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Technical Memorandum
Sediment Sampling Summary – 2003 Sampling Events
Site 13 Defense Property Disposal Office (DPDO) Yard,
Colts Neck, New Jersey
Naval Weapons Station Earle

Site 13 is an area of fill material (landfill) under a portion of the Defense Property Disposal Office (DPDO) yard that extends northward toward a wetland area at Naval Weapons Station (NWS) Earle in Colts Neck, New Jersey. Site 13 is in the Navy's Installation Restoration Program (IRP) and the Superfund Remedial Program. The Remedial Investigation (RI), Feasibility Study (FS), and Proposed Plan for Site 13 have been completed. The Record of Decision (ROD) for this site is currently being finalized. The ROD will document the selected remedy for this site, which includes a low permeability cover system over the landfill area, excavation of contaminated soils and sediments outside the landfill area and placement of that material under the cover system, institutional controls, and long-term monitoring. The areas of soil and sediment contamination to be excavated are associated with erosion from the landfill or with erosion in the ditch that flows adjacent to Site 13.

In 2003, the Navy decided to conduct a pre-design investigation for Site 13 that would delineate the area of soil/sediment to be excavated outside the limits of the landfill. This Technical Memorandum provides a brief description of the Site 13 pre-design sediment sampling investigation. All of the samples collected were referred to as sediment because the initial areas of investigation were associated with particles that were moved by erosion (i.e., sediment). The sediment sampling occurred in three phases from June to December 2003. In addition, this Technical Memorandum recommends an area of contamination to be remediated.

This Technical Memorandum is divided into five sections. Section 1.0 discusses the current status of Site 13 and the previous investigations and studies at the site that are relevant to the excavation areas. Section 2.0 summarizes the pre-design sediment sampling investigation and results. Those results indicate that contamination extends into a potentially valuable wetland. Section 3.0 discusses the wetland in greater detail, including the functions and values of the wetland. Section 4.0 presents the Navy's approach for determining the most appropriate excavation areas by attempting to balance the disturbance in the wetland with the benefit of removal of contaminated soil/sediment. Section 5.0 summarizes the proposed excavation areas and the general methodology for determining when excavation is complete.

1.0 PREVIOUS INVESTIGATIONS

Site 13 has been the subject of several previous reports and environmental investigations. The following investigations were conducted at Site 13: an Initial Assessment Study (IAS) in 1982, a Site Inspection (SI) in 1993 (Roy F. Weston, 1993), a RI in 1996 with its associated addendum released in 1998 (B&R Environmental 1996 and 1998), and an FS in 2000 (TtNUS, 2000). The Proposed Plan for Site 13, issued in December 2002 (TtNUS, 2002), presented the proposed remedy for Site 13. The selection of the proposed remedy was primarily based on environmental data collected during the RI.

Remedial Investigation

The RI included the installation and sampling of monitoring wells, the collection of soil, surface water, and sediment samples, and the excavation of test pits to observe wastes and sample subsurface soil. This Technical Memorandum focuses on additional sediment sampling required for the upcoming design; therefore, the discussion of previous investigations will also focus on the sediment medium. Three sediment samples (13SD01 to 13SD03) were collected during the RI in June and August 1995, see Figure 1. Sample 13SD01 was collected from the point where a culvert discharges into a drainage ditch that parallels the DPDO yard. Sample 13SD02 was collected downstream of sample 13SD01 in the same ditch north of the DPDO yard's northern fence line. Sample 13SD03 was collected near the toe of the landfill where erosion had cut a channel into the landfill. The samples were collected to see if contaminants were being transported from the site via erosion. The RI sediment sample locations are shown on Figure 1. The RI sediment samples were collected from 0 to 6 inches below ground surface and were analyzed for Target Analyte List (TAL) metals, Target Compound List (TCL) volatiles, semivolatiles, pesticides/polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPH), pH, moisture content, and explosives. Two of samples (13SD01 and 13SD03) were inadvertently not analyzed for TCL semivolatiles. As discussed below, the concentrations of PCBs in sediment samples 13SD01 and 13SD03, and silver in sample 13SD03, were identified as resulting in moderate risk to ecological receptors.

The following discussion concerning the RI sediment samples was excerpted from the FS (TtNUS, 2002). Concentrations of most metals in site-related sediment samples were similar to background ranges. Antimony, cadmium, and silver were detected at low levels in site-related sediment samples (the highest levels were in 13SD03) but were not found in background sediments. Lead was detected in 13SD03 at a level slightly greater than the range found in background samples.

Polynuclear aromatic hydrocarbons (PAHs), phthalates, and pesticides were detected in site-related

sediment samples at levels generally within background concentration ranges. Benzo(b)fluoranthene (48 ug/kg), chrysene (56 ug/kg), fluoranthene (81 ug/kg), pyrene (67.5 ug/kg), and diethyl phthalate (51 ug/kg) were each detected in one site-related sediment sample. The pesticides gamma-chlordane (0.16 ug/kg), 4,4'-DDE (2.45 ug/kg), and 4,4'-DDT (6.4 ug/kg) were each detected in one site-related sediment sample.

Several compounds were detected in site-related sediment samples that were not found in background sediment samples. Aroclor 1254 (58 to 3,900 ug/kg) was detected in all three site-related sediment samples, and aroclor 1260 (33 to 1,200 ug/kg) was detected in two sediment samples. Alpha-chlordane (11 to 20 ug/kg) and endrin aldehyde (31 to 90 ug/kg) were each detected in two site-related sediment samples, and endosulfan sulfate (0.3 ug/kg) was detected in one site-related sediment sample. Miscellaneous parameter analyses of sediment samples at Site 13 consisted of percent solids, percent moisture, pH, and total organic carbon (TOC).

Human health and ecological risk assessments were conducted for Site 13 during the RI. The human health risk assessment concluded that cancer and non-cancer risks greater than guideline ranges occur under future industrial and future residential scenarios, based on compounds found in local groundwater. It was noted in the ecological risk assessment that silver and two aroclors in sediment may pose a moderate potential risk to aquatic and semi-aquatic receptors. The ecological risk assessment is summarized in further detail below.

Summary of Ecological Risk Assessment

A screening-level ecological risk assessment (SERA) was prepared as part of the RI that was completed in 1996 (B&R Environmental, 1996). The SERA evaluated the following data collected as part of the RI:

- Three sediment samples: two collected in the drainage ditch/channelized stream on the western boundary of the site and one located in the washout area
- One surface water sample from the drainage ditch/channelized stream on the western boundary of the site.

Surface water, sediment, and soil samples collected as part of the SI (Roy F. Westin, 1993) were evaluated qualitatively.

The area of primary concern was the wetlands; soil samples from the landfill area were not evaluated in the SERA because the habitat on the landfill is relatively poor.

The SERA consisted of comparing chemical concentrations in surface water and sediment samples to various screening levels to determine if there were potential risks to ecological receptors. For sediment, conservative and less conservative screening levels were used to provide a range of potential risks.

In surface water, aluminum, barium, chromium, and silver were the only chemicals detected at concentrations that exceeded screening levels and were retained as Chemicals of Potential Concern (COPCs). In sediment, antimony, lead, mercury, silver, 4,4'-DDE, 4,4'-DDT, alpha-chlordane, aroclor-1254, aroclor-1260, and endrin aldehyde were the only chemicals detected at concentrations that exceeded screening levels and were retained as COPCs. Also, aluminum, beryllium, and vanadium were retained as COPCs in sediment because no screening values were available.

The SERA concluded that the Hazard Quotients (HQs) for inorganic chemicals in surface water were indicative of low potential risk except for silver, which had a relatively high HQ. However, the detection of silver was only slightly greater than background, and the screening level may be conservative. For sediment, the HQs for inorganic chemicals were indicative of low potential risk except for silver, concentrations of which slightly exceeded the less conservative screening level. For organic chemicals in the sediment, the HQs were indicative of low potential risk except for aroclor-1254 and aroclor-1260, both of which exceeded the less conservative screening levels. Therefore, in summary, the SERA concluded that silver and PCBs may pose moderate risk to ecological receptors, but it does not appear that silver is migrating or PCBs have the potential to migrate to aquatic habitats downstream in Hockhockson Brook.

Proposed Remedy in Relation to Potential Excavation Areas

The Proposed Plan indicated two areas might need to be excavated for consolidation within the limits of the proposed landfill's low permeability cover system. These areas were associated with RI sediment samples 13SD01 and 13SD03. These samples contained elevated concentrations of silver and PCBs and were associated with a higher potential risk to ecological receptors in the RI SERA.

The first area, related to RI sample 13SD01, was located in a ditch that flows adjacent to Site 13. The other area is associated with RI sample 13SD03 and was located along the northwestern toe of slope of the landfill where an erosion gully washed soil and landfill material out of the landfill (see Figure 1). This area is referred to as the landfill washout area. Surface water originating from the landfill washout area eventually reaches a forested wetland approximately 60 feet down gradient of the toe of the landfill. Based on the wetland delineation report (TtNUS, 2003b), the wetland area appears to be only seasonally saturated, and no surface water was visible during the wetland

delineation. Therefore, both terrestrial and aquatic invertebrates may be present in the sediment at different times throughout the year.

2.0 SUMMARY OF PRE-DESIGN SEDIMENT INVESTIGATION

The objective of the pre-design investigation was to collect data that would be used to further define the limits of contamination within the ditch area and within the landfill washout area. Based on the SERA, silver and PCBs were identified as the contaminants that should be used to delineate the contamination. All sediment samples were analyzed for TCL PCBs, and TAL metals. In addition to silver, all the TAL metals were analyzed because other metals exceeded screening levels in the SERA.

As site-specific Preliminary Remediation Goals were not developed in the RI for silver and total PCBs, action levels were needed to determine where the contamination area was bounded. Remediation levels (RLs) were proposed in the approved Quality Assurance Project Plan (QAPP) for Pre-Design Investigation Sediment Sampling at Site 13 DPDO Yard (TtNUS 2003a), however these RLs were based on an implicit assumption that the area of contamination was very small (on the order of 10 to 20 feet in diameter). During the remedial design stage, when additional sampling and analyses was conducted, it became apparent that the area of contamination was significantly larger, and these levels would not be appropriate to determine the limits of excavation. The discussion of the levels presented in the QAPP will be presented in terms of action levels rather than RLs, so that it may be clearly understood that these levels were not used to define the limit of excavation.

The action levels were set at 3.7 mg/kg for silver and 1.0 mg/kg for total PCBs in the QAPP (TtNUS, 2003a) and were based on published screening levels. The use of literature-based screening levels was initially proposed because it was expected than that the area of sediment contamination was relatively small and did not warrant a more in-depth analysis. The rationale for the sediment action levels was presented in the QAPP and is reproduced below. The proposed sediment action level for silver (3.7 mg/kg) was based on the effect range–medium (ER-M) level (Long, et al., 1995). This ER-M level is based on marine sediment; however, it was proposed as a surrogate for the freshwater sediment at Site 13 because freshwater screening levels for silver are not readily available.

The proposed sediment action level for total PCBs was 1.0 mg/kg as cited in United States Environmental Protection Agency (USEPA) Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-01, A Guide on Remedial Actions at Superfund Sites with PCB Contamination (1990). This level is based on the protection of human health under a residential scenario. Although this cleanup level is based on human health rather than ecological risks, it has

been previously used for PCB remedial actions at other sites. As discussed above, although 1.0 mg/kg of PCBs was originally proposed as the RL, the extent of contamination warranted the consideration of ecological risk in determining the area of excavation. This will be discussed in Section 4.0.

Three sampling events were required to bound the limits of contamination of silver and PCBs at both investigation areas. Eleven sediment samples were collected from the ditch that borders the western side of the DPDO yard, and thirty-four sediment samples were collected from the landfill washout area. The samples collected near the landfill washout area were labeled as sediment because the suspected method of contaminant transport was through the transport of sediments. Although the samples were labeled as sediment samples, some of the samples are actually soils and others are seasonally saturated as described above as the sample locations moved farther from the original washout area. A summary of the sediment sample results is provided in the following sections.

Table 1 presents a summary of criteria used to evaluate the metals and PCBs results. Table 1 presents criteria for both soil and sediment because some of the samples could either be considered soil or sediment depending on the variable level of saturation. Although the excavation areas were investigated due to potential ecological risks from exposure to silver and PCBs, New Jersey Residential Direct Contact Soil Cleanup Criteria (NJDEP, 1999) are also included in Table 1 to ensure that human health risks are considered in determining the proposed excavation area. The NJDEP soil cleanup criteria were not considered for samples collected from the ditch or for samples located in the wetland area because it is unlikely that humans would be living in these areas.

Two effects levels of ecological sediment screening criteria are provided in Table 1 for reference, a lower effects level and a higher effects level. The lower effects levels are typically used to screen chemicals for selection as COPCs. However, toxicity thresholds for significant effects (i.e., higher effects levels) are typically used as PRGs (Efroymson, et al., 1997). Because the objective of this investigation was to delineate an area for remediation, the higher effects levels were used for comparisons to sample results.

2.1 Ditch Sediment Samples

Eleven surface sediment samples (13SD09 to 13SD19) were collected within the drainage ditch upstream and downstream of RI sediment sample 13SD01. All samples were collected from the 0- to 6-inch range to match the depth used in the RI. None of the 11 sediment samples collected in June 2003 contained silver or total PCBs at concentrations in excess of the action levels presented in the QAPP or in excess of the NJDEP soil cleanup criteria. No additional sediment samples were

collected from the ditch after June 2003 because the limit of contamination was determined. Sample locations are shown on Figure 1. The validated pre-design sediment data for the ditch are presented in Table 2. Table 2 also contains sediment screening criteria for all of the other metals (other that silver) from Table 1. Soil screening criteria were not considered for the ditch because all of these samples collected were from areas where water is normally flowing. If a sample result exceeded the criteria, it is highlighted in Table 2. Only one hit of vanadium marginally exceeds the additional metals screening criterion.

2.2 Landfill Washout Area Sediment Samples

The collection of sediment samples from the landfill washout area proceeded in a stepwise fashion with rings of samples propagating outward from the landfill washout area. The first ring of samples was collected in June 2003; however, concentrations detected were in excess of the action levels so additional samples were required to define the limit of contamination. Eventually seven rings of sediment samples were collected as shown on Figure 2. Rings 4, 5, 6, and 7 were collected in December 2003, but to minimize analytical costs only samples from ring 5 were initially analyzed; the rest of the samples were archived. Based on the ring 5 results, select archived samples were analyzed to bound the limit of contamination. The analyses from ring 5 were completed with a 7-day turnaround time (TAT) so that the holding time for PCBs (14 days) on the archived samples would not be exceeded.

The sample locations on Figure 2 are color coded to show that the limit of contamination (based on either the action levels for silver and total PCBs from the QAPP or the NJDEP soil cleanup criteria). The color codes are as follows:

- Red -- Samples in which either the silver or total PCB action level was exceeded
- Blue -- Samples in which the action levels were not exceeded
- Purple -- Samples that were collected, archived, but not analyzed

As shown in Figure 2, the horizontal extent of samples exceeding the action levels is bounded by samples with acceptable concentrations.

In addition to surface (0- to 6-inch) sediment samples collected at the landfill washout area, deeper (12- to 18-inch) samples were collected at a rate of approximately 25 percent of the surface samples to determine if contaminants had migrated vertically from the landfill washout area. At some locations, contamination in excess of the action levels was found in the deeper samples.

The validated pre-design sediment data for the landfill washout area are presented in Tables 3 and 4.

Table 3 highlights any exceedance of the higher effects sediment criteria in Table 1. Table 4 highlights any exceedance of the lower of either the human health or ecological soil criteria. Two tables are presented because it is unclear as to whether the material is more appropriately designated as soil or sediment. Note yellow and blue highlights on Tables 3 and 4 will be discussed in Section 4.0. As can be seen from Tables 3 and 4, numerous exceedances of the screening criteria are noted. Also, Figure 2 shows that the silver and PCB contamination extends into the forested wetlands at Site 13.

The Navy and the regulators discussed the wetland at Site 13 during the RI/FS stage at which time a general consensus was reached that based on the value of the wetland, disturbance in this area should be minimized or avoided if possible. The Navy's goal is to protect the environment while balancing the amount of remediation against the amount of disturbance, taking into consideration the value of the wetland and the uncertainty in screening levels. The following section describes the wetland in greater detail.

3.0 SITE 13 WETLAND

The wetlands north of Site 13 were delineated by the Navy in April 2003 as part of the pre-design investigation. Initially, it was thought that the Site 13 remedy would not disturb the wetlands, however, as shown on Figure 2 samples containing PCBs and/or silver exceeding action levels are located within the wetlands. The wetlands north and west of the landfill are forested and constitute an ecologically valuable natural resource. Photographs 1 and 2 show the wetland. The following text is excerpted from the Wetland Delineation Report for Site 13 (TtNUS, 2003a). The forested wetland is referred to as Wetland 13B in the wetland delineation report (The ditch area was wetland 13A; however, it was determined that no wetlands exist in the ditch).

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 from the toe of the landfill. 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. 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 appears 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.

Many of the deciduous trees within the wetland grow on small hummocks (mounds of soil) and display distinctively shallow root systems (Photograph 2). 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 of 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 upgradient 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.

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 of 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.

Classification: The forested wetland forming Area 13B would be classified as Palustrine Forested under the classification system developed by the United States Fish and Wildlife Service (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 that are perceived as valuable to society (Adamus, et al., 1991). Table 5 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 and is based on the descriptive approach for wetland functional assessment developed as part of the Highway Methodology by the New England District of the United States Army corps of Engineers. 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 (Attachment A). 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 all of the waste buried in the landfill, the wetland will continue to play a role in shielding aquatic habitats from the landfill even after 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 are not found 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 suggest 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 and the vegetation may thus help to stabilize surface soils against gully erosion caused by runoff. However, 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 is 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 are favorable 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): An RI prepared by the Navy in 1996 determined that there are no sensitive habitats (other than wetlands) or threatened or endangered species at Site 13 (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.

4.0 DEVELOPMENT OF PROPOSED REMEDIATION AREAS

4.1 Proposed Limit of Excavation in the Ditch Area

The only sample in the ditch area that exceeded the action levels was RI sample 13SD01. In addition, one pre-design sample (13SD09) exceeded the screening level for vanadium. A limited area of excavation is proposed around 13SD01 because the sample in the ditch with elevated silver and PCB concentrations is bounded by samples with acceptable concentrations. The proposed limit of excavation in the ditch area is shown on Figure 1.

4.2 Proposed Limit of Excavation in the Landfill Washout Area

As stated in Section 3.0, the contamination associated with the landfill washout area extends into a potentially valuable wetland. The Navy's approach to determining an appropriate area of excavations is to attempt to balance the disturbance in the wetland with the benefit of the removal of contamination. The approach was to select an excavation area that would contain the majority of the highest contaminant concentrations and therefore result in the greatest risk reduction for the area disturbed. The amount of risk reduction was then quantified in the risk evaluation presented later in this section of the memorandum. The following presents the process used to determine the proposed limit of excavation:

Initial Risk Evaluation

- Determine which contaminant would likely cause the most risk.
- Propose a remediation area based on that chemical and determine if it encompasses most of the other contaminants.

Risk Evaluation of Proposed Removal Area

- Calculate the average contaminant concentration over the home range of a shrew (1 acre).
- Evaluate the reduction in average contaminant concentrations under difference removal area scenarios (Table 6).
- Conduct food-chain modeling (Attachment B).
- If reduction does not appear to be acceptable, propose a larger remediation area.

Initial Risk Evaluation in the Landfill Washout Area

As presented in Section 1.0, silver and PCBs were the primary risk drivers from the SERA presented in the RI report (B&R Environmental 1996 and 1998), although other metals also exceeded screening levels. For that reason, the soil/sediment samples collected during the pre-design sampling in 2003 were analyzed for metals and PCBs. The following paragraphs briefly discuss the toxicity of metals and PCBs to ecological receptors.

The level of PCBs at the site (maximum detection of 13 mg/kg) are not expected to cause adverse impacts to plants at the site, as concentrations are below the plant-screening level of 40 mg/kg developed by Efroymson, et al. (1997) for the Oak Ridge National laboratory (ORNL). Further, it is not expected that PCB concentrations will cause adverse impacts to invertebrates based on toxicity test data in several studies (a no effects concentration [NOEC] of 72 mg/kg [Meier, et al., 1997], a lethal concentration 50 [LC50] of 530 mg/kg [Rhett, et al., 1988], and a toxicity threshold between 500 and 2500 mg/kg [Parmelee, et al. 1997]) which are significantly above what is available on site. PCBs are bioaccumulative and may impact small mammals and/or birds that consume prey items that have accumulated PCBs from the soil/sediment. PCBs can impact the reproduction of mammals and birds, which are more sensitive to PCBs than are plants or invertebrates. As presented in Appendix Table B-4, reproductive endpoints were selected for the toxicity thresholds used to evaluate risks to mammals and birds from PCBs.

Some metals can accumulate in food items (i.e., plants and invertebrates) at levels that may impact birds and mammals that consume the items, and metals can also be directly toxic to plants and invertebrates. As presented in Tables 3 and 4, several metals in various samples were detected at concentrations that exceeded screening levels. The area with elevated metals concentrations does not visually appear to be impacted from the metals, so direct toxicity to plants and invertebrates is

likely not a significant concern. However, the impacts to wildlife from metals that bioaccumulate in food items cannot be easily observed.

Organic matter in sediment/soil can reduce the bioavailability of metals (USEPA, 2003 and Allen, 2002). Reducing the bioavailability of metals will tend to reduce their toxicity as well. Six sediment samples from the landfill washout area were analyzed for TOC, three in the upland area (13SD21, 13SD23, and 13SD31) and three within the delineated wetland boundary (13SD26, 13SD39, and 13SD44) (see Figure 2). The TOC values in the three upland samples were 2.6 percent, 4.2 percent, and 26.5 percent, while the TOC values in the other three samples ranged from 21.2 percent to 35.4 percent. The three samples with the higher TOC values were spread throughout the area indicating the sