TETRA TECH

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May 20, 2010

Project Number 112G02091

Naval Facilities Engineering Command Mid-Atlantic
Northeast IPT
9742 Maryland Avenue
Norfolk, Virginia 23511-3095
Attn: Mr. Roberto Pagtalunan, P.E.

Reference: CLEAN Contract No. N62470-08-D-1001
Contract Task Order (CTO) No. WE15

Subject: Technical Memorandum: Site 7 - Landfill South of "P" Barricades (OU 10) and Evaluation of Soil Cover
Naval Weapons Station (NWS) Earle
Colts Neck, New Jersey

Dear Mr. Pagtalunan:

Tetra Tech NUS, Inc. (Tetra Tech) is pleased to provide this evaluation of Site 7 – Landfill South of "P" Barricades at NWS Earle and placement of a soil cover. The following paragraphs provide the site description and environmental setting, brief history of use, summary and review of environmental investigations, and Tetra Tech's identification and recommendation of a suitable site cover. As requested by the Navy, this technical memorandum is also being forwarded to Ms. Jessica Mollin at the United States Environmental Protection Agency (EPA), Region 2, and Ms. Erica Bergman at the New Jersey Department of Environmental Protection (NJDEP).

INTRODUCTION

NWS Earle, EPA ID number NJ0170022172 is located in Monmouth County, New Jersey, approximately 47 miles south of New York City. The facility is an active Navy installation whose primary mission is to supply ammunition to the Atlantic Fleet and it is expected to remain active for the foreseeable future. The Navy is the lead agency, in consultation with the United States Environmental Protection Agency (EPA) the support agency, for the conduct of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) activities at NWS Earle. Site 7, Landfill South of "P" Barricades, is designated Operable Unit 10 (OU 10) and is part of a comprehensive environmental investigation and cleanup program currently being performed by the Navy pursuant to a Federal Facility Agreement (FFA) dated December 10, 1990. Environmental investigations and remediation at the Base are funded under the Environmental Restoration, Navy (ER,N) Program.

Site 7 is a former landfill disposal site operated by the Navy within the Chapel Hill portion of the NWS Earle Waterfront Area (See Figure 1). Potential releases of hazardous substance at NWS Earle were evaluated in an Initial Assessment Study (IAS) in 1983 that was conducted by Fred C. Hart and Associates, and an Installation Restoration Program (IRP) Phase II Confirmation Study in 1986 by Roy F. Weston, Inc. These were preliminary investigations to determine the number of sources, compile histories of waste-handling and disposal practices at the sites, and acquire data on the types of contaminants present and potential human health and environmental receptors. Site 7 was initially identified by the Navy as part of the 1983 IAS.

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SITE DESCRIPTION AND ENVIRONMENTAL SETTING

As shown on Figure 2, the immediate areas surrounding Site 7 are heavily wooded. Access to the site is through a Navy-controlled access point and an unpaved road which borders the landfill to the north (See Figure 3). Other earthen and grass covered roads are located along the west and south perimeters of the site. The ground surface slopes south to north, from approximately 145 feet mean sea level (msl) near well MW7-03 to approximately 125 feet msl near well MW7-02. Large, white pine trees (up to 20-30 feet in height) as well as heavy grass-type vegetation currently cover the landfill surface. The closest surface water body is located approximately 1,500 feet west of the site; as shown on Figure 1 there are no surface water bodies located downstream of the site. Site 7 is located within the outcrop area of the Red Bank sand and Navesink aquifer. As part of various groundwater investigations, field measurements of the water table elevation in each monitoring well were collected. The potentiometric surface including interpreted groundwater flow direction, from an April 2005 sampling event, is shown in Figure 3. Underlying shallow groundwater flow direction is to the north towards Sandy Hook Bay. Additional description of the site and environmental setting are provided in the 1996 Remedial Investigation (RI) Report for NWS Earle (B&R, 1996). Appendix A contains recent photographs of Site 7.

Previous reports detailed the presence of a small wetland area on the surface of the landfill (B&R, 1996). Heavy grasses and tall reeds are currently present in this area. In August 2009, the Navy conducted an evaluation of the five-acre landfill, including the suspected wetland area. The evaluation was conducted in accordance with methodology described in the *Federal Manual for Identifying and Delineating Wetlands* (Federal Interagency Committee for Wetland Delineation [FICWD], 1989) and the Routine Onsite Determination Method as described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (U.S. Army Corps of Engineers [USACE], 1987). The New Jersey Department of Environmental Protection (NJDEP) has regulatory jurisdiction over freshwater water wetlands and requires that wetland delineations be conducted in accordance with the FICWD methodology (AGVIQ-CH2M HILL, 2009). Based on the field survey and methodologies outlined in the FICWD and USACE manuals, no jurisdictional wetlands are present at the site. Two distinct vegetative communities were identified – upland pine forest and open successional, field; however, neither of these communities demonstrated all three necessary wetland parameters. None of the three wetland parameters were identified in the upland pine forest and only one parameter, hydrophytic vegetation was identified as present in the open successional field community. A summary report of the wetland evaluation study, including completed data forms and photographs is contained in Appendix B.

During previous investigation activities conducted at Site 7, it was identified that the depth of waste materials ranged from 3.5 to 6 feet below the existing grade. Depth to groundwater has varied from a seasonal high (April 2005) of 2.16 feet at MW7-02 to 17.89 feet at MW7-03 to a low (October 1995) of 11.81 feet at MW7-02 to 25.57 feet at MW7-03. Groundwater or saturated wastes were not encountered during any of the test pit investigations (see Previous Environmental Investigations below). Based on these findings, it was concluded that should the bottom of any fill materials be in contact with groundwater, it would be seasonal in nature and of relatively short duration.

SITE OPERATING HISTORY

From 1965 to 1977, the Navy used Site 7 to dispose of municipal-type solid waste and waste from Waterfront industrial operations. Wastes reportedly consisted of munitions shipping wastes (dunnage and packing), shop wastes from the Waterfront Public Works Shop and the Munitions Handling Laboratory (glass, wood, and small quantities of waste paint, thinners, and solvents), and domestic refuse. The landfilled materials were covered with a thin layer of loose sand quarried from the surrounding area. The Navy subsequently planted a number of pine seedlings at the site, which have now grown to approximately 20 to 30 feet in height. There have been no disposal activities at the site since 1977.

PREVIOUS ENVIRONMENTAL INVESTIGATIONS

Site investigation activities related to areas of potential environmental concern at NWS Earle have been undertaken by the Navy since approximately 1982. The following reports include Site 7 and have been submitted to EPA and NJDEP for Environmental Restoration (ER) Program work at NWS Earle.

- Initial Assessment Study (Fred C. Hart and Associates; February 1983).
- Interim Report for a Confirmation Study to Determine Existence and Possible Migration of Specific Chemicals In Situ (Roy F. Weston, December 1986).
- Current Situation and Draft Plan of Action (Weston, December 1988).
- Remedial Investigation/Feasibility Study for 11 Sites, Volumes 1-3 (Weston, September 1993).
- Remedial Investigation Report for Naval Weapons Station Earle, Volumes, IA, IB, and II) (Brown & Root Environmental, July 1996).
- Feasibility Study for Site 7, Landfill South of "P" Barricades (Tetra Tech, July 2008).
- Groundwater Sampling Report for Site 7 Landfill South of "P" Barricades (Draft), (Tetra Tech, September 2009).

Results from the previous Site 7 investigations including the 1995/1996 RI are summarized below.

Initial Assessment and Site Investigation Studies

The Initial Assessment Study (Fred C. Hart and Associates; February 1983) was a document prepared for the Navy that identified 29 areas of concern at NWS Earle based on employee interviews, record searches, and site tours. The IAS did not recommend Site 7 for a confirmation study.

As part of a base-wide site investigation (SI) conducted in 1986 (Weston, December 1986), three monitoring wells, MW07-01, MW07-02 and MW07-03, were installed around the perimeter of Site 7 (Figure 3). Groundwater samples were found to contain acetone and phthalate.

1991-1992 Phase I Remedial Investigation

Site 7 was included in a 1991-1992 remedial investigation at NWS Earle (Weston, September 1993), and as part of this investigation seven test pits were excavated and two additional monitoring wells (MW07-04 and MW07-05) were installed at Site 7 (Figure 4). A layer of trash, ranging in thickness from 2.5 to 6 feet, was encountered in five of the seven test pits. The encountered waste consisted of glass, paper, plastic, cans, and other types of household or shipboard-generated waste. Metal scrap, lumber, concrete, bricks, and other construction debris were also encountered. The cover material was thin to nonexistent. No sustained organic vapor readings were detected in any of the test pits. Two soil samples were collected from soil test pits for full target compound list (TCL)/target analyte list (TAL) and total petroleum hydrocarbon (TPH) analysis. Ethylhexylphthalate was found in soil samples collected from test pits TP-01 and TP-07. However, no compounds were detected at concentrations above NJDEP residential and non-residential soil cleanup criteria or impact to groundwater criteria.

Groundwater samples were obtained from the three existing monitoring wells (MW07-01 through MW07-03) and two new wells (MW07-04 and MW07-05) during three different sampling events, March 1991, October 1991 and November 1991. Samples were submitted for full TCL/TAL, VOCs, drinking water metals analysis, and landfill indicator parameters. Beryllium, cadmium, chromium, iron, lead, and

manganese were detected at maximum concentrations above their respective NJDEP Groundwater Quality Standards (GWQSs) or EPA Maximum Contaminant Levels (MCLs). 1,1,2,2-Tetrachloroethane and 1,1,2-trichloroethene were detected in one well at concentrations that exceeded their respective GQWS.

1995/1996 Phase II Remedial Investigation

As part of the Navy's Installation Restoration Program (IRP) a remedial investigation of 27 sites, including Site 7, at NWS Earle was conducted in 1995. A complete discussion of the 1995 RI, including sampling methodology and results, is presented in the July 1996 "Remedial Investigation Report for Naval Weapons Station Earle" prepared by Brown & Root Environmental (now Tetra Tech NUS, Inc.).

Between July and October 1995, Brown & Root Environmental conducted the following field investigation activities at Site 7:

- Sampling and analysis of one sediment (surface soil) sample (07 SD WET 7-B2).
- Sampling and analysis of one surface water sample (WSSW30) (Wagner Creek Watershed).
- Sampling and analysis of groundwater from the five existing monitoring wells (MW07-01 through MW07-05).
- Measurement of static water levels in the five monitoring wells.

The Phase II RI sampling locations are shown on Figure 4.

Results from the sampling of the five monitoring wells indicated that concentrations of most metals were within the range of background results. Aluminum and iron were detected at levels above their respective GWQSs and upgradient background concentrations. Manganese was detected in one well at a concentration less than the upgradient background concentration, but greater than its GWQS. Thallium was also detected in one well in excess of its GWQS. Benzene was detected in one well at a concentration greater than the NJDEP GWQS, but less than the MCL. No organic compounds were detected in the surface soil or surface water samples.

April 2005 Groundwater Sampling

In April 2005, Tetra Tech collected groundwater samples from the five existing monitoring wells (MW7-01 through MW7-05), including upgradient well MW7-03 (see Figure 4). The analytical results showed that VOC concentrations had decreased since the previous sampling round conducted in 1995. One well (MW7-02) had a detection of chlorobenzene at a concentration of 4.4 micrograms per liter (µg/L) much less than the New Jersey GWQS of 50 µg/L. All other VOCs were not detected or had an estimated value below the analytical method detection limit. Aluminum and iron were detected above their respective GWQSs and upgradient background levels. Manganese was detected at 914 µg/L in upgradient well MW7-03 and at 118 µg/L in downgradient well MW7-02; both levels are above the NJDEP GWQS of 50 µg/L. The full analytical results and data validation reports for the April 2005 sampling event were included in the 2008 Feasibility Study (Tetra Tech, 2008).

Feasibility Study

In July 2008, the Navy completed a Feasibility Study for Site 7. The Navy proposed placement of a soil cover, land use controls, and long-term monitoring as the selected remedy for the site based on the sampling data available at that time, results from the human health and environmental risk assessments, identification of applicable or relevant and appropriate requirements (ARARs), and review of applicable technologies. In subsequent review and discussions with EPA and NJDEP, it was agreed that although

groundwater concentrations of manganese, aluminum, and iron exceed NJDEP GWQSs, a CERCLA remedial action for these metals is not necessary because:

- Manganese concentrations in site wells are significantly less than upgradient or background levels.
- The manganese hazard quotient (HQ) based on the updated Human Health Risk Assessment (HHRA) is less than 1 for the child resident exposure scenario.
- Maximum site concentrations of aluminum (1,710 µg/L) and iron (965 µg/L) are significantly less than site-specific calculated risk-based concentrations of 7,800 µg/L (aluminum) and 5,500 µg/L (iron) for unlimited use and unrestricted exposure.
- NJDEP GWQSs for aluminum, iron and manganese are aesthetic-based concentrations.

To address concerns raised regarding the presence and vertical extent of any site-related VOCs in groundwater, the Navy agreed to conduct an additional groundwater investigation.

July 2009 Groundwater Sampling

At the request of the regulatory agencies, the Navy conducted an additional groundwater investigation to define the vertical extent, and presence of certain VOCs immediately adjacent to, and downgradient of, the landfill. Historical groundwater sampling had indicated the presence of low concentrations of chlorobenzene, benzene, chloroform, and 1,1,2-trichloroethane. In July 2009, the Navy conducted one soil boring and two groundwater sampling borings using the direct push technology (DPT). Boring locations, sampling methodology, and laboratory analyses were done in accordance with the NJDEP and EPA approved Sampling and Analysis Plan for Site 7 Groundwater (Tetra Tech, 2009). Figure 4 details the 2009 soil boring and groundwater sampling locations.

Three discreet groundwater samples were collected from each HydroPunch® boring and submitted to a NJDEP and Navy certified laboratory for analyses. Each sample was analyzed for benzene, chlorobenzene, chloroform, and 1,1,2-trichloroethane. The analytical results indicated that benzene and chloroform were present in site groundwater but only at estimated concentrations slightly above their respective method detection limits. Chlorobenzene and 1,1,2-trichloroethane were not detected in any of the groundwater samples. Benzene was detected at estimated concentrations ranging from 0.16J µg/L to 0.27 µg/L. Chloroform was detected in one borehole at the interval depth of 19 feet at an estimated concentration of 0.32 µg/L. All of the detected estimated concentrations of benzene and chloroform were significantly less than their respective NJDEP GWQS (1 µg/L and 70 µg/L, respectively). A detailed discussion of the sampling methodology, results and conclusions is presented in the September 2009 Groundwater Sampling Report, Site 7 Landfill South of "P" Barricades (Tetra Tech, 2009). Based on the sampling and analytical results and comparison to NJDEP GWQSs, EPA MCLs and the project objectives outlined in the Sampling and Analysis Plan for Site 7 Groundwater Sampling, it was concluded that no further sampling of groundwater for organics is recommended for Site 7.

PROPOSED SOIL COVER

The current cover at Site 7 consists of a sandy type soil, reportedly obtained from a nearby source, and vegetation consisting of tall grasses and large white pine trees. The thickness of the existing cover material is thin and irregular, so the Navy has indicated that they intend to place additional clean fill over the landfill area and to establish a permanent vegetative covering. Prior to the placement of the proposed soil cover, any exposed debris will be removed from the site and the existing landfill surface will be graded to encourage runoff of precipitation. Clearing and grubbing of the existing vegetative cover is necessary to prepare for soil placement and final site grading. The horizontal limits of the buried waste materials were determined by the Navy in September 2009 through the construction of additional test pits.

Appendix C contains a summary report of the test pitting including photographs and a revised site layout based on the surveyed test pit locations. Trees located within the landfill waste boundaries will be removed in order to allow for the placement of a uniform layer of cover materials over the buried wastes. Trees outside the boundary of buried wastes, and not in the way of construction of the landfill cover or any surface water controls, will be left in place.

Grading of the landfill area and placement of the surface soil cover will be performed as needed. The final surface slope of the landfill will range between three percent (3V:100H) and five percent (5V:100H) to ensure slope stability, control erosion, and allow for compaction, seeding and revegetation of the cover material. The objective of the final slope design is to promote precipitation runoff while inhibiting erosion or infiltration. The appropriate slopes for the final covering will be determined during the design of the soil cover system and will be based on the existing site configuration.

Clean fill will be obtained from an offsite location and will be certified from a clean source. Following the placement of the cover soil, the site shall be seeded with a perennial grass seed mixture suitable for the Earle location. Figure 5 provides a conceptual view of the proposed soil cover.

Signs outlining no disturbance of the soil cover will be posted by the Navy near the site perimeter.

Should you have any questions regarding the information provided, please do not hesitate to contact me.

Sincerely,

Mary M. Mang

Mary M. Mang, CHMM
Environmental Project Manager

MMM/nfs

Enclosures

c: Scott Fleming (NWS Earle) (2 copies)
Jessica Mollin (EPA) (2 copies)
Erica Bergman (NJDEP) (3 copies)
Bonnie Capito (NAVFAC Lant)
Garth Glenn (Tetra Tech, Norfolk)
John Trepanowski (Tetra Tech, King of Prussia)
Glenn Wagner (Tetra Tech, Pittsburgh)
File

REFERENCES

AGVIQ-CH2M HILL Constructor, Inc. Joint Venture III (AGVIQ-CH2M HILL), 2009. Site 7 Landfill, Naval Weapons Station (NWS) Earle, New Jersey – Wetland Evaluation. August.

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B&RE, 1998. Remedial Investigation Addendum Report for Naval Weapons Station Earle, Colts Neck, New Jersey. Wayne, Pennsylvania. January.

Hart (Fred C. Hart and Associates, Inc.). 1983. Initial Assessment Study, Naval Weapons Station Earle, Colts Neck, New Jersey. New York, New York. February.

NEESA (Naval Energy and Environmental Support Activity), 1992. Addendum to the Preliminary Assessment (Initial Assessment Study) of Naval Weapons Station Earle, Colts Neck, New Jersey. NEESA 13-020A. Port Hueneme, California. July 31.

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Tetra Tech, 2009. Groundwater Sampling Report, Site 7 Landfill South of "P" Barricades (Draft). September.

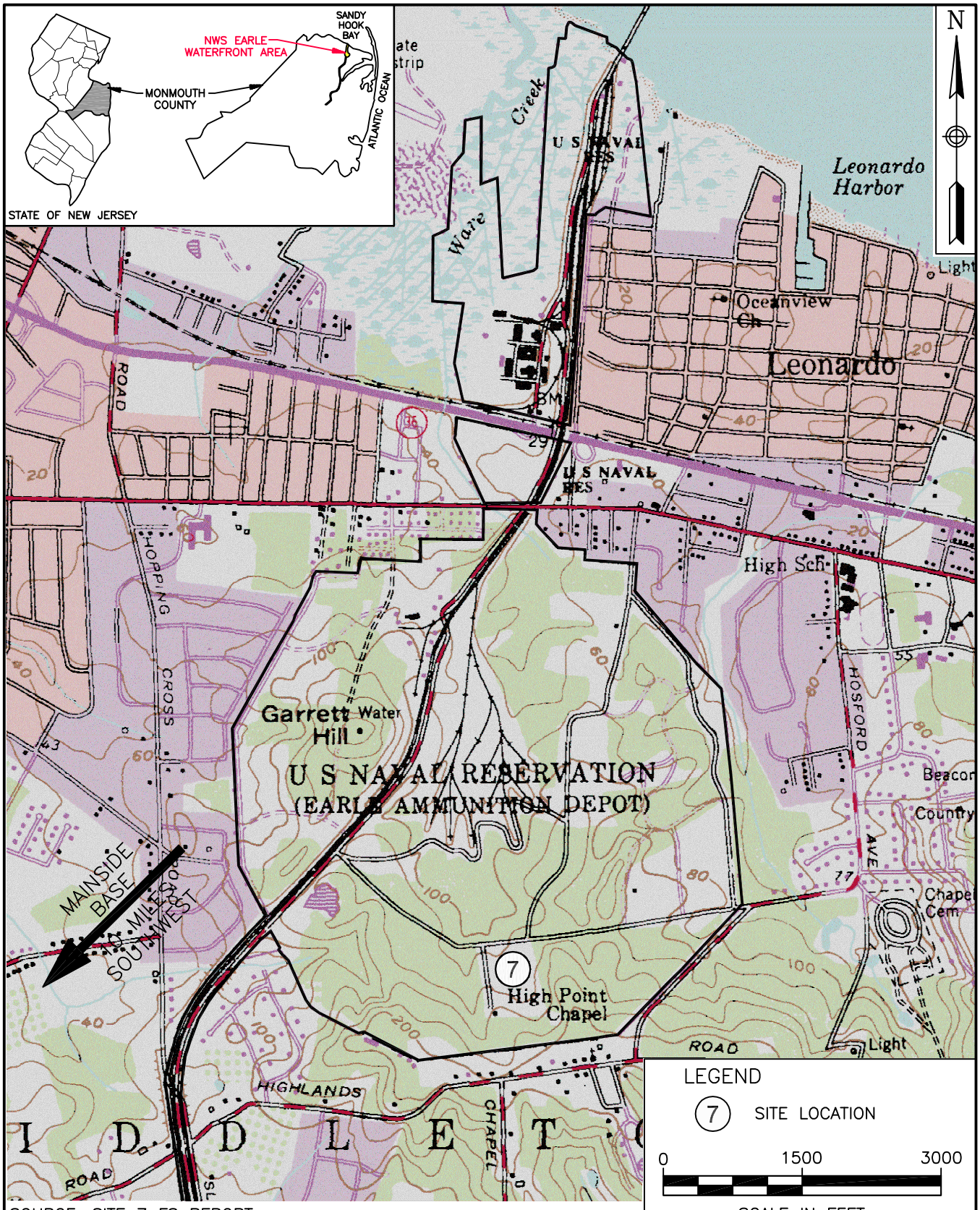
Weston (Roy F. Weston, Inc.), 1986. Interim Report for a Confirmation Study to Determine Existence and Possible Migration of specific Chemicals in Situ. West Chester, Pennsylvania. December.

Weston, 1988. Report of Current Situation and Draft Plan of Action, Naval Weapons Station Earle, Colts Neck, New Jersey. West Chester, Pennsylvania. December.

Weston, 1993. Installation Restoration Program Remedial Investigation/Feasibility Study for 11 sites at NWS Earle, Colts Neck, New Jersey. West Chester, Pennsylvania. September.

FIGURES

112G02091/0610/112G02091CM01.DWG 05/06/10 MKB



SOURCE: SITE 7 FS REPORT

TETRA TECHNUS, INC.

SITE LOCATION
WATERFRONT AREA
NAVAL WEAPONS STATION
COLTS NECK, NEW JERSEY

SCALE	AS NOTED
FILE	112G02091CM01
REV	0
DATE	05/06/10
FIGURE NUMBER	FIGURE 1

112G02091\0610\112G02091GM04.DWG 05/10/10 MKB

LEGEND

— — — APPROXIMATE LANDFILL BOUNDARY

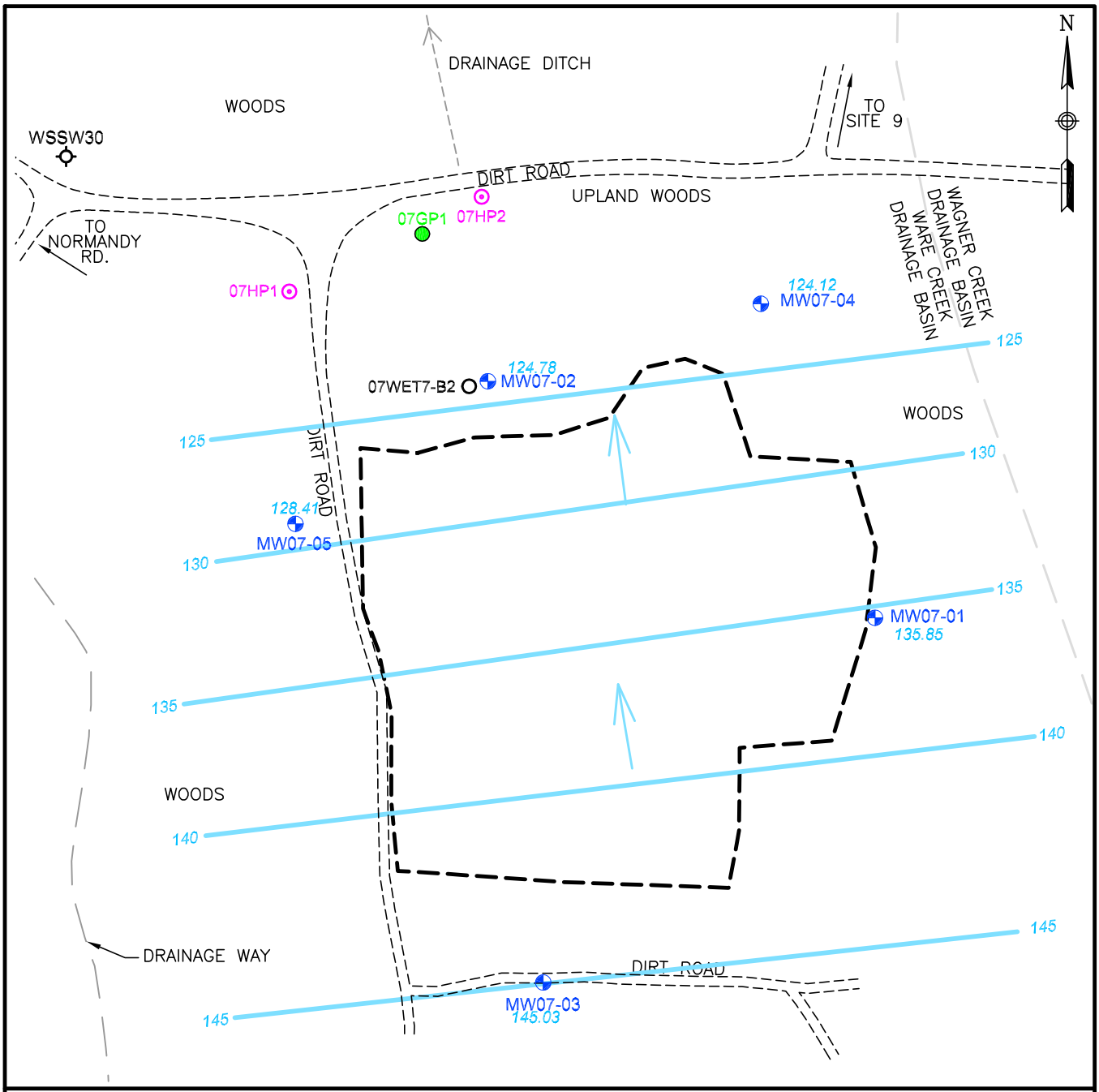
0 400 800

SCALE IN FEET

TETRA TECHNUS, INC.

