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NWS YORKTOWN
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FINAL TECHNICAL MEMORANDUM SITE 1 DUDLEY ROAD LANDFILL EXTENT OF LANDFILL WASTE AND SOIL COVER NWS YORKTOWN VA

01/01/2014

CH2M HILL

Site 1 Dudley Road Landfill
Extent of Landfill Waste and Soil Cover

PREPARED FOR:	Naval Weapons Station Yorktown Tier I Partnering Team
PREPARED BY:	CH2M HILL
DATE:	January 2014

Purpose

This technical memorandum has been prepared in response to the Naval Weapons Station (WPNSTA) Yorktown *Final Third Five-Year Review Report* (CH2M HILL, 2013a) recommendation to confirm that the soil cover adequately covers the landfill waste area and will be protective in the future at Site 1. The soil cover remedy was determined to be protective of human health and the environment in the short-term because Institutional Controls are in place that restrict access and prevent residential development or disturbance of the soil cover. However, uncertainties were identified associated with the future long-term protectiveness of the remedy because the extent of the landfill cover in relation to the remaining waste could not be confirmed.

The landfill cover investigation was completed to confirm the lateral extent of landfill waste, to confirm the vertical and lateral extent of the soil cover over the landfill, and to delineate waste within the landfill potentially not covered by the existing soil cover. In addition to addressing the recommendation in the Five-Year Review, the landfill delineation will also support future groundwater remediation to be completed at the site. Landfilled waste is a potential continuing source of groundwater contamination, and any groundwater remedy to be implemented will involve addressing contamination beyond the point of compliance (the landfill boundary).

Site Setting and History

Site 1, the Dudley Road Landfill, is a 10-acre landfill located in the northern portion of WPNSTA Yorktown, west of Indian Field Creek and north of an unnamed tributary to the creek (**Figure 1**). Site 1 is grassy and generally flat, and is surrounded by woods. Along the southern and eastern edges of the site, topography slopes more steeply down to an unnamed creek and Indian Field Creek, respectively. There is an abandoned sand reclamation pit on the eastern edge of the site, and a pond exists in the western portion of the site.

1991 Site Photograph Album

Historical photographic albums were compiled in 1991 (Baker, 1991) and later revised in1999 (Baker, 1999). Review of the historical photographs indicated that the landfill area was reportedly excavated as borrow pits to approximately 20 feet deep prior to waste disposal. Waste material was then brought to the site and dumped into the borrow pit area and covered with 4 to 6 inches of soil. In 1977, two excavations were discovered where oil had been discarded. When the landfill was initially closed, it was covered with 2 feet of earth, graded, and reseeded. The cover material for the initial landfill cover was obtained from the immediate area, across the entry road from the main landfill, where the pond now exists.

1993 Round One Remedial Investigation

According to the *Final Round One Remedial Investigation Report for Sites 1-9, 11, 12, 16-19, and 21* (Baker and Weston, 1993), the landfill at Site 1 was originally used for sand mining and was then operated under a Virginia Department of Environmental Quality Conditional Permit (No. 287) and used from approximately 1965 to 1979 for solid waste disposal; however, one area continued to be used for the disposal of plastic lens-grinding waste until 1983. Historical documentation indicates that the landfill did not receive additional wastes from 1983 through 1985, when the landfill was officially closed. Wastes disposed at the site are reported to have included asbestos from steam pipe insulation; empty oil, grease, paint, and solvent containers (possibly including trichloroethene [TCE], trichloroethane, methylene chloride, acetone, and cyclohexanol); explosives-contaminated carbon;

household appliances; scrap-metal banding; construction rubble; plastic lens-grinding wastes; tree limbs; lumber; packaging wastes; electrical wires; and waste oil. Waste quantities were estimated to be 17 tons per year for approximately 15 years, for an approximate total waste disposal of 255 tons over the landfill operation period (C.C. Johnson and CH2M HILL, 1984). The landfill was covered by a 2-foot soil cover and the sand reclamation pit was covered with 8 feet of soil following its closure in the mid-1980s.

1997 Round Two Remedial Investigation

The *Final Round Two Remedial Investigation Report, Sites 1 and 3* (Baker, 1997) provided additional information related to waste disposal practices at the site and identified Site 1 as a landfill consisting of two sand borrow pits that were later used for waste disposal. Although the exact locations of these borrow pits is unknown, the first was reportedly located in the eastern portion of the site, and the second in the southwest portion of the site. Wastes were reportedly disposed in both borrow pits.

1999 Record of Decision and Remedial Action

According to the *Final Record of Decision, Operable Unit Nos. VIII and IX, Site 1-Dudley Road Landfill and Site 3-Group 16 Magazines Landfill* (Navy, 1999), the landfill was covered with approximately 2 feet of soil following its closure. The Record of Decision also stated that the remedy would consolidate exposed waste and add additional soil to those areas that had become exposed. In 1999, metal surface debris was removed from the site and recycled and 413 tons of arsenic-contaminated waste and soil was disposed offsite. The old landfill area was regraded, covered with 18 inches of backfill and 6 inches of topsoil, and seeded (OHM, 2001).

2012 Phase II Remedial Investigation

The *Final Phase II Remedial Investigation Report, Sites 1 and 3* identified tetrachloroethene, TCE, cis-1,2-dichloroethene, and vinyl chloride as constituents of concern for groundwater (combined Columbia and Yorktown Eastover aquifers) at Site 1 (CH2M HILL, 2012). A pre-Feasibility Study is ongoing, which will further investigate volatile organic compound (VOC) and metals contamination in groundwater and other media.

Site Inspections

Site inspections have been performed by NAVFAC at least once per year since 2007; the last inspection was completed in July 2013. From 2003 to 2007, inspections were performed by WPNSTA Yorktown environmental personnel (CH2M HILL, 2013a). Small areas of unvegetated soil have been noted in the inspections, but there is no history of the main landfill being exposed.

Investigation Methodology

Pre-investigation Activities

The investigation methodology was developed and documented in the *Final Sampling and Analysis Plan, Site 1 Pre-Feasibility Study Investigation* (CH2M HILL, 2013b). The key historical information included:

- Boring logs from previous investigations (**Appendix A**) and historical photographs (**Appendix B**) were reviewed. Historical photographs are available from 1988, 1992, 2002, and 2008. Trace waste material was identified in the boring logs for GW012, GW018, and GW019 (**Figure 2**), but the logs did not provide much detail on either the depth or type of the waste.
- Shelby Tube data collected during the Round 2 Remedial Investigation were reviewed for waste and cover thickness information; however, no soil descriptions or documentation of waste material were included.
- Waste was found in three of the four earlier test pits (TP1/02, TP1/03, and TP1/04), but these were all located within the landfill area (**Figure 2**).
- Soil to the north of wells GW012, GW012A, and GW012B was removed in 1999 to address arsenic contamination (**Figure 2**). Soil in this area is outside of the waste area due to the historical removal action that attained the established cleanup goal.

- Geophysical anomalies had been detected in the northern portion of the site and presented possible evidence of landfill material (**Figure 2**).

Based on this information, 18 initial test pit locations accessible by backhoe were selected based on the presence of waste discovered during historical investigation activities to focus on the geophysical anomaly to the north and the edge of clearing activities to the east and south. Prior to test pitting, a field survey was conducted to identify any visual indications of historical landfill operations and activity. Earthen mounds were observed on the southern landfill slope, and these could have been created during landfill activities. Five additional locations were identified where either metal debris or drums were visible at the surface or mounded terrain was present. These five locations were located on the southern landfill slope, were inaccessible by backhoe, and would require hand-digging.

Test Pitting

Twenty test pits were completed using a backhoe in June 2013 (**Figure 3**). One of the 18 originally proposed locations, TP17, was inaccessible and could not be completed due to saturated ground. TP17 was located adjacent to the pond created by excavating some of the material that became the landfill cover. Three additional backhoe-accessible test pits (TP19-TP21) were selected in the field based on the results of the initial locations to further delineate the extent of the landfill and the cover over the landfill. Five locations along the southern slope were investigated by hand-digging to a depth of 3 feet below ground surface (bgs) to confirm the presence or absence of waste.

Backhoe-accessible test pits were excavated to 8 feet bgs, unless waste was identified at shallower depths. Test pits were terminated if waste was encountered, and no attempt was made to determine the thickness of waste. At each location, pictures were taken and the soil was logged (**Appendix C**). Soil samples were not collected during this investigation. Soil and waste material were placed back into the test pit hole, with any waste material placed on the bottom and cover material placed on the top.

Surveying

A Geo XH global positioning system unit was used to collect coordinates for the test pit locations.

Investigation Derived Waste Management

Investigation-derived waste (IDW) was contained in drums and consisted of soil and water IDW. Soil IDW consisted of excess soil removed from equipment. Aqueous IDW consisted of equipment decontamination fluids. One soil and two liquid composite samples were collected from drums for Full Toxicity Characteristic Leachate Procedure (VOCs, semivolatile organic compounds, pesticides, and inorganics) and ignitability, corrosivity, and reactivity analyses. The solid and liquid IDW was determined to be nonhazardous and was removed from the site by Clearfield MMG and disposed at a Department of the Navy (Navy)-approved facility. The IDW disposal documentation will be contained in the *Phase III Remedial Investigation Report* (CH2M HILL, in preparation).

Investigation Results

Nature and Extent of Landfill Waste and Soil Cover

Table 1 and **Figure 3** summarize the waste data and landfill cover contours constructed from the combined data sources. Any non-native material listed in the boring logs was initially considered to be waste material. However, because of the historical activities in a waste area that would have included heavy truck traffic and earth-moving equipment, it is not unanticipated that individual pieces of debris could be inadvertently dragged outside the main body of waste. In the cases where items were identified outside the inferred soil cover, the onsite geologist used professional judgment by considering the extent of the material, as well as the size and depth of material, to determine whether the items were evidence of significant and continuous waste.

Table 1 summarizes all the landfill waste information at the site. Waste was identified as plastic, metal, wood, fabric, concrete, and lens-grinding dust (**Appendix A** and **Appendix C**). The depth to waste was at least 2 feet in all locations except test pit TP14, described below. The boundary of landfill waste and the landfill cover contours

shown on **Figure 3** were determined based on a review of historical aerial photographs, historical soil boring and test pit locations, and the 2013 field observations and test pit and hand-dug locations. Topography was also considered in drawing these boundaries.

Northern Edge

The northern waste boundary was determined based on test pit results, the road, and the tree line. The area to the north of the landfill between TP05 and TP14 is heavily wooded. TP14 was selected for investigation based on the presence of a geophysical anomaly. One 6-foot-long piece of sheet metal was found at a depth of 1 foot bgs in the test pit (**Appendix C**), and this lone piece of waste is considered to be an isolated occurrence and not representative of an extension of the landfill. Historical aerial photographs dating to 1988 do not show any evidence of landfilling or earth-moving activities in this area, so there is no evidence suggesting that debris extends south from TP14 to TP05 (**Appendix B**). The trees have consistently remained at the edge of the northern road, so the tree line to the north has remained consistent over time. The estimated waste boundary was drawn closer to the test pits without waste (TP05, TP1/01, and TP07) than the borings with waste (TP01 and TP02), to follow the line of vegetation and the road (**Table 1**).

Western Edge

Debris was encountered during drilling activities for three previously installed monitoring wells (GW012, GW018, and GW019) on the western side of the landfill. However, the materials identified (a 2.5-inch piece of wood and trace debris) were not considered landfill waste as they were insignificant in size and not continuous with the main body of the landfill, as confirmed by test pits TP12 and TP08 and neighboring wells GW012A and GW012B. The estimated landfill waste boundary was drawn near TP09, the western-most location where landfill waste was identified.

Southern Edge

Test pit TP20 helped confirm the extent of the waste detected in TP10 in the southern area of the site, but access issues prevented test pits from being completed south of the waste detected in TP09 and TP19. Due to areas on the southern slope being inaccessible by backhoe, monitoring well boring logs (GW012, GW019, GW020, GW021, GW022, GW023, GW024, GW026, GW024A, GW026A, GW027, and GW027A) and hand-digging (the five locations shown in yellow on **Figure 3**) were used to help delineate the southern extent of the landfill waste boundary. The absence of buried waste was confirmed by hand-digging at these five locations. The landfill cover was at least 2 feet thick at all locations along the southern edge of the site (**Table 1**). Historical photographs from 1988, 1992, 2002, and 2008 show a stable tree line, so the estimated landfill waste boundary was drawn near this tree line (**Appendix B**), with locations at the edge of the tree line where waste was encountered (TP09 and TP19) included inside the edge of the landfill cover boundary. The boring logs for the wells on the southern slope indicate varying amounts of sand, silt, and clay, but no waste material was noted (**Table 1**).

Eastern Edge

No test pits were completed along the tree line, but the surrounding test pits indicate a general increase in landfill cover thickness to the east (**Figure 3**). Historical photographs from 1988 to 2008 do not show any evidence of landfill activities in the wooded area, and the tree line and topography in this corner of the site have remained consistent over time (**Appendix B**). The estimated northeastern waste boundary was drawn along the tree line and at the edge of the road. To the southeast, the section of trees by the road is visible in aerial photographs dating back to 1988. This area of trees in the vicinity of GW005 and GW005A is located in an area several feet lower in elevation than the rest of the site, and no evidence suggests it was used for landfilling activities.

Overall, a definitive waste boundary can be identified with the existing data. The boundary is presented on **Figure 3** and is consistent with the site history and the previous extent estimates. **Figure 3** additionally presents a

contour map showing the estimated thickness of soil cover across the site. The available data support delineation of a minimum 2-foot-thick landfill cover boundary over the defined extent of the waste boundary.

Conclusions

Both the extent of landfill waste material and the soil cover were delineated using historical aerial photographs, historical and recent soil borings and test pit locations, the 2013 field observations and test pit and hand-dug locations, and topography to address uncertainties identified in the 2013 Third Five-Year Review Report. All areas of landfilled waste were found to be covered by at least 2 feet of soil, and the boundaries of the landfill cover could be determined with confidence from the available data.

Recommendations

Based on these conclusions, the Navy recommends a Land Use Control Remedial Design for Site 1 with continued annual site inspections. The uncertainty in the extent of the landfill cover boundary has been addressed and the next Five-Year Review will document that the landfill cover thickness is adequate and protective in the long-term. A Five-Year-Review Addendum is not required, as the soil cover remedy was already determined to be protective of human health and the environment in the short-term (CH2M HILL, 2013a).

References

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Department of the Navy (Navy). 1999. *Final Record of Decision Operable Unit Nos. VIII and IX, Site 1-Dudley Road Landfill and Site 3-Group 16 Magazines Landfill, Naval Weapons Station Yorktown, Yorktown, Virginia*. June.

OHM Remedial Services, Inc. (OHM). 2001. *Final Report, Remedial Action, Sites 1 and 3, and SSA 22, Naval Weapons Station, Yorktown, Virginia*. June.

Acronyms and Abbreviations

bgs	below ground surface
IDW	investigation-derived waste
Navy	Department of the Navy
TCE	trichloroethene
VOC	volatile organic compound
WPNSTA	Naval Weapons Station

Table

TABLE 1

Summary of Available Waste Data

Site 1 Tech Memo

Naval Weapons Station Yorktown

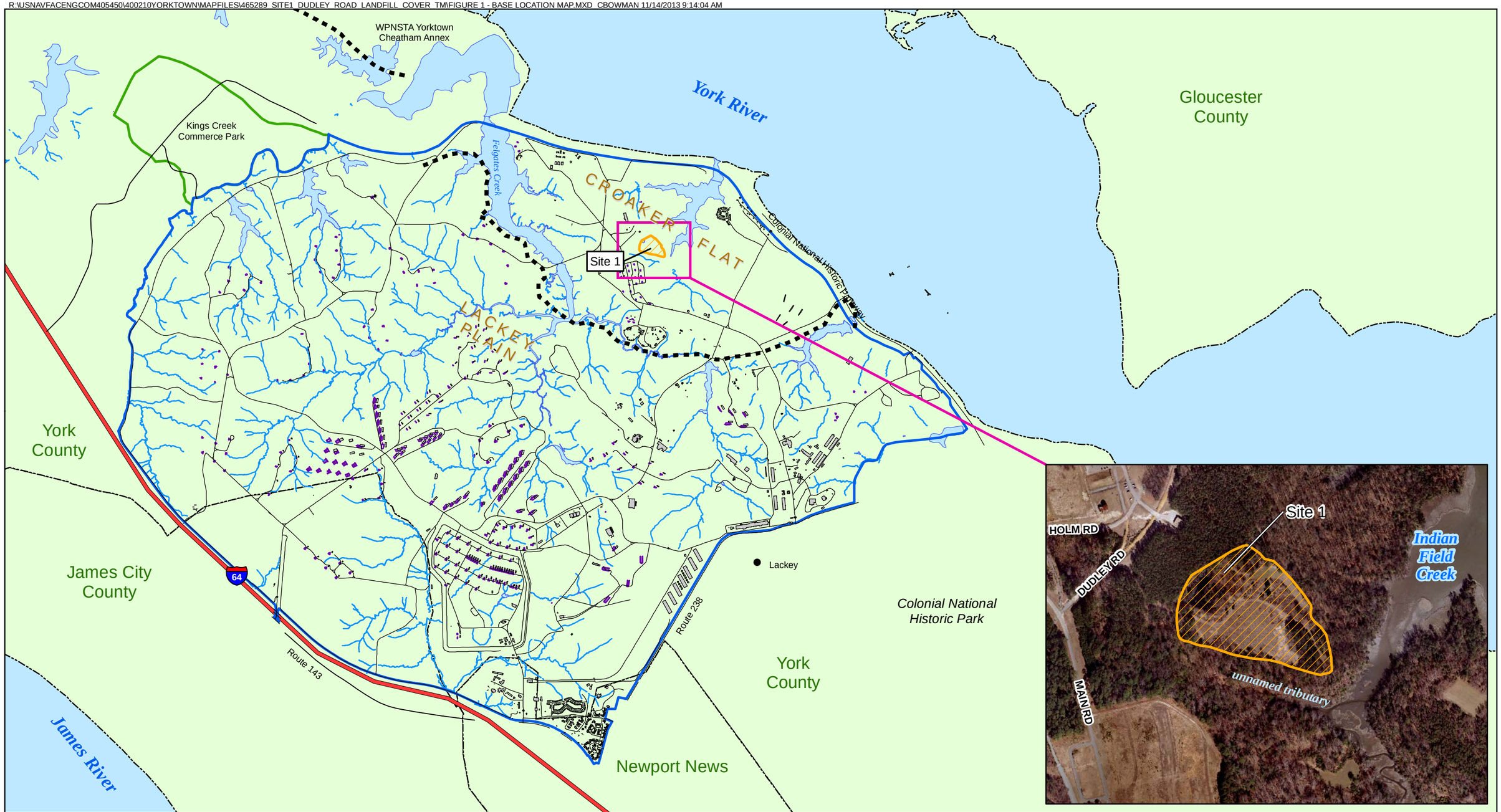
Yorktown, Virginia

Location	Date	Waste Description	Depth to Waste (feet below ground surface)	Part of Landfill Waste?
Historic Test Pits				
TP1/01	1/25/1996	none	none	no
TP1/02	1/25/1996	concrete, wood, metal	4	yes
TP1/03	1/25/1996	metal	3.5	yes
TP1/04	1/25/1996	construction debris	5	yes
2013 Test Pits				
TP01	6/13/2013	metal, plastic, fabric fibers	3.5	yes
TP02	6/12/2013	burnt wood, non-native white material	4	yes
TP03	6/12/2013	metal, fabric	5.5	yes
TP04	6/12/2013	none	none	no
TP05	6/12/2013	none	none	no
TP06	6/12/2013	none	none	no
TP07	6/13/2013	none	none	no
TP08	6/13/2013	none	none	no
TP09	6/12/2013	fabric, wood	2	yes
TP10	6/12/2013	metal	5	yes
TP11	6/12/2013	fabric	2.5	yes
TP12	6/12/2013	none	none	no
TP13	6/12/2013	none	none	no
TP14	6/13/2013	metal	1	no
TP15	6/12/2013	none	none	no
TP16	6/13/2013	none	none	no
TP18	6/12/2013	none	none	no
TP19	6/13/2013	plastic, metal	3	yes
TP20	6/13/2013	none	none	no
TP21	6/13/2013	none	none	no
Historic Groundwater Wells				
GW004A	5/11/2000	none	none	no
GW005	12/11/1985	none	none	no
GW005A	5/10/2000	none	none	no
GW012	6/10/1992	0.2' piece of wood	4	no
GW012A	1/24/1996	none	none	no
GW012B	1/27/1996	none	none	no
GW013	6/10/1992	none	none	no
GW013A	1/25/1996	none	none	no
GW014	6/9/1992	none	none	no
GW017	6/10/1992	none	none	no
GW018	1/24/1996	trace debris	9-11	no
GW019	1/23/1996	trace construction debris	0-7	no
GW020	1/23/1996	none	none	no
GW021	1/24/1996	none	none	no
GW022	2/17/2009	none	none	no
GW023	2/23/2009	none	none	no
GW024	2/24/2009	none	none	no
GW025	2/25/2009	none	none	no
2013 Groundwater Wells				
GW024A	4/30/2013	none	none	no
GW026*	6/6/2013	none	none	no
GW026A	5/30/2013	none	none	no
GW027*	5/23/2013	none	none	no
GW027A	5/13/2013	none	none	no

* Detailed soil logs not developed for the shallow well in each shallow/deep well pair installed in 2013 (GW026/26A and GW027/27a). Waste was not encountered during well installation.

Figures

R:\USNAVFACENGCOM405450\400210YORKTOWN\MAPFILES\465289_SITE1_DUDLEY_ROAD_LANDFILL_COVER_TM\FIGURE 1 - BASE LOCATION MAP.MXD CBOWMAN 11/14/2013 9:14:04 AM



Legend

- Generalized Study Area
- Buildings and Structures
- Yorktown Naval Weapons Station Base Boundary
- Kings Creek Commerce Park
- Camp Peary Scarp
- Shoreline and Water Bodies
- Interstate 64
- Magazines
- County Boundary

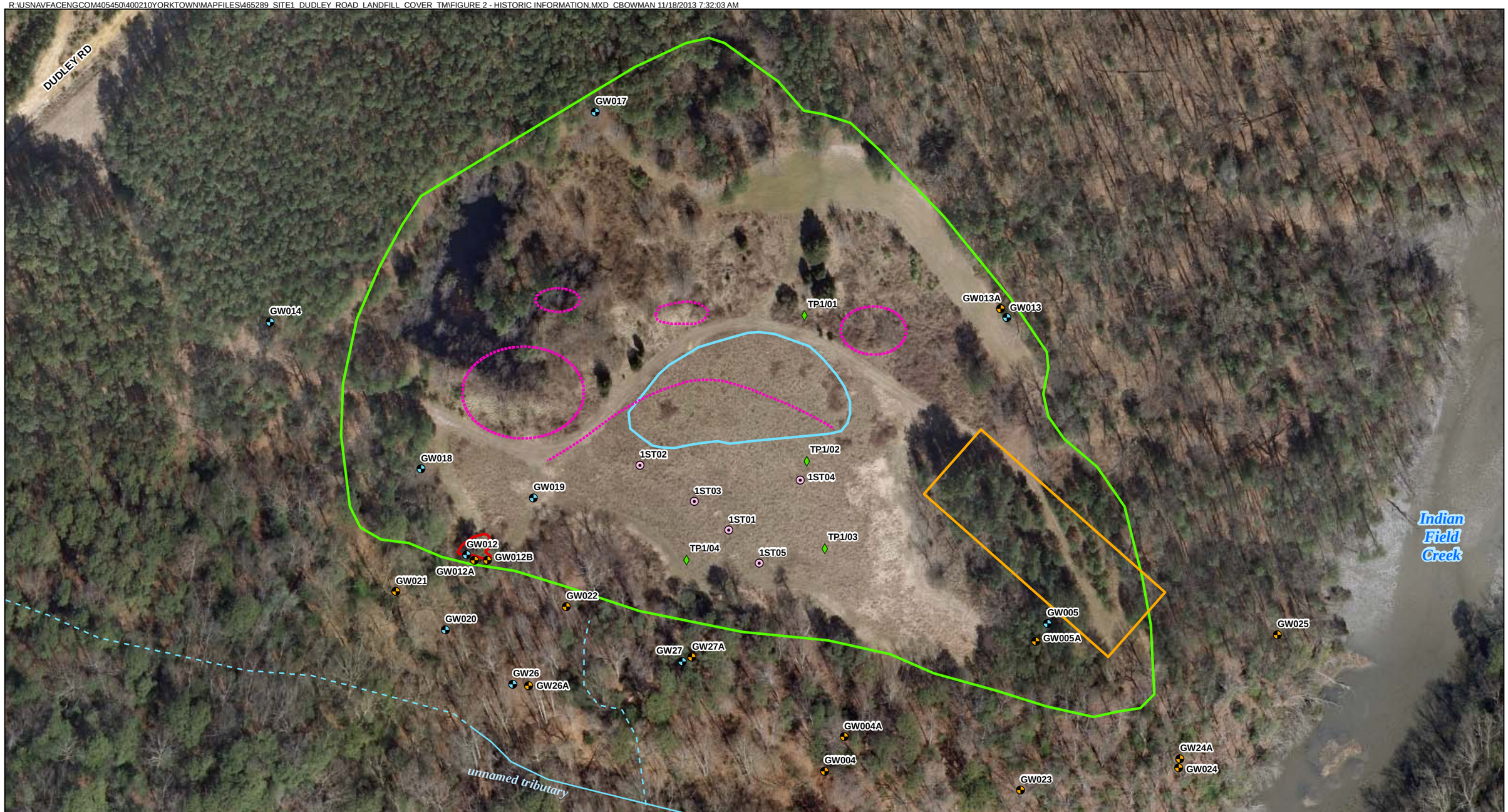
N

0 3,500 7,000 Feet

Figure 1
Base and Site 1 Map
Site 1 Dudley Road Landfill
Landfill Cover Technical Memorandum
Naval Weapons Station Yorktown
Yorktown, Virginia

CH2MHILL

R:\USNAVFACENGCOM405450\400210YORKTOWN\MAPFILES\465289_SITE1_DUDLEY_ROAD_LANDFILL_COVER_TM\FIGURE 2 - HISTORIC INFORMATION.MXD CBOWMAN 11/18/2013 7:32:03 AM



Legend

- Test Pit Location
- Shelby Tube Sampling Location
- Columbia Aquifer Monitoring Well
- Yorktown-Eastover Aquifer Monitoring Well
- Tributary
- Intermittent Tributary
- Approximate Area of Excavation of Arsenic Contaminated Soil
- Landfill Area with New Cap (2001 Remedial Action, OHM)
- Former Sand Reclamation Pit (Roy F. Weston, Inc., 1993)
- Study Area Boundary
- Approximate locations of geophysical anomalies, (Roy F. Weston, 1993)

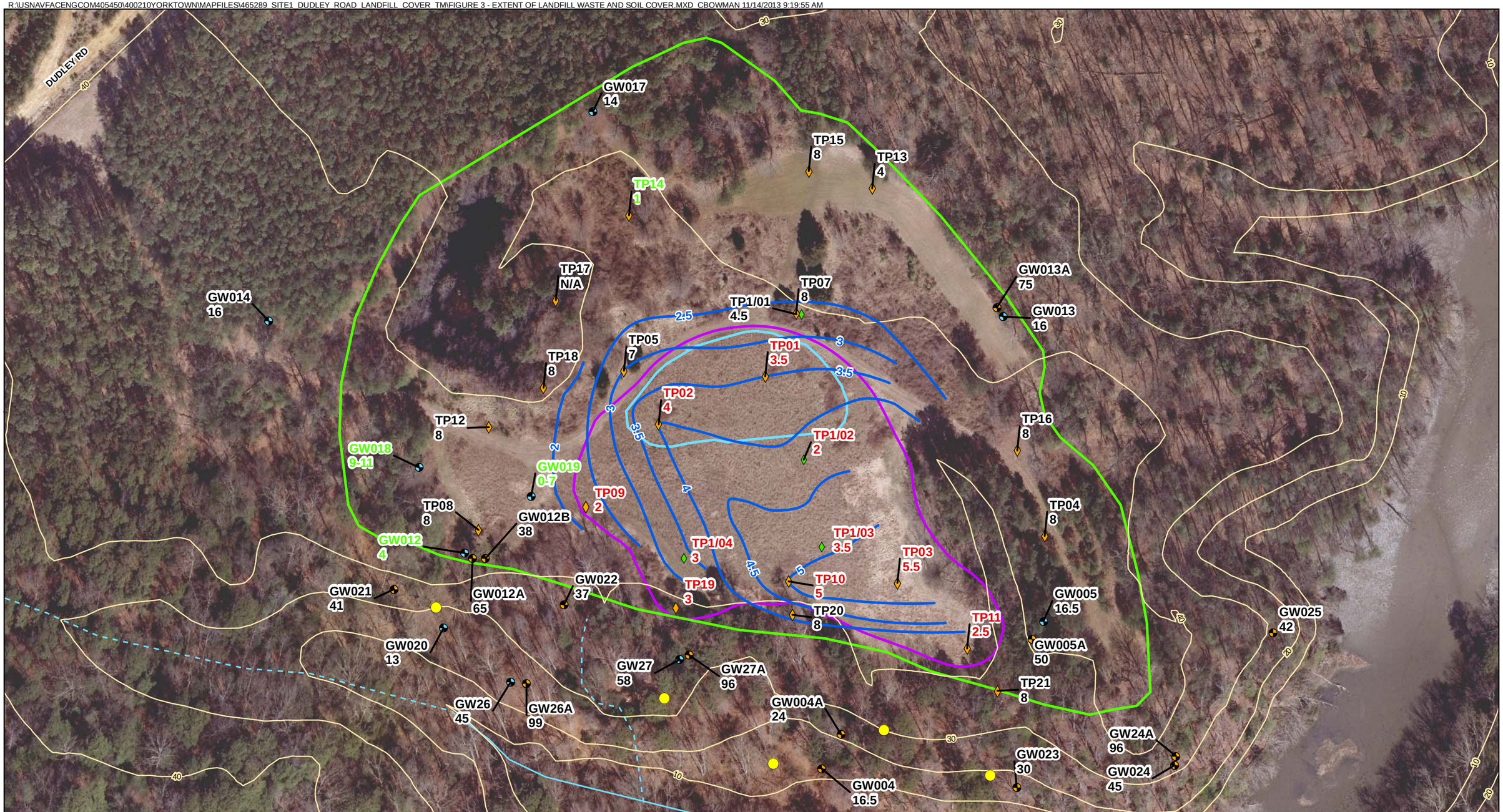
N

0 55 110 Feet

Figure 2
Historic Information
Site 1 Dudley Road Landfill
Landfill Cover Technical Memorandom
WPNSTA Yorktown
Yorktown, Virginia

CH2MHILL.

