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NWS EARLE
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Wetland Delineation Report
for
Site 13 - Defense Property Disposal Office Yard (Operable Unit 5)

Naval Weapons Station Earle
Colts Neck, New Jersey

Engineering Field Activity Northeast
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0851

September 2003

TETRA TECH NUS, INC.

TETRA TECH NUS, INC.
661 Andersen Drive • Pittsburgh, PA 15220
Tel 412.921.7090 • Fax 412.921.4040 • www.tetratech.com

PITT-09-3-014

September 11, 2003

Project Number N6710

Ms. Michele DiGeambeardino
Naval Facilities Engineering Command
EFANE (Code EV21/MD)
10 Industrial Highway, Mail Stop #82
Lester, PA 19113-2090

Reference: CLEAN Contract No. N62467D-94-0888
Contract Task Order No. 851

Subject: Transmittal of Wetland Delineation Report (Revision 1)
Site 13 – Defense Property Disposal Office Yard (OU-5)
Naval Weapons Station Earle, Colts Neck, New Jersey

Dear Ms. DiGeambeardino:

Enclosed please find one (1) copy of the Wetland Delineation Report (Revision 1) for the above-referenced site. Copies of this package have been sent, via this letter, to Nancy Kuntzleman (EFANE) and Larry Burg (NWS Earle).

Should you have any questions, please call me at (412) 921-8259 or Bob Mertz at (412) 921-7617 in our Pittsburgh office.

Sincerely,

Daniel C. Witt, P.E.
Project Manager

DW/kf

Enclosures

c: Mr. Roger Boucher, NORTHDIV (w/o enclosure)
Ms. Nancy Kuntzleman, EFANE (12 copies & 1 CD)
Mr. Larry Burg, NWS Earle (1 copy)
Mr. John Trepanowski, Tetra Tech NUS, Inc. (1 copy)
Mr. Peyton Doub, Tetra Tech NUS, Inc. (1 copy))
Project File N6710

060307/P

WETLAND DELINEATION REPORT
FOR
SITE 13 - DEFENSE PROPERTY
DISPOSAL OFFICE YARD (OU-5)

NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Engineering Field Activity Northeast
Environmental Department, Code EV2
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop #82
Lester, Pennsylvania 19113-2090

Submitted by:
Tetra Tech NUS, Inc.
600 Clark Avenue, Suite 3
King of Prussia, Pennsylvania 19406-1433

CONTRACT NUMBER N62467-94-D-0888
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SEPTEMBER 2003

PREPARED UNDER DIRECTION OF:

DANIEL C. WITT, P.E.
PROJECT MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA

APPROVED FOR SUBMISSION BY:

JOHN J. TREPANOWSKI, P.E.
PROGRAM MANAGER
TETRA TECH NUS, INC.
KING OF PRUSSIA, PENNSYLVANIA

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ACRONYMS

ARAR	applicable, relevant, and appropriate requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
DBH	diameter at breast height
ESQD	explosive safety quantity distance
FACW	Facultative Wetland
FICWD	Federal Interagency Committee for Wetland Delineation
LOI	Letter of Interpretation
NCDC	National Climatic Data Center
NJAC	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NJSA	New Jersey State Act
NRCS	National Resource Conservation Service
NWS	Naval Weapons Station
OBL	Obligate Wetland
PFO	Palustrine Forested
RI	remedial investigation
RME	reasonable maximum exposure
SCS	United States Soil Conservation Service
TtNUS	Tetra Tech NUS, Inc.
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish & Wildlife Service
UXO	unexploded ordnance

1.0 INTRODUCTION

Areas meeting the definition of wetlands used by the U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344) and the New Jersey Department of Environmental Protection (NJDEP) under the New Jersey Freshwater Wetlands Protection Act (N.J.S.A. 13:9B) were delineated on that part of the Naval Weapons Station (NWS) Earle in Colts Neck, New Jersey designated as Site 13 - Defense Property Disposal Office Yard. Chemical contamination on Site 13 will be remediated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601 et seq.). The remedy will consist of excavating some areas of contaminated soil and installing a low permeability cover system over the landfill (excavated soil will be placed under the new cover system). The USACE, USEPA, and NJDEP define wetlands as "those areas that are inundated or saturated 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 (40 C.F.R. 230.3, 33 C.F.R. 328.3, and N.J.A.C. 7:7A-1.4)". Under this definition, wetlands may be either under the influence of tides (tidal) or unaffected by tides (nontidal).

NWS Earle is located in Monmouth County in east-central New Jersey (Figure 1-1). The NWS Earle encompasses approximately 11,134 acres and includes a Waterfront Area and a Mainside Area. The Waterfront Area is located on Sandy Hook Bay and includes an ammunition depot and associated piers. The Mainside Area is located approximately 10 miles inland and includes residences, office buildings, workshops and warehouses, recreational areas, open space, and undeveloped land. The majority of the Mainside Area consists of undeveloped land associated with ordnance operations, production, and storage facilities. Much of the undeveloped land is encumbered by explosive safety quantity distance (ESQD) arcs. Land surrounding the Mainside Area includes agricultural areas, vacant land, and low density residential land (TtNUS, 2003).

Site 13 is an area of fill material located near the rail classification yards within the Mainside Area (Figure 1-2). Activities at the site included storage of scrap metals and batteries and the burial of material, such as cars, trucks, electronic equipment, clothing/shoes, sheet metal, furniture, scrap metal, and batteries. Additionally, batteries were broken open at the site for lead recovery, and acid was drained onto the ground. Because the primary function of the site was scrap metal storage, unexploded ordnance (UXO) is not expected to be present in the fill material; however, ordnance "shapes" have been encountered during previous intrusive activities at the site.

A baseline human health risk assessment performed as part of a remedial investigation (RI) concluded that reasonable maximum exposure (RME) cancer risk estimates for future residents consuming and exposed to groundwater below Site 13 exceeded the target maximum acceptable risk range. The

estimated human health risk for the future industrial (groundwater) exposure scenario was at the upper end of the target maximum acceptable risk range. Arsenic and vinyl chloride were the principal compounds of concern in the groundwater contributing to the estimated cancer risks. Unacceptable noncancer risks were also reported for future residential and future industrial (groundwater) exposure scenarios. The principal noncancer compounds of concern include arsenic, cadmium, and iron (TtNUS, 2003).

All of NWS Earle, including Site 13, is located in the coastal lowlands of Monmouth County, within the Atlantic Coastal Plain Physiographic Province of New Jersey. The Mainside Area, which includes Site 13, is relatively flat, with elevations ranging from approximately 100 to 300 feet above mean sea level. The headwaters and drainage basins of three major coastal plain rivers (the Swimming, Manasquan, and Shark Rivers) originate in the Mainside Area. All ultimately discharge to the Atlantic Ocean. The Swimming River and Shark River supply reservoirs used for public water supplies. Site 13 drains to an unnamed perennial drainage that flows into Hockhockson Brook, a tributary to the Swimming River (TtNUS, 2003).

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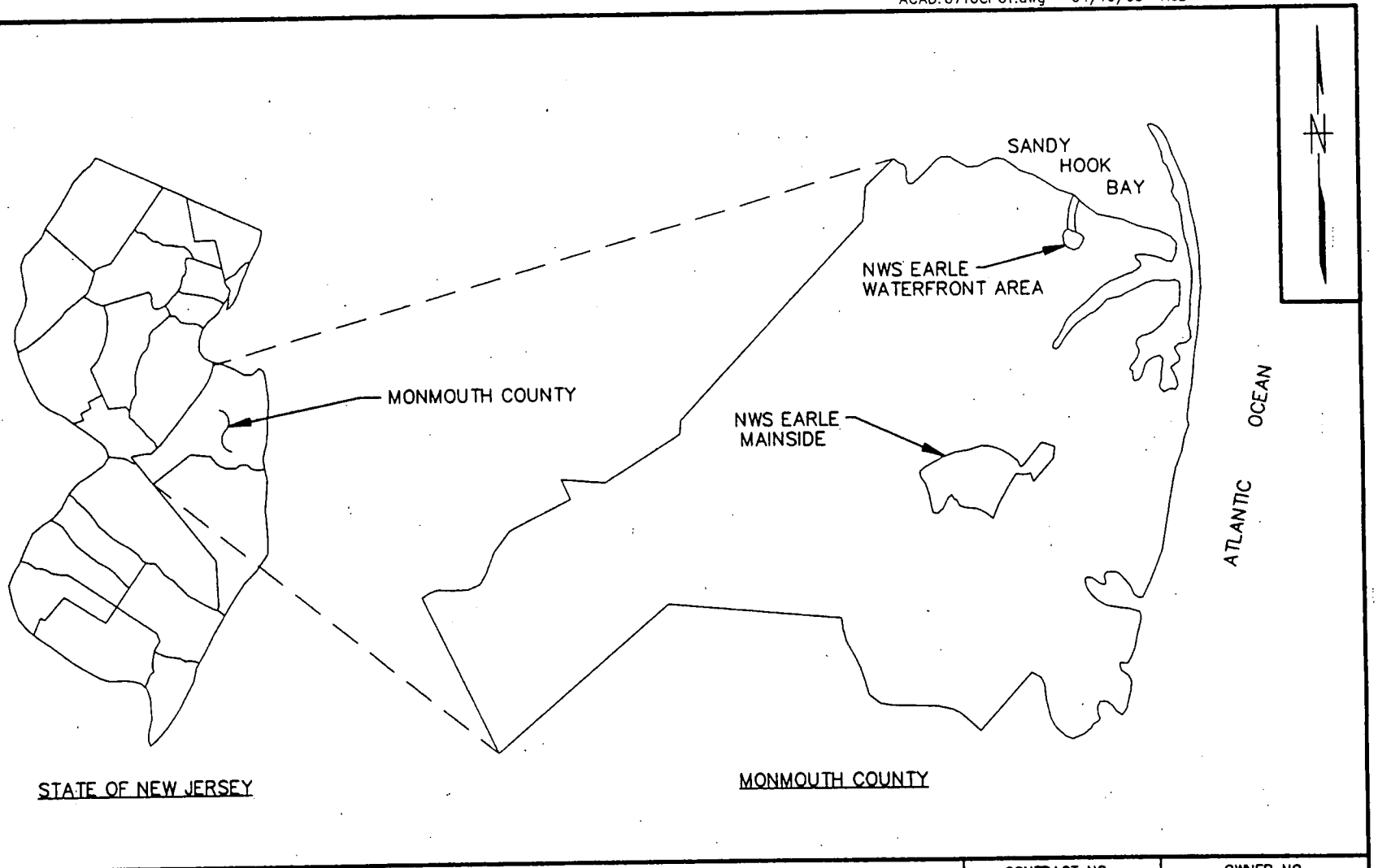

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CHECKED BY DATE	REGIONAL SITE MAP NAVAL WEAPONS STATION EARLE COLTS NECK, NEW JERSEY	APPROVED BY Daniel C Witt	DATE 4/10/03
COST/SCHED-AREA		APPROVED BY	DATE
SCALE NOT TO SCALE		DRAWING NO. FIGURE 1-1	REV. 0

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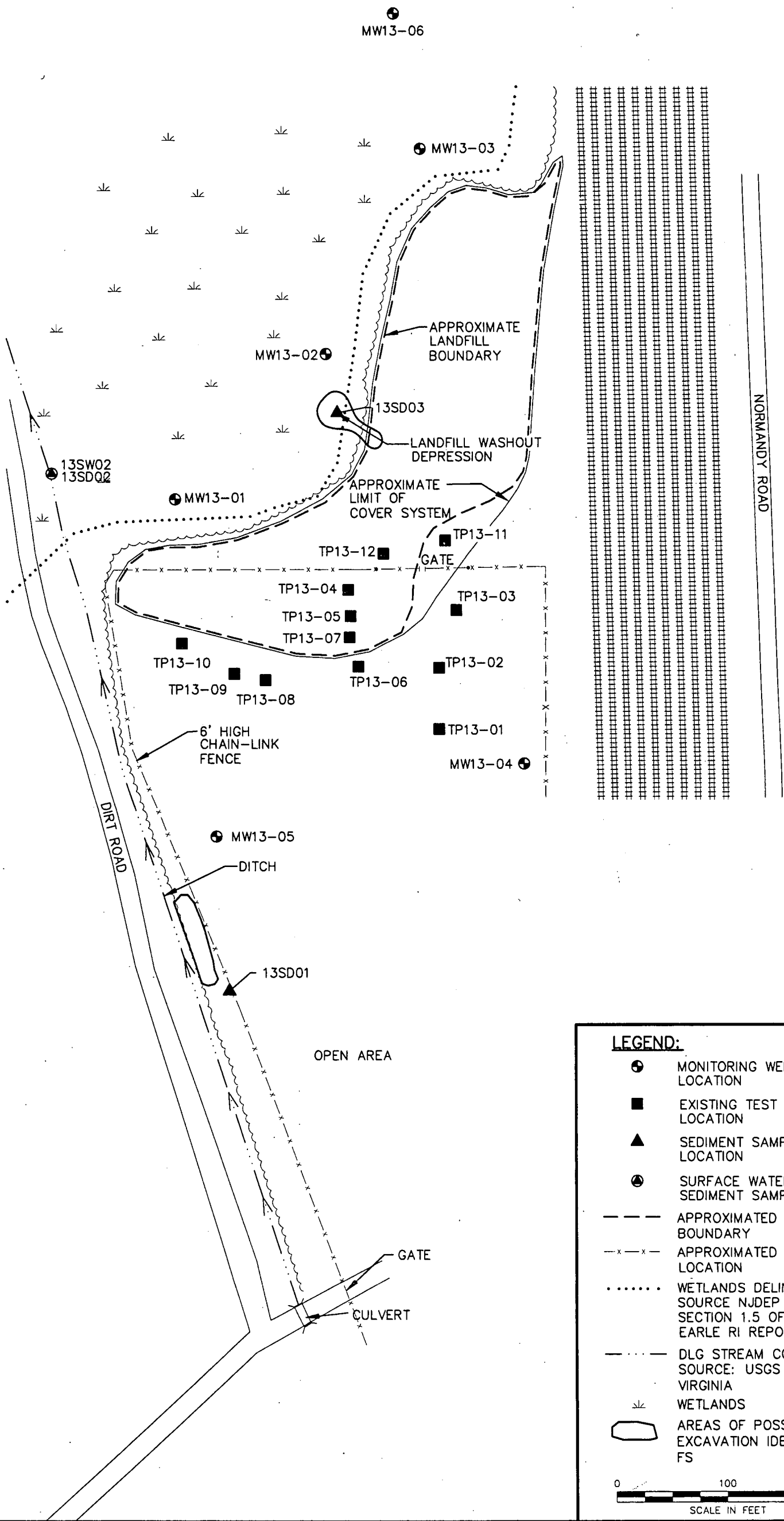

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COST/SCHED-AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 1-2	REV. 0

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2.0 METHODOLOGY

Fieldwork for the wetland delineation was conducted on April 29 and 30, 2003. The wetland delineation followed the Routine Onsite Determination Method, Plant Community Assessment Procedure in Section 4.11 of the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (Federal Manual) (FICWD, 1989). Although the Federal Manual was recognized by the USACE from 1989 until 1991 as the technical direction for delineating wetlands throughout the United States for purposes of determining jurisdiction of the CWA, the USACE has since 1991 reverted to an earlier wetland delineation manual for CWA permitting purposes. The earlier manual is termed the U.S. Army Corps of Engineers Wetlands Delineation Manual (USACE Manual; Environmental Laboratory, 1987). However, the USACE has delegated administration of most elements of Section 404 to the NJDEP in New Jersey. While the NJDEP recognizes the same definition of wetlands as the USACE, it recognizes the Federal Manual rather than the USACE Manual as the procedural guide for delineating wetlands.