SITE MAP
SITE 7 – LANDFILL SOUTH OF "P" BARRICADES
NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

SCALE	AS NOTED
FILE	112G02091GM04
REV	0
DATE	05/10/10
FIGURE NUMBER	FIGURE 2



LEGEND

- MONITORING WELL LOCATION
- SURFACE SOIL SAMPLE LOCATION
- WATERSHED SAMPLE LOCATION
- GEOPROBE LOCATION
- HYDROPUNCH LOCATION
- APPROXIMATE LANDFILL BOUNDARY
- GROUNDWATER CONTOUR, APRIL 2005
- 135.85 GROUNDWATER ELEVATION, APRIL 2005
- GROUNDWATER FLOW DIRECTION, APRIL 2005

0 150 300

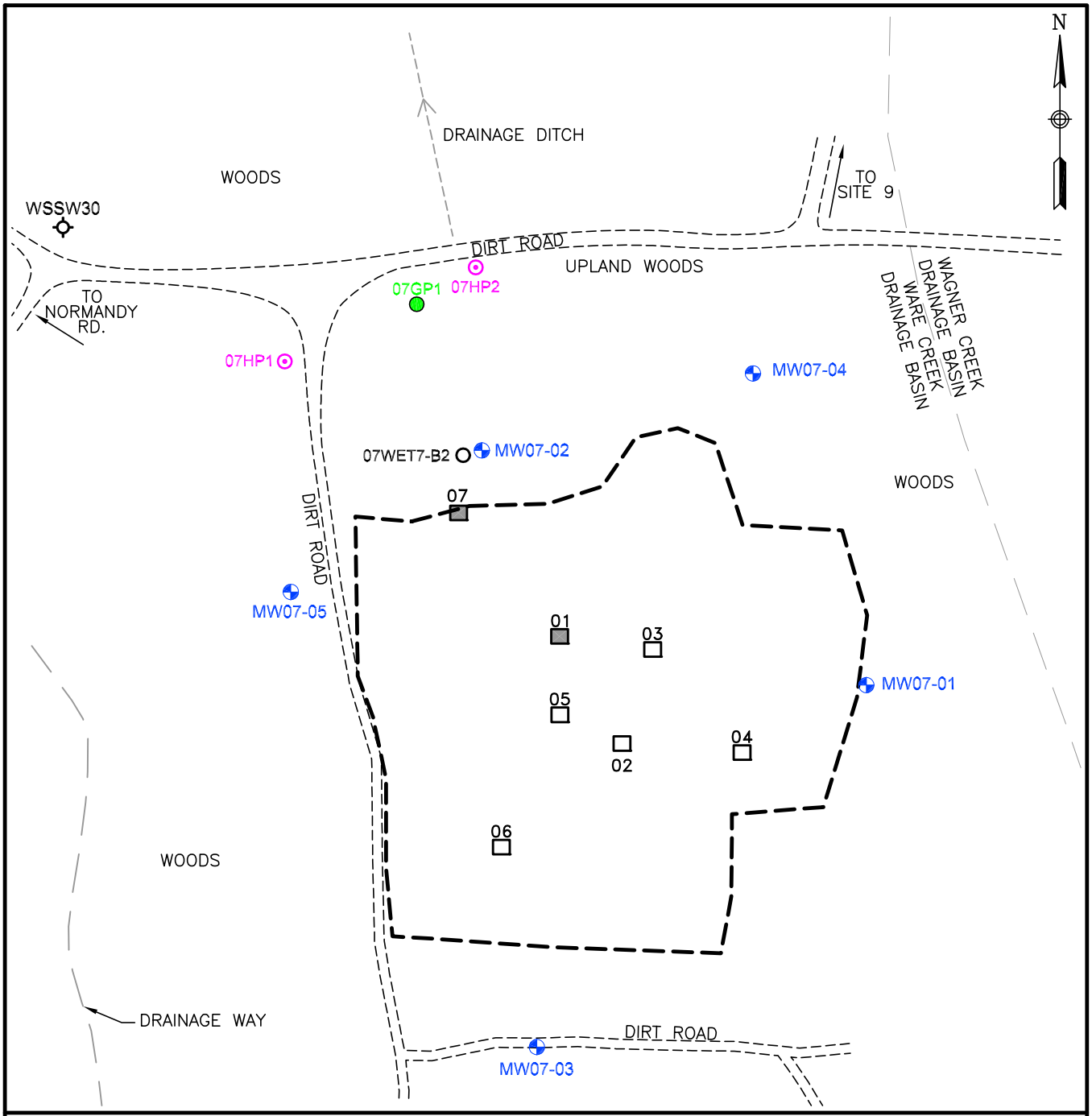
SCALE IN FEET

TETRA TECHNUS, INC.

GROUNDWATER MONITORING LOCATIONS
SITE 7 – LANDFILL SOUTH OF "P" BARRICADES
NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

SCALE	AS NOTED
FILE	112G02091GM03-2
REV	0
DATE	05/14/10
FIGURE NUMBER	FIGURE 3

112G02091\0610\112G02091GM03-1.DWG 05/14/10 MKB



LEGEND

- MONITORING WELL LOCATION
- SURFACE SOIL SAMPLE LOCATION
- WATERSHED SAMPLE LOCATION
- GEOPROBE LOCATION
- HYDROPUNCH LOCATION
- APPROXIMATE LANDFILL BOUNDARY
- TEST PIT (1991–1992 RI)
- TEST PIT SAMPLE (1991–1992 RI)

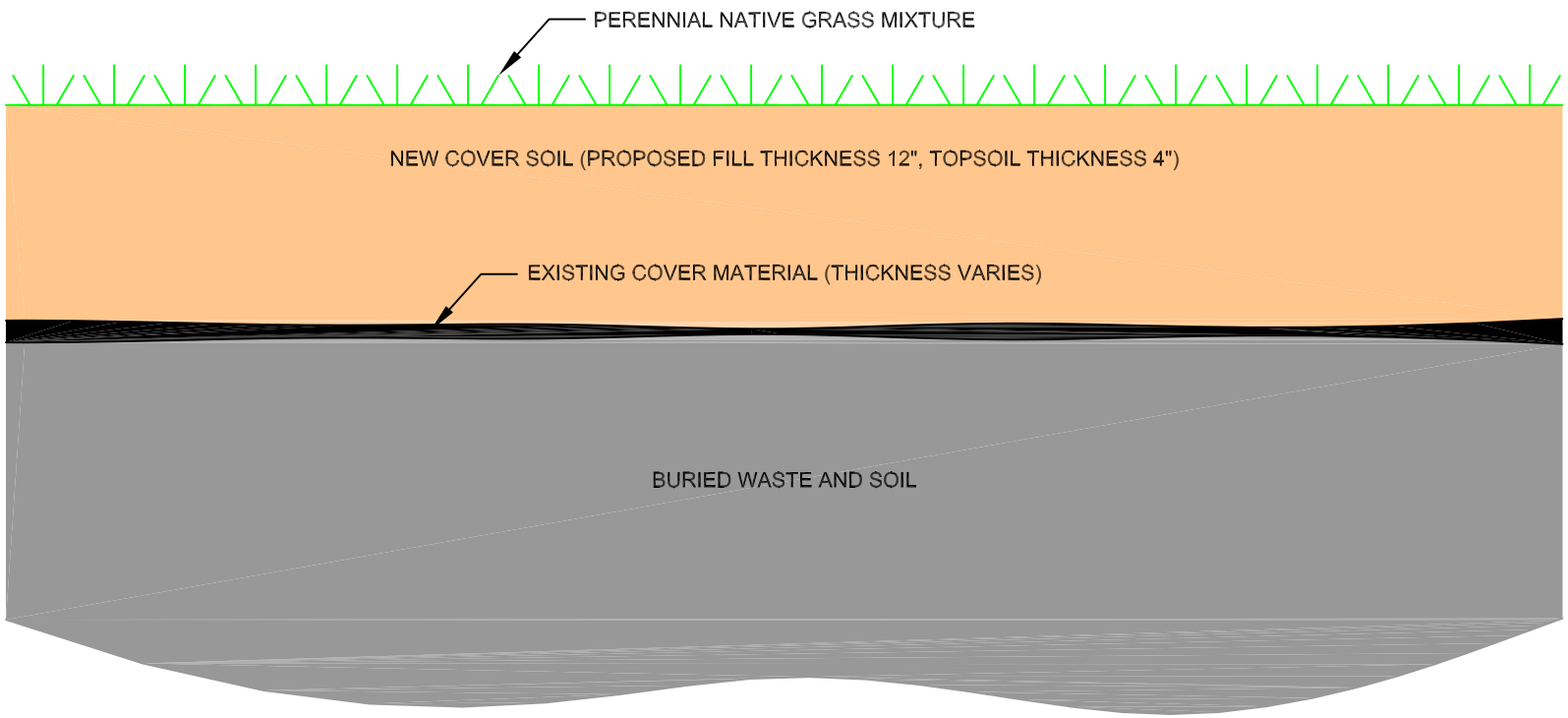
0 150 300

SCALE IN FEET

TETRA TECHNUS, INC.

SAMPLE LOCATION MAP
SITE 7 – LANDFILL SOUTH OF "P" BARRICADES
NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

SCALE	AS NOTED
FILE	112G02091GM03-1
REV	0
DATE	05/14/10
FIGURE NUMBER	FIGURE 4



TETRA TECH NUS, INC.

PROPOSED SOIL COVER
SITE 7 – LANDFILL SOUTH OF "P" BARRICADES
NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

SCALE	AS NOTED
FILE	112G02091GS01
REV	0
DATE	05/20/10
FIGURE NUMBER	FIGURE 5

APPENDIX A

SITE PHOTOGRAPHS

APPENDIX B

2009 WETLAND EVALUATION REPORT

Site 7 Landfill, Naval Weapons Station (NWS) Earle, New Jersey-- Wetland Evaluation

PREPARED FOR: Mr. Roberto Pagtalunan
NAVFAC Mid-Atlantic
Environmental Business Line

PREPARED BY: AGVIQ-CH2M HILL Constructor, Inc. Joint Venture III (AGVIQ-CH2M HILL)

DATE: August 26, 2009

Introduction

NWS Earle is located in Monmouth County in east-central New Jersey (Figure 1-1). It is situated on approximately 11,000 acres and includes a Mainside Area located approximately 10 miles inland from the Atlantic Ocean at Sandy Hook Bay, and a Waterfront Area that includes an ammunition depot and piers. The Mainside and Waterfront areas are linked by a narrow tract of land that serves as a right-of-way for a government road and railroad.

AGVIQ-CH2M HILL conducted a wetland delineation at the Site 7 Landfill South of P Barricades in support of the proposed landfill soil cover remedy. The proposed remedy includes regrading the area, placing a soil cover over the landfill, re-vegetating the area, and fencing the area. The landfill is an approximately 5-acre site located within the Waterfront Area, bordering an unpaved road (Figures 1-2 and 1-3). The ground surface within the vicinity of the site slopes downward to the north from an approximate elevation of 160 feet mean sea level (msl). The area is bounded on the north, west, and south by an unpaved road. The site is heavily vegetated with white pine trees and various shrubs. About 3.6 acres of the site contains landfilled waste materials as determined by a 1974 U.S. Environmental Protection Agency (USEPA) Environmental Photographic Interpretation Center (EPIC) photograph. From 1965 to 1977, the site was used to dispose of municipal-type solid waste and waste from Waterfront Area industrial operations. Wastes reportedly consisted of munitions shipping wastes (dunnage, packing), shop wastes from the Waterfront Public Works Shop and Munitions Handling Laboratory (glass, wood, and small quantities of waste paint, thinners, and solvents), and domestic refuse. The landfilled materials reportedly were covered with a thin layer of loose sand quarried from the surrounding area.

Methods

Prior to the onsite jurisdictional wetland delineation, CH2M HILL reviewed available secondary source information to investigate site conditions and identify potential locations of wetlands and other regulated water bodies. These sources included U.S. Geological Survey (USGS) quadrangle maps (USGS 2009); NRCS Monmouth County, New Jersey soil

surveys (NRCS 2009); NWI maps (NWI 2009); NJDEP i-map Wetland mapping (NJDEP 2009); and aerial photography.

The New Jersey Department of Environmental Protection (NJDEP) has regulatory jurisdiction over freshwater wetland (FWW) resources in the state of New Jersey and requires that wetland delineations be conducted in accordance with methodology described in the *Federal Manual for Identifying and Delineating Wetlands* (Federal Interagency Committee for Wetland Delineation [FICWD] 1989). CH2M Hill conducted a wetland field survey at the project area on Monday August 10, 2009 in accordance with these requirements and the Routine Onsite Determination Method as described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (U.S. Army Corps of Engineers [USACE], 1987), which defines wetlands as

> *"… those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."*

The Routine Onsite Determination Method involves the following steps.

- Locate the project area
- Identify the community type(s)
- Select representative observation points
- Record the indicator status of dominant species
- Determine whether hydrophytic vegetation is present and dominant
- Determine whether wetland hydrology is present
- Determine whether hydric soils are present

Under this method, areas exhibiting a presence of wetland hydrology, hydric soils, and a dominance of hydrophytic vegetation are defined as wetlands. The method requires that additional consideration be given to sites with atypical conditions (i.e., evidence of sufficient natural or human-induced alterations that significantly alter the soils, vegetation, or hydrology) and sites where normal environmental conditions are not present during the wetland delineation (e.g., no hydrophytic vegetation due to annual or seasonal fluctuations in precipitation or groundwater levels). All wetland delineation activities were performed in accordance with the NJDEP Freshwater Wetlands Protection Act (N.J.A.C 7:7).

The entirety of the project area was walked to make field wetland evaluations. Standard USACE data forms were completed for each observation point. These data forms are provided in Appendix B, and photographs taken at each sampling location are provided in Appendix C.

Sample locations were classified using the United States Fish and Wildlife Service (USFWS) classification system (Cowardin et al., 1979). Dominant vegetation was noted according to category: tree; shrub/sapling; woody vine; herb; or bryophyte. The wetland indicator status (Table 1) for each species was identified using the *National Wetlands Inventory List of Plants that Occur in Wetlands* (Reed, 1988) and subsequent approved modifications to this list. Plants were identified using current taxonomic references. Where recent taxonomic changes

resulted in plant names that were not included in the *National Wetlands Inventory List of Plants that Occur in Wetlands,* appropriate synonymy was used to reference the national list.

Within the area investigated, soil samples were inspected for hydric soil indicators as provided on the wetland data forms. Using the *Munsell Soil Color Charts* (1994), hue and chroma of soil samples were recorded. Soil composition information and any observation of mottling were also recorded. Wetland hydrology observations included soil saturation, evidence of any standing or ponded water, and presence of drainage patterns, drift lines, oxidized root channels and/or water-stained leaves (primary and secondary hydrology indicators).

TABLE 1
Definitions for Wetland Indicator Status
NWS – Earle, NJ Project

Code	Term	Definition
OBL	Obligate	Species occurs in wetlands greater than 99% of time
FACW	Facultative Wetland	Species occurs in wetlands 67 to 99% of time
FAC	Facultative	Species occurs in wetlands 34 to 66% of time
FACU	Facultative Upland	Species occurs in wetlands 1 to 33% of time
UPL	Upland	Species occurs in wetlands less than 1% of time

An indicator status with a "+" added indicates a plant that would be in the wetter third of the indicated range of the status, while a "-" would indicate the drier third of the range of the status.

Results

No wetlands or waterbodies were mapped on the NWI maps (NWI 2009) or the NJDEP i-Map Database wetland maps (NJDEP 2009) prior to the site visit on Monday August 10, 2009. No wetlands or waters of the U.S. were identified within the proposed project area during the site visit.

Data points were collected throughout the proposed project site. The site contains two distinct vegetative communities, upland pine forest and open successional field.

The upland pine forest encompassed the majority of the project site. Vegetation within the upland pine forest was dominated by an overstory of eastern white pine (*Pinus strobus*) which has an indicator status of facultative upland and pitch pine (*Pinus rigida*) which has an indicator status of facultative upland. Understory and ground cover was minimal and included poison ivy (*Toxicodendron radicans*) which has a facultative indicator status and deer tongue grass (*Panicum clandestinum*) which has a facultative plus indicator status. Soils within this area had a matrix of 10YR 4/4 from 0-6 inches, 10YR 3/4 from 6-10 inches and 10YR 3/3 from 10- 16 inches. The soils texture in this area was consistently loamy sand. No wetland hydrology features were noted in this area.

The open successional field was located in the center of the site along the western boundary of the project site. The field was surrounded by the upland pine forest. Vegetation in this area was dominated by common reed (*Phragmites australis*) which has a facultative wetland indicator status, Napalese browntop (*Microstegium vimineum*) which has a facultative indicator status, milkweed (*Asclepias syriaca*) which does not have an indicator status, deer tongue grass (*Panicum clandestinum*) which has a facultative plus indicator status and multiflora rose (*Rosa multiflora*) which has a facultative indicator status. Soils within this area had an organic layer from 0-2 inches, a matrix of 10YR 4/6 from 3-6 inches, 10YR 4/4 from 6-13 inches with 10% gravel and 10YR 4/6 from 14- 24 inches. The soils texture in this area was consistently loamy sand with some traces of clay. No wetland hydrology features were noted in this area.

The *U.S. Army Corps of Engineers Wetlands Delineation Manual* (U.S. Army Corps of Engineers [USACE], 1987) requires that additional consideration be given to sites with atypical conditions (i.e., evidence of sufficient natural or human-induced alterations that significantly alter the soils, vegetation, or hydrology) and sites where normal environmental conditions are not present during the wetland delineation (e.g., no hydrophytic vegetation due to annual or seasonal fluctuations in precipitation or groundwater levels). Because this site was historically used as a landfill and was subsequently covered with a layer of soil, Section F (Atypical Situations), Subsection 4 – Man Induced Wetlands of the 1987 USACE Wetlands Delineation Manual was reviewed.

Evaluation of the criteria in the 1987 ACOE Wetland Delineation Manual, Part IV, Section F (Atypical Situations), Subsection 4 – Man Induced Wetlands, conclude that the project area would not be considered a disturbed wetland (Appendix B).

Therefore, the 1987 ACOE Wetland Delineation Manual requires all three wetland parameters be met to be considered a wetland. Neither the upland pine forest nor the open successional field demonstrated all three wetland parameters. Therefore, no jurisdictional wetlands according to the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (U.S. Army Corps of Engineers [USACE], 1987) are present.

Conclusion

The survey for wetlands and waterbodies of the US conducted on Monday August 10, 2009 on the 5-acre landfill site did not identify any jurisdictional features according to the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (U.S. Army Corps of Engineers [USACE], 1987) and the methodology described in the *Federal Manual for Identifying and Delineating Wetlands* (Federal Interagency Committee for Wetland Delineation [FICWD] 1989). Neither of the two vegetative communities identified demonstrated all three necessary wetland parameters. None of the three wetland parameters were identified within the upland forest. Although hydrophytic vegetation dominated the open successional area, no hydrology or hydric soils were present.

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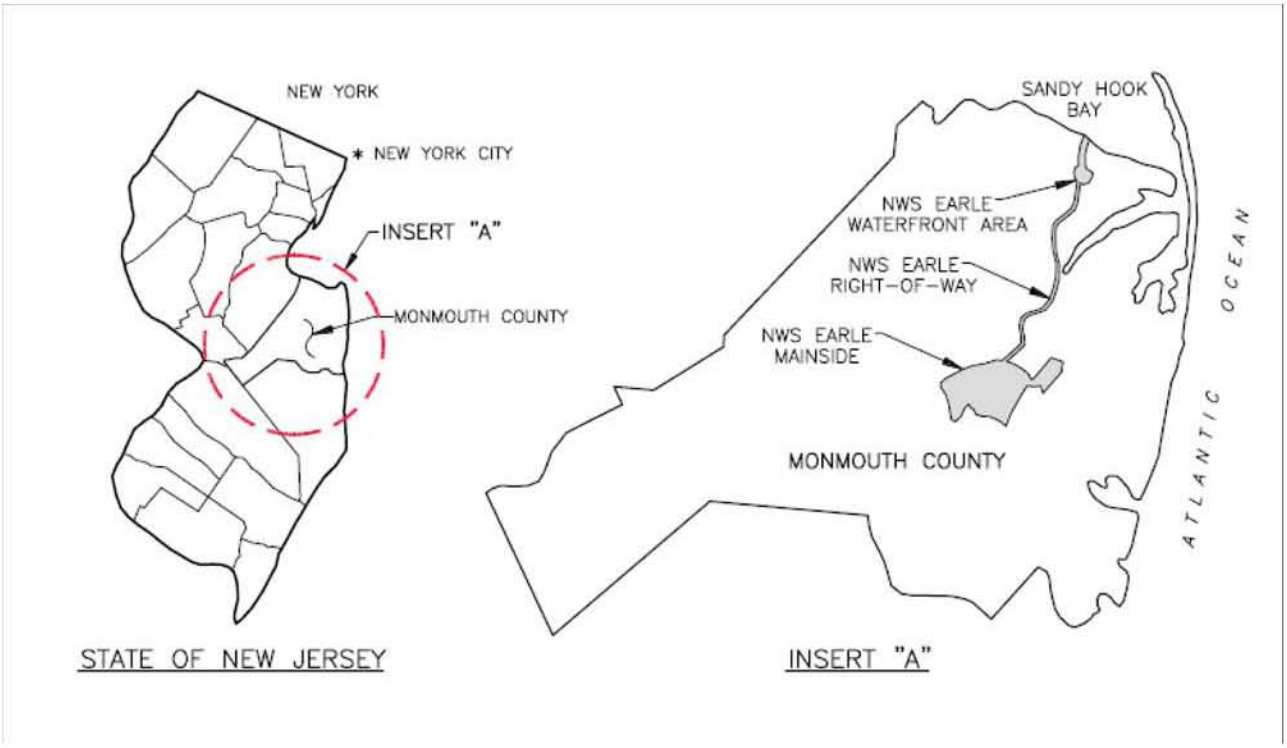
APPENDIX A

Figures



NO SCALE

SOURCE FILE: TTNUS NWS EARLE SITE 7 LANDFILL SOUTH OF "P" BARRIADES (OU-10) NAVAL WEAPONS STATION EARLE, COLTS NECK NEW JERSEY JULY 2008.

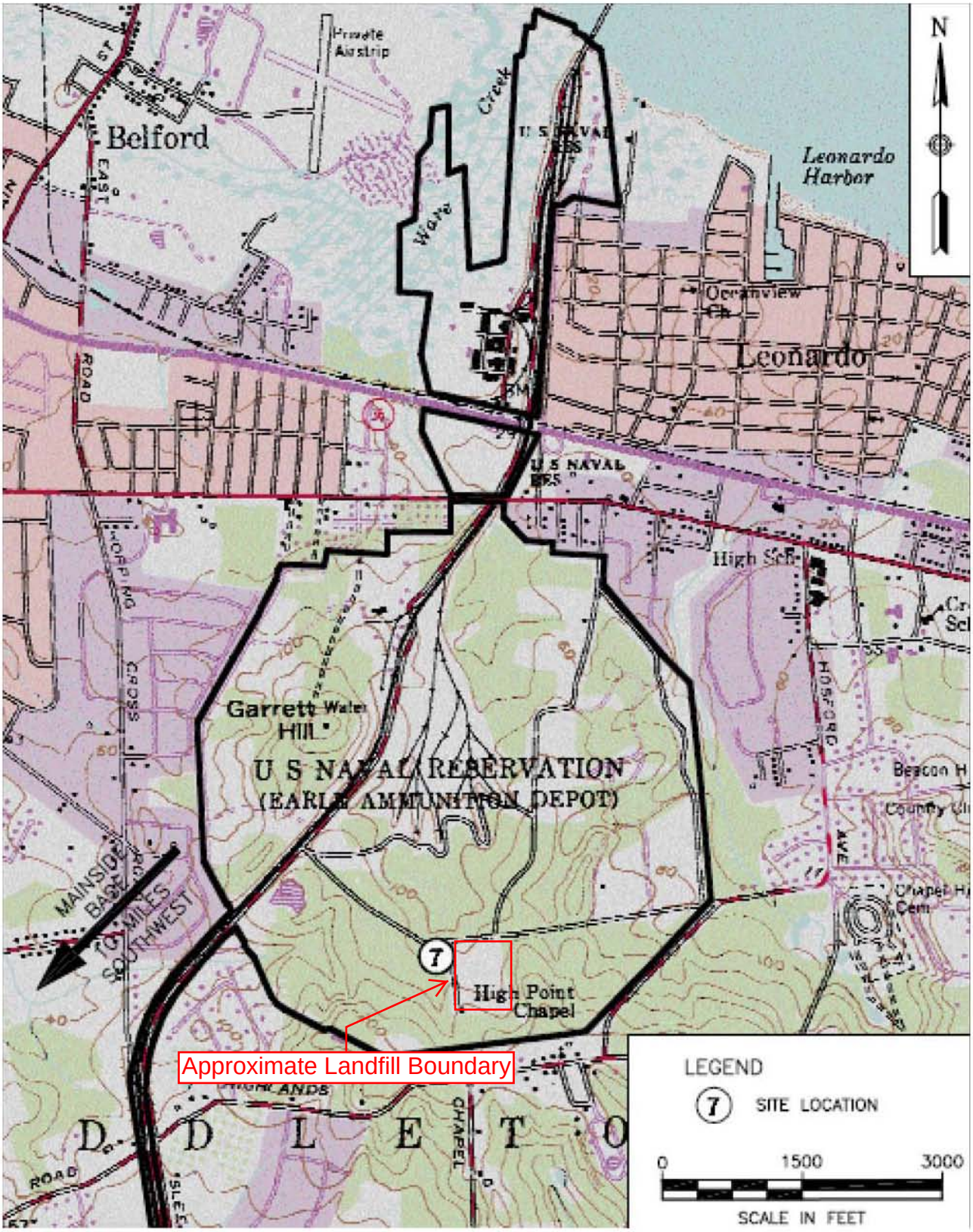
NORTH

Facility Number	Facility Name	
—	FIGURE 1-1 BASE LOCATION	
Prop. Record No: PN 1771	Facility Location: EDIT HERE MAP GRID	Building Area: NWS EARLE

AGVIQ CH2M HILL

AGVIQ ENVIRONMENTAL LLC
VIRGINIA BEACH, VIRGINIA

CADD File Name: Cx1014f0.dwg



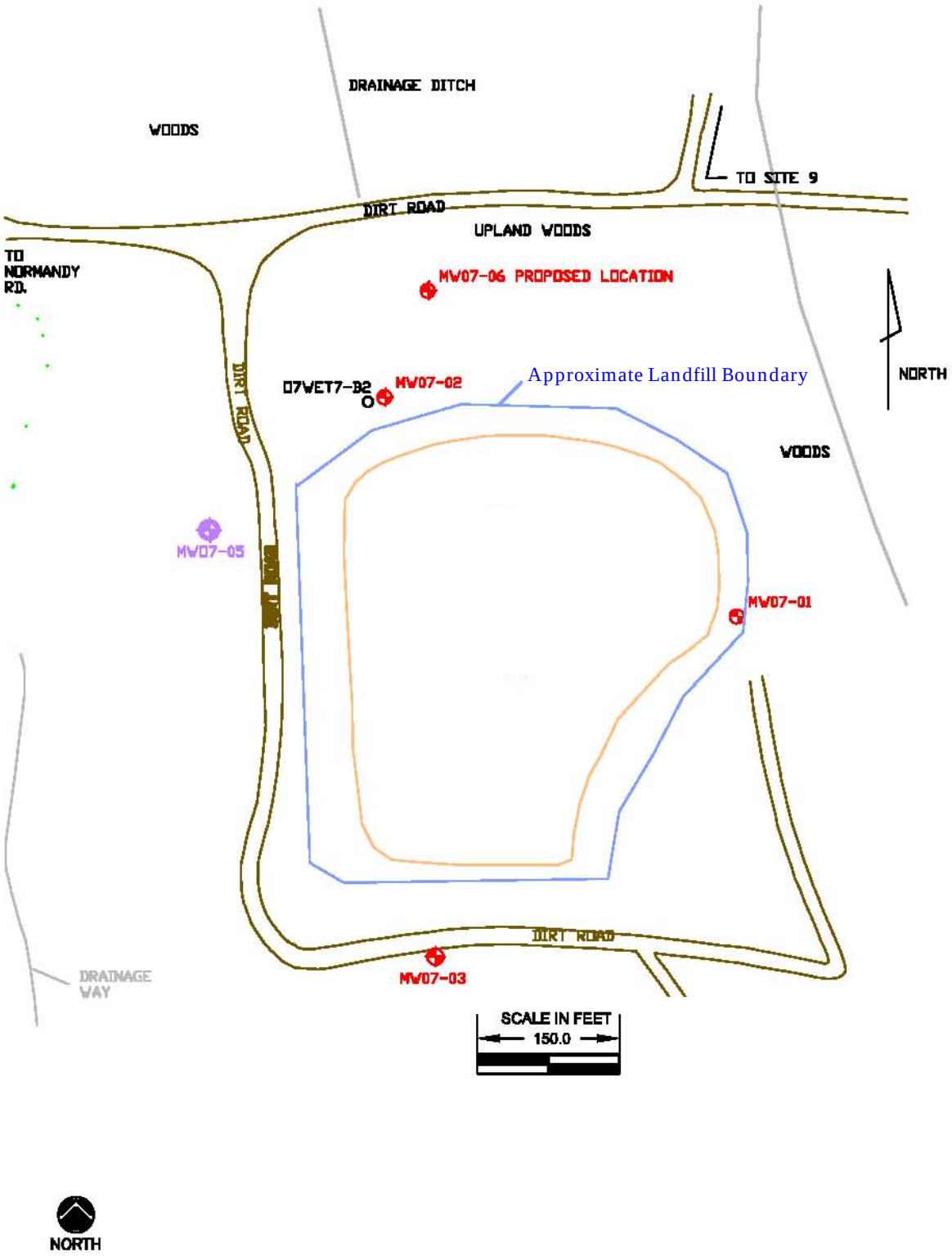
SOURCE FILE: TTNUS 2008, FEASIBILITY STUDY FOR SITE 7 LANDFILL SOUTH OF "P" BARRICADES (OU 10) NAVAL WEAPONS STATION EARLE,COLTS NECK NEW JERSEY.

Facility Number	Facility Name	
—	FIGURE 1-2 SITE LOCATION	
Prop. Record No: PN 1771	Facility Location --- ---	Building Area: NWS EARLE

AGVIQ CH2M HILL

AGVIQ ENVIRONMENTAL LLC
VIRGINIA BEACH, VIRGINIA

CADD File Name: :\TSBRAC\TASKORDERS\WE04\WORKPLANS\DRAWINGS\FIG1-2 SITE LOCATION



Facility Number	Facility Name	
—	FIGURE 1-3 - Site 7 Landfill South of P Barricades	
Prop. Record No: PN 1771	Facility Location — —	Building Area: NWS EARLE

AGVIQ CH2M HILL

AGVIQ ENVIRONMENTAL LLC
VIRGINIA BEACH, VIRGINIA

CADD File Name: ATSBRACTTASKORDERS\WE041WORKPLANS\DRAWINGS\FIG1-3 LIMIT OF CLEARING

APPENDIX B

Datasheets

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	NWS Earle, New Jersey	Date:	August 10, 2009
Applicant/Owner:		County:	Monmouth
Investigator:	Tony DiLella/Kate Mayrides	State:	NJ

Do Normal Circumstances exist on the site?	NO	Community ID:	Forest
Is the site significantly disturbed (Atypical Situation)?	YES	Transect ID:	
Is the area a potential Problem Area? (If needed, explain on reverse)	NO	Plot ID:	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Pinus rigida*	T	FACU	9.		
2. *Pinus strobus*	T	FACU	10.		
3. *Toxicodendron radicans*	V	FAC	11.		
4. *Panicum clandestinum*	H	FAC+	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 25%

Remarks:

HYDROLOGY

____ Recorded Data (Describe in Remarks):	Wetland Hydrology Indicators:
____ Stream, Lake or Tide Gauge	Primary Indicators:
_X_ Aerial Photographs	____ Inundated
____ Other	____ Saturated in Upper 12 Inches
____ No Recorded Data Available	____ Water Marks
	____ Sediment Deposits
	____ Drainage Patterns in Wetlands
Field Observations:	Secondary Indicators (2 or more required):
Depth of Surface Water: NA (in.)	____ Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: NA (in.)	____ Water-Stained Leaves
	____ Local Soil Survey Data
Depth to Saturated Soil NA (in.)	____ FAC-Neutral Test
	____ Other (Explain in Remarks)

Remarks: No hydrology noted.

SOILS

Map Unit Name (Series and Phase): _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? Yes No

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0-6	A	10YR 4/4			Loamy Sand
6-10	A	10YR 3/4			Loamy Sand
10-16	B	10YR 3/3			Loamy Sand

Hydric Soil Indicators:

_____ Histosol	_____ Concretions
_____ Histic Epipedon	_____ High Organic Content in Surface Layer in Sandy Soils
_____ Sulfidic Odor	_____ Organic Streaking in Sandy Soils
_____ Aquic Moisture Regime	_____ Listed on Local Hydric Soils List
_____ Reducing Conditions	_____ Listed on National Hydric Soils List
_____ Gleyed or Low-Chroma Colors	_____ Other (Explain in Remarks)

Remarks

No hydric soil indicators noted.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	No	
Wetland Hydrology Present?	No	
Hydric Soils Present?	No	Is this Sampling Point Within a Wetland? No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	NWS Earle, New Jersey	Date:	August 10, 2009
Applicant/Owner:		County:	Monmouth
Investigator:	Tony DiLella/Kate Mayrides	State:	NJ

Do Normal Circumstances exist on the site?	NO	Community ID:	Open Field
Is the site significantly disturbed (Atypical Situation)?	YES	Transect ID:	
Is the area a potential Problem Area? (If needed, explain on reverse)	NO	Plot ID:	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Phragmites australis*	H	FACW	9.		
2. *Microstegium vimineum*	H	FAC	10.		
3. *Asclepias syriaca*	H	NL	11.		
4. *Panicum clandestinum*	H	FAC+	12.		
5. *Rosa multiflora*	H	FAC	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 60%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):
- ____ Stream, Lake or Tide Gauge
- X Aerial Photographs
- ____ Other

____ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)

Depth to Free Water in Pit: NA (in.)

Depth to Saturated Soil NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ____ Inundated
- ____ Saturated in Upper 12 Inches
- ____ Water Marks
- ____ Sediment Deposits
- ____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ____ Oxidized Root Channels in Upper 12 Inches
- ____ Water-Stained Leaves
- ____ Local Soil Survey Data
- ____ FAC-Neutral Test
- ____ Other (Explain in Remarks)

Remarks: No hydrology noted.

SOILS

Map Unit Name (Series and Phase): _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? Yes No

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0-2	O	10YR 3/2			Organic Material
3-6	A	10YR 4/6			Loamy Sand
6-13	B	10YR 4/4		10% gravel	Loamy Sand
14-24	B	10YR 4/6			Loamy Sand

Hydric Soil Indicators:

_____ Histosol	_____ Concretions
_____ Histic Epipedon	_____ High Organic Content in Surface Layer in Sandy Soils
_____ Sulfidic Odor	_____ Organic Streaking in Sandy Soils
_____ Aquic Moisture Regime	_____ Listed on Local Hydric Soils List
_____ Reducing Conditions	_____ Listed on National Hydric Soils List
_____ Gleyed or Low-Chroma Colors	_____ Other (Explain in Remarks)

Remarks

No hydric soil indicators noted.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes		
Wetland Hydrology Present?	No		
Hydric Soils Present?	No	Is this Sampling Point Within a Wetland?	No

Remarks:

DATA FORM
ATYPICAL WETLAND DETERMINATION

Project/Site:	NWS Earle, New Jersey	Date:	August 10, 2009
Applicant/Owner:		County:	Monmouth
Investigator:	Tony DiLella/Kate Mayrides	State:	NJ

Do Normal Circumstances exist on the site?	NO	
Is the site significantly disturbed (Atypical Situation)?	YES	
Is the area a potential Problem Area? (If needed, explain on reverse)	NO	

1987 ACOE Wetland Delineation Manual Atypical Situations Determination

Evaluation of the criteria in the 1987 ACOE Wetland Delineation Manual, Part IV, Section F (Atypical Situations), Subsection 4 – Man Induced Wetlands, conclude that the project area would not be considered a disturbed wetland because all of the following questions (Step 1) were documented as 'No'. The questions include:

a. Has a recent man-induced change in hydrology occurred that caused the area to become significantly wetter?

b. Has a major man-induced change in hydrology that occurred in the past caused a former deepwater aquatic habitat to become significantly drier?

c. Has man-induced stream channel realignment significantly altered the area hydrology?

d. Has the area been subjected to long-term irrigation practices?

If the answer to any of the above questions is YES, document the approximate time during which the change in hydrology occurred, and PROCEED TO STEP 2. If the answer to all of the questions is NO, procedures described in Section D or E must be used.

Sections D and E of the 1987 ACOE Wetland Delineation Manual require that all three wetland parameters be met for the areas in question to be considered a wetland. Neither the upland pine forest nor the open successional field demonstrated all three wetland parameters. Therefore, no jurisdictional wetlands according to the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (U.S. Army Corps of Engineers [USACE], 1987) are present.

APPENDIX C

Site Photos

SITE PHOTOGRAPHS

Photo 1: Facing east from western boundary road.

Photo 2: Facing north from open field area.

Photo 3: Facing west from open field area.

Photo 4: Facing east from western boundary between open field and upland forest.

Photo 5: Facing south from western boundary.

Photo 6: Facing north from western boundary.

Photo 7: Facing south from edge of open field towards upland pine forest.

Photo 8: Facing east from eastern edge of open field.

Photo 9: Facing north from southeastern boundary.

Photo 10: Facing west from eastern edge of open field.

Photo 11: Facing south from northern edge of open field.

Photo 12: Facing southeast from western edge of open field.

APPENDIX C

2009 TEST PITTING REPORT

Naval Weapons Storage Earle – Site 7 Landfill Area – Test Pitting

Technical Memo #1

PREPARED FOR: Colleen Reilly/MKE

PREPARED BY: James Balas/NJO

COPIES: Taylor Sword/AGVIQ
Don Edelman/AGVIQ

DATE: September 3, 2009

PROJECT NUMBER: 392668.04.05.05.91

Description of Activities Performed

During the week of August 10, 2009 CH2M HILL and AGVIQ personnel were at the Naval Weapons Storage (NWS) Earle facility located in Leonardo, NJ performing a wetland delineation and test pitting to determine the extent of a historic landfill. The results from the wetland delineation will be prepared and submitted as a separate technical memorandum. This technical memorandum will focus on the test pitting activities only.

Utilizing a Komatsu PC160 excavator, test pitting was performed to determine the limits of a historic landfill at Site 7 NWS-Earle. Prior to test pitting activities, CH2M HILL personnel used Figure 3-1 (Tetra Tech, 2008. Feasibility Study for Site 7 Landfill South of "P" Barricades (OU10), NWS Earle, Colts Neck, New Jersey. July) (Attachment 1) as a reference to mark out the possible limits to the landfill. Along with the figure and the rough outline delineated in the field visual indicators such as unnatural changes in topography and/or vegetation were identified and used to initiate test pitting activities. The area is dominated by young (20-30 year old) coniferous trees with little undergrowth requiring extensive clearing to access test pit locations. The surrounding area had a mature forest consisting of mixed hardwood and conifers. In an attempt to reduce the amount tree removal, the clearing was conducted beginning inside the known limits of the landfill moving outward, as the trees inside the limits of the landfill will be removed during future construction activities at the site.

During test pit activities, AGVIQ and CH2M HILL personnel observed waste debris such as rubber piping, plastic bags, metal sheeting, steel conduit, vehicular tires, steel cabinets, bottles, cans and other non-hazardous household type waste. Attachment 2 is the picture log for the test pitting activities showing the waste found in test pits. In all cases debris was encountered between one (1) to four (4) feet below ground surface (bgs) with actual excavation depths extending up to eight (8) feet bgs.

A total of thirty three (33) test pits were required to determine the limits of the landfill. The attached field notes (Attachment 3) identify each test pit and observations made. Additionally, the picture log documents the test pits and their contents. While mobilizing from one test pit location to the next the excavator disturbed the earth through tree removal and clearing. This practice would expose areas up to two feet bgs. As the excavator cleared, the operator would take note of visible debris just below ground surface. As stated above the clearing process worked from the center of the site outward to the perimeter, allowing the operator to observe any waste through less intrusive activities. Please refer to the picture log where debris was noted during the clearing of trees in their root balls and other disturbances. Additionally, anthropogenic factors such as berms or depressions were used to identify the possible limits. Locations of the test pits were agreed upon between CH2M HILL and AGVIQ personnel based upon observations made in the field and indicators as stated above. The included field notes contain the approximate dimensions of the test pits. Twenty three (23) of these test pits will be used as the limits of the landfill area, because no debris was noted. Table 1 below lists the test pits that will be used as the limits of the landfill.

TABLE 1: SUMMARY OF TEST PITS TO BE USED FOR LIMITS OF LANDFILL
Site 7 NWS-Earle Landfill Area
Leonardo, New Jersey

Test Pit ID	Test Pit ID	Test Pit ID
TP-2	TP-18	TP-27
TP-5	TP-19	TP-28
TP-6	TP-20	TP-29
TP-9	TP-21	TP-30
TP-12	TP-22	TP-31
TP-14	TP-24	TP-32
TP-15	TP-25	TP-33
TP-17	TP-26	

In general, test pit locations were approximately 50-100 feet apart , with some as far as 150 feet difference. In a phone conversation with Taylor Sword and Don Edelman, Mr. Sword approved the change in the work plan allowing greater spatial separation of test pits in locations where the limits of the landfill were easily identified such as a man-made berm or vegetation change (Attachment 4). At locations where debris was encountered, the test pits were reduced to 10-40 foot distance based on AGVIQ/CH2M HILL judgment. The northern and eastern limits had little to no topographic or vegetation change and determining the limits in those areas required multiple test pit locations. The northwestern limit did have a visual decrease in topographic elevation from the landfill footprint to the surrounding area. This was confirmed through test pits that revealed debris at the higher elevation and no debris at the base of the elevation change. The southern limit was roughly bounded by an earthen berm that rose approximately five (5) feet above the footprint of the landfill. The

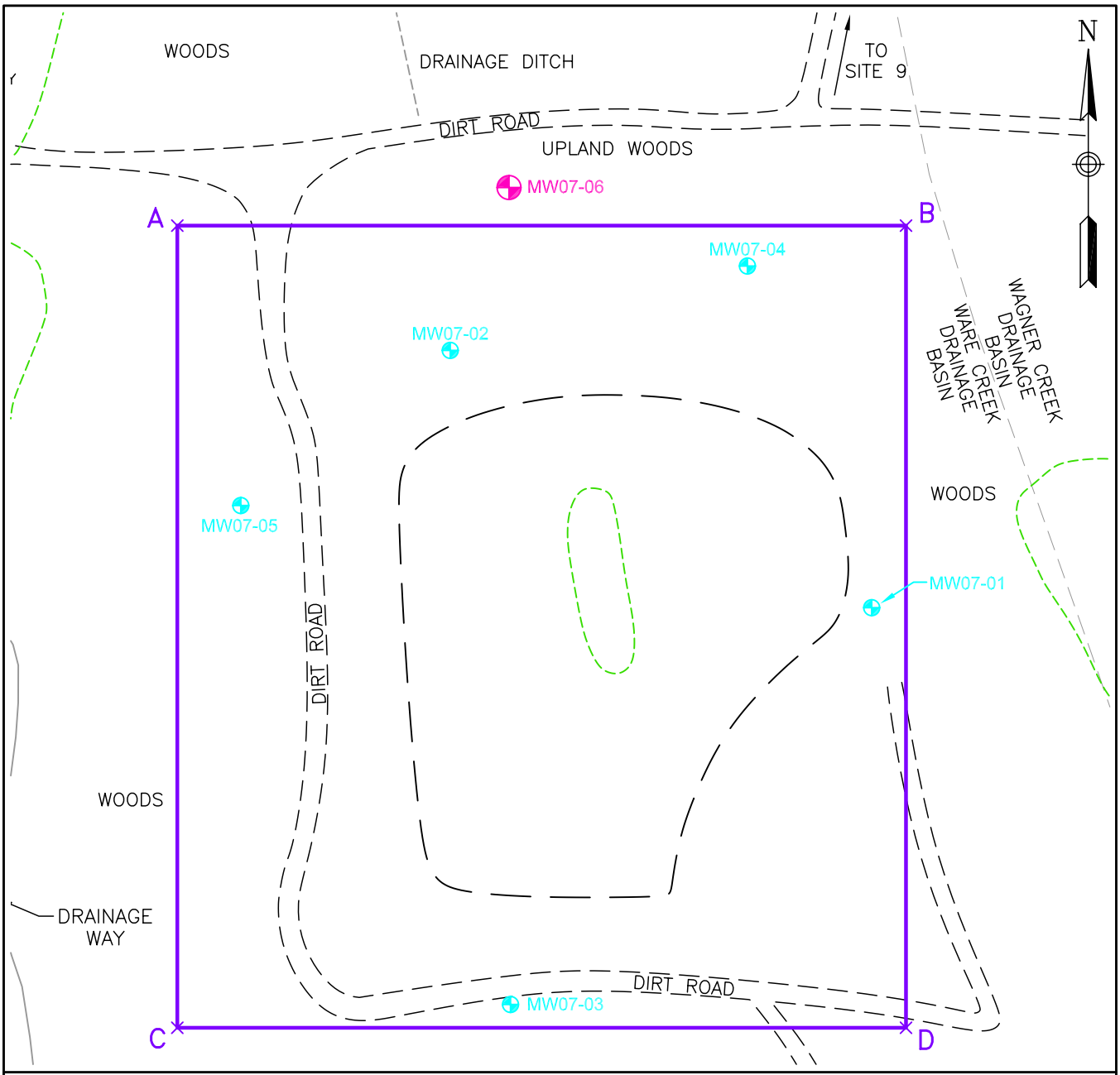
western limit was bounded approximately six (6) feet east of primitive dirt road know as FR-314.

All test pit locations were surveyed by a licensed surveyor from Vargo Surveying on August 14 and 17, 2009. In addition to the test pit location survey, a complete topographic survey of the site was conducted and extended to 50 feet beyond the limits of the landfill.

Additionally, an inspection was conducted of the five (5) monitoring wells associated with the site. One (1) well MW07-03 located to the south of the site was damaged. The exterior steel casing and lid were visually damaged and are not properly functioning. No lock was found on the casing or immediately surrounding the monitoring well. Upon opening the well, the inner PVC casing was filled with leaf litter rendering the well not functional. MW07-03 is not properly functioning and corrective action should be taken. All other monitoring wells were in good condition closed and locked properly.

ATTACHMENT 1

112G00012/0315/112G00012GM09.DWG 06/04/08 MKB



LEGEND

- MONITORING WELL LOCATION
- PROPOSED MONITORING WELL LOCATION
- APPROXIMATE LANDFILL BOUNDARY (EPIC, 1974)
- FIELD ESTIMATED WETLANDS
- PROPOSED CLASSIFICATION EXCEPTION AREA

0 150 300

SCALE IN FEET

POINT	EASTING	NORTHING
A	610971.8318	571330.7679
B	611659.5250	571330.7679
C	610971.8318	570573.5540
D	611659.5250	570573.5540

NOTE:
NORTHINGS AND EASTINGS ARE IN NEW JERSEY STATE PLANE COORDINATE SYSTEM.

TETRA TECHNUS, INC.

LIMIT OF PROPOSED CLASSIFICATION EXCEPTION AREA SITE 7 – LANDFILL SOUTH OF "P" BARRICADES NAVAL WEAPONS STATION EARLE COLTS NECK, NEW JERSEY

SCALE: AS NOTED
FILE: 112G00012GM09
REV: 0
DATE: 06/04/08
FIGURE NUMBER: FIGURE 3–1

ATTACHMENT 2

Mounding North of Landfill Site

Mounding North of Landfill Site

55 gallon drum East of Landfill – No product or residues noted

Damaged Monitoring well MW07-03 south of Site– casing and cover damaged and inner PVC filled with leaf liter

MW07-03 – Damaged monitoring well cap and casing south of site

ID of damaged monitoring well MW07-03

Access road on western side of site

Fragmities and location of suspect wetland

Fragmities and location of suspect wetland

Clearing at landfill site

Surficial debris noted – steel rebar

Asphalt pile found at south end of site

Southeast boundary – berm noted

Mounding in center of site

Eastern boundary

Tire ruts on site

Unknown steel casing found on east access road

Unknown steel casing found on east access road

East access road

Berm found on western side of site

Clearing at center of site, location of suspect wetland

Large unnatural mound west of site

Large mound west of site

Komatsu PC160 arriving at site

TP-1 – excavating long trench to locate debris

Debris found in TP-1 – cloth, steel cable, etc.

Close up of steel cable found in TP-1

TP-2 - no debris noted

TP-3 – debris consisting of brick, plastic, cans, bottles, wood, metal, building materials

TP-4 – cement and cloth debris

TP-5 no debris noted

TP-6 debris noted at south end of excavation none at north, boundary set at north end of excavation

TP-8 – wood and metal (55 gallon drum remnants) debris

TP-9 no debris

TP-11 – metal strapping, steel grating, 55 gallon drum (no residues noted)

TP-11 – metal debris and surficial 55 gallon drum

TP-12 – no debris

TP-13 – wood debris and a tire found in test pit

TP-13 – wood and other construction debris noted

TP-14 – no debris noted

TP-15 – no debris noted

Clearing through north portion of site to gain access to test pit locations

Clearing of trees by excavator

Clearing on north side of site

TP-16 – steel debris

TP-17 – no debris noted

TP-18 – no debris noted

TP-19 – no debris noted

TP-20 – covered, bee hive encountered and covered immediately, no debris noted

TP-21 – no debris noted

TP-22 – No debris noted

TP-23 – metal and wood debris

Debris in root ball from felled tree

TP-24 – No debris noted

TP-25 – No debris noted

TP-26 – No debris noted

TP-27 – No debris noted

TP-28 – No debris noted

TP-29 – No debris noted

TP-30 – No debris noted

TP-31 – No debris noted

TP-32 – No debris noted

TP-33 – No debris noted

Clearing through center of site looking east to boundary

Clearing through center of site looking to south east toward boundary

ATTACHMENT 3

2

CONTENTS

PAGE	REFERENCE	DATE

3

Location Leonardo, NJ Date 8/10/09

Project / Client AGVIQ - Navy

Sunny 100°F

- 800 - OB meets with Kate Mayridis & Tony Dilella - at Leonardo portion site
- 905 - arrive at main Gate for passes - Colts Neck
- 1030 - arrive back at Leonardo - car pass after gate
- 1100 - arrive at location drive out on site
- 1120 - well inspection - familiarize with site
  - MW07-05 - cap & lock ok
  - MW-07-02 - cap rusted lock ok
  - MW07-04 - cap & lock ok
  - MW07-03 casing & cap - dented no lock, well filled with debris
- unnatural earthen mounds noted N of site
- fragments of garbage - sheet metal, steel ducting, etc
  - 55 gal drum, tires, metal cabinets
- MW07-01 - Cap & lock ok

Location Leonardo, NJ Date 8/10/05

Project / Client NWS Earle - AGVIQ, Navy

- 1245 - begin marking approximate boundary of landfill using Tetra Tech figure as ref
- south - pile of asphalt, cement blocks & other debris
- at end of berm on south east - walked north - not disturbances till ~75-100' - mounding extended east ~45'
- tires, steel, other debris noted on east area of site
- mound ends after ~30 ft N
- when compare east boundary on map - no good indicator of it on site - no change in vegetation/topography. visual debris fairly consistent - random debris throughout
- NE corn id'd at area of clearing
- on corner of east dirt road at south - metal casing observed in road - possible bollard/monitor

Location Leonardo, NJ Date 8/10/05

Project / Client NWS Earle AGVIQ a-Navy

Photo log

1. mounding - North side
2. mounding - North
3. Debris - metal ducting / 55 Gal drum
4. damaged well - 03 filled w/ debris / damaged casing & cap
5. close MW07-3 - damage cap & casing
6. ID of well
7. access road - west facing North
8. area of suspect wetland
9. area of suspect wetland
10. North - looking W -> E of clearing & Northern boundary
11. S. West corner - earthen berm
12. S. East corner - end of earthen berm
13. berm on east side of site
14. possible tire tracks for drive way?
15. metal casing - monitor/bollard
16.
17. east side of site

6

Location Leonardo, NJ Date 8/10/09

Project / Client AG VSC - Nave

Photo log
18 - earthen mound on east side of site
19 - center of site - looking w- possible wetland area

8/10/09

7

Location Leonardo, NJ Date 8/10/09

Project / Client

- 1500 - Kate, Tony, and James toured surrounding site to confirm wetlands per NJDEP IMAP for Kate + Tony's survey
- 1515 - Kate + Tony left site
- 1600 - Don Edelman arrives at site - security denies entrance - no adm. after 1430
- 1630 - DB and Don leave site

8/10/09

8

Location Leonardo, NJ Date 8/11/09

Project / Client ~~AGVIQ~~ Landfill 7 test pit 2
AGVIQ - Navy

- 0645 Don Edelman arrives onsite to get access badge
- 745 - James Balas arrives onsite meets with Don
- 815 - arrive at site - take tour with Don
- 845 Don to meet driver of excavator & bring onsite
- 910 excavator arrives at site Komatsur PC160
- 950 - begin test pitting NW area of site
- all activites require clearing & grubbing
- 1500 - ended excavation for day
- 1545 James Balas and Don Edelman offsite

8/11/09

9

Location Leonardo, NJ Date 8/11/09

Project / Client Landfill 7 test Pit
AGVIQ, Navy

Photo Log
-20 - observe mound across road ~~street~~ on west side of site
-21 - same
-22 - Excavator arriving
23 - TP-1 trench
-24 - debris found S - TP-1
-25 - moved out from TP-1 to TP-2 - no debris
26 - N limit of TP-1
27 - debris in TP-1 close up
28 - TP-3 - debris - brick, plastic bags, cans, wood beems, other building debris plastics, metals
29 - debris TP-3 looking N
~~30~~ 29 - TP-5 - Clean
31 - TP-6 - clean holed
32 - TP-8 - debris wood + metal
33 - TP-9 clean pit
34 - TP-11 debris - metal
35 - TP-12 no debris
36 - TP-13 debris in bucket
37 TP-13 debris + excavator

10

Location Leonardo, NJ Date 8/11/09

Project / Client

Test Pit	Location	Time	Depth
TP-1	NW	945	7'
TP-2	S Seast of South limit TP-1	1030	4'
TP-3	50' E TP-1	1050	

11

Location Date

Project / Client

Notes

North side clearing ~7 ft deep light brown sand - all virgin
- surficial debris noted
- extended south ~ 70 ft steel cable + other debris noted ~2-3' bgs
- no debris noted location ~~of TP-2 be corner~~ along access Road

- debris encountered ~1 ft bgs - wood, cans, bottles, metal building debris, plastic bags continued debris heading N
- Don + I decided to move out to end of Pine tree dominant area where topo changes to lower elevation - area in now all trees look about same age - indicates possible of planting at same time 4'd x 4'w - 35' L N-S

Location _____ Date _____

Project / Client Same

Test Pit	Location	Depth	Time
TP-4	~200' N TP-3	6'	1153
TP-5	~10' N TP-4	6'	1157
TP-6	~150' S TP-5	5'	1215
TP-7	~65 E TP-6		1300
TP-8	~35' North East TP-7		1320
TP-9	~30' North TP-8		1325

Location _____ Date _____

Project / Client Same

Notes

cement block, clothe strap, other common debris 4x4x6

no debris noted 4x4x6 N-S

20 x 4 x 5 - debris noted at S 5 ft of excavation - hot water heater, steel straps, bottles, etc

- none at North end of excavation - clean line noted

- located area that dominant youth evergreen ends and mixed hard wood + evergreen, some mature

cans + bottle debris, plastic E-W 7' x 5' x 4'

pulverized 55 gal drum, wood, paper, other metal debris, 3 ft bgs 4' x 4' x 3'

- no debris noted - all brown sand 9 x 5 x 7'

12

14

Location _____ Date _____

Project / Client Same

Test Pit	Location		Time
TP-10	55' SE TP-9	*	1335
TP-11	30' E TP-10		1343
TP-12	~50' N TP-8		1402
TP-13	~30' SE TP-12		1411
TP-14	~45' E TP-13		1420
TP-15	~40' SE TP-14		1427

15

Location _____ Date _____

Project / Client Same

Carpet remants, rubber hose, metal conduit, wood, etc 2' bgs 4'x4'x5'

metal strappings, steel Grating 55gal drum ~1' bgs 4x7x4

no debris noted - will back up 6x4x4 south - ~~may not be used for backfill of test pit~~

wire, wood debris 8x4x5

no debris noted 6x4x5

no debris noted 5x4x3

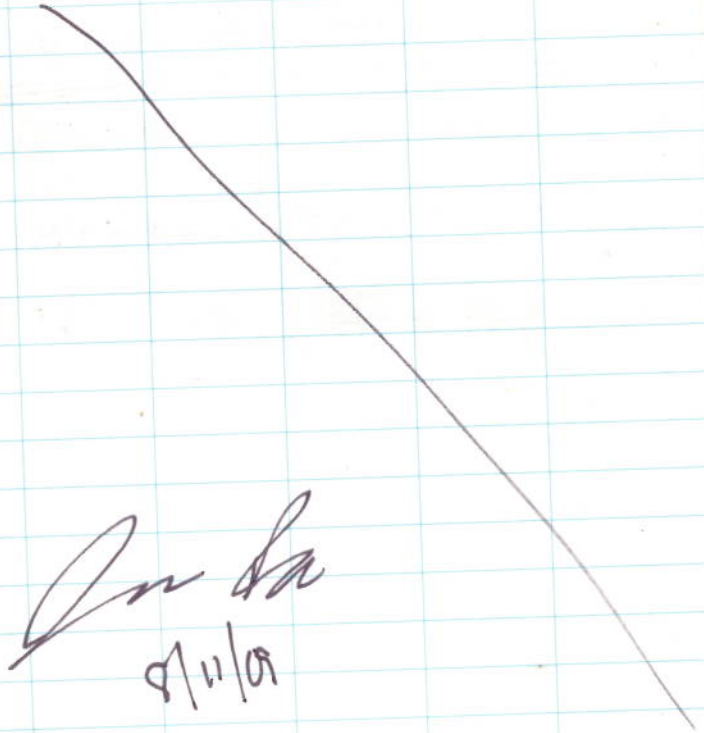
12

16

Location _____ Date _____

Project / Client Same

Photo Log
38-TP-14 no debris
39-TP-15 no debris
40 - clearing at N looking to W
41 - " "
42 - " "



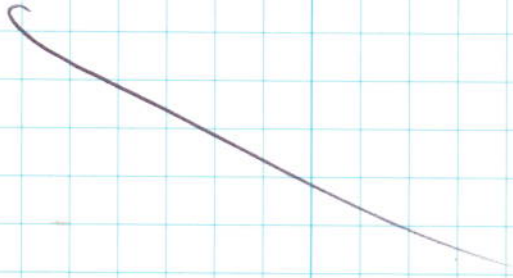
8/11/09

Location Leonardo, NJ Date 8/12/09

17

Project / Client AGVIQ, Navy
Site 7 Landfill Delineation

- 700 - Don Edelman - on site
- 715 - James Balas on site
- Don Edelman cleaning out clearing made on 8/12/09
- Begin day - 745 at NW to look for corner
- 830 - Don clear trees to access east side
- 1110 - James Balas to security ~~clearance~~ office to confirm survey crew access - not in system - contacted Colleen left message to explain
- 1220 - rain
- 1530 - James Balas and Don Edelman leave site



12

18

Location _____ Date _____

Project / Client Same

Photo Log

43 - TP-16 - twisted steel debris
44 TP-17 no debris
45 TP-18 no debris
46 TP-19 no debris
47 TP-20 covered, no debris bees nest
48 TP-21 no debris
49 TP-22 no debris
50 TP-23 - metal, wood debris
51 TP-27 - plastic + other debris
in roots from fell/el tree
52 - TP-24 no debris
53 - TP-25 no debris
54 - TP-26 - no debris
55 - TP-27 no debris
56 - TP-28 no debris
57 - TP-27 no debris

TP

19

Location _____ Date _____

Project / Client Same

12

20

Location

Date

Project / Client Same

Test Pit	Location	Time
TP-16	50' East road	745
TP-17	30' NE TP-16	800
TP-18	15' E of west Road	815
TP-19	East Boundary	915
TP-20	South East TP-19 ~150'	1010
TP-21	N TP20 ~50'	1035
TP-22	S TP 2 ~70'	1100
TP-23	S TP 22 ~100'	1140
TP-24	~35' N TP-23	1210

21

Location

Date

Project / Client Same

Notes

Steel debris ranted, 4' bgs
5x4x5'

no debris 10x4x7'

no debris 10x4x8'
establishes N W Corner

no debris 15x5'x8

no debris - bees nest encountered

no debris - all locations have been brown sand some silt
5x4x5

no debris encountered
30x4x7'

on line with assumed boundary from over head figure - wood, metal, plastic debris

no debris noted 8x4x7

12

22

Location _____ Date _____

Project / Client Same

Test Pit	Location	Time
TP-25	~150' SW TP-23	1230
TP-26	~100 ft SW TP-25	1255
TP-27	~50 ft S TP-26	1305
TP-28	~100 ft W TP-27	1315
TP-29	~50 ft W TP-T2	1425

23

Location _____ Date _____

Project / Client Same

Notes

debris noted at very edge of western side of pit - none along eastern side - marker at east edge of pit 10x5x4

no debris encountered 8x4x7

no debris 6x4x6
SE corner marker

~~Collected~~ dug at base of berm
no debris noted, asphalt slab noted just to west of location
no debris noted

8/12/09

12

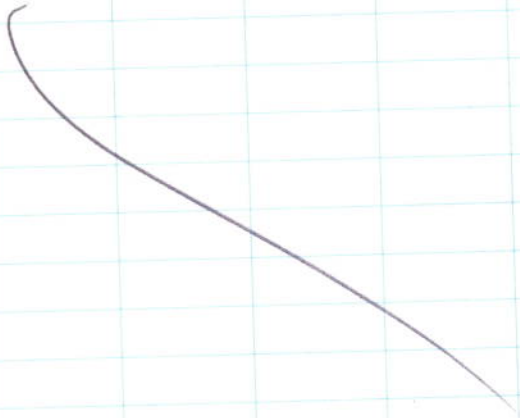
24

Location Leonardo, NJ Date 8/13/09

Project / Client AGVIQ, Navy

Site 7 Landfill Delineation

- 730 - James Balas / Don Edelman arrive on site
- finalize west boundary & complete paper work
- 1030 - finalized test pitting cleaned site
- 1200 - excavator picked up
- 1300 - excavator offsite
- 1345 - James Balas and Don Edelman offsite
- 1445 - OBS download pictures
- 1530 - day ended



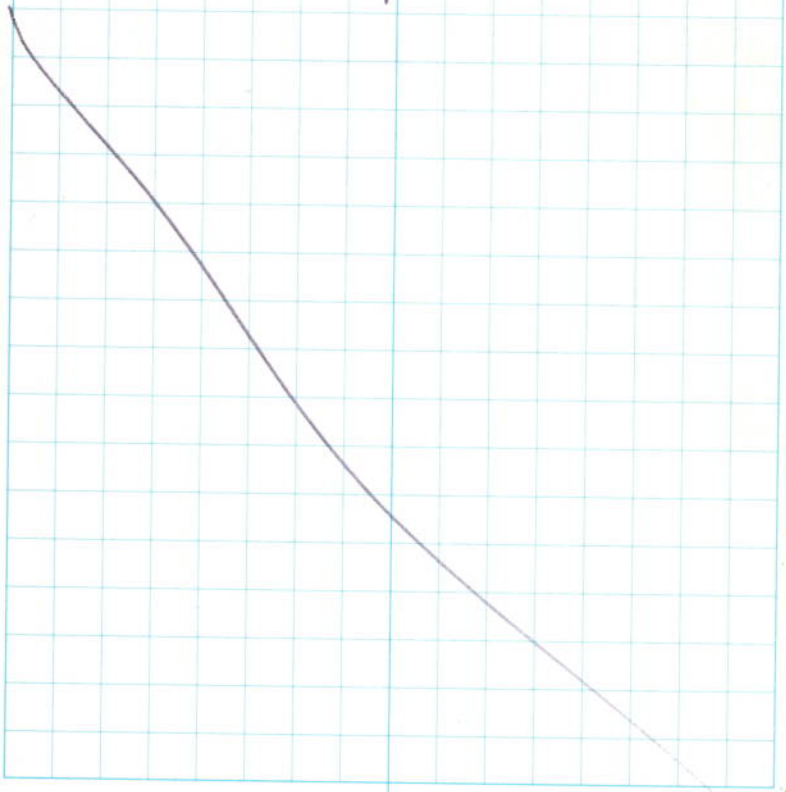
25

Location Same Date

Project / Client

Photo Log

58 - TP-30 - no debris noted
59 - TP-31 no debris
60 - TP-32 no debris
61 - TP-33 no debris
62 - clearing picture East
63 - clearing picture East



12

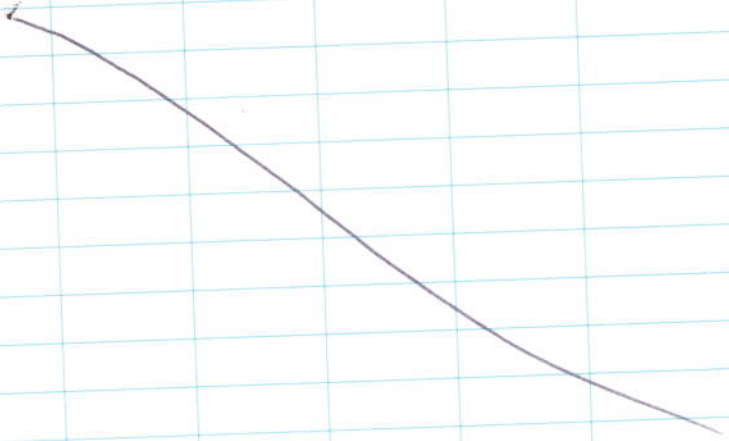
26

Location _____ Date _____

Project / Client Same

Test Pit	Location	Time
TP-30	S.W. boundary	840
TP-31	N TP-30 ~ 50'	900
TP-32	N TP-31 ~ 70'	912
TP-33	N TP-32 ~ 50'	935

test pitting completes



27

Location _____ Date _____

Project / Client Same

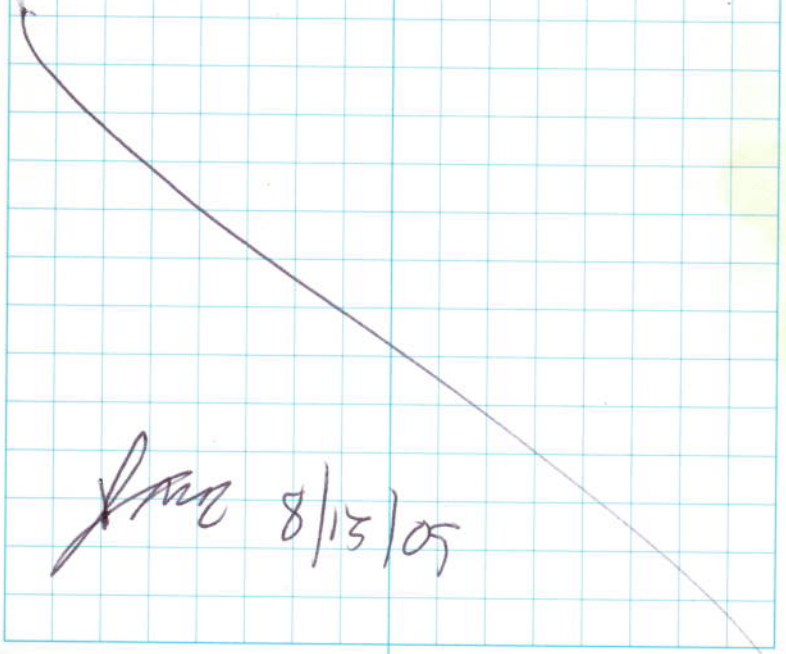
Notes

limestone rock ~5' bgs
no debris noted 8x4x8

no debris noted 8x4x6'

no debris 12'x4x8

no debris noted



8/15/05

12

28

Location Leonardo, NJ Date 8/14/09

Project / Client Navy
Landfill Site / delineation

- 0800 - James Balas onsite
met with surveyors from Vargo
Paul Scheaffer
Mike Panichelli
- 0815 - obtained badges from
security
- 0900 - mobe survey equipment
- 1000 - Survey began
- 1400 - survey crew + James Balas
offsite

TP

29

Location Date

Project / Client Same

Test Pits for Boundary

TP-2
TP-5
TP-6
TP-9
TP-12
TP-14
TP-15
TP-17
TP-18
TP-19
TP-20
TP-21
TP-22
TP-24
TP-25
TP-26
TP-27
TP-28
TP-29
TP-30
TP-31
TP-32
TP-33

ATTACHMENT 4

Balas, James/NJO

From: Balas, James/NJO
Sent: Thursday, September 03, 2009 10:03 AM
To: Reif, Marty/WDC
Subject: FW: NWS Earle Site work

From: Taylor Sword [mailto:taylor.sword@tikigaq.com]
Sent: Thursday, September 03, 2009 9:51 AM
To: Balas, James/NJO
Subject: RE: NWS Earle Site work

Yes I did give him permission to increase the distance- and we both agreed if this did not compromise the delination of the edge of the former landfill.

From: James.Balas@CH2M.com [mailto:James.Balas@CH2M.com]
Sent: Thursday, September 03, 2009 9:47 AM
To: Taylor Sword
Subject: RE: NWS Earle Site work

Taylor,

On the first day of test pitting activities (8/11/2009), Don and yourself had a phone conversation some time mid-morning concerning extending the distance of the test pits in areas that the limits were easily identifiable such as an unnatural change in topography. At the time, I did not note that conversation in my log book at the time and I was recently asked about this. Can you please confirm that you gave permission to extend the distance between test pits.

Thanks,

James Balas
Environmental Scientist
CH2M HILL
119 Cherry Hill Road
Parsippany, NJ 07054
www.ch2mhill.com

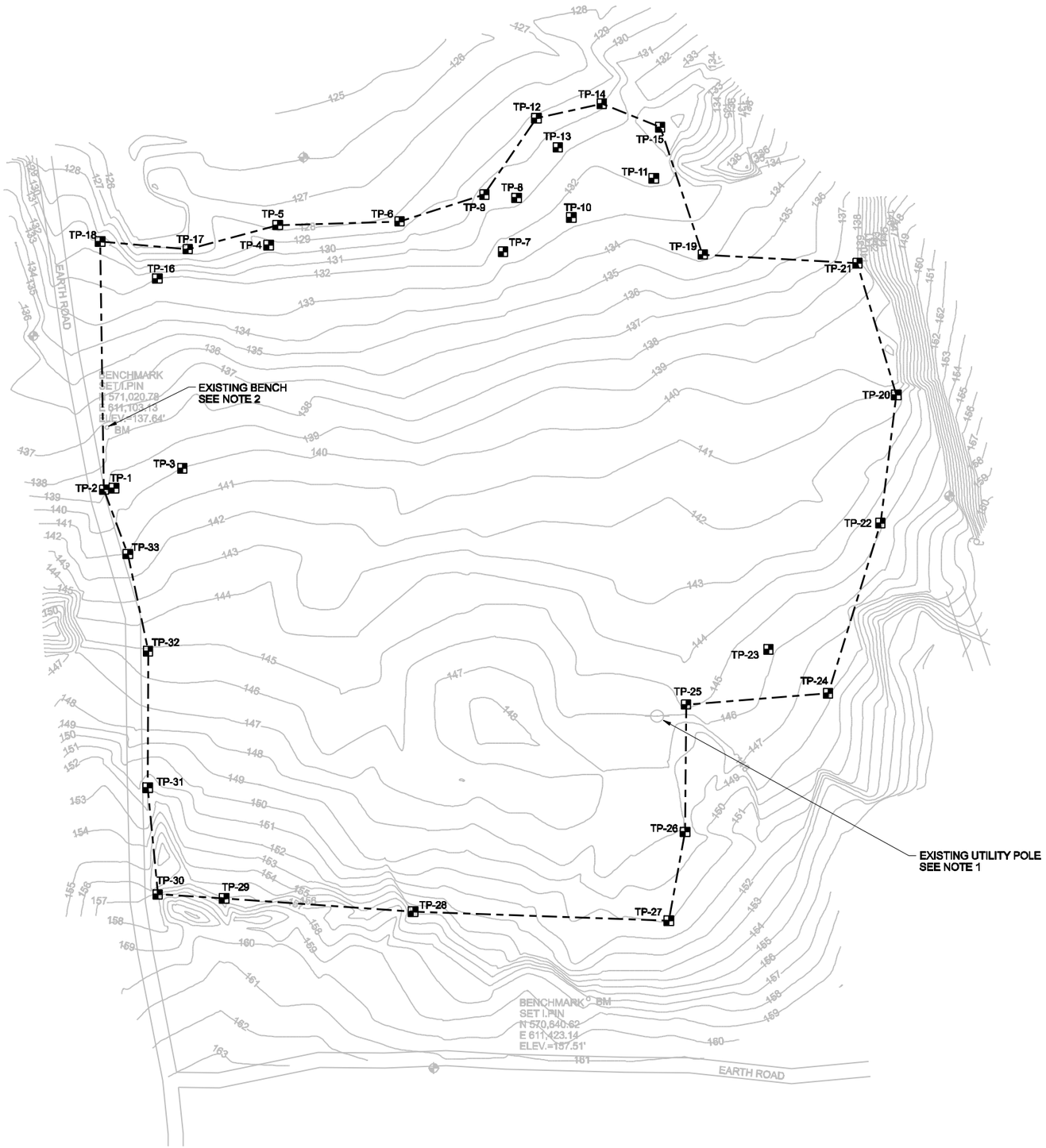
From: Taylor Sword [mailto:taylor.sword@tikigaq.com]
Sent: Thursday, September 03, 2009 9:05 AM
To: Reilly, Colleen/MKE; Balas, James/NJO
Subject: NWS Earle Site work

Colleen / James:
For internal monthly reporting – and reporting on to the Navy for the month of August I need to report manhours on site --- from the daily reports for the period of 8/10 – 8/17 I have 131 manhours. What I am interested in is what day did we finish the survey – work with the surveyors on site, was it on the 17th (a Monday) or did we carry over and also work on site on the 18th?

I am just checking. Let me know thanks.

P. Taylor Sword
Sr. Project Manager
Agviq Environmental Services LLC
4610 Westgrove CT.
Viginia Beach, VA. 23455
p 757.318.9420 x 13
f 757.318.9421
c 757.217.5725
tsword@tikigaq.com

ATTACHMENT 5



NOTES:

1. UTILITY POLE TO BE REMOVED PRIOR TO CONSTRUCTION.
2. SURVEYOR TO RELOCATE BENCHMARK PRIOR TO BEGINING CONSTRUCTION.

LEGEND

- TP-23 — TEST PITS
- 150 — EXISTING CONTOUR
- — — — LIMITS OF WASTE
- EXISTING UTILITY POLE
- BM — EXISTING BENCH MARK

N

0 40 80 120

Scale In Feet

MARTIN A. REIF

N.J. PROFESSIONAL ENGINEER NO. 32634

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
		SG HUTSELL	MA WALKER	MA REIF	APVD	C REILY	

NAVAL WEAPONS STATION EARLE LANDFILL
COVER SITE 7
NAVAL WEAPONS STATION
COLTS NECK, NEW JERSEY

CIVIL

EXISTING SITE PLAN

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCTOBER 2009
PROJ	PROJECT-NO
DWG	C-1
SHEET	3 OF 10

FILENAME: dn05c101_392668.dgn PLOT DATE: 10/16/2009 PLOT TIME: 2:33:51 PM