R:\USNAVFACENGCOM405450\400210YORKTOWN\MAPFILES\465289_SITE1_DUDLEY_ROAD_LANDFILL_COVER_TM\FIGURE 3 - EXTENT OF LANDFILL WASTE AND SOIL COVER.MXD CBOWMAN 11/14/2013 9:19:55 AM



Legend

- 2013 Hand-dig Location
- 2013 Test Pit Location
- Previous Test Pit Location
- Columbia Aquifer Monitoring Well
- Yorktown-Eastover Aquifer Monitoring Well
- Landfill Soil Cover Contour
- Elevation Contour (10 ft interval)
- Tributary
- Intermittent Tributary
- Landfill Area with New Cap (2001 Remedial Action, OHM)
- Approximate Boundary of Former Clearing and Activities
- Extent of Landfilled Waste

Notes:
Identifiers in red represent depth that continuous waste was encountered
Identifiers in green represent depth that trace material which was not considered landfill waste was encountered
Identifiers in black represent total depth advanced with no waste being encountered

N

0 55 110 Feet

Figure 3
Extent of Landfill Waste and Soil Cover
Site 1 Dudley Road Landfill
Landfill Cover Technical Memorandom
WPNSTA Yorktown
Yorktown, Virginia

CH2MHILL.

Appendix A
Boring Logs

Test Pit

BORING NO.: 1TP0

Baker

Baker Environmental, Inc.

TEST BORING RECORD

INSTALLATION: WNSTA Yorktown

CTO NO.: 0318

SITE/AREA:

COORDINATES: NORTH: _____, EAST: _____

SURFACE ELEVATION: _____

RIG: Backhoe	SPLIT SPOON	AUGERS NA	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	NA	4-1/4" ID	1-25-96	4.5	overcast 35	—
LENGTH	2.0'	5.0'				
TYPE	Std.	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample
B = backhoe bucket sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	~~SPT~~ RAD meter (cpm)	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	El
	B1		0		0	Top soil	
1						Coarse to fine SAND, some silt, light brown, damp to moist	
2	B2		0		0		
3							
4							
	B3		0		0	SAME except little fine gravel	
5						Test pit Complete at 4.5' bgs	
6							
7							
8							
9							
10							

Match to Sheet 2

DRILLING CO.: Parrott-Wolff

BAKER REP.: D. Martin

DRILLER: K. White

BORING NO.: 1TP01

SHEET 1 OF 1

Test Pit

BORING NO.: 1TP02

Baker

Baker Environmental, Inc.

TEST BORING RECORD

INSTALLATION: WNSTA Yorktown

CTO NO.: 0318

SITE/AREA:

COORDINATES: NORTH: _____, EAST: _____

SURFACE ELEVATION: _____

RIG: Backhoe	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)		4-1/4" ID	1-25-96	7.5	overcast 35°	7.5+
LENGTH	2.0'	5.0'				
TYPE	Std.	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
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ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	~~SPT~~ RAD meter (CPM)	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation
1	B1		0		0	Sand and clay, some silt FILL	
2						sand and clay, some silt, brown to dark brown	
3	B2		0		0	FILL w/ misc. debris	
4						Concrete block, tree limbs, wood, scrap metal, packaging materials	
5							
6	B3		0		0		
7							
	B4		0		0	coarse to fine SAND, some silt, light brown moist to very moist	
8						Test Pit complete at 7.5' bgs	
9							
10							

Match to Sheet 2

DRILLING CO.: Parrot-Wolff

BAKER REP.: D. Martin

DRILLER: _____

BORING NO.: _____

SHEET 1 OF __

Test Pit

BORING NO.: 1TP03

Baker

Baker Environmental, Inc.

TEST BORING RECORD

INSTALLATION: WNSTA Yorktown

SITE/AREA: Site 1

CTO NO.: 0318

COORDINATES: NORTH: _____, EAST: _____

SURFACE ELEVATION: _____

RIG: Backhoe	SPLIT SPOON	AUGERS NA	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	NA	4-1/4" ID	1-25-96		Overcast -	8.0
LENGTH	2.0'	5.0'				
TYPE	Std.	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
B = backhoe bucket sample
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	~~SPT~~ RAD meter (cpm)	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Ele
1	B1		0		0	TOPSOIL / Coarse to fine sand, some silt brown, damp FILL	
2	B2		50		0		
3							
4	B3				0	possible tense grinding dust Coarse to fine sand, little silt light brown FILL * Misc debris within soil: scrape metal, metal banding	
5							
6							
7							
8	B4			1TP01	0	coarse to fine SAND, some silt light brown - moist to wet	▽
9						Test Pit Complete at 8' bgs	
10						Match to Sheet 2	

DRILLING CO.: Parrot-Wolff

BAKER REP.: D. Martin

DRILLER: K. White

BORING NO.: 1TP03

SHEET 1 OF 1

Test Pit

BORING NO.: 1TP04

Baker

Baker Environmental, Inc.

TEST BORING RECORD

INSTALLATION: WNSTA Yorktown

CTO NO.: 0318

SITE/AREA: Site 1

COORDINATES: NORTH: _____, EAST: _____

SURFACE ELEVATION: _____

RIG: backhoe	SPLIT SPOON	AUGERS NA	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	NA	4-1/4" ID	1-25-96	7.5	overcast	7.5
LENGTH	2.0'	5.0'				
TYPE	Std.	HSA				
HAMMER WT.	140#	–				
FALL	30"	–				

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample
B = backhoe bucket sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	~~SPT~~ RAD meter (cpm)	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation
1	B1		0		0	coarse to fine sand, some silt FILL	
2	B2		0		0	Clay and fine sand, some silt brn to dk. brn. FILL	
3							
4	B3		0		0	FILL Construction debris	
5							
6							
7	B4		0	1TP04	0	med-fine SAND, some silt, light brown moist to wet	▽
8						Test pit completed at 7.5' bgs	
9							
10						Match to Sheet 2	

DRILLING CO.: Parrott-Wolff

BAKER REP.: D. Martin

DRILLER: K. White

BORING NO.: 1TP04

SHEET 1 OF 1

CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP01 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 | LOCATION :Naval Weapons Station Yorktown | LOGGER : Melanie Young

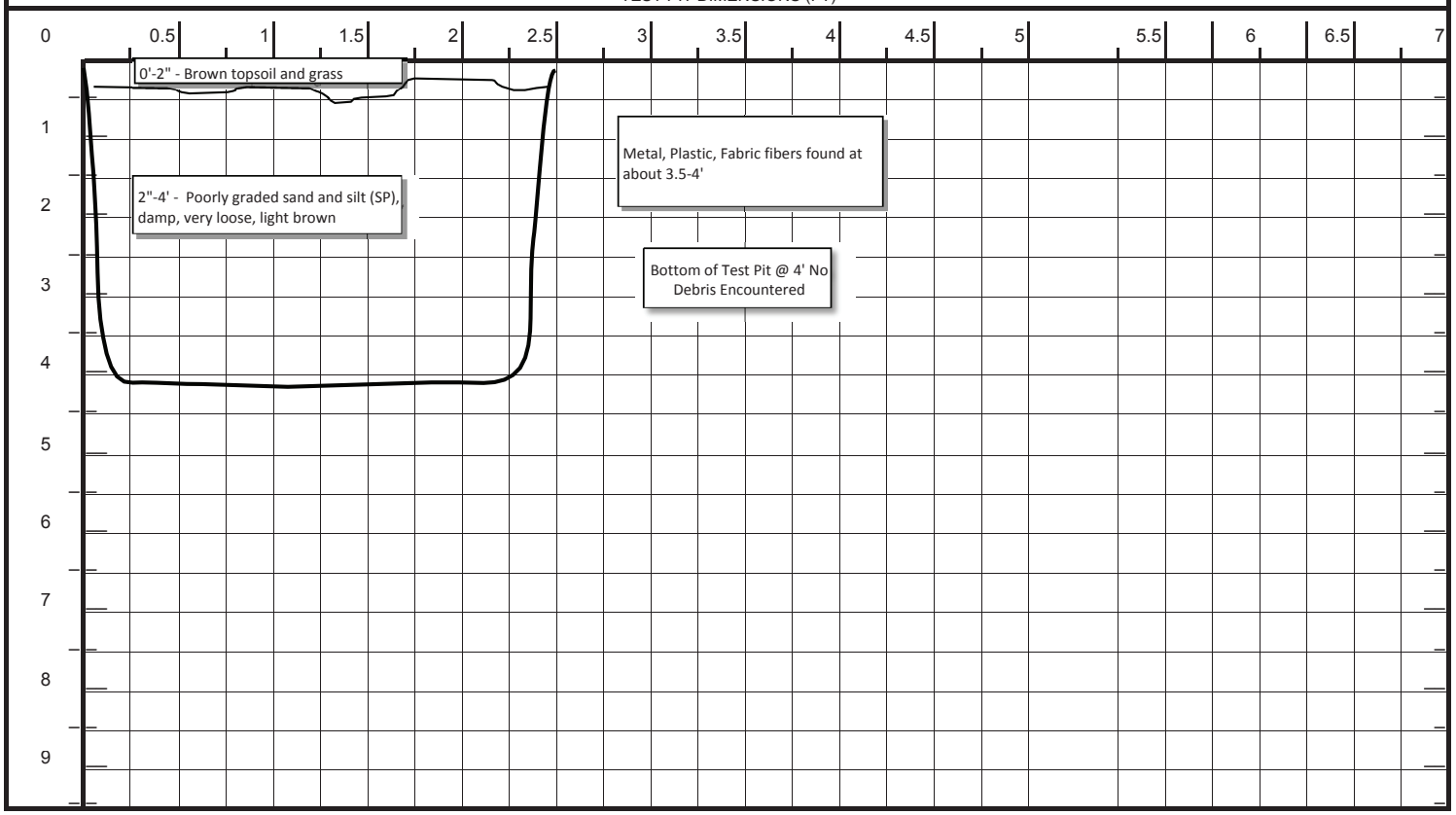
ELEVATION : Not Measured | CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 | DATE EXCAVATED: 6/13/2013

WATER LEVEL : N/A | APPROX. DIMENS: Length: 6 ft | Width: 2.5 ft | Max. Depth: 4 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



PROJECT NUMBER	TEST PIT NUMBER
429391.FI.FS.01	TP02 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 | LOCATION :Naval Weapons Station Yorktown | LOGGER : Melanie Young

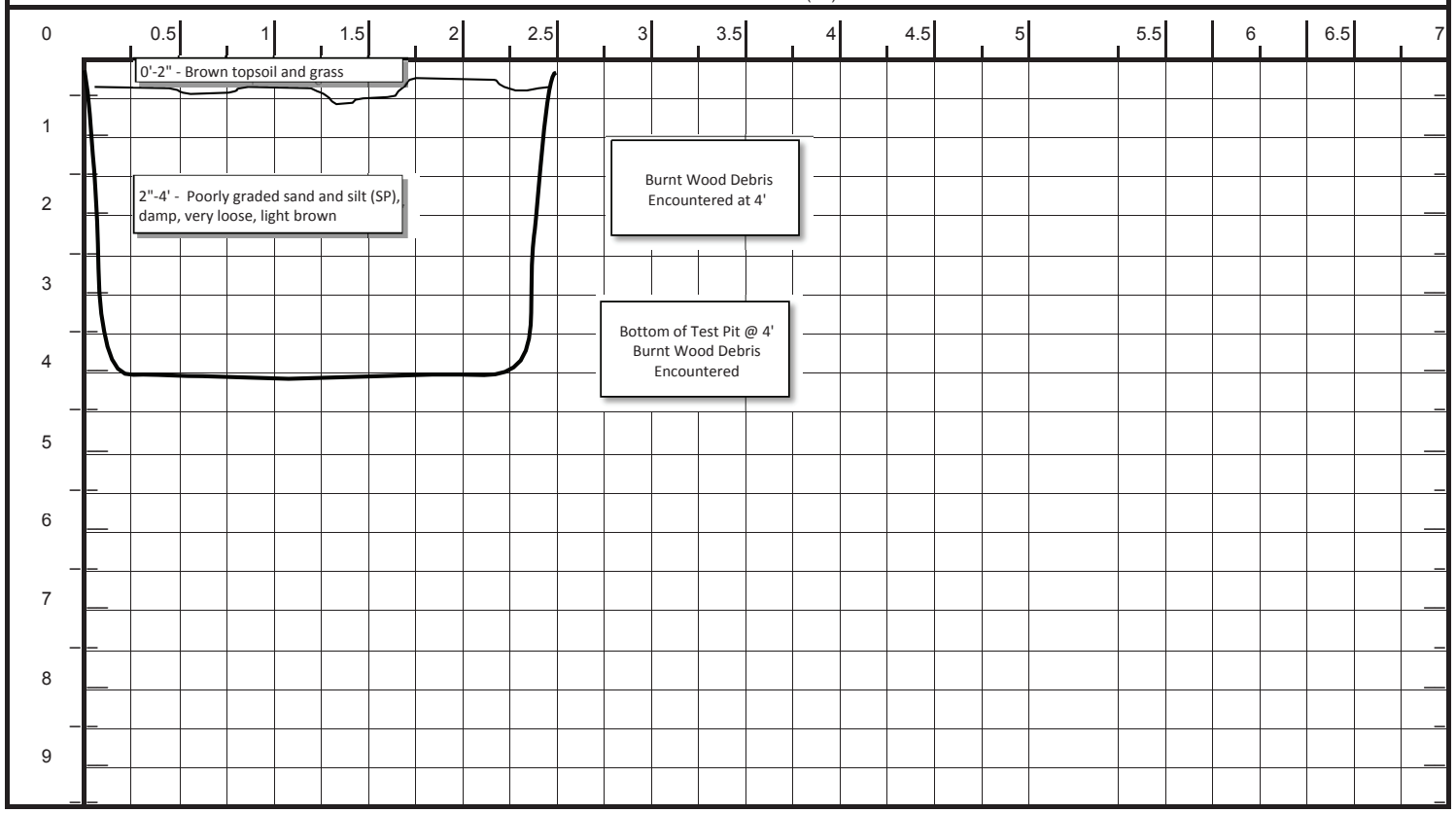
ELEVATION : Not Measured | CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 | DATE EXCAVATED: 6/12/2013

WATER LEVEL : N/A | APPROX. DIMENS: Length: 6 ft | Width: 2.5 ft | Max. Depth: 4 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



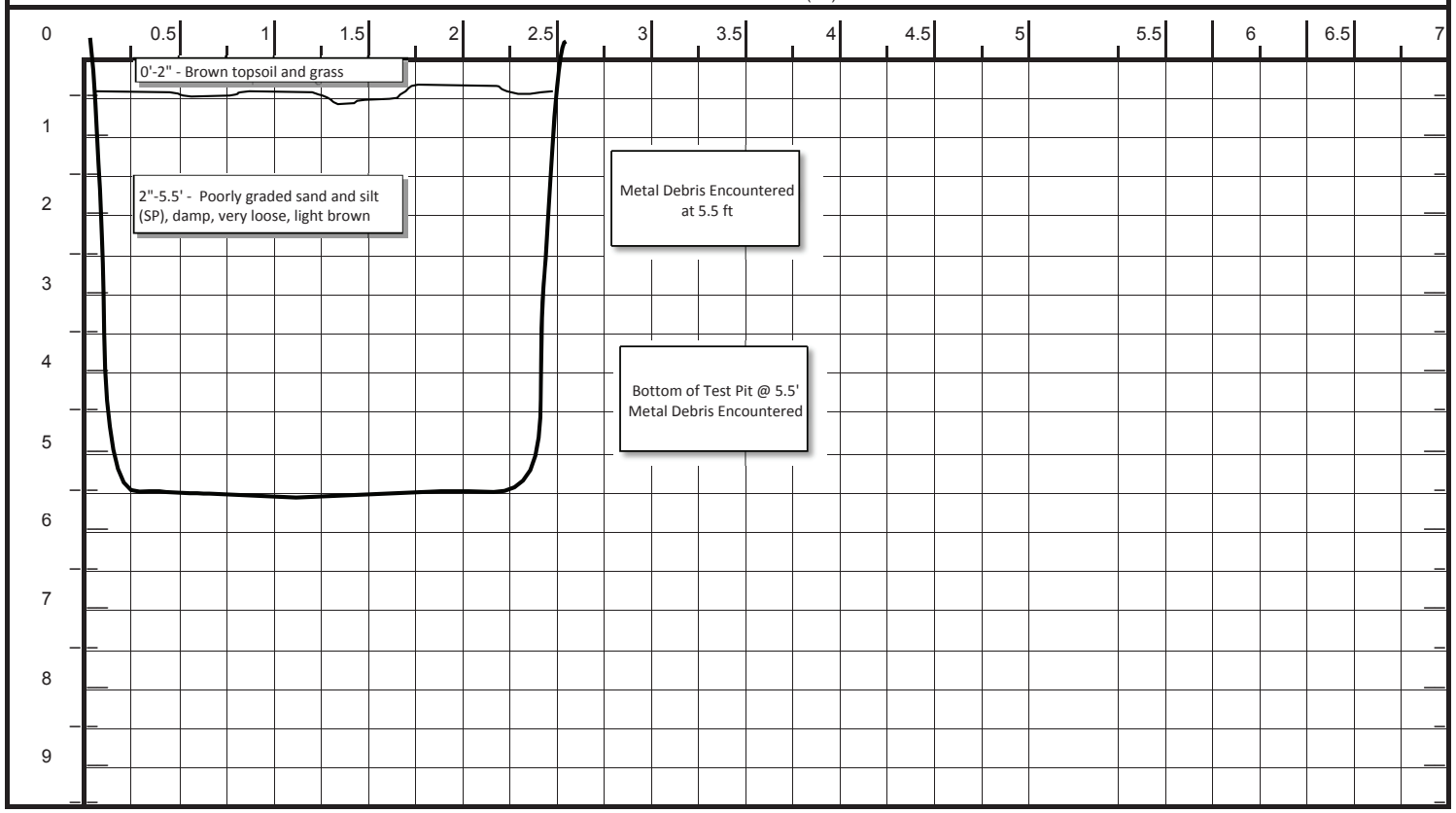
CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP03 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1	LOCATION :Naval Weapons Station Yorktown	LOGGER : Melanie Young
ELEVATION : Not Measured	CONTRACTOR : Parratt-Wolff, Inc.	
EXCAVATION EQUIPMENT USED : Bobcat Excavator 442		DATE EXCAVATED: 6/12/2013
WATER LEVEL : N/A	APPROX. DIMENS: Length: 6 ft Width: 2.5 ft Max. Depth: 5.5 ft	

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP04 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 LOCATION :Naval Weapons Station Yorktown LOGGER : Melanie Young

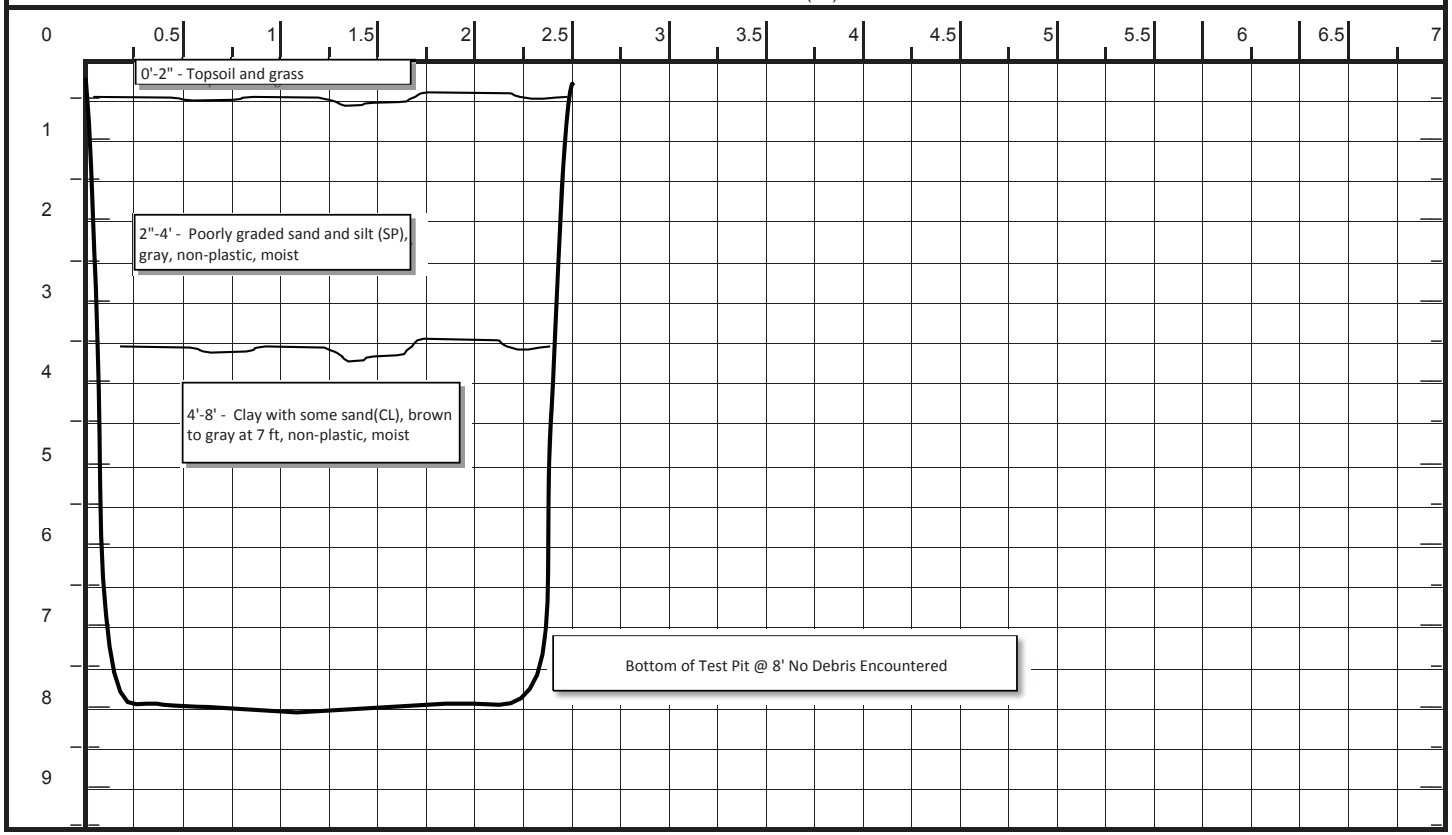
ELEVATION : Not Measured CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 DATE EXCAVATED: 6/12/2013

WATER LEVEL : N/A APPROX. DIMENS: Length: 6 ft Width: 2.5 ft Max. Depth: 8 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



PROJECT NUMBER	TEST PIT NUMBER
429391.FI.FS.01	TP05 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 LOCATION :Naval Weapons Station Yorktown LOGGER : Melanie Young

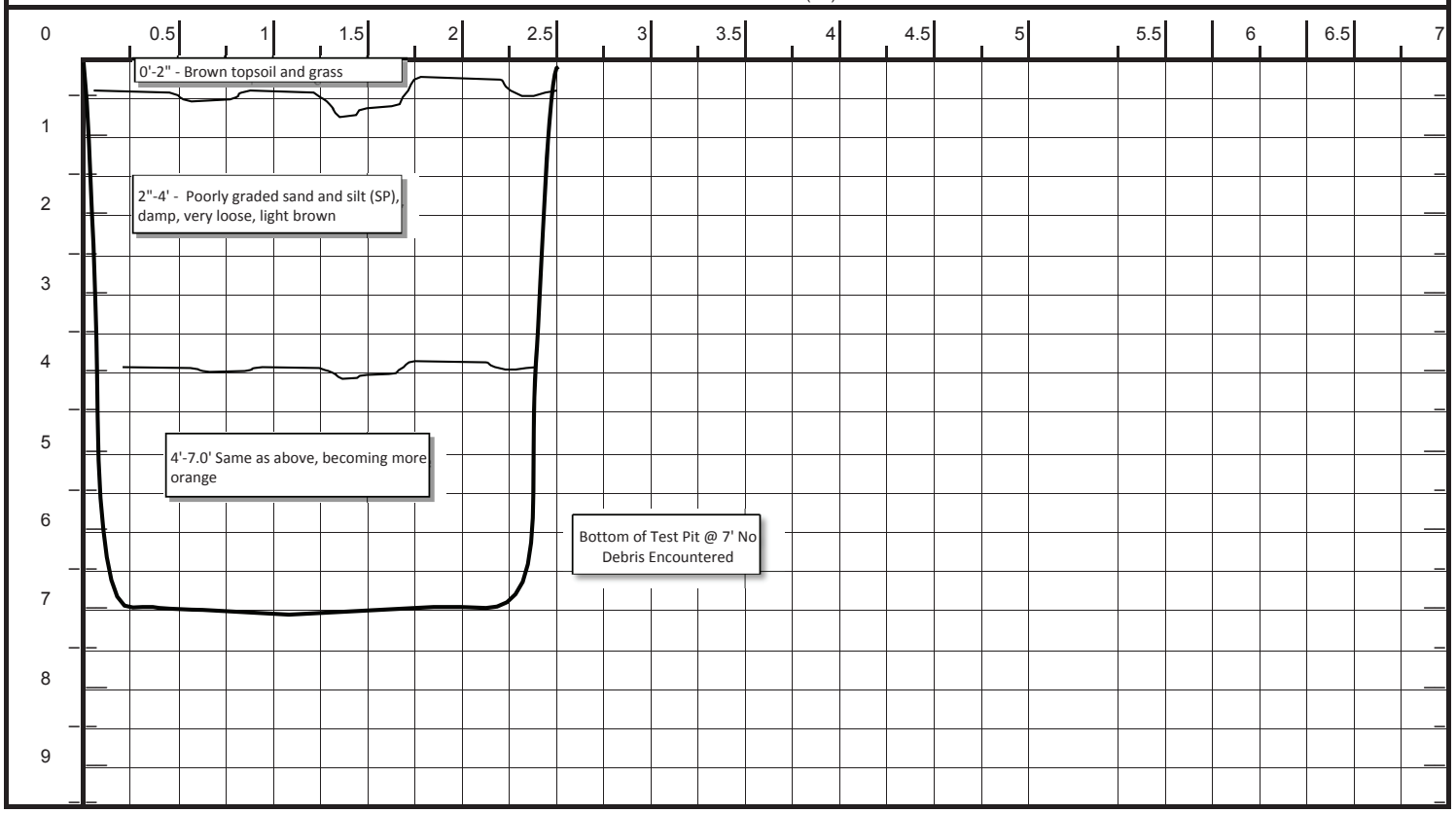
ELEVATION : Not Measured CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 DATE EXCAVATED: 6/12/2013

WATER LEVEL : N/A APPROX. DIMENS: Length: 6 ft Width: 2.5 ft Max. Depth: 7 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



PROJECT NUMBER	TEST PIT NUMBER
429391.FI.FS.01	TP06 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 LOCATION :Naval Weapons Station Yorktown LOGGER : Melanie Young

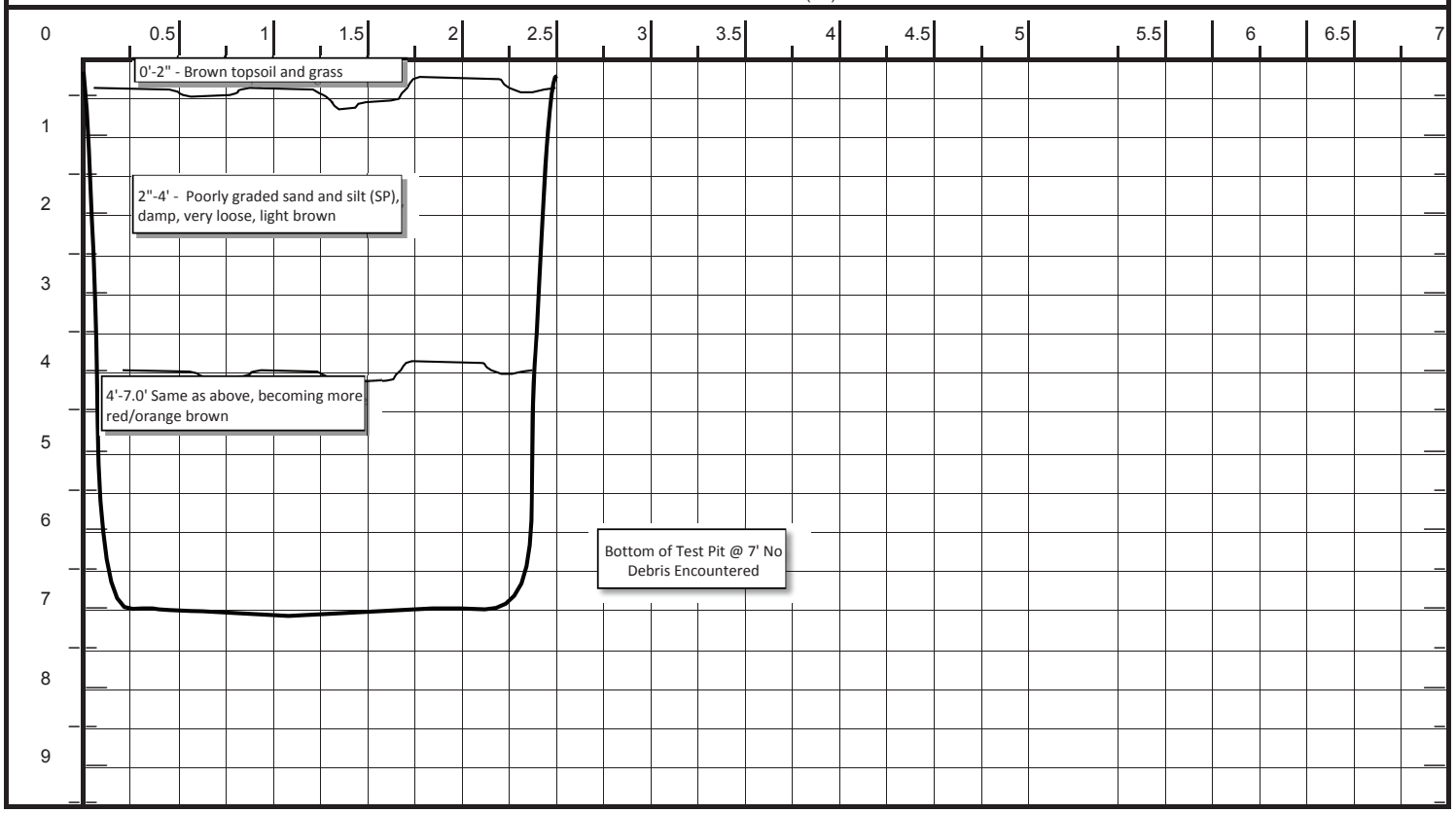
ELEVATION : Not Measured CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 DATE EXCAVATED: 6/12/2013

WATER LEVEL : N/A APPROX. DIMENS: Length: 6 ft Width: 2.5 ft Max. Depth: 7 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



CH2MHILL	PROJECT NUMBER 364428.FI.FS	TEST PIT NUMBER TP07 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 | LOCATION :Naval Weapons Station Yorktown | LOGGER : Melanie Young

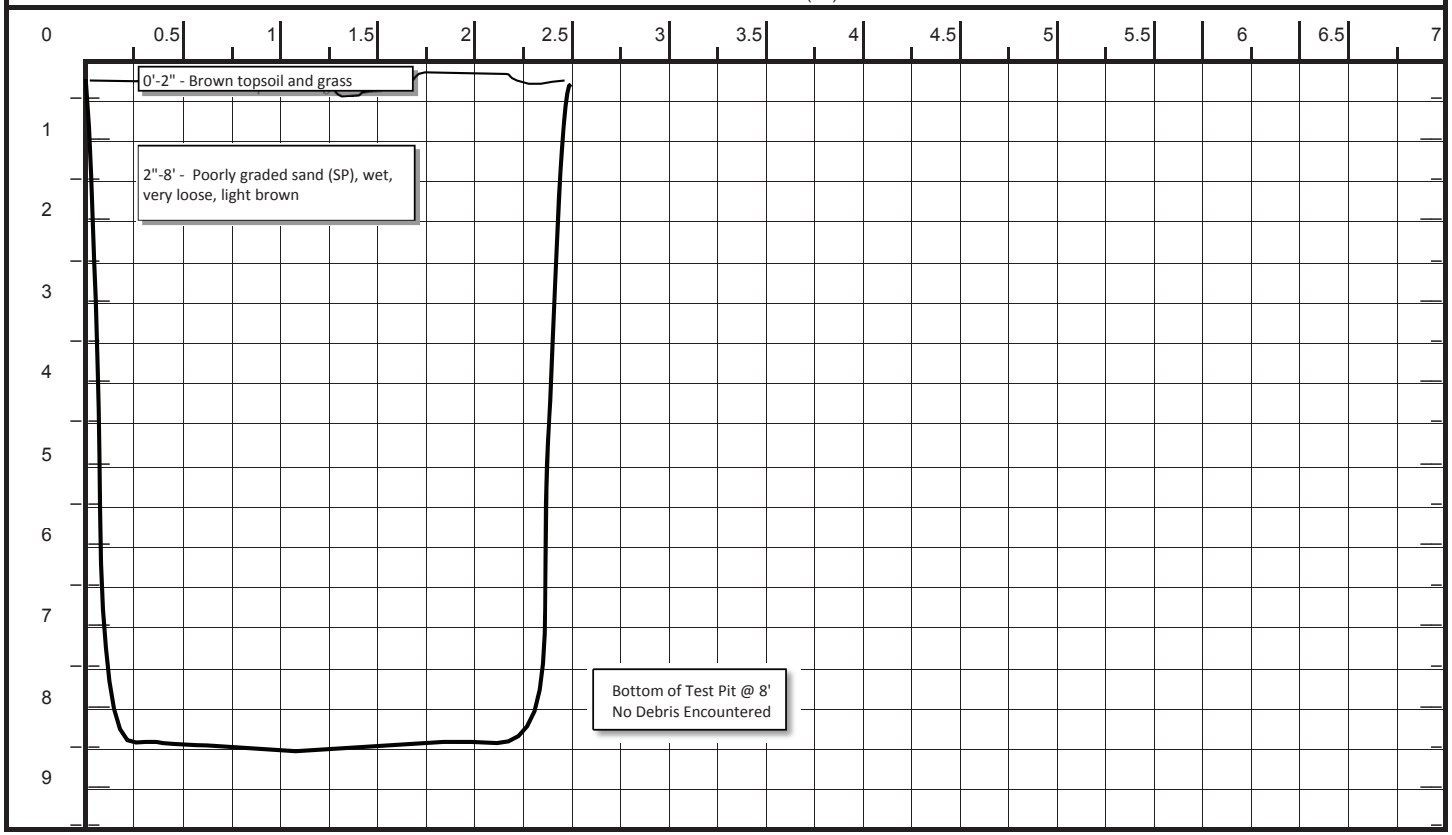
ELEVATION : Not Measured | CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 | DATE EXCAVATED: 6/13/2013

WATER LEVEL : N/A | APPROX. DIMENS: Length: 6 ft | Width: 2.5 ft | Max. Depth: 8 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



PROJECT NUMBER	TEST PIT NUMBER
429391.FI.FS.01	TP08 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 LOCATION :Naval Weapons Station Yorktown LOGGER : Melanie Young

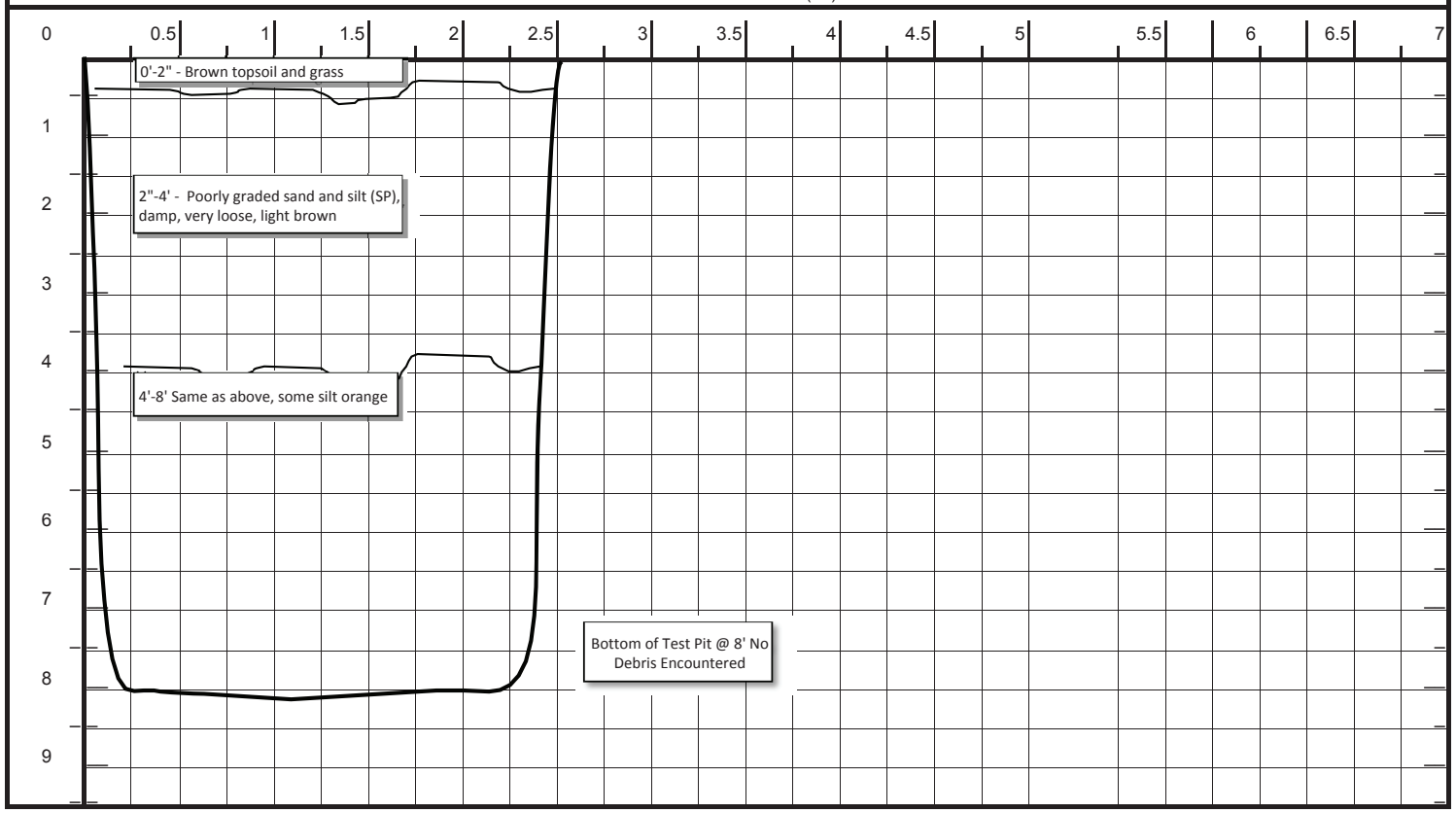
ELEVATION : Not Measured CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 DATE EXCAVATED: 6/13/2013

WATER LEVEL : N/A APPROX. DIMENS: Length: 6 ft Width: 2.5 ft Max. Depth: 8 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



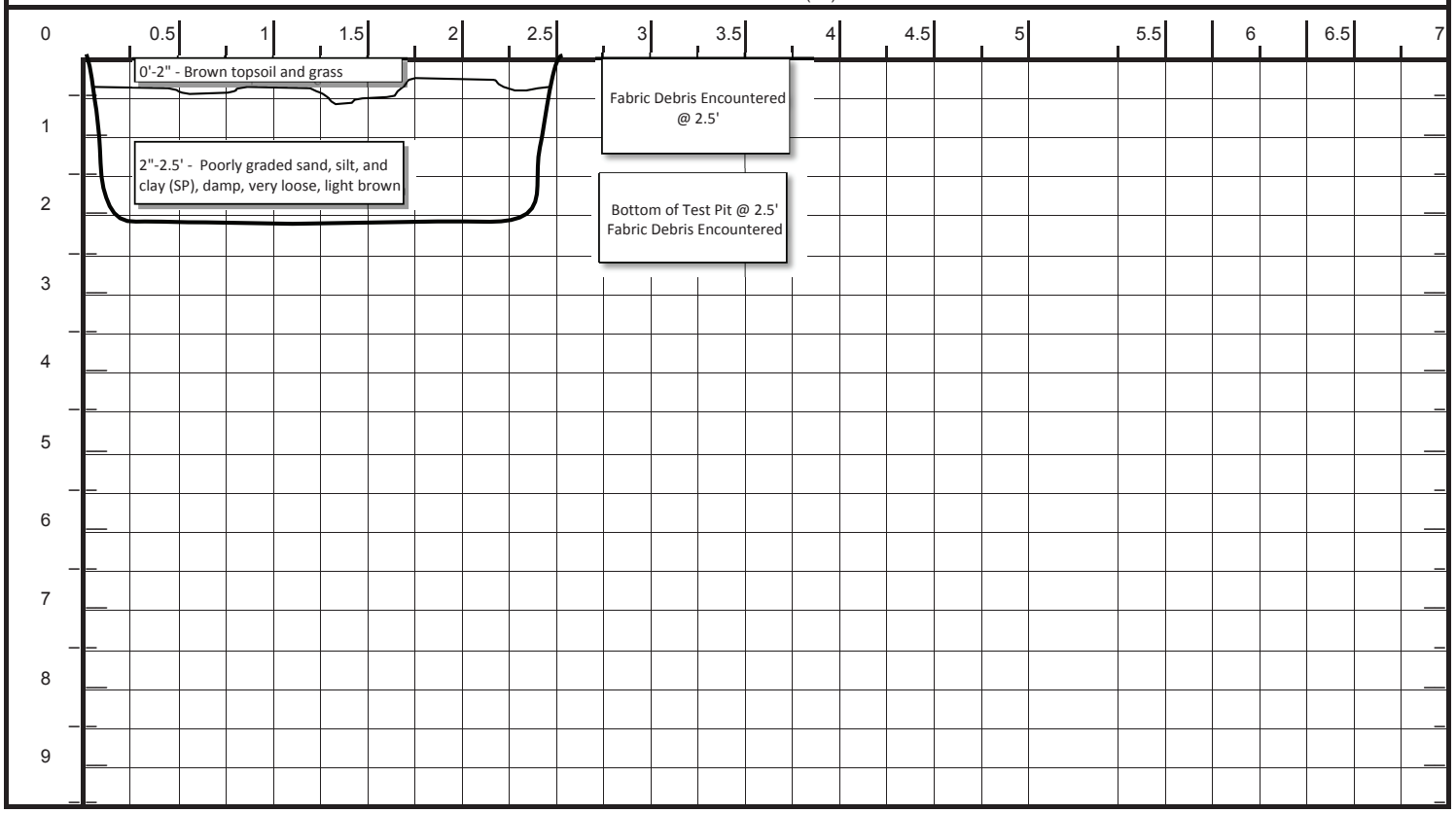
CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP09 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1	LOCATION :Naval Weapons Station Yorktown	LOGGER : Melanie Young
ELEVATION : Not Measured	CONTRACTOR : Parratt-Wolff, Inc.	
EXCAVATION EQUIPMENT USED : Bobcat Excavator 442		DATE EXCAVATED: 6/12/2013
WATER LEVEL : N/A	APPROX. DIMENS: Length: 6 ft Width: 2.5 ft	Max. Depth:2.5 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP10 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 | LOCATION :Naval Weapons Station Yorktown | LOGGER : Melanie Young

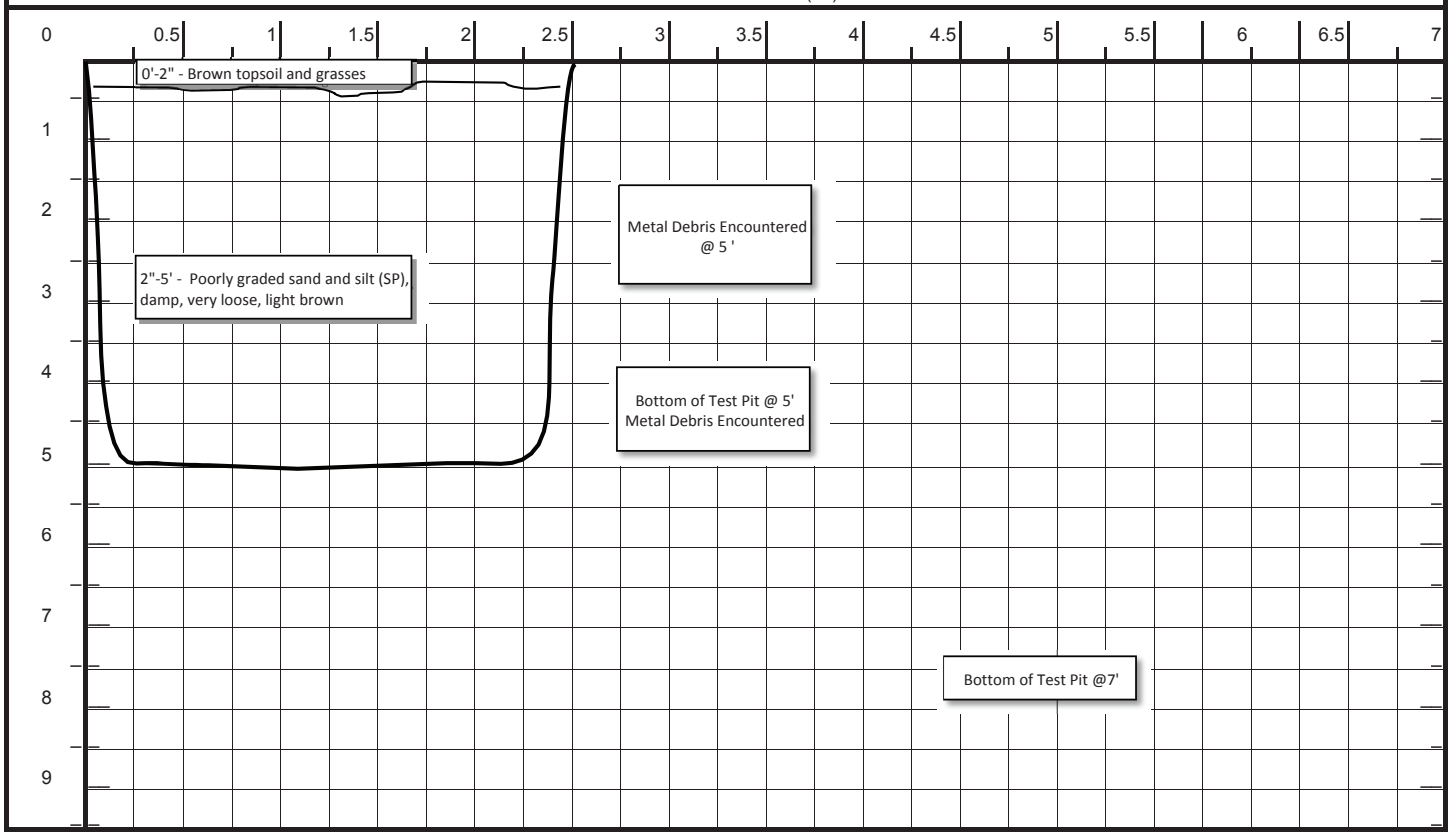
ELEVATION : Not Measured | CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 | DATE EXCAVATED: 6/12/2013

WATER LEVEL : N/A | APPROX. DIMENS: Length: 6 ft | Width: 2.5 ft | Max. Depth: 5 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP11 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 | LOCATION :Naval Weapons Station Yorktown | LOGGER : Melanie Young

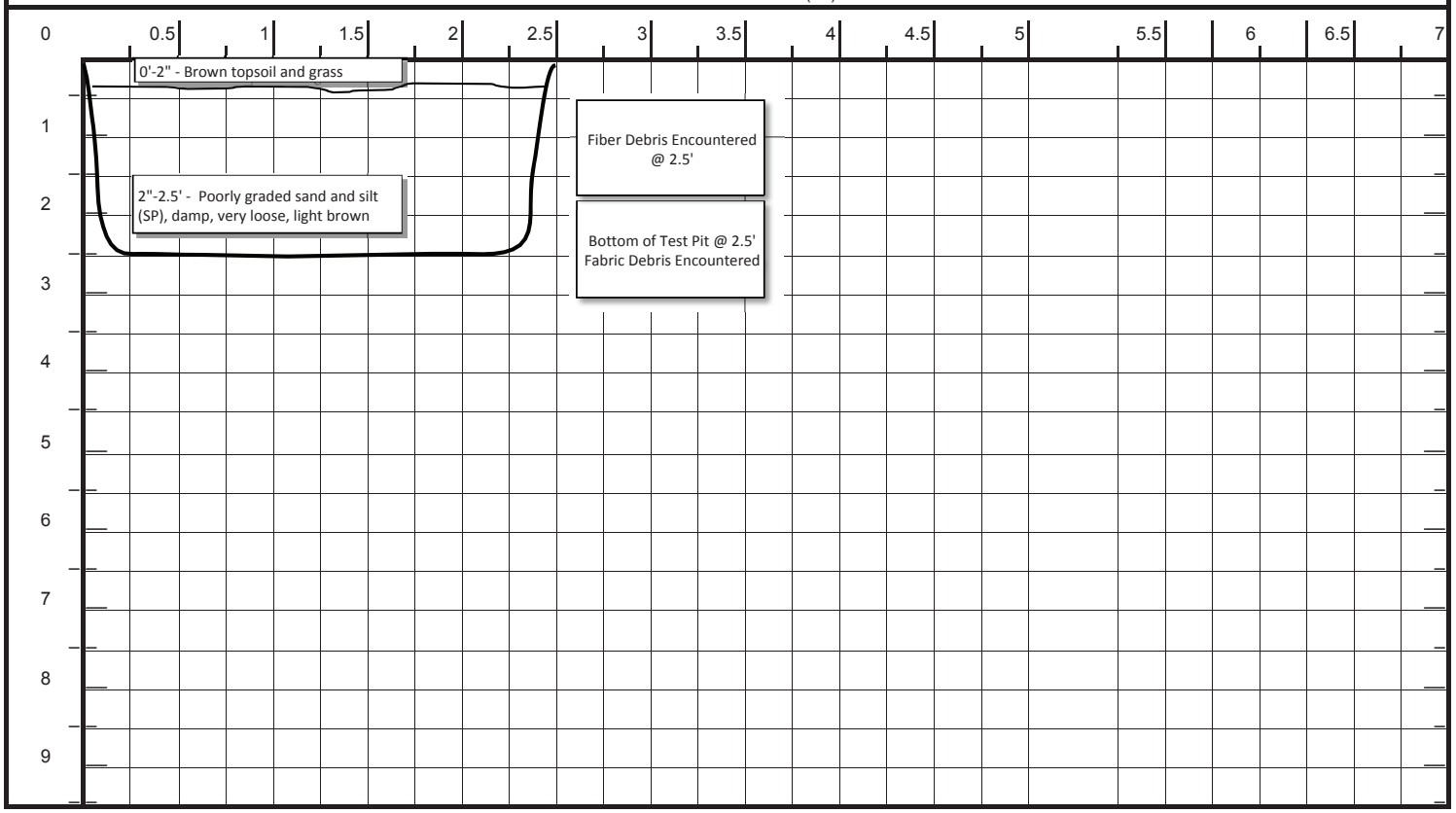
ELEVATION : Not Measured | CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 | DATE EXCAVATED: 6/12/2013

WATER LEVEL : N/A | APPROX. DIMENS: Length: 6 ft | Width: 2.5 ft | Max. Depth: 2.5 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP12 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 | LOCATION :Naval Weapons Station Yorktown | LOGGER : Melanie Young

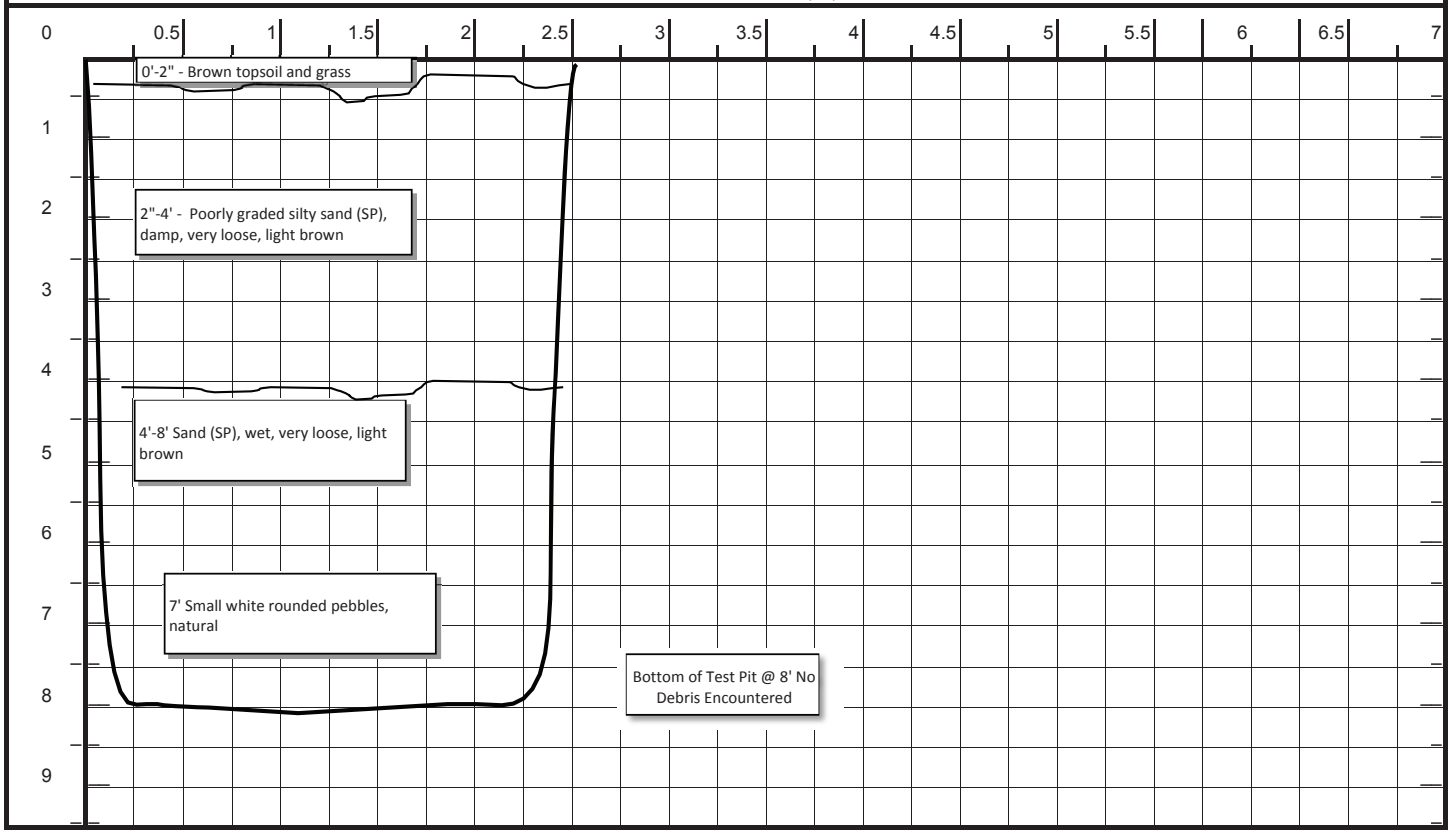
ELEVATION : Not Measured | CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 | DATE EXCAVATED: 6/12/2013

WATER LEVEL : N/A | APPROX. DIMENS: Length: 6 ft | Width: 2.5 ft | Max. Depth: 8 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP13 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 | LOCATION :Naval Weapons Station Yorktown | LOGGER : Melanie Young

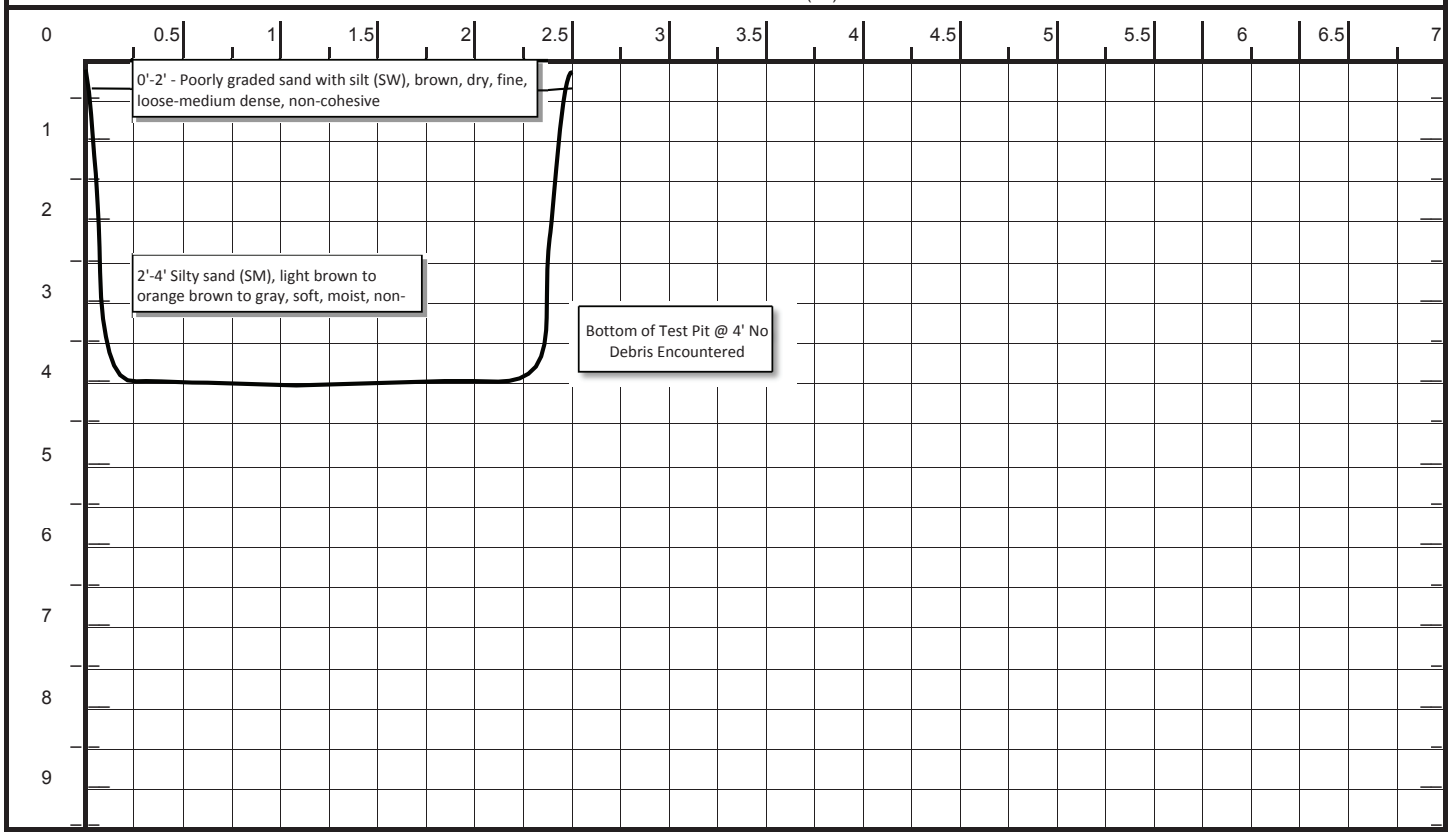
ELEVATION : Not Measured | CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 | DATE EXCAVATED: 6/12/2013

WATER LEVEL : N/A | APPROX. DIMENS: Length: 6 ft | Width: 2.5 ft | Max. Depth: 4 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP14 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 | LOCATION :Naval Weapons Station Yorktown | LOGGER : Melanie Young

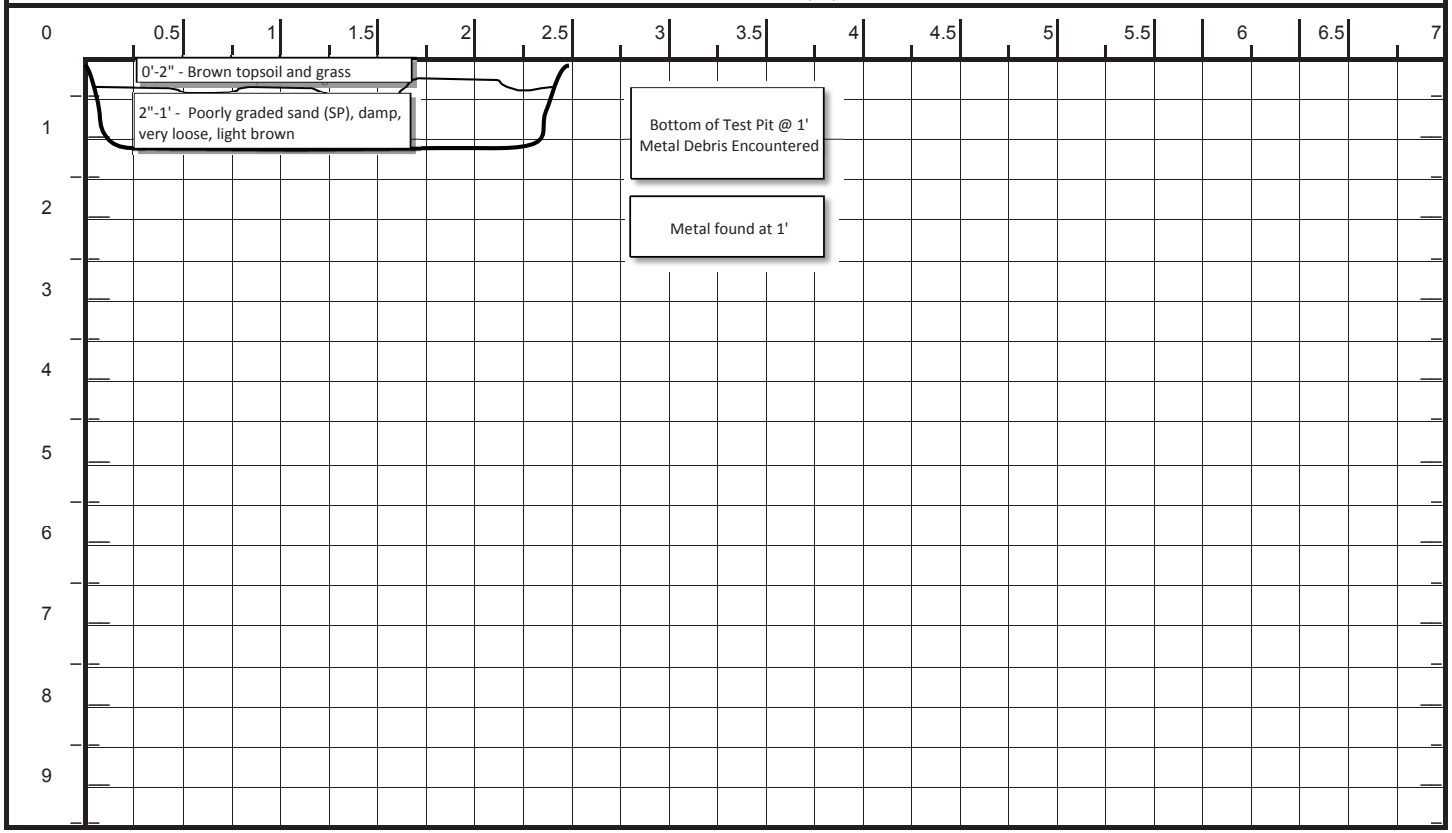
ELEVATION : Not Measured | CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 | DATE EXCAVATED: 6/13/2013

WATER LEVEL : N/A | APPROX. DIMENS: Length: 3 ft | Width: 2.5 ft | Max. Depth: 1 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP15 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 | LOCATION :Naval Weapons Station Yorktown | LOGGER : Melanie Young

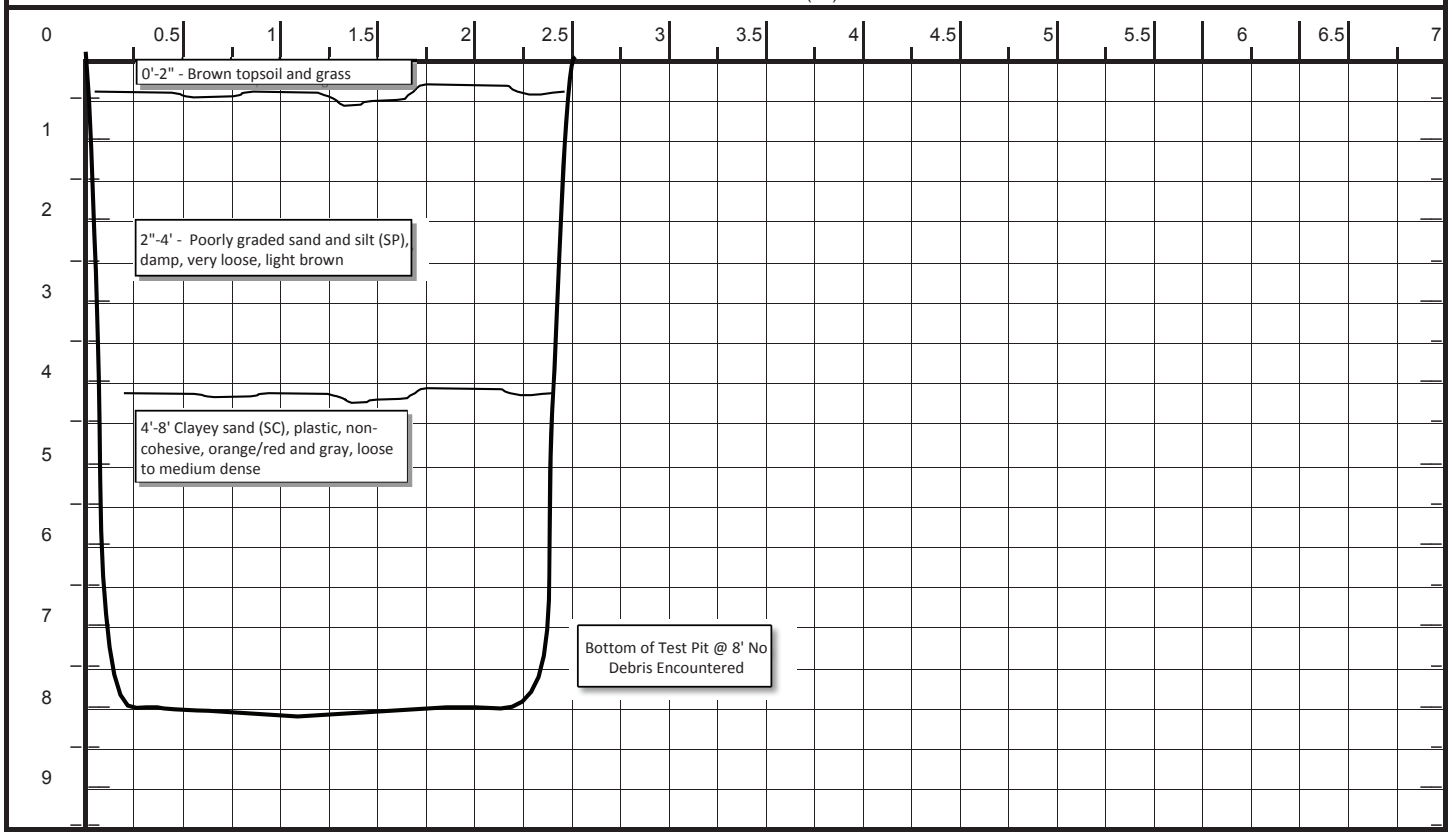
ELEVATION : Not Measured | CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 | DATE EXCAVATED: 6/12/2013

WATER LEVEL : N/A | APPROX. DIMENS: Length: 6 ft | Width: 2.5 ft | Max. Depth: 8 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



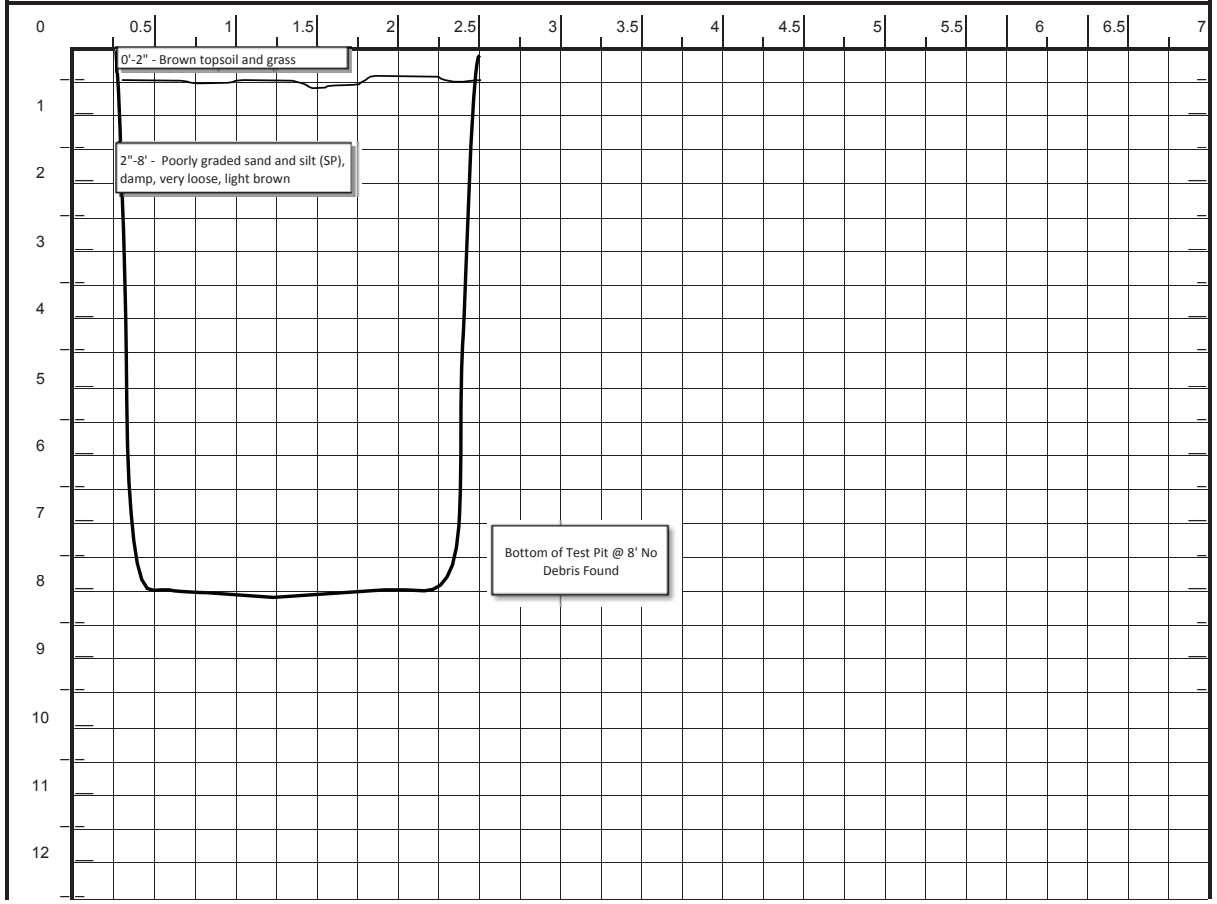
CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP16 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1	LOCATION :Naval Weapons Station Yorktown	LOGGER : Melanie Young
ELEVATION : Not Measured	CONTRACTOR : Parratt-Wolff, Inc.	
EXCAVATION EQUIPMENT USED : Bobcat Excavator 442		DATE EXCAVATED: 6/13/2013
WATER LEVEL : N/A	APPROX. DIMENS: Length: 6 ft Width: 2.5 ft	Max. Depth: 8 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP18 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 | LOCATION :Naval Weapons Station Yorktown | LOGGER : Melanie Young

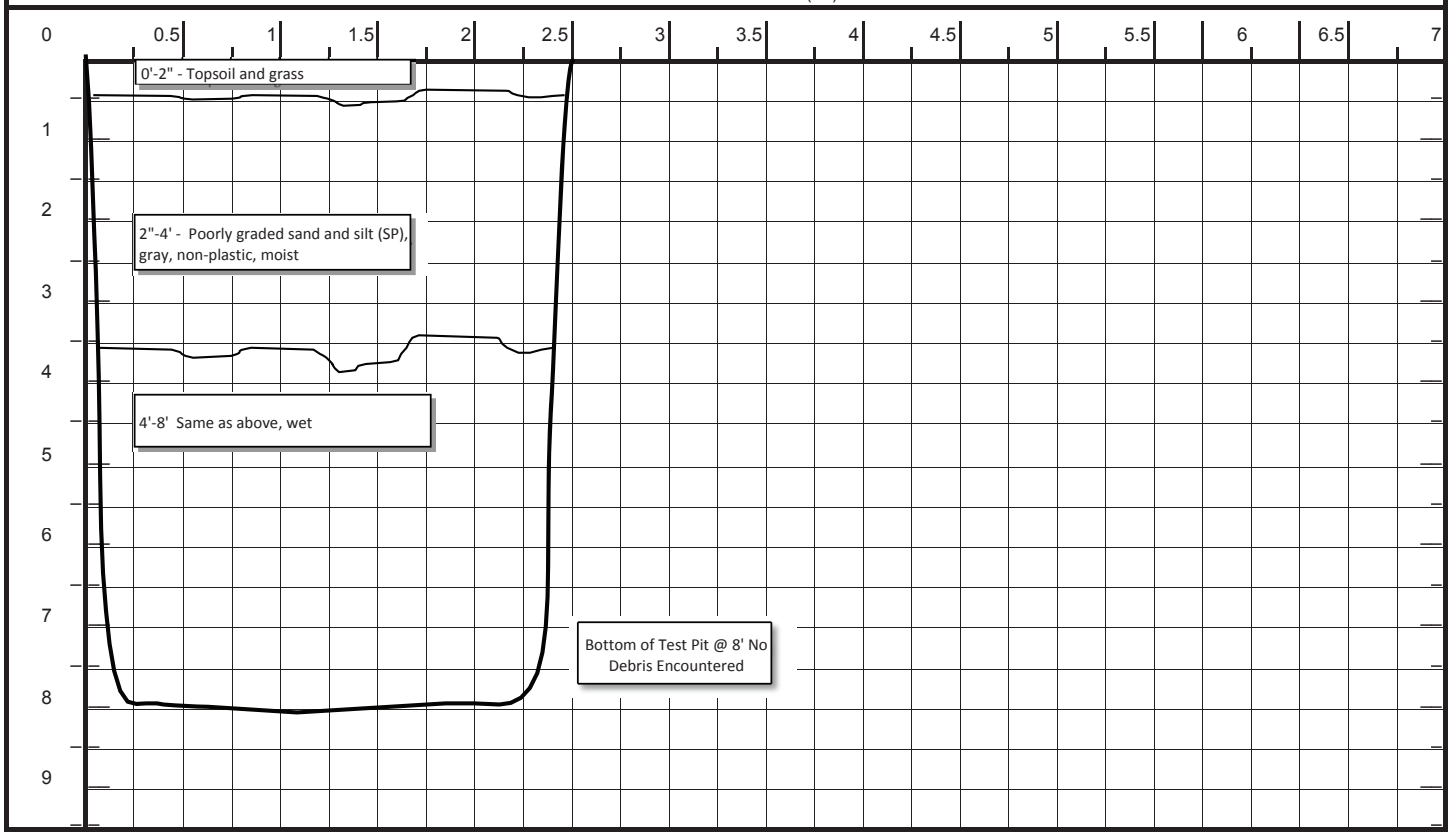
ELEVATION : Not Measured | CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 | DATE EXCAVATED: 6/12/2013

WATER LEVEL : N/A | APPROX. DIMENS: Length: 6 ft | Width: 2.5 ft | Max. Depth: 8 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP19 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 | LOCATION :Naval Weapons Station Yorktown | LOGGER : Melanie Young

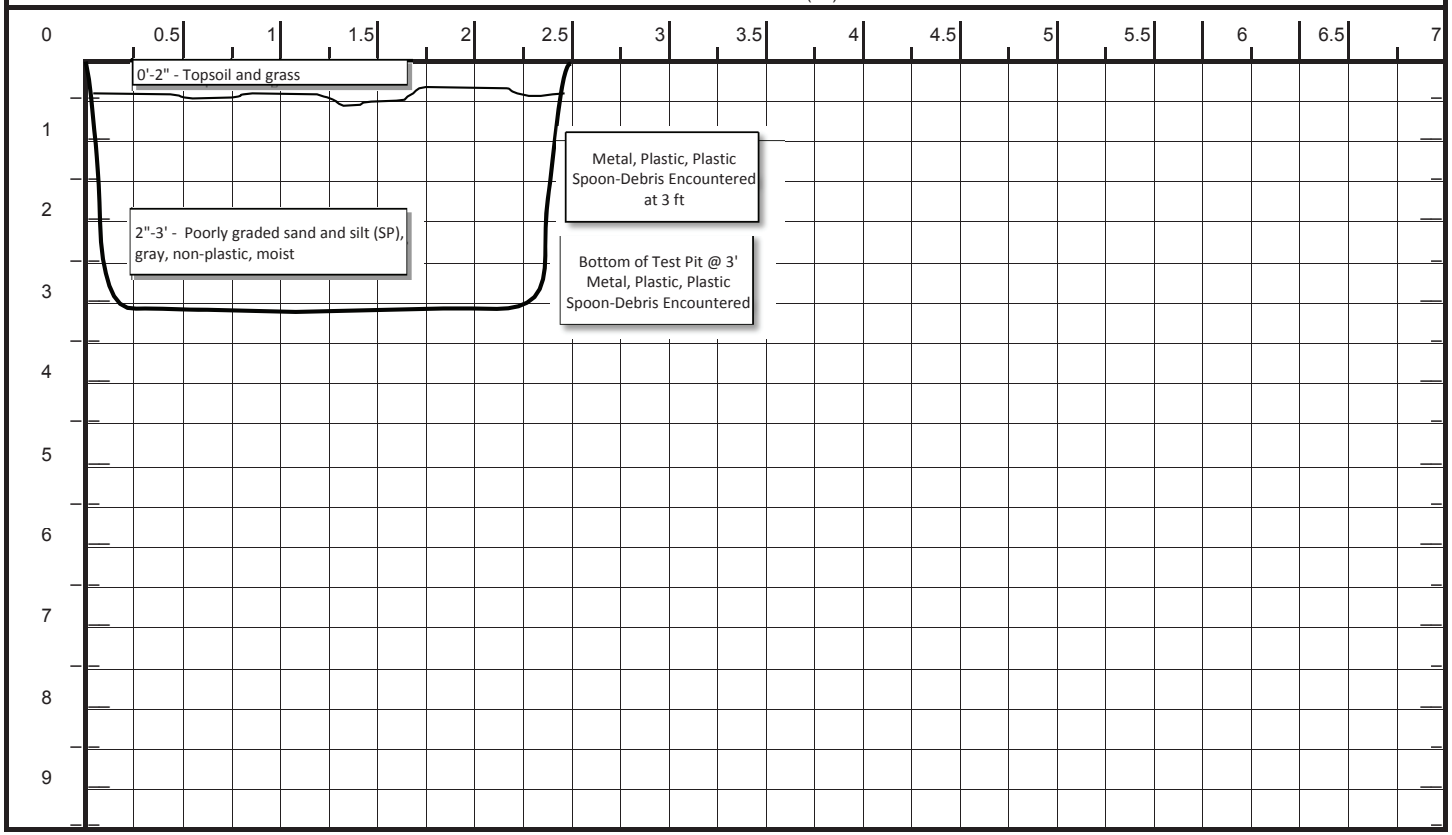
ELEVATION : Not Measured | CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 | DATE EXCAVATED: 6/13/2013

WATER LEVEL : N/A | APPROX. DIMENS: Length: 6 ft | Width: 2.5 ft | Max. Depth: 3 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP20 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1 | LOCATION :Naval Weapons Station Yorktown | LOGGER : Melanie Young

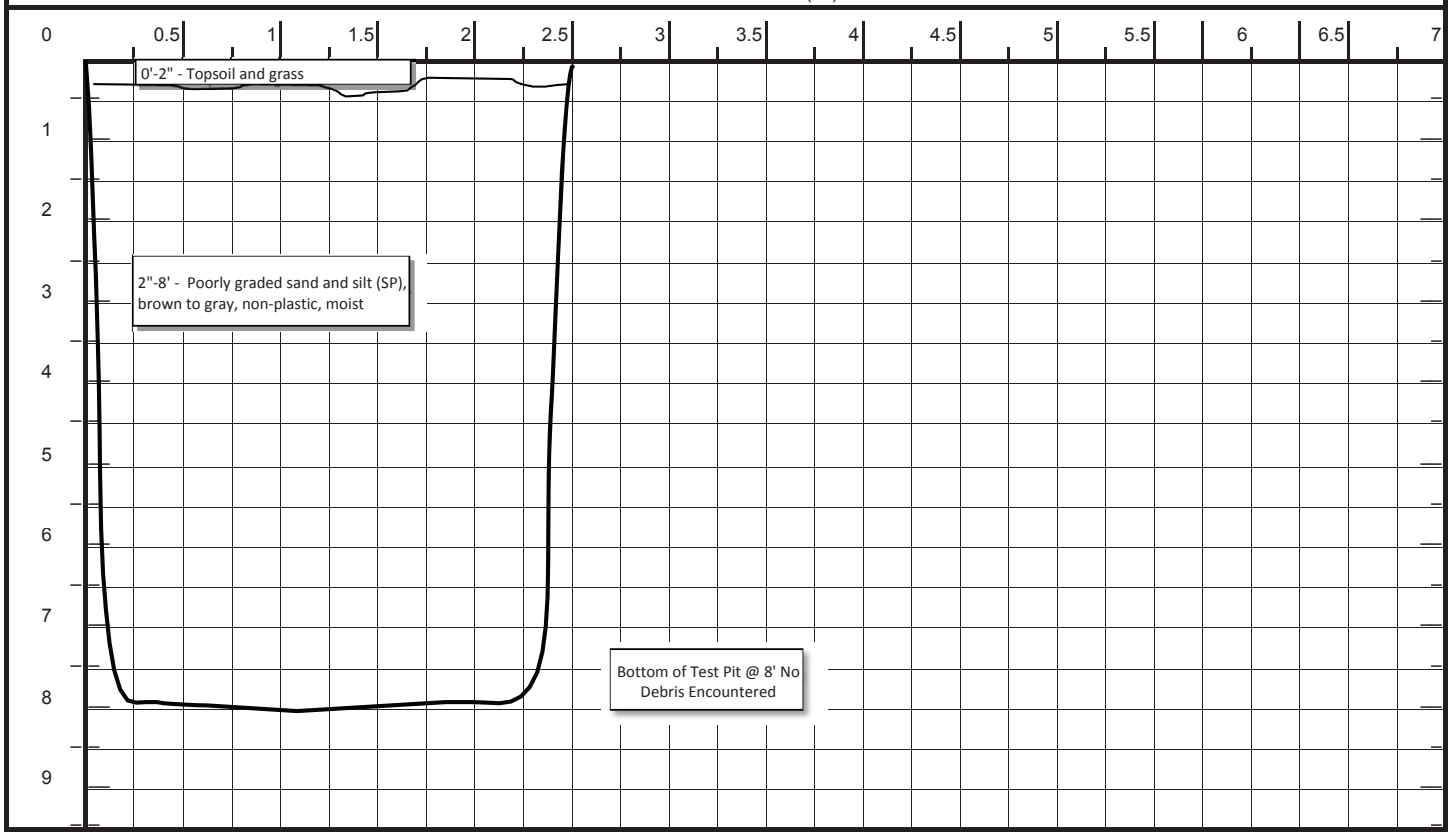
ELEVATION : Not Measured | CONTRACTOR : Parratt-Wolff, Inc.

EXCAVATION EQUIPMENT USED : Bobcat Excavator 442 | DATE EXCAVATED: 6/13/2013

WATER LEVEL : N/A | APPROX. DIMENS: Length: 6 ft | Width: 2.5 ft | Max. Depth: 8 ft

DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



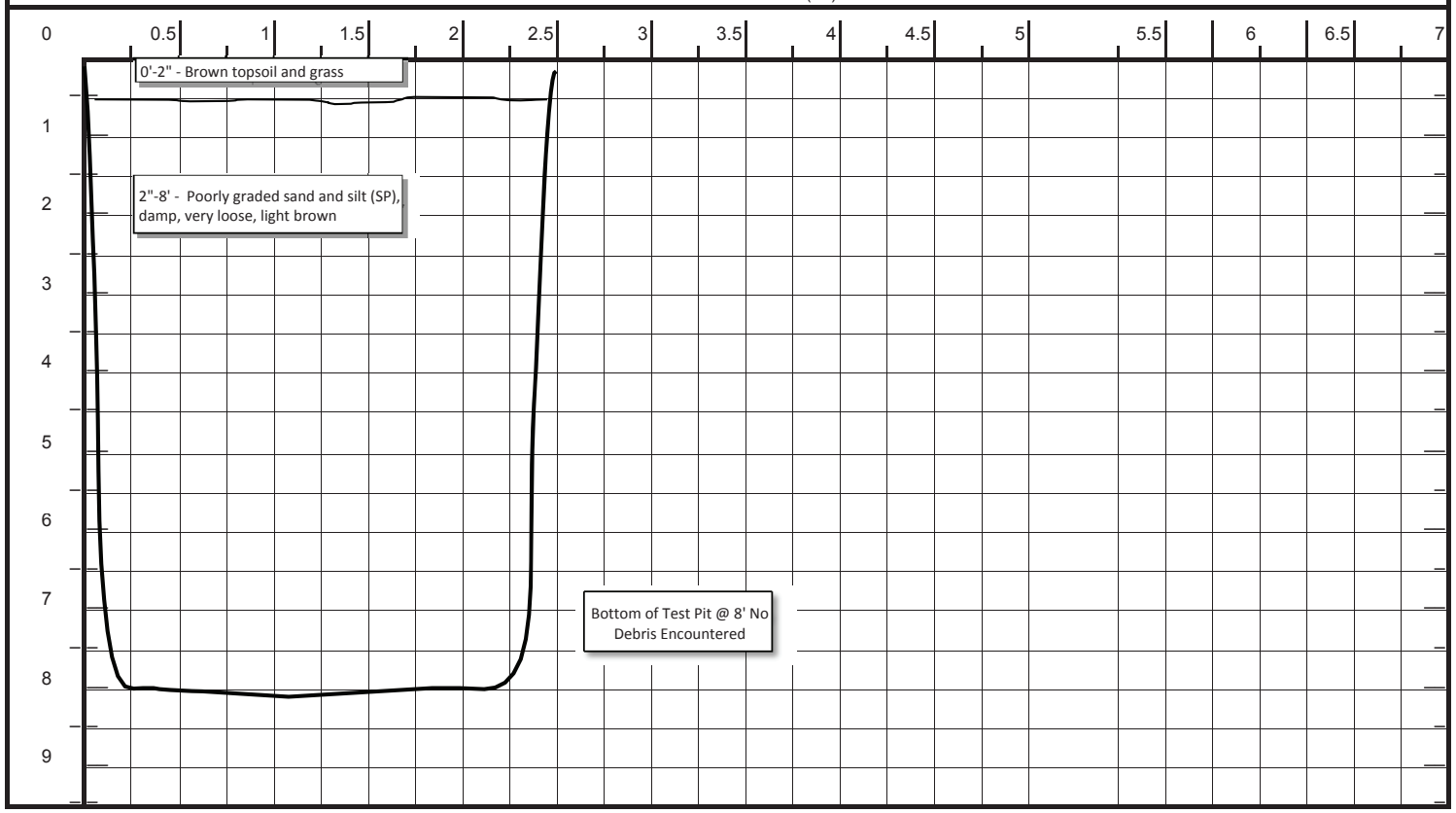
CH2MHILL	PROJECT NUMBER 429391.FI.FS.01	TEST PIT NUMBER TP21 SHEET 1 OF 1

TEST PIT LOG

PROJECT : Site 1	LOCATION :Naval Weapons Station Yorktown	LOGGER : Melanie Young
ELEVATION : Not Measured	CONTRACTOR : Parratt-Wolff, Inc.	
EXCAVATION EQUIPMENT USED : Bobcat Excavator 442		DATE EXCAVATED: 6/13/2013
WATER LEVEL : N/A	APPROX. DIMENS: Length: 6 ft Width: 2.5 ft Max. Depth: 8 ft	

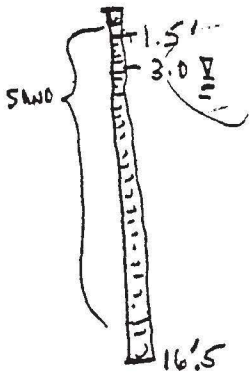
DESCRIPTION	COMMENTS
(I.E., SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	(I.E., DIFFULCULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, WATER SEEPAGE)

TEST PIT DIMENSIONS (FT)



Dames & Moore

LOCATION OF BORING



DATUM

ELEVATION

JOB NO.	CLIENT	LOCATION
13542	LANTDIV - US NAVY	NWS - yorktown VA

DRILLING METHOD: Ardco ATV MC55 7½" HSA

BORING NO. NW 1GW04

SHEET 1 OF 1

SAMPLING METHOD: 24" gpt spoon

					DRILLING START	DRILLING FINISH
WATER LEVEL	3-3.5'		-		TIME 14:15	TIME 16:30
TIME	16:00					
DATE	1-7-86				DATE 1-7-86	DATE 1-7-86
CASING DEPTH						

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
				1		0		clean ~~and~~ poorly sorted (well graded) fine to coarse sands, LOOSE
				2 2 2 1 (4)		1		
						2	SP	Brown silty well graded fine to med sands
				1 2 (3)		3		saturated
				1 1 1 (1)		4	SM	silty poorly sorted fine to med sands, LOOSE
						5		
						6		
						7		
						8		
						9		
				4 4 5 (9)		10	SC	grey-green clayey fine sand, LOOSE
						11		
						12		
						13		
						14		
				4 6 7 (13)		15		
						16	SP	grey-green shelly med and fine sands ~~[illegible]~~ MEDIUM DENS
						17	N=11	
						18		
						19		
						20		

A-1

DRILLING CONTR.

No. 28408

BY

DATE

CHK'D BY

628.1 (3) (REV. 11-80)

Baker

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Yorktown Naval Weapon Station - Well Installation,
PROJ. NO.: CTO 102 BORING NO.: 1GW04A
COORDINATES: EAST: 2562919.6 NORTH: 342881.34
ELEVATION: SURFACE: TOP OF PVC CASING 9.36

Rig: BLF-150 MiniSonic	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	--	8"	--	--	05/11/2000	18		
Length	--	--	--	--	05/12/2000	24		
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks: (1) Based on log for 1GW04, lithology known and boring advanced without split spoon sampling, except when determining where to set the 10" steel casing.

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

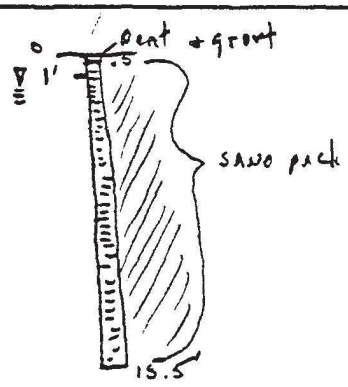
Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC riser	2 in	0	32 ft
Sch 40 .010 Slot Screen	2 in	32 ft	42 ft

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1	A-N	(1)			BKG= 0.0ppm 0		cement bentonite grout	-1.00
2								
3								
4								
5								
6								
7								
8								
9								
10						Match to Sheet 2		

DRILLING CO.: Parrot Wolfe BAKER RE Dave Martin
DRILLER: Jim Lansing BORING N 1GW04A SHEET 1 OF 3

Dames & Moore

LOCATION OF BORING



JOB NO.	CLIENT	LOCATION
13542	LANTDIV - US. NAVY	NWS - Yorktown VA

DRILLING METHOD: NC 45 7¾ H.S.A. NW

BORING NO. 1GW05

SHEET 1 OF 1

SAMPLING METHOD: 24" split spoon

					DRILLING START TIME	DRILLING FINISH TIME
WATER LEVEL	1.0'				13:15	14:20
TIME	14:00					
DATE	12-11-85				DATE 12-11-85	DATE 12-11-85
CASING DEPTH	15.5'					

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
				3 4 4 / 8		0		TAN silty uniform med SAND - saturated, LOOSE
						1		
				5 6 6 / 12		2	SP	white-grey fine sand - v. uniform - dark heavy minerals present - saturated, MEDIUM DENSE
						3		
				4 3 3 / 6		4		orange to brown, uniform fine sand w/ dark heavy minerals present, LOOSE
						5		
						6		
						7		
						8		
						9		
				2 2 / 5		10		dk green-grey clayey silt to fine SAND, MEDIUM STIFF
						11	ML/SM	
						12		
						13		
						14		
				3 3 3 / 6		15	ML	grey green w/ brown mottling clayey silt, STIFF
						16		
						17		
						18		
						19		
						20		

DRILLING CONTR. _____ BY _____ DATE _____ CHK'D BY _____

No. 28451

SBB.1 (3) (REV: 11-80)

Baker

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Yorktown Naval Weapon Station - Well Installation,		
PROJ. NO.:	CTO 102	BORING NO.:	1GW05A
COORDINATES:	EAST: 2563183.6	NORTH:	343041.69
ELEVATION:	SURFACE:	TOP OF PVC CASING:	37.83

Rig: BLF-150 MiniSonic	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	--	8"	--	--	05/10/2000	22		
Length	--	--	--	--	05/11/2000	50		
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks: (1) Based on log for 1GW05, lithology known and boring advanced without split spoon sampling, except when determining where to set the 10" steel casing.

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC riser	2 in	0	62 ft
Sch 40 .010 Slot Screen	2 in	62 ft	72 ft

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1								-1.00
2	A-N						cement bentonite grout	
3								
4							10-inch steel casing	
5								
6	S-1		2 3 2 1			Orange, moist to wet, medium SAND, little silt		
7								
8								
9								
10								
	S-2		2			Match to Sheet 2		

DRILLING CO.:	Parrot Wolfe	BAKER REP.:	Marlene Ivester (first 22') and Dave Martin (<22')
DRILLER:	Jim Lansing	BORING NO.:	1GW05A SHEET 1 OF 5

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 1GW12 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/10/92 END DATE : 06/10/92

LOGGER/COMPANY : W. BREW

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) :

TOTAL DEPTH : 14.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 16.00 ft. BGS
METHOD : HSA FLUID :
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENAN
DRILL RIG TYPE : B-61

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	42.500
N. COORDINATE :	0.0000	343136.0000
E. COORDINATE :	0.0000	2562505.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N

	TYPE	DEPTH
PURGE :		0.00
SAMPLE :		0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

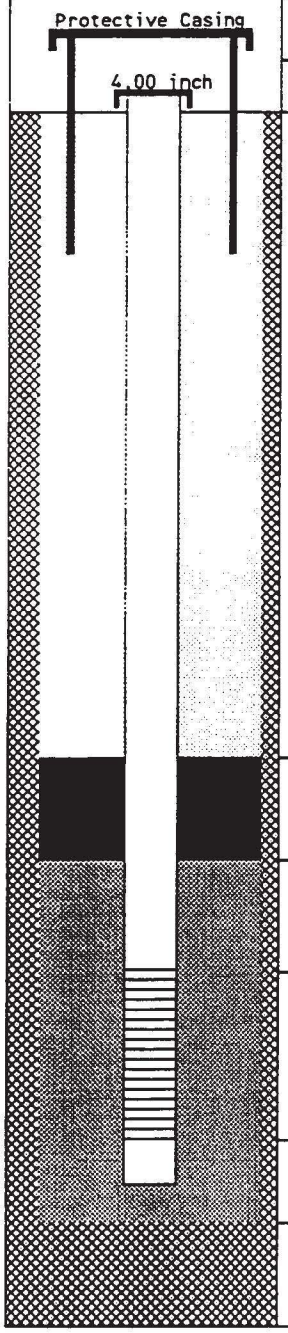
COMMENTS :

NWS-00313-03.13-07/01/93

Well Completion Summary **ROY F. WESTON, Inc.**

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	W. BREW

WELL ID	1GW12	*WATER LEVELS*
START DATE	06/10/92	6.20 FT (TOC) ON 07/15/92
COMPLETION DATE	06/10/92	



DEPTH		ELEV.
2.50	TC	45.00
0.00	GS	42.50
2.00	BN	40.50
3.00	SP	39.50
4.00	SC	38.50
14.00	BS	28.50
14.00	TD	28.50

DRILLING SUMMARY

Driller ROYCE KEENAN
Drilling Fluid NONE
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 4.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.50 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 2.00 *ft.*

Seal Type: BENTONITE PELLETS *Interval:* 2.00 to 3.00 *ft.*

Sand Pack Type : #2 SAND *Interval:* 3.00 to 14.00 *ft.*
Grain Size : UNIFORM *Median Diameter:*
Screen Diameter: 4.00 *Interval:* 4.00 to 14.00 *ft.*
Type : PVC *Slots:* .020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:

NOTE: Well Diagram not to Scale *Elevations are feet above mean sea level*

01/06/93

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 14.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW12	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343136.0000 surveyed	DRILLING RIG	: B-61
EASTING	: 2562505.0000 surveyed	DATE STARTED	: 06/10/92
ELEVATION	: 42.500 surveyed	DATE COMPLETED	: 06/10/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			65	Fill	DK YLLWISH BRN	SFT	MST	2 1 1 1	OVA 0.0	
41	1									
40	2		10	Fill	DK YLLWISH BRN	SFT	MST	3 3 4 3	OVA 0.0	
39	3									
38	4		60	Fill	BROWNISH YELLOW	LSE	MST	2 4 3 6	OVA 0.0	0.2' piece of wood in spoon OVA = 3 units.
37	5									
36	6		85	Fill	BROWNISH YELLOW	LSE	MST	5 7 9 8	OVA 0.0	
35	7			Silty sand, SM	YLLWISH BROWN	SFT	WET		OVA 0.0	
34	8		75	Silty sand, SM	YELLOWISH BROWN	SFT	WET	3 6 4 4	OVA 0.0	
33	9			Poorly graded sand with silt, SP-SM	LT GRAY	SFT	WET		OVA 0.0	
32	10		80	Poorly graded sand with silt, SP-SM	LT GRAY	SFT	WET	1 3 2 2	OVA 0.0	

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 14.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW12	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343136.0000 surveyed	DRILLING RIG	: B-61
EASTING	: 2562505.0000 surveyed	DATE STARTED	: 06/10/92
ELEVATION	: 42.500 surveyed	DATE COMPLETED	: 06/10/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Poorly graded sand with silt, SP-SM	LT GRAY	SFT	WET		OVA 0.0	
31	11			Silty sand, SM		SFT	WET		OVA 18.2	
30	12		95	Silty sand, SM		SFT	WET	2 3 4 6	OVA 0.0	
29	13			Silty sand, SM		FRM	WET		OVA 0.0	
28	14		90	Silty sand, SM		FRM	WET	3 3 3 4		
27	15			Sandy lean clay, CL		FRM	MST		OVA 0.0	
26	16									
25	17									
24	18									
23	19									
22	20									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 14

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
1GW12	1	1	0.00	2.00	SPS		0	F	40	50	10	0		MOD	POR	SFT	MST	
1GW12	2	1	2.00	4.00	SPS		0	F	40	50	10	0		MOD	POR	SFT	MST	
1GW12	3	1	4.00	6.00	SPS		0	F	90	10	0	0			MOD	LSE	MST	
1GW12	4	1	6.00	7.10	SPS		0	F	90	10	0	0			MOD	LSE	MST	
1GW12	4	2	7.10	8.00	SPS		0	F	80	20	0	0			MOD	SFT	WET	
1GW12	5	1	8.00	9.00	SPS		0	F	80	20	0	0			MOD	SFT	WET	
1GW12	5	2	9.00	10.00	SPS		0	F	90	10	0	0			MOD	SFT	WET	
1GW12	6	1	10.00	10.70	SPS		0	F	90	10	0	0			MOD	SFT	WET	
1GW12	6	2	10.70	12.00	SPS		0	F	85	15	0	0			MOD	SFT	WET	
1GW12	7	1	12.00	12.80	SPS		0	F	85	15	0	0			MOD	SFT	WET	
1GW12	7	2	12.80	14.00	SPS		0	F	50	50	0	0		MOD		FRM	WET	
1GW12	8	1	14.00	14.80	SPS		0	F	50	50	0	0		MOD		FRM	WET	
1GW12	8	2	14.80	16.00	SPS		0		40	20	40	0		MOD		FRM	MST	

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1
CTO NO.: 318 BORING NO.: 1SB12A
COORDINATES: EAST: NORTH:
ELEVATION: SURFACE: 41.4 TOP OF PVC CASING: 43.34

RIG:	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)		10"			1-24-96	13ft	Rain 65°	3	1620
LENGTH		13'			1-26-96	52ft	Cold 30°		
TYPE									
HAMMER WT.									
FALL									
STICK UP									

REMARKS:

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Riser	2"	PVC	+2.5	49.5
Screen	2"	PVC 0.01"	49.5	64.5

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
1	S-00					(* SAMPLE 1SB12A-00 collected)	Locking cover	Protective
2–3	S-1	1.0 50%	1 1 2 2		0.4	(* SAMPLE 1SB12A-01, MS/MSD and Dup. collected. SAND, fine to coarse little SILT, Brown to Dark Brown, moist wet at 3ft.	Cement / Bent grout	
4–5	S-2	1.0 50%	3 3 6 7		0.4		Sch 40 PVC Riser	
6–7	S-3	1.0 50%	3 4 5 7		0.5	SAND, fine to medium, trace SILT, Lt. Brown stained Orange, wet		
8–9	S-4	1.0 50%	4 5 7 5		0.5	Color change to Gray.	10" Casing	
10	S-5	2.0 100%	1 2 1 2		0.4	CLAY and SILT Lt. Brown, damp		

Match to Sheet 2

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: Doug Toma BORING NO.: 1SB12A

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1
CTO NO.: 318 BORING NO.: ISB 12A

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
N = No Sample
A = Auger
W = Wash
C = Core
P = Piston

DEFINITIONS
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
11						Continued from Sheet 1		
12 / 13	S-6	2.0 / 100%	2 3 3 3		0.3	CLAY and SILT, Lt. Brown, damp	10" casing	
14 / 15	S-7	1.5 / 75%	2 3 6 6		0.2	SILT and CLAY, trace fine SAND, Grayish Blue, damp,	Cement/Bent grout	
16 / 17	S-8	1.5 / 75%	WOH WOH 3 6		0.2		Sch 40 Riser	
18 / 19	S-9	1.5 / 75%	4 6 7 8		0.2			
20 / 21	S-10	1.5 / 75%	3 3 4 5		0.2			
22 / 23	S-11	1.75 / 75%	4 4 5 4		0.2	SILT and CLAY, trace fine SAND, 2" shell hash layer, Gray with brown organics, dry		
24 / 25	S-12	1.5 / 75%	WOH WOH 7 6		0.2			
26 / 27	S-13	1.75 / 85%	4 4 4 8		0.2	SILT some CLAY, little Shell fragments, trace fine SAND, Light brown moist to wet		
28 / 29	S-14	0.5 / 25%	3 WOH WOH WOH		0.2			
30	S-15	2.0 / 100%	4 4 4 5		0.2			

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: Doug Toma BORING NO.: ISB12A SHEET 2 OF

Baker

Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1

CTO NO.: 318 BORING NO.: 1SB12A

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
						Continued from Sheet 1		
31	31							
2	S-16	1.0 50%		WOH WOH 5 4	0.2	SILT some CLAY, trace fine SAND, little Shell fragments, lt. Gray, wet		
3	33							
4	S-17	1.5 75%		WOH WOH 4 5	0.2			
5	35							
6	S-18	1.75 85%		WOH WOH 4 6	0.2			
7	37							
8	S-19	1.75 85%		4 6 11 12	0.2			
9	39							
40	S-20	1.5 75%		WOH 10 11 13	0.2		Cement/Bentonite grout	
1	41							
2	S-21	1.5 75%			0.2			
3	43							
4	S-22	1.5 75%		9 9 11 12	0.2		Bent Slurry Seal	
5	45							
6	S-23	1.0 50%		13 22 32	0.2			
7	47							
8	S-24	1.5 75%		12 23 32 36	0.2		sch 40 PVC Riser	
9	49							
50	51	S-25	1.5 75%		0.2		0.01 SLOTT PVC SCREEN	

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis

DRILLER: Doug Tarna BORING NO.: 1SB12A SHEET 3 OF

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1
CTO NO.: 3181 BORING NO.: 1SB12A

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
						Continued from Sheet 1		
51						SILT some CLAY trace fine SAND, little Shell fragments, Gray, wet		
2	S-26	1.5	12 17		0.2			
3	53	75%	17 23					
4	S-27	1.5	29 22		0.2			
5	55	75%	27 26					
6	S-28	1.0	10 15		0.2	SILT and SAND, fine to medium, trace Shell fragments, Gray to Brown wet		
7	57	75%	24 18					
8	S-29	2.0	26 28		0.2		Silica SAND Pack	
9	59	100%	36 28					
60	S-30	1.5	17 16		0.1			
1	61	75%	15 12				0.01" SLOT PVC Screen	
2	S-31	1.5	7 [illegible] 9		0.1	SILT some fine SAND, trace CLAY, trace Shell fragments, Dark Gray damp		
3	63	75%	9					
4	S-32	2.0	Shelby Tube collected.					
5	65	100%					Caved Soil	
6								
7								
8								
9								
70								

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: Doug Toma BORING NO.: 1SB12A SHEET 4 OF

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1
CTO NO.: 318 BORING NO.: 1SB12B
COORDINATES: EAST: NORTH:
ELEVATION: SURFACE: 40.70 TOP OF PVC CASING: 41.48

RIG:	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)		10"			1-27-96	13	Rain 60°		
LENGTH		13'			1-27-96	25			
TYPE									
HAMMER WT.									
FALL									
STICK UP									

REMARKS:

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Riser	2"	Sch 40	+2.5	28
Screen	2"	0.01" SLOT	28	38

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
1						(* See 1SB12A log for soil descriptions)	Locking Protective Cover	
2							10" casing	
3								
4							Sch 40 PVC Riser	
5								
6								
7								
8								
9								
10								

Match to Sheet 2

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: Doug Toma BORING NO.: 1SB12B SHEET 1 OF 2

Baker

Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1

CTO NO.: 318 BORING NO.: 1SB 12B

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
						Continued from Sheet 1		
11								
12							10" Casing	
13								
14								
15								
16								
17								
18								
19								
20								
21							Cement/Be grout	
22								
23								
24							Bent Slury Seal	
25								
26							Sch 40 pvc Riser	
27								
28								
29							0.01" slot Screen	
30								

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis

DRILLER: Doug Toma BORING NO.: 1SB12B SHEET 2 OF

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1
CTO NO.: 318 BORING NO.: 1SB12B

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
						Continued from Sheet 1		
31								
2								
3								0.01" SLOT PVC Screen
4								
5								
6								Silica SAND PACK
7								
8								
9						END OF BORING at 38 ft.		
40								
1								
2								
3								
4								
5								
6								
7								
8								
9								
50								

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: Doug Torma BORING NO.: 1SB12B SHEET 3 OF

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 1GW13 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/10/92 END DATE : 06/10/92

LOGGER/COMPANY : W. BREW

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 16.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 16.00 ft. BGS
METHOD : HSA FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENAN
DRILL RIG TYPE : B61

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	40.700
N. COORDINATE :	0.0000	343392.0000
E. COORDINATE :	0.0000	2563140.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N TYPE DEPTH
PURGE : 0.00
SAMPLE : 0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :

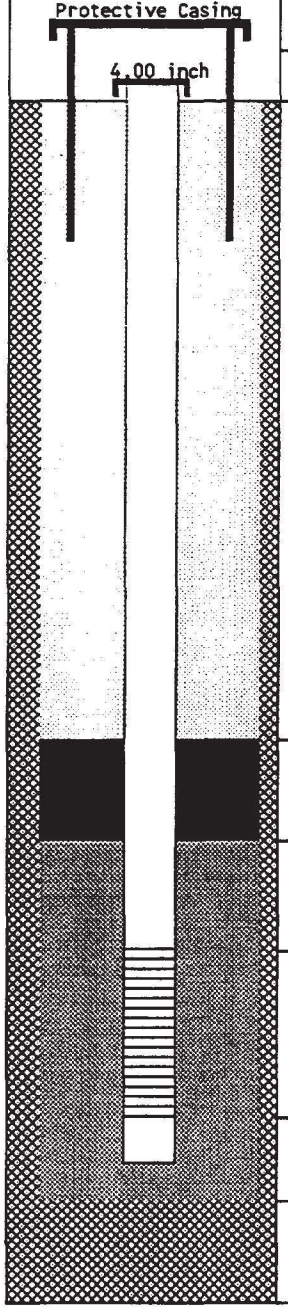
NWS-00313-03.13-07/01/93

Well Completion Summary **ROY F. WESTON, Inc.**

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	W. BREW

WELL ID	1GW13
START DATE	06/10/92
COMPLETION DATE	06/10/92

WATER LEVELS



DEPTH		ELEV.
2.50	TC	43.20
0.00	GS	40.70
2.00	BN	38.70
3.00	SP	37.70
4.00	SC	36.70
14.00	BS	26.70
14.00	TD	26.70

DRILLING SUMMARY

Driller ROYCE KEENAN
Drilling Fluid NONE
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 4.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.50 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 2.00 *ft.*

Seal Type: BENTONITE *Interval:* 2.00 to 3.00 *ft.*

Sand Pack Type : #2 *Interval:* 3.00 to 14.00 *ft.*
Grain Size : UNIFORM *Median Diameter:* 2-3
Screen Diameter: 4.00 *Interval:* 4.00 to 14.00 *ft.*
Type : PVC *Slots:* .020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:

NOTE: Well Diagram not to Scale *Elevations are feet above mean sea level*

01/06/93

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 16.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW13	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343392.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2563140.0000 surveyed	DATE STARTED	: 06/10/92
ELEVATION	: 40.700 surveyed	DATE COMPLETED	: 06/10/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			65	Silty sand, SM	YELLOWISH BROWN	SFT	MST	2 2 4 5		
39	1									
38	2		90	Silty sand, SM	YELLOWISH BROWN	SFT	MST	4 6 6 5		
37	3									
36	4		70	Silty sand, SM	YELLOWISH BROWN	SFT	MST	2 3 5 6		
35	5			Poorly graded sand, SP	PALE BROWN	SFT	WET			
34	6		85	Poorly graded sand, SP	PALE BROWN	SFT	WET	4 5 5 4		
				Silty sand, SM	YELLOWISH BROWN	LSE	WET			
33	7									
32	8		80	Silty sand, SM	YELLOWISH BROWN	LSE	WET	2 2 2 2		
31	9			Silty sand, SM	PALE BROWN	FRM	WET			
30	10		85	Silty sand, SM	PALE BROWN	FRM	WET	1 2 1 1		

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 16.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW13	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343392.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2563140.0000 surveyed	DATE STARTED	: 06/10/92
ELEVATION	: 40.700 surveyed	DATE COMPLETED	: 06/10/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Silty sand, SM	PALE BROWN	FRM	WET			
29	11									
				Silty sand, SM		FRM	WET			
28	12		90	Silty sand, SM		FRM	WET	1 2 3 3		
27	13									
26	14		90	Sandy lean clay, CL		FRM	MST	2 2 3 2	OVA 0.0	Same lith unit as above except gradational changes with depth.
25	15									
24	16									
23	17									
22	18									
21	19									
20	20									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 15

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
1GW13	1	1	0.00	2.00	SPS		0	F	85	15	0	0			MOD	SFT	MST	
1GW13	2	1	2.00	4.00	SPS		0	F	85	15	0	0			MOD	SFT	MST	
1GW13	3	1	4.00	5.00	SPS		0	F	85	15	0	0			MOD	SFT	MST	
1GW13	3	2	5.00	6.00	SPS		0	F	95	5	0	0			MOD	SFT	WET	
1GW13	4	1	6.00	6.20	SPS		0	F	95	5	0	0			MOD	SFT	WET	
1GW13	4	2	6.20	8.00	SPS		0	F	75	25	0	0			MOD	LSE	WET	
1GW13	5	1	8.00	9.10	SPS		0	F	75	25	0	0			MOD	LSE	WET	
1GW13	5	2	9.10	10.00	SPS		0	F	85	15	0	0		LOW		FRM	WET	
1GW13	6	1	10.00	11.80	SPS		0	F	85	15	0	0		LOW		FRM	WET	
1GW13	6	2	11.80	12.00	SPS		0	F	60	35	5	0		LOW		FRM	WET	
1GW13	7	1	12.00	14.00	SPS		0	F	60	35	5	0		LOW		FRM	WET	
1GW13	8	1	14.00	16.00	SPS		0	F	30	30	40	0		MOD		FRM	MST	

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1
CTO NO.: 318 BORING NO.: 1SB13A
COORDINATES: EAST: NORTH:
ELEVATION: SURFACE: TOP OF PVC CASING:

RIG:	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)		10"			1-25-96	13 ft	Rain 60	4 ft	1030
LENGTH		13'			1-28-96	62	Clear 50		
TYPE									
HAMMER WT.									
FALL									
STICK UP									

REMARKS: * No HNu due to rain

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
N = No Sample
A = Auger
W = Wash
C = Core
P = Piston

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Riser	2"	Sch 40 PVC	+2.5	60
Screen	2"	0.01" slot	60	75

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
1	S-00					(* SAMPLE COLLECTED 1SB13A-00)	Locking Protective Cover	
2–3 (3)	S-1	2.0 100%	5 7 9 9		0.3	(* SAMPLE COLLECTED 1SB13A-01) SAND, fine to coarse little SILT, dark brown, moist	Sch 40 PVC Riser	
4–5 (5)	S-2	2.0 100%	3 3 5 7		0.3	wet at 4 ft.	Cement/[illegible]	
6–7 (7)	S-3	2.0 100%	3 3 5 8		0.3	SAND, fine to coarse, some SILT, brown, wet		
8–9 (9)	S-4	2.0 100%	[illegible]		0.3			
10 (11)	S-5	2.0 100%	WOH 1 2 WOH		0.3			

Match to Sheet 2

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: Doug Toma BORING NO.: 1SB13A SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1
CTO NO.: 318 BORING NO.: 1SB13A

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
						Continued from Sheet 1		
11						SILT little SAND, trace CLAY gray, moist		10" Casing
12	S-06	2.0 100%				Shelby Tube collected		Sch 40 PVC Riser
13								
14	S-07	2.0 100%	WOH		*	SILT, some fine SAND, some CLAY, Brown to Gray, moist		
15								
16	S-08	2.0 100%	NOH					
17								
18	S-09	1.75 85%	WOH					
19								
20	S-10	1.75 85%	NOH			CLAY trace SILT trace fine SAND, Gray to dark Brown, damp		
21								
22	S-11	1.75 85%	WOH					
23								
24	S-12	1.75 85%	WOH					
25						SILT some to little CLAY trace fine SAND, dark gray moist		
26	S-13	2.0 100%	WOH			SILT little CLAY, dark Gray, damp to dry		
27								
28	S-14	2.0 100%	WOH					
29						SILT some Shell fragments, Brownish Red, iron stain, dry		
30	S-15	2.0 100%	4 6 8 8			SILT and shell fragments, trace CLAY, trace fine SAND, Gray to brown wet.		
31								

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: Doug Toma BORING NO.: 1SB13C SHEET 2 OF

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1
CTO NO.: 318 BORING NO.: 1SB13A

SAMPLE TYPE		DEFINITIONS
S = Split Spoon	A = Auger	SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
T = Shelby Tube	W = Wash	RQD = Rock Quality Designation (%)
R = Air Rotary	C = Core	Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
D = Denison	P = Piston	Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis
N = No Sample		

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
						Continued from Sheet 1		
31								
2	S-16	2.0 100%	8 6 0 7		*	SILT and to little shell fragments trace CLAY, trace fine SAND, trace decomposed shells, Gray, wet		
3 33								Cement / Ben grou
4	S-17	2.0 100%	3 5 7 9		0.0			
5 35								
6	S-18	2.0 100%	7 6 5 6		0.0			Sc[illegible] PVC Riser
7 37								
8	S-19	2.0 100%	3 4 5 3		0.0			
9 39								
40	S-20	2.0 100%	3 2 3 5		0.0	SILT and fine SAND, trace CLAY, trace Shell frags. partially decomposed, Gray, wet		
1 41								
2	S-21	1.0 50%	5 10 12 12		0.0			
3 43								
4	S-22	1.5 75%	8 16 18 26		0.0			
5 45								
6	S-23	1.75 85%	9 14 19 33		*	SILT and fine to medium SAND, trace Shell frags, Gray, wet		
7 47								
8	S-24	1.5 75%	22 31 45 56					
9 49								
50 51	S-25	1.75 85%	9 11 12 23			SAND, fine and SILT trace shells, Gray to dark Gray, wet		

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: Doug Toma BORING NO.: 1SB13A SHEET 3 OF

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1
CTO NO.: 318 BORING NO.: 1SB13A

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
						Continued from Sheet 1		
51								
2	S-26	1.75 85%	6 9 23 29		*	SAND, fine and SILT trace decomposed Shells, Gray to dark gray, wet		
3 53								
4	S-27	1.75 85%	14 20 17 27				Cement/Bentonite grout	
5 55								
6	S-28	1.75 85%	10 20 19 37				Bent. Slurry Seal	
7 57								
8	S-29	2.0 100%	7 20 42 50					
9 59							Sch 40 PVC Riser	
60	S-30	2.0 100%	11 15 11 5					
1 61						SILT and fine SAND trace to NO CLAY, trace Shell frags. Dk. Gray to Gray damp to wet		
2	S-31	2.0 50%	11 9 11 17				Silica Sand Pack	
3 63								
4	S-32	1.0 100%	3 4 6 7					
5 65							0.01" SLOT PVC Screen	
6	S-33	1.0 100%	6 8 11 14					
7 67								
8	S-34	1.0 100%	7 7 14 19					
9 69								
70 71	S-35	1.75 85%	6 6 8 9					

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: Doug Toma BORING NO.: 1SB13A SHEET 4 OF

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Land fill Site 1
CTO NO.: 318 BORING NO.: ISB13A

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
						Continued from Sheet 1		
1								
2	S-36	1.75 85%	12 14 20 22		≠	SILT and fine SAND, trace shell fragments dk Gray to Gray, wet		
3	73						Silica SAND Pack	
4	S-37	1.75 85%	15 24 50 30				0.01" SLOT PVC SCREEN	
5	75							
6						END OF BORING 6 at 75 ft.		
7								
8								
9								
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								
0								

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: Doug Torma BORING NO.: ISB13A SHEET OF

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 1GW14 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/09/92 END DATE : 06/09/92

LOGGER/COMPANY : W. BREW

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 16.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 16.00 ft. BGS
METHOD : HSA FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENAN
DRILL RIG TYPE : B61

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	44.800
N. COORDINATE :	0.0000	343412.0000
E. COORDINATE :	0.0000	2562286.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N

	TYPE	DEPTH
PURGE :		0.00
SAMPLE :		0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :

NWS-00313-03.13-07/01/93

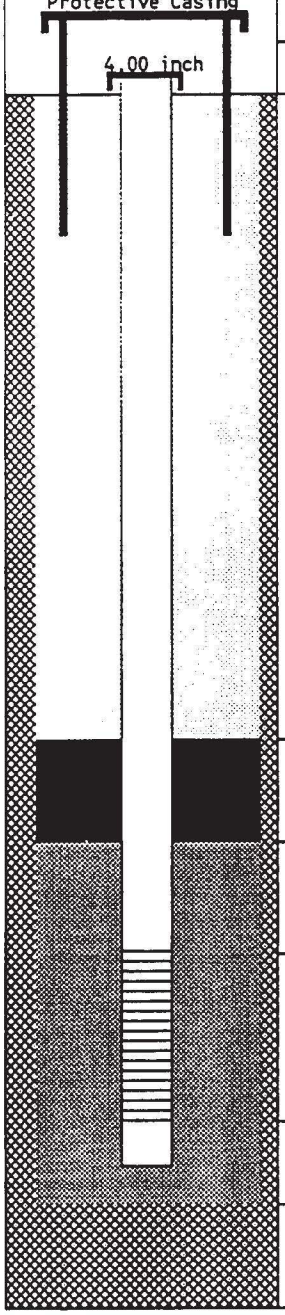
Well Completion Summary

ROY F. WESTON, Inc.

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	W. BREW

WELL ID	1GW14
START DATE	06/09/92
COMPLETION DATE	06/09/92

WATER LEVELS



DEPTH		ELEV.
2.50	TC	47.30
0.00	GS	44.80
3.00	BN	41.80
4.00	SP	40.80
5.00	SC	39.80
15.00	BS	29.80
15.00	TD	29.80

DRILLING SUMMARY

Driller ROYCE KEENAN
Drilling Fluid NONE
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 5.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.50 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 3.00 *ft.*

Seal Type: BENTONITE *Interval:* 3.00 to 4.00 *ft.*

Sand Pack Type : #2 *Interval:* 4.00 to 15.00 *ft.*
Grain Size : UNIFORM *Median Diameter:*
Screen Diameter: 4.00 *Interval:* 5.00 to 15.00 *ft.*
Type : PVC *Slots:* .020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:

NOTE: Well Diagram not to Scale

Elevations are feet above mean sea level

01/06/93

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 16.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW14	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343412.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2562286.0000 surveyed	DATE STARTED	: 06/09/92
ELEVATION	: 44.800 surveyed	DATE COMPLETED	: 06/09/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			90	Silty sand, SM	V. DK BROWN	LSE	MST	2 2 2 2	OVA 0.0	
				Silty sand, SM	YELLOWISH BROWN	LSE	MST	3 3 3 4	OVA 0.0	
43	1									
42	2		60	Poorly graded sand, SP	YELLOWISH BROWN	LSE	MST		OVA 0.0	
41	3									
40	4		60	Poorly graded sand, SP	YELLOWISH BROWN	LSE	MST	5 8 10 9	OVA 0.0	
39	5									
38	6		65	Poorly graded sand, SP	YELLOWISH BROWN	LSE	MST	6	OVA 0.0	
				Poorly graded sand, SP	PALE BROWN	LSE	WET	7 7 9	OVA 0.0	
37	7									
36	8			No Sample Recovered				3 3 1 3		
35	9									
34	10		75	Poorly graded sand with silt, SP-SM	PALE BROWN	LSE	WET	2 4 5 4	OVA 0.0	

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 16.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW14	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343412.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2562286.0000 surveyed	DATE STARTED	: 06/09/92
ELEVATION	: 44.800 surveyed	DATE COMPLETED	: 06/09/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Poorly graded sand with silt, SP-SM	PALE BROWN	LSE	WET		OVA 0.0	
33	11			Poorly graded sand with silt, SP-SM	V. DK GRYSH BRN	SFT	WET		OVA 0.0	
32	12		85	Poorly graded sand with silt, SP-SM	V DK GRYSH BRN	SFT	WET	3 2 1 2	OVA 0.0	
31	13									
30	14		95	Poorly graded sand with silt, SP-SM	V DK GRYSH BRN	SFT	WET	1 2 2 3	OVA 0.0	
29	15			Lean clay, CL	V DK GRYSH BRN	FRM	DRY		OVA 0.0	
28	16									
27	17									
26	18									
25	19									
24	20									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 16

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
1GW14	1	1	0.00	0.50	SPS		0	F	80	0	0	20			MOD	LSE	MST	
1GW14	1	2	0.50	2.00	SPS		0	MF	90	0	0	20			MOD	LSE	MST	
1GW14	2	1	2.00	4.00	SPS		0	MF	90	0	0	0			MOD	LSE	MST	
1GW14	3	1	4.00	6.00	SPS		0	MF	90	0	0	0			MOD	LSE	MST	
1GW14	4	1	6.00	6.10	SPS		0	MF	90	0	0	0			MOD	LSE	MST	
1GW14	4	2	6.10	8.00	SPS	F	10	MF	85	5	0	0			MOD	LSE	WET	
1GW14	5	1	8.00	10.00	SPS		0		0	0	0	0						
1GW14	6	1	10.00	11.00	SPS		0	F	90	10	0	0			MOD	LSE	WET	
1GW14	6	2	11.00	12.00	SPS		0	F	90	10	0	0			MOD	SFT	WET	
1GW14	7	1	12.00	14.00	SPS		0	F	90	10	0	0			MOD	SFT	WET	
1GW14	8	1	14.00	15.00	SPS		0	F	90	10	0	0			MOD	SFT	WET	
1GW14	8	2	15.00	16.00	SPS		0	VF	5	5	90	0		MOD		FRM	DRY	

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 1GW17 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/10/92 END DATE : 06/10/92

LOGGER/COMPANY : W. BREW

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 14.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 14.00 ft. BGS
METHOD : HSA FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENEN
DRILL RIG TYPE : B61

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	38.900
N. COORDINATE :	0.0000	343645.0000
E. COORDINATE :	0.0000	2652670.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N

	TYPE	DEPTH
PURGE :		0.00
SAMPLE :		0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :

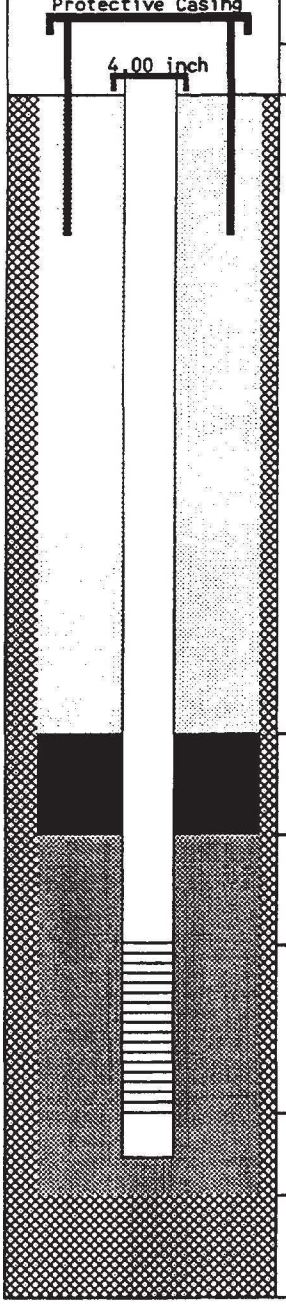
NWS-00313-03.13-07/01/93

Well Completion Summary **ROY F. WESTON, Inc.**

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	W. BREW

WELL ID	1GW17
START DATE	06/10/92
COMPLETION DATE	06/10/92

WATER LEVELS



DEPTH		*ELEV.*
2.50	*TC*	41.40
0.00	*GS*	38.90
0.50	*BN*	38.40
1.00	*SP*	37.90
2.00	*SC*	36.90
12.00	*BS*	26.90
12.00	*TD*	26.90

DRILLING SUMMARY

Driller ROYCE KEENAN
Drilling Fluid NONE
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 2.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.50 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 0.50 *ft.*

Seal Type: BENTONITE *Interval:* 0.50 to 1.00 *ft.*

Sand Pack Type : #2 *Interval:* 1.00 to 12.00 *ft.*
Grain Size : UNIFORM *Median Diameter:* 2.3
Screen Diameter: 4.00 *Interval:* 2.00 to 12.00 *ft.*
Type : PVC *Slots:* .020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:

NOTE: Well Diagram not to Scale *Elevations are feet above mean sea level*

01/06/93

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 14.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW17	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343645.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2652670.0000 surveyed	DATE STARTED	: 06/10/92
ELEVATION	: 38.900 surveyed	DATE COMPLETED	: 06/10/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			80	Poorly graded sand with silt, SP-SM	DK REDDISH BRN	SFT	MST	3 3 2 2	OVA 0.0	
37	1									
36	2		85	Poorly graded sand with silt, SP-SM	DK REDDISH BRN	SFT	MST	3 6 7 1	OVA 0.0	
35	3			Poorly graded sand with silt, SP-SM	DK REDDISH BRN	SFT	WET		OVA 0.0	Ion stained
				Poorly graded sand with silt, SP-SM	PALE BROWN	LSE	WET		OVA 0.0	
34	4		80	Poorly graded sand with silt, SP-SM	PALE BROWN	LSE	WET	2 2 3 2	OVA 0.0	
33	5			Silty sand, SM	PALE BROWN	LSE	WET		OVA 0.0	
32	6		75	Silty sand, SM	PALE BROWN	LSE	WET	3 6 3 4	OVA 0.0	
				Poorly graded sand, SP	V. DK GRAY	LSE	WET		OVA 0.0	
31	7									
30	8		90	Poorly graded sand, SP	V. DK GRAY	LSE	WET	3 2 3 3	OVA 0.0	
29	9			Silty sand, SM	V. DK GRAY	SFT	WET		OVA 0.0	
28	10		90	Silty sand, SM	V. DK GRAY	SFT	WET	2 2 2 1	OVA 0.0	

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 14.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW17	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343645.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2652670.0000 surveyed	DATE STARTED	: 06/10/92
ELEVATION	: 38.900 surveyed	DATE COMPLETED	: 06/10/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Silty sand, SM	V. DK GRAY	SFT	WET		OVA 0.0	
27	11									
				Lean clay, CL	DK OLIVE	FRM	MST			
26	12		95	Lean clay, CL	DK OLIVE	FRM	MST	1 2 2 2		
25	13									
24	14									
23	15									
22	16									
21	17									
20	18									
19	19									
18	20									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 17

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
1GW17	1	1	0.00	2.00	SPS		0	MF	90	10	0	0			MOD	SFT	MST	
1GW17	2	1	2.00	3.20	SPS		0	MF	90	10	0	0			MOD	SFT	MST	
1GW17	2	2	3.20	3.80	SPS		0	F	90	10	0	0			MOD	SFT	WET	
1GW17	2	3	3.80	4.00	SPS		0	F	90	10	0	0			MOD	LSE	WET	
1GW17	3	1	4.00	5.00	SPS		0	F	90	10	0	0			MOD	LSE	WET	
1GW17	3	2	5.00	6.00	SPS		0	F	85	15	0	0			MOD	LSE	WET	
1GW17	4	1	6.00	6.20	SPS		0	F	85	15	0	0			MOD	LSE	WET	
1GW17	4	2	6.20	8.00	SPS		0	F	95	5	0	0			MOD	LSE	WET	
1GW17	5	1	8.00	9.00	SPS		0	F	95	5	0	0			MOD	LSE	WET	
1GW17	5	2	9.00	10.00	SPS		0	F	85	15	0	0			MOD	SFT	WET	
1GW17	6	1	10.00	11.70	SPS		0	F	85	15	0	0			MOD	SFT	WET	
1GW17	6	2	11.70	12.00	SPS		0		0	5	85	10		MOD		FRM	MST	
1GW17	7	1	12.00	14.00	SPS		0		0	5	85	10		MOD		FRM	MST	

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Duddy Road Land fill Site 1
CTO NO.: 318 BORING NO.: 1SB18
COORDINATES: EAST: NORTH:
ELEVATION: SURFACE: TOP OF PVC CASING:

RIG:	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)					1-24-96	19	Rain 65°	4.0	1415
LENGTH									
TYPE									
HAMMER WT.									
FALL									
STICK UP									

REMARKS: * No HNu readings due to Rain

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
PVC Riser	2"	Sch 40 PVC	+2.5	3
PVC Screen	2"	0.01" slotted	3	18

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
0.5	S-00					(* SAMPLE 1SB18-00 collected)		
1	AN							
2	S-01	2.0 100%	11 17 9 8		*	(* SAMPLE 1SB18-01 collected) SAND, fine to medium, little SILT, trace Gravel, Dark Brown, trace Organics, moist, wet at 4ft		
3								
4	S-02	2.0 100%	2 2 2 4		*			
5								
6	S-03	1.0 50%	3 6 12 10		*			
7								
8	S-04	0.2 10%	7 7 9 7		*			
9								
10	S-05	2.0 100%	2 2 2 2		*	SAND, fine to medium trace SILT, trace Debris, Brown wet Match to Sheet 2		
11								

DRILLING CO.: Parratt-Wolff BAKER REP.: Nat Lewis
DRILLER: BORING NO.: 1SB18 SHEET 1 O

Baker

Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Duddy Road Landfill Site 1

CTO NO.: 318 BORING NO.: 1SB18

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
11						Continued from Sheet 1		
12	S-07	2.0 100%	3 3 5 6		*	SAND, fine trace SILT, Light Gray, wet		
13								
14	S-08	2.0 100%	3 4 5 6		*			
15								
16	S-09	2.0 100%	2 3 3 4		*			
17								
18	S-10	1.0 [illegible]	5 [illegible]		*	CLAY and SILT Grayish Blue, moist organic odore.		
19						END OF BORING 19 feet.		
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis

DRILLER: BORING NO.: 1SB18 SHEET 2 OF

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Duddy Road Landfill Site 1
CTO NO.: 318 BORING NO.: 1SB19
COORDINATES: EAST: NORTH:
ELEVATION: SURFACE: TOP OF PVC CASING:

RIG:	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE (96)	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)	2"				1-23	15 ft	Foggy, 30°	4.5	1230
LENGTH	2'								
TYPE	S.S.								
HAMMER WT.	STD								
FALL	STD								
STICK UP									

REMARKS:

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Riser	2"	Sch 40 PVC	+2.5	3.0
Screen	2"	0.01" slotted PVC	3.0	13.0

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
	S-00	1			0.2	*(SAMPLE COLLECTED 1SB19-00)	Locking Protective cover	
1	A-N							
2	S-01	1.0 50%	1 1 2 3		0.2	SAND, fine to med, little SILT, trace construction debris. Dk Brown to Brown, moist,	Bent. Chips, Seal	
3							Sch 40 PVC Riser	
4	S-02	1.5 75%	11 3 4 6		0.3	*(Sample Collected 1SB19-02) → Wet at 4.5 ft	SAND PACK	
5								
6	S-03	1.0 50%	6 6 5 7		0.2		0.01 Slott PVC SCREEN	
7								
8	S-04	1.0 50%	5 5 5 6		0.2	SAND, fine to coarse, trace SILT, Lt Brown, wet		
9								
10	S-05	1.75 87.5%	3 4 3 4		0.2	SAND, fine trace SILT, Lt Gray, wet		
						Match to Sheet 2		

DRILLING CO.: Parratt-Wolff BAKER REP.: Matt Lewis
DRILLER: BORING NO.: 1SB19 SHEET 1 OF

Baker

Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Landfill

CTO NO.: 318 BORING NO.: ISB19

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
11						Continued from Sheet 1		
12	S-06	2.0 100%	2 2 2 2		0.2	SAND, fine, little CLAY, trace SILT, Gray, moist	SAND PACK	
13							0.01 SLOTT SCREEN	
14	S-07	2.0 100%	WOH WOH 3 3		0.2		Caved Soil	
15						END OF BORING 15ft		
16	S-08							
17								
18	S-09							
19								
20	S-10							
21								
22	S-11							
23								
24	S-12							
25								
26	S-13							
27								
28	S-14							
29								
30								

DRILLING CO.: Parratt-Wolff BAKER REP.: Matt Lewis

DRILLER: BORING NO.: ISB19 SHEET 2 O

Baker

Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1

CTO NO.: 318 BORING NO.: 1SB20

COORDINATES: EAST: NORTH:

ELEVATION: SURFACE: TOP OF PVC CASING:

RIG:	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)					1-23-96	13 ft	Clear 40°	2 ft	1445
LENGTH									
TYPE									
HAMMER WT.									
FALL									
STICK UP									

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
PVC Riser	2"	Sch. 40	+2.5	5
PVC Screen	2"	0.01 Slott	5	10

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
.5	S-00					(* SAMPLE COLLECTED 1SB20-00)	Locking protective cover	
1	A-N					(* SAMPLE COLLECTED 1SB20-01)		
2	S-01	2.0 100%	1 1 2 3		0.1	SAND, fine to medium, little to trace SILT, Brown to dark Brown, damp, wet at 2.0 feet.	Bentonite Chip Seal	
3								
4	S-02	2.0 100%	3 6 9 13		0.1		Sch 40 PVC Riser	
5							SAND Pack	
6	S-03	2.0 100%	3 2 4 4		0.1		.001 Slotted PVC Screen	
7								
8	S-04	2.0 100%	10 10 6 1		0.1	SILT and SAND, fine to medium, trace clay, light Brown to Brown		
9								
10	S-05	2.0 100%	5 5 5 6		0.1	CLAY, trace SILT, Brown, Moist. Match to Sheet 2	Caved Soil	
11								

DRILLING CO.: Parratt Wolff Inc BAKER REP.: Matt Lewis

DRILLER: BORING NO.: 1SB20 SHEET 1 O

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudely Road Landfill Site 1
CTO NO.: 318 BORING NO.: 1SB20

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
11	11					Continued from Sheet 1		
12	S-06	1:0 50%	8 8 9 8			CLAY, trace SILT, Brown to Light Brown, moist	Caved Soil	
13	13							
14						END OF Boring		
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: BORING NO.: 1SB20 SHEET 2 OF

Baker

Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1

CTO NO.: 312 BORING NO.: 1SB21

COORDINATES: EAST: NORTH:

ELEVATION: SURFACE: TOP OF PVC CASING:

RIG:	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)		10"			1-24-96	21	Rain 65	20 ft	0830
LENGTH		13'							
TYPE									
HAMMER WT.									
FALL									
STICK UP									

REMARKS: * HNu Malfunction during Rain.

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
PVC Riser	2"	Sch 40	+2.5	25
PVC Screen	2"	0.01 Slotted	25	40

Depth (ft.)		Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
1	1	S-00 A-N					(*SAMPLE COLLECTED 1SB21-00)	Locking Protection Cover	
2		S-01	2.0 100%	3 3 2 3		0.1	SAND, fine to medium, trace SILT, Dark Brown to Brown moist		
3	3						SAND, fine to medium, little CLAY, trace SILT, Lt Brown, moist		
4		S-02	2.0 100%	6 7 9 8		0.1	SILT and CLAY, little fine SAND, Lt. Brown to Gray, damp, trace Organics.		Sch 40 PVC Riser
5	5								
6		S-03	2.0 100%	2 2 3 4		0.1	SILT little CLAY, trace fine SAND, Lt Brown to Gray, moist		10" Casing
7	7								
8		S-04	2.0 100%	4 4 4 4		0.1			Cement Bent Seal
9	9								
10	11	S-05	2.0 100%	4 3 5 5		*	Match to Sheet 2		

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis

DRILLER: Doug Toma BORING NO.: 1SB21 SHEET 1 (

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill Site 1
CTO NO.: 318 BORING NO.: 1SB21

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
11						Continued from Sheet 1		
12 / 13	S-06	2.0 100%	3 3 4 4		0.1	(* SAMPLE COLLECTED 1SB21-06) SILT and CLAY, trace fine SAND, Lt. Brown to Gray, moist.		10" Casing
14 / 15	S-07	2.0 100%	WOH WOH WOH 2		0.1			Sea Lo PVC Riser
16 / 17	S-08	2.0 100%	WOH WOH WOH WOH		0.1	Some Iron Staining Color change to Orange		
18 / 19	S-09	2.0 100%	3 3 3 3		0.1	(* SAMPLE COLLECTED 1SB21-09)		Sea
20 / 21	S-10	2.0 100%	2 3 4 4		0.1	SILT and CLAY, little fine SAND, Reddish Brown, moist. SILT and CLAY, trace fine SAND, little Shell fragments, Gray to dark gray, wet		Lor Surv Sea
22 / 23	S-11	1.75 87.5%	3 4 6 4		0.2			
24 / 25	S-12	1.75 87.5%	6 6 7 6		0.2			Sand Rock
26 / 27	S-13	0.5 25%	5 5 3 2		0.2			0.01 Slot Screen
28 / 29	S-14	1.0 50%	5 4 3 2		0.2			
30	S-15	1.5 75%	WOH WOH 3-6		0.2	SILT and Fine SAND, little Shell fragments, Gray, wet		

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: Doug Toma BORING NO.: 1SB21 SHEET 2 OF

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Dudley Road Landfill
CTO NO.: 318 BORING NO.: 1SB21

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
						Continued from Sheet 1		
31								
2	S-16	1.5 75%	7 5 10 15		0.2	SILT and fine SAND little Shell fragments, Dark Gray, Wet		
3 33								
4	S-17	1.5 75%	7 9 13 15		0.2		0.01" SLOT PVC Screen	
5 35								
6	S-18	1.5 75%	9 11 13 18		0.2			
7 37								
8	S-19	1.0 50%	14 17 22 23		0.2	SILT and fine SAND, trace shell fragments Dark Gray with Lt. Gray laminations.	SAND pack	
9 39								
40	S-20	1.5 75%	4 11 21 23		0.2			
1 41							Cuttings	Soil
2						END OF BORING AT 41 ft.		
3								
4								
5								
6								
7								
8								
9								
50								

DRILLING CO.: Parratt Wolff BAKER REP.: Matt Lewis
DRILLER: Doug Toma BORING NO.: 1SB21 SHEET 3 OF 3

PROJECT NUMBER	BORING NUMBER	
358315.FI.FS	YS01-GW22	SHEET 1 OF 1

SOIL BORING LOG

PROJECT :CTO-166 Sites 1, 3, 6, and 7 LOCATION : Yorktown NWS

ELEVATION: 39.54 ft msl (TOC) DRILLING CONTRACTOR : Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED : 4 1/4 inch ID Hollow Stem Auger on Truck Rig

WATER LEVELS : 30.16 ft (TOC) START : 2/17/09 END : 2/17/09 LOGGER : Caitlin Lippincott

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
5	0'-4'	36"/48"	1		silty SAND (SM), brown to tan, moist, loose, fine-medium grained SAND, organics	PID=0.0 ppm
10	4'-8'	48"/48"	2		**4'-5':** SAA **5'-8':** silty SAND (SM), greenish grey, moist-wet, fine-medium grained loose SAND	PID=0.0 ppm PID=0.0 ppm
15	8'-12'	24"/48"	3		sandy silty CLAY (CL), greenish gray, moist, soft-medium stiff CLAY, high plasticity	PID=3.7 ppm
	12'-16'	36"/48"	4		SAA except becoming bluish-green	PID=14.7 ppm
20	16'-20'	24"/48"	5		SAA	PID=44.7 ppm
25	20'-24'	48"/48"	6		**20'-22':** SAA **22'-24':** silty CLAY (ML), bluish green, dry-moist, stiff CLAY w/ some sand and shell hash	PID=48 ppm
30	24'-28'	36"/48"	7		**24'-26':** SAA except very stiff and moist-wet **26'-28':** silty clayey SAND (SC), white, moist-wet, loose-medium dense SAND w/ shell hash	PID=23 ppm
	28'-32'	48"/48"	8		clayey silty SAND (SC), white to yellowish orange, moist-wet, dense SAND w/ shell hash	PID=40 ppm
35	32'-36'	48"/48"	9		**32'-35':** SAA except wet and coarser SANDS **35'-36':** CLAY (CL), greenish gray, moist-wet soft-stiff CLAY w/ silts, sand, and shell hash	PID=20 ppm
40	36'-40'	48"/48"	10		**36'-39':** SAA except CLAY is very soft-soft **39'-40':** silty sandy CLAY (CL), bluish-gray, dry-moist stiff-hard, some shell hash	PID=12 ppm

Well Screened from 27'-37' bgs

PROJECT NUMBER	BORING NUMBER	
358315.FI.FS	YS01-GW23	SHEET 1 OF 1

SOIL BORING LOG

PROJECT :CTO-166 Sites 1, 3, 6, and 7 LOCATION : Yorktown NWS

ELEVATION : 16.91 ft msl (TOC) DRILLING CONTRACTOR : Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED : 4 1/4 inch ID Hollow Stem Auger on 850X ATV Rig

WATER LEVELS : 14.45 ft (TOC) START : 2/23/09 END : 2/23/09 LOGGER : Patrick Murphy

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
	0'-4'	24"/48"	1		SAND (SW), 10YR6/6 brownish yellow, dry-moist, loose, well graded SAND.	PID=0.0 ppm
5						
	4'-8'	36"/48"	2		sandy CLAY (SC), 10YR5/8 yellowish brown, dry-moist, stiff CLAY w/ sand	PID=13.9ppm
10						
	8'-12'	48"/48"	3		SAA w/ less sand	PID=3.8ppm
15						
	12'-16'	40"/48"	4		silty sandy CLAY (SC), 10YR4/2 dark grayish brown, moist, soft CLAY w/ sands and trace silts	PID=36.7ppm
20	16'-20'	40"/48"	5		silty SAND (SM), 2.5Y5/3 light olive brown, moist-wet loose medium grained SAND w/ silts	PID=0.0 ppm
	20'-24'	40"/48"	6		silty SAND (SM), 2.5Y5/3 light olive brown, saturated loose medium grained SAND w/ silts and shell hash	PID=0.0 ppm
25						
	24'-28	48"/48"	7		SAA	PID=0.0 ppm
30						
	28'-32'	48"/48"	8		SAA	PID=0.0 ppm

Well Screened from 20'-30' bgs

PROJECT NUMBER	BORING NUMBER	
358315.FI.FS	YS01-GW24	SHEET 1 OF 1

SOIL BORING LOG

PROJECT :CTO-166 Sites 1, 3, 6, and 7 LOCATION : Yorktown NWS

ELEVATION : 35.25 ft msl (TOC) DRILLING CONTRACTOR : Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED : 4 1/4 inch ID Hollow Stem Auger on 850X ATV Rig

WATER LEVELS : 33.73 ft (TOC) START : 2/24/09 END : 2/24/09 LOGGER : Patrick Murphy

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
5	0'-4'	24"/48"	1		SAND (SP), 10YR7/2 light gray, dry-moist, f/g loose poorly graded SAND	
10	4'-8'	30"/48"	2		clayey SAND (SC), 10YR5/6 yellowish brown, dry-moist, v. dense medium SAND w/ clay and trace silts	
15	8'-12'	48"/48"	3		sandy CLAY (SC), 5YR5/8 yellowish red mottled w/ 7.5 YR4/3 brown, dry-moist, v. stiff CLAY w/ well graded sand, trace silts, and organics	
	12'-16'	48"/48"	4		clayey SAND (SC), 7.5YR5/8 strong brown mottled w/ 7.5YR7/1 light gray, dry-moist, medium dense, f/g SAND w/ clay and trace silts	
20	16'-20'	48"/48"	5		sandy CLAY (SC), 7.5YR5/8 strong brown mottled w/ 7.5YR7/1 light gray, dry-moist, v. stiff CLAY w/ f/g sand and silts.	
25	20'-24'	48"/48"	6		SAA	PID=0.0ppm
	24'-28'	48"/48"	7		sandy silty CLAY (ML), 2.5Y4/3 olive brown, moist v. stiff CLAY w/ silts and trace f/g sand, shell hash	PID=0.0ppm
30	28'-32'	48"/48"	8		silty CLAY (ML), 2.5Y5/3 light olive brown, moist-wet soft CLAY w/ silts, trace sand, shell hash	PID=0.0ppm
35	32'-36'	24"/48"	9		silty SAND (SM), 2.5Y5/3 light olive brown, saturated loose, f/g SAND w/ silts and shell hash	PID=0.0ppm
40	36'-40'	48"/48"	10		SAA	PID=0.0ppm
	40'-44'	48"/48"	11		SAA	PID=0.0ppm

Well Screened from 35'-45' bgs

PROJECT NUMBER	BORING NUMBER	
358315.FI.FS	YS01-GW25	SHEET 1 OF 1

SOIL BORING LOG

PROJECT :CTO-166 Sites 1, 3, 6, and 7 LOCATION : Yorktown NWS

ELEVATION : 31.55 ft msl (TOC) DRILLING CONTRACTOR : Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED : 4 1/4 inch ID Hollow Stem Auger on 850X ATV Rig

WATER LEVELS : 29.96 ft (TOC) START : 2/25/09 END : 2/25/09 LOGGER : Patrick Murphy

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
	0'-4'	24"/48"	1		SAND (SW), 10YR6/4 light yellowish brown, f/g loose, well graded SAND w/ organics	
5						
	4'-8'	36"/48"	2		sandy CLAY (SC), 10YR4/6 dark yellowish brown, dry-moist, stiff CLAY w/ medium coarse sand and organics	PID=0.0ppm
10						
	8'-12'	48"/48"	3		sandy CLAY (SC), 10YR4/6 mottled w/ 10YR7/2 light gray, dry, stiff CLAY w/ medium coarse sand	PID=0.0ppm
15						
	12'-16'	48"/48"	4		SAA	PID=0.0ppm
20	16'-20'	48"/48"	5		SAA	PID=0.0ppm
	20'-24'	48"/48"	6		**20'-22':** SAA **22'-24':** sandy silty CLAY (ML), 10YR7/2 light gray mottled w/ browns, dry-moist, medium stiff CLAY w/ silts, sands, and shell hash	PID=6.8ppm
25						
	24'-28'	48"/48"	7		sandy silty CLAY (ML), 2.5Y5/3 light olive brown, moist, soft CLAY w/ silts, trace sands and shell hash	PID=0.5ppm
30						
	28'-32'	40"/48"	8		SAA except wet @ **32'**	PID=0.0ppm
35						
	32'-36'	48"/48"	9		silty SAND (SM), 2.5Y5/3 light olive gray, saturated v. loose f/g SAND w/ silts and shell hash	PID=0.0ppm
40	36'-40'	48"/48"	10		SAA	PID=0.0ppm
	40'-44'	48"/48"	11		SAA	PID=0.0ppm

Well Screened from 32'-42' bgs

PROJECT NUMBER	BORING NUMBER	
429391	GWO24A	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Site 1 | LOCATION : Yorktown NWS

ELEVATION: | DRILLING CONTRACTOR : Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED : DPT CMENG

WATER LEVELS : 30.16 ft (TOC) | START : 4/30/2013 | END : | LOGGER : Brian Wachter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
	0-4	MC1	2.5/4		0-1- Topsoil, dark yellowish brown (10YR3/4), moist, loose, organics (roots) 1-2.5- SAND (SP), poorly graded, fine-medium grained (fine downward), yellowish brown (10YR5/6), moist, loose 2.5-4: NO RECOVERY	PID: 0 PID: 0 PID: 0 PID: 0
5	4-8	MC2	4/4		4-7- SAND (SP), poorly graded, fine grained, very pale brown (10YR8/4), moist, loose	PID: 0 PID: 0 PID: 0
	8-12	MC3	4/4		7-10- CLAYEY SAND (SC), yellowish brown (10YR5/8), moist, loose, sand with little clay	PID: 0 PID: 0
10	12-16	MC4	4/4		10-12- SANDY CLAY (CL), reddish yellow (5YR6/8), moist, stiff, clay with little sand 12-16- SANDY (CL), yellowish red (5YR5/8), moist, stiff, clay with some sand	PID: 0 PID: 0 PID: 0 PID: 0 PID: 0
15	16-20	MC5	4/4		16-19.5-CLAYEY SAND (SC), pale brown, (10YR6/3), moist, medium dense, sand with trace clay 17.5-20.5- SANDY CLAY (CL), reddish yellow (5YR6/8), moist, stiff, clay with little sand	PID: 0 PID: 0 PID: 0 PID: 0 PID: 0
20	20-24	MC6	4/4		20.5-25- SANDY SILTY CLAY (CL), light reddish brown (5YR6/4), moist, wet, stiff, clay and sand and sluff hash	PID: 0 PID: 0 PID: 0 PID: 0 PID: 0
25	24-28	MC7	3/4		25-27- NO RECOVERY	PID: 0 PID: 0 PID: 0
	28-32	MC8	4/4		27-33- SANDY CLAY (CL), yellowish brown (10YR5/4)) wet, soft to medium stiff, clay and sand and shell hash	PID: 0 PID: 0
30	32-36	MC9	4/4		33-36- CLAYEY SAND (SC), yellowish brown (10YR5/4), wet, medium dense, sand and clay and shell hash)	PID: 0 PID: 0 PID: 0 PID: 0 PID: 0
35	36-40	MC10	4/4		36-42.5- CLAYEY SILTY SAND (SM), yellowish brown (10YR5/4), wet, loose, sand and silt with trace clay and some shell hash)	PID: 0 PID: 0 PID: 0 PID: 0 PID: 0

PROJECT NUMBER	BORING NUMBER	
429391	GWO24A	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Site 1 — LOCATION : Yorktown NWS

ELEVATION: — DRILLING CONTRACTOR : Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED : DPT CMENG

WATER LEVELS : 30.16 ft (TOC) — START : 4/30/2013 — END : — LOGGER : Brian Wachter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
40	40-44	MC11	4/4			PID: 0
						PID: 0
					42.5-44.5 SAND (SP), poorly graded, fine grained, yellowish brown (10YR5/8), medium dense	PID: 0
						PID: 0
	44-48	MC12	4/4		44.5-47- SILTY SAND (SM), yellowish brown (10YR5/4), wet, loose, sand and silt and trace shell hash	PID: 0
45						PID: 0
						PID: 0
					47-48.5 SILTY SAND (SM), yellowish brown (10YR5/4), wet, medium dense, sand with little silt and some shell hash	PID: 0
	48-52	MC13	4/4		48.5-50- SILTY SAND (SM) brown (10YR5/3), wet, loose, sand with some silt and trace shell hash	PID: 0
						PID: 0
50					50-52- SAND (SP), poorly graded, fine grained, brown (10YR5/3), wet, medium dense	PID: 0
						PID: 0
	52-56	MC14	4/4		52-54, SHELLY SILTY SAND (SM) brown (10YR5/3), wet, loose, sand with some silt and shally hash	PID: 0
						PID: 0
					54-57.5- SHELLY SILTY SAND (SM), bluish gray (GLEY 2 5/1), wet, medium dense, sand with trace silt and little shell	PID: 0
55						PID: 0
	56-58	SS1	2/2			PID: 0
					57.5-60- SANDY CLAY (CL), bluish gray (GLEY 2 10BG 6/1), wet, medium stiff, clay with some sand and little shell hash	PID: 0
						PID: 0
	58-60	SS2	2/2			PID: 0
60					60-62- CLAYEY SAND (SC), dark greenish gray (GLEY 2 10BG 4/1), wet, medium dense, sand with little clay and little shell hash	PID: 0
	60-62	SS3	2/2			PID: 0
					62-63- SILTY SAND (SM), dark greenish gray (GLEY 2 10BG 4/1), wet, medium, dense, sand and silt	PID: 0
	62-64	SS4	1/2		63-64- NO RECOVERY	PID: 0
					64-68- SILTY SAND (SM), dark greenish gray (GLEY 2 10BG 4/1), wet, medium dense, sand with some silt and trace shell hash	PID: 0
65	64-66	SS5	2/2			PID: 0
						PID: 0
	66-68	SS6	2/2			PID: 0
					68-70- SAND (SW), well graded, fine grained, greenish gray (GLEY 2 10 BG 5/1), wet, medium dense, sand with little shell hash	PID: 0
	68-70	SS7	2/2			PID: 0
70					70-71- SAND (SW), well graded, fine grained, greenish gray (Gley 2 10 BG 5/1), wet, medium dense, sand with little shell hash	PID: 0
	70-72	SS8	2/2		71-74- CLAYEY SAND (SC), greenish gray (GLEY 2 10 BG 5/1), medium dense, sand with little clay and little shell hash	PID: 0
						PID: 0
	72-74	SS9	2/2			PID: 0
					74-80- SILTY SAND (SM), greenish gray (GLEY 2 10 BG 5/1), medium dense, sand with some silt and little shell hash	PID: 0

PROJECT NUMBER	BORING NUMBER	
429391	GWO24A	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Site 1 | LOCATION : Yorktown NWS

ELEVATION: | DRILLING CONTRACTOR : Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED : DPT CMENG

WATER LEVELS : 30.16 ft (TOC) | START : 4/30/2013 | END : | LOGGER : Brian Wachter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
75	74-76	SS10	2/2			PID: 0
						PID: 0
	76-78	SS11	2/2			PID: 0
						PID: 0
	78-80	SS12	2/2			PID: 0
80					80-82- CLAYEY SAND (SC), bluish gray (GLEY 2 5/1 10PB), wet, medium dense, sand with some clay and some shell hash	PID: 0
	80-82	SS13	2/2			PID: 0
					82-86- CLAYEY SAND (SC), grayish brown (10YR 5/2), wet, medium dense, sand with some clay and little shell hash	PID: 0
	82-84	SS14	2/2			PID: 0
						PID: 0
85	84-86	SS15	2/2			PID: 0
					86-93.5- SILTY SAND (SM) greenish gray (GLEY 2 10 BG 5/1), wet, dense, sand and silt with little clay and trace shell hash	PID: 0
	86-88	SS16	2/2			PID: 0
						PID: 0
	88-90	SS17	2/2			PID: 0
90						PID: 0
	90-92	SS18	2/2			PID: 0
						PID: 0
	92-94	SS19	2/2		93.5-94- SILTY CLAY (CL), greenish gray (Gley 2 10 BG 5/1), wet, medium stiff, clay and silt	PID: 0
						PID: 0
95	94-96	SS20	2/2		94-96- SILTY CLAY (CL), greenish gray (GLEY 2 10 BG 5/1), moist, medium stiff, clay and silt	PID: 0
						PID: 0
	96-98					
	98-100					
100						
					END OF BORING 96 FEET	

PROJECT NUMBER	BORING NUMBER	
429391	GWO26A	SHEET 1 OF 1

SOIL BORING LOG

PROJECT :Site 1 LOCATION : Yorktown NWS

ELEVATION : DRILLING CONTRACTOR : Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED : DPT CMENG

WATER LEVELS : START : 5/30/13 END : 6/5/13 LOGGER : Brian Wachter, Melanie Young

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
	0-4	MC1	4/4		0-3- CLAYEY SILTY SAND, (SM), dark brown, (10YR3/3), dry very loose sand and silt with trace clay	PID: 0.1 PID: 0.2
					3-5- SANDY SILTY CLAY (CL) brownish yellow (10YR 6/8), moist, medium stiff, clay and silt with little sand	PID: 0.1 PID: 0.1
5	4-8	MC2	4/4		5-6.5- SILTY SAND (SM), yellow (10YR8/6), dry, very loose, sand with little silt	PID: 0.2
					6.5-8- SANDY SILTY CLAY (CL), yellowish brown (10YR 5/8), moist, medium stiff clay with some silt and trace sand	PID: 0.1 PID: 0.1
					8-10.5- CLAYEY SAND (SC), light yellow from (10YR6/4), moist, loose, sand with trace clay	PID: 0.1
	8-12	MC3	4/4			PID: 0.1
10					10.5-14- SILTY CLAY (CL), yellowish brown (10YR5/8), moist stiff, clay with some silt	PID: 0.1 PID: 0.2
	12-16	MC4	4/4			PID: 0 PID: 0
					14-15.5- SILTY CLAY (CL), yellowish brown (10YR5/8), moist, medium stiff, clay and silt	PID: 0
15					15.5-19- SHELLY SANDY CLAY (CL), greenish gray (GLEY 2 6/1 10BG), medium stiff clay and sand with some shell hash	PID: 0
	16-20	MC5	4/4			PID: 0 PID: 0 PID: 0
					19-20 SHELLY SANDY CLAY (CL) brown (10YR 5/3) wet, soft clay and sand with some shell hash	PID: 0
20					20-23- SHELLY CLAYEY SAND (SC) greenish gray (Gley 2 6/1 10 BG), wet, loose, sand with little clay and little shell hash	PID: 0
	20-24	MC6	4/4			PID: 0
					23-24- SHELLY SILTY SAND (SM) greenish gray (Gley2 6/1 10BG), wet, loose, sand with little silt and little shell hash	PID: 0 PID: 0
					24-26.5 SHELLY CLAYEY SAND (SC), greenish gray (Gley 2 6/1 10 BG), wet, loose, sand and clay with some shell hash	PID: 0
25	24-28	MC7	3/4			PID: 0
					26.5-28- SHELLY SILTY SAND (SM), greenish gray (Gley 2 6/1 10 BG), wet, loose, and with some silt and some shell hash	PID: 0 PID: 0
					28-36- SILTY SAND (SM), grayish brown (2.5 YR 5/2), wet loose, sand, and silt with trace shell hash	PID: 0
	28-32	MC8	4/4			PID: 0
30						PID: 0 PID: 0 PID: 0
	32-36	MC9	4/4			PID: 0 PID: 0

PROJECT NUMBER	BORING NUMBER	
429391	GWO26A	SHEET 1 OF 1

SOIL BORING LOG

PROJECT :Site 1 LOCATION : Yorktown NWS

ELEVATION : DRILLING CONTRACTOR : Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED : DPT CMENG

WATER LEVELS : START : 5/30/13 END : 6/5/13 LOGGER : Brian Wachter, Melanie Young

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
35						PID: 0
					36-40.5 SHELLY SILTY SAND (SM), greenish gray (GLEY 2 6/1 10 BG), wet, medium dense, sand with little silt and trace shell hash	PID: 0
	36-40	MC10	4/4			PID: 0
						PID: 0
						PID: 0
40	40-44	MC11	4/4		40.5-43.5- SHELLY SILTY SAND (SM), grayish brown (2.5 Y 5/2), wet loose, sand and silt with some shell hash	PID: 0
						PID: 0
						PID: 0
					43.5-44.5- SILTY SAND (SC) greenish gray (Glay 2 6/1 10 BG), wet, medium dense, sand with little silt and little shell hash	PID: 0
	44-48	MC12	4/4		44.5-47- SANDY SILTY CLAY, greenish gray (Gley 2 6/1 10 BG), moist, medium stiff, clay and silt with trace sand and trace shell hash	PID: 0
45						PID: 0
						PID: 0
					47-48-SANDY CLAY (CL), greenish gray (Gley 2 6/1 10 BG), wet, soft, clay and sand with little shell hash	PID: 0
						PID: 0
						PID: 0
50	50-54	MC13	4/4		50-52.5 SILT AND SAND (SM), dark greenish gray (5 GY 4/1) wet, medium dense, fine- medium, well sorted sand. Shells 50-52	PID: 0
						PID: 0
					52.5-54- SAND AND SILT (SM), dark greenish gray (% GY 4/1), wet, medium dense, fine to coarse sand, few small rounded pebbles throughout and trace shells, medium sorted	PID: 0
						PID: 0
						PID: 0
55	55-59	MC14	4/4		55-58.5, SILT AND SAND, little shells (SM), dark greenish gray (5 GY 4/1), wet, medium dense, fine to medium grained sand, well sorted	PID: 0
						PID: 0
						PID: 0
					58.5-59- SAND SOME SILT, (SM), dark greenish gray (5 GY 4/1), wet, medium dense, fine-medium well sorted sand	PID: 0
						PID: 0
60	60-64	MC15	4/4		60-64 SILT AND SAND (SM), dark greenish gray, (5 GY 4/1), wet, medium dense, fine-medium, well sorted sand, shells throughout. 60.8-61 layer of white shells	PID: 0
						PID: 0
						PID: 0
						PID: 0
						PID: 0
65	65-69	MC16	4/4		65-60 SAA, trace shells throughout, no shell layer	PID: 0
						PID: 0
						PID: 0
						PID: 0
						PID: 0

PROJECT NUMBER	BORING NUMBER	
429391	GWO26A	SHEET 1 OF 1

SOIL BORING LOG

PROJECT :Site 1 LOCATION : Yorktown NWS

ELEVATION : DRILLING CONTRACTOR : Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED : DPT CMENG

WATER LEVELS : START : 5/30/13 END : 6/5/13 LOGGER : Brian Wachter, Melanie Young

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
70	70-74	MC17	4/4		70-74- SAA	PID: 0 PID: 0 PID: 0 PID: 0 PID: 0
75	75-79	MC18	4/4		75-79- SAA	PID: 0 PID: 0 PID: 0 PID: 0 PID: 0
80	80-84	MC19	4/4		80-84- SAA, less dense, shell later at 81.8-82	PID: 0 PID: 0 PID: 0 PID: 0 PID: 0
85	85-89	MC20	4/4		85-85.2 SAA 85.2-89- SILT trace sand (ML), dark greenish gray (5 GY 4/1) wet, firm- stiff, slight plasticity, trace shells throughout	PID: 0 PID: 0 PID: 0 PID: 0 PID: 0
90	90-94	MC21	4/4		90-90.5-SAA, shells at 91 90.5-94- CLAY and sand to clay trace sand (CL), dark greenish gray (G GY 4/1) wet, firm- stiff, slight to low plasticity, trace shells throughout	PID: 0 PID: 0 PID: 0 PID: 0 PID: 0
95	95-99	MC22	4/4		95-95.3- SAA, shells- trace 95.3-99- CLAY, less than trace very very fine sand (CL), dark greenish gray (5GY 4/1), wet, firm, low to med plasticity	PID: 0 PID: 0 PID: 0 PID: 0
100					**END OF BORING 99 FEET**	

PROJECT NUMBER	BORING NUMBER	
429391	GWO27A	SHEET 1 OF 1

SOIL BORING LOG

PROJECT :Site 1 | LOCATION : Yorktown NWS
ELEVATION : | DRILLING CONTRACTOR : Parratt Wolff
DRILLING METHOD AND EQUIPMENT USED : DPT CMENG
WATER LEVELS : | START : 5/13/13 | END : | LOGGER : Brian Wachter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
	0-4	MC1	2/4		0-1- SILTY SAND (SM), dusky yellowish brown (10YR 4/6), dry, loose, sand with trace silt	PID: 0
					1-2- SAND (SP) poorly graded, fine grained, brownish yellow (10YR6/8), dry, loose	PID: 0
					2-4 NO RECOVERY	
					4-10- SANDY SILTY CLAY (CL), brownish yellow (10YR6/6), moist, stiff, clay and silt with trace sand, increasing sand with depth	
5	4-8	MC2	4/4			PID: 0.2
						PID: 0.1
						PID: 0.1
						PID: 0.1
	8-12	MC3	4/4			PID: 0.1
10					10-12- SILTY CLAY (CL), reddish brown (2.5YR5/4), moist, very stiff, clay with some silt	PID: 0.1
						PID: 0.2
					12-14.5 SANDY SILTY CLAY (CL), reddish yellow (5YR6/8), moist, stiff, clay and silt with little sand	PID: 0
	12-16	MC4	4/4			PID: 0
						PID: 0
15					14.5-16- SILTY CLAY (CL), gray (gley 6/N), moist, very stiff, clay and silt	PID: 0
					16-19.5-SANDY SILTY CLAY (CL), brownish yellow (10YR6/8), moist, medium, stiff, clay and silt with trace sand	PID: 0
	16-20	MC5	4/4			PID: 0
						PID: 0
					19.5-20- CLAYEY SAND (SC), brownish yellow (10YR6/8), moist, medium dense, sand with little clay	PID: 0
20					20-22.5- SILTY CLAY (CL), gray (10YR6/1), moist, soft to medium stiff clay and silt	PID: 0
	20-24	MC6	4/4			PID: 0
					22.5-26- CLAYEY SAND (SP), very pale brown (10YR 8/3), wet, medium dense, sand, and clay and shell hash	PID: 0
						PID: 0
						PID: 0
25	24-28	MC7	4/4			PID: 0
					26-28- SANDY CLAY (CL), very pale brown (1-YR8/3), wet, soft, clay and sand and shell hash	PID: 0
						PID: 0
					28-30- SANDY CLAY (CL), greenish gray (GLEY 6/1 10 BG), wet, soft, clay with some sand and some shell hash	PID: 0
	28-32	MC8	4/4			PID: 0
					30-31.5- SILTY CLAY (CL), greenish gray (Gley 2 6/1 10BG), moist to wet, medium stiff, clay and silt with little shale hash	
30						PID: 0
					31.5-33.5- SANDY CLAY (CL), greenish gray (Gley 2 5/1 10BG), wet, medium stiff, clay with some sand and little shell hash	PID: 0
						PID: 0
					33.5-36- CLAYEY SAND (SC), greenish gray (Gley 2 5/1 10 BG), wet, loose to medium dense, sand with little clay and little shell hash	
	32-36	MC9	4/4			PID: 0
						PID: 0
35						PID: 0
					36-37- SILTY SAND (SM), greenish gray (Gley 2 5/1 10 BG), wet, loose, sand and clay with little shell hash	PID: 0
	36-40	MC10	4/4			PID: 0

PROJECT NUMBER	BORING NUMBER	
429391	GWO27A	SHEET 1 OF 1

SOIL BORING LOG

PROJECT :Site 1 LOCATION : Yorktown NWS

ELEVATION : DRILLING CONTRACTOR : Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED : DPT CMENG

WATER LEVELS : START : 5/13/13 END : LOGGER : Brian Wachter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
						PID: 0
					39-41- CLAYEY SILTY SAND (SM), greenish gray (Gley 2 5/1 10 BG) wet, medium dense, sand with some silt and trace clay and trace shell hash	PID: 0
40	40-44	MC11	4/4			PID: 0
					41-43- CLAYEY SILTY SAND (SM), greenish gray (Gley 2 5/1 10 BG), wet, loose, sand and silt with little clay and trace shells hash	PID: 0
						PID: 0
					43-47- SILTY SAND (SM), greenish gray (Gley 2 5/1 10 BG), wet, medium dense, sand with trace silt and trace shell hash	PID: 0
	44-48	MC12	4/4			PID: 0
45						PID: 0
						PID: 0
					47-48.5, SANW), well graded, fine grained greenish gray (Gley 2 5/1 10 BG), wet, medium dense sand with trace shell hash	PID: 0
					48.5-51- CLAYEY SILTY SAND (SM), greenish gray (Gley 2 5/1 10 BG), wet, loose, sand and silt with trace clay and shell hash	PID: 0
	48-52	MC13	4/4			PID: 0
50						PID: 0
					51-52- SILTY SAND (SM), greenish grey (Gley 2 5/1 10BG), wet, medium dense, sand with trace silt	PID: 0
	52-56	MC14	4/4		53-53.5- SAA loose, sand and silt	PID: 0
					53.57- SILTY SAND (SM), greenish gray (Gley 2 5/1 10 BG), wet, medium dense, sand with little silt	PID: 0
						PID: 0
55						PID: 0
	56-58	SS1	2/2			PID: 0
					57-58- SANDY SILTY CLAY (CL) greenish gray (Gley 2 5/1 10 BG), wet, medium dense, clay and silt with trace sand	PID: 0
	58-60				58-60- SANDY CLAY (CL), greenish gray (Gley 2 5/1 10 BG), wet, soft, clay and sand and shell hash	PID: 0
		SS2	2/2			PID: 0
					60-62- CLAYEY SAND (SC) greenish gray (Gley 2 5/1 10 BG), wet, medium dense, sand with little clay and trace shell hash	
60	60-62					PID: 0
		SS3	2/2			PID: 0
					62-72- SILTY SAND (SM), greenish gray (Gley 2 5/1 10 BG), wet, medium dense, sand with some silt and little shell hash, decreasing shell hash with depth	
	62-64					PID: 0
		SS4	2/2			PID: 0.1
	64-66					PID: 0
65		SS5	2/2			PID: 0
	66-68					PID: 0
		SS6	2/2			PID: 0
	68-70					PID: 0.1
		SS7	2/2			PID: 0.1
70	70-72					PID: 0
		SS8	2/2			PID: 0
					72-74- SILTY SAND (SM), greenish gray (Gley 2 5/1 10 BG), wet, medium dense, sand with little silt and trace shell hash	
	72-74					PID: 0
		SS9	2/2			PID: 0
					74-76- CLAYEY SILTY SAND, greenish gray (Gley 2 5/1 10 BG), wet, medium dense, sand with some silt and trace clay and trace shell hash	
	74-76					PID: 0

PROJECT NUMBER	BORING NUMBER	
429391	GWO27A	SHEET 1 OF 1

SOIL BORING LOG

PROJECT :Site 1 LOCATION : Yorktown NWS

ELEVATION : DRILLING CONTRACTOR : Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED : DPT CMENG

WATER LEVELS : START : 5/13/13 END : LOGGER : Brian Wachter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
75		SS10	2/2			PID: 0
	76-78				76-82- SILTY SAND (SM) greenish gray (Gley 2 5/1 10 BG), wet, medium dense, sand with some silt and trace shell hash	PID: 0.1
		SS11	2/2			PID: 0
	78-80					PID: 0
		SS12	2/2			PID: 0.1
80	80-82					PID: 0.1
		SS13	2/2			PID: 0.1
	82-84				82-86- CLAYEY SILTY SAND (SM), greenish gray (Gley 2 5/1 10 BG), wet, dense, sand and silt with trace clay and trace shell hash	PID: 0.3
		SS14	2/2			PID: 0.3
	84-86					PID: 0.3
85		SS15	2/2			PID: 0.1
	86-88				86-90- SANDY CLAY (CL), greenish gray (Gley 2 5/1 10 BG), wet, soft to medium stiff, clay and sand with trace shell hash	PID: 0.3
		SS16	2/2			PID: 0.4
	88-90					PID: 0.3
		SS17	2/2			PID: 0.3
90	90-92					
		SS18	2/2			
	92-94					
		SS19	2/2			
	94-96					
95		SS20	2/2			
	96-98					
	98-100					
100						
					END OF BORING 90 FEET	

Appendix B
Historical Photographs

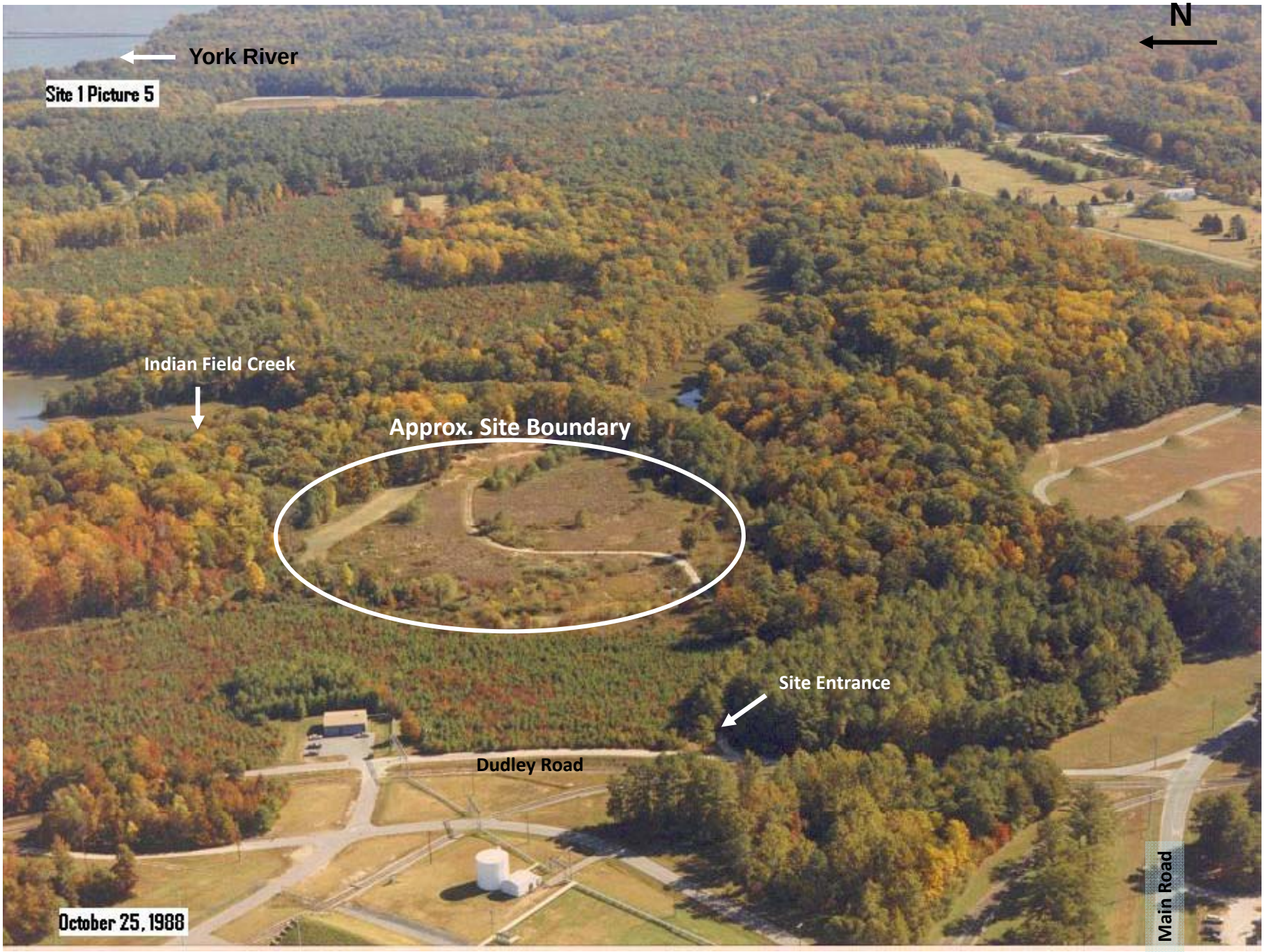
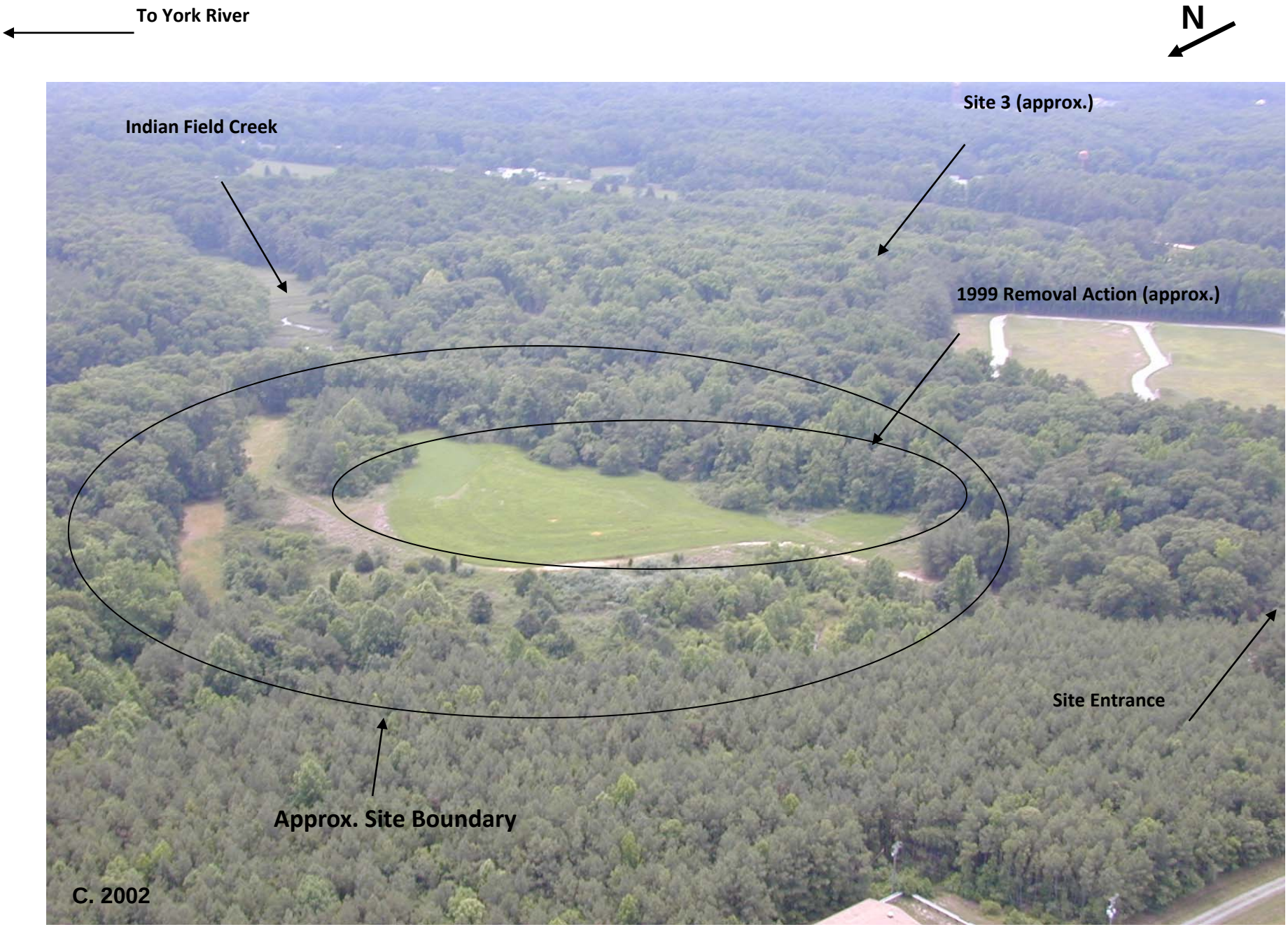
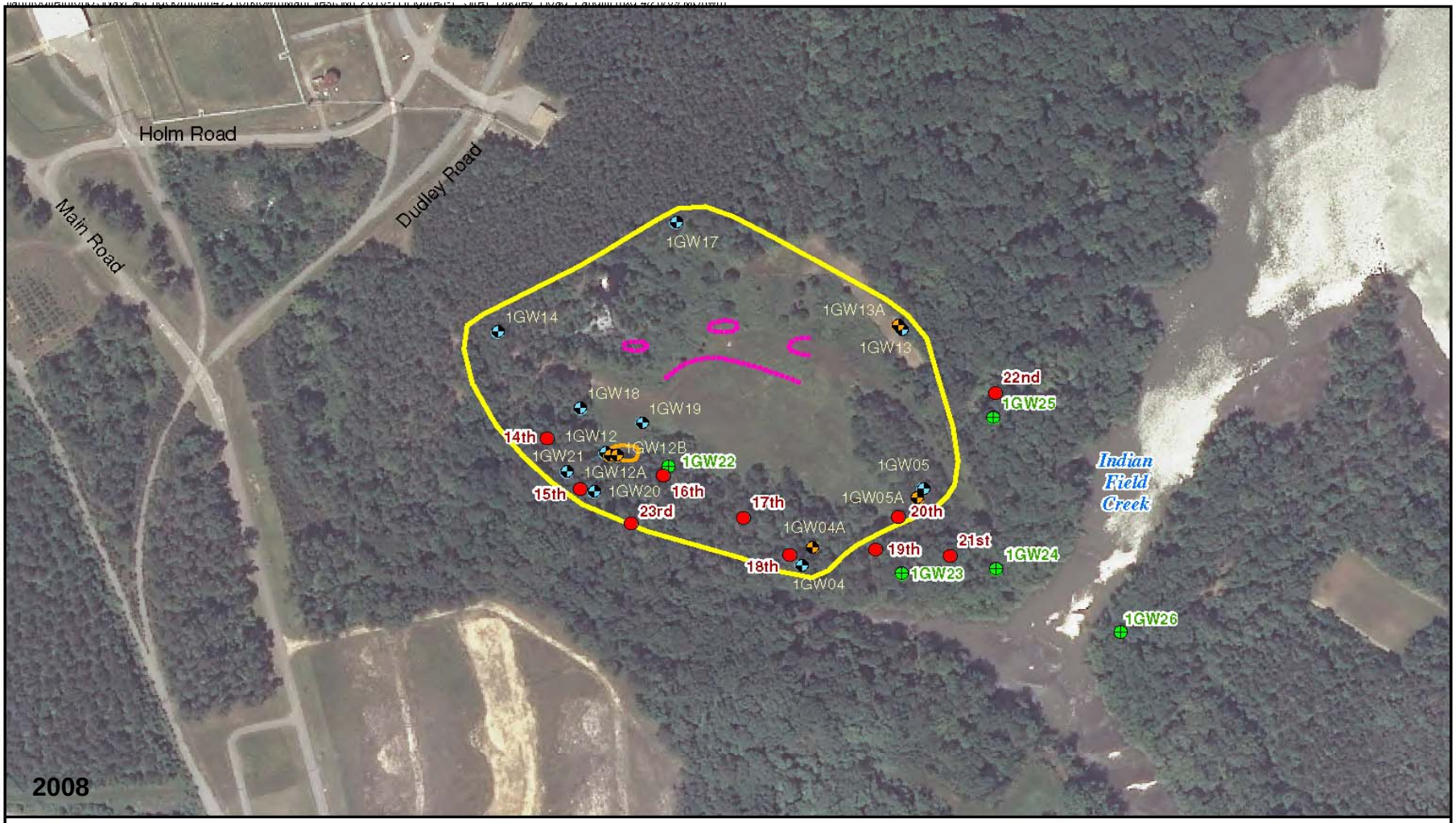

N
York River
Site 1 Picture 5
Indian Field Creek
Approx. Site Boundary
Site Entrance
Dudley Road
Main Road
October 25, 1988

FIGURE II
YORKTOWN NAVAL WEAPONS STATION

VEGETATION STRESS ANALYSIS
JULY 7, 1992

APPROX. SCALE 1: 19,950


To York River
N
Indian Field Creek
Site 3 (approx.)
1999 Removal Action (approx.)
Site Entrance
Approx. Site Boundary
C. 2002



Legend

- Columbia Monitoring Wells
- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Area of Excavation of Arsenic Contaminated Soil
- Interpreted (Geophysical Survey) Northern Extent of Main Disposal Area (Roy F. Weston, Inc., 1993)
- MIP Locations
- Proposed Monitoring Well Locations

N W E S

0 150 300 Feet

CH2MHILL

Appendix C
Test Pit Photographs and Field Notes

Location Yorktown Date 6.11.13

Project / Client Site 1

M.y. MW Development

weather: partly cloudy, high 80s, humid

1515 Jim onsite, backhoe 1st thing a.m. Jim offsite to get water + drums

1530 Turbidity still high. Purged ~1100-1430 high turb. Slow pump rate for ~1 hr still high turb. Inform K.B. & turn up flow.

1605 Take 1 more reading on YSI Turbidity ~25 NTU. Done w development

- Inform K.B. says 25 NTU is low enough.

GW024A Development COMPLETE

1610 Start to clean GW024A area

- Set up at GW26 cluster

1710 offsite, lock gate

Melanie Clapsy
6.11.13

Location Yorktown Date 6.12.13

Project / Client Site 1 429391.F1FS.01

M.y. Test Pits, MW Development

weather: mostly sunny, morning 70's, after noon high ~94, 20% rain

0650 Pass + 1D office
Parratt Wolff onsite

0730 H+S overview, heat, ticks
discuss daily events

0735 MY calls K.B discuss plan
- start development then test pit

0745 Calibrate minirae

Type	Pine SN	VOC	fresh air
minirae	19787	100.0	0.0

Calibrate YSI 6920 (Pine SN)

DO	94.5		100.4
Turb 0NTU	24.5		out of range
cond	~~1.36~~	1.370	1.413
pH1(7)	6.90		6.99
pH2(4)	4.8		4.1
ORP	236		240
Turb 126NTU	126		126

0840 Jim to go get backhoe

0848 Jim onsite w/ backhoe

0920 Start TP10

Location Yorktown Date 6 12 13

Project / Client Site 1

MY, MW Development, Test Pit

Test Pit 10 5' bgs debris

0940 ~5' bgs. brown sandt silt, decayed wood ~4'. Piece ~3' piece of metal encountered at ~5' bgs. Fill hole after calling Kristen.

- Decon

Test Pit 11 2.5' bgs debris

1024 Start

1026 Find debris, fabric (carpet like fiber, or tarplike, or heavy canvas burlapsak type at ~2.5 ft bgs, soil type same as TP 10 Fill in, decon

1042 Test Pit 9 2-2.5' debris

- Topsoil, brown silt and clay

~2-2.5' long piece of heavy duty fabric found 3 plus yards long, red, red + green, fill - wood. not natural decaying wood

- Decon

Location Yorktown Date 6 12 13

Project / Client Site 1

MY GW026A Development

GW026A Development

start 0900 6 12 13 end:

Time	Temp	Cond	pH	orp	Turb	DO	Gal purged	WL
0900	17.26	.330	6.07	155.9	110.9	54.6	—	9.87
0915	16.39	.383	6.84	140.2	1727.6	52.0	~15	—
0920	Went - Dry				—	—	~20	~88
1010	17.36	.535	8.29	112.1	1319	50.3	~20	~48
1053	Went - Dry				—	—	~35	~88
~~1200~~ 1137	Start pumping				—	—	—	~~~~ ~50
1200	18.47	.459	8.01	114	138	35	~40	—
1205	Stop pumping - lunch						—	—
1330	Start pumping				—	—	—	29.3
1410	Went Dry				—	—	—	—
1505	19.90	.400	7.98	111.7	1138	31.8	~57	~37.5
1530	Went dry -				—	—	—	—
~~1605~~ 1605	17.85	.389	7.98	130.3	1180	54	~73	—
	Went Dry				—	—	~85	—
1635	25.60	.342	7.85	142.3	458	27.1	~90	~69

1640 went Dry - end for day

cont 10.7

Location Yorktown Date 6.12.13

Project / Client Site1

My. MW Development + Test Pits

Test Pit 12 8' bgs No Debris

1105 Start test Pit 12

Topsoil, Silty sand, brown becomes more sandy ~4' bgs red brown, roots

~7ft, small white pebbles, coarse sand.

~8' found nothing, caving in badly, backfill

Decon

Test Pit 3 5.5' bgs Debris

1145 Start Test Pit 3

Sand and silt, brown (under topsoil)

~1155 Metal Debris ~5.5 ft bgs

- back fill
- decon
- lunch

1330 Start to redevelop

Test Pit 18 8 bgs No debris

1332 Start

1345 End, Topsoil, silty sand, dark brown to red brown

Total Depth ~8', started to

Location Yorktown Date 6.12.13

Project / Client Site 1

My MW Development + Test Pits

collapse so stopped at 8'

water table encountered at 8' bgs, no debris

- backfill
- decon

Test Pit 2 4 bgs Debris

1408 Start

1418 End, Topsoil, silty sand dark brown to red brown, ~3' bgs white material ~4' bgs a layer of burnt wood

- backfill ▽ ~4' bgs

Test Pit 5 7' bgs no debris

1436 Start test Pit 5

1445 Stop ~7' bgs, ▽ ~7' bgs

collapsing, no debris

Topsoil, silty sand, dark brown - red brown / orangey

- backfill
- decon

Test Pit 6 7' bgs No Debris

1520 Start test Pit 6

Silty sand, brown to red / orange brown

Location Yorktown Date 6·12·13
Project / Client Site 1
M.Y. MW Development / Test Pits

~7' bgs, ▽ encountered, water actually flowing into hole - causing collapse end at 7' bgs no debris
- backfill
- decon

1545 [Test Pit 15] 8' bgs No Debris
Start TP15, SILTY SAND, topsoil lt brown sand, to orange brown sand, Gray sand ~4', ▽ ~4' water flowing in, dig to 8' collapse, stop digging

1553 End Digging
- backfill
- decon

1605 [Test Pit 13] 4' bgs No Debris
1614 start end Silty sand, (under topsoil) lt brown to gray sand ~ 4' bgs too much water to dig further hole started to fill up
- fill hole
- decon
- pickup MW development

1700 lock gate, offsite
Melanie Cyrus 6.12.13

Location Yorktown Date 6·13·13
Project / Client Site 1
M.Y, KS MW Development / Test Pits

weather: morning 80's afternoon 90 heat index 105, storms likely

0645 MY Pass + ID
- MY onsite
- Kathryn Smith onsite
- transfer equipment

Calibrate YSI 6920 (Pine SN)

	reading 1	reading 2
DO	108.4	100.2
Turb (0)	-12.3	0.2
cond	.790	1.379
pH 7	6.40	7.02
pH 4	4.02	3.99
orp	228.4	240.2
Turb 126	125.1	126.2

Calibrate MiniRae 19787
VOC: fresh air:

0720 Parratt Wolff onsite
H+S overnew, HEAT! :(
- set up to develop both GW026 + GW026A

0820 Start Develop
- move to TP7

Location Yorktown Date 6.13.13

Project / Client Site 1

My, KS MW Development / Test Pit

Test Pit 7 8' collapse to 4'; No Debris

0820 Start test Pit 7

SAND little silt, light brown to orange brown (under topsoil) sand coarse grained (all sand in all soil coarse grained so far). Dug to 8' collapse to ~4'; water flowing in hole No Debris

0830 Fill in hole

- decon

Test Pit 16 8' No debris

0849 Start test Pit 16

Top soil, sand and silt to sand little silt, coarse grained, some small pebbles. Dig to 8' no debris, no water.

0902 fill in

- decon

0918 Test Pit 4 8' no debris

Start test pit 4

Top soil, sandy silt, moving to silt, clay material.

Location Yorktown Date 6.13.13

Project / Client Site 1

My, KS MW Develop Test Pit

GW026 A Development

Time	Temp	Cond	pH	orp	Turb	Do	Gal Purged	WL
830	17.54	.673	7.87	17.82	1236	2.03	5	11.50
~830	Went	Dry		—	—	—	—	—
1325	17.67	.606	8.71	63.5	502.6	4.06	—	15.35
13.35	17.77	.584	8.43	98.9	521.3	4.24	~10.7	
1340	Went	Dry						
1515	18.28	0.589	8.49	140.4	~~140.4~~ 154.1	405.2	~~405.2~~ 4.01	34.3
—	16.85	.639	8.31	~~154.1~~ 154.1	~~140.4~~ 154.1	714.2	~~714.7~~ 2.72	—
—	16.71	.582	8.29	156.8	~~156.8~~ 154.1	1722.2	~~1722.2~~ 3.04	—
—	17.26	.573	8.27	158.8	~~158.8~~	927.2	~~927.2~~ 4.07	—

Location Yorktown Date 6.13.13

Project / Client Site 1

MY, KS MW Development / Test Pits

Test Pit 4 continued

native wood chunk about 4' orange brown to gray clay / silt, gray ~7' bgs
backfill
- decon

Test Pit 14 ~1' bgs metal debris

0945 Start

0948 ~1' down into topsoil long (~6') piece of metal ~ 4' wide.
- fill in, decon

Test Pit 1 ~3.5-4' metal, Plastic, fibers

1015 Start

1020 Stop, topsoil, reddish brown sand, some silt, debris ~3.5-4' bgs, Plastic bags, carpet fabric type fibers but long over a foot - cluster of this, and long thin metal, ~~tet~~ backfill, clean
- call KB - can't access TP17 due to thick brush on one side and standing water other, adds 3 test pits to south of 9, 10, 11. (TP19, 20, 21)

Location Yorktown Date 6.13.13

Project / Client Site 1

MY, KS MW Development / Test Pit

GW026 Development

Time	Temp	Cond	pH	Orp	Turb	Do	Gal Purged	WL
0910	16.94	.551	8.06	139.0	1730	3.45	—	
925	16.68	.545	7.77	137.5	1695.6	4.52	—	17.3
940	16.47	.558	7.72	112	1602.0	2.80	—	28
955	16.44	.552	7.70	24.6	884.9	3.28	—	40
1005	16.38	.555	7.71	17.8	640.7	3.72	—	45
1015	16.59	.542	7.67	-10.0	571.9	3.30	—	50
1020	15.91	.559	7.68	-9.2	484.7	2.94	—	55
1025	18.23	.519	7.69	20.3	1681.7	1.54	—	—
1030	16.87	.552	7.62	19.8	1068	3.46	—	—
1045	16.03	.569	7.68	-2.5	880.5	3.91	—	—
1100	16.32	.546	7.72	-15.6	1313.2	4.77	—	—
1105	16.38	.548	7.74	9.1	806.9	4.53	—	—
1110	16.30	.541	7.58	-29.5	749.9	2.45	—	—
1115	16.64	.542	7.60	-24.3	486.0	4.46	—	—
1120	16.67	.549	7.70	10.8	368.5	5.16	—	—

con't #6115

Location Yorktown Date 6 13 13

Project / Client Site1

My, KS Test Pits, MW Development

Test Pit 8 8' no debris

1050 Start test Pit 8

1110 Finish, topsoil, sand and silt to sand some silt, coarse grained lt brown to orange brown. 8 bags total, no debris

NOTE: some borings like 13 were dug deeper than noted (8') however collapse was immediate)

- backfill, clean

Test Pit 19 Debris @ ~3'

Northing: 3624012.28

Easting: 1204565.50

HAE -76.56

1125 Start

1130 Stop, Topsoil, sand + silt, coarse sand, light brown to orange brown. Debris ~2.5-3' bgs plastic, plastic spoon, metal

- backfill

~~TP~~ Test Pit 20 8' no debris

1150 Start test pit 20

1205 end, HAE: 93.99

northing: 3623946.96

easting: 1204589.68

Location Yorktown Date 6 13 13

Project / Client Site1

My, KS Test Pits, MW Development

Test Pit	Northing	Easting
Test Pit 2	3624168.09	12045735.65
Test Pit 3	accurate to plan	
Test Pit 6	3624~~200.63~~ 302.86	1204~~5680~~ 894.63 72
Test Pit 7	3624296.01	12045895.77
Test Pit 8	3624045.09	12045526.34
Test Pit 9	3624072.41	12045651.44
Test Pit 10	3623985.58	12045889.05
Test Pit 11	accurate to plan	
Test Pit 12	3624164.67	12045538.34

2 = -73.62 ft HAE

3 = accurate to plan

~~4~~6 = -73.36

~~5~~7 -61.96

8 -40.00

9 -74.94

10 -73.13

11 accurate to plan

12 -50.66

Location Yorktown Date 6.13.13
Project / Client Site 1
My, KS MW Development / test Pits

Test Pit 20 Continued

Topsoil, coarse sand, light brown to orange brown gray sand at ~7' bgs. Total Depth 8' bgs, no debris
- backfill, clean
- Get ready for lunch
- My speaks w Bill F + K B GW026, 24 well volumes removed - 130 gal, all parameters about stable except turbidity which won't go below 200 NTU. Development complete ok from Bill.
- Test Pit edge of landfill behind TP11
lunch

1310 Onsite, continue Development
1315 Test Pit 21
1325 End test pit 21 8' no debris
- top soil, sand + silt, coarse light brown to orange brown
- cover up, decon / clean back hoe

Location Yorktown Date 6.13.13
Project / Client Site 1
My, KS MW Development / test Pits

northing: 3623858.66
easting: 1204612 9.73
HAE: -50.00
- pick up drums from GW026 cluster
- clean up area.
Talk to Kristen. GW026A 10 well volumes purged Development complete
- try to flatten entry way.
- Give Kathryn key to gate, transfer binders etc.
81 drums total onsite used.

Location _____ Date _____

Project / Client _____

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Location Yorktown Date 6.13.13

Project / Client Site 1

MY,KS MW Development / Test Pit

MW026 Development
Continued

Time	Temp	Cond	pH	orp	Turb	DO	Gal Pumped	WL
1125	16.16	.545	7.66	-28.7	256.1	~~5.46~~ 3.57		—
1130	16.11	.546	7.60	-28.5	193.6	~~3.79~~ 3.93		—
1135	16.13	.545	7.61	-28.8	216.8	→ 3.87		—
1140	16.19	.544	7.60	-27.4	206.5	3.85	130	

Development Complete

Test Pit 1- Metal, Plastic, fabric fibers found about 3.5-4.0 feet bgs. (Central North East)

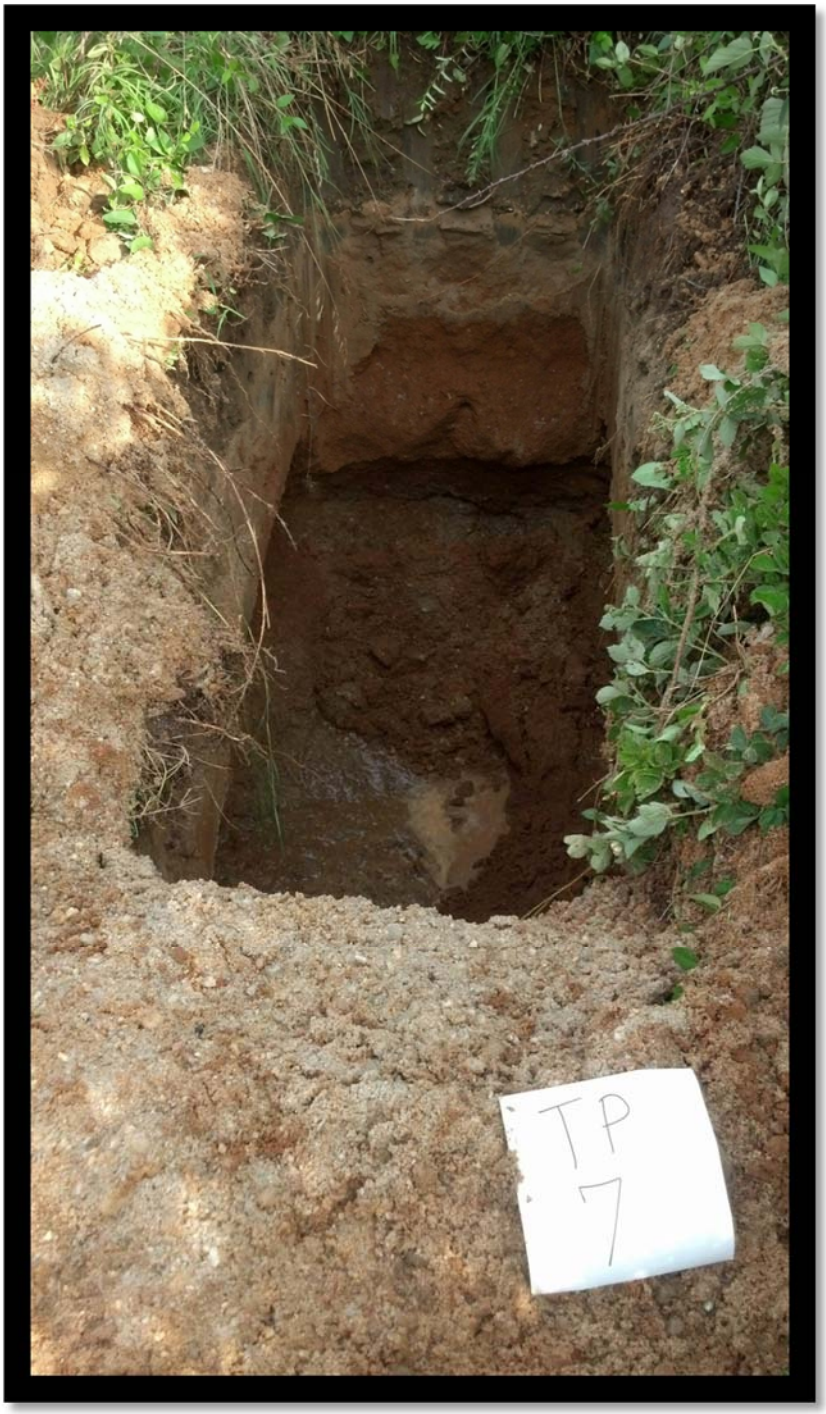
Test Pit 2- Burnt wood and non-native white material found about 4 ft bgs.(Central South West)

Test Pit 3 - Metal and fabric found about 5.5 ft bgs (South East)

Test Pit 4- No Debris. Total depth about 8 feet bgs. (South East)

Test Pit 5- No Debris (North West)

Test Pit 6- No Debris (North West).



Test Pit 7- No Debris. Dug to 8 feet bgs however collapse to 4 feet was immediate. (North East)

Test Pit 8- No Debris. Total depth about 8 feet bgs. (South West)

Test Pit 9- Fabric and wood found about 2.0-2.5 ft bgs (South)

Test Pit 10- Metal found about 5 feet bgs (South East)

Test Pit 11- Fabric found about 2.5 ft bgs (South East)

Test Pit 12- No Debris (South East)

Test Pit 13- No debris. Dug to 8 feet bgs but collapse to 4 feet bgs was immediate. (North East)

Test Pit 14- Metal debris found about 1 foot bgs (West)

Test Pit 15- No debris. (North East)

Test Pit 16- No Debris. Total depth about 8 feet bgs (East)

Test Pit 18- No Debris (Central West)

Test Pit 19- Plastic, plastic spoon, and metal about 3 feet bgs (South)

Test Pit 20- No Debris. Total depth about 8 feet bgs. (South West)

Test Pit 21-No debris. Total depth about 8 feet bgs. (South West)