With few exceptions, areas identified as a wetland using the Federal Manual must display positive evidence of each of the following three parameters indicative of wetland conditions:

- Hydrophytic Vegetation – Defined as macrophytic plant life growing in water, soil, or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content (Federal Manual, Section 2.1).

- Hydric Soil – Defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (Federal Manual, Section 2.6).

- Wetland Hydrology – Defined as permanent or periodic inundation, or soil saturation to the surface, at least seasonally (Federal Manual, Section 2.8).

The definitions of hydrophytic vegetation and hydric soil in the Federal Manual and in the USACE Manual are approximately the same. However, with respect to wetland hydrology, Section 2.8 of the Federal Manual states that the presence of water for a week or more during the growing season typically creates anaerobic conditions in the soil, which affect the types of plants that can grow and the types of soils that develop. In contrast, Section 48 of the USACE Manual states that areas that are inundated or saturated for less than 5 percent of the growing season (generally 1 to 2 weeks in the middle Atlantic states such as New Jersey) are not wetlands.

The fieldwork commenced with walking the site to identify areas displaying potential evidence of each of the three parameters. Data collection points were then oriented at 10-foot intervals on representative

transects perpendicular to the hydrological gradient of suspected wetland areas. Vegetation, soil, and hydrology data were recorded at each data collection point to determine whether the hydrophytic vegetation, hydric soil, and wetland hydrology parameters were met.

Dominant plant species for each vegetative stratum (tree canopy, saplings, shrubs, herbs, and woody vines) at each data point were determined based on estimated percent aerial cover (Table 2-1). Wetland indicator statuses developed by the U.S. Fish & Wildlife Service (USFWS) (Reed, 1988) were assigned to each dominant species and used as the basis for determining whether the vegetation was hydrophytic (Table 2-2). A soil pit was hand augured at each data point location to a minimum depth of 20 inches and the color, texture, and other descriptive data were recorded for each encountered soil horizon. These observations were used to determine whether field indicators of hydric soils, as listed in the Federal Manual and the Natural Resources Conservation Service (NRCS, 1998), were present. Surface and subsurface observations were made at each data point to determine which field indicators of wetland hydrology, as listed in the Federal Manual, were present.

Wetland delineation data sheets provided in the Federal Manual for use in routine onsite wetland delineations were completed for each data point and are provided in Appendix A. Delineated wetland boundaries were marked in the field using wooden stakes and red ribbon. Each stake was labeled "WET 13X-N", with "X" as a letter corresponding to the specific wetland occurrence and "N" as the numeric order of the stake along the boundary. A land survey depicting the location of each stake was subsequently completed and is the basis for the wetland delineation map provided in Section 3.0.

TABLE 2-1

DEFINITIONS OF VEGETATION STRATA USED IN WETLAND DELINEATION
NWS EARLE SITE 13 – DPDO YARD
COLTS NECK, NEW JERSEY

Stratum	Symbol	Definition[1]	Plot Diameter (feet)[2]
Canopy	C	Trees over 5 inches in diameter at breast height (DBH)	30
Saplings	SA	Woody plants over 20 feet in height but under 5 inches DBH	15
Shrubs	SH	Woody plants under 20 feet in height	15
Herbaceous Groundcover	H	Nonwoody plants and woody seedlings under 3 feet in height	5
Woody Vines	V	Woody vines attached to the trunks of trees or saplings	15

1 Source: FICWD, 1989
2 Plot size used for visually estimating percent aerial cover for plant species (circular plots)

TABLE 2-2

DEFINITIONS OF WETLAND PLANT INDICATOR STATUSES USED IN WETLAND DELINEATION
NWS EARLE SITE 13 – DPDO YARD
COLTS NECK, NEW JERSEY

Indicator Status	Definition
Obligate Wetland (OBL)	Species recognized as occurring in wetlands greater than 99 percent of the time
Facultative Wetland (FACW)	Species recognized as occurring in wetlands 67 to 99 percent of the time
Facultative (FAC)	Species equally likely to occur in wetlands or uplands (nonwetlands)
Facultative Upland (FACU)	Species recognized as occurring in wetlands 1 to 33 percent of the time
Obligate Upland (UPL)	Species recognized as occurring in wetlands less than 1 percent of the time

Source: Reed, 1988

3.0 RESULTS AND DISCUSSION

The wetland delineation identified two areas on Site 13 that are regulated under Section 404 of the CWA and under the New Jersey Freshwater Wetlands Protection Act (Figure 3-1). The first, designated as Area 13A (Photograph 1), is a ditch near the western edge of the landfill. The second, designated as Area 13B (Photograph 2), is a forested wetland northwest of the landfill. Although the wetland and the ditch are contiguous north of Site 13, they are separated by more than 50 feet of uplands at Site 13.

The landfill itself does not contain any wetlands. The landfill surface consists of mixed soil and gravel overlying the landfill materials (Photograph 3). The southern part of the landfill is used for exterior storage of metal parts. The northern part of the landfill supports a sparse cover of ruderal vegetation, such as broomsedge (*Andropogon virginicus*) and switchgrass (*Panicum virgatum*). A few pitch pine (*Pinus rigida*) seedlings have established on the northern part of the landfill. The landfill surface is generally smooth throughout without noticeable ditches, swales, or depressions that could potentially hold surface water following rainfall events. An exception is a shallow ditch that separates the northern part of the landfill from railroad tracks east of the landfill. The ditch was dry as of the wetland delineation (April 29 and 30, 2003). It supported vegetation similar to other parts of the landfill and lacked watermarks, scouring, or other visible evidence of seasonal surface water.

The western edge of the landfill consists of a steep slope, with areas at the toe of the slope more than 10 feet lower in elevation than areas at the top. The ditch abuts the toe of the slope in the southern part of the landfill. Although forest vegetation directly abuts the slope to the northern part of the landfill, the delineated boundary of the forested wetland (Area 13B) is 30 to 50 feet west of the slope at most locations.

3.1 AREA 13A: DITCH

An unnamed ditch originates in a forested area southwest of the site and flows past the western edge of the landfill in a northwesterly direction. It flows in a roughly northerly direction, and aerial photographs suggest that it forms a headwater to Hockhockson Brook. The delineation addressed a segment of the ditch extending from a culvert under a gravel access road to the site; approximately 100 feet upstream from the landfill to a point approximately 100 feet downstream (northwest) from the landfill. The ditch is straight, narrow (approximately 10 to 15 feet bank to bank), and deeply incised (embankments 5 to 10 feet from the toe to top of slope) for the entire length. Slow running water 6 to 12 inches in depth was present at the time of the delineation. The substrate at the bottom of the ditch is natural soil. U.S. Geological Survey topographic maps suggest that the ditch drains a watershed of just over 100 acres.

No areas meeting the criteria for delineation as a wetland adjoin the delineated segment of the ditch. What appeared to be the approximate location of the ordinary high water mark on the lower part of the steep embankments was therefore delineated as the outer edge of waters of the United States and New Jersey open waters. Wooden stakes numbered from "WET 13A-1" to "WET 13A-14" mark the ordinary high water mark on the west embankment, and stakes numbered from "WET 13A-15" to "WET 13A-27" mark the ordinary high water mark on the east embankment. Above the ordinary high water mark, the steep embankments support upland forest vegetation dominated by species such as pitch pine, white oak (*Quercus alba*), and black oak (*Quercus velutina*), with occasional sweetgum (*Liriodendron tulipifera*) and paper birch (*Betula sp.*).

The ditch does not contain any wetlands and thus is not expected to display most of the functions and values typical of wetlands. The shallow running water in the ditch could provide habitat for some small fish species and well as some benthic organisms typical of shallow headwaters with a soft bottom. However, the channelized condition and artificially steep gradient would, at best, favor only those species tolerant of substantially disturbed freshwater aquatic habitats. The shade provided by the tree cover on the embankments does however, function to cool the water, which could be beneficial to biota favoring shaded running water in forest settings.

The ditch would be best classified as Riverine, Upper Perennial Unconsolidated Bottom (R3UB) or Riverine, Intermittent Unconsolidated Bottom (R4UB) under the classification system developed by the USFWS (Cowardin et al., 1979). The Riverine system is defined as all surface waters and wetlands contained within a channel.

3.2 AREA 13B: FORESTED WETLAND

Most of the forested area northwest of the landfill constitutes a seasonally saturated forested wetland. The wetland boundary does not extend to the toe of the landfill; instead the boundary lies within the forested area as much as 50 to 75 feet distant from the toe of the landfill. The boundary, which corresponds to the edge of the area meeting the delineation criteria in the Federal Manual, was marked with stakes numbered from "WET 13B-1" to "WET 13B-17". The entire boundary surrounding the forested wetland was not delineated; the delineation only addressed areas within 100 feet of the toe of the landfill. The wetland encompasses a large area extending several hundred feet north and west from the landfill.

The sections below summarize the vegetation, soils, hydrology, classification, and functions and values for the delineated wetland.

Vegetation: Vegetation throughout Area 13B is dominated by deciduous trees, especially red maple (*Acer rubrum*) and black gum (*Nyssa sylvatica*), with scattered Atlantic white cedar (*Chamaecyparis*

thyoides). Some widely scattered white pine (*Pinus strobus*) and pitch pine (*Pinus rigida*) trees occur within the wetland, especially close to the delineated boundary. Most trees are visually estimated to range between 6 and 12 inches in diameter at breast height (DBH). Canopy cover is variable, visually estimated to range from roughly 40 percent to 70 percent at most locations. The deciduous shrub highbush blueberry (*Vaccinium corymbosum*) forms a sparse to moderately dense understory throughout most of the wetland. Herbaceous groundcover is sparse throughout. Patches of what appear to be a small sedge (*Carex sp.*) or bulrush (*Scirpus sp.*) species were observed, although the absence of distinguishing fruiting structures prevented identification. Widely scattered sprouts of skunk cabbage (*Symplocarpus foetidus*) were observed at several locations within the wetland. Small patches of sphagnum moss (*Sphagnum sp.*) were observed scattered throughout.

Vegetation in Area 13B meets the hydrophytic vegetation parameter according to the Federal Manual. More than 50 percent of the dominant plant species in vegetation at data points 13B-7-1 and 13B-10-1, both located 10 feet downgradient of the delineated wetland boundary, are designated as obligate wetland (OBL), facultative wetland (FACW), or facultative plant species by the USFWS (Reed, 1988) (Field Indicator Number 2 of hydrophytic vegetation in Section 3.6 of the Federal Manual). Many of the deciduous trees within the wetland grow on small hummocks (mounds of soil) and display distinctively shallow root systems (Photograph 4). Some of the deciduous trees displayed slight evidence of trunk buttressing (flare close to ground level). Section 3.37 of the Federal Manual indicates that distinctively shallow root systems and trunk buttressing are morphological adaptations of plants to inundated or saturated soils and are a field indicator of wetland hydrology.

Vegetation does not change abruptly at the delineated wetland boundary. The overall dominance by red maple and black gum continues upgradient from the boundary, but the hummocking, shallow root systems, and other morphological plant adaptations of the trees to saturated soil conditions cease up-gradient of the boundary. Upland species such as pitch pine, gray birch, and white oak become increasingly dominant. However, the forest vegetation in most areas between the delineated wetland boundary and the toe of the landfill meets the technical criteria in the Federal Manual for hydrophytic vegetation. Highbush blueberry forms patchy shrub cover on both sides of the boundary, but mountain laurel (an upland shrub) is dominant in many locations upgradient. Skunk cabbage is present only downgradient of the boundary.

Soils: Soils in Area 13B are mapped by the U.S. Soil Conservation Service (SCS) (predecessor to the NRCS) as Atsion sand (SCS, 1989). The Atsion soil series is described as nearly level, poorly drained, sandy soils occurring on upland flats. Extensive areas of forest land on and in the vicinity of the NWS Earle Mainside are mapped as Atsion sands. The typical profile described by the SCS for Atsion soils in Monmouth County includes a surface layer (topsoil) consisting of 2 inches of matted, partly decomposed

organic matter and roots (O-Horizon) underlain by 6 inches of black (10YR 2/1) sand (A-Horizon). The subsurface layer (E-Horizon) is described as a 14-inch layer of grayish brown (10YR 5/2) sand. The subsoil (B-Horizon) is described as an 8-inch dark reddish brown (5YR 3/2) loamy sand (Bh-Horizon) over a 10-inch brown (10 YR 4/3) sand with large prominent dark brown (7.5YR 4/2) mottles (BC-Horizon). The substratum (C-Horizon) is described as a yellowish brown (10YR 5/4) fine sand with distinct light brownish gray (10YR 6/2) mottles (SCS, 1989).

The surface soils observed throughout Area 13B are generally consistent with the SCS description for Atsion sand but appear to be considerably deeper. Consistent with the SCS description, the surface soils in Area 13B appear to be black sands, although the sands appear to be highly fine-textured and might include a substantial proportion of muck (small grains of well-decomposed organic matter). While the SCS describes the surface layer as typically 8 inches thick, the surface layer throughout Area 13B ranges between roughly 12 and 20 inches deep (generally deeper in the interior of the wetland and shallower close to the delineated boundary). The subsurface soils throughout Area 13B tend to be 2.5Y 6/2 (light brownish gray) or 5Y 6/2 (light olive gray) fine sands or fine loamy sands. They generally resemble the E-Horizon described by the SCS for Atsion sands but occur at a somewhat deeper depth and are distinctly more yellow in hue. The transition from the E-Horizon to the B-Horizon and C-Horizon was not evident in the shallow soil borings performed for the wetland delineation.

Atsion sand is a mapping unit identified by the SCS as a hydric soil in its list of hydric soils for Monmouth County, New Jersey (SCS, 1990). Section 3.27 of the Federal Manual states that if a soil's characteristics match those described for a hydric soil, then the hydric soil criterion is met. Section 3.28 of the Federal Manual states that many of the field indicators commonly used as evidence of hydric soils, especially the presence of gleyed and low chroma soil colors, cannot be used to assess whether sandy soils are hydric. The deep surface accumulations of black sand are suggestive of an exceptionally high organic matter content in the surface horizon, a field indicator of a sandy hydric soil [Federal Manual Section 3.28(8)(A)].

The SCS maps the landfill itself as Udorthents, soils that have been altered by excavating or filling. The SCS does not distinguish an area of upland (i.e., non-hydric) soils between Area 13A and the landfill edge (SCS, 1989). This area is too narrow to be resolved on SCS maps. The surface profile between the delineated wetland boundary and the edge of the landfill still generally resembles that for an Atsion sand but the surface layer is thinner, and the profile displays thin layers (horizons) of higher-chroma soil within 1 or 2 inches of the surface.

Hydrology: Areas inside the delineated wetland boundary appear to be seasonally saturated only. No surface water was visible anywhere within the wetland during the wetland delineation (April 29 and 30, 2003) and there were no watermarks on the trees, surface sediment deposits, water-stained leaves or

other visible evidence of surface water in the months preceding the wetland delineation. The water table was observed to be within about 12 to 18 inches below the soil surface, although visible saturation was observed within 2 or 3 inches of the soil surface. Capillary action typically causes organic soil material (muck and peat) to be saturated several inches above the water table. The looser condition of peat on the surface of the soil might be preventing saturation from reaching to the surface.

Considering the deep surface layer of soil high in organic matter content, the frequency of Atlantic white cedar (an OBL plant species), and the presence of hummocking and shallow roots systems for the red maple and black gum, the absence of field indicators of surface saturation and the depth below the surface of the water table is surprising. New Jersey, including Monmouth County, experienced a significant drought in 2001, when the statewide annual rainfall was 35.65 inches versus a normal of 44.72 inches (NCDC, 2003). However, the statewide annual rainfall in 2002 was 46.76 inches (slightly above normal), and 14.52 inches fell between January 1 and April 30 of 2003 (slightly above the average of 14.24 inches for that period). It is possible that the regional water table has not yet completely recovered from the 2001 drought and lies further below the ground surface than expected.

It is additionally possible that the channelization of the unnamed ditch (Area 13A) could have artificially lowered the water table in the Area 13B wetland. Although the ditch (Area 13A) and the wetland (Area 13B) are not contiguous within Site 13, they are contiguous approximately 250 feet north of the site. It is also possible that the past development of the landfill and storage areas has diverted surface runoff into the stream instead of into the wetland. Another plausible hypothesis concerns the fact that the hydrology of any wetland is not static even in the absence of human disturbance. For example, it is plausible that continued deposition of plant material in Area 13B over a prolonged time (decades or centuries) could have gradually elevated the soil surface until it is no longer within reach of the capillary fringe of the seasonal high water table.

Classification: The forested wetland forming Area 13B would be classified as Palustrine Forested (PFO) under the classification system developed by the USFWS (Cowardin et al., 1979). The palustrine system is described by the USFWS as consisting of nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens.

Functions and Values: Wetland functions are physical, chemical, and biological processes or attributes of wetlands that are vital to the integrity of a wetland system, regardless of how those benefits are perceived by society. Wetland values are attributes that are not necessarily important to the integrity of a wetland system but which are perceived as valuable to society (Adamus et al., 1991). Table 3-1 lists several commonly recognized functions and values provided by wetlands (DeSanto and Flieger, 1995). The following discussion of the functions and values of the wetlands delineated in Area 13B is subjective,

based on the descriptive approach for wetland functional assessment developed as part of the Highway Methodology by the New England District of the USACE. More rigorous quantitative and semi-quantitative models are available for assessing the functions and values of wetlands but are rarely necessary to support most permitting and planning decisions affecting wetlands.

A descriptive review of the physical and biological attributes of the Area 13B wetland suggest that the wetland could potentially play a role with respect to the following functions and values: groundwater recharge/discharge, floodflow alteration, fish and shellfish habitat, sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, production export, wildlife habitat, recreation, educational/scientific value, uniqueness/heritage, visual quality/aesthetics, and endangered species habitat (Appendix B). However, the review suggests that the principal functions and values of the Area 13B wetland are limited to sediment/toxicant/pathogen retention, production export, wildlife habitat, and endangered species habitat. It is recommended that these principal functions form the focus of efforts to mitigate wetland impacts resulting from the proposed remediation of the site.

Groundwater Recharge/Discharge (Occurrence-Yes; Principal-No): The Area 13B wetland and adjoining forested wetlands to the north likely function to trap precipitation and runoff from upgradient uplands and contribute to groundwater recharge. Even if surface water (inundation) sometimes occurs (the wetland surface was not inundated anywhere at the time of the April 2003 wetland delineation), the coarse soils and apparent lack of claypans or other layers of fine-textured soil near the surface suggests that the wetland tends to function more with respect to groundwater recharge than groundwater discharge. Because Monmouth County receives relatively heavy annual precipitation and contains large expanses of tidal and non-tidal wetlands, it is unlikely that any individual wetland in the county serves a principal function with respect to groundwater recharge or discharge.

Floodflow Alteration (Occurrence-Yes; Principal-No): The dense vegetation and coarse soils within the Area 13B wetland likely function to trap surface runoff from upgradient uplands, thereby reducing the potential for small-stream flooding along Hockhockson Brook over its 1- to 2-mile course before emptying into the tidal Swimming River. The cumulative importance of the remaining areas of Atsion sands and other forested wetlands in reducing the influx of runoff into the non-tidal tributaries to the Swimming River will continue to increase as the area becomes increasingly urbanized, with larger amounts of impervious surface generating greater quantities of runoff and with more structures and other facilities susceptible to overbank flooding along the streams. However, the relatively level topography and proximity to tidal waters suggests that the potential for non-tidal flooding is low; floodflow alteration is therefore not identified as a principal function of the subject wetland.

Sediment/Toxicant/Pathogen Retention (Occurrence-Yes; Principal-Yes): The dense vegetation in the Area 13B wetland appears capable of detaining surface runoff for extended periods, trapping suspended sediment and any toxicants or pathogens carried in the runoff. The landfill is a source of eroding sediment that can carry chemical contamination originating from waste buried in the landfill. The wetland is positioned to serve as a buffer separating the landfill from Hockhockson Brook and other downgradient aquatic habitats. Because the proposed remedy involves containment rather than excavation and removal of at least some of the waste buried in the landfill, the wetland will continue to play a role in shielding aquatic habitats from the landfill even once the remedy is implemented.

Fish and Shellfish Habitat (Occurrence-Yes; Principal-No): The data collected for the wetland delineation suggest that the Area 13B wetland does not regularly experience surface inundation for extended periods of time. It therefore does not likely provide fish or shellfish habitat directly. However, the ability of the dense vegetation and coarse sand in the wetland to modulate the downgradient movement of runoff and sediment, and the ability of the vegetation to cool surface runoff and contribute beneficial biomass to the runoff, likely contributes to the quality of the estuarine waters and marshes of the Swimming River as habitat for fish and shellfish.

Nutrient Removal/Retention/Transformation (Occurrence-Yes; Principal-No): The large size, dense vegetation, and high organic matter in the surface soils of the Area 13B wetland likely function to trap dissolved nutrients in surface runoff entering the wetland from upgradient uplands. However, large agricultural operations and other large sources of nutrients do not occur upgradient of the subject wetland. Most of the upgradient watershed contributing surface runoff to the subject wetland is undeveloped forest or exterior industrial land within NWS Earle Mainside that is not used for agriculture and not likely subject to large-scale application of fertilizers or pesticides for landscaping purposes.

Production Export (Occurrence-Yes; Principal-Yes): The large size, dense and varied forest vegetation, abundant wildlife food sources, and abundant downed logs and other detritus within the Area 13B wetland suggests that the wetland contributes substantially to the regional food chain, including the aquatic food chains of Hockhockson Brook and Swimming River and the terrestrial food chain of adjoining undeveloped lands.

Sediment/Shoreline Stabilization (Occurrence-No; Principal-No): The Area 13B wetland and adjoining forested wetlands lack shorelines and permanent standing water, hence the ability of the vegetation in the wetland to stabilize soils against water erosion caused by currents, floods, or storm surges is not important. There is a slight topographic gradient within the wetland. The vegetation may thus help to stabilize surface soils against gully erosion caused by runoff. But this function does not appear to be substantial.

Wildlife Habitat (Occurrence-Yes; Principal-Yes): Aerial photographs and soil survey data (SCS, 1989) suggest that the Area 13B wetland is contiguous to more than 100 acres of unfragmented forested wetland habitat of similar vegetational composition adjoined by large tracts of forested upland habitat broken only by occasional roads and widely scattered military facilities (all part of NWS Earle). The NWS Earle Mainside forms an oasis of large forested tracts, wetland and upland, surrounded by a rural-residential landscape where forest tracts are becoming increasingly fragmented by residential construction. Forest land on the NWS Earle Mainside therefore forms a refuge for birds and mammals preferring large tracts of contiguous forest land with minimal human intrusion. Although the subject wetland itself lies at the edge, rather than in the interior of, a large forested wetland area; loss of the subject wetlands would reduce the overall size of the forested wetland and reduce the area providing favorable habitat to forest-interior dwelling wildlife.

Recreation (Occurrence-Yes; Principal-No): The Area 13B wetland is located in an industrial setting (heavy equipment is stored on an exterior gravel pad that covers part of the landfill and some land immediately south of the landfill) on a secured military base not open to the public. The subject wetland and adjoining areas are not developed with trails or other recreational facilities. Because the subject wetland could be suitable for certain passive recreational activities and are located close to the administrative buildings of the NWS Earle Mainside, the recreation function is noted as present but not as principal.

Educational Scientific Value (Occurrence-Yes; Principal-No): The large size of the subject wetland and adjoining wetlands and the physical exclusion of the general public makes for potential value for scientific research, although no specific research activities are presently underway.

Uniqueness/Heritage (Occurrence-Yes; Principal-No): The Area 13B wetland is part of a large wetland that is typical of other inland forested wetlands in Monmouth County. Because of increasing urbanization in Monmouth County, the large tracts of forested wetlands and adjoining forested uplands on NWS Earle are increasing in importance as relics of the area's unique natural and cultural heritage.

Visual Quality/Aesthetics (Occurrence-Yes; Principal-No): The dense forest vegetation within and adjoining the Area 13B wetland is visually attractive and is visually enhanced by the contrast between the evergreen trees and shrubs and deciduous trees and shrubs. However, the wetland is not visible to the public and is not in a part of NWS Earle that is heavily frequented by personnel living or working on the installation.

Endangered Species Habitat (Occurrence-Yes; Principal-Yes): A remedial investigation prepared by the U.S. Navy in 1996 determined that there are no sensitive habitats (other than wetlands) or threatened or endangered species at Site 13 (U.S. Navy, 1996). However, the large size and (apparently) largely undisturbed condition of the Area 13B wetland north and west of the site could be conducive to the occurrence of certain rare, threatened, or endangered species endemic to forested wetlands in coastal New Jersey.

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TABLE 3-1

COMMON FUNCTIONS AND VALUES OF WETLANDS
NWS EARLE SITE 13 – DPDO YARD
COLTS NECK, NEW JERSEY
PAGE 1 OF 2

Functions	Description
Groundwater Recharge	Some wetlands function to catch and detain surface runoff, allowing at least some of the detained water to leach down into underlying aquifers. Wetlands capable of best performing this function tend to receive runoff from a large watershed, support dense vegetation, and have a narrow (constricted) outlet (or no outlet).
Groundwater Discharge	Some wetlands function as areas where groundwater is discharged to the surface. Such wetlands are commonly referred to as seeps or springs and represent a means by which wildlife inhabiting the surface can access water reserves held in the ground.
Floodflow Alteration	Some wetlands function to slow the overland runoff of floodwaters, thereby reducing peak flow levels following heavy precipitation events. Wetlands capable of best performing this function tend to be located in the upper parts of the watershed to stream systems.
Sediment/ Shoreline Stabilization	Vegetation in wetlands bordering streams and other waterbodies can stabilize banks and shorelines against erosion caused by currents and waves.
Sediment/ Toxicant Retention	Some wetlands serve to detain surface flow (surface runoff or channel flow) allowing some suspended sediments, toxicants, and/or pathogens to settle out into the wetland soil, thereby preventing their migration into downstream waters. Wetlands capable of best performing this function tend to support dense vegetation, have constricted (or no) outlets, and be located near disturbed soils or toxicant sources.
Nutrient Removal/ Transformation	Some wetlands serve to detain surface flow (surface runoff or channel flow) allowing nutrients such as nitrogen and phosphorus to settle out into the wetland soil, thereby preventing their migration into downstream waters. High nutrient levels in waterbodies cause eutrophication, a condition where undesirable algal growths deplete dissolved oxygen and interfere with other aquatic biota. Wetlands capable of best performing this function tend to support dense vegetation, have constricted (or no) outlets, and be located near areas of heavy fertilizer use.
Production Export	Some wetlands serve as sources of biomass, nutrients, and food sources supporting aquatic ecosystems in downgradient waterbodies. Wetlands capable of best performing this function tend to have dense, diverse vegetation and be connected to areas of open water.
Aquatic Diversity/ Abundance	Wetlands adjoining or forming a part of streams, lakes, and other areas of open water tend to provide specialized habitat for many species of fish and other aquatic biota, thereby enhancing the diversity of aquatic ecosystems.
Wildlife Diversity/ Abundance	Wetlands provide favored habitat for many amphibian, reptile, bird, and mammal species. The exact species of wildlife attracted by a wetland depends largely on the wetland's vegetation composition.

TABLE 3-1

**COMMON FUNCTIONS AND VALUES OF WETLANDS
NWS EARLE SITE 13 – DPDO YARD
COLTS NECK, NEW JERSEY
PAGE 2 OF 2**

Values	Description
Recreation	Many wetlands provide opportunities for recreational activities such as hiking, canoeing, boating, fishing, and hunting. The recreational value of a wetland depends not only on its physical characteristics but also on its public accessibility and proximity to population centers.
Uniqueness/ Heritage	Many wetlands are inherently "special" places that reflect or contribute to the history and/or culture of the surrounding region.
Educational/ Scientific Value	Many wetlands, especially wetlands that have experienced little human alteration or disturbance, are of value for scientific research and/or for public outdoor education. The location of a wetland on public land and/or in close proximity to schools enhances this value.
Visual Quality/ Aesthetics	Especially in urban/suburban settings, many wetlands are visually pleasing natural areas that can buffer, screen, or offset the visual impacts of developed areas.

Source: Adamus *et al.*, 1991 and De Santo and Flieger, 1995.

Photograph 1: Ditch forming Area 13A. The ditch is a Water of the United States and New Jersey State Open Water. Note the absence of wetlands within the steep embankments on each side of the stream.

Photograph 2: Palustrine Forested Wetland (Area 13B)

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Photograph 3: NWS Earle Site 13 Landfill Surface – No Wetlands.

Photograph 4: Shallow Root Systems and Hummocking at Red Maple and Black Gum Trees in Palustrine Forested Wetlands Forming Area 13B.

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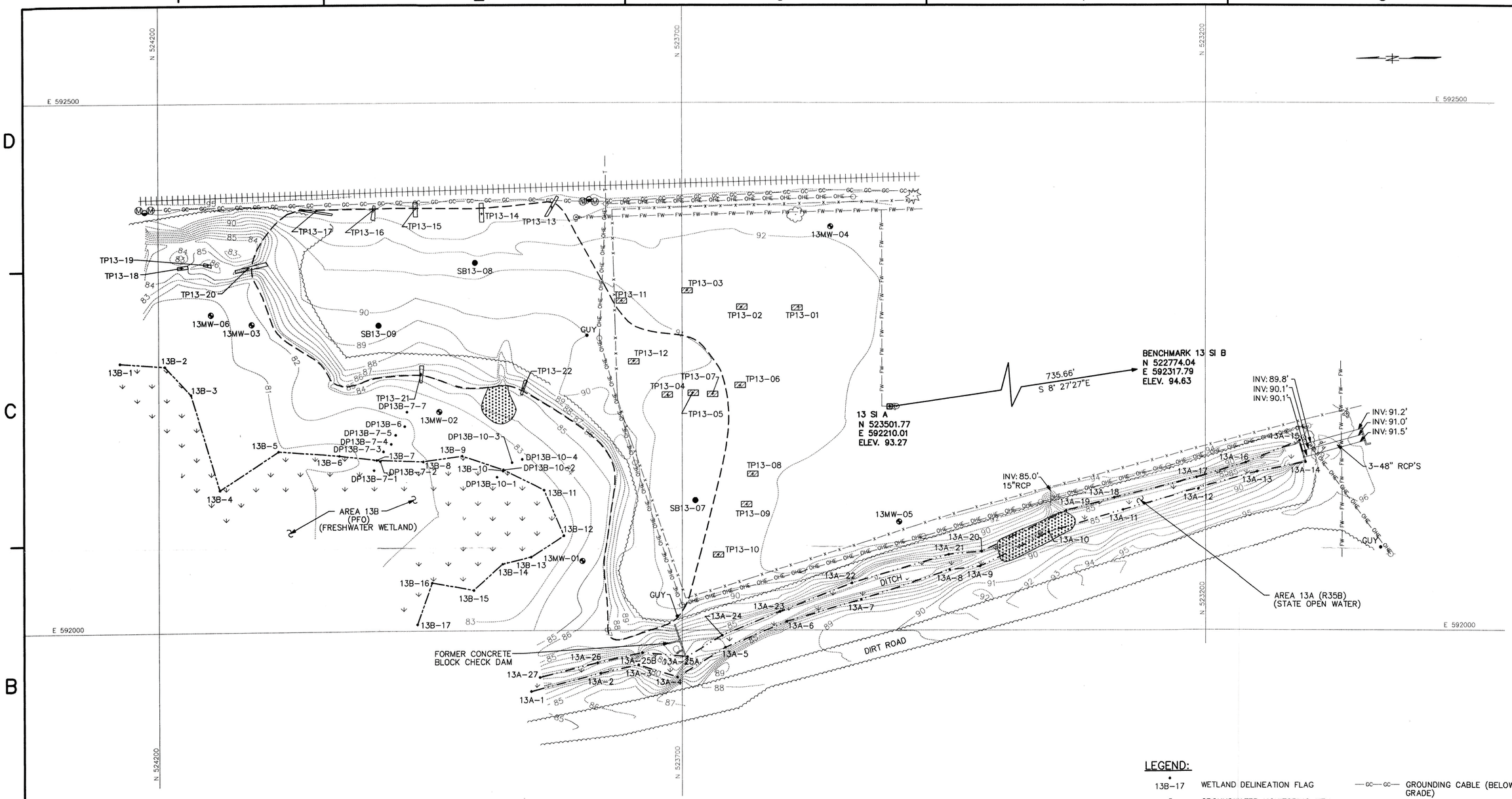

NOTES:

1. GRID COORDINATES REFERENCE NEW JERSEY STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (NAD83).
2. ELEVATIONS REFERENCE NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88).
3. ONE FOOT CONTOUR INTERVALS UNLESS OTHERWISE INDICATED.
4. UTILITY INFORMATION WAS OBTAINED FROM NAVAL WEAPONS STATION EARLE PUBLIC WORKS DEPARTMENT. THE LOCATIONS ARE APPROXIMATE AND MUST BE VERIFIED PRIOR TO ANY CONSTRUCTION.
5. EXISTING TOPOGRAPHY, SURFACE FEATURES, GEOTECHNICAL TEST LOCATIONS, AND WETLAND LIMITS WERE SURVEYED BY JAMES M. STEWART INC. LAND SURVEYORS, PHILADELPHIA, PENNSYLVANIA VIA A FIELD SURVEY CONDUCTED IN MAY 2003. THE WETLANDS WERE DELINEATED BY TtNUS DURING A FIELD INVESTIGATION PERFORMED IN APRIL 2003.
6. THE IDENTIFIED LANDFILL LIMITS WERE OBTAINED FROM A REPORT TITLED "PROPOSED PLAN FOR SITE 13 (OU-5), NAVAL WEAPONS STATION EARLE, COLTS NECK, NEW JERSEY" AND WERE REFINED BASED ON THE RESULTS OF THE PRE DESIGN INVESTIGATION CONDUCTED BY TtNUS DURING APRIL AND MAY OF 2003. THE LANDFILL LIMITS SHOULD BE CONSIDERED APPROXIMATE.
7. 100-YEAR FLOODPLAIN NOT DELINEATED BY FEMA WITHIN NWS EARLE PROPERTY.
8. WETLAND DELINEATION PERFORMED BY J. PEYTON DOUB, PWS, OF TtNUS ON APRIL 30, 2003. DELINEATION NOT YET VERIFIED IN A LETTER OF INTERPRETATION ISSUED BY NEW JERSEY DEPARTMENT OF ENVIRONMETAL PROTECTION.

LEGEND:

13B-17	WETLAND DELINEATION FLAG
13MW-05	GROUNDWATER MONITORING WELL
SB13-09	SOIL BORING
13 SI A	BENCHMARK (DISK SET IN CONCRETE)
	MANHOLE FOR LIGHTNING POLE
	UTILITY POLE
	FIRE HYDRANT
	DECIDUOUS TREE
	CONIFEROUS TREE
90	FINAL CONTOUR
90	EXISTING CONTOUR
x	FENCE
	TREE LINE
	LIMIT OF DELINEATED WETLAND
	RAILROAD TRACKS
	LANDFILL BOUNDARY
	ORDINARY HIGH WATER MARK
GC	GROUNDING CABLE (BELOW GRADE)
T	FIRE HOUSE TELEPHONE LINE
FW	FIRE WATER
OHE	OVERHEAD ELECTRIC
	WETLANDS
TP13-22	APPROXIMATE LIMITS OF 2003 TEST TRENCHES
TP13-04	APPROXIMATE LIMITS OF 1995 TEST TRENCHES
+	APPROXIMATE CENTER OF TEST TRENCH (SURVEYED)
	LIGHTNING POLE
	SEDIMENT EXCAVATION AREA

0 50 100
SCALE IN FEET
CHECK GRAPHIC SCALE BEFORE USING

ACAD:6710CP10.dwg 06/12/03 DM PIT

APPR	DATE	DESCRIPTION	SYM.

DESIGNED & ENGINEERED BY:
EFA NORTHEAST
NAVAL FACILITIES ENGINEERING COMMAND

SEAL

APPROVED
ACTIVITY - SATISFACTORY TO
DATE
APPROVED
FOR EFA FOR COMMANDER NAVFAC
DATE

A/E EFD
TWS DESIGN
HJB DRAWN
REVIEW
QC
CHIEF ARCH./ ENGR.
DESIGN MANAGER
FIRE PROTECTION
BRANCH MANAGER
DESIGN DIRECTOR

DEPARTMENT OF THE NAVY
ENGINEERING FIELD ACTIVITY NORTHEAST
NAVAL FACILITIES ENGINEERING COMMAND
LESTER PENNSYLVANIA

WETLAND DELINEATION MAP
SITE 13 – DPDO YARD
COLTS NECK, NEW JERSEY

CODE ID. NO. 80091 SIZE D
SCALE: 1"=50'
EFD NO. X
STA. PROJ. NO. X
SPEC. NO. X
CONSTR. CONTR. NO. ----
NAVFAC DRAWING NO. --
SHEET 1 OF 1

FIGURE 3-1

000708 N01X

4.0 CONCLUSIONS

Wetland Delineation Summary: The wetland delineation identified two areas on Site 13 that meet regulatory definitions under Section 404 of the CWA and the New Jersey Freshwater Wetlands Protection Act (Figure 3-1). The first, designated as Area 13A, is a ditch on the western edge of the site. The ditch is a water of the United States and a New Jersey state open water but is not adjoined by wetlands. The second, designated as Area 13B, is a forested wetland in the northwestern part of the site. Although the wetland and the stream are contiguous north of Site 13, the ditch is adjoined by steep upland embankments where it traverses the site. The landfill itself does not contain any wetlands.

Other Regulated Sensitive Lands: The NJDEP also regulates impacts to a number of other environmentally sensitive lands in addition to freshwater wetlands, such as coastal (tidal) wetlands and 100-year floodplains. The delineation revealed that Site 13 does not contain any coastal (tidal) wetlands as defined under New Jersey's older Wetlands Act of 1970 (N.J.S.A. 13:9A). Floodplains, as regulated under the New Jersey Flood Hazard Control Act (N.J.S.A. 58:16A) have not been delineated for Site 13. Visual inspection of Site 13 suggests that the potential occurrence of 100-year floodplain is limited to areas directly adjoining the ditch to the west of the landfill (Area 13A). The ditch is bounded on both sides by steep embankments that are 5 to 7 feet higher in elevation than the stream; the 100-year floodplain undoubtedly lies within the embankments. The wetland forming Area 13B is part of a broad flat of poorly drained soils where the headwaters of several small streams originate and is thus not likely itself within the 100-year floodplain of any stream.

Because Site 13 is located well to the west of the coastal shorelines of Monmouth County, it does not likely contain any areas regulated under the New Jersey Waterfront Development Act (N.J.S.A. 12:5-3) or the New Jersey Tidelands Act (N.J.S.A. 12:3). Site 13 lies outside of the coastal area regulated under the New Jersey Coastal Area Facility Review Act (CAFRA; N.J.S.A. 13:19).

Pot ntial Permit Requirements: The remedy will be conducted in the context of CERCLA, and therefore environmental permits and formal approvals are not required. However, CERCLA actions must comply with the substantive requirements of federal state applicable, relevant, and appropriate requirements (ARARs), which include federal and state wetland protection regulations such as Section 404 of the CWA and the New Jersey Freshwater Wetlands Protection Act. The first step in meeting the substantive requirements of the wetland ARARs is to request that the NJDEP, the agency responsible for verifying wetland delineations in New Jersey, issue a letter of interpretation (LOI) authenticating the wetland delineation of Site 13. The remedial design must then minimize physical disturbance within the wetlands and other surface water features identified in the LOI.

It is noted that the New Jersey Freshwater Wetlands Protection Act addresses actions within upland buffers, termed transition areas, that adjoin freshwater wetlands. The width of the transition area is 50 feet for most wetlands, although the NJDEP could designate a transition area as narrow as 0 feet or as wide as 150 feet, depending on the resource value (functional value) of the wetland. The NJDEP officially designates the transition area width for each wetland when issuing an LOI verifying a wetland delineation. CERCLA actions in New Jersey are typically designed to minimize encroachment into the transition area, but formal transition area waivers are not required.

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APPENDIX A

WETLAND DELINEATION DATA SHEETS

DATA POINT 13B-7-1

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): J PEYTON DOUB PWS, CEP Date: APRIL 29, 2003
Project/Site: NWS EARLE, IR SITE 13 State: NJ County: MONMOUTH
Applicant/Owner: US NAVY Plant Community #/Name: RED MAPLE FOREST
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes X No ____ (if no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly distributed?
Yes ____ No X (if yes, explain on back)

VEGETATION

Dominant Plant Species (Cover Class)	Indicator Status	Stratum	Other Plant Species (Cover Class)	Indicator Status	Stratum
1. NYSSA SYLVATICA (3)	FAC	C	11. ACER RUBRUM (1)	FAC	SA
2. ACER RUBRUM (3)	FAC	C	12. SYMPLOCARPUS FOETIDUS (T)	OBL	H
3. NYSSA SYLVATICA (1)	FAC	SA	13. KALMIA LATIFOLIA (1)	FACU	H
4. VACCINIUM CORYMBOSUM (1)	FACU-	SH	14.		
5. KALMIA LATIFOLIA (1)	FACU	SH	15.		
6. CAREX SP.	VAR	H	16.		
7. SPHAGNUM SP.	NI	BR	17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 80
Is the hydrophytic vegetation criterion met? Yes X No ____
Rationale: >50% OF DOMINANT PLANT SPECIES ARE OBL, FACW, OR FAC [FM SEC 3.6(2)]

SOILS

Series/phase: ATSION SAND Subgroup:[2] AERIC HAPLAQUODS
Is the soil on the hydric soils list? Yes X No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X
Is the soil: Mottled? Yes ____ No X Gleyed? Yes ____ No X
Matrix Color: 2.5Y 2.5/1 (0-2 DEPTH) Mottle Colors: NONE (0-2 DEPTH)
Other hydric soil indicators: DEEP BLACK SANDS ON SURFACE ARE HIGH IN ORGANIC MATTER
Is the hydric soil criterion met? Yes X No ____
Rationale: SOIL PROFILE MATCHES A SOIL MAPPING UNIT ON COUNTY LIST OF HYDRIC SOILS [FM SEC 3.27]
(Soil Profile Presented on Back of Page)

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Surface water depth: NONE
Is the soil saturated? Yes ____ No X
Depth to free-standing water in pit/soil probe hole: 18 INCHES
List other field evidence of surface inundation or soil saturation.
MORPHOLOGICAL PLANT ADAPTATIONS (SHALLOW ROOTS, TRUNK BUTTRESSING), HUMMOCKING
Is the wetland hydrology criterion met? Yes X No ____
Rationale: MORPHOLOGICAL PLANT ADAPTATIONS [FM SEC 3.35(10)]

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes X No ____
Rationale for jurisdictional decision: HYDROPHYTIC VEGETATION, HYDRIC SOILS, AND WETLAND HYDROLOGY OCCUR CONCURRENTLY

1 This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
2 Classification according to "Soil Taxonomy."

SOIL PROFILE DATA
DATA POINT: 13B-7-1

Map Unit Name (Series and Phase): ATSION SAND

Taxonomy (subgroup): AERIC HAPLAQUODS

Drainage Class: POORLY DRAINED

Field Observations Confirmed Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture Concretions, Structure, etc,
0-20	A	2.5Y 2.5/1	NONE	N/A	FINE LOAMY SAND
20-24	E or B	2.5Y 6-5/2	NONE	N/A	FINE LOAMY SAND
24-30+	B	5Y 6/2	NONE	N/A	FINE LOAMY SAND

Hydric Soil Indicators:

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

Remarks: HYDRIC SOIL [FM SEC 3.27]

DATA POINT 13B-1-2

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): J. PEYTON DOUB, PWS, CEP Date: APRIL 29, 2003
Project/Site: NWS EARLE, IR SITE 13 State: NJ County: MONMOUTH
Applicant/Owner: US NAVY Plant Community #/Name: RED MAPLE FOREST
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes X No ____ (if no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly distributed?
Yes ____ No X (if yes, explain on back)

VEGETATION

Dominant Plant Species (Cover Class)	Indicator Status	Stratum	Other Plant Species (Cover Class)	Indicator Status	Stratum
1. ACER RUBRUM (3)	FAC	C	11. PINUS STROBUS (1)	FACU	C
2. NYSSA SYLVATICA (3)	FAC	C	12. VACCINIUM CORYMBOSUM (T)	FACW-	SH
3. ACER RUBRUM (1)	FAC	SA	13.		
4. NYSSA SYLVATICA (1)	FAC	SA	14.		
5. KALMIA LATIFOLIA (2)	FACU	SH	15.		
6. CAREX SP.	VAR	H	16.		
7. SPHAGNUM SP.	NI	BR	17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC ____
Is the hydrophytic vegetation criterion met? Yes X No ____
Rationale: >50% OF DOMINANT SPECIES ARE OBL, FACW, OR FAC [FM SEC 3.6 (2)]

SOILS

Series/phase: ATSION SAND Subgroup:[2] AERIC HAPLAQUODS
Is the soil on the hydric soils list? Yes X No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X
Is the soil: Mottled? Yes ____ No X Gleyed? Yes ____ No X
Matrix Color: 2.5Y 2.5/1 (0-20" DEPTH) Mottle Colors: NONE (0-20" DEPTH)
Other hydric soil indicators: NONE
Is the hydric soil criterion met? Yes X No ____
Rationale: ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOILS.

(Soil Profile Presented on Back of Page)

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Surface water depth: NONE
Is the soil saturated? Yes ____ No X
Depth to free-standing water in pit/soil probe hole: 20 INCHES
List other field evidence of surface inundation or soil saturation.
UPPER EDGE OF MORPHOLOGICAL PLANT ADAPTATIONS
Is the wetland hydrology criterion met? Yes X No ____
Rationale: UPPER EDGE OF APPARENT WETLAND HYDROLOGY

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes X No ____
Rationale for jurisdictional decision: UPPER EDGE OF WHERE ALL 3 PARAMETERS CLEARLY OCCUR CONCURRENTLY

1 This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
2 Classification according to "Soil Taxonomy."

SOIL PROFILE DATA
DATA POINT: 13B-7-2

Map Unit Name (Series and Phase): ATSION SAND
Taxonomy (subgroup): AERIC HAPLAQUODS
Drainage Class: POORLY DRAINED
Field Observations Confirmed Mapped Type? Yes (circled) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture Concretions, Structure, etc,
0-20	A	2.5Y 2.5/1	NONE	N/A	FINE LOAMY SAND
20-24+	B	5Y 6/2	NONE	N/A	FINE LOAMY SAND

Hydric Soil Indicators:

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

Remarks: HYDRIC SOIL [FM SEC 3.27]
ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOIL

DATA POINT 15B-1-5

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): J. PEYTON DOUB, PWS, CEP Date: APRIL 29, 2003
Project/Site: NWS EARLE, IR SITE 13 State: NJ County: MONMOUTH
Applicant/Owner: US NAVY Plant Community #/Name: RED MAPLE FOREST
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes X No ____ (if no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly distributed?
Yes ____ No X (if yes, explain on back)

VEGETATION

Dominant Plant Species (Cover Class)	Indicator Status	Stratum	Other Plant Species (Cover Class)	Indicator Status	Stratum
1. NYSSA SYLVATICA (3)	FAC	C	11. ACER RUBRUM (1)	FAC	C
2. PINUS STROBUS (2)	FACU	C	12. PINUS RIGIDA (1)	FACU	C
3. ACER RUBRUM (1)	FAC	SA	13. CHAMAECYPARIS THYOIDES (T)	OBL	C
4. NYSSA SYLVATICA (1)	FAC	SA	14.		
5. VACCINIUM CORYMBOSUM (1)	FACW-	SH	15.		
6. KALMIA LATIFOLIA (1)	FACU	SH	16.		
7. SPHAGNUM SP	NI	BR	17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 67
Is the hydrophytic vegetation criterion met? Yes X No ____
Rationale: >50% OF DOMINANT PLANT SPECIES ARE OBL, FACW, OR FAC [FM SEC 3.6(2)]

SOILS

Series/phase: ATSION SAND-UPPER EDGE Subgroup:[2] AERIC HAPLAQUODS
Is the soil on the hydric soils list? Yes X No ____ Undetermined UPPER EDGE
Is the soil a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X
Is the soil: Mottled? Yes ____ No X Gleyed? Yes ____ No X
Matrix Color: 2.5 Y 5/3-2 (12-24" DEPTH) Mottle Colors: NONE (12-24" DEPTH)
Other hydric soil indicators: NONE
Is the hydric soil criterion met? Yes ____ No X
Rationale: ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOIL

(Soil Profile Presented on Back of Page)

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Surface water depth: NONE
Is the soil saturated? Yes ____ No X
Depth to free-standing water in pit/soil probe hole: 20 INCHES
List other field evidence of surface inundation or soil saturation.
NONE
Is the wetland hydrology criterion met? Yes ____ No X
Rationale: JUST UPGRADIENT OF UPPER EDGE OF APPARENT WETLAND HYDROLOGY

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No X
Rationale for jurisdictional decision: JUST UPGRADIENT OF UPPER EDGE OF APPARENT WETLAND HYDROLOGY, ON GRADUAL TRANSITION FROM WETLAND TO UPLAND

1 This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
2 Classification according to "Soil Taxonomy."

SOIL PROFILE DATA
DATA POINT: 13B-7-3

Map Unit Name (Series and Phase): ATSION SAND
Taxonomy (subgroup): AERIC HAPLAQUODS
Drainage Class: POORLY DRAINED
Field Observations Confirmed Mapped Type? Yes (No) TRANSITIONAL

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture Concretions, Structure, etc,
0-12	A	2.5Y 2.5/1	NONE	N/A	FINE LOAMY SAND
12-24	E or B	2.5Y 5/3-2	NONE	N/A	FINE LOAMY SAND
24-30	B	5Y 6/2	NONE	N/A	FINE LOAMY SAND

Hydric Soil Indicators:

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

Remarks: ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOIL.

DATA POINT 13B-7-4

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): J. PEYTON DOUB, PWS, CEP Date: APRIL 29, 2003
Project/Site: NWS EARLE, IR SITE 13 State: NJ County: MONMOUTH
Applicant/Owner: US NAVY Plant Community #/Name: RED MAPLE FOREST
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes X No ____ (if no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly distributed?
Yes ____ No X (if yes, explain on back)

VEGETATION

Dominant Plant Species (Cover Class)	Indicator Status	Stratum	Other Plant Species (Cover Class)	Indicator Status	Stratum
1. PINUS STROBUS (3)	FACU	C	11. ACER RUBRUM (1)	FAC	C
2. NYSSA SYLVATICA (2)	FAC	C	12. CHAMAECYPARIS THYOIDES (1)	OBL	C
3. PINUS RIGIDA (2)	FACU	C	13.		
4. NYSSA SYLVATICA (1)	FAC	SA	14.		
5. ACER RUBRUM (1)	FAC	SA	15.		
6. VACCINIUM CORYMBOSUM (1)	FACW-	SH	16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 67
Is the hydrophytic vegetation criterion met? Yes X No ____
Rationale: >50% OF DOMINANT PLANT SPECIES ARE OBL, FACW, OR FAC [FM SEC 3.6.(2)]

SOILS

Series/phase: ATSION SAND - UPPER EDGE Subgroup:[2] AERIC HAPLAQUODS
Is the soil on the hydric soils list? Yes X No ____ Undetermined UPPER EDGE
Is the soil a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X
Is the soil: Mottled? Yes ____ No X Gleyed? Yes ____ No X
Matrix Color: 2.5YR 3/1 (1-4" DEPTH) Mottle Colors: NONE (1-4" DEPTH)
Other hydric soil indicators: NONE
Is the hydric soil criterion met? Yes ____ No X
Rationale: ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOIL

(Soil Profile Presented on Back of Page)

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Surface water depth: NONE
Is the soil saturated? Yes ____ No X
Depth to free-standing water in pit/soil probe hole: 20 INCHES
List other field evidence of surface inundation or soil saturation.
NONE
Is the wetland hydrology criterion met? Yes ____ No X
Rationale: UPGRADIENT OF UPPER EDGE OF APPARENT WETLAND HYDROLOGY

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No X
Rationale for jurisdictional decision: ON GRADUAL TRANSITION FROM WETLAND TO UPLAND

1 This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
2 Classification according to "Soil Taxonomy."

SOIL PROFILE DATA
DATA POINT: 13B-7-4

Map Unit Name (Series and Phase): ATSION SAND

Drainage Class: POORLY DRAINED

Taxonomy (subgroup): AERIC HAPLAQUODS

Field Observations Confirmed Mapped Type? Yes (No) TRANSITIONAL

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture Concretions, Structure, etc,
0-1	A	2.5Y 3/1	NONE	N/A	FINE LOAMY SAND
1-4	E?	2.5Y 5/3	NONE	N/A	FINE LOAMY SAND
4-20	A?	2.5Y 3/1	NONE	N/A	FINE LOAMY SAND
20-24+	E or B?	5Y 6/2	NONE	N/A	FINE LOAMY SAND

Hydric Soil Indicators:

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

Remarks: ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOIL

DATA POINT 13B-7-5

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): J. PEYTON DOUB, PWS, CEP Date: APRIL 29, 2003
Project/Site: NWS EARLE, IR SITE 13 State: NJ County: MONMOUTH
Applicant/Owner: US NAVY Plant Community #/Name: RED MAPLE FOREST
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes X No ____ (if no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly distributed?
Yes ____ No X (if yes, explain on back)

VEGETATION

Dominant Plant Species (Cover Class)	Indicator Status	Stratum	Other Plant Species (Cover Class)	Indicator Status	Stratum
1. PINUS STROBUS (3)	FACU	C	11. ILEX OPACA (T)	FACU	H
2. PINUS RIGIDA (2)	FACU	C	12.		
3. NYSSA SYLVATICA (2)	FAC	C	13.		
4. ACER RUBRUM (2)	FAC	C	14.		
5. NYSSA SYLVATICA (1)	FAC	SA	15.		
6. ACER RUBRUM (1)	FAC	SA	16.		
7. VACCINIUM CORYMBOSUM (1)	FACW-	SH	17.		
8. SPHAGNUM SP (2)	NI	BR	18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 71
Is the hydrophytic vegetation criterion met? Yes X No ____
Rationale: >50% OF DOMINANT PLANT SPECIES ARE OBL, FACW, OR FAC [FM SEC 36(2)]

SOILS

Series/phase: ATSION SAND - UPPER EDGE Subgroup:[2] AERIC HAPLAQUODS
Is the soil on the hydric soils list? Yes X No ____ Undetermined UPPER EDGE
Is the soil a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X
Is the soil: Mottled? Yes ____ No X Gleyed? Yes ____ No X
Matrix Color: 2.5Y 3/1 (50%)(0-10" DEPTH) Mottle Colors: 2.5Y 6/3 (%)(0-10" DEPTH)
Other hydric soil indicators: NONE
Is the hydric soil criterion met? Yes ____ No X
Rationale: ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOIL

(Soil Profile Presented on Back of Page)

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Surface water depth: NONE
Is the soil saturated? Yes ____ No X
Depth to free-standing water in pit/soil probe hole: >12 INCHES
List other field evidence of surface inundation or soil saturation.
NONE
Is the wetland hydrology criterion met? Yes ____ No X
Rationale: UPGRADIENT OF UPPER EDGE OF APPARENT WETLAND HYDROLOGY

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No X
Rationale for jurisdictional decision: ON GRADUAL TRANSITION FROM WETLAND TO UPLAND.

1 This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
2 Classification according to "Soil Taxonomy."

SOIL PROFILE DATA
DATA POINT: 13B-7-5

Map Unit Name (Series and Phase): ATSION SAND

Drainage Class: POORLY DRAINED

Taxonomy (subgroup): AERIC HAPLAQUODS

Field Observations Confirmed Mapped Type? Yes (No) TRANSITIONAL

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture Concretions, Structure, etc,
0-10	A/E	2.5Y 3/1 (50%)	2.5Y 6/3 (50%)	POLYCHROMATIC	FINE LOAMY SAND
10-24	A/E	2.5Y 3/1	NONE	N/A	FINE LOAMY SAND
24-30	B	2.5Y 6/2	NONE	N/A	FINE LOAMY SAND

Hydric Soil Indicators:

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

Remarks: ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOIL

DATA POINT 13B-7-6

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): J. PEYTON DOUB, PWS, CEP Date: APRIL 29, 2003
Project/Site: NWS EARLE, IR SITE 13 State: NJ County: MONMOUTH
Applicant/Owner: US NAVY Plant Community #/Name: RED MAPLE FOREST
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes X No ____ (if no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly distributed?
Yes ____ No X (if yes, explain on back)

VEGETATION

Dominant Plant Species (Cover Class)	Indicator Status	Stratum	Other Plant Species (Cover Class)	Indicator Status	Stratum
1. PINUS STROBUS (3)	FACU	C	11.		
2. PINUS RIGIDA (2)	FACU	C	12.		
3. NYSSA SYLVATICA (2)	FAC	C	13.		
4. ACER RUBRUM (2)	FAC	C	14.		
5. NYSSA SYLVATICA (1)	FAC	SA	15.		
6. VACCINIUM CORYMBOSUM (1)	FACW-	SH	16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 67
Is the hydrophytic vegetation criterion met? Yes X No ____
Rationale: >50% OF DOMINANT PLANT SPECIES ARE OBL, FACW, OR FAC [FM SEC 3.6(2)]

SOILS

Series/phase: ATSION SAND - UPPER EDGE Subgroup:[2] AERIC HAPLAQUODS
Is the soil on the hydric soils list? Yes X No ____ Undetermined UPPER EDGE
Is the soil a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X
Is the soil: Mottled? Yes ____ No X Gleyed? Yes ____ No X
Matrix Color: 2.5Y 3/1 (50%) (0-10" DEPTH) Mottle Colors: 2.5Y 6/3 (25%) (0-10" DEPTH)
Other hydric soil indicators: NONE
Is the hydric soil criterion met? Yes ____ No X
Rationale: ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOIL

(Soil Profile Presented on Back of Page)

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Surface water depth: NONE
Is the soil saturated? Yes ____ No X
Depth to free-standing water in pit/soil probe hole: >12 INCHES
List other field evidence of surface inundation or soil saturation.
NONE
Is the wetland hydrology criterion met? Yes ____ No X
Rationale: UPGRADIENT OF UPPER EDGE OF APPARENT WETLAND HYDROLOGY

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No X
Rationale for jurisdictional decision: ON GRADUAL TRANSITION FROM WETLAND TO UPLAND

1 This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
2 Classification according to "Soil Taxonomy."

SOIL PROFILE DATA
DATA POINT: 13B-7-6

Map Unit Name (Series and Phase): ATSION SAND

Taxonomy (subgroup): AERIC HAPLAQUODS

Drainage Class: POORLY DRAINED

Field Observations Confirmed Mapped Type? Yes (No) TRANSITIONAL

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture Concretions, Structure, etc,
0-10	A/E	2.5Y 3/1 (50%)	2.5Y 6/3 (50%)	POLYCHROMATIC	FINE LOAMY SAND
10-24	A/E	2.5Y 3/1	NONE	N/A	FINE LOAMY SAND
24-30	B	2.5Y 6/2	NONE	N/A	FINE LOAMY SAND

Hydric Soil Indicators:

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

Remarks: ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOIL

DATA POINT 13B-7-7

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): J. PEYTON DOUB, PWS, CEP Date: APRIL 29, 2003
Project/Site: NWS EARLE, IR SITE 13 State: NJ County: MONMOUTH
Applicant/Owner: US NAVY Plant Community #/Name: RED MAPLE FOREST
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes X No ____ (if no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly distributed?
Yes ____ No X (if yes, explain on back)

VEGETATION

Dominant Plant Species (Cover Class)	Indicator Status	Stratum	Other Plant Species (Cover Class)	Indicator Status	Stratum
1. PINUS STROBUS (4)	FACU	C	11. PINUS RIGIDA (2)	FACU	C
2. NYSSA SYLVATICA (2)	FAC	SA	12. NYSSA SYLVATICA (2)	FAC	C
3. VACCINIUM CORYMBOSUM (1)	FACW-	SH	13. ACER RUBRUM (2)	FAC	C
4. CHAMAECYPARIS THYOIDES (1)	OBL	SH	14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 75
Is the hydrophytic vegetation criterion met? Yes X No ____
Rationale: >50% OF DOMINANT PLANT SPECIES ARE OBL, FACW, OR FAC [FM SEC 3.6(2)]

SOILS

Series/phase: ATSION SAND Subgroup:[2] AERIC HAPLAQUODS
Is the soil on the hydric soils list? Yes X No ____ Undetermined UPPER EDGE
Is the soil a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X
Is the soil: Mottled? Yes ____ No X Gleyed? Yes ____ No X
Matrix Color: 2.5Y 7/6 (1-10" DEPTH) Mottle Colors: NONE (1-10" DEPTH)
Other hydric soil indicators: NONE
Is the hydric soil criterion met? Yes ____ No X
Rationale: DISTINCT AEROBIC SOIL HORIZON AT SURFACE

(Soil Profile Presented on Back of Page)

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Surface water depth: NONE
Is the soil saturated? Yes ____ No X
Depth to free-standing water in pit/soil probe hole: 18 INCHES
List other field evidence of surface inundation or soil saturation.
NONE
Is the wetland hydrology criterion met? Yes ____ No X
Rationale: SURFACE SOIL APPEARS TO DISPLAY GOOD DRAINAGE

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No X
Rationale for jurisdictional decision: HYDRIC SOIL AND WETLAND HYDROLOGY PARAMETERS ARE CLEARLY NOT MET.

1 This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
2 Classification according to "Soil Taxonomy."

SOIL PROFILE DATA
DATA POINT: 13B-7-7

Map Unit Name (Series and Phase): ATSION SAND
Taxonomy (subgroup): AERIC HAPLAQUODS
Drainage Class: POORLY DRAINED
Field Observations Confirmed Mapped Type? Yes (No) TRANSITIONAL

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture Concretions, Structure, etc,
0-1	A	2.5Y 3/1	NONE	N/A	FINE LOAMY SAND
1-10	B2	2.5Y 7/6	NONE	N/A	FINE LOAMY SAND
10-30+	2	2.5Y 3/1	NONE	N/A	FINE LOAMY SAND

Hydric Soil Indicators:

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

Remarks: DISTINCT AEROBIC SOIL HORIZON AT SURFACE

DATA POINT 13B-10-1

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): J PEYTON DOUB, PWS, CEP Date: APRIL 30, 2003
Project/Site: NWS EARLE, IR SITE 13 State: NJ County: MONMOUTH
Applicant/Owner: US NAVY Plant Community #/Name: RED MAPLE FOREST
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes X No ____ (if no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly distributed?
Yes ____ No X (if yes, explain on back)

VEGETATION

Dominant Plant Species (Cover Class)	Indicator Status	Stratum	Other Plant Species (Cover Class)	Indicator Status	Stratum
1. ACER RUBRUM (4)	FAC	C	11. CHAMAECYPARIS THYOIDES (2)	OBL	C
2. NYSSA SYLVATICA (3)	FAC	C	12. SPHAGNUM SP (T)	NI	BR
3. ACER RUBRUM (1)	FAC	SA	13.		
4. VACCINIUM CORYMBOSUM (3)	FACW-	SH	14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes X No ____
Rationale: >50% OF DOMINANT PLANT SPECIES ARE OBL, FACW, OR FAC [FM SEC 3.6(2)]

SOILS

Series/phase: ATSION SAND Subgroup:[2] AERIC HAPLAQUODS
Is the soil on the hydric soils list? Yes X No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X
Is the soil: Mottled? Yes ____ No X Gleyed? Yes ____ No X
Matrix Color: 2.5Y 6/3 OR 6/2 (12-15" DEPTH) Mottle Colors: NONE (12-15" DEPTH)
Other hydric soil indicators: BLACK SANDS NR. SURFACE (0-12" DEPTH) MAY BE ORGANIC MATTER ACCUM.
Is the hydric soil criterion met? Yes X No ____
Rationale: SOIL PROFILE MATCHES A SOIL MAPPING UNIT ON COUNTY LIST OF HYDRIC SOILS [FM SEC 3.27]
(Soil Profile Presented on Back of Page)

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Surface water depth: NONE
Is the soil saturated? Yes ____ No X
Depth to free-standing water in pit/soil probe hole: 15 INCHES
List other field evidence of surface inundation or soil saturation.
MORPHOLOGICAL PLANT ADAPTATIONS (SHALLOW ROOTS, BUTTRESSED TRUNKS) [FM SEC 3.35(10)]
Is the wetland hydrology criterion met? Yes X No ____
Rationale: MORPHOLOGICAL PLANT ADAPTATIONS (SHALLOW ROOTS, BUTTRESSED TRUNKS) [FM SEC 3.35(10)]. ABNORMALLY DRY 2002 COULD EXPLAIN LACK OF SURFACE SATURATION.

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes X No ____
Rationale for jurisdictional decision: HYDROPHYTIC VEGETATION, HYDRIC SOILS, AND WETLAND HYDROLOGY OCCUR CONCURRENTLY

1 This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
2 Classification according to "Soil Taxonomy."

SOIL PROFILE DATA
DATA POINT: 13B-10-1

Map Unit Name (Series and Phase): ATSION SAND

Taxonomy (subgroup): AERIC HAPLAQUODS

Drainage Class: POORLY DRAINED

Field Observations Confirmed Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture Concretions, Structure, etc,
0-12	A	2.5Y 4/1	NONE	N/A	FINE LOAMY SAND
12-15	E or B	2.5Y 6/3-2	NONE	N/A	FINE LOAMY SAND
15-24+	B	5Y 6/2	NONE	N/A	FINE LOAMY SAND

Hydric Soil Indicators:

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

Remarks: HYDRIC SOIL [FM SEC 3.27]

DATA POINT 13B-10-2

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): J. PEYTON DOUB, PWS, CEP Date: APRIL 30, 2003
Project/Site: NWS EARLE, IR SITE 13 State: NJ County: MONMOUTH
Applicant/Owner: US NAVY Plant Community #/Name: RED MAPLE FOREST
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes X No ____ (if no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly distributed?
Yes ____ No X (if yes, explain on back)

VEGETATION

Dominant Plant Species (Cover Class)	Indicator Status	Stratum	Other Plant Species (Cover Class)	Indicator Status	Stratum
1. ACER RUBRUM (4)	FAC	C	11. CHAMAECYPARIS THYOIDES (2)	OBL	C
2. NYSSA SYLVATICA (3)	FAC	C	12. BETULA POPULIFOLIA (1)	FAC	SA
3. ACER RUBRUM (3)	FAC	SA	13.		
4. NYSSA SYLVATICA (2)	FAC	SA	14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes X No ____
Rationale: >50% OF DOMINANT PLANT SPECIES ARE OBL, FACW, OR FAC [FM SEC 3.6(2)]

SOILS

Series/phase: ATSION SAND - UPPER EDGE Subgroup:[2] AERIC HAPLAQUODS
Is the soil on the hydric soils list? Yes X No ____ Undetermined UPPER EDGE
Is the soil a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No X Gleyed? Yes ____ No X
Matrix Color: 5Y 3/1 (70%) (0-4" DEPTH) Mottle Colors: 5Y 5/3 (30%) (0-4" DEPTH)
Other hydric soil indicators: NONE
Is the hydric soil criterion met? Yes X No ____
Rationale:
ON TRANSITION TO NON-HYDRIC SOIL
(Soil Profile Presented on Back of Page)

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Surface water depth: NONE
Is the soil saturated? Yes ____ No X
Depth to free-standing water in pit/soil probe hole: 15 INCHES
List other field evidence of surface inundation or soil saturation.
UPPER EDGE OF MORPHOLOGICAL PLANT ADAPTATIONS
Is the wetland hydrology criterion met? Yes ____ No X
Rationale: UPPER EDGE OF APPARENT WETLAND HYDROLOGY

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes X No ____
Rationale for jurisdictional decision: UPPER EDGE OF WHERE ALL 3 PARAMETERS APPEAR TO OCCUR SIMULTANEOUSLY.

1 This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
2 Classification according to "Soil Taxonomy."

SOIL PROFILE DATA
DATA POINT: 13B-10-2

Map Unit Name (Series and Phase): ATSION SAND

Taxonomy (subgroup): AERIC HAPLAQUODS

Drainage Class: POORLY DRAINED

Field Observations Confirmed Mapped Type? Yes (No) TRANSITIONAL

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture Concretions, Structure, etc,
0-4	A/E	5Y 3/1 (70%)	5Y 5/3 (30%)	POLYCHROMATIC	FINE LOAMY SAND
4-8	A ?	5Y 2.5/1	NONE	N/A	FINE LOAMY SAND
8-		5Y 5/2	5Y 6/6	INDISTINCT (<5%)	FINE LOAMY SAND

Hydric Soil Indicators:

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

Remarks:

ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOIL

DATA POINT 13B-10-3

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): J. PEYTON DOUB, PWS, CEP Date: APRIL 30, 2003
Project/Site: NWS EARLE, IR SITE 13 State: NJ County: MONMOUTH
Applicant/Owner: US NAVY Plant Community #/Name: RED MAPLE FOREST
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes X No ____ (if no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly distributed?
Yes ____ No X (if yes, explain on back)

VEGETATION

Dominant Plant Species (Cover Class)	Indicator Status	Stratum	Other Plant Species (Cover Class)	Indicator Status	Stratum
1. ACER RUBRUM (4)	FAC	C	11. BETULA POPULIFOLIA (1)	FAC	SA
2. NYSSA SYLVATICA (2)	FAC	C	12. NYSSA SYLVATICA (1)	FAC	SA
3. ACER RUBRUM (2)	FAC	SA	13. NYSSA SYLVATICA (T)	FAC	SH
4. SPHAGNUM SP (1)	NI	BR	14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes X No ____
Rationale: >50% OF DOMINANT PLANT SPECIES ARE OBL, FACW, OR FAC [FM SEC 3.6(2)]

SOILS

Series/phase: ATSION SAND-UPPER EDGE Subgroup:[2] AERIC HAPLAQUODS
Is the soil on the hydric soils list? Yes X No ____ Undetermined UPPER EDGE
Is the soil a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X
Is the soil: Mottled? Yes ____ No X Gleyed? Yes ____ No X
Matrix Color: 5Y 3/1 (70%) (0-3" DEPTH) Mottle Colors: 5Y 5/3 (30%) (0-3" DEPTH)
Other hydric soil indicators: NONE
Is the hydric soil criterion met? Yes ____ No X
Rationale: ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOIL

(Soil Profile Presented on Back of Page)

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Surface water depth: NONE
Is the soil saturated? Yes ____ No X
Depth to free-standing water in pit/soil probe hole: 18 INCHES
List other field evidence of surface inundation or soil saturation.
NONE
Is the wetland hydrology criterion met? Yes ____ No X
Rationale: JUST UPGRADIENT OF UPPER EDGE OF APPARENT WETLAND HYDROLOGY

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No X
Rationale for jurisdictional decision: JUST UPGRADIENT OF UPPER EDGE OF HYDRIC SOILS AND APPARENT WETLAND HYDROLOGY

1 This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
2 Classification according to "Soil Taxonomy."

SOIL PROFILE DATA
DATA POINT: 13B-10-3

Map Unit Name (Series and Phase): ATSION SAND

Drainage Class: POORLY DRAINED

Taxonomy (subgroup): AERIC HAPLAQUODS

Field Observations Confirmed Mapped Type? Yes (No) TRANSITIONAL

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture Concretions, Structure, etc,
0-3	A/E?	5Y 3/1 (70%)	5Y 5/3 (30%)	POLYCHROMATIC	FINE LOAMY SAND
3-18	A	5Y 3/1	NONE	N/A	FINE LOAMY SAND
18-24+	B	5Y 5/2	5Y 6/6	INDISTINCT (~10%)	FINE LOAMY SAND

Hydric Soil Indicators:

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

Remarks: ON TRANSITION FROM HYDRIC TO NON-HYDRIC SOIL

DATA POINT 13B-10-4

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): J. PEYTON DOUB, PWS, CEP Date: APRIL 30, 2003
Project/Site: NWS EARLE, IR SITE 13 State: NJ County: MONMOUTH
Applicant/Owner: US NAVY Plant Community #/Name: RED MAPLE FOREST
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes X No ____ (if no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly distributed?
Yes ____ No X (if yes, explain on back)

VEGETATION

Dominant Plant Species (Cover Class)	Indicator Status	Stratum	Other Plant Species (Cover Class)	Indicator Status	Stratum
1. ACER RUBRUM (4)	FAC	C	11. NYSSA SYLVATICA (1)	FAC	C
2. NYSSA SYLVATICA (1)	FAC	SA	12. VACCINIUM CORYMBOSUM (T)	FACW-	SH
3. ACER RUBRUM (2)	FAC	SA	13. SPHAGNUM SP. (T)	NI	BR
4.			14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100
Is the hydrophytic vegetation criterion met? Yes X No ____
Rationale: >50% OF DOMINANT PLANT SPECIES ARE OBL, FACW, OR FAC [FM SEC 3.6(2)]

SOILS

Series/phase: ATSION SAND - UPPER EDGE Subgroup:[2] AERIC HAPLAQUODS
Is the soil on the hydric soils list? Yes X No ____ Undetermined UPPER EDGE
Is the soil a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X
Is the soil: Mottled? Yes ____ No X Gleyed? Yes ____ No X
Matrix Color: 5Y 5/4 (0-10" DEPTH) Mottle Colors: NONE (0-10" DEPTH)
Other hydric soil indicators: NONE
Is the hydric soil criterion met? Yes ____ No X
Rationale: DISTINCT AEROBIC SOIL HORIZON AT SURFACE

(Soil Profile Presented on Back of Page)

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Surface water depth: NONE
Is the soil saturated? Yes ____ No X
Depth to free-standing water in pit/soil probe hole: >24 INCHES
List other field evidence of surface inundation or soil saturation.
NONE
Is the wetland hydrology criterion met? Yes ____ No X
Rationale: SURFACE SOIL HORIZON APPEARS TO DISPLAY GOOD DRAINAGE

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No X
Rationale for jurisdictional decision: HYDRIC SOIL AND WETLAND HYDROLOGY PARAMETERS ARE CLEARLY NOT MET

1 This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
2 Classification according to "Soil Taxonomy."

SOIL PROFILE DATA
DATA POINT: 13B-10-4

Map Unit Name (Series and Phase): ATSION SAND

Taxonomy (subgroup): AERIC HAPLAQUODS

Drainage Class: POORLY DRAINED

Field Observations Confirmed Mapped Type? Yes (No) TRANSITIONAL

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture Concretions, Structure, etc,
0-10	E or B	5Y 5/4	NONE	N/A	FINE SANDY LOAM
10-30	B or A	5Y 2.5/1	NONE	N/A	FINE SANDY LOAM

Hydric Soil Indicators:

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

Remarks: DISTINCT AEROBIC HORIZON AT SURFACE

APPENDIX B

WETLAND FUNCTION-VALUE DATA SHEET

AREA 13

Wetland Function-Value Evaluation Form

Total area of wetland >100A[1] Human made? N Is wetland part of a wildlife corridor? Y or a "habitat island"? N

Adjacent land use FOREST, CLOSED LANDFILL Distance to nearest roadway or other development ~500 FT

Dominant wetland systems present PALUSTRINE Contiguous undeveloped buffer zone present Y

Is the wetland a separate hydraulic system? N If not, where does the wetland lie in the drainage basin? HEADWATERS

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see ~~attached list~~ APPENDIX A)

Wetland I.D. NWS EARLE - 13B

Latitude N523700 Longitude E592250[2]

Prepared by: P. DOUB Date 4/30/03

Wetland Impact:
Type LF REMEDIATION Area <0.5 A

Evaluation based on:
Office ____ Field X

Corps manual wetland delineation completed? Y X N ____ (FEDERAL 1989 MANUAL)

Function/Value	Occurence Y	Occurence N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	X		2,4,5,16		LANDSCAPE POSITION AND PHYSICAL CONDITIONS SUGGEST MORE OF A RECHARGE THAN DISCHARGE ROLE
Floodflow Alteration	X		1,2,3,5,6,9,18		DENSE VEGETATION AND BROAD AREA IN HEADWATERS BUT STILL CLOSE TO COASTAL AREA
Fish and Shellfish Habitat	X		1,2		PRODUCTION EXPORT AND WATER QUALITY FUNCTIONS COULD ENHANCE DOWN-GRADIENT HABITAT
Sediment/Toxicant Retention	X		1,2,4,5,7,8,9	X	DENSE VEGETATION AND OTHER FAVORABLE PHYSICAL CONDITIONS, LOCATED NEXT TO LANDFILL
Nutrient Removal	X		1,3,8,11,12		DENSE VEGETATION AND OTHER FAVORABLE PHYSICAL CONDITIONS BUT FEW APPARENT UP-GRADIENT NUTRIENT SOURCES
Production Export	X		1,2,4,5,7,8,12	X	DENSE AND DIVERSE VEGETATION, ABUNDENT WILDLIFE FOOD SOURCES
Sediment/Shoreline Stabilization		X	2,3,14		NO SHORELINES OR OPEN WATER NEAR POTENTIALLY AFFECTED AREA
Wildlife Habitat	X		1,3,5,6,7,8,11,14,15,17	X	LARGE EXPANSE OF UNBROKEN FOREST COVER, GOOD VEGETATIONAL DIVERSITY
Recreation	X		4,5,7		POTENTIAL FOR PASSIVE RECREATION (e.g., HIKING) BUT NOT OPEN TO THE PUBLIC
Educational Scientific Value	X		2,4,5,14		LARGE, GENERALLY UNDISTURBED WETLAND BUT NOT OPEN TO THE PUBLIC
Uniqueness/Heritage	X		3,15,16,19,28		TYPICAL OF OTHER INLAND WETLANDS CHARACTERIZED BY ATSION SANDS
Visual Quality/Aesthetics	X		3,4,5,7,8		FAVORABLE APPEARANCE BUT NOT VISIBLE TO THE PUBLIC
ES Endangered Species Habitat	X		3	X	POTENTIAL FOR OCCURRENCE
Other					

Notes: [1] >100 A FOR ENTIRE WETLAND, BUT PRIMARY FOCUS OF THE ASSESSMENT IS UPON <0.5 ACRES IMMEDIATELY ADJOINING THE SITE 13 LANDFILL.

[2] NJ STATE PLANE COORDINATE SYSTEM, NA DATUM OF 1983.

*Refer to back up list of numbered considerations.

Appendix

Wetland evaluation supporting documentation and reproducible forms.

Below is an example list of considerations that was used for a New Hampshire highway project. Considerations are flexible, based on best professional judgement and interdisciplinary team consensus. This example provides a comprehensive base, however, and may only need slight modifications for use in other projects.

GROUNDWATER RECHARGE/DISCHARGE— This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either.

CONSIDERATIONS/QUALIFIERS

1. Public or private wells occur downstream of the wetland.
2. Potential exists for public or private wells downstream of the wetland.
3. Wetland is underlain by stratified drift.
4. Gravel or sandy soils present in/or adjacent to the wetland.
5. Fragipan does not occur in the wetland.
6. Fragipan, impervious soils, or bedrock, does occur in the wetland.
7. Wetland is associated with a perennial or intermittent watercourse.
8. Signs of groundwater recharge are present or piezometer data demonstrates recharge.
9. Wetland is associated with a watercourse, but lacks a defined outlet or contains a constricted outlet.
10. Wetland contains only an outlet.
11. Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards.
12. Quality of water associated with the wetland is high.
13. Signs of groundwater discharge are present (e.g. springs).
14. Water temperature suggests it is a discharge site.
15. Wetland shows signs of variable water levels.
16. Gravel or sandy soils present in or adjacent to wetland.
17. Piezometer data demonstrates discharge.
18. Other

FLOODFLOW ALTERATION (Storage & Desynchronization) — This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas.

CONSIDERATIONS/QUALIFIERS

1. Area of this wetland is large relative to its watershed.
2. Wetland occurs in the upper portions of its watershed.
3. Effective flood storage is small or non-existent upslope of or above the wetland.
4. Wetland watershed contains a high degree of impervious surfaces.
5. Wetland contains hydric soils which are able to absorb and detain water.
6. Wetland exists in a relatively flat area that has flood storage potential.
7. Wetland has an intermittent outlet, ponded water, or signs are present of variable water level.
8. During flood events, this wetland can retain higher volumes of water than under normal or average rainfall conditions.
9. Wetland receives and retains overland or sheet flow runoff from surrounding uplands.
10. In the event of a large storm, this wetland may receive and detain excessive flood water from a nearby watercourse.
11. Valuable properties, structures or resources are located in or near the floodplain downstream from the wetland.
12. The watershed has a history of economic loss due to flooding.
13. This wetland is associated with one or more watercourses.
14. This wetland watercourse is sinuous or diffuse.
15. This wetland outlet is constricted.
16. Channel flow velocity is affected by this wetland.
17. Land uses downstream are protected by this wetland.
18. This wetland contains a high density of vegetation.
19. Other

FISH AND SHELLFISH HABITAT — This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in question for fish and shellfish habitat.[1]

CONSIDERATIONS/QUALIFIERS

1. Forest land dominant in the watershed above this wetland.
2. Abundance of cover objects present.

STOP HERE IF THIS WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE

3. Size of this wetland is able to support large fish/shellfish populations.
4. Wetland is part of a larger, contiguous watercourse.
5. Wetland has sufficient size and depth in open water areas so as not to freeze solid and retains some open water during winter.
6. Stream width (bank to bank) is more than 50 feet.
7. Quality of the watercourse associated with this wetland is able to support healthy fish/shellfish populations.
8. Streamside vegetation provides shade for the watercourse.
9. Spawning areas are present (submerged vegetation or gravel beds).
10. Food is available to fish/shellfish populations within this wetland.
11. Barrier(s) to anadromous fish (such as dams, including beaver dams, water falls, road crossing, etc.) are absent from the stream reach associated with this wetland.
12. Evidence of fish is present.
13. Wetland is stocked with fish.
14. The watercourse is persistent.
15. Man-made streams are absent.
16. Water velocities are not too excessive for fish usage.
17. Defined stream channel is present.
18. Other

SEDIMENT/TOXICANT/PATHOGEN RETENTION —This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens in runoff water from surrounding uplands, or upstream erod-

ing wetland areas.

CONSIDERATIONS/QUALIFIERS

1. Potential sources of excess sediment are in the watershed above the wetland.
2. Potential or known sources of toxicants are in the watershed above the wetland.
3. Opportunity for sediment trapping by slow moving water or deepwater habitat are present in this wetland.
4. Mineral, fine grained, or organic soils are present.
5. Long duration water retention time is present in this wetland.
6. Public or private water sources occur downstream.
7. The wetland edge is broad and intermittently aerobic.
8. The wetland is known to have existed for more than 50 years.
9. Drainage ditches have not been constructed in the wetland.

STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.

10. Wetland is associated with an intermittent or perennial stream, or a lake.
11. Channelized flows have visible velocity decreases in the wetland.
12. Effective floodwater storage in wetland is occurring. Areas of impounded open water are present.
13. No indicators of erosive forces are present. No high water velocities are present.
14. Diffuse water flows are present in the wetland.
15. Wetland has a high degree of water and vegetation interspersion.
16. Dense vegetation provides opportunity for sediment trapping and/or signs of sediment accumulation is present by dense vegetation.
17. Other

NUTRIENT REMOVAL/RETENTION/TRANSFORMATION — This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands, and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.

CONSIDERATIONS/QUALIFIERS

1. Wetland is large relative to the size of its watershed.
2. Deep water or open water habitat exists.
3. Overall potential for sediment trapping exists in the wetland.
4. Potential sources of excess nutrients present in the watershed above the wetland.
5. Wetland saturated for most of the season. Ponded water is present in the wetland.
6. Deep organic/sediment deposits are present.
7. Slowly drained mineral, fine grained, or organic soils, are present.
8. Dense vegetation is present.
9. Emergent vegetation and/or dense woody stems are dominant.
10. Aquatic diversity/abundance sufficient to utilize nutrients.
11. Opportunity for nutrient attenuation exists.
12. Vegetation diversity/abundance sufficient to utilize nutrients.

STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.

13. Waterflow through this wetland is diffuse.
14. Water retention/detention time in this wetland is increased by constricted outlet or thick vegetation.
15. Water moves slowly through this wetland.
16. Other

PRODUCTION EXPORT (Nutrient) — This function evaluates the effectiveness of the wetland to produce food or usable products for man or other living organisms.

CONSIDERATIONS/QUALIFIERS

1. Wildlife food sources grow within this wetland.
2. Detritus development is present within this wetland
3. Economically or commercially used products found in this wetland.

4. Evidence of wildlife use found within this wetland.
5. Higher trophic level consumers are utilizing this wetland.
6. Fish or shellfish develop or occur in this wetland.
7. High vegetation density is present.
8. Wetland exhibits high degree of plant community structure/species diversity.
9. High aquatic diversity/abundance is present.
10. Nutrients exported in wetland watercourses (permanent outlet present).
11. "Flushing" of relatively large amounts of organic plant material occurs from this wetland.
12. Wetland contains flowering plants which are used by nectar-gathering insects.
13. Indications of export are present.
14. High production levels occurring however, no visible signs of export (assumes export is attenuated).
15. Other

SEDIMENT/SHORELINE STABILIZATION — This function considers the effectiveness of a wetland to stabilize stream banks and shorelines against erosion.

CONSIDERATIONS/QUALIFIERS

1. Indications of erosion, siltation present.
2. Topographical gradient is present in wetland.
3. Potential sediment sources are present up-slope.
4. No distinct shoreline or bank is evident between the waterbody and the wetland or upland.
5. A distinct step between the open waterbody or stream and the adjacent land exists (i.e. sharp bank) with dense roots throughout.
6. Wide wetland (>10') bordering watercourse, lake, or pond.
7. High flow velocities in the wetland.
8. Potential sediment sources present upstream.
9. The watershed is of sufficient size to produce channelized flow.
10. Open water fetch is present.
11. Boating activity is present.
12. Dense vegetation is bordering watercourse, lake, or pond.
13. High percentage of energy absorbing emergents and/or shrubs bordering watercourse, lake or pond.
14. Vegetation comprised of large trees and shrubs which withstand major flood events or erosive incidents and stabilize the shoreline on a large scale (feet).
15. Vegetation comprised of dense resilient herbaceous layer which stabilizes sediments and the shoreline on a small scale (inches) during minor flood events or potentially erosive events.
16. Other

WILDLIFE HABITAT — This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/or migrating species must be considered. Species lists of observed and potential animals should be included in the wetland assessment report.[2]

CONSIDERATIONS/QUALIFIERS

1. Wetland is not degraded by human activity.
2. Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards.
3. Wetland is not fragmented by development.
4. Upland surrounding this wetland is undeveloped.
5. More than 40% of this wetland edge is bordered by upland wildlife habitat (e.g.brushland, wood land, active farmland, or idle land) at least 500 feet in width.
6. Wetland contiguous with other wetland systems connected by watercourse or lake.
7. Wildlife overland access to other wetlands is present.
8. Wildlife food sources are within this wetland or are nearby.

9. Wetland exhibits a high degree of interspersion of vegetation classes and/or open water.
10. Two or more islands or inclusions of upland within the wetland are present.
11. Dominant wetland class includes deep or shallow marsh or wooded swamp.
12. More than three acres of shallow permanent open water (less than 6.6 feet deep), including streams in or adjacent to wetland are present.
13. Density of the wetland vegetation is high.
14. Wetland exhibits a high degree of plant species diversity.
15. Wetland exhibits a high degree of diversity in plant community structure (e.g. tree/shrub/vine /grasses/mosses/etc.)
16. Plant/animal indicator species present.
17. Animal signs observed (tracks, scats, nesting areas, etc.)
18. Seasonal uses vary for wildlife, and wetland appears to support varied population diversity/abundance during different seasons.
19. Wetland contains or has potential to contain a high population of insects.
20. Wetland contains or has potential to contain large amphibian populations.
21. Wetland has a high avian utilization or its potential.
22. Indications of less disturbance-tolerant species present.
23. Signs of wildlife habitat enhancement present (birdhouses, nesting boxes, food sources, etc.).
24. Other

RECREATION (Consumptive and Non-Consumptive) — This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals, or other resources that are intrinsic to the wetland. Non-consumptive opportunities do not consume or diminish these resources of the wetland.

CONSIDERATIONS/QUALIFIERS

1. Wetland is part of a recreation area, park, forest, or refuge.
2. Fishing is available within or from the wetland.
3. Hunting is permitted in the wetland.
4. Hiking occurs or has potential to occur within the wetland.
5. Wetland is a valuable wildlife habitat.
6. The watercourse, pond, or lake, associated with the wetland is unpolluted.
7. High visual/aesthetic quality of this potential recreation site.
8. Access to water is available at this potential recreation site for boating, canoeing, or fishing.
9. The watercourse associated with this wetland is wide and deep enough to accommodate canoeing and/or non-powered boating.
10. Off-road public parking available at the potential recreation site.
11. Accessibility and travel ease is present at this site.
12. The wetland is within a short drive or safe walk from highly populated public and private areas.
13. Other

EDUCATIONAL/SCIENTIFIC VALUE — This value considers the suitability of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.

CONSIDERATIONS/QUALIFIERS

1. Wetland contains or is known to contain threatened, rare, or endangered species.
2. Little or no disturbance is occurring in this wetland.
3. Potential educational site contains a diversity of wetland classes which are accessible or potentially accessible.
4. Potential educational site is undisturbed and natural.
5. Wetland is considered to be a valuable wildlife habitat.

6. Wetland is located within a nature preserve or wildlife management area.
7. Signs of wildlife habitat enhancement present (bird houses, nesting boxes, food sources, etc.).
8. Off-road parking at potential educational site suitable for school bus access in or near wetland.
9. Potential educational site is within safe walking distance or a short drive to schools.
10. Potential educational site within safe walking distance to other plant communities.
11. Direct access to perennial stream at potential educational site available.
12. Direct access to pond or lake at potential educational site available.
13. No known safety hazards within the potential educational site.
14. Public access to the potential educational site is controlled.
15. Handicap accessibility is available.
16. Site is currently used for educational or scientific purposes.
17. Other

UNIQUENESS/HERITAGE — This value considers the effectiveness of the wetland or its associated waterbodies to provide certain special values. These may include archaeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, its relative importance as a typical wetland class for this geographic location. These functions are clearly valuable wetland attributes relative to aspects of public health, recreation, and habitat diversity.

CONSIDERATIONS/QUALIFIERS

1. Upland surrounding wetland primarily urban.
2. Upland surrounding wetland developing rapidly.
3. More than 3 acres of shallow permanent open water occur in wetlands (less than 6.6 feet deep) including streams .
4. Three or more wetland classes present.
5. Deep and/or shallow marsh, or wooded swamp dominate.
6. High degree of interspersion of vegetation and/or open water occurring in this wetland.
7. Well-vegetated stream corridor (15 feet on each side of the stream) occurs in this wetland.
8. Potential educational site is within a short drive or a safe walk from schools.
9. Off-road parking at potential educational site is suitable for school buses.
10. No known safety hazards exist within this potential educational site.
11. Direct access to perennial stream or lake at potential educational site.
12. Two or more wetland classes visible from primary viewing locations.
13. Low-growing wetlands (marshes, scrub-shrub, bogs, open water) visible from primary viewing locations.
14. Half an acre of open water or 200 feet of stream is visible from the primary viewing locations.
15. Large area of wetland is dominated by flowering plants, or plants which turn vibrant colors in different seasons.
16. General appearance of the wetland visible from primary viewing locations is unpolluted and/or undisturbed.
17. Overall view of the wetland is available from the surrounding upland.
18. Quality of the water associated with the wetland is high.
19. Opportunities for wildlife observations are available.
20. Historical buildings occur within the wetland.
21. Presence of pond or pond site and remains of a dam occur within the wetland.
22. Wetland within 50 yards of the nearest perennial watercourse.
23. Visible stone or earthen foundations, berms, dams, standing structures or associated features occur within the wetland.
24. Wetland contains critical habitat for a state or federally listed threatened or endangered species.
25. Wetland is known to be a study site for scientific research.
26. Wetland is a natural landmark or recognized by the state natural heritage inventory authority as an exemplary natural community.
27. Wetland has local significance because it serves several functional values.

28. Wetland has local significance because it has biological, geological, or other features which are locally rare or unique.
29. Wetland is known to contain an important archaeological site.
30. Wetland is hydrologically connected to a state or federally designated scenic river.
31. Wetland is located in an area experiencing a high wetland loss rate.
32. Other

VISUAL QUALITY/AESTHETICS — This value considers the visual and aesthetic quality or usefulness of the wetland.

CONSIDERATIONS/QUALIFIERS

1. Multiple wetland classes visible from primary viewing locations.
2. Emergent marsh and/or open water visible from primary viewing locations.
3. Diversity of vegetation species visible from primary viewing locations.
4. Wetland dominated by flowering plants, or plants which turn vibrant colors in different seasons.
5. Land use surrounding the wetland is undeveloped as seen from primary viewing locations.
6. Visible surrounding land use form contrasts with wetland.
7. Wetland views absent of trash, debris, and signs of disturbance.
8. Wetland is considered to be a valuable wildlife habitat.
9. Wetland is easily accessed.
10. Low noise level at primary viewing locations.
11. Unpleasant odors absent at primary viewing locations.
12. Relatively unobstructed sight line exists through wetland.
13. Other

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ENDANGERED SPECIES HABITAT — This value considers the suitability of the wetland to support threatened or endangered species.

CONSIDERATIONS/QUALIFIERS

1. Wetland contains or is known to contain threatened or endangered species.
2. Wetland contains critical habitat for a state or federally listed threatened or endangered species.
3. Other

1 Although the above example refers to freshwater wetlands, it can also be adapted for marine ecosystems. Below is an example of an adaptation for the fish and shellfish function provided by the National Marine Fisheries Service.

FISH AND SHELLFISH HABITAT — This function considers the effectiveness of wetlands, embayments, tidal flats, vegetated shallows, and other environments in supporting marine resources such as fish, shellfish, marine mammals, and sea turtles.

CONSIDERATIONS/QUALIFIERS (Marine)

1. Special aquatic sites (tidal marsh, mud flats, eelgrass beds) are present.
2. Suitable spawning habitat is present at the site or in the area.
3. Commercially or recreationally important species are present or suitable habitat exists.
4. The wetland/waterway supports prey for higher trophic level marine organisms.
5. The waterway provides migratory habitat for anadromous fish.
6. Other

2 In March 1995 a rapid wildlife habitat assessment method was completed by a University of Massachusetts research team, with funding and oversight provided by the New England Transportation Consortium. The method is called WEThings (wetland habitat indicators for non- game species). It produces a list of potential wetland- dependent mammals, reptiles, and amphibian species that may be present in the wetland. The output is based on observable habitat characteristics documented on the field data form. This method may be used to generate the wildlife species list recommended as backup information to the wetland evaluation form, and to augment the considerations. Use of this method should first be coordinated with the Corps project manager. A computer program is also available to expedite this process.