
D-15	05/11/83	774.1	740.6	742.1	755.6	Dry		752.1	742.1	-	771.1	768.1
D-16	05/05/83	819.6	785.6	787.1	800.6	Dry		797.1	787.1	-	816.6	813.6
D-17	05/12/83	790.3	783.3	No Well	783.3	Dry		No Well		-	-	-
D-17A	05/13/83	730.8	704.8	707.8	704.8	724.9	05/01/84	717.8	707.8	706.3	727.8	724.8
D-18	05/31/83	798.6	758.1	760.1	773.1	Dry		770.1	760.1	-	795.6	792.6
D-19	04/29/83	810.4	766.9	769.4	784.4	782.0	03/05/84	779.4	769.4	-	807.4	804.4
D-20	05/03/83	771.9	739.9	744.9	739.9	765.0	07/13/83	754.9	744.9	741.4	768.9	765.9
D-21	05/20/83	827.8	789.8	795.3	804.8	Dry		805.3	795.3	-	824.8	821.8
D-21A	11/03/83	827.8	683.3	684.3		779.3	03/01/84	694.3	684.3	-	827.8	*807.8
D-22	05/20/83	804.2	771.2	773.2	786.2	Dry		783.2	773.2	-	801.2	798.2
D-23	06/01/83	763.8	715.8	718.8	730.8	729.8	05/01/84	728.8	718.8	-	760.8	757.8
D-24	06/14/83	818.3	763.3	767.8	793.3	782.4	03/05/84	777.8	767.8	-	815.3	812.3
D-25	05/02/83	860.6	830.1	833.1	845.1	837.9	03/06/84	843.1	833.1	-	857.6	854.6
D-26	05/17/83	813.2	767.7	770.7	782.7	Dry		780.7	770.7	-	810.2	807.2
D-27	04/29/83	747.7	722.7	727.7	722.7	745.6	05/01/84	737.7	727.7	724.2	744.7	741.7
D-28	04/27/83	848.1	790.1	793.1	824.1	804.3	05/01/84	803.1	793.1	-	845.1	842.1
D-29	06/08/83	877.6	843.6	845.1	858.6	Dry		855.1	845.1	-	874.6	871.6
D-30	06/09/83	842.7	798.2	800.7	813.2	Dry		810.7	800.7	-	839.7	836.7
D-31	06/06/83	803.6	742.6	745.1	757.6	751.0	03/06/84	755.1	745.1	-	800.6	797.6
D-32	05/19/83	795.5	762.5	763.5	777.5	Dry		773.5	763.5	-	792.5	789.5
D-33	06/17/83	836.2	788.2	789.7	821.2	792.2	09/14/83	799.7	789.7	-	833.2	830.2
M-1	10/31/83	792.1	634.6	635.6	776.1	720.5	05/01/84	645.6	635.6	-	792.1	*772.1
M-2	11/03/83	877.6	762.1	763.1	858.2	836.3	03/01/84	773.1	763.1	-	877.6	*857.6
M-3	11/01/83	798.6	725.1	726.1	773.1	758.1	05/01/84	736.1	726.1	-	798.6	*778.6
M-4	11/01/83	803.6	711.1	712.1	757.6	752.9	05/01/84	722.1	712.1	-	803.6	*783.6
E-1	04/11/84	695.1	606.1	607.6	666.5	651.5	05/01/84	617.6	607.6	-	695.1	*675.1
E-2	04/11/84	657.4	548.4	549.9	639.4**	601.6	05/01/84	559.9	549.9	-	657.4	*637.4

Prepared By: CENTURY ENGINEERING, INC.
Towson, Maryland 21204

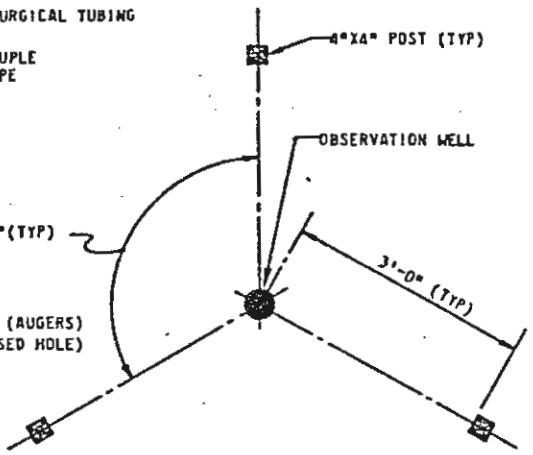
* Sealed with grout

** Equivalent



SECTION

NO SCALE



POST LAYOUT

NOTE: IF GROUNDWATER LEVEL OCCURS WITHIN 5' ABOVE TOP OF ROCK, INSTALL ROCK OBSERVATION WELL.

CARROLL COUNTY, MARYLAND

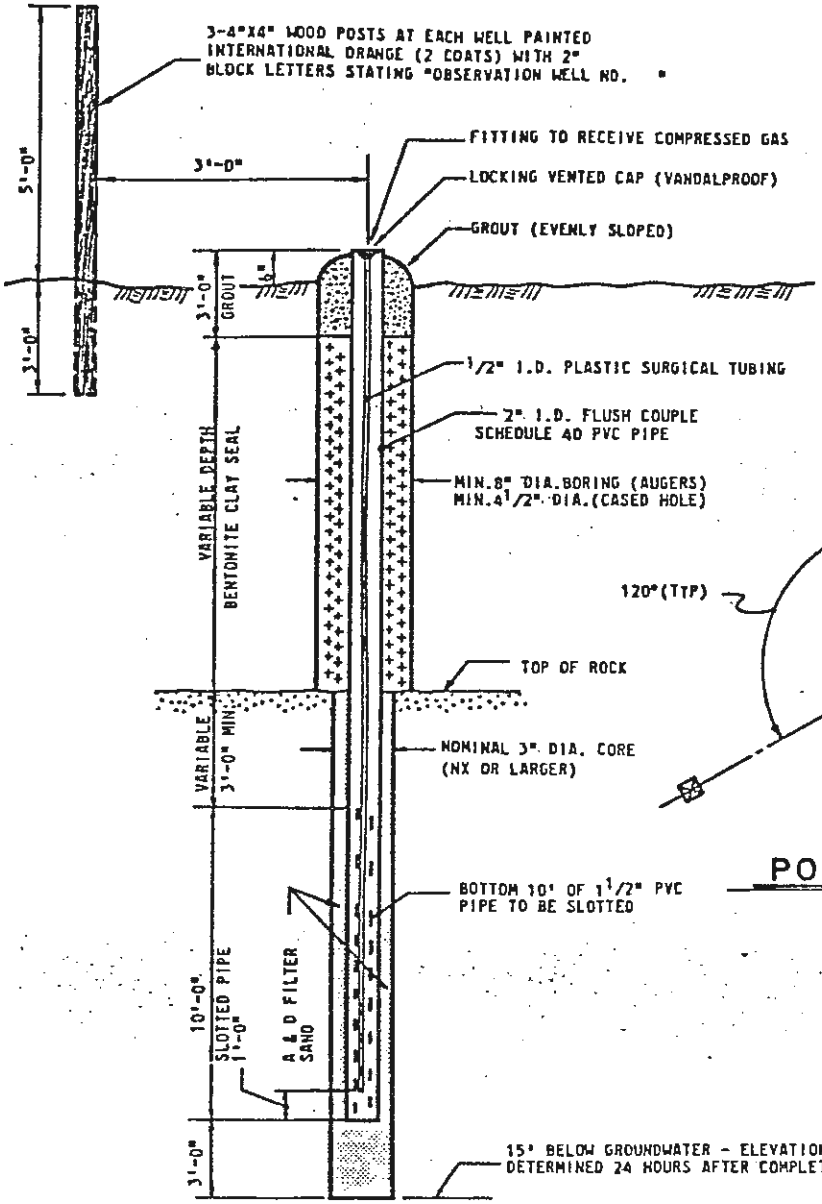
NORTHERN SANITARY LANDFILL
PHASE II

OBSERVATION WELL IN SOIL

prepared by:

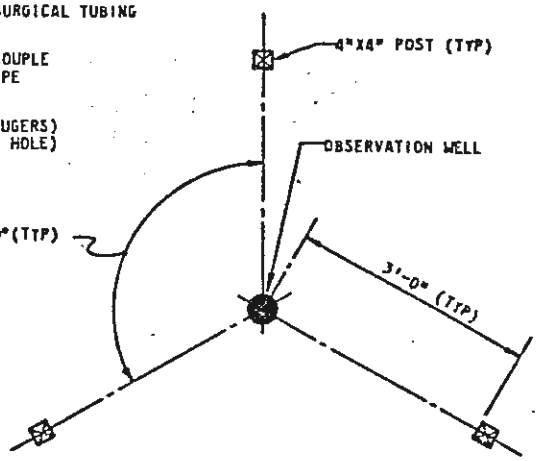
CENTURY ENGINEERING, INC.
Consulting Engineers - Planners
Towson, Maryland 21204

February 1, 1983
Dwg. 1 of 2
CEI J.O. 3181



SECTION

NO SCALE



POST LAYOUT

CARROLL COUNTY, MARYLAND

NORTHERN SANITARY LANDFILL
PHASE II

OBSERVATION WELL IN ROCK

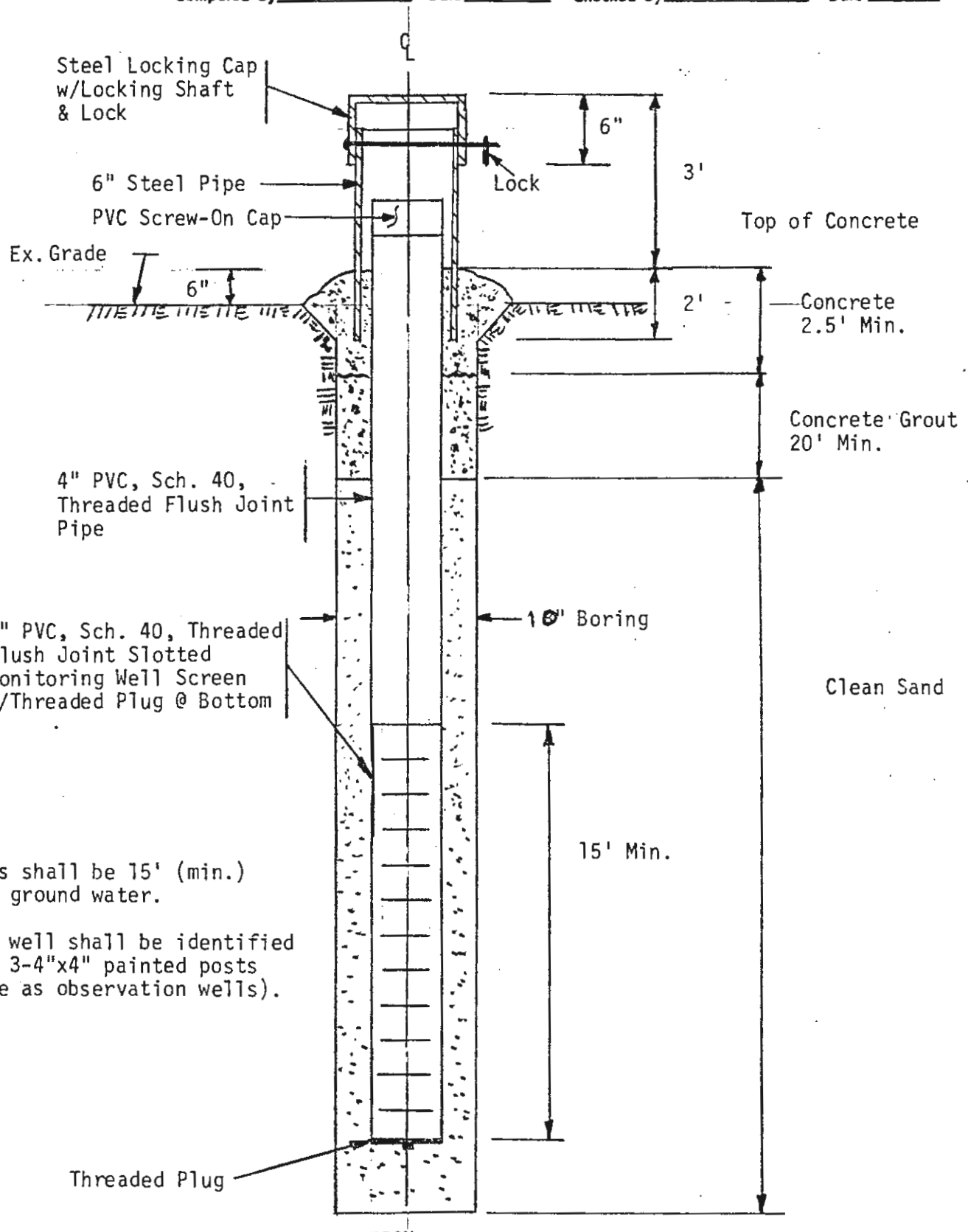
prepared by:

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Consulting Engineers - Planners
Towson, Maryland 21204

February 1, 1983
Dwg. 2 of 2
CEI J.O. 3181

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Project Northern Landfill, Carroll County — Contract No. 3181
Subject Groundwater Monitoring — Sheet No. 1 of 1
Well Detail — Drawing No
Computed by JPK — Date 8/8/83 — Checked by TJM — Date 8/8/83



SECTION
No Scale

Notes:

1. Wells shall be 15' (min.) into ground water.

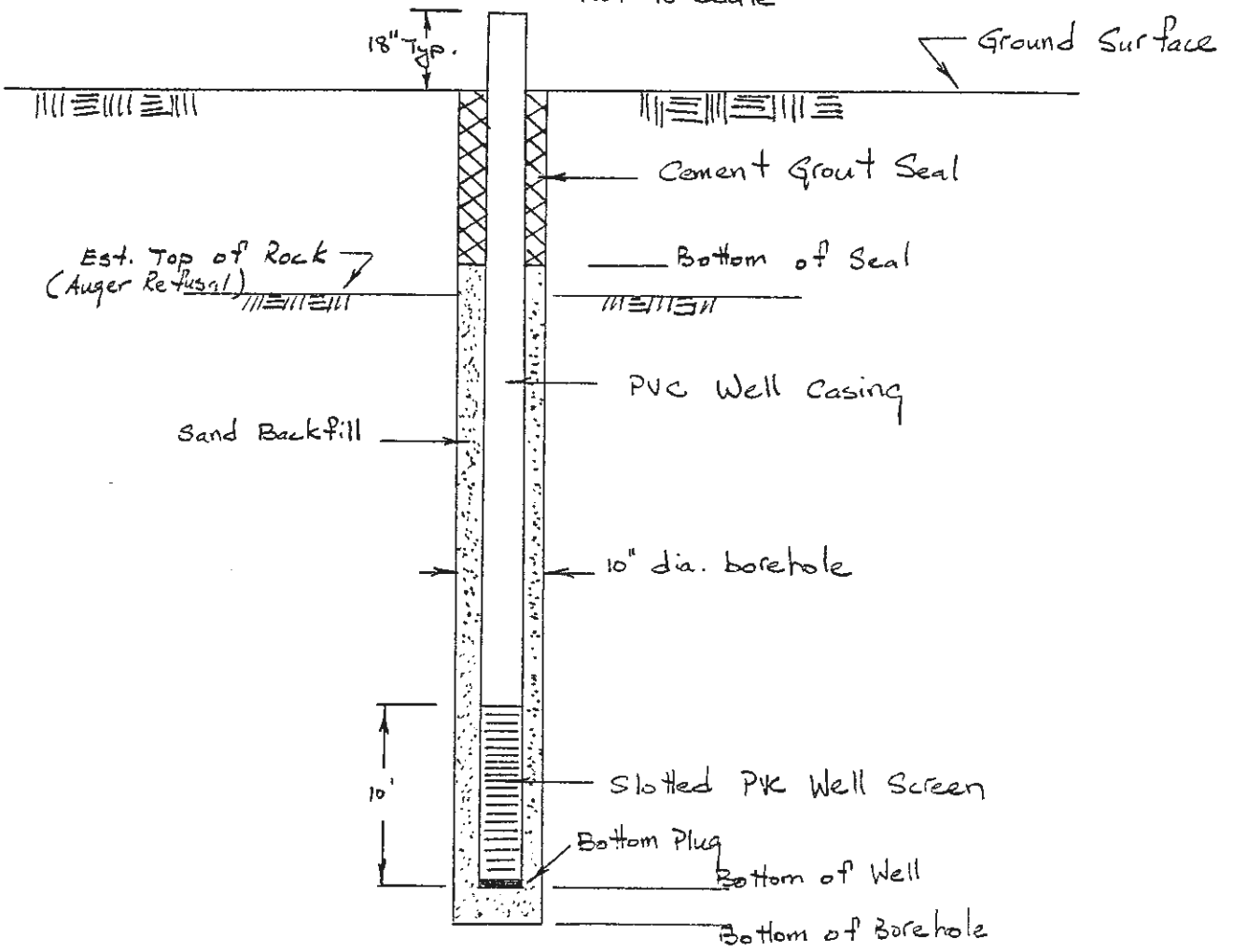
2. Each well shall be identified with 3-4"x4" painted posts (same as observation wells).

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Project Northern Sanitary Landfill — Contract No. 81-3181
Subject Monitoring Wells — Sheet No. ____ of ____
Drawing No 1 of 1
Computed by PAD — Date 11/22/83 — Checked by TJM — Date 11/83

Typical Monitoring Well Profile

Not to Scale



Monitoring Well Construction Summary

Well #	Elev. - Ground Surface	Elev. - Bottom of Hole	Well dia.	Elev. - Bottom of Well	Elev. - Bottom of Seal	Elev. - Auger Refusal
D-21 A	827.8	683.3	2"	684.3	807.8	804.8
M-1	792.1	634.6	4"	635.6	772.1	776.1
M-2	877.6	762.1	4"	763.1	857.6	858.6
M-3	798.6	725.1	4"	726.1	778.6	773.1
M-4	803.6	711.1	4"	712.1	783.6	757.6

APPENDIX D ROCK CORE DESCRIPTIONS AND ROCK QUALITY DATA

CENTURY ENGINEERING, INC.
CONSULTING ENGINEERS · PLANNERS

Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 1
Drawing No D-1

BORING NO: D-5 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	RQD IN	%	DRILLING TIME	REMARKS
1	20.5	25.5	19	32	0	0		
2	25.5	26.5	5	40	0	0		
3	26.5	31.5	12	20	0	0		

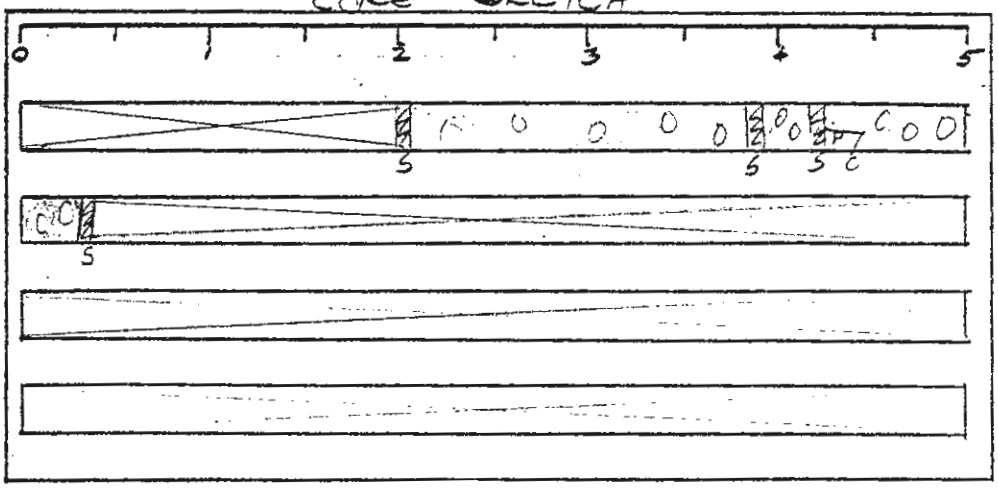
DESCRIPTION OF ROCK TYPE

DEPTH (FT.) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
20.5	31.5		GREEN MICA SCHIST WITH QUARTZITE
			LENSES. FOLIATION 20°-30° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	SOME ORANGE IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

a, b, c, ... = parallel to foliation

a, b, c, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

CENTURY ENGINEERING, INC.
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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 1
Drawing No D-2

BORING NO: D-6 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	RQD IN	%	DRILLING TIME	REMARKS
1	34.5	39.5	32	54	29	48		
2	39.5	44.5	46	76	35	58		
3	44.5	49.5	42	70	25	42		

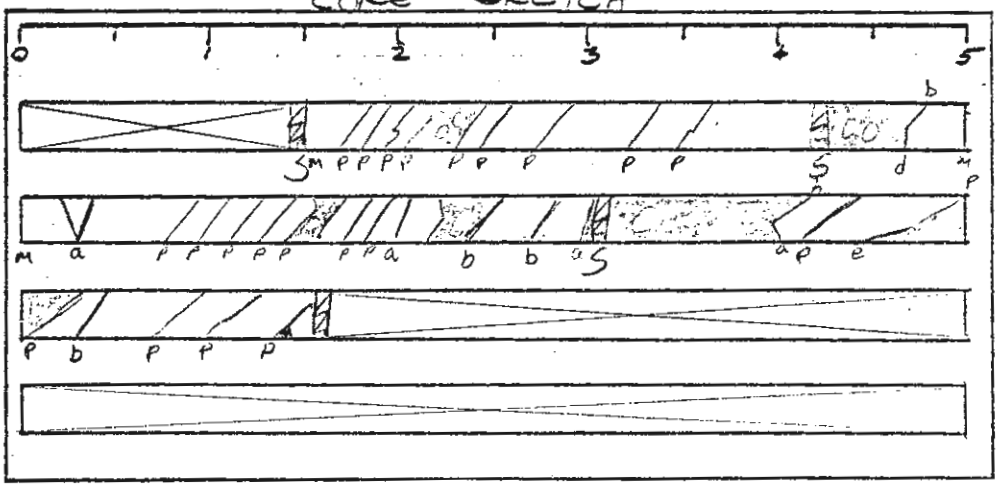
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
34.5	42.5		SILACEOUS RED GRAY MICA SCHIST WITH QUARTZITE
			LENSES. Foliation well pronounced at 30°-45° from core axis
42.5	49.5		Tan Gray mica schist with quartzite lenses. Foliation
			at 30°-50° from core axis

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	SOME RED BROWN IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

a, b, c, ... = parallel to foliation

a, b, c, ... = perpendicular to foliation

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 21-3131
Subject BORING LOGS Sheet No. 1 of 1
Drawing No 1-3

BORING NO.: D-7 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	RQD IN	%	DRILLING TIME	REMARKS
1	10.5	15.5	11	18	0	0		
2	15.5	20.5	38	64	8	13		
3	20.5	25.5	50	84	21	35		

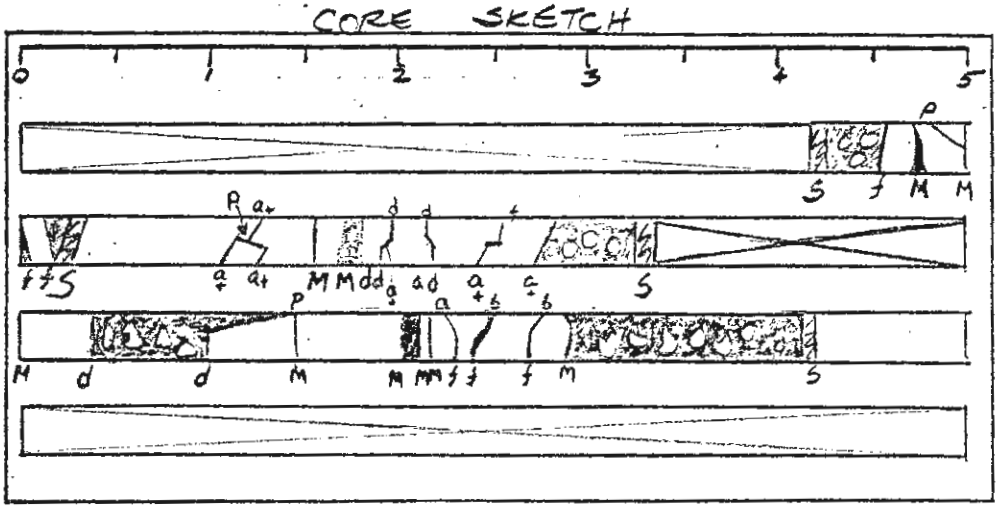
DESCRIPTION OF ROCK TYPE

DEPTH (FT.) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
10.5	25.5		GREEN MICA SCHIST WITH QUARTZITE LENSES
			FOLIATION POORLY PRONOUNCED AT 10°-30° FROM
			CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	red iron staining in joints.						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$a_{\perp}$, $b_{\perp}$, $c_{\perp}$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

ENTURY ENGINEERING, INC.
CONSULTING ENGINEERS · PLANNERS

Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-4

BORING NO: D-8 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	20.5	25.5	36	60	7	12		
2	25.5	30.5	37	62	16	27		
3	30.5	35.5	38	64	14	23		

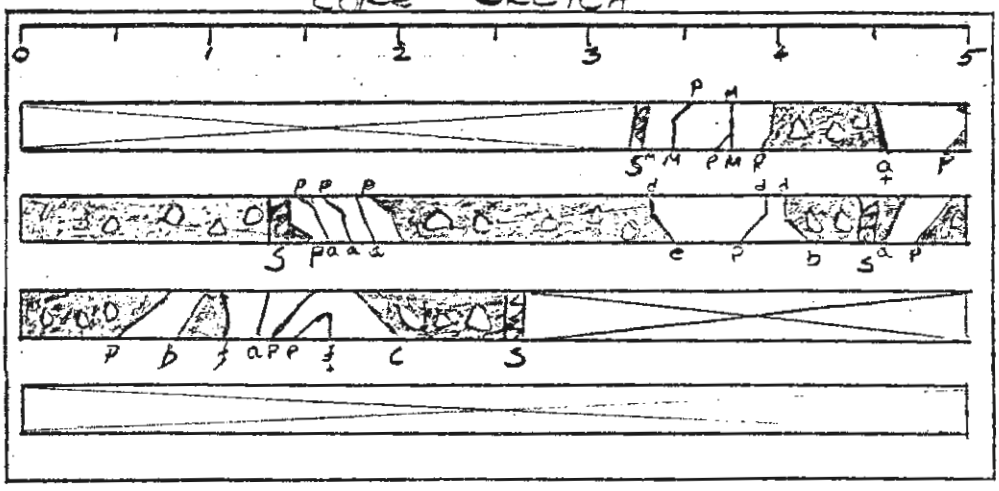
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
20.5	35.5		SILVERY GRAY GREEN MICA SCHIST WITH QUARTZITE LENSES
			HIGHLY LAMINAR WITH FOLIATION AT 30°-45° FROM CORE
			AXIS.

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL							

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$\underline{a}_{\perp}$, $\underline{b}_{\perp}$, $\underline{c}_{\perp}$, ... = perpendicular to foliat.

S $\frac{3}{4}$ = wood spacer block

P = Foliation parting

M = Mechanical or handling break

ENTURY ENGINEERING, INC.
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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-5

BORING NO: D-10 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	33.0	38.0	12	20	0	0		
2	38.0	43.0	4	6	0	0		
3	43.0	48.0	10	16	0	0		

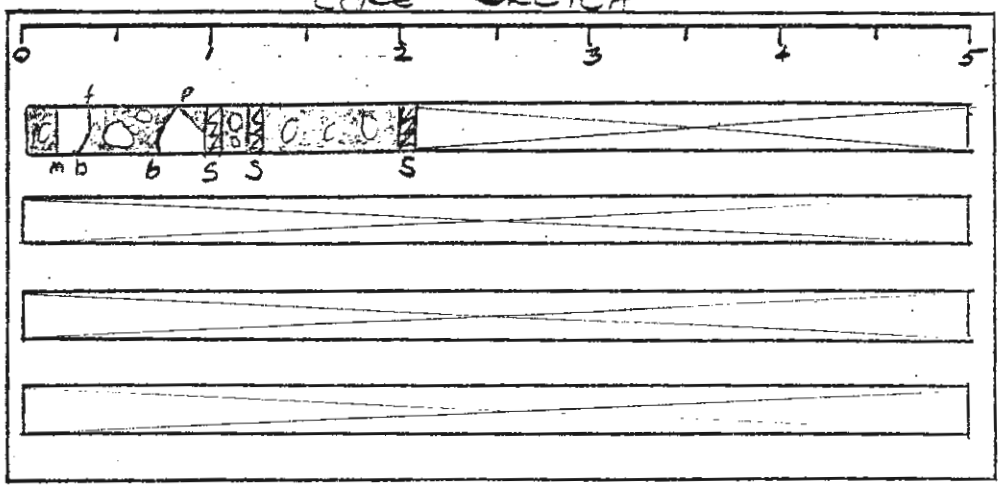
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
33.0	48.0		GREEN MICA SCHIST WITH QUARTZITE LENSES
			FOLIATION 30°-40° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	orange iron staining in joints						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

a, b, c, ... = parallel to foliation

$a_\perp$, $b_\perp$, $c_\perp$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

CENTURY ENGINEERING, INC.
CONSULTING ENGINEERS · PLANNERS

Project NORTHERN LANDFILL . CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-6

BORING NO: D-11 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	18.0	21.5	38	91	19	45		
2	21.5	26.0	54	100	33	61		
3	26.0	31.0	55	92	35	58		
4	31.0	33.0	20	85	9	38		

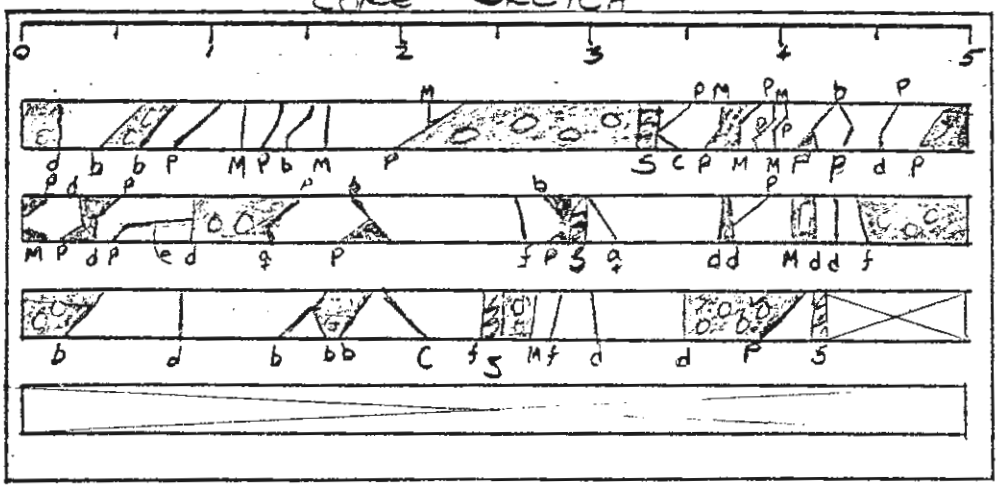
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
18.0	33.0		GREEN RED MICA SCHIST WITH QUARTZITE LENSES. FOLIATION AT 20°-30° FROM CORE AXIS AND BECOMING LESS PRONOUNCED WITH DEPTH

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	Red, orange, and yellow iron staining in some joints increasing with depth.						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

a, b, c, ... = parallel to foliation

a, b, c, ... = perpendicular to foliat.

S = Wood spacer block

P = Foliation parting

M = Mechanical or handling break

CENTURY ENGINEERING, INC.
CONSULTING ENGINEERS · PLANNERS

Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-7

BORING NO: D-12 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	RQD IN	%	DRILLING TIME	REMARKS
1	3.5	8.5	18	30	4	7		
2	8.5	13.5	32	54	12	20		
3	13.5	18.5	31	52	17	28		

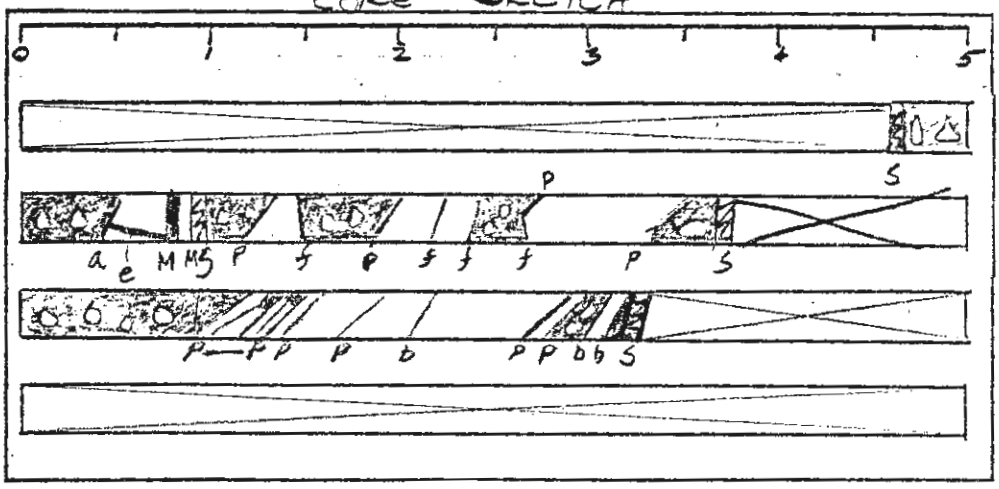
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
3.5	18.5		SILVERY RED BROWN (GREEN INCREASING WITH DEPTH)
			Mica schist with high iron accessory mineral content
			and quartzite lenses. FOLIATION AT 30°-45° FROM CORE
			AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	RED BROWN IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

a, b, c, ... = parallel to foliation

a, b, c, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 21-3181
Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-8

BORING NO: D-14 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	3.5	8.5	37	62	21	35		
2	8.5	13.5	38	64	7	12		
3	13.5	18.5	47	18	8	13		

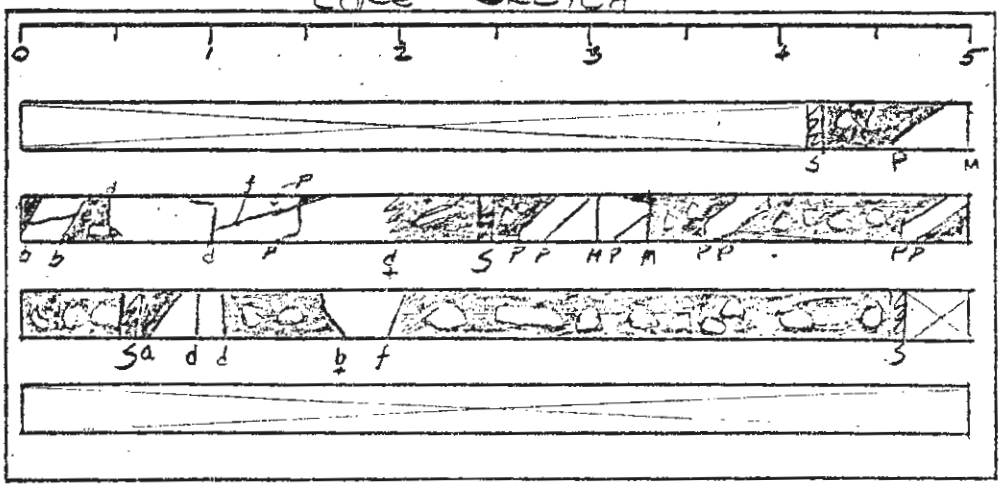
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
3.5	18.5		GREEN MICA SCHIST WITH QUARTZITE LENSES FOHATION AT 30°-40° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	SOME TAN ORANGE IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$a_{\perp}$, $b_{\perp}$, $c_{\perp}$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Drawing No C-5

BORING NO: D-15 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	18.5	23.5	47	78	29	48		
2	23.5	28.5	35	58	6	10		
3	29.5	33.5	48	80	11	18		

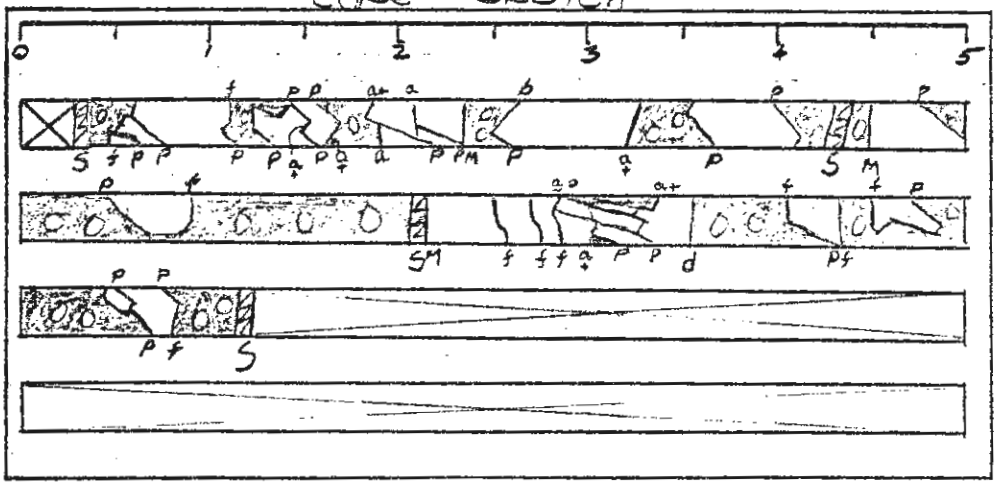
DESCRIPTION OF ROCK TYPE

DEPTH (FT.) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
18.5	33.5		Highly laminar green MICA schist with quartzite lenses. Foliation at 20°-30° from core axis.

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	BROWN RED IRON STAINING IN NON-FOLIATION JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$a_\perp$, $b_\perp$, $c_\perp$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-10

BORING NO: D-16 Computed by I.D.M. Date 10/83 Checked by T.S.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	19.0	24.0	22	36	4	7		
2	24.0	29.0	48	80	13	22		
3	29.0	34.0	48	80	14	23		

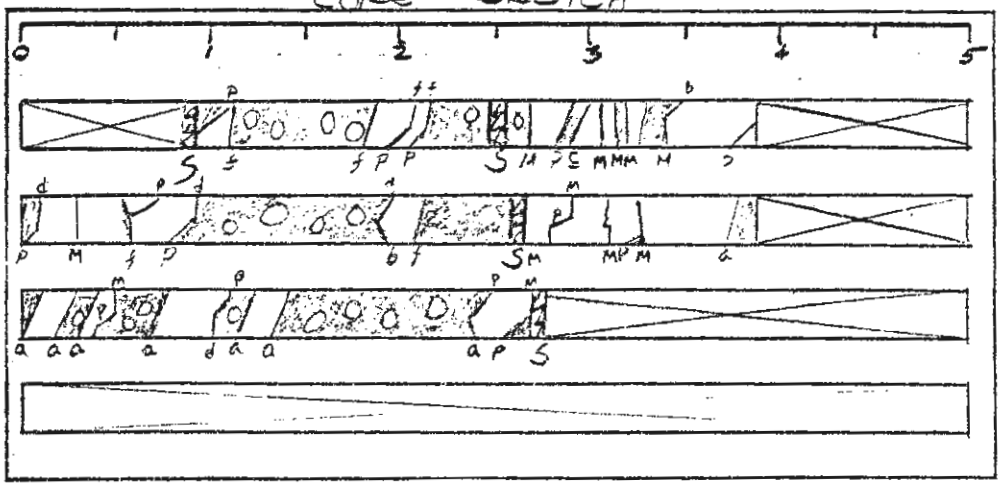
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
			MICA SCHIST TURNING FROM TAN TO GREEN
			WITH DEPTH, WITH QUARTZITE LENSES
			FOLIATION 35°-45° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	RED IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$\underline{\underline{a}}$, $\underline{\underline{b}}$, $\underline{\underline{c}}$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-11

BORING NO: D-17 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	RQD IN	%	DRILLING TIME	REMARKS
1	7.0	10.5	17	40	0	0		
2	10.5	14.0	42	100	21	50		

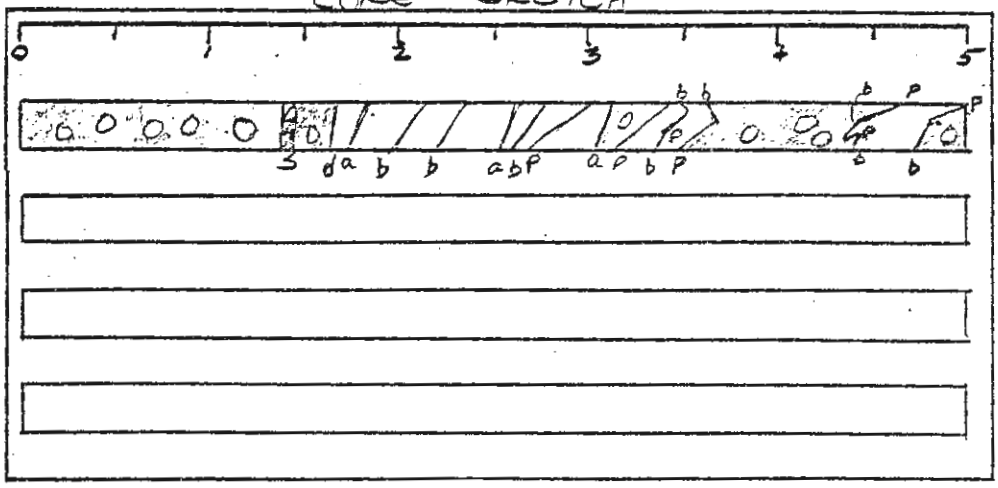
DESCRIPTION OF ROCK TYPE

DEPTH (FT.) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
7.0	14.0		GREAN MICA SCHIST WITH QUARTZITE LENSES
			FOLIATION AT 20° - 35° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	VERY LITTLE TAN IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

a, b, c, ... = parallel to foliation

a, b, c, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-12

BORING NO.: B-18 Computed by IDM Date 10/83 Checked by T.S.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	25.5	30.5	60	100	44	73		
2	30.5	35.5	60	100	43	72		
3	35.5	40.5	60	100	36	60		

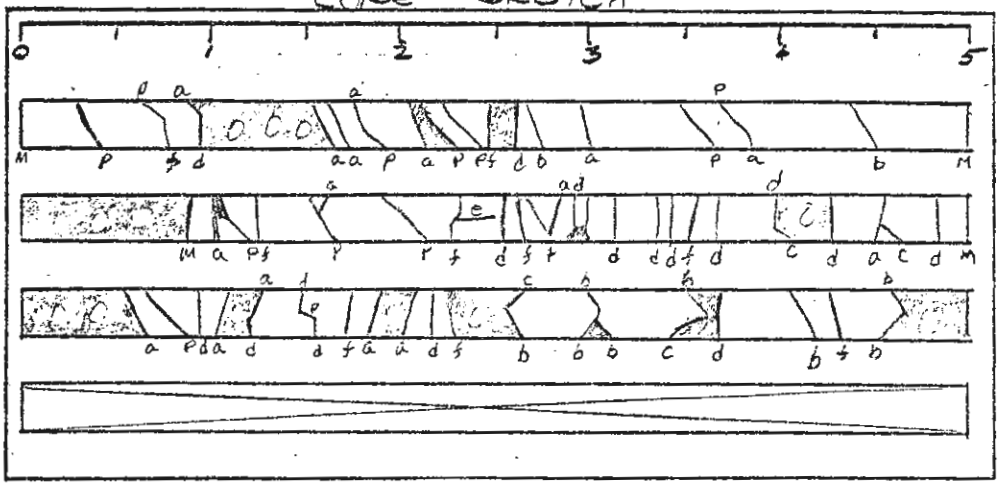
DESCRIPTION OF ROCK TYPE

DEPTH (FT.) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
25.5	40.5		Tan Gray Mica Schist with quartzite lenses
			Foliation at 30°-45° from core axis

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	Some orange iron staining in joints						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$a_\perp$, $b_\perp$, $c_\perp$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-13

BORING NO: D-19 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	26.0	31.0	56	94	42	70		
2	31.0	36.0	16	26	0	0		
3	36.0	41.0	23	38	0	0		
4	41.0	43.5	24	80	13	43		

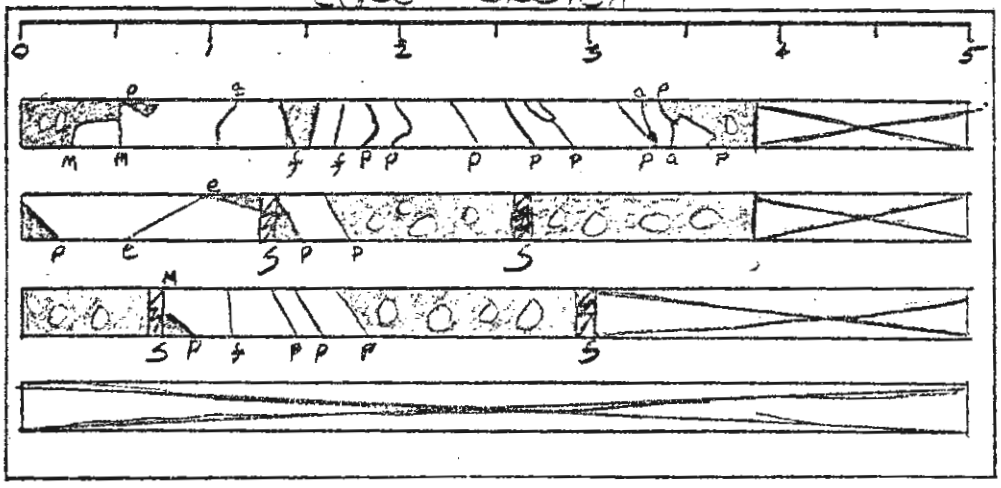
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
26.0	43.5		consolidated green mica schist w/ quartzite lenses. Foliation at 0°-20° (foliation altered locally around some quartzite lenses - @ depth 28')

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wary. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	red brown iron staining in joints.						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

a, b, c, ... = parallel to foliation

a, b, c, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-14

BORING NO: D-21 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No.	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	23.0	28.0	24	40	0	0		
2	28.0	33.0	40	66	22	37		
3	33.0	38.0	30	50	0	0		

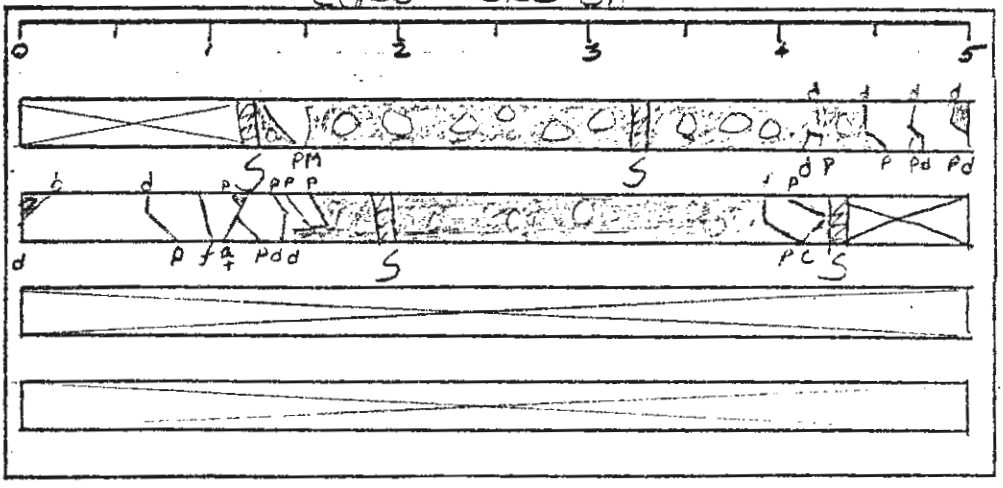
DESCRIPTION OF ROCK TYPE

DEPTH (FT.) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
23.0	38.0		GOLD BROWN AND GREEN MICA SCHIST W/ QUARTZITE LENSES. FOLIATION AT 30°-40° FROM CORE AXIS.

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	SOME ORANGE IRON STAINING IN JOINTS.						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

a, b, c, ... = parallel to foliation

a, b, c, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3131
Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-15

BORING NO: D-22 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	RQD IN	%	DRILLING TIME	REMARKS
1	18.0	23.0	28	46	17	28		
2	23.0	28.0	23	38	0	0		
3	28.0	33.0	29	48	6	10		

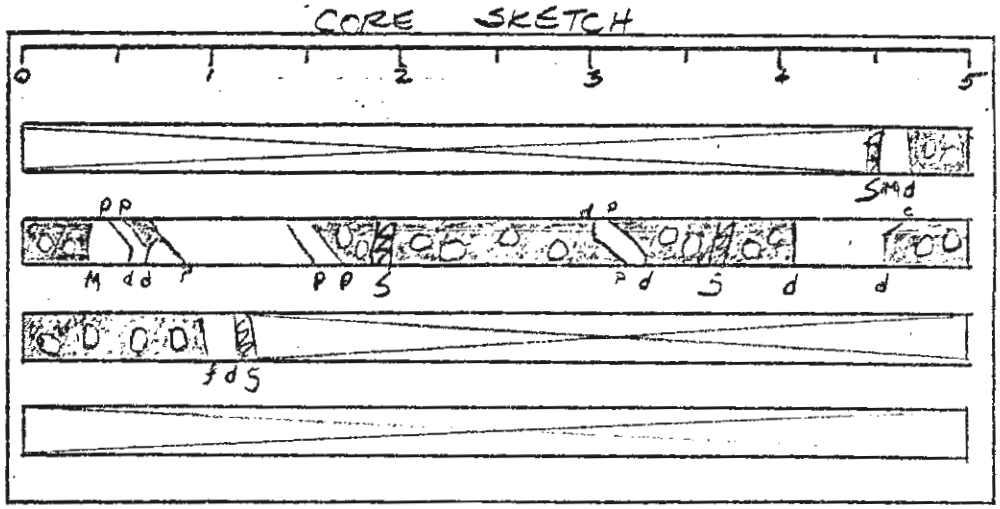
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
18.0	33.0		SILVERY GRAY MICA SCHIST WITH QUARTZITE LENSES
			FOLIATION AT 20°-30° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	Red-brown iron staining in joints						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$\underline{\perp}$, $\underline{\perp}$, $\underline{\perp}$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-16

BORING NO: D-23 Computed by I.D.M. Date 10/83 Checked by T.S.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	33.0	38.0	8	14	0	0		
2	38.0	43.0	10	16	0	0		
3	43.0	48.0	14	24	7	12		

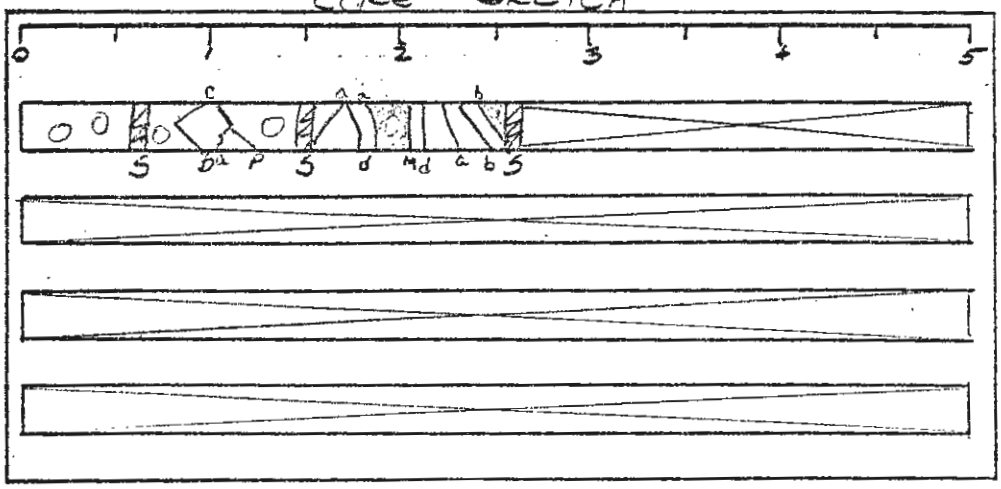
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
33.0	48.0		SILVER GRAY-TAN MICA SCHIST WITH QUARTZITE
			LENSES. FOLIATION AT 30° - 40° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	LITTLE RED IRON STAINING IN JOINTS BELOW 43.0' DEPTH						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$\overset{\perp}{a}$, $\overset{\perp}{b}$, $\overset{\perp}{c}$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 7
Drawing No C-17

BORING NO: D-24 Computed by L.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	25.0	30.0	53	88	41	68		
2	30.0	35.0	48	80	21	35		
3	35.0	40.0	5	8	0	0		
4	40.0	45.0	5	8	0	0		

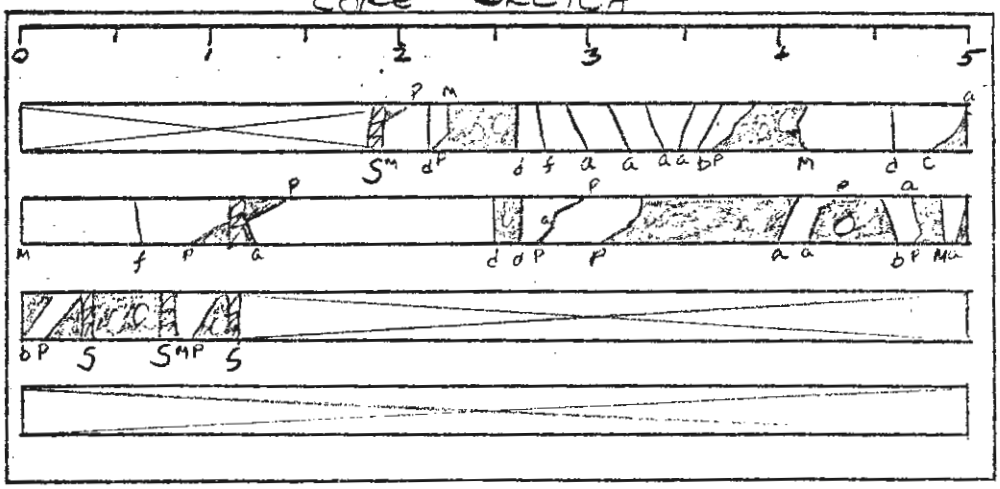
DESCRIPTION OF ROCK TYPE

DEPTH (FT.) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
25.0	45.0		GREEN MICA SCHIST WITH QUARTZITE LENSES
			FOLIATION AT 20°-35° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	SOME RED TAN IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

a_1, b_1, c_1, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 2 of 2
Drawing No C-17A

BORING NO: D-24 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	RQD IN	%	DRILLING TIME	REMARKS
5	45.0	50.0	14	24	9	15		
6	50.0	55.0	24	40	11	18		

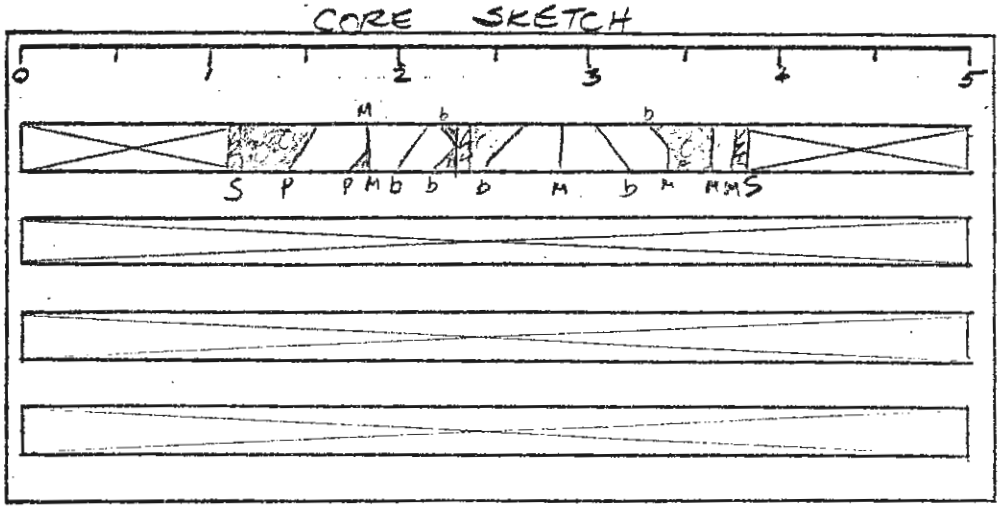
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
			GREEN MICA SCHIST WITH QUARTZITE LENSES
			FOLIATION 30°-45° FROM CORE AXIS (STEEPER THAN
			RUNS 1-4)

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	NO IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$\underline{\underline{a}}$, $\underline{\underline{b}}$, $\underline{\underline{c}}$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

CENTURY ENGINEERING, INC.
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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-18

BORING NO: D-25

Computed by I.D.M. Date 10/83 Checked by T.S.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	15.5	20.5	18	30	0	0		
2	20.5	25.5	18	30	0	0		
3	25.5	30.5	22	36	4	7		

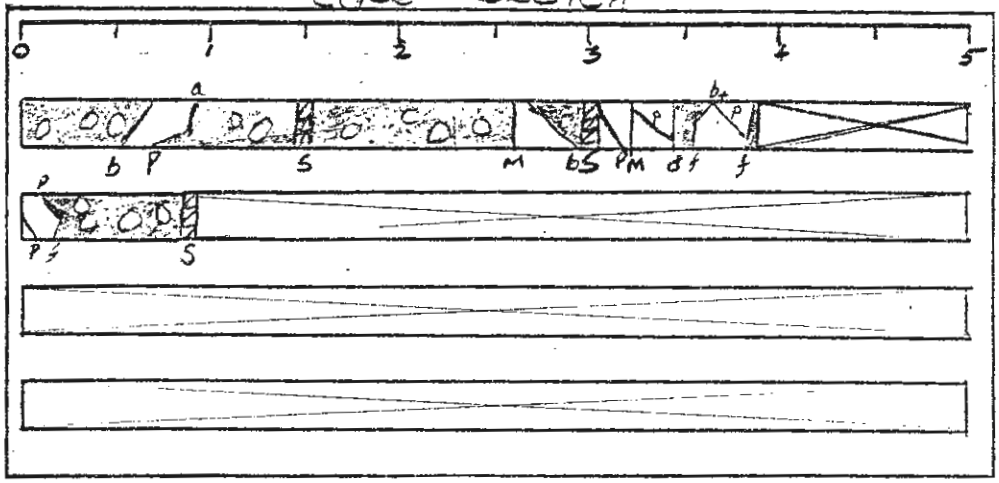
DESCRIPTION OF ROCK TYPE

DEPTH (FT.) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
15.5	20.5		GRAY MICA SCHIST W/ QUARTZITE LENSES
20.5	30.5		TAN GRAY MICA SCHIST W/ QUARTZITE LENSES
			FOLIATION AT 20°-30° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	TAN IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

a_1, b_1, c_1, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 21-3181
Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-19

BORING NO: D-76 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	RQD IN	%	DRILLING TIME	REMARKS
1	30.5	35.5	30	50	11	18		
2	35.5	40.5	32	54	6	10		
3	40.5	45.5	53	88	36	60		

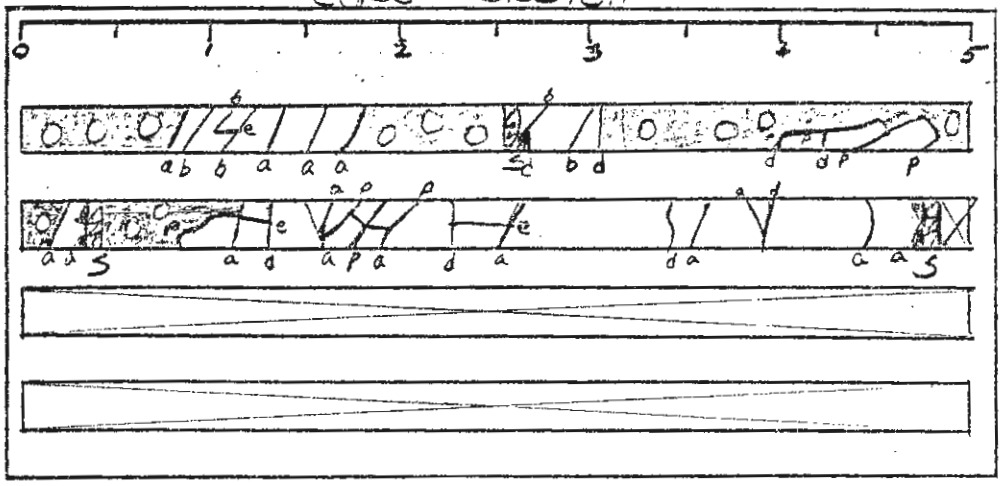
DESCRIPTION OF ROCK TYPE

DEPTH (FT.) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
30.5	45.5		RED TAN (GREEN INCREASING W/ DEPTH) MICA SCHIST W/ QUARTZITE LENSES. FOLIATION AT 30°-45° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	RED BROWN IRON STAINING IN JOINTS DEMINISHING WITH DEPTH						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

a, b, c, ... = parallel to foliation

a, b, c, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

ENTURY ENGINEERING, INC.
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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 2
Drawing No C-20

BORING NO: D-28 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	24.0	25.0	8	70	0	0		
2	25.0	28.5	34	81	12	29		
3	28.5	33.5	48	80	25	58		
4	33.5	38.5	43	72	27	45		

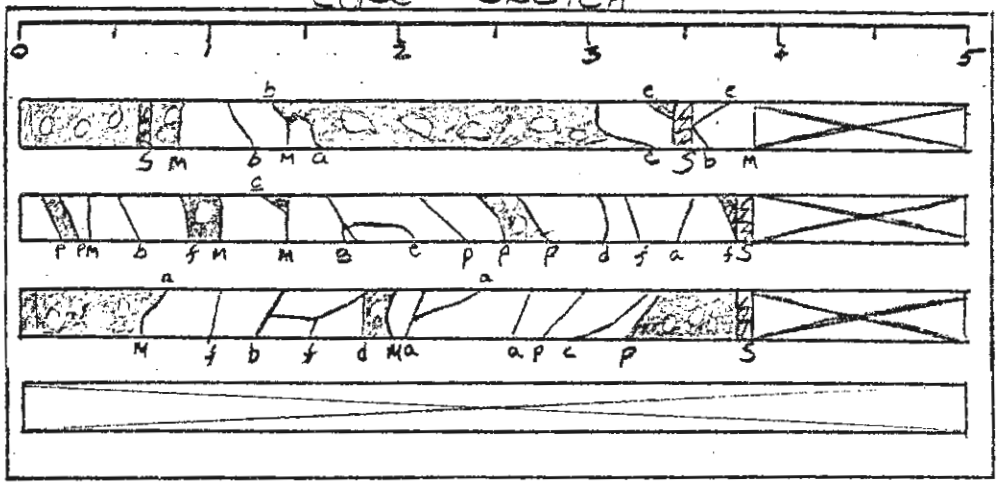
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
24.0	38.5		Tan-gray (some green) mica schist w/ concentration of weathered iron minerals, also with quartzite lenses. Foliation poorly pronounced at 30°-45° from core axis.

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	orange brown iron staining prominent in joints						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$\underline{\underline{a}}$, $\underline{\underline{b}}$, $\underline{\underline{c}}$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 2 of 2
Drawing No C-20A

BORING NO: D-28 Computed by I.D.M. Date 10/83 Checked by T.S.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	RQD IN	%	DRILLING TIME	REMARKS
5	38.5	43.5	0	0	0	0		
6	43.5	48.0	0	0	0	0		
7	48.0	53.0	4	6	0	0		
8	53.0	58.0	11	18	0	0		

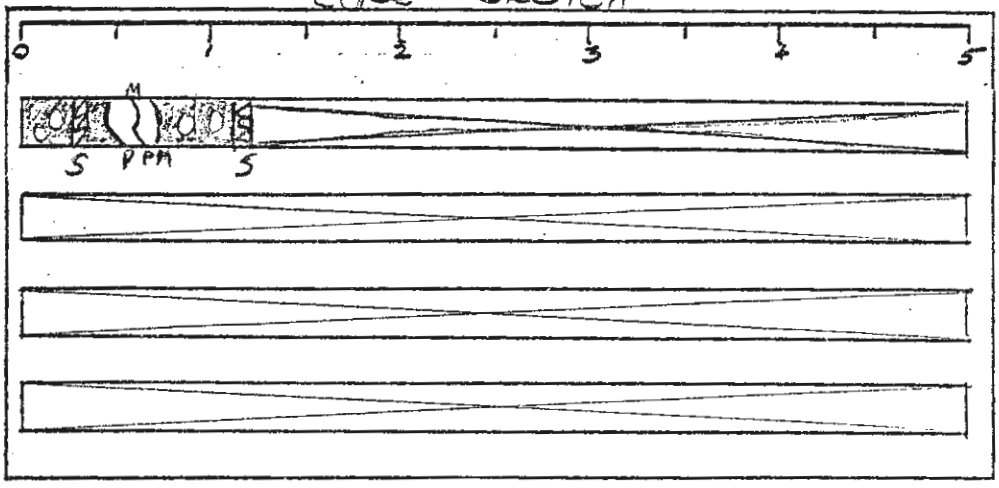
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
38.5	58.0		Tan gray (some green) mica schist w/ concentration of weathered iron minerals, also with quartzite lenses. Foliation partly pronounced at 30°-45° from core axis.

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	orange brown iron staining prominent in joints						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$a_\perp$, $b_\perp$, $c_\perp$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 21-3131
Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-21

BORING NO: D-29 Computed by IDM Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	RQD IN	%	DRILLING TIME	REMARKS
1	19.0	24.0	25	41	4	7		
2	24.0	29.0	18	30	0	0		
3	29.0	34.0	30	50	13	22		

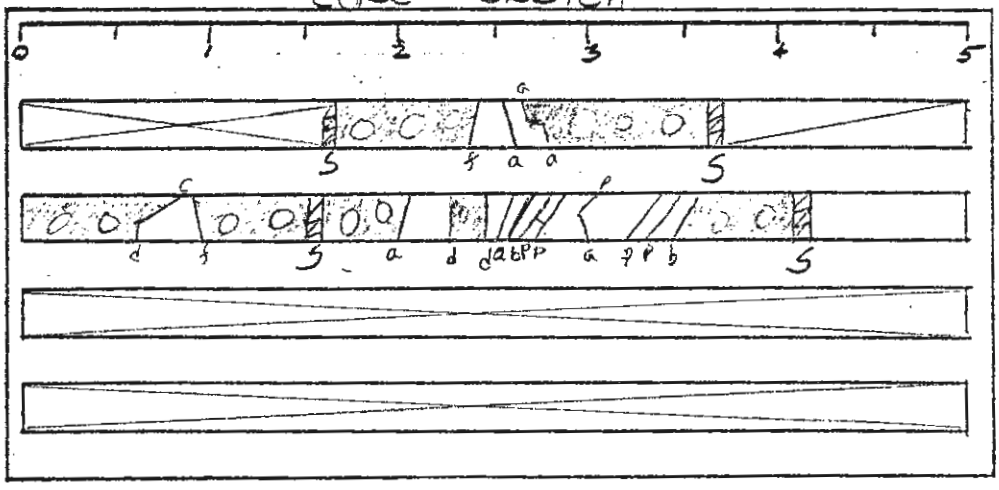
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
			Tan (greening with depth) well weathered mica schist with qu. lenses. Foliation (INCREASING WITH DEPTH) AT 35°-45° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	BROWN IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$\underline{\underline{a}}$, $\underline{\underline{b}}$, $\underline{\underline{c}}$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

CENTURY ENGINEERING, INC.
CONSULTING ENGINEERS · PLANNERS

Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3131
Subject BORING LOGS Sheet No. 1 of 1
Drawing No a-22

BORING NO.: D-30 Computed by I.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	29.5	34.5	11	18	0	0		
2	34.5	39.5	7	12	0	0		
3	39.5	44.5	16	26	0	0		

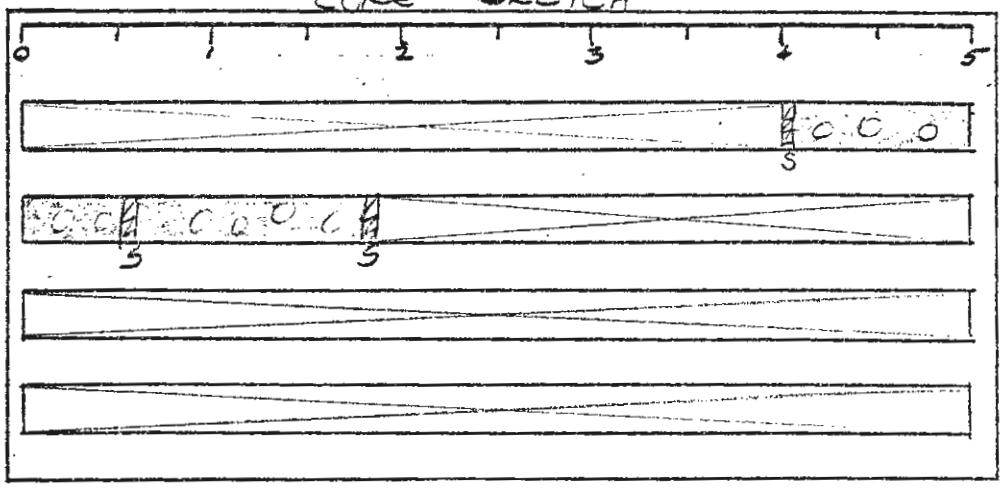
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
29.5	44.5		BROWN MICA SCHIST WITH QUARTZITE LENSES
			FOLIATION AT 15° - 30° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	RED BROWN IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

a, b, c, ... = parallel to foliation

a, b, c, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

ENTURY ENGINEERING, INC.
CONSULTING ENGINEERS · PLANNERS

Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 1
Drawing No C-23

BORING NO: D-31 Computed by DM Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	RQD IN	%	DRILLING TIME	REMARKS
1	46.0	51.0	12	20	0	0		
2	51.0	56.0	48	80	4	7		
3	56.0	61.0	18	30	5	8		

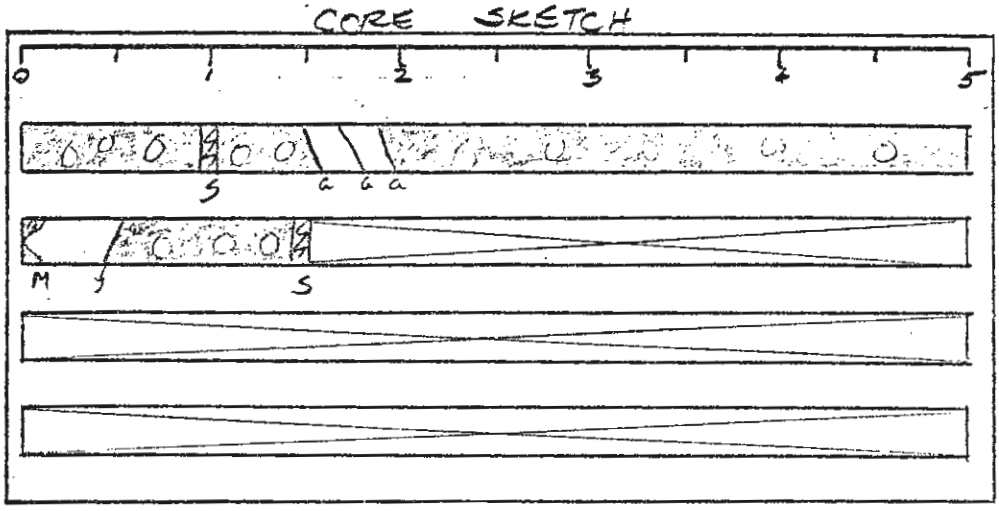
DESCRIPTION OF ROCK TYPE

DEPTH (FT.) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
46.0	61.0		TAN RED WITH SOME GREEN MICA SCHIST WITH QUARTZITE LENSES. FOLIATION AT 15°-30° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	TAN RED IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$\underline{\underline{a}}$, $\underline{\underline{b}}$, $\underline{\underline{c}}$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

CENTURY ENGINEERING, INC.
CONSULTING ENGINEERS · PLANNERS

Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 1
Drawing No C.-2A

BORING NO: D-32 Computed by J.D.M. Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	18.0	23.0	44	74	28	47		
2	23.0	28.0	18	30	5	8		
3	28.0	33.0	36	60	12	20		

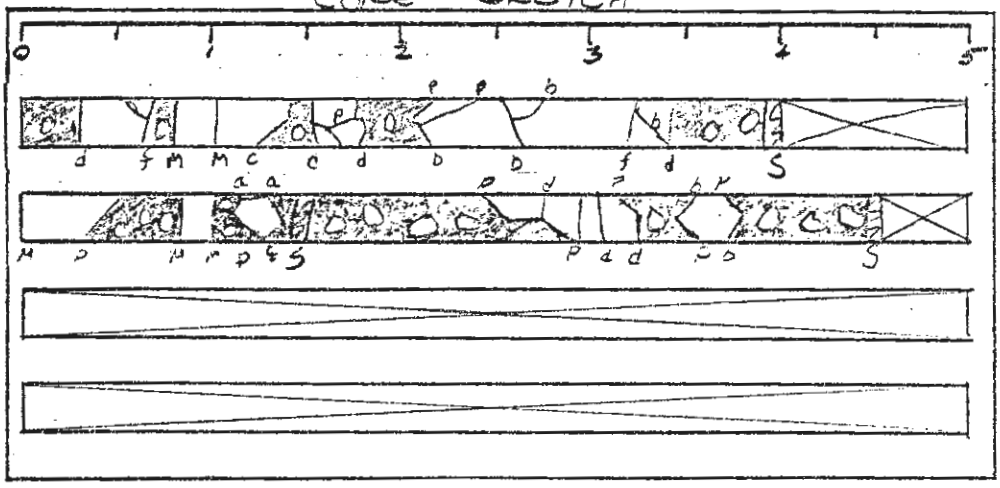
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
18.0	33.0		GREEN MICA SCHIST WITH QUARTZITE LENSES
			FOLIATION AT 30°-45° FROM CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	ORANGE BROWN IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$\underline{\underline{a}}$, $\underline{\underline{b}}$, $\underline{\underline{c}}$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

ENTURY ENGINEERING, INC.
CONSULTING ENGINEERS · PLANNERS

Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 1 of 2
Drawing No C-25

BOIRING NO: D-33 Computed by I.D.M. Date 10/83 · Checked by T.J.M. Date 10/83

RUN No.	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
1	15.0	20.0	18	30	15	25		
2	20.0	25.0	0	0	0	0		
3	25.0	30.0	0	0	0	0		
4	30.0	35.0	0	0	0	0		

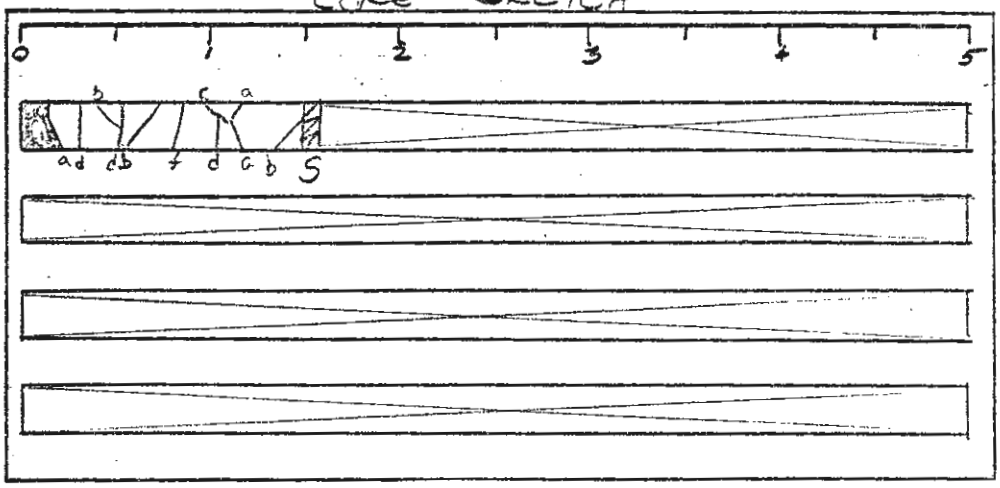
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
15.0	20.0		Tan Gray mica schist with quartzite lenses. Foliation
			poorly pronounced and indistinguishable in this sample

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation generally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	Brown iron staining in joints						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

a, b, c, ... = parallel to foliation

a, b, c, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

ENTURY ENGINEERING, INC.
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Project NORTHERN LANDFILL, CAR. COUNTY Contract No. 81-3181
Subject BORING LOGS Sheet No. 2 of 2
Drawing No C-25A

BORING NO: D-33 Computed by IDM Date 10/83 Checked by T.J.M. Date 10/83

RUN No	DEPTH (FT.) FROM	TO	RECOVERY IN	%	R Q D IN	%	DRILLING TIME	REMARKS
5	35.0	40.0	0	0	0	0		
6	40.0	45.0	12	20	0	0		
7	45.0	48.0	22	36	16	27		

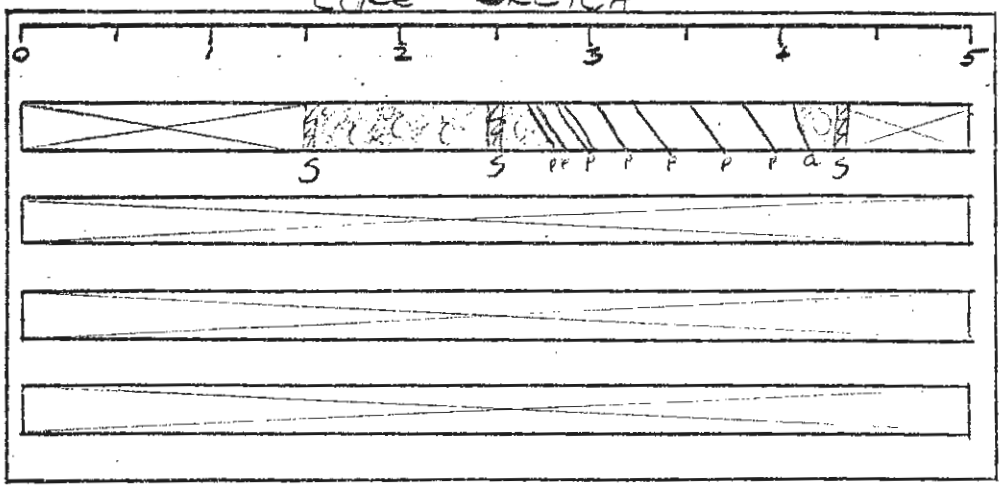
DESCRIPTION OF ROCK TYPE

DEPTH (FT) FROM	TO	TYPE CODE	DESCRIPTION (Color, Type, Weathering, Structure, etc...)
40.0	48.0		WELL WEATHERED ORANGE GRAY SILACEOUS MICA SCHIST
			WITH QUARTZITE LENSES. FOLIATING AT 40°-45° FROM
			CORE AXIS

DESCRIPTION OF JOINTS

	a	b	c	d	e	f	
INCLINATION TO CORE AXIS	60°	45°	30°	90°	0-20°	70°	
SHAPE AND ROUGHNESS	Foliation gererally planar and slightly wavy. Cross foliation breaks are rough (serrated) and irregular.						
COATINGS — FILLING MATERIAL	ORANGE IRON STAINING IN JOINTS						

CORE SKETCH



LEGEND

A, B, C, ... = Rock Type

a, b, c, ... = discontinuity

$\underline{a}$, $\underline{b}$, $\underline{c}$, ... = parallel to foliation

$\overset{\perp}{a}$, $\overset{\perp}{b}$, $\overset{\perp}{c}$, ... = perpendicular to foliat.

S = wood spacer block

P = Foliation parting

M = Mechanical or handling break

TABLE I

LIST OF RQD VALUES

Boring No.	Run	Depth	RQD
D-5	1	20.5 - 25.5	0
	2	25.5 - 26.5	0
	3	26.5 - 31.5	0
D-6	1	34.5 - 39.5	48
	2	39.5 - 44.5	58
	3	44.5 - 49.5	42
D-7	1	10.5 - 15.5	0
	2	15.5 - 20.5	13
	3	20.5 - 25.5	35
D-8	1	20.5 - 25.5	12
	2	25.5 - 30.5	27
	3	30.5 - 35.5	23
D-10	1	33.0 - 38.0	0
	2	38.0 - 43.0	0
	3	43.0 - 48.0	0
D-11	1	18.0 - 21.5	45
	2	21.5 - 26.0	61
	3	26.0 - 31.0	58
	4	31.0 - 33.0	38
D-12	1	3.5 - 8.5	7
	2	8.5 - 13.5	20
	3	13.5 - 18.5	28
D-14	1	3.5 - 8.5	35
	2	8.5 - 13.5	12
	3	13.5 - 18.5	13
D-15	1	18.5 - 23.5	48
	2	23.5 - 28.5	10
	3	28.5 - 33.5	18
D-16	1	19.0 - 24.0	7
	2	24.0 - 29.0	22
	3	29.0 - 34.0	23
D-17	1	7.0 - 10.5	0
	2	10.5 - 14.0	50
D-18	1	25.5 - 30.5	73
	2	30.5 - 35.5	72
	3	35.5 - 40.5	60
D-19	1	26.0 - 31.0	70
	2	31.0 - 36.0	0
	3	36.0 - 41.0	0
	4	41.0 - 43.5	43
D-21	1	23.0 - 28.0	0
	2	28.0 - 33.0	37
	3	33.0 - 38.0	0
D-22	1	18.0 - 23.0	28
	2	23.0 - 28.0	0
	3	28.0 - 33.0	10

TABLE I

LIST OF RQD VALUES

Boring No.	Run	Depth	RQD
D-23	1	33.0 - 38.0	0
	2	38.0 - 43.0	0
	3	43.0 - 48.0	12
D-24	1	25.0 - 30.0	68
	2	30.0 - 35.0	35
	3	35.0 - 40.0	0
	4	40.0 - 45.0	0
	5	45.0 - 50.0	15
	6	50.0 - 55.0	18
D-25	1	15.5 - 20.5	0
	2	20.5 - 25.5	0
	3	25.5 - 30.5	7
D-26	1	30.5 - 35.5	18
	2	35.5 - 40.5	10
	3	40.5 - 45.5	60
D-28	1	24.0 - 25.0	0
	2	25.0 - 28.5	29
	3	28.5 - 33.5	58
	4	33.5 - 38.5	45
	5	38.5 - 43.5	0
	6	43.5 - 48.0	0
	7	48.0 - 53.0	0
	8	53.0 - 58.0	0
D-29	1	19.0 - 24.0	7
	2	24.0 - 29.0	0
	3	29.0 - 34.0	22
D-30	1	29.5 - 34.5	0
	2	34.5 - 39.5	0
	3	39.5 - 44.5	0
D-31	1	46.0 - 51.0	0
	2	51.0 - 56.0	7
	3	56.0 - 61.0	8
D-32	1	18.0 - 23.0	47
	2	23.0 - 28.0	8
	3	28.0 - 33.0	20
D-33	1	15.0 - 20.0	25
	2	20.0 - 25.0	0
	3	25.0 - 30.0	0
	4	30.0 - 35.0	0
	5	35.0 - 40.0	0
	6	40.0 - 45.0	0
	7	45.0 - 48.0	27

APPENDIX E SUMMARY OF BOREHOLE PERMEABILITY TESTS

Carroll County
Northern Sanitary Landfill
Geologic Report
November 1983

TABLE II SUMMARY OF BOREHOLE PERMEABILITY TESTS

Boring No.	Depth	Permeability(k) cm/sec.
D-5	10.0'	5.0×10^{-3}
	15.0'	3.9×10^{-3}
D-10	10.0'	7.8×10^{-3}
	15.0'	1.8×10^{-3}
D-15	10.0'	2.1×10^{-3}
	15.0'	5.2×10^{-3}
D-16	7.0'	7.2×10^{-3}
	13.6'	1.5×10^{-3}
D-17A	10.0'	1.5×10^{-2}
	15.0'	3.1×10^{-2}
D-20	16.0'	5.6×10^{-4}
	20.0'	4.7×10^{-3}
D-26	10.0'	5.3×10^{-3}
	14.4'	7.8×10^{-4}
D-32	10.0'	1.2×10^{-3}
	15.0'	9.4×10^{-4}

APPENDIX F RESULTS OF LABORATORY TESTS

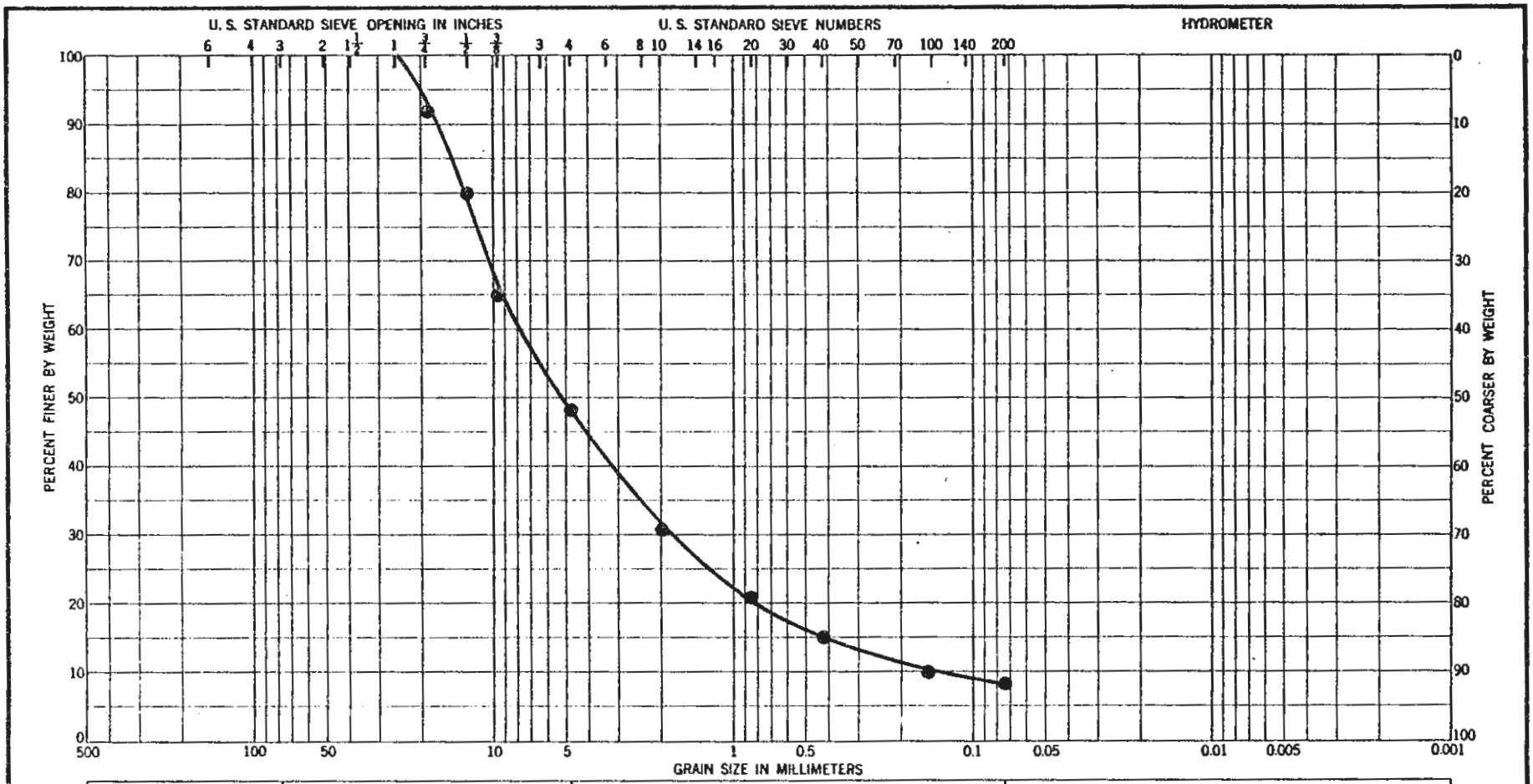
CENTURY ENGINEERING, INC. - Consulting Engineers - Towson, MD

SUMMARY OF TEST RESULTS

Project Name Northern Sanitary Landfill
Location Carroll County, Maryland

Project No. 81-3181
Date 3/9/84
Sheet 1 of 1

BORING NO.	SAMPLE NO.	DEPTH	VISUAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	PLAS-TICITY INDEX	PERCENT FINES		
D-2	6	13.5-15.0	Tan ROCK FRAGMENTS and SAND, tr. silt				8.0%		
D-5	3	5.0-6.5	Brown SAND and ROCK FRAGMENTS, little silt (decomposed rock)				18.0		
D-10	1	0-1.5	Brown CLAY & SILT, tr. sand	35.0	23.5	11.5			
D-17A	5	15.0-16.5	Brown SAND, some silt, little rock fragments				29.0		
D-19	1	0-1.5	Brown CLAY & SILT, tr. sand	34.0	23.0	11.0			
D-19	3	10.0-10.7	Brown SAND, some rock fragments, little silt (decomposed rock)				15.0		
D-20	1	0-1.5	Brown CLAY & SILT, tr. sand	34.0	21.0	13.0			
D-20	7	20.0-21.5	Brown SAND and ROCK FRAGMENTS, some silt, (decomposed rock)				23.0		
D-25	6	12.5-13.4	Brown SAND, some rock fragments, little silt, (decomposed rock)				15.0		
D-27	1	0-1.5	Brown CLAY & SILT, tr. sand	39.0	26.5	12.5			
D-29	1	0-1.5	Brown SILT & CLAY, tr. sand	30.5	23.0	7.5			



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
6	13.5-15.0	Tan ROCK FRAGMENTS and SAND, trace silt				

GRADATION CURVES

Project: Northern Sanitary Landfill

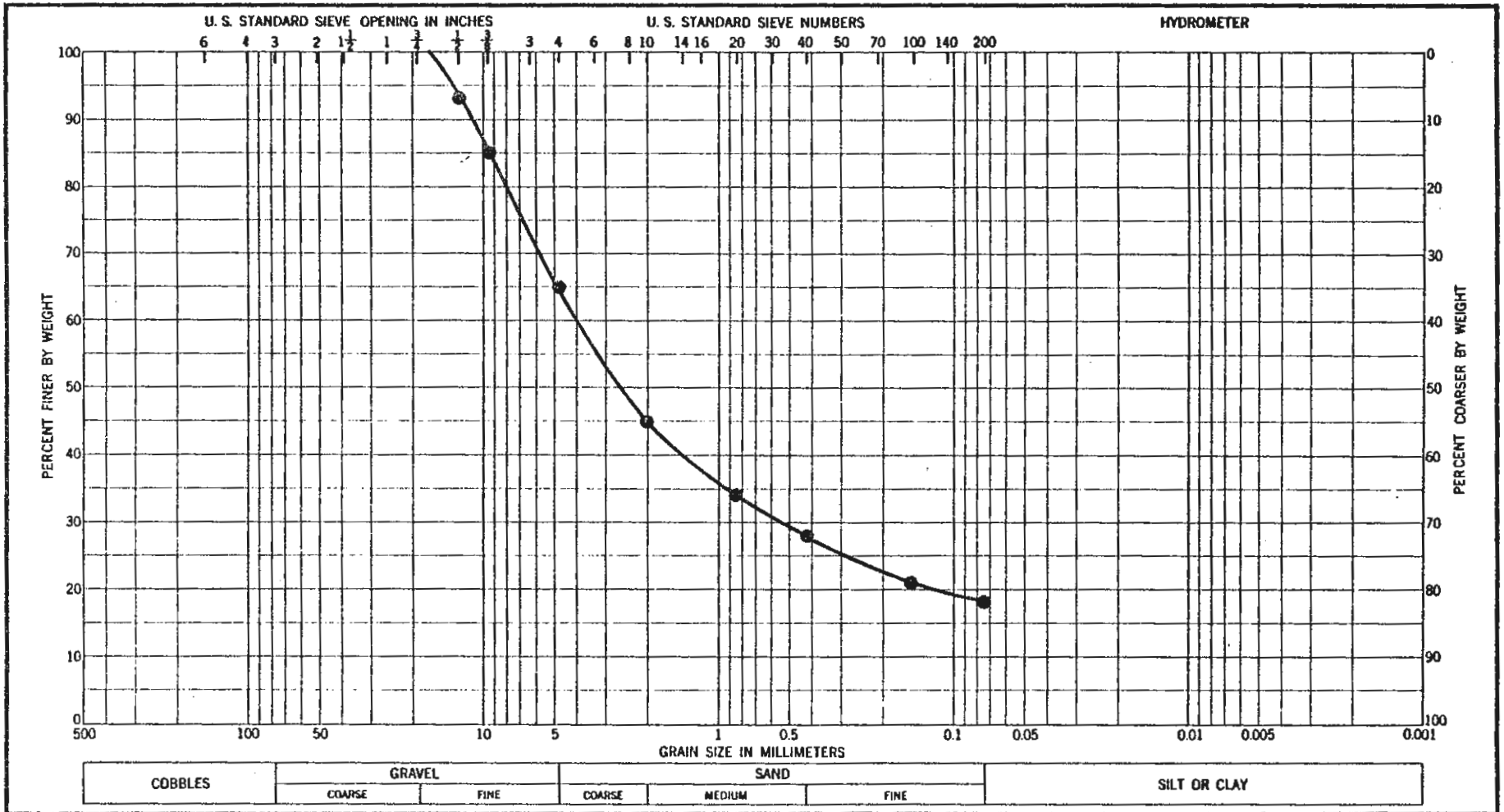
Area: Carroll County, Maryland

Boring No.: D-2

Date: 3/9/84

ENG FORM 1 MAY 63 2087

CEI 81-3181



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
3	5.0-6.5	Brown SAND & ROCK FRAGMENTS little silt (decomposed rock)				

GRADATION CURVES

Project: Northern Sanitary Landfill

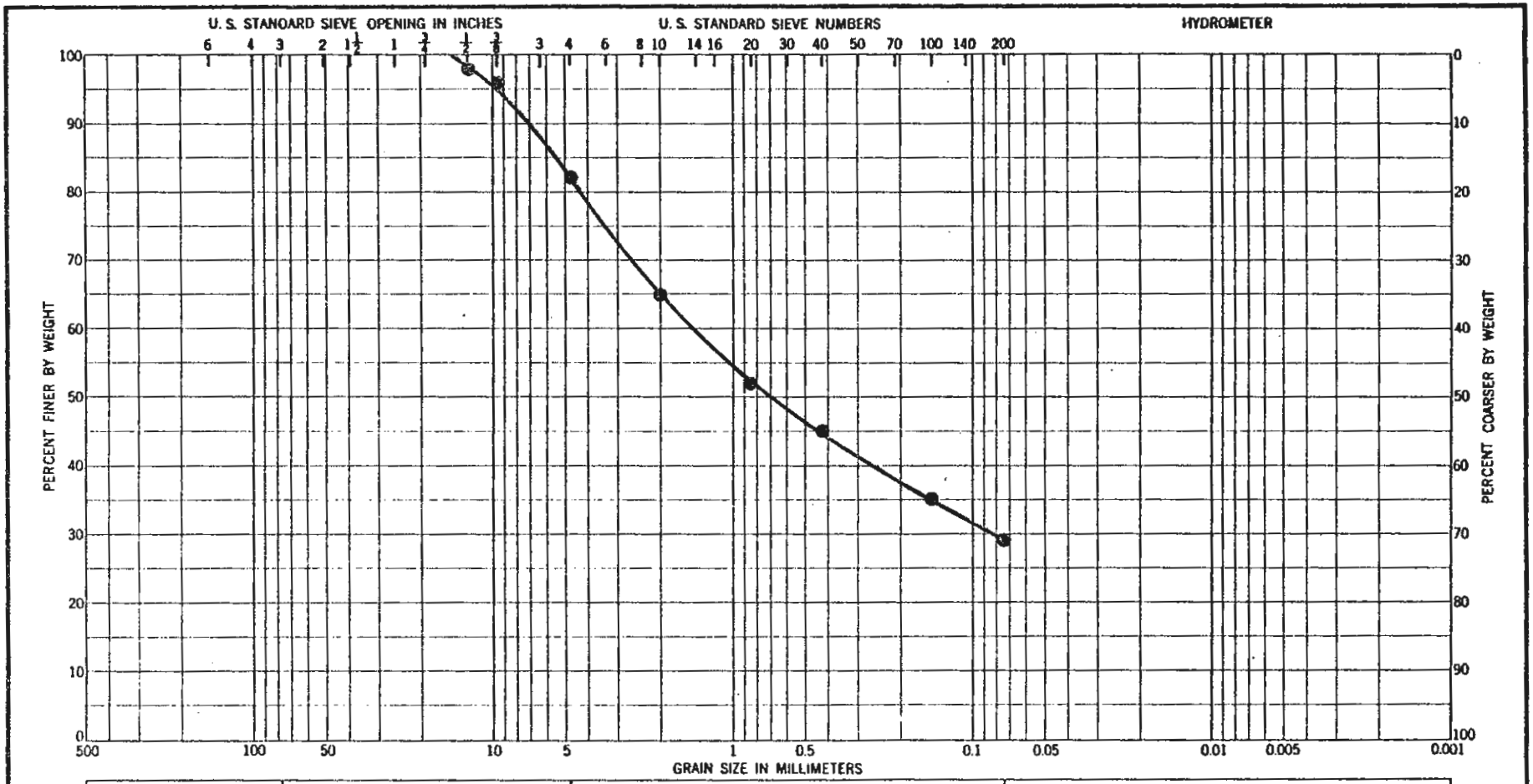
Area: Carroll County, Maryland

Boring No.: D-5

Date: 3/9/84

ENG FORM 1 MAY 63 2087

CEI 81-3181



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
5	15.0-16.5	Brown SAND, some silt, little rock fragments				

GRADATION CURVES

Project: Northern Sanitary Landfill

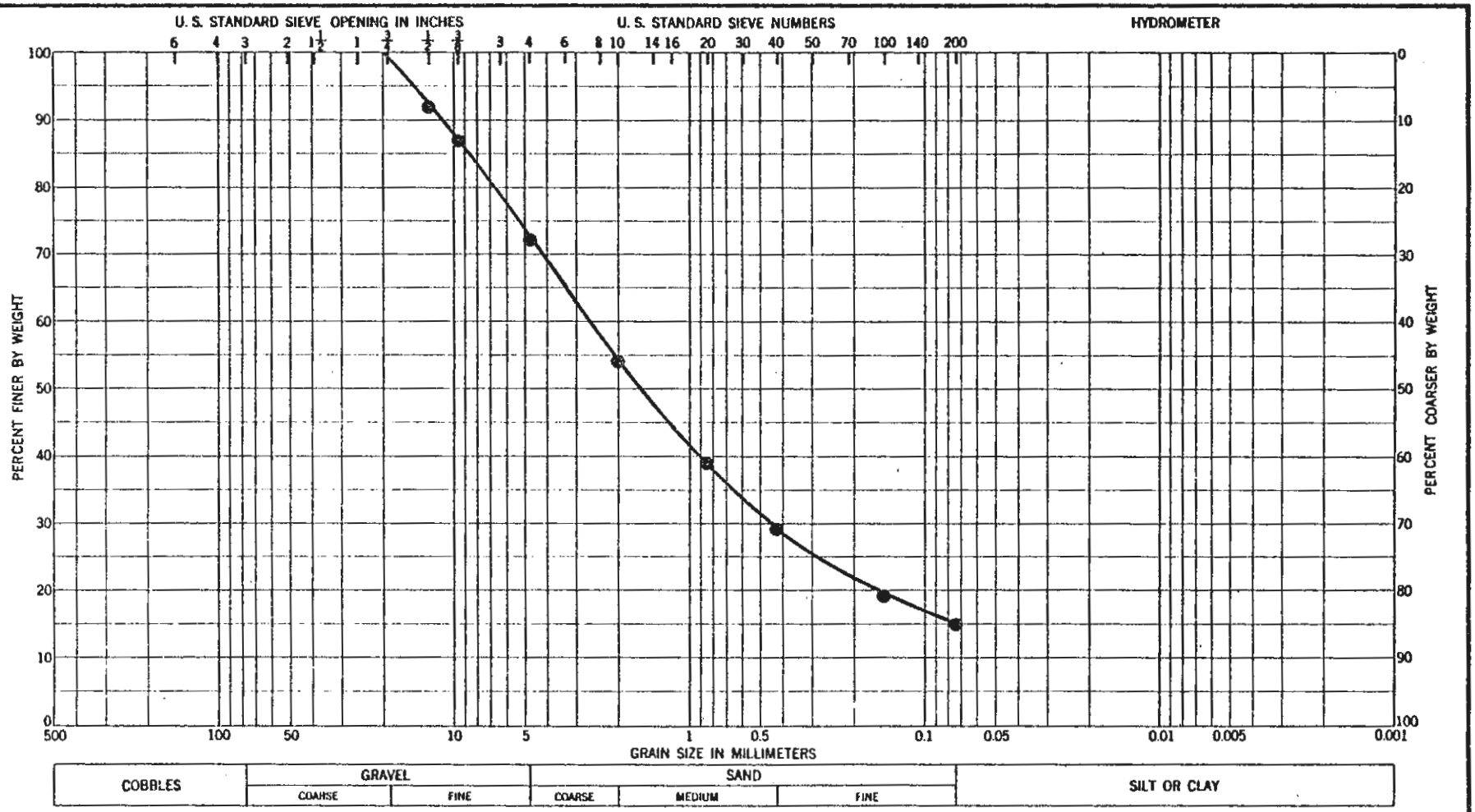
Area: Carroll County, Maryland

Boring No.: D-17A

Date: 3/9/84

CEI 81-3181

ENG FORM 1 MAY 63 2087



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
3	10.0-10.7	Brown SAND, some rock fragments, little silt (decomposed rock)				

GRADATION CURVES

Project: Northern Sanitary Landfill

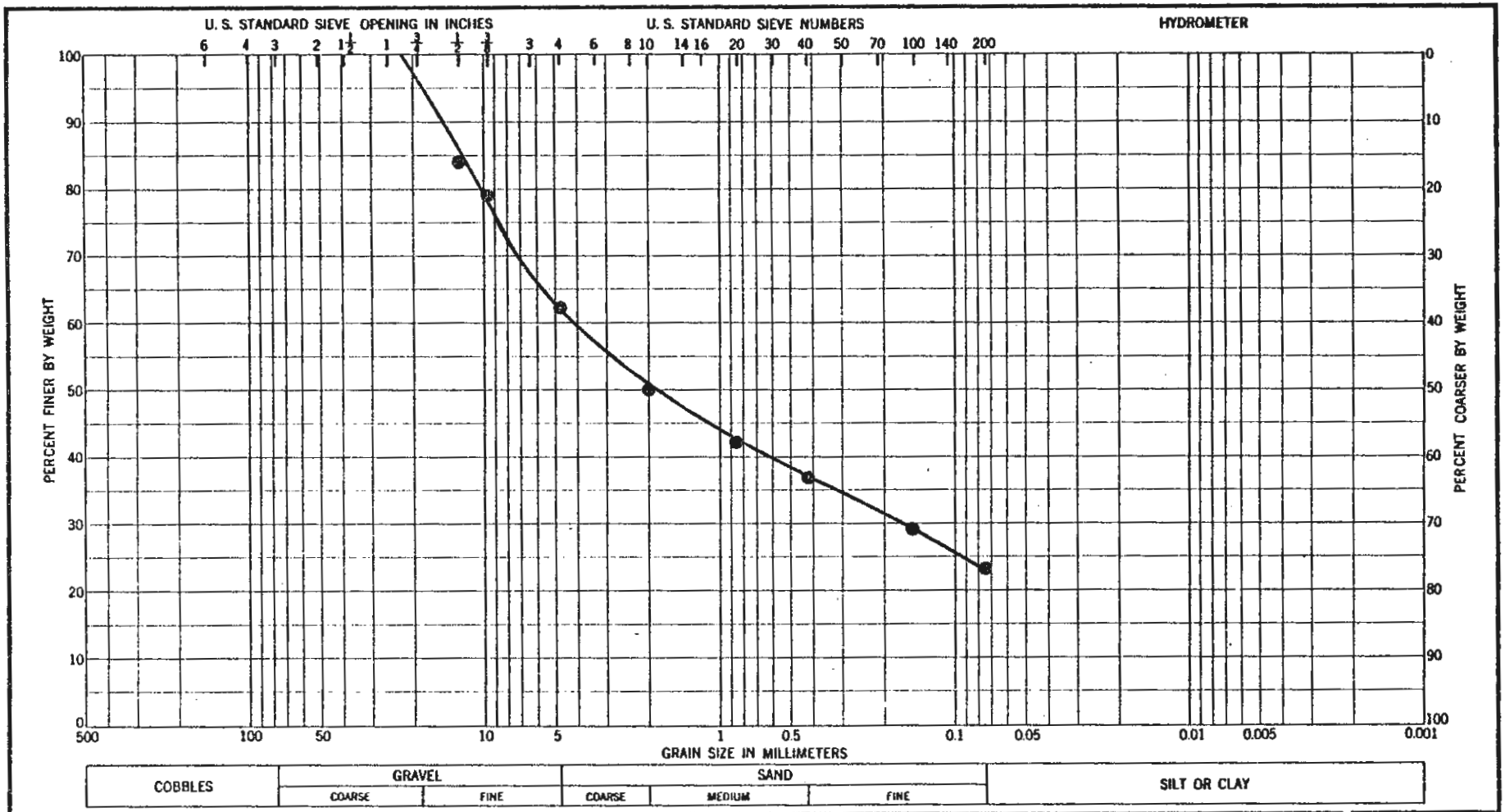
Area: Carroll County, Maryland

Boring No.: D-19

Date: 3/9/84

ENG FORM 1 MAY 63 2087

CEI 81-3181



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
7	20.0-21.5	Brown SAND & ROCK FRAGMENTS some silt (decomposed rock)				

GRADATION CURVES

Project: Northern Sanitary Landfill

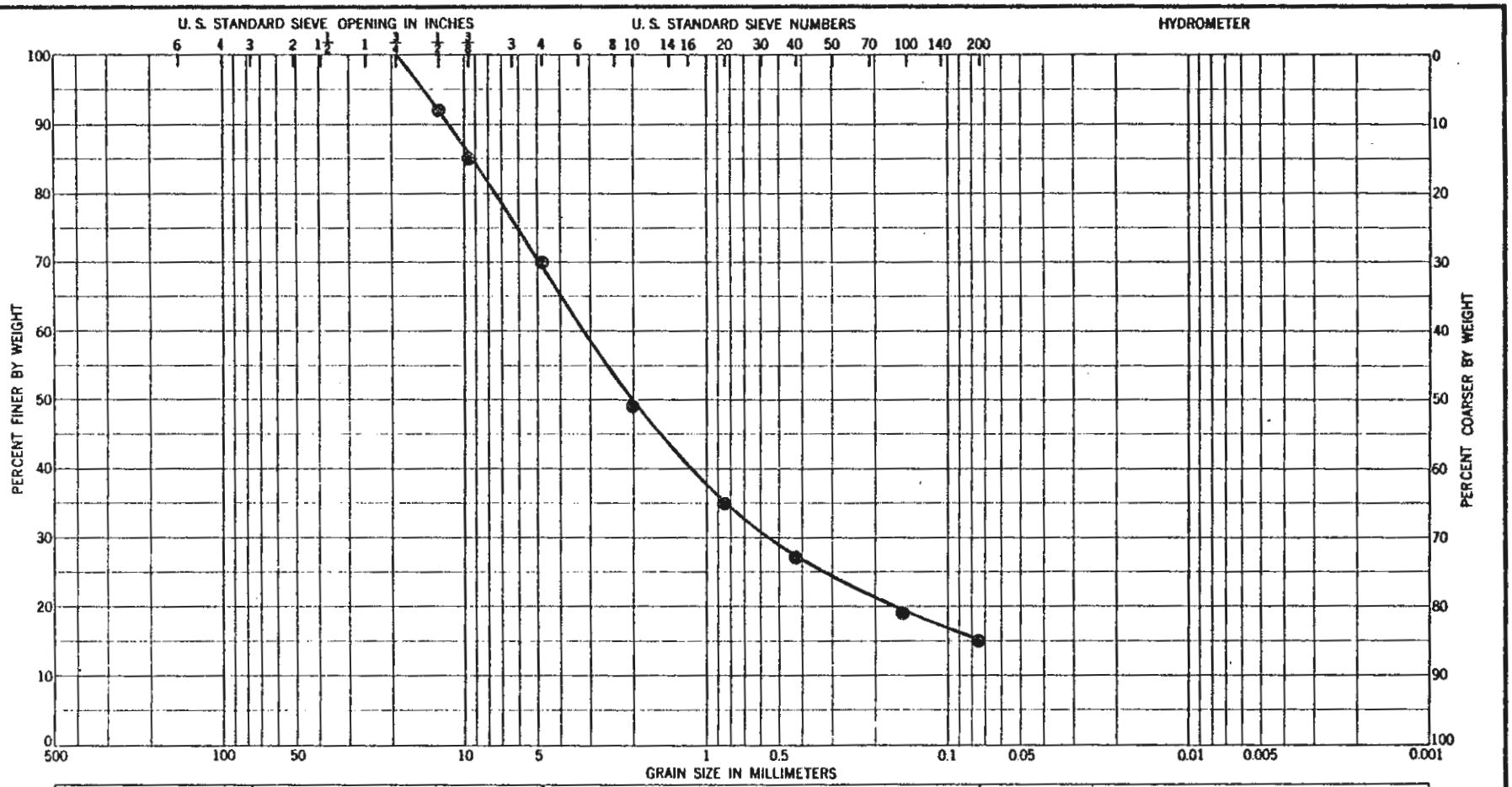
Area: Carroll County, Maryland

Boring No.: D-20

Date: 3/9/84

CEI 81-3181

ENG FORM 1 MAY 63 2087



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
6	12.5-13.4	Brown SAND, some rock fragments, little silt (decomposed rock)				

GRADATION CURVES

Project: Northern Sanitary Landfill

Area: Carroll County, Maryland

Boring No. D-25

Date: 3/9/84

CEI 81-3181

ENG FORM 1 MAY 63 2087

APPENDIX G ADJACENT WELL RECORDS

EXISTING ADJACENT WELLS

PLAN LOCATION NUMBER *	PERMIT NUMBER	DEPTH (FEET)	YIELD (g/m)	FORMATION
9	10301	100	8	Prettyboy Schist
13	12066	64	10	Prettyboy Schist
14	13100	66	12	Prettyboy Schist
15	13430	79	22	Prettyboy Schist
23	None	58	NA	Prettyboy Schist
24	None	21	NA	Prettyboy Schist
47	None	Spring	NA	NA
48	None	Spring	10-54	Prettyboy Schist
50	39231	340	3	Prettyboy Schist
51	40058	400	3	Prettyboy Schist
52	40047	297	5	Prettyboy Schist
53	40056	340	10	Prettyboy Schist
A	CL 73 2730	130	21	NA
B	CL 70 0130	80	12	NA
C	CL 72 0864	85	20	NA
D	CL 73 3060	143	12	NA
E	CL 73 6507	425	2	NA
F	CL 73 0597	200	3	NA
G	CL 73 6566	270	4	NA

AVERAGE

* Refer to Drawing 14 of 15

APPENDIX H MINIMUM DESIGN ELEVATIONS

November, 1983

CARROLL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
NORTHERN SANITARY LANDFILL
GEOLOGIC REPORT

Prepared by:

Century Engineering, Inc.
Consulting Engineers-Planners
Towson, Maryland 21204
CEI No. 3181

MINIMUM DESIGN ELEVATIONS FOR SOLID WASTE PLACING AND GRADING

Well Designation	High Groundwater			Refusal		Control Elevation		Min. Design Elev. for Solid Waste and Grading	Ground Elev. @ Well	Max. Depth of Excavation L.F.	Depth of Cover Over Rock/Water L.F.
	Depth (Ft.)	Date	Elevation	Depth (Ft.)	Elevation (Ft.)						
D-1	22.2	5/01/84	641.6	30.0	633.0	(W)	641.6		663.0	-0-	
D-2	4.1	5/01/84	632.7	23.0	612.9	W	632.7		635.9	-0-	
D-3	9.0	5/01/84	625.9	22.0	611.9	W	625.9		633.9	-0-	
D-4	6.8	3/05/84	620.7	21.0	606.0	W	620.7		627.0	-0-	
D-5				20.5	700.1	R	700.1		720.6	-0-	
D-6	36.8	5/01/84	702.0	34.5	703.3	R	703.3	709.8	737.8	28.0	6.5
D-7				10.5	733.2	R	733.2		743.7	-0-	
D-8				20.5	686.5	W	686.5		707.0	-0-	
D-9	11.7	5/01/84	680.2	22.0	669.0	W	680.4		691.0	-0-	
D-10	33.3	5/01/84	716.8	33.0	715.6	W	716.8	721.6	748.6	27.0	6.0
D-11				18.0	776.1	R	776.1		794.1	-0-	
D-12				3.5	754.3	R	754.3		757.8	-0-	
D-13	4.0	5/01/84	725.4	25.4	703.3	W	725.4		728.7	-0-	
D-14				3.5	787.1	R	787.1		790.6	-0-	
D-15				18.5	755.6	R	755.6		774.1	-0-	
D-16				19.0	800.6	R	800.6	806.6	819.6	13.0	6.0
D-17				7.0	783.3	R	783.3		789.0	1.0	6.0
D-17A	7.4	5/01/84	724.9	26.0	704.8	W	724.9		730.8	-0-	
D-18				25.5	773.1	R	773.1		798.6	-0-	
D-19	29.4	3/05/84	782.0	26.0	784.4	R	784.4		810.4	-0-	
D-20	8.5	7/13/83	765.0	32.0	739.9	W	765.0		771.9	-0-	
D-21				23.0	804.8	R	804.8	810.8	827.8	17.0	6.0
D-21A	50.0	3/01/84	779.3	23.0	804.8	R	804.8	810.8	827.8	17.0	6.0
D-22				18.0	786.2	R	786.2	792.2	804.2	12.0	6.0
D-23	35.1	5/01/84	729.8	33.0	730.8	R	730.8		763.8	-0-	
D-24	36.9	3/05/84	782.4	25.0	793.3	R	793.3		818.3	-0-	
D-25	23.6	3/06/84	837.9	15.5	845.1	R	845.1	851.6	860.6	9.0	6.5
D-26				30.5	782.7	R	782.7	788.2	813.2	25.0	5.5
D-27	3.3	5/01/84	745.6	25.0	722.7	W	745.6		747.7	-0-	
D-28	45.3	5/01/84	804.3	24.0	824.1	R	824.1		848.1	-0-	
D-29				19.0	858.2	R	858.6		877.6	-0-	
D-30				29.5	813.2	R	813.2		842.7	-0-	
D-31	53.6	3/06/84	751.0	46.0	757.6	R	757.6		803.6	-0-	
D-32				18.0	777.5	R	777.5	783.5	795.5	12.0	6.0
D-33	45.0	9/14/83	792.2	15.0	821.2	R	821.2	827.2	836.2	9.0	6.0
M-1	73.1	5/01/84	720.5	18.0	776.1	R	776.1		792.1	-0-	
M-2	42.8	3/01/84	836.3	19.0	858.2	R	858.2		877.6	-0-	
M-3	42.0	5/01/84	758.1	25.5	773.1	R	773.1		798.6	-0-	
M-4	52.2	5/01/84	752.9	46.0	757.6	R	757.6		803.6	-0-	
E-1	46.1	5/01/84	651.5	28.6	666.5	R	666.5	672.5	695.1	22.6	6.0
E-2	58.3	5/01/84	601.6	18.0	639.4	R	639.4	645.4	657.4	12.0	6.0

APPENDIX I WATER QUALITY DATA

Prepared by
Century Engineering, Inc.
Consulting Engineers - Planners
Towson, Maryland 21204

CARROLL COUNTY DEPARTMENT OF PUBLIC WORKS
NORTHERN SANITARY LANDFILL
GEOLOGIC REPORT
SURFACE WATER QUALITY SUMMARY

November, 1983

Water Quality Parameter	Surface Water Quality Data				Recommended Drinking Water Standard	
	Site A	Site B	Site C	Site D	Highest Desirable Level	Maximum Permissible Level
pH	7.2	6.2	6.8	7.2	7.0 - 8.5	6.5 - 9.5
Turbidity N.T.U.	1.0	5.0	20	1.3	5	25
Alkalinity, Total (as $CaCO_3$), mg/l MO (as $CaCO_3$), mg/l	11 11	5 5	9 9	9 9	No Std.	--
Chlorides, mg/l	30	11	5	24	200	600
Total Hardness (as $CaCO_3$), mg/l	45	44	25	38	100	500
Iron, mg/l	< 0.01	0.02	0.18	< 0.01	0.1	1.0
Ammonia Nitrogen, mg/l	0.3	0.6	0.6	0.6	0.02(fish)	--
Total Kjeldahl Nitrogen, mg/l	2.4	1.7	3.1	7.2	No Std.	--
Nitrate Nitrogen, mg/l	4.3	7.9	3.3	3.7	10	10
Nitrite Nitrogen, mg/l	<0.01	<0.01	<0.01	<0.01	No Std.	--
Sulfate, mg/l	<1	<1	<1	<1	200	400
Calcium, mg/l	8.4	8.4	5.5	7.2	75	200
Magnesium, mg/l	5.7	5.5	2.7	4.8	150	150
Cadmium, mg/l	<0.01	<0.01	<0.01	<0.01	--	0.01
Total Chromium, mg/l	<0.01	<0.01	<0.01	<0.01	--	0.05
Copper, mg/l	<0.01	<0.01	<0.01	<0.01	0.05	1.5
Lead, mg/l	<0.01	<0.01	<0.01	<0.01	--	0.05
Mercury, mg/l	<0.001	<0.001	<0.001	<0.00	--	0.002
Nickel, mg/l	<0.01	<0.01	<0.01	<0.01	No Std.	--
Zinc, mg/l	<0.01	<0.01	<0.01	<0.01	5.0	15.0
Potassium, mg/l	1.6	1.1	1.0	1.3	No Std.	--
Sodium, mg/l	14.1	2.8	2.3	11.3	No Std.	--
Chemical Oxygen Demand, mg/l	66	52	74	74	No Std.	--
Specific Conductance, umhos/cm	162	113	67	137	No Std.	--
Dissolved Solids (180°C), mg/l	87	51	34	75	250	--
Sulfide, mg/l	< 0.1	< 0.1	0.27	0.80	0.002(fish)	--
Arsenic, mg/l	< 0.01	< 0.01	< 0.01	< 0.01	--	0.05
Hexavalent Chromium, mg/l	< 0.01	< 0.01	< 0.01	< 0.01	--	0.05
Silver, mg/l	< 0.01	< 0.01	< 0.01	< 0.01	--	0.05

Prepared by
Century Engineering, Inc.
Consulting Engineers - Planners
Towson, Maryland 21204

CARROLL COUNTY DEPARTMENT OF PUBLIC WORKS
NORTHERN SANITARY LANDFILL
GEOLOGIC REPORT
GROUNDWATER QUALITY SUMMARY

November, 1983

Water Quality Parameter	Groundwater Quality Data			Recommended Drinking Water Standard	
	D-10	D-20	D-27	Highest Desirable Level	Maximum Permissible Level
pH	6.0	6.3	5.5	7.0 - 8.5	6.5 - 9.5
Turbidity N.T.U.	62	47	12	5	25
Alkalinity, Total (as $CaCO_3$), mg/l	6	12	5	No Std.	--
Chlorides, mg/l	14	14	13	200	600
Total Hardness (as $CaCO_3$), mg/l	47	48	47	100	500
Iron, mg/l	0.07	0.02	<0.01	0.1	1.0
Ammonia Nitrogen, mg/l	0.1	0.3	0.3	No Std.	--
Total Kjeldahl Nitrogen, mg/l	1.1	1.4	1.4	No Std.	--
Nitrate Nitrogen, mg/l	8.9	6.7	7.8	10	10
Nitrite Nitrogen, mg/l	0.02	0.02	<0.01	No Std.	--
Sulfate, mg/l	2	9	3	200	400
Calcium, mg/l	8.2	10.3	11.4	75	200
Magnesium, mg/l	7.1	6.4	4.4	150	150
Cadmium, mg/l	<0.01	<0.01	<0.01	--	0.01
Total Chromium, mg/l	<0.01	<0.01	<0.01	--	0.05
Copper, mg/l	<0.01	<0.01	<0.01	0.05	1.5
Lead, mg/l	<0.02	<0.02	<0.02	--	0.05
Mercury, mg/l	<0.001	<0.001	<0.001	--	0.002
Nickel, mg/l	<0.02	<0.02	<0.02	No Std.	--
Zinc, mg/l	0.11	<0.01	0.05	5.0	15.0
Potassium, mg/l	1.5	2.3	0.9	No Std.	--
Sodium, mg/l	3.9	4.8	2.7	No Std.	--
Chemical Oxygen Demand, mg/l	26	11	31	No Std.	--
Biochemical Oxygen Demand mg/l	<2	<2	<2	No Std.	--
Total Solids (180°C) mg/l	273	578	144	250	--

MARTEL

Certificate of Laboratory Analysis

Martel Laboratory Services, Inc. 1025 Cromwell Bridge Road Baltimore, Maryland 21204 (301) 825-7790

Invoice Number 9984

Sample W-3920 Surface Water Analysis Received 5/12/83
Sample A: H_2O coming in by stream
B: 200 St. North of D-20
C: Spring by D-8 and D-9
D: H_2O leaving stream near D-4

Century Engineering, Inc.
32 West Road
Baltimore, MD. 21204

June 30, 1983

	A	B	C	D
pH	7.2	6.2	6.8	7.2
Turbidity N.T.U.	1.0	5.0	20	1.3
Alkalinity, Total (as $CaCO_3$), mg/l	11	5	9	9
MO (as $CaCO_3$), mg/l	11	5	9	9
Chlorides, mg/l	30	11	5	24
Total Hardness (as $CaCO_3$), mg/l	45	44	25	38
Iron, mg/l	< 0.01	0.02	0.18	< 0.01
Ammonia Nitrogen, mg/l	0.3	0.6	0.6	0.6
Total Kjeldahl Nitrogen, mg/l	2.4	1.7	3.1	7.2
Nitrate Nitrogen, mg/l	4.3	7.9	3.3	3.7
Nitrite Nitrogen, mg/l	< 0.01	< 0.01	< 0.01	< 0.01
Sulfate, mg/l	< 1	< 1	< 1	< 1
Calcium, mg/l	8.4	8.4	5.5	7.2
Magnesium, mg/l	5.7	5.5	2.7	4.8
Cadmium, mg/l	< 0.01	< 0.01	< 0.01	< 0.01
Total Chromium, mg/l	< 0.01	< 0.01	< 0.01	< 0.01
Copper, mg/l	< 0.01	< 0.01	< 0.01	< 0.01
Lead, mg/l	< 0.01	< 0.01	< 0.01	< 0.01
Mercury, mg/l	< 0.001	< 0.001	< 0.001	< 0.001
Nickel, mg/l	< 0.01	< 0.01	< 0.01	< 0.01
Zinc, mg/l	< 0.01	< 0.01	< 0.01	< 0.01
Potassium, mg/l	1.6	1.1	1.0	1.3
Sodium, mg/l	14.1	2.8	2.3	11.3

MARTEL

Invoice Number 9984

June 30, 1983

	A	B	C	D
Chemical Oxygen Demand, mg/l	66	52	74	74
Specific Conductance, umhos/cm	162	113	67	137
Dissolved Solids (180°C), mg/l	87	51	34	75
Sulfide, mg/l	< 0.1	< 0.1	0.27	0.80
Arsenic, mg/l	< 0.01	< 0.01	< 0.01	< 0.01
Hexavalent Chromium, mg/l	< 0.01	< 0.01	< 0.01	< 0.01
Silver, mg/l	< 0.01	< 0.01	< 0.01	< 0.01

RG Edwards

Robert G. Edwards, Ph. D.
Vice President

bsg

MARTEL

RECEIVED
OCT 14 1983
CENTURY ENGINEERING, INC.

Certificate of Laboratory Analysis

Martel Laboratory Services, Inc. 1025 Cromwell Bridge Road Baltimore, Maryland 21204 (301) 825-7790

32 WEST ROAD
TOWSON, MARYLAND 21204

Invoice Number 10895

Sample W-4498 3 Monitoring well samples received by Martel Laboratory Services on 9/9/83

Century Engineering, Inc.
32 West Road
Baltimore, Maryland 21204

October 3, 1983

Attention: Jim Krawczek

	D-10	D-20	D-27
pH	6.0	6.3	5.5
Color	0	150 (apparent)	0
Turbidity (N.T.U.)	62	47	12
Alkalinity (as $CaCo_3$), mg/l	6	12	5
Organic Nitrogen, mg/l	1.0	1.1	1.1
Total Phosphorus, mg/l	0.05	0.25	0.03
Chlorides, mg/l	14	14	13
Fluorides, mg/l	<0.1	<0.1	<0.1
Total Hardness (as $CaCo_3$), mg/l	47	48	47
Iron, mg/l	0.07	0.02	<0.01
Manganese, mg/l	0.25	0.15	0.25
Ammonia Nitrogen, mg/l	0.1	0.3	0.3
Total Kjeldahl Nitrogen, mg/l	1.1	1.4	1.4
Nitrate Nitrogen, mg/l	8.9	6.7	7.8
Nitrite Nitrogen, mg/l	0.02	0.02	<0.01
Selenium, mg/l	<0.01	<0.01	<0.01
Sulfate, mg/l	2	9	3
Calcium, mg/l	8.2	10.3	11.4
Magnesium, mg/l	7.1	6.4	4.4
Cadmium, mg/l	<0.01	<0.01	<0.01
Total Chromium, mg/l	<0.01	<0.01	<0.01

MARTEL

	D-10	D-20	D-27
Copper, mg/l	<0.01	<0.01	<0.01
Lead, mg/l	<0.02	<0.02	<0.02
Mercury, mg/l	<0.001	<0.001	<0.001
Nickel, mg/l	<0.02	<0.02	<0.02
Zinc, mg/l	0.11	<0.01	0.05
Potassium, mg/l	1.5	2.3	0.9
Sodium, mg/l	3.9	4.8	2.7
Total Solids, 104°C mg/l	273	578	144
Biochemical Oxygen Demand, mg/l	<2	<2	<2
Chemical Oxygen Demand, mg/l	26	11	31

Robert G. Edwards, Ph. D.
Vice President

jel

APPENDIX J FLOODPLAIN DETERMINATION

CENTURY ENGINEERING, INC.
CONSULTING ENGINEERS · PLANNERS

Project Carroll County Northern Landfill — Contract No. 81-3181
Subject 100 Yr. Floodplain — Sheet No. 1 of 5
Drawing No
Computed by JRR — Date 3/83 — Checked by JPK — Date 4/83

Drainage Areas & Soils

Drainage Area A = 450 Acres
Drainage Area B = 147 Acres
Drainage Area C = 19 Acres

Total Drainage area to Section A = 450 Acres
Total Drainage area to Section B = 597 Acres
Total Drainage area to Section C = 616 Acres

Area A

Woods (B soil group)	=	36 Acres
Woods (A soil group)	=	26 Acres
Res. (B soil group)	=	55 Acres
Agriculture (B soil group)	=	333 Acres
Total	=	450 Acres

Soil Classification	Hyd. Soil Group
G_c	B
M_t	A
M_g	B
G_i	B

Area B

Woods (B soil group)	=	46 Acres
Woods (A soil group)	=	31 Acres
Agricult. (A soil group)	=	9 Acres
Agricult. (B soil group)	=	61 Acres
Total	=	147 Acres

Area C

Woods (B soil group) = 19 Acres = Total

ENTURY ENGINEERING, INC.
CONSULTING ENGINEERS · PLANNERS

Project: Carroll County Northern Landfill — Contract No.: 81-3181
Subject: 100 yr. Floodplain — Sheet No. 2 of 5
Drawing No.:
Computed by: JRR — Date: 3/83 — Checked by: JPK — Date: 4/83

Drainage Area = 450 Acres = 0.70 mi^2 Section A

RUNOFF CURVE NUMBER

Hydrologic Soil Group 1	Land Use 2	Treatment or Practice 3	Hydrologic Condition 4	Runoff Curve Number 5	Area (Ac.) 6	Col. 5 X Col. 6 7
B	Woods	Good Cover	Good	55	36	1,980
A	Woods	Good Cover	Good	25	26	650
B	Resid.	lot size:1 ac.+	Good	68	55	3,740
B	Agricultural	Cult. land	Good	71	333	23,643
				TOTALS =	450	30,013

Weighted Runoff Curve No. = $\frac{\text{Total Col. 7}}{\text{Total Col. 6}}$ = 66.70 ; Use 67

TIME OF CONCENTRATION

Flow Description 1	Length (ft.) 2	Slope 3	n 4	R 2/3 5	V 6	T_c (hrs.) 7
				TOTAL TIME =		hr

PEAK DISCHARGE = From Fig. D-2 TR #55 csm./in. x $\frac{\text{D.A.}}{640}$ = 220 cfs/in. R.O.

Rainfall Freq. =	100 Yr.	Yr.	Yr.
Rainfall =	7.1 Inches	Inches	Inches
Runoff =	3.39 Inches	Inches	Inches
Peak Discharge = Q x Runoff =	746 cfs	cfs	cfs

C NTURY ENGINEERING, INC.
CONSULTING ENGINEERS · PLANNERS

Project Carroll County Northern Landfill — Contract No. 81-3181
Subject 100 yr. Floodplain — Sheet No. 3 of 5
Drawing No
Computed by JRR — Date 3/83 — Checked by — Date

Drainage Area = 597 Acres = 0.93 mi^2

Section B

RUNOFF CURVE NUMBER

Hydrologic Soil Group 1	Land Use 2	Treatment or Practice 3	Hydrologic Condition 4	Runoff Curve Number 5	Area (Ac.) 6	Col. 5 X Col. 6 7
B	Woods	Good Cover	Good	55	82	4,210
A	Woods	Good Cover	Good	25	57	1,425
B	Resid.	Lot size: 1 ac.+	Good	68	55	3,740
A	Agric.	Cult.Land	Good	62	9	558
B	Agric.	Cult.Land	Good	71	394	27,974
				TOTALS =	597	38,207

Weighted Runoff Curve No. = $\frac{\text{Total Col. 7}}{\text{Total Col. 6}}$ = 64.0 ; Use 64

TIME OF CONCENTRATION

Flow Description 1	Length (ft.) 2	Slope 3	n 4	R 2/3 5	V 6	T_c (hrs.) 7
				TOTAL TIME =		hr.

PEAK DISCHARGE = From Fig. D-2 TR #55 csm./in. x $\frac{\text{D.A.}}{640}$ = 250 cfs/in. R.O.

Rainfall Freq. =	100 Yr.	Yr.	Yr.
Rainfall =	71 Inches	Inches	Inches
Runoff =	3.07 Inches	Inches	Inches
Peak Discharge = Q x Runoff =	767 cfs	cfs	cfs

C NTURY ENGINEERING, INC.
CONSULTING ENGINEERS · PLANNERS

Project Carroll County Northern Landfill — Contract No. 81-3181
Subject 100 yr. Floodplain — Sheet No. 4 of 5
Drawing No
Computed by JRR — Date 3/83 — Checked by — Date

Drainage Area = 616 Acres = 0.96 mi^2

RUNOFF CURVE NUMBER — Section C

Hydrologic Soil Group 1	Land Use 2	Treatment or Practice 3	Hydrologic Condition 4	Runoff Curve Number 5	Area (Ac.) 6	Col. 5 X Col. 6 7
B	Woods	Good Cover	Good	55	101	5,555
A	Woods	Good Cover	Good	25	57	1,425
B	Resid.	Lot size:1 Ac.+	Good	68	55	3,740
A	Agric.	Cultivated Land	Good	62	9	558
B	Agric.	Cultivated Land	Good	71	394	27,974
				TOTALS =	616	39,252

Weighted Runoff Curve No. = $\frac{\text{Total Col. 7}}{\text{Total Col. 6}}$ = 63.72 ; Use 64

TIME OF CONCENTRATION

Flow Description 1	Length (ft.) 2	Slope 3	n 4	R 2/3 5	V 6	T_c (hrs.) 7
				TOTAL TIME =		hr

PEAK DISCHARGE = From Fig. D-2 TR #55 csm./in. x $\frac{\text{D.A.}}{640}$ = 255 cfs/in. R.O.

Rainfall Freq. =	100 Yr.	Yr.	Yr.
Rainfall =	7.1 Inches	Inches	Inches
Runoff =	3.07 Inches	Inches	Inches
Peak Discharge = Q x Runoff =	783 cfs	cfs	cfs

Depths of flow for 100 year floods determined by trial and error application of the Mannings Equation:

$$Q = AV = \frac{1.49}{N} AR^{2/3} S^{1/2}$$

S = Average slope of stream = 1.8%
N for "rather rough stream bed 0.045

$$= \frac{1.49}{.045} \frac{A^{5/3}}{P^{2/3}} \quad (= 0.134)$$

$$Q = AV = 4.44 \frac{A^{2/3}}{P^{2/3}}$$

For Section A: Q = 746 cfs
D = 4.9', V = 7.5 fps

For Section B: Q = 767 cfs
D = 4.0', V = 7.0 fps

For Section C: Q = 783 cfs
D = 4.5', V = 7.5 fps

For Section D: Q_{100} = 2/3 difference between Sections A & B (from Drainage Area delineations)
Q = 2/3 (767-746) = 14 cfs
D = 1.0', V = 2.8 fps

APPENDIX K WATER BALANCE COMPUTATIONS

CARROLL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
NORTHERN SANITARY LANDFILL
GEOLOGIC REPORT

CLIMATOLOGICAL DATA

Prepared by: Century Engineering, Inc.
Engineers - Planners
Towson, MD 21204
November, 1983

TEMPERATURE DATA
AND
COMPUTATION OF POTENTIAL EVAPOTRANSPIRATION (PET)

TEMPERATURE (^{o}F)													
Year	Month												Annual Average
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1977	18.6	33.2	--	54.5	65.0	67.8	75.4	73.6	68.3	52.8	45.6	31.6	--
1978	25.1	23.2	--	51.1	59.6	69.7	--	--	--	--	--	--	--
1979	28.0	23.0	46.2	51.6	63.9	68.8	73.2	73.2	66.7	54.1	49.7	38.1	53.0
1980	31.0	29.9	40.3	53.6	64.9	69.4	77.5	77.1	70.9	55.0	42.5	33.9	53.8
1981	26.7	38.2	40.9	56.9	62.3	72.3	75.5	72.6	65.2	53.1	45.2	32.7	53.5
5 Year Average	25.9	29.5	42.5	53.5	63.1	69.6	75.4	74.1	67.8	53.8	45.8	34.1	52.9
Historical Norm. (69 Yr.Record)	31.4	33.0	--	52.5	62.0	70.3	74.5	72.7	66.2	55.7	44.5	33.4	53.2

-- Indicates "No Record"

Climatological data obtained from U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Environmental Data Service. Annual summaries were used. Data from 1977 and 1978 from station "Westminster 2 SSE", and 1979-82 from Station "Westminster Police Barracks".

POTENTIAL EVAPOTRANSPIRATION (INCHES)													
Item	Month												
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1) Average Temp. (from above)	31.4	33.0	42.5	52.5	62.0	70.3	74.5	72.5	66.2	55.7	44.5	33.4	53.2
2) I Value (Heat Index)	0.0	.04	1.26	3.48	6.19	8.96	10.48	9.82	7.55	4.33	1.84	0.06	54.01
3) Unadjusted PET	0.0	0.0	0.02	0.06	0.09	0.13	0.15	0.15	0.11	0.07	0.03	0.00	
4) Adjustment Factor @ Latitude $39^{o}40'$	25.2	24.9	30.9	33.3	37.2	37.5	38.1	35.4	31.2	28.8	24.9	24.3	
5) Adjusted PET (inches) (3 x 4)	0.0	0.0	0.61	2.00	3.35	4.88	5.72	5.31	3.43	2.02	0.75	0.0	28.07

PET Data from "Instructions and Tables for Computing Potential Evaporation and the Water Balance", Drexel Institute of Technology, Publications in Climatology, Vol. X, No. 3

Prepared by: Century Engineering, Inc.
Engineers - Planners
Towson, MD 21204
November, 1983

CARROLL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
NORTHERN SANITARY LANDFILL

GEOLOGIC REPORT

CLIMATOLOGICAL DATA (contd.)

PRECIPITATION (INCHES)

Year	Month												Annual Average
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1977	1.35	0.60	5.40	4.82	1.09	5.89	2.64	2.81	1.02	4.62	4.67	5.64	40.55
1978	6.75	0.60	--	1.42	4.57	2.79	--	--	--	--	--	--	--
1979	8.28	4.82	3.11	3.28	4.91	2.35	4.80	5.71	10.69	8.25	2.81	1.20	60.21
1980	1.28	0.62	5.02	4.73	5.93	4.38	2.77	2.34	1.31	3.83	2.45	0.33	34.99
1981	0.64	0.78	1.33	4.94	4.63	7.48	3.96	1.47	1.96	3.78	0.41	1.88	33.26
5 Year Average	3.66	1.48	3.72	3.84	4.23	4.58	3.54	3.08	3.75	5.12	2.59	2.26	41.85
Historical Norm - 69 Year Record	2.97	2.79	3.88	3.43	3.69	3.65	4.54	4.10	3.04	2.94	3.36	3.47	41.86

-- Indicates "No Record"

Climatological data obtained from U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

Environmental Data Service annual summaries were used. Data for 1977-78 from station "Westminster 2 SSE", and 1979-82 from station "Westminster Police Barracks".

September, 1983

CARROLL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
NORTHERN SANITARY LANDFILL
GEOLOGIC REPORT
HYDROLOGIC INFORMATION

WATER BALANCE

Water Balance is Based on Metnod Shown in SW-168.Use of tne Water Balance Method for Predicting Leachate Generation From Solid Waste Disposal Sites U.S. Environmental Protection Agency, 1973

Based on the Equation: Per = P.R/O. ST. ET 25.4 mm = 1.D inch

Prepared by: Century Engineering, Inc.
Consulting Engineers - Planners
Towson, Maryland 21204

NO.	PARAMETER		MONTH												ANNUAL
			JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	
1	PET (Potential Evapotrans-piration)	in.	0.0	0.0	0.61	2.00	3.35	4.88	5.72	5.31	3.43	2.02	0.75	0.00	28.07
		mm	0.0	0.0	15.49	50.80	85.09	123.95	145.29	134.87	87.12	51.31	19.05	0.00	712.98
2	P (Precipitation)	in.	2.97	2.79	3.88	3.43	3.69	3.65	4.54	4.10	3.04	2.94	3.36	3.47	41.86
		mm	75.44	70.87	98.55	87.12	93.73	92.71	115.32	104.14	77.22	74.68	85.34	88.14	1063.40
3	$C_{R/O}$ (Surface Runoff Coefficient)		.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	--
4	R/O (Surface Runoff) 3 x 2	in.	1.04	.98	1.36	1.21	1.29	1.27	1.60	1.44	1.06	1.04	1.18	1.22	14.67
		mm	26.32	24.89	34.50	30.58	32.72	32.35	40.54	36.62	27.02	26.32	29.88	30.94	372.67
5	I (Infiltration) 2 minus 4	in.	1.93	1.81	2.52	2.22	2.40	2.38	2.94	2.66	1.98	1.90	2.18	2.25	27.19
		mm	49.02	45.97	64.01	56.39	60.96	60.45	74.68	67.56	50.29	48.26	55.37	57.15	690.12
6	I-PET Infiltration Minus Potential Evapotranspiration 5 minus 1	in.	(+)1.93	(+)1.81	(+)1.91	(+)0.22	(-)0.95	(-)2.50	(-)2.78	(-)2.65	(-)1.45	(-)0.12	(+)1.43	(+)2.25	(-0.9)
		mm	(+) 49.02	(+) 45.97	(+) 48.51	(+)5.59	(-) 24.13	(-) 63.50	(-) 70.61	(-) 67.31	(-) 36.83	(+)3.05	(+) 36.32	(+) 57.15	(+)84.07
7	Σ Neg (I-PET) Summation of Negative Values of I-PET from 6	in.				(0)	(-) .95	(-)3.45	(-)6.23	(-)8.88	(-) 10.33	(-) 10.45			
		mm				(0)	(-) 14.73	(-) 69.09	(-) 128.02	(-) 184.91	(-) 214.12				
8	ST Soil Moisture Storage (Table 2 and Table 11 of EPA Publication SW-168)	in.	7.87	7.87	7.87	7.87	7.28	5.55	4.09	3.07	2.68	2.87	4.65	7.24	
		mm	200	200	200	200	185	141	104	78	68	73	118	184	
9	Δ ST Change in Soil Moisture Month to Month	in.	0	0	0	0	(-)0.59	(-)1.73	(-)1.46	(-)1.02	(-)0.39	(+)0.19	(+)1.78	(+)2.59	
		mm	0	0	0	0	(-)15	(-)44	(-)37	(-)26	(-)10	(+)5	(+)45	(+)66	
10	AET Actual Evapotranspiration AET=PET + [(I-PET)-Δ ST] When I-PET is Plus, AET = PET	in.	0	0	0.61	2.00	2.99	4.11	4.40	3.68	2.37	2.02	0.75	0.0	22.94
		mm	0	0	15.49	50.80	75.95	104.39	111.76	93.47	60.20	51.31	19.05	0.0	582.42
11	PERC Percolation Occurs When I Exceeds AET	in.	1.93	1.81	1.91	0.22	0	0	0	0	0	0	1.43	2.25	9.55
		mm	56.64	53.09	48.51	5.59	0	0	0	0	0	0	36.32	57.15	242.57

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COORDINATE TABLE

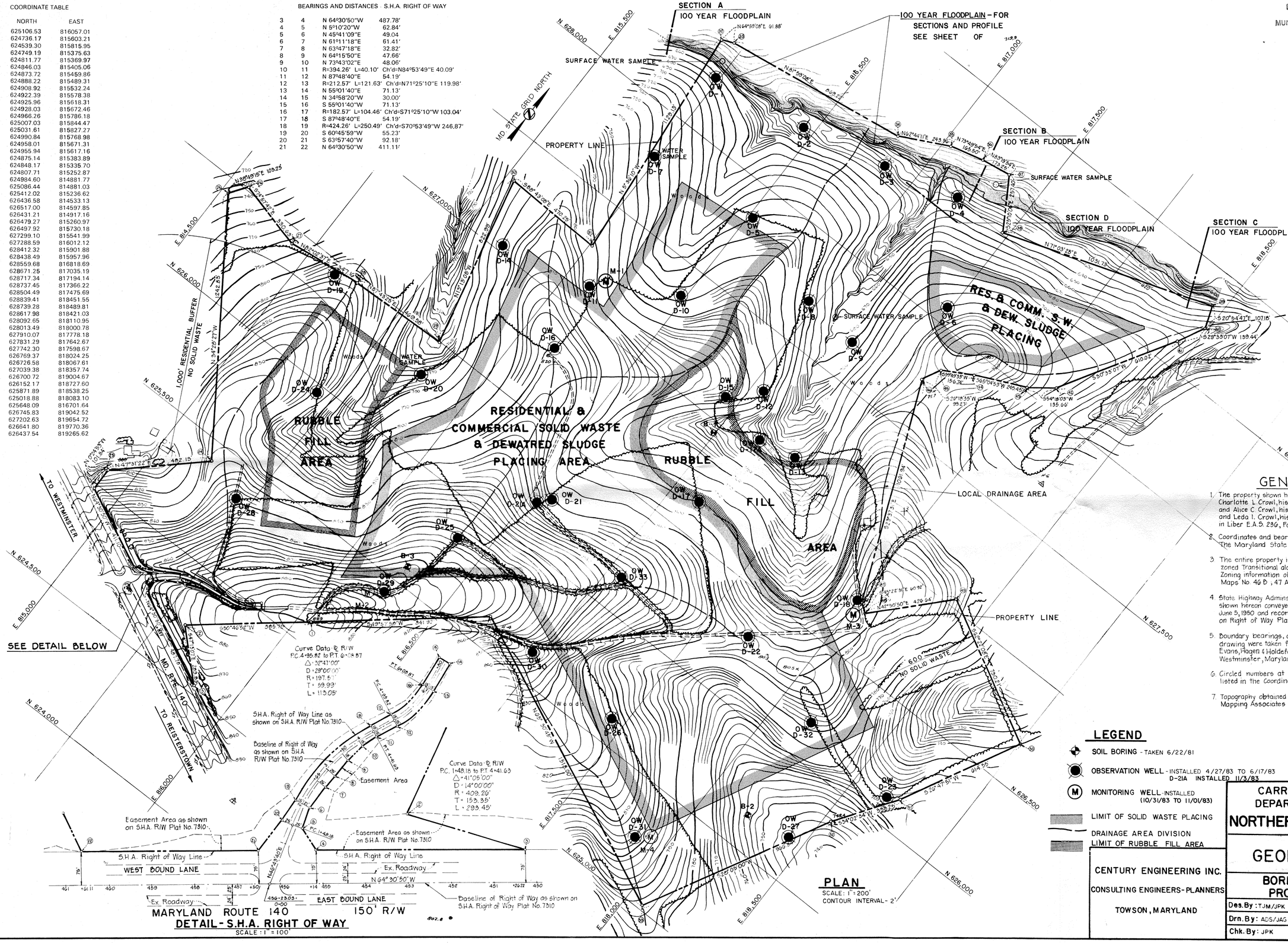
NO.	NORTH	EAST
1	625106.53	816057.01
2	624736.17	815603.21
3	624539.30	815815.95
4	624749.19	815375.63
5	624811.77	815369.97
6	624846.03	815405.06
7	624873.72	815459.86
8	624888.22	815489.31
9	624908.92	815532.24
10	624922.39	815578.38
11	624925.96	815618.31
12	624928.03	815672.46
13	624966.26	815786.18
14	625007.03	815844.47
15	625031.61	815827.27
16	624990.84	815768.98
17	624958.01	815671.31
18	624955.94	815617.16
19	624875.14	815383.89
20	624848.17	815335.70
21	624807.71	815252.87
22	624984.60	814881.77
23	625086.44	814881.03
24	625412.02	815236.62
25	626436.58	814533.13
26	626517.00	814597.85
27	626431.21	814917.16
28	626479.27	815260.97
29	626497.92	815730.18
30	627299.10	815541.99
31	627288.59	816012.12
32	628412.32	815901.88
33	628438.49	815957.96
34	628559.68	816818.69
35	628671.25	817035.19
36	628717.34	817194.14
37	628737.45	817366.22
38	628504.49	817475.69
39	628839.41	818451.55
40	628739.28	818489.81
41	628617.98	818421.03
42	628092.65	818110.95
43	628013.49	818000.78
44	627910.07	817778.18
45	627831.29	817642.67
46	627742.30	817598.67
47	626769.37	818024.25
48	626726.58	818067.61
49	627039.38	818357.74
50	626700.72	819004.67
51	626152.17	818727.60
52	625871.89	818538.25
53	625018.88	818083.10
54	625648.09	816701.64
55	626745.83	819042.52
56	627202.63	819654.72
57	626641.80	819770.36
58	626437.54	819265.62

BEARINGS AND DISTANCES - S.H.A. RIGHT OF WAY

3	4	N 64°30'50"W	487.78'
4	5	N 5°10'20"W	62.84'
5	6	N 45°41'09"E	49.04'
6	7	N 61°11'18"E	61.41'
7	8	N 63°47'18"E	32.82'
8	9	N 64°15'50"E	47.66'
9	10	N 73°43'02"E	48.06'
10	11	R=394.26' L=40.10'	Ch'd=N84°53'49"E 40.09'
11	12	N 87°48'40"E	54.19'
12	13	R=212.57' L=121.63'	Ch'd=N71°25'10"E 119.98'
13	14	N 55°01'40"E	71.13'
14	15	N 34°58'20"W	30.00'
15	16	S 55°01'40"W	71.13'
16	17	R=182.57' L=104.46'	Ch'd=S71°25'10"W 103.04'
17	18	S 87°48'40"E	54.19'
18	19	R=424.26' L=250.49'	Ch'd=S70°53'49"W 246.87'
19	20	S 60°45'59"W	55.23'
20	21	S 63°57'40"W	92.18'
21	22	N 64°30'50"W	411.11'

COORDINATES OF OBSERVATION WELLS

NO.	NORTH	EAST
OW D- 1	628257.5407	815981.6044
OW D- 2	628327.4546	816452.2348
OW D- 3	628411.3968	816855.5622
OW D- 4	628502.6219	817209.8713
OW D- 5	627852.3260	816523.2854
OW D- 6	628076.3453	817484.6501
OW D- 7	627791.4676	815983.9219
OW D- 8	627709.8004	816968.6479
OW D- 9	627680.1040	817240.3800
OW D-10	627361.6294	816481.4108
OW D-11	627137.8727	816117.4776
OW D-12	627251.7900	817054.1634
OW D-13	627099.6235	817370.2965
OW D-14	627035.6618	816684.4509
OW D-15	627122.1023	816939.2415
OW D-16	626810.2620	816167.1480
OW D-17A	627059.0415	817184.6395
OW D-18	626753.7645	817997.4612
OW D-19	626443.0473	815156.1692
OW D-20	626324.9003	815756.0747
OW D-21	626196.9566	816550.9563
OW D-22	626308.4962	817703.2921
OW D-23	626120.4276	818672.7990
OW D-24	625968.7459	815429.7250
OW D-25	625839.0783	816356.4291
OW D-26	625614.9168	817441.4869
OW D-27	625694.4783	818429.8464
OW D-28	625343.8379	815436.0437
OW D-29	625429.6631	816243.2440
OW D-30	625635.8029	816964.0328
OW D-31	625255.7164	817860.3569
OW D-32	626175.0753	818183.5123
OW D-33	626161.2846	817068.9031
OW D-17	626655.75	817136.72



GENERAL NOTES

1. The property shown hereon is owned by John R. Crowl and Charlotte L. Crowl, his wife, (½ interest) and by Donald E. Crowl and Alice C. Crowl, his wife, (½ interest) by deed of Ernest L. Crowl and Lelia I. Crowl, his wife, dated August 31, 1954 and recorded in Liber E.A.S. 236, Folio 548.
2. Coordinates and bearings shown hereon are based on The Maryland State Coordinate System.
3. The entire property is zoned Agricultural, excepting a portion zoned Transitional along Md. Route 140 as shown hereon. Zoning information obtained from Carroll County Zoning Maps No. 46 D ; 47 A
4. State Highway Administration Right of Way and Easement Areas shown hereon conveyed by Ernest L. Crowl by deed dated June 5, 1950 and recorded in Liber E.A.S. 205, Folio 107 and shown on Right of Way Plat No. 7310.
5. Boundary bearings, distances and coordinates shown on this drawing were taken from an outline survey plat by Evans, Hagen & Holdefer, Inc. 111 John Street, Westminster, Maryland 21157. February 1983, Drwg. No. 2804-R
6. Circled numbers at boundary corners correspond to numbers listed in the Coordinate Table.
7. Topography obtained from Aerial Photogrammetry by Mapping Associates Inc. during August 1982.

LEGEND

- SOIL BORING - TAKEN 6/22/81
- OBSERVATION WELL - INSTALLED 4/27/83 TO 6/17/83 D-21A INSTALLED 11/3/83
- (M) MONITORING WELL - INSTALLED (10/31/83 TO 11/01/83)
- LIMIT OF SOLID WASTE PLACING
- DRAINAGE AREA DIVISION
- LIMIT OF RUBBLE FILL AREA

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CARROLL SOIL CONSERVATION DISTRICT

CENTURY ENGINEERING INC.
CONSULTING ENGINEERS - PLANNERS
TOWSON, MARYLAND

CARROLL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
NORTHERN SANITARY LANDFILL

GEOLOGIC REPORT

BORING LOCATION AND PROPERTY BOUNDARY

Des. By: TJM/JPK	Scale: AS NOTED	Proj. No.
Drn. By: ADS/JAG	Date: NOV. 1983	Drawing No. 1 OF 14
Chk. By: JPK	Approved:	

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MUNICIPAL WASTE
DIVISION

PROPERTY LINE

MD STATE GRID NORTH

N 628,000 E 815,500

E 816,500 E 817,000 E 817,500 E 818,500 E 819,000

N 629,000 N 628,500 N 627,500 N 626,000 N 625,500 N 625,000 N 624,500 N 624,000

E 815,000 E 815,500 E 816,000 E 816,500 E 817,000 E 817,500 E 818,000 E 818,500

OW D-1 OW D-2 OW D-3 OW D-4 OW D-5 OW D-6 OW D-7 OW D-8 OW D-9 OW D-10 OW D-11 OW D-12 OW D-13 OW D-14 OW D-15 OW D-16 OW D-17 OW D-18 OW D-19 OW D-20 OW D-21 OW D-21A OW D-22 OW D-23 OW D-24 OW D-25 OW D-26 OW D-27 OW D-28 OW D-29 OW D-30 OW D-31 OW D-32 OW D-33

M-1 M-2 M-3 M-4

B-1 B-2 B-3 B-4

620 630 640 650 660 670 680 690 700 710 720 730 740 750 760 770 780 790 800 810 820 830 840 850

TO WESTMINSTER

TO REISTERSTOWN

MD RTE 140

FOR INFORMATION ON SHA RIGHT-OF-WAY IN THIS AREA, SEE SHEET 1 OF 14

PROPERTY LINE

NOTE: FOR COMPLETE PROPERTY LINE INFORMATION AND COORDINATE LOCATIONS OF OBSERVATION WELLS, SEE SHEET 1 OF 14

LEGEND

- SOIL BORING TAKEN 2/22/83
- OBSERVATION WELL INSTALLED 4/27/83 TO 6/17/83 (D-21A INSTALLED 11/01/83)
- (M) MONITORING WELL INSTALLED (10/31/83 TO 11/01/83)
- LIMIT OF SOLID WASTE PLACING
- ROCK REFUSAL CONTOURS (REFUSAL CONTOUR INTERVAL 10')
- LIMIT OF RUBBLE FILL AREA

PLAN

EXIST GROUND CONTOUR INTERVAL - 2'

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MUNICIPAL WASTE
MANAGEMENT DISTRICT

CENTURY ENGINEERING INC.
CONSULTING ENGINEERS-PLANNERS
TOWSON, MARYLAND

CARROLL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS

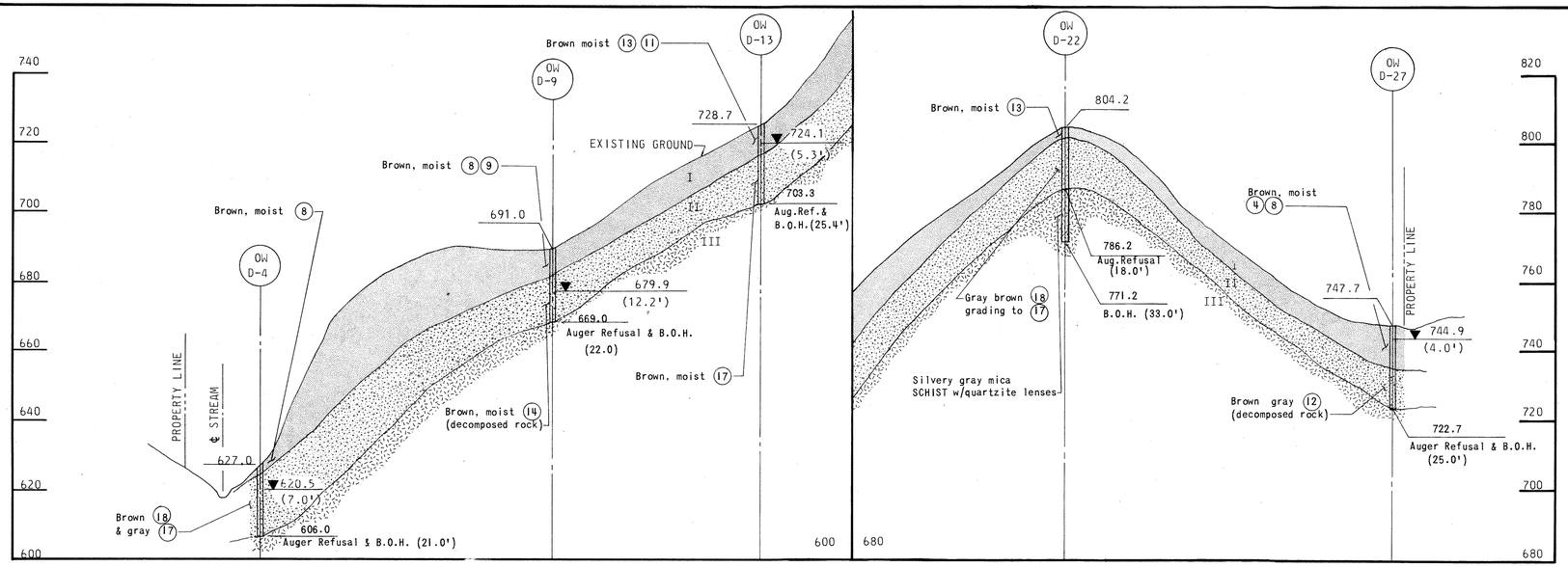
NORTHERN SANITARY LANDFILL

GEOLOGIC REPORT

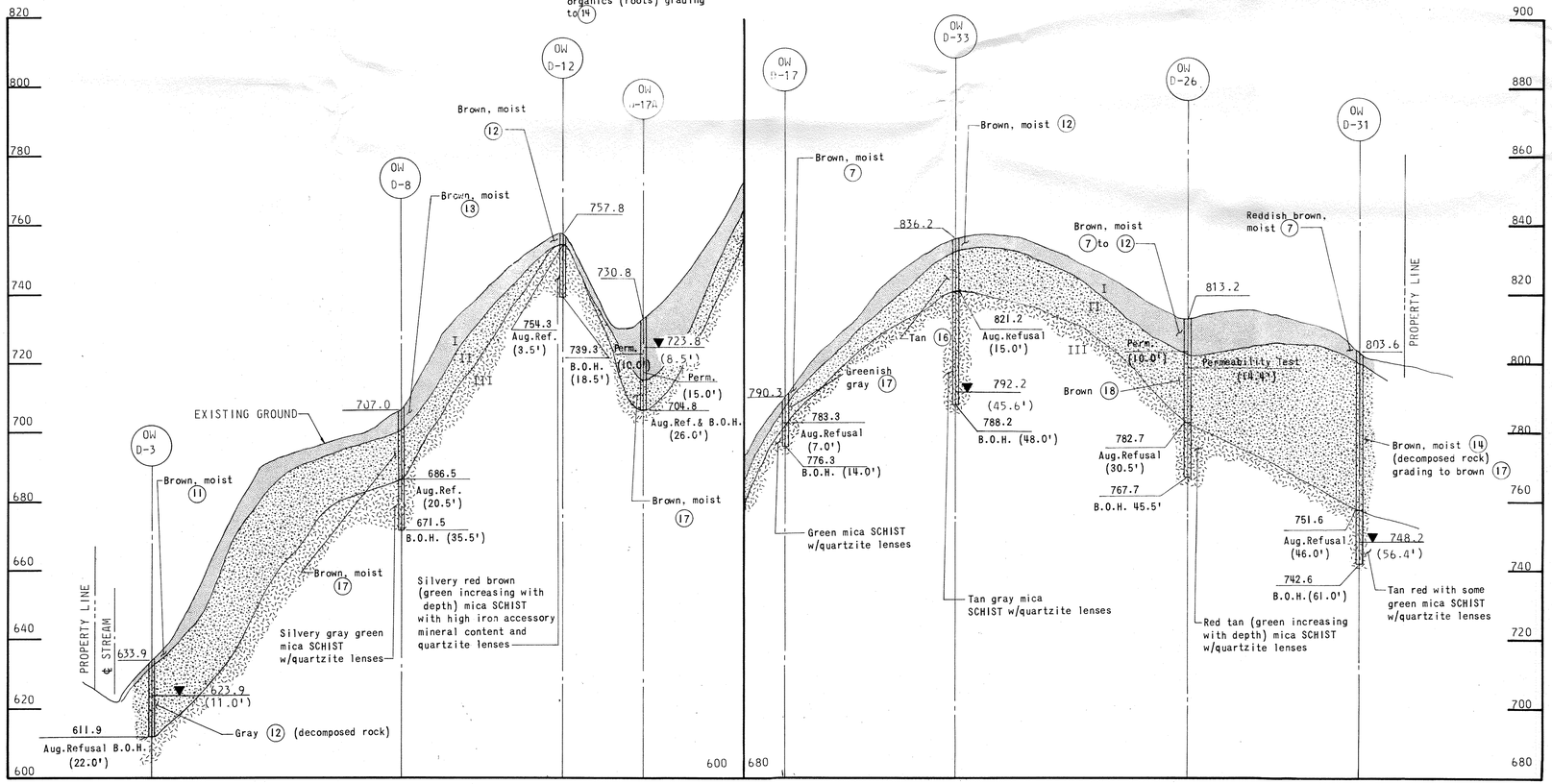
AUGER REFUSAL CONTOURS

Des. By: J.R.	Scale: 1"=200'	Proj. No.
Drn. By: A.D.S.	Date: NOV. 1983	Drawing No. 8 OF 14
Chk. By: J.P.K.	Approved:	

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DEC 6
MUNICIPAL WASTE DIVISION



SECTION NS-6
LOOKING EAST



SECTION NS-5
LOOKING EAST

SOIL AND DECOMPOSED ROCK DESCRIPTION KEY*

ZONE I
1. CLAY AND SILT, tr. cf sand
2. CLAY AND SILT, little rock fragments, tr. cf sand
3. CLAY AND SILT, some rock fragments, tr. cf sand
4. CLAY AND SILT AND ROCK FRAGMENTS, tr. organics
5. SILT AND CLAY, tr. rock fragments, tr. cf sand
6. Clayey SILT, tr. cf sand (ML)
7. Clayey SILT, little rock fragments, tr. cf sand (ML)
8. Clayey SILT, some rock fragments, tr. cf sand (ML)
9. Clayey SILT AND ROCK FRAGMENTS, little cf sand (ML)
10. SILT (ML)
11. SILT, tr. rock fragments, tr. cf sand (ML)
12. SILT, little rock fragments, tr. cf sand (ML)
13. SILT, some rock fragments, tr. cf sand (ML)
14. SILT AND ROCK FRAGMENTS, tr. cf sand (ML)

ZONE II
15. ROCK FRAGMENTS, little sand (decomposed rock)
16. ROCK FRAGMENTS, little silt, tr. cf sand (decomposed rock)
17. ROCK FRAGMENTS, some silt, tr. cf sand (decomposed rock)
18. ROCK FRAGMENTS AND SILT, tr. cf sand (decomposed rock)
19. ROCK FRAGMENTS AND CLAYEY SILT, tr. cf sand (decomposed rock)
20. ROCK FRAGMENTS, little clayey silt (decomposed rock)
21. ROCK FRAGMENTS AND CF SAND, tr. clayey silt (decomposed rock)

NOTE: ROCK FRAGMENTS IN ALL SAMPLES RANGE FROM COARSE TO FINE

ZONE III — ROCK

* Soils Classified in accordance with the Burmeister Soil Classification System.

NOTE: GROUNDWATER ELEVATIONS HAVE BEEN DETERMINED FROM TOP OF PIPE ELEVATIONS.

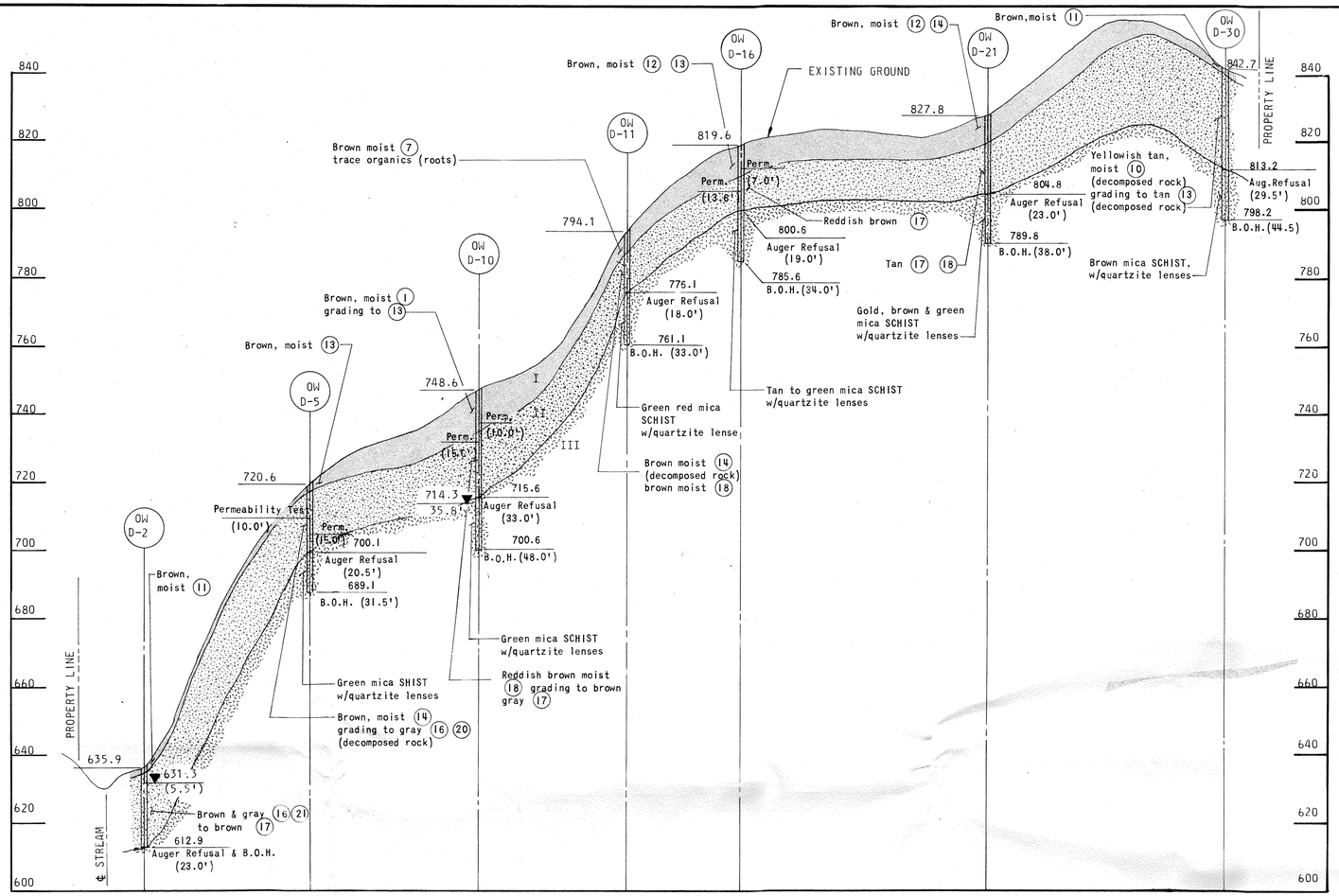
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GEOLOGIC REPORT
GEOLOGIC PROFILES

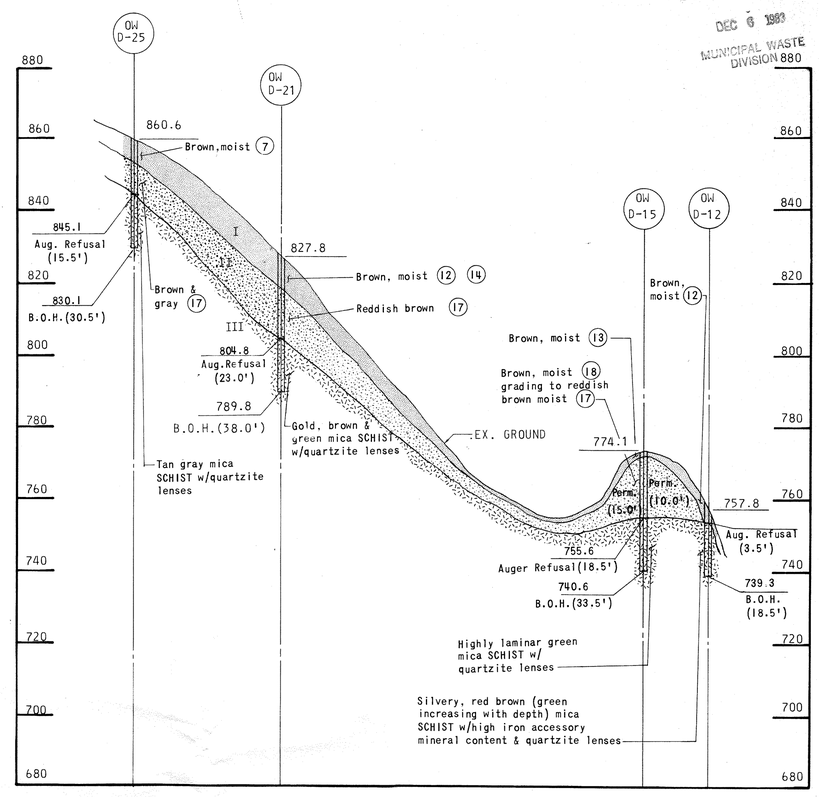
CENTURY ENGINEERING INC.
CONSULTING ENGINEERS-PLANNERS
TOWSON, MARYLAND

Des.By: JR/JPK	Scale: 1"= 200' Horiz 1"= 20 Vert	Proj.No.
Drn.By: ADS	Date: NOV. 1983	Drawing No. 7 OF 14
Chk.By: JPK	Approved:	

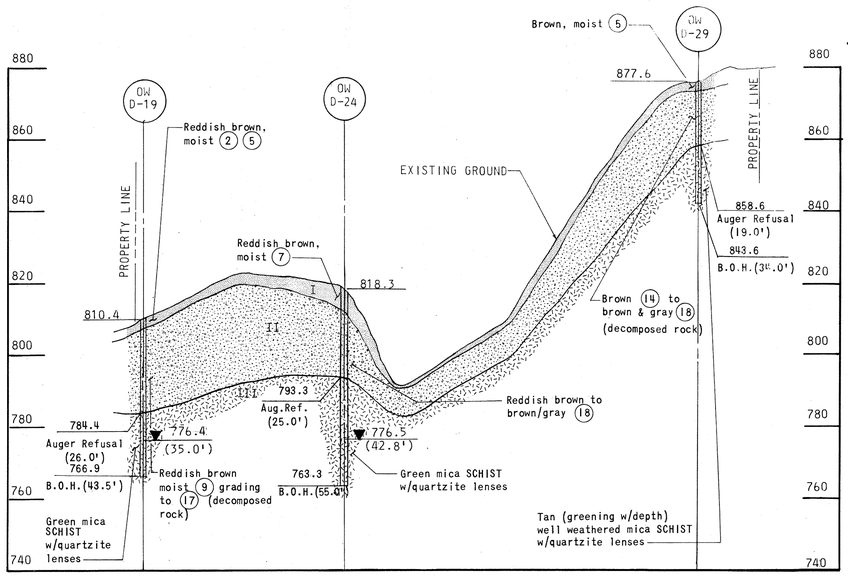
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DIVISION



SECTION NS-4
LOOKING WEST



SECTION NS-3
LOOKING NORTHEAST



SECTION NS-1
LOOKING NORTHEAST

SOIL AND DECOMPOSED ROCK DESCRIPTION KEY*

ZONE I
1. CLAY AND SILT, tr. cf sand
2. CLAY AND SILT, little rock fragments, tr. cf sand
3. CLAY AND SILT, some rock fragments, tr. cf sand
4. CLAY AND SILT AND ROCK FRAGMENTS, tr. organics
5. SILT AND CLAY, tr. rock fragments, tr. cf sand
6. Clayey SILT, tr. cf sand (ML)
7. Clayey SILT, little rock fragments, tr. cf sand (ML)
8. Clayey SILT, some rock fragments, tr. cf sand (ML)
9. Clayey SILT AND ROCK FRAGMENTS, little cf sand (ML)
10. SILT (ML)
11. SILT, tr. rock fragments, tr. cf sand (ML)
12. SILT, little rock fragments, tr. cf sand (ML)
13. SILT, some rock fragments, tr. cf sand (ML)
14. SILT AND ROCK FRAGMENTS, tr. cf sand (ML)

ZONE II
15. ROCK FRAGMENTS, little sand (decomposed rock)
16. ROCK FRAGMENTS, little silt, tr. cf sand (decomposed rock)
17. ROCK FRAGMENTS, some silt, tr. cf sand (decomposed rock)
18. ROCK FRAGMENTS AND SILT, tr. cf sand (decomposed rock)
19. ROCK FRAGMENTS AND CLAYEY SILT, tr. cf sand (decomposed rock)
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21. ROCK FRAGMENTS AND CF SAND, tr. clayey silt (decomposed rock)

NOTE: ROCK FRAGMENTS IN ALL SAMPLES RANGE FROM COARSE TO FINE

ZONE III — ROCK

* Soils Classified in accordance with the Burmeister Soil Classification System.

NOTE: GROUNDWATER ELEVATIONS HAVE BEEN DETERMINED FROM TOP OF PIPE ELEVATIONS.

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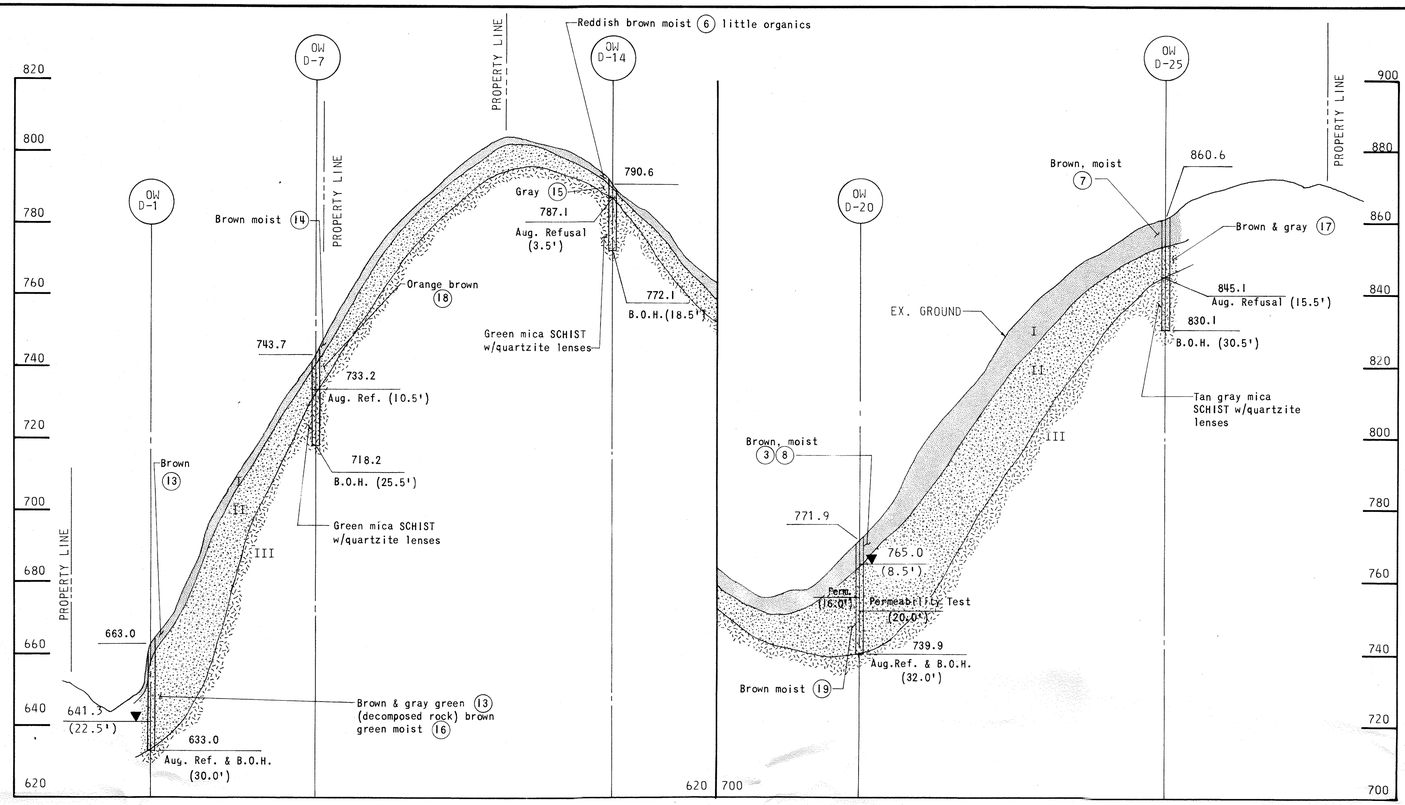
CARROLL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
NORTHERN SANITARY LANDFILL

GEOLOGIC REPORT
GEOLOGIC PROFILES

CENTURY ENGINEERING INC.
CONSULTING ENGINEERS-PLANNERS
TOWSON, MARYLAND

Des.By: JR/JPK	Scale: 1" = 200' Horiz. 1" = 20' Vert	Proj. No.	
Drn.By: ADS	Date: NOV. 1983	Drawing No.	
Chk.By: JPK	Approved:	6 OF 14	

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DIVISION



SECTION NS-2
LOOKING EAST

SOIL AND DECOMPOSED ROCK DESCRIPTION KEY*

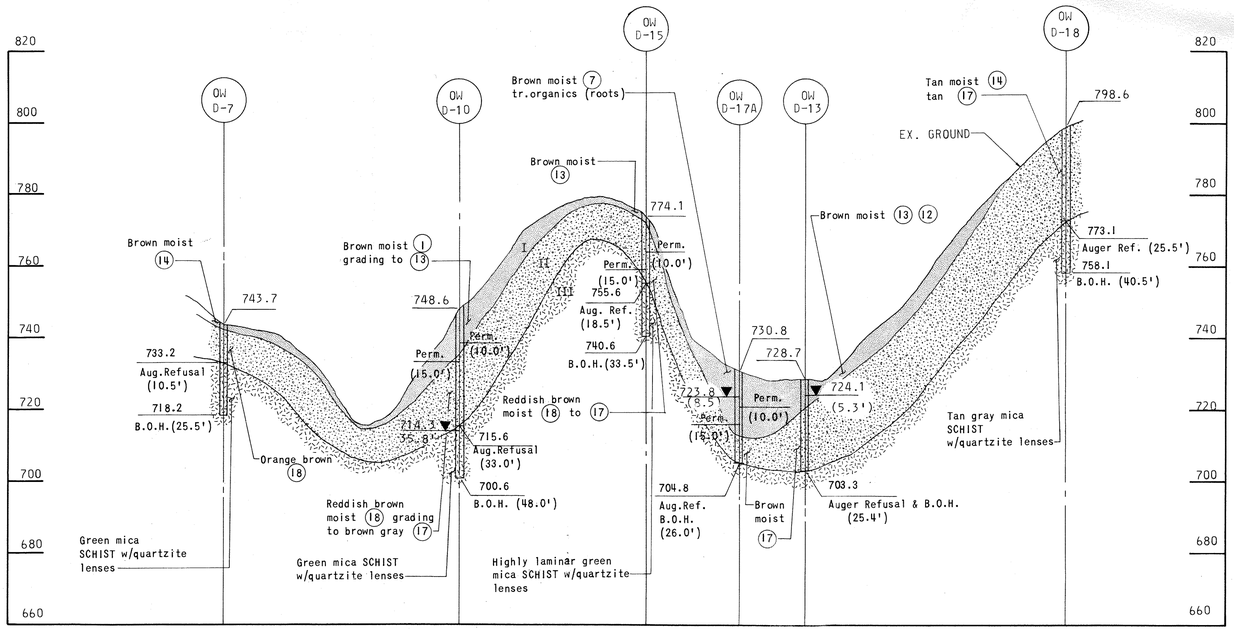
ZONE I
1. CLAY AND SILT, tr. cf sand
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3. CLAY AND SILT, some rock fragments, tr. cf sand
4. CLAY AND SILT AND ROCK FRAGMENTS, tr. organics
5. SILT AND CLAY, tr. rock fragments, tr. cf sand
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14. SILT AND ROCK FRAGMENTS, tr. cf sand (ML)

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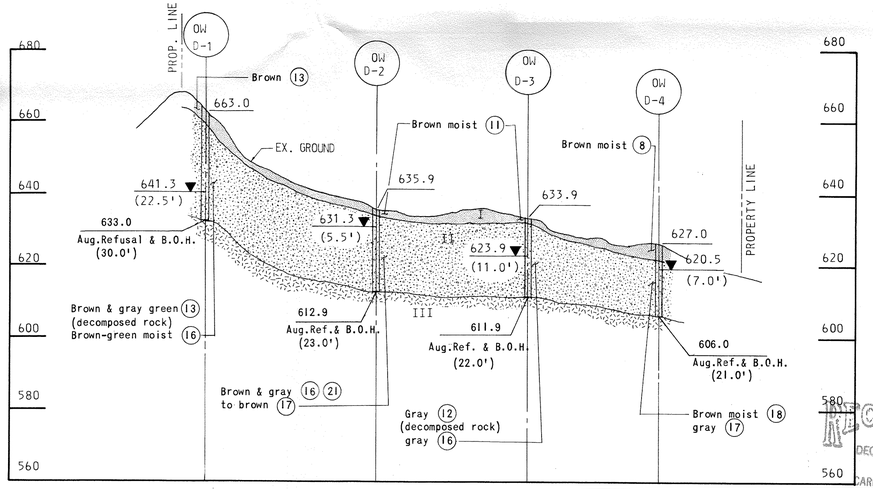
NOTE: ROCK FRAGMENTS IN ALL SAMPLES RANGE FROM COARSE TO FINE

ZONE III — ROCK

* Soils Classified in accordance with the Burmeister Soil Classification System.



SECTION EW-4
LOOKING NORTHEAST



SECTION EW-5
LOOKING NORTH

NOTE: GROUNDWATER ELEVATIONS HAVE BEEN DETERMINED FROM TOP OF PIPE ELEVATIONS.

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CARROLL COUNTY, MARYLAND
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NORTHERN SANITARY LANDFILL

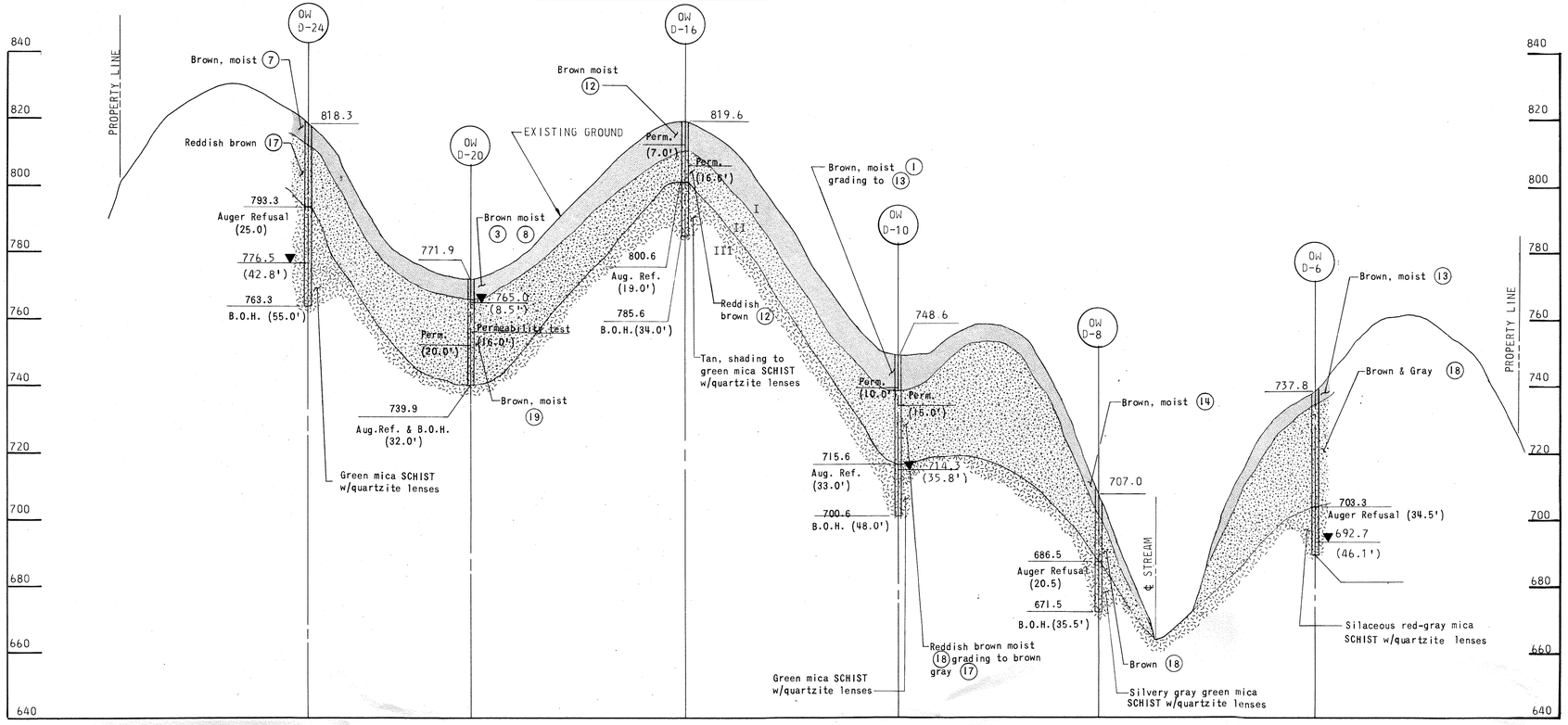
GEOLOGIC REPORT

GEOLOGIC PROFILES

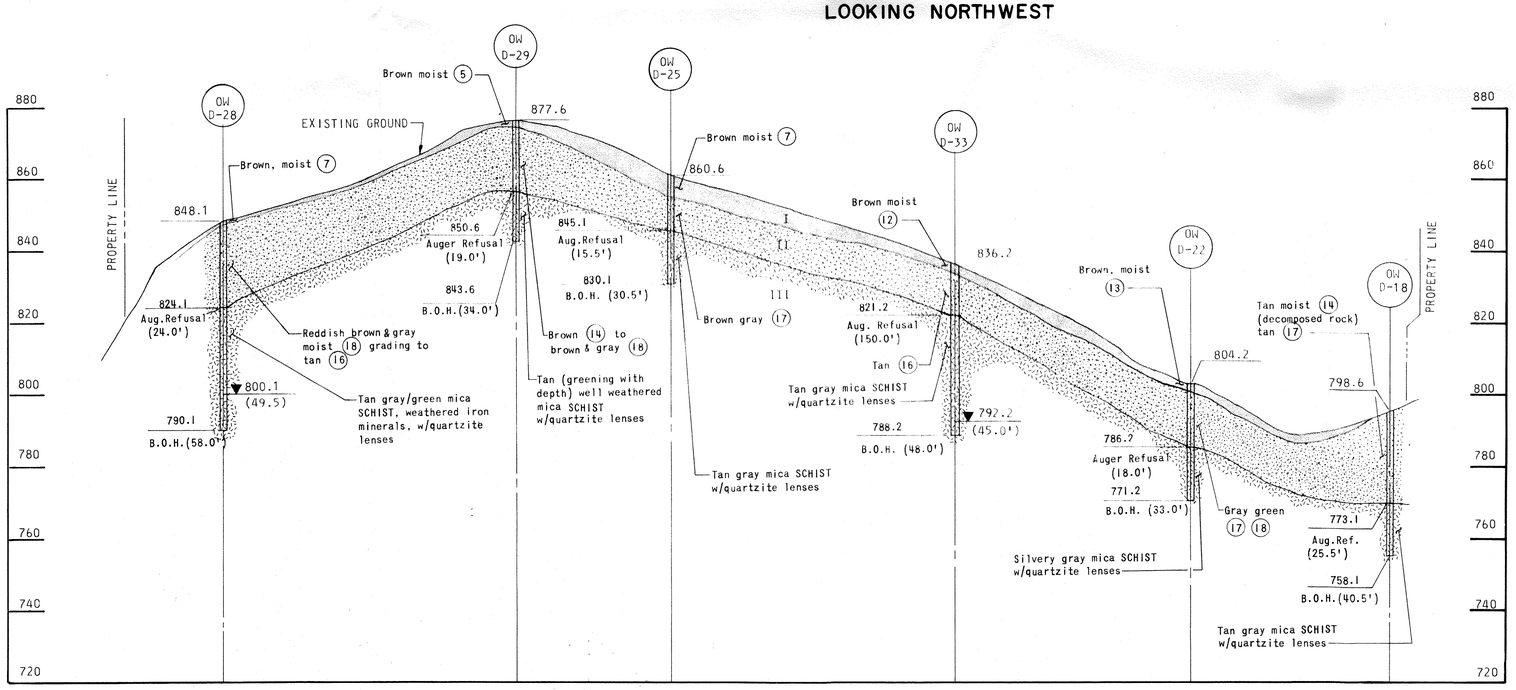
CENTURY ENGINEERING INC.
CONSULTING ENGINEERS-PLANNERS
TOWSON, MARYLAND

Des. By: J.R./J.P.K.	Scale: 1"=200' Horiz. 1"=20' Vert.	Proj. No.
Drn. By: A.D.S.	Date: NOV. 1983	Drawing No. 5 OF 14
Chk. By: J.P.K.	Approved:	

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SECTION EW-2
LOOKING NORTHWEST



SECTION EW-1
LOOKING NORTHWEST

SOIL AND DECOMPOSED ROCK DESCRIPTION KEY*

ZONE I
1. CLAY AND SILT, tr. cf sand
2. CLAY AND SILT, little rock fragments, tr. cf sand
3. CLAY AND SILT, some rock fragments, tr. cf sand
4. CLAY AND SILT AND ROCK FRAGMENTS, tr. organics
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NOTE: ROCK FRAGMENTS IN ALL SAMPLES RANGE FROM COARSE TO FINE

ZONE III — ROCK

* Soils Classified in accordance with the Burmeister Soil Classification System.

SECTION EW-3
LOOKING NORTH

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NOTE: GROUNDWATER ELEVATIONS HAVE BEEN DETERMINED FROM TOP OF PIPE ELEVATIONS.

CARROLL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
NORTHERN SANITARY LANDFILL

GEOLOGIC REPORT

GEOLOGIC PROFILES

CENTURY ENGINEERING INC.
CONSULTING ENGINEERS-PLANNERS
TOWSON, MARYLAND

Des.By: JR/JPK	Scale: 1" = 200' Horiz. 1" = 20' Vert.	Proj.No.
Drn.By: ADS	Date: NOV. 1983	Drawing No. 4 OF 14
Chk.By: JPK	Approved:	

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DIVISION

PROPERTY LINE

MD STATE GRID NORTH

EW5 EW4 EW2 EW1 EW3

NS1 NS2 NS3 NS4 NS5 NS6

OW D-1 OW D-2 OW D-3 OW D-4 OW D-5 OW D-6 OW D-7 OW D-8 OW D-9 OW D-10 OW D-11 OW D-12 OW D-13 OW D-14 OW D-15 OW D-16 OW D-18 OW D-19 OW D-20 OW D-21 OW D-21A OW D-22 OW D-23 OW D-24 OW D-25 OW D-26 OW D-27 OW D-28 OW D-29 OW D-30 OW D-32 OW D-33

M-1 M-2 M-3 M-4

B-1 B-2 B-3

N 628,000 E 815,500 N 627,000 E 814,500 N 625,500 N 624,500 E 815,000 N 624,000 E 816,000 E 816,500 E 817,000 E 817,500 E 818,000 E 818,500 E 819,000 E 819,500 N 628,500 N 629,000 N 627,500 N 626,500 N 626,000 N 625,500

TO WESTMINSTER

TO REISTERSTOWN

MD. RTE. 140

FOR INFORMATION ON S H A RIGHT-OF-WAY IN THIS AREA, SEE SHEET 1 OF 14

NOTE: FOR COMPLETE PROPERTY LINE INFORMATION AND COORDINATE LOCATIONS OF OBSERVATION WELLS, SEE SHEET 1 OF 14

PLAN

EXIST. GROUND CONTOUR INTERVAL-2'

LEGEND

- SOIL BORING TAKEN 6/22/81
- OBSERVATION WELL INSTALLED 4/27/83 TO 6/17/83 D-21A INSTALLED 11/3/83
- (M) MONITORING WELL-INSTALLED (10/31/83 TO 11/01/83)
- EW SECTIONS
- NS SECTIONS
- LIMIT OF SOLID WASTE PLACING
- LIMIT OF RUBBLE FILL AREA

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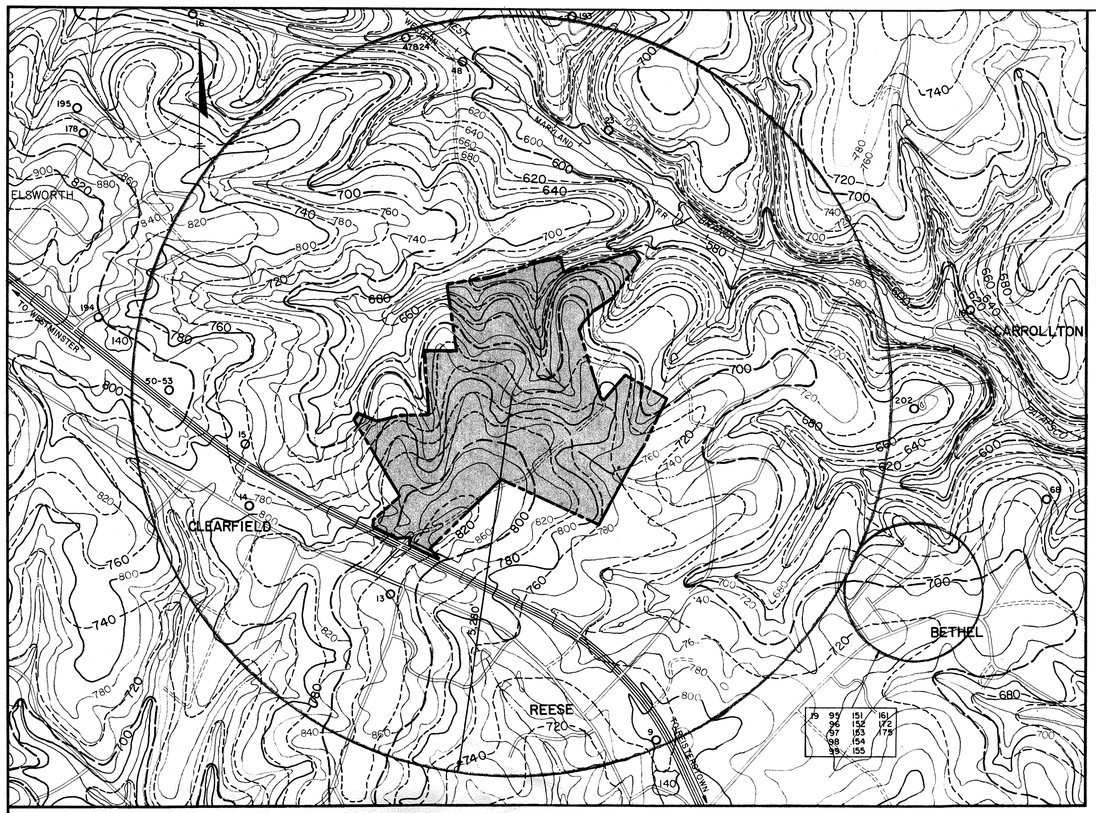
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GEOLOGIC REPORT

GEOLOGIC SECTIONS

Des. By: J. R.	Scale: 1"= 200'	Proj. No.
Drn. By: A.D.S.	Date: NOV. 1983	Drawing No. 3 OF 14
Chk. By: J.P.K	Approved:	

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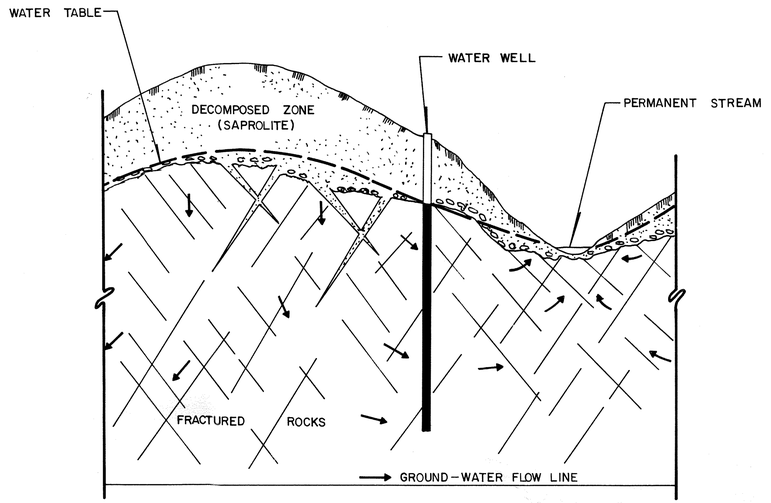


—840— EXISTING GROUND — — —700— — GROUNDWATER LEVELS

PLAN—ESTIMATED REGIONAL DEPTH TO GROUNDWATER AND EXISTING ADJACENT WELLS

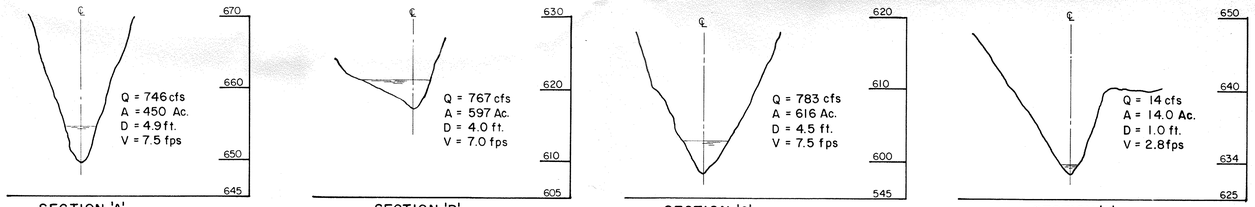
Scale: 1" = 1,000'

GROUND CONTOURS TAKEN FROM USGS WESTMINSTER, MD. MAP.
GROUNDWATER CONTOURS TAKEN FROM HYDROGEOLOGIC ATLAS (WESTMINSTER QUADRANGLE) AND WELL WATER LEVELS.
WELL LOCATIONS SHOWN O ARE TAKEN FROM WATER RESOURCES BASIC DATA REPORT NO. 12, 1981.



OCCURRENCE AND MOVEMENT OF GROUND WATER IN PIEDMONT TERRAIN

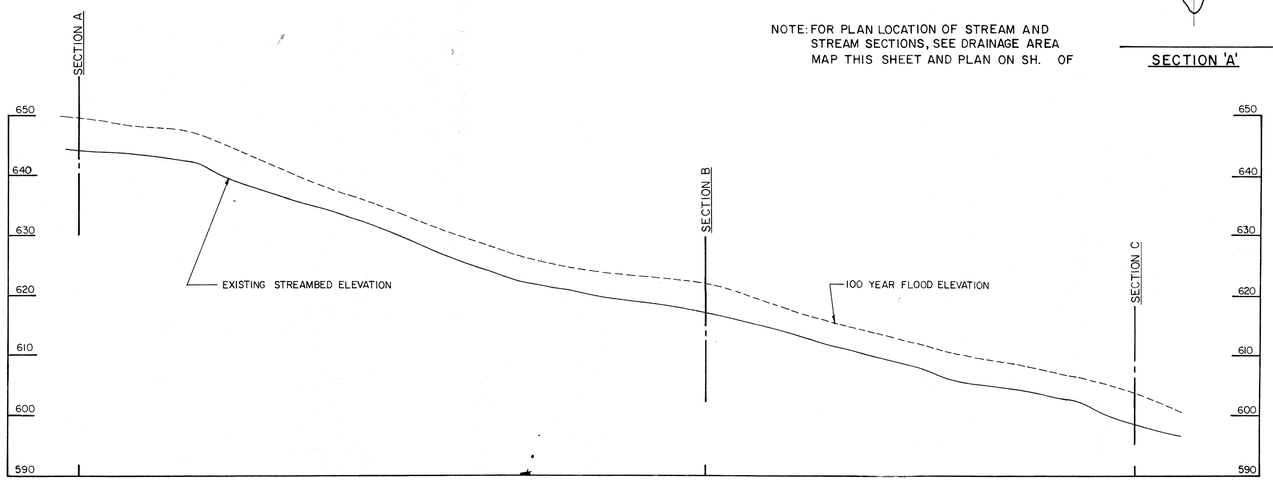
Scale: None



SECTIONS - 100-YEAR FLOOD

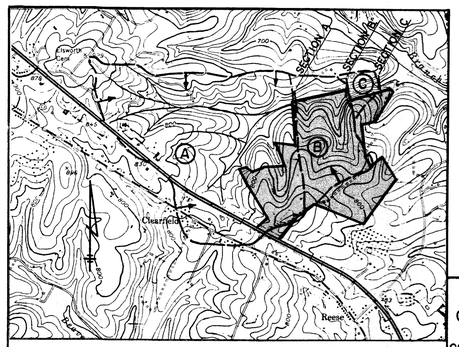
Scale: 1" = 100' Horiz.
1" = 10' Vert.

NOTE: FOR PLAN LOCATION OF STREAM AND STREAM SECTIONS, SEE DRAINAGE AREA MAP THIS SHEET AND PLAN ON SH. OF



PROFILE - 100-YEAR FLOOD, STREAM AT NORTH BOUNDARY

Scale: 1" = 200' (Horiz.)



DRAINAGE AREA MAP

Scale: 1" = 2,000'
TAKEN FROM USGS WESTMINSTER, MD. MAP SHOWING DRAINAGE AREAS FOR STREAM AT NORTHERN BOUNDARY OF SITE.

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NORTHERN SANITARY LANDFILL

GEOLOGIC REPORT

SURFACEWATER, GROUNDWATER, AND WELL DATA

Des. By: J.R.	Scale: As Noted	Proj. No.
Drn. By: A.D.S.	Date: NOV. 1983	Drawing No. 2 OF 14
Chk. By: J.P.K.	Approved:	

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CARROLL COUNTY, MARYLAND

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NORTHERN SANITARY LANDFILL

GEOLOGIC REPORT

SUMMARY OF GROUNDWATER READINGS

	OBSERVATION WELL DESCRIPTION	D-21A	D-22	D-23	D-24	D-25	D-26	D-27	D-28	D-29	D-30	D-31	D-32	D-33	M-1	M-2	M-3	M-4
OBSERVATION WELL DATA	CONTROL ELEVATION	804.8	786.2	730.8	793.3	845.1	782.7	744.9	824.1	858.6	813.2	757.6	777.5	821.2	776.1	858.6	773.1	757.6
	OBSERVATION WELL COORDINATES	N626196.9 E816550.9	N626308.5 E817703.3	N626120.4 E818672.6	N625968.7 E815429.7	N625839.1 E816356.4	N625614.9 E817441.5	N625694.5 E818429.8	N625343.8 E815436.0	N625429.6 E816243.2	N625635.8 E816964.0	N625255.7 E817860.3	N626175.1 E818183.5	N626161.3 E817068.9	N627144.9 E816123.5	N625425.6 E816235.2	N626743.8 E817998.5	N625262.7 E817867.3
	DATE COMPLETED	11/3/83	5/20/83	6/1/83	6/14/83	5/2/83	5/17/83	4/29/83	4/27/83	6/8/83	6/9/83	6/6/83	5/18/83	6/17/83	10/31/83	11/3/83	11/1/83	11/1/83
	TOP OF PIPE ELEVATION	829.3	805.5	764.9	819.3	861.5	814.6	748.9	849.6	878.61	843.7	804.6	796.4	837.2	793.6	879.1	800.1	805.1
	GROUND ELEVATION	827.8	804.2	763.8	818.3	860.6	813.2	747.7	848.1	877.6	842.7	803.6	795.5	836.2	792.1	877.6	798.6	803.6
	DEPTH (FT.)	144.5	33.0	48.0	55.0	30.5	45.5	25.0	58.0	34.0	44.5	61.0	33.0	48.0	157.5	115.5	73.5	92.5
	BOTTOM ELEVATION	683.3	771.2	715.8	763.3	830.10	767.7	722.7	790.1	843.6	798.2	742.6	762.5	788.2	634.6	762.1	725.1	711.1
	AUGER REFUSAL DEPTH	N/A	18.0	33.0	25.0	15.5	30.5	25.0	24.0	19.0	29.5	46.0	18.0	15.0	N/A	N/A	N/A	N/A
	REFUSAL ELEVATION	N/A	786.2	730.8	793.3	845.1	782.7	722.7	824.1	858.6	813.2	757.6	777.5	821.2	N/A	N/A	N/A	N/A
READINGS @ COMPLETION OF DRILLING	DATE OF READING		5/20/83	6/1/83	6/14/83	5/2/83	5/17/83	4/29/83	4/27/83	6/8/83	6/9/83	6/6/83	5/18/83	6/17/83				
	DIST. TO TOP OF GROUNDWATER		10.0*	25.3*	10.0*	4.3*	5.0*	4.5*	40.5*	10.0*	17.2*	44.0*	5.0*	40.5*				
	GROUNDWATER ELEVATION		794.2	738.5	808.8	856.3	808.2	743.2	808.7	867.6	825.5	759.6	790.5	795.7				
GROUNDWATER CONTOURS ARE BASED ON THESE READINGS	DATE OF READING		6/17/83	6/17/83	6/22/83	6/22/83	6/17/83	6/17/83	6/21/83	6/22/83	6/22/83	6/22/83	6/22/83	6/22/83				
	DIST. TO TOP OF GROUNDWATER		⇩ DRY	READING	⇩ 42.8	⇩ DRY	⇩ DRY	⇧ 4.0	⇩ DRY	⇩ DRY	⇩ DRY	⇩ DRY	⇩ DRY	⇩ DRY				
	GROUNDWATER ELEVATION			IN ERROR	⇩ 776.5			⇧ 744.9										
	DATE OF READING		7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83				
	DIST. TO TOP OF GROUNDWATER		DRY	37.6	⇩ 44.5	DRY	DRY	⇩ 6.4	⇧ 49.5	DRY	DRY	DRY	DRY	DRY				
	GROUNDWATER ELEVATION			727.3	⇩ 774.8			⇩ 742.5	⇧ 800.1									
	DATE OF READING		8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83				
	DIST. TO TOP OF GROUNDWATER		DRY	⇩ 40.0	⇩ 47.4	DRY	DRY	⇩ 7.9	⇩ 51.8	DRY	DRY	⇧ 56.4	DRY	⇧ 45.6				
	GROUNDWATER ELEVATION			⇩ 724.9	⇩ 771.9			⇩ 741.0	⇩ 797.8			⇧ 748.2		⇧ 791.6				
	DATE OF READING		9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83				
	DIST. TO TOP OF GROUNDWATER		DRY @ 31.6	⇩ 40.3	⇩ 48.7	DRY @ 27.5	DRY @ 42.8	⇩ 9.1	⇩ 52.6	DRY @ 33.1	DRY @ 32.8	⇩ 57.1	DRY @ 33.1	⇧ 45.0				
	GROUNDWATER ELEVATION		773.9	⇩ 723.5	⇩ 770.6	834.0	771.8	⇩ 739.8	⇩ 797.0	845.1	810.9	⇩ 747.5	763.3	⇧ 792.2				
	DATE OF READING	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83
	DIST. TO TOP OF GROUNDWATER	132.0	DRY @ 31.6	⇩ 41.0	⇩ 50.5	DRY @ 27.5	DRY @ 42.8	⇩ 9.6	⇩ 55.4	DRY @ 33.1	DRY @ 32.8	⇩ 58.0	DRY @ 33.1	⇧ 45.3	87.4	92.0	47.0	61.5
	GROUNDWATER ELEVATION	697.3	773.9	⇩ 723.9	⇩ 768.8	834.0	771.8	⇩ 739.3	⇩ 794.2	845.1	810.9	⇩ 746.6	763.3	⇧ 791.9	706.2	787.1	753.1	743.6
	DATE OF READING																	
	DIST. TO TOP OF GROUNDWATER																	
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	GROUNDWATER ELEVATION																	

NOTE: WATER MEASUREMENT TAKEN FROM TOP OF PIPE

(NC.) - NO CHANGE

⇧ - INDICATES GROUNDWATER RISE

⇩ - INDICATES GROUNDWATER FALL

CONTROL ELEVATION - LOWER UNIT OF SOLID WASTE PLACING

* WATER LEVELS AT COMPLETION OF BOREHOLE INFLUENCED BY WATER ADDED DURING ROCK CORING.

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CARROLL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
NORTHERN SANITARY LANDFILL

GEOLOGIC REPORT

GROUNDWATER READINGS

CENTURY ENGINEERING INC.
CONSULTING ENGINEERS-PLANNERS
TOWSON, MARYLAND

Des. By: JPK	Scale: NONE	Proj. No.
Drn. By: PS	Date: NOV. 1983	Drawing No. 14 OF 14
Chk. By: JPK	Approved:	

CARROLL COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS

NORTHERN SANITARY LANDFILL

GEOLOGIC REPORT

SUMMARY OF GROUNDWATER READINGS

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DIVISION

	OBSERVATION WELL DESCRIPTION	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9	D-10	D-11	D-12	D-13	D-14	D-15	D-16	D-17	D-17A	D-18	D-19	D-20	D-21
OBSERVATION WELL DATA	CONTROL ELEVATION	641.3	631.3	623.9	620.5	700.1	703.3	733.2	686.5	679.9	715.6	776.1	754.3	724.1	787.1	755.6	800.6	783.0	723.8	773.1	784.4	765.0	804.8
	OBSERVATION WELL COORDINATES	N628257.5 E815981.6	N628327.4 E816452.2	N628411.4 E816855.6	N628502.6 E817209.9	N627852.3 E816523.3	N628076.3 E817484.6	N627791.5 E815983.9	N627709.8 E816968.6	N627680.1 E817240.4	N627361.6 E816481.4	N627137.9 E816117.5	N627251.8 E817054.1	N627099.6 E817370.3	N627035.7 E815684.4	N627122.1 E816939.2	N626810.3 E816167.1	N686655.7 E817136.7	N627059.0 E817184.6	N626753.8 E817997.5	N626443.0 E815156.2	N626324.9 E815756.1	N626196.9 E816550.9
	DATE COMPLETED	6/9/83	5/5/83	6/10/83	6/2/83	5/10/83	6/8/83	5/24/83	5/27/83	5/3/83	5/6/83	5/23/83	5/26/83	6/2/83	5/25/83	5/11/83	5/5/83	5/12/83	5/13/83	5/31/83	4/28/83	5/3/83	5/20/83
	TOP OF PIPE ELEVATION	663.8	636.8	634.9	627.5	721.9	738.8	744.6	708.3	692.1	750.1	795.5	759.0	729.4	791.3	775.6	820.6	791.0	732.3	800.0	811.4	773.5	829.0
	GROUND ELEVATION	663.0	635.9	633.9	627.0	720.6	737.8	743.7	707.0	691.0	748.6	794.1	757.8	728.7	790.6	774.1	819.6	790.0	730.8	798.6	810.4	771.9	827.6
	DEPTH (FT.)	30.0	23.0	22.0	21.0	31.5	49.5	25.5	35.5	22.0	48.0	33.0	18.5	25.4	18.5	33.5	34.0	14.0	26.0	40.5	43.5	32.0	38.0
	BOTTOM ELEVATION	633.0	612.9	611.9	606.0	690.1	688.3	718.2	671.5	669.0	700.6	761.1	739.3	703.3	772.1	740.6	785.6	776.0	704.8	738.1	766.9	739.9	789.8
	AUGER REFUSAL DEPTH	30.0	23.0	22.0	21.0	20.5	34.5	10.5	20.5	22.0	33.0	18.0	3.5	25.4	3.5	18.5	19.0	7.0	26.0	25.5	26.0	32.0	23.0
	REFUSAL ELEVATION	633.0	612.9	611.9	606.0	700.1	703.3	733.2	686.5	669.0	715.6	776.1	754.3	703.3	787.1	755.6	800.6	783.0	704.8	773.1	784.4	739.9	804.8
WATER LEVEL READINGS	DATE OF READING	6/9/83	5/5/83	6/10/83	6/2/83	5/10/83	6/8/83	5/24/83	5/27/83	5/3/83	5/6/83	5/23/83	5/26/83	6/2/83	5/25/83	5/11/83	5/5/83	5/12/83	5/13/83	5/31/83	4/28/83	5/3/83	5/20/83
	DIST. TO TOP OF GROUNDWATER	23.0	DRY	10.0	12.0	20.3*	35.0*	DRY	10.0*	14.0	46.5*	DRY	DRY	9.7	3.6*	25.0*	DRY	DRY	6.0	27.5*	25.3*	6.0*	4.3*
	GROUNDWATER ELEVATION	640.8		623.9	615.5	700.3	702.8		698.3	678.1	702.1			719.0	787.7	750.6			724.8	771.0	785.1	765.9	823.5
	DATE OF READING	6/21/83	6/21/83	6/21/83	6/17/83	6/21/83	6/17/83	6/21/83	6/21/83	6/17/83	6/21/83	6/21/83	6/21/83	6/17/83	6/21/83	6/21/83	6/21/83		6/17/83	6/17/83	6/22/83	6/21/83	6/17/83
	DIST. TO TOP OF GROUNDWATER	DRY	DRY	DRY	9.5	DRY	DRY	DRY	DRY	READING IN ERROR	35.8	DRY	DRY	5.5	DRY	DRY	DRY		12.0	DRY	DRY	9.0	DRY
	GROUNDWATER ELEVATION				618.0						714.3			723.9					718.8			764.5	
	DATE OF READING	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83	7/13/83		7/13/83	7/13/83	7/13/83	7/13/83	7/13/83
	DIST. TO TOP OF GROUNDWATER	22.5	5.5	11.0	8.8	DRY	DRY	DRY		12.2	39.0	DRY	DRY	5.3	DRY	DRY	DRY		8.5	DRY	35.0	8.5	DRY
	GROUNDWATER ELEVATION	641.3	631.3	623.9	618.7					679.9	711.1			724.1				ABANDONED	723.8	N.C.	776.4	765.0	
	DATE OF READING	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83	8/23/83		8/23/83	8/23/83	8/23/83	8/23/83	8/23/83
	DIST. TO TOP OF GROUNDWATER	22.9	6.4	11.7	7.0	DRY @ 28.8	46.1	DRY @ 24.0	DRY @ 32.9	12.7	41.0	DRY @ 31.6	DRY @ 17.9	6.4	DRY @ 14.9	DRY @ 32.9	DRY @ 33.1		9.3	DRY @ 39.0	37.7	12.0	DRY @ 33.0
	GROUNDWATER ELEVATION	640.9	630.4	623.2	620.5	693.4	692.7	709.2	675.4	679.4	709.1	763.9	741.1	723.0	776.4	742.7	787.5		723.0	761.0	773.7	761.5	796.0
	DATE OF READING	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83	9/14/83		9/14/83	9/14/83	9/14/83	9/14/83	9/14/83
	DIST. TO TOP OF GROUNDWATER	23.0	6.7	11.8	9.0	DRY @ 28.8	47.2	DRY @ 24.0	DRY @ 32.9	12.8	41.9	DRY @ 31.6	DRY @ 17.9	6.6	DRY @ 14.9	DRY @ 32.9	DRY @ 33.1		9.5	DRY @ 39.0	DRY @ 38.0	12.5	DRY @ 33.0
	GROUNDWATER ELEVATION	640.8	630.1	623.1	618.5	693.1	691.6	709.2	675.4	679.3	708.2	763.9	741.1	722.8	776.4	742.7	787.5		722.8	761.0	773.4	761.0	796.0
	DATE OF READING	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83	11/3/83		11/3/83	11/3/83	11/3/83	11/3/83	11/3/83
	DIST. TO TOP OF GROUNDWATER	23.0	6.5	DRY @ 12.0	8.0	DRY @ 28.5	DRY @ 47.0	DRY @ 24.0	DRY @ 32.9	12.4	45.0	DRY @ 31.6	DRY @ 17.9	7.0	DRY @ 14.9	DRY @ 32.9	DRY @ 33.1		9.9	DRY @ 39.0	DRY @ 38.0	13.0	DRY @ 33.0
	GROUNDWATER ELEVATION	640.8	630.3	622.9	619.5	693.4	691.8	709.2	675.4	679.7	705.1	763.9	741.1	722.4	776.4	742.7	787.5		722.4	761.0	773.4	760.5	796.0
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READINGS @ COMPLETION OF DRILLING

GROUNDWATER CONTOURS ARE BASED ON THESE READINGS

NOTE: WATER MEASUREMENT TAKEN FROM TOP OF PIPE

(NC.) - NO CHANGE

⇧ - INDICATES GROUNDWATER RISE

⇩ - INDICATES GROUNDWATER FALL

CONTROL ELEVATION - LOWER UNIT OF SOLID WASTE PLACING

* WATER LEVELS AT COMPLETION OF BOREHOLE INFLUENCED BY WATER ADDED DURING ROCK CORING.

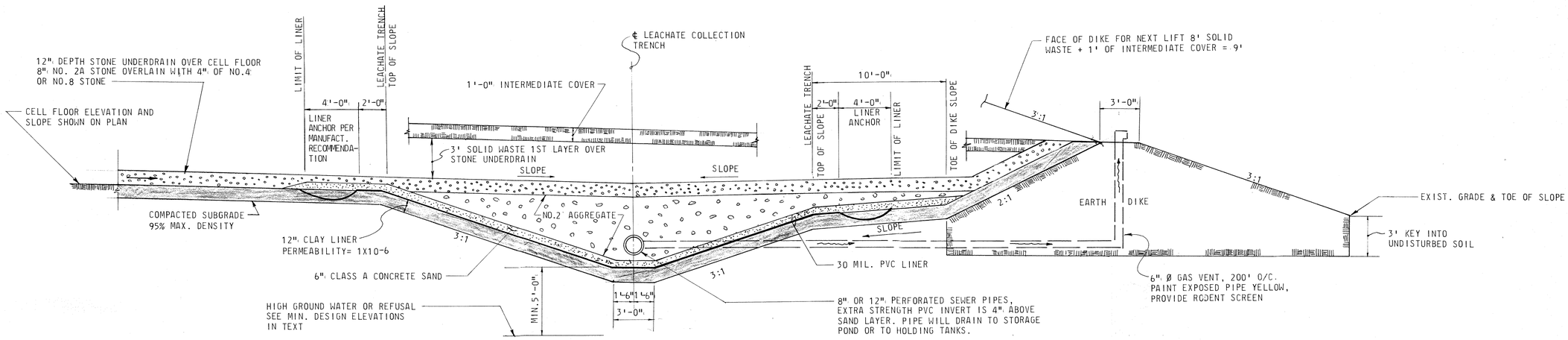
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TOWSON, MARYLAND

CARROLL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
NORTHERN SANITARY LANDFILL
GEOLOGIC REPORT
GROUNDWATER READINGS

Des. By: J.P.K.	Scale: NONE	Proj. No.
Drn. By: P.S.	Date: NOV. 1983	Drawing No. 13 OF 14
Chk. By: J.P.K.	Approved:	

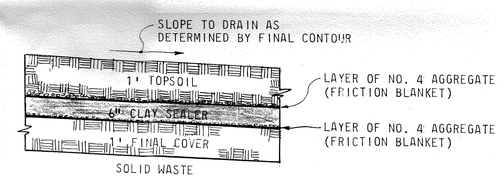
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PROPOSED LEACHATE UNDERDRAIN, TRENCH & CELL FLOOR

SCALE: 1/4" = 1'-0"

SHOWING MAKE-UP OF CELL FLOOR, LEACHATE COLLECTION SYSTEM AND INSTALLATION OF 1ST LIFT OF SOLID WASTE, TYPICAL ALL CELLS.



FINAL COVER DETAIL

SCALE: 1/2" = 1'-0"

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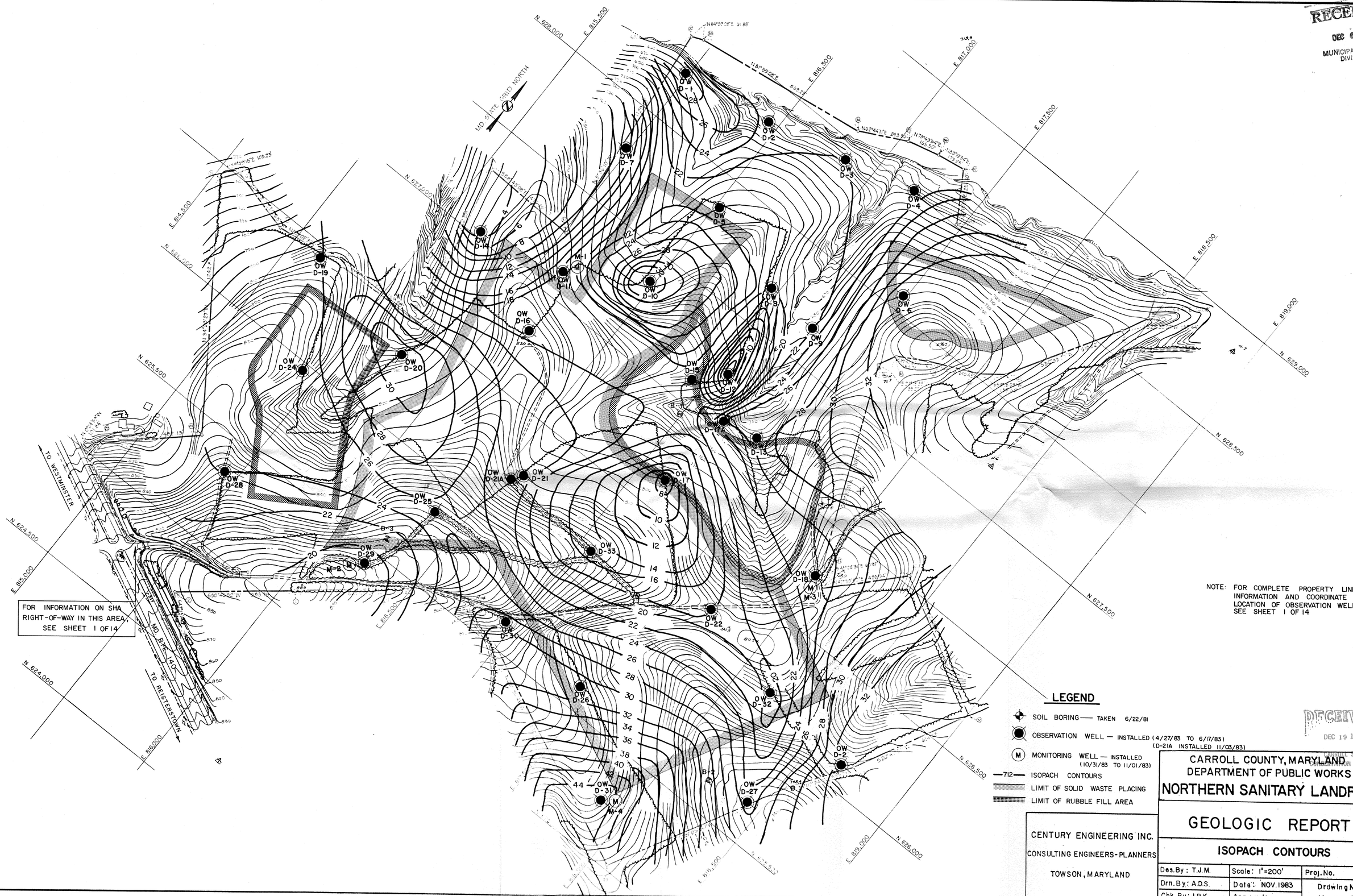
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DETAILS

CENTURY ENGINEERING INC.
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TOWSON, MARYLAND

Des. By: J.P.K.	Scale: As Noted	Proj. No.
Drn. By: F.W.	Date: NOV. 1983	Drawing No. 12 OF 14
Chk. By: J.P.K.	Approved:	

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NOTE: FOR COMPLETE PROPERTY LINE INFORMATION AND COORDINATE LOCATION OF OBSERVATION WELLS, SEE SHEET 1 OF 14

LEGEND

- SOIL BORING — TAKEN 6/22/81
- OBSERVATION WELL — INSTALLED (4/27/83 TO 6/17/83) (D-21A INSTALLED 11/03/83)
- (M) MONITORING WELL — INSTALLED (10/31/83 TO 11/01/83)
- —712— ISOPACH CONTOURS
- LIMIT OF SOLID WASTE PLACING
- LIMIT OF RUBBLE FILL AREA

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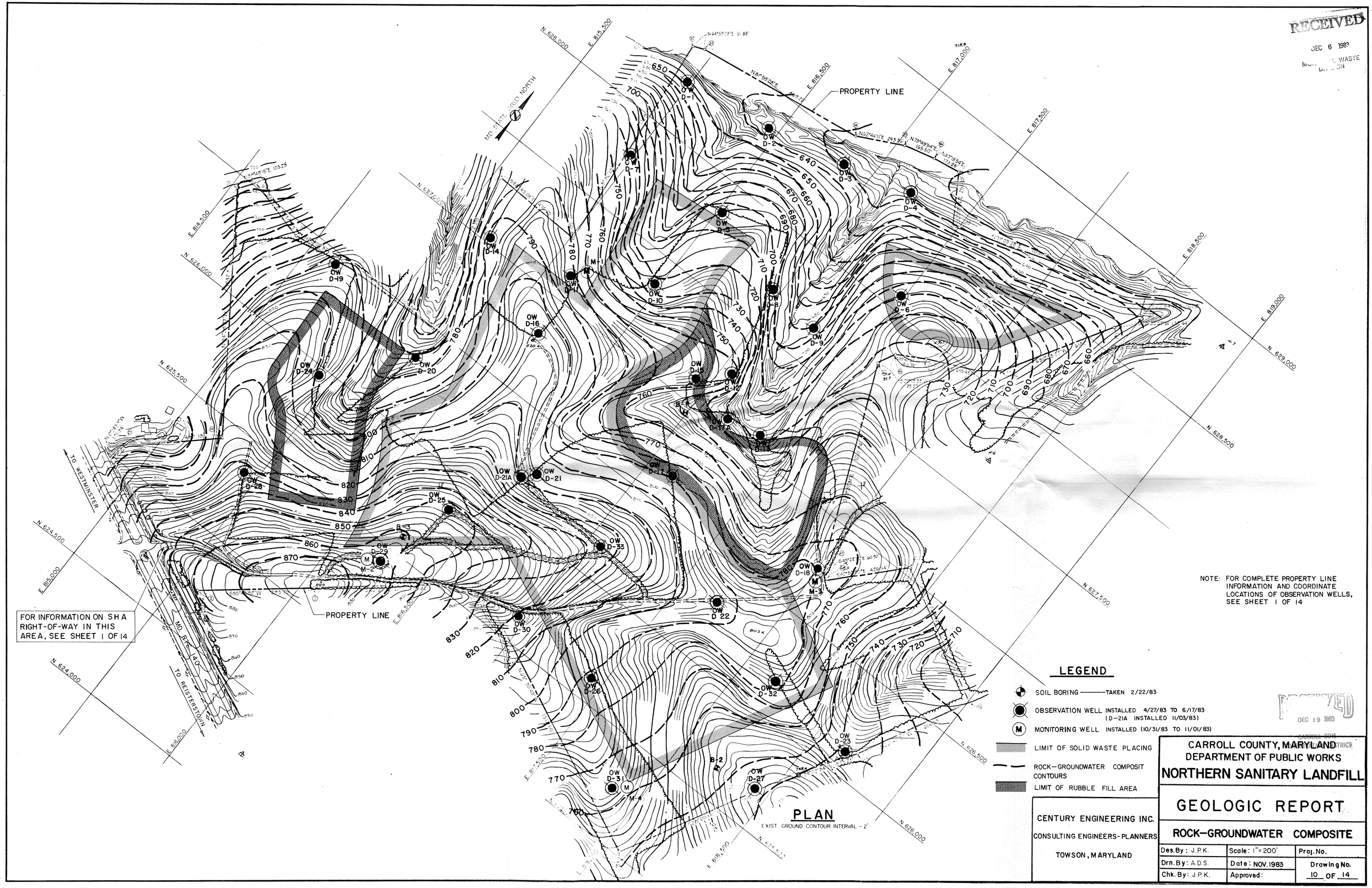
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GEOLOGIC REPORT

ISOPACH CONTOURS

Des. By: T.J.M.	Scale: 1"=200'	Proj. No.
Drn. By: A.D.S.	Date: NOV. 1983	Drawing No. 11 OF 14
Chk. By: J.P.K.	Approved:	

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DIVISION



NOTE: FOR COMPLETE PROPERTY LINE INFORMATION AND COORDINATE LOCATIONS OF OBSERVATION WELLS, SEE SHEET 1 OF 14

LEGEND

- SOIL BORING ——— TAKEN 2/22/83
- OBSERVATION WELL INSTALLED 4/27/83 TO 6/17/83 (D-21A INSTALLED 11/03/83)
- (M) MONITORING WELL INSTALLED (10/31/83 TO 11/01/83)
- LIMIT OF SOLID WASTE PLACING
- ROCK–GROUNDWATER COMPOSIT CONTOURS
- LIMIT OF RUBBLE FILL AREA

PLAN

EXIST GROUND CONTOUR INTERVAL - 2'

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TOWSON, MARYLAND

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NORTHERN SANITARY LANDFILL

GEOLOGIC REPORT

ROCK–GROUNDWATER COMPOSITE

Des. By: J.P.K.	Scale: 1"= 200'	Proj. No.
Drn. By: A.D.S.	Date: NOV. 1983	Drawing No. 10 OF 14
Chk. By: J.P.K.	Approved:	

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SURFACE WATER SAMPLE

BASIN "B"

PROPERTY LINE

FRACTURE TRACE

MD STATE GRID NORTH

BASIN "C"

FRACTURE TRACE

SURFACE WATER SAMPLE

100 YEAR FLOODPLAIN - FOR SECTIONS AND PROFILE SEE SHEET OF

BASIN "A"

FRACTURE TRACE

SURFACE WATER SAMPLE

LOCAL DRAINAGE AREA

TO WESTMINSTER

FOR INFORMATION ON SHA RIGHT-OF-WAY IN THIS AREA, SEE SHEET 1 OF 14

MD. RTE. 140

TO REISTERSTOWN

LOCAL DRAINAGE AREA

PROPERTY LINE

BASIN "E"

BASIN "D"

NOTE: FOR COMPLETE PROPERTY LINE INFORMATION AND COORDINATE LOCATIONS OF OBSERVATION WELLS, SEE SHEET 1 OF 14

LEGEND

- 711 — GROUNDWATER CONTOUR (WATERTABLE CONDITION)
- DIRECTION OF GROUNDWATER FLOW
- GW 792.1 — PHREATIC GROUNDWATER LEVEL ENCOUNTERED AT DEPTH IN ROCK
- APPROXIMATE LIMITS OF LESS WEATHERED, INTACT ROCK WITH LOW OCCURRENCE OF WATER BEARING FRACTURES.
- FRACTURE TRACE (FROM HYDROGEOLOGIC ATLAS)

LEGEND

- RECOMMENDED MONITORING WELL LOCATION
- SOIL BORING - TAKEN 6/22/81
- OBSERVATION WELL - INSTALLED 4/27/83 TO 6/17/83 D-21A INSTALLED 11/3/83
- (M) MONITORING WELL - INSTALLED (10/31/83 TO 11/01/83)
- DRAINAGE AREA DIVISION
- LIMIT OF SOLID WASTE PLACING
- LIMIT OF RUBBLE FILL AREA

PLAN

EXIST. GROUND CONTOUR INTERVAL - 2'

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NORTHERN SANITARY LANDFILL

GEOLOGIC REPORT

GROUNDWATER TABLE CONTOUR MAP

Des. By: JPK	Scale: 1" = 200'	Proj. No.
Drn. By: ADS	Date: NOV. 1983	Drawing No. 9 OF 14
Chk. By: JPK	Approved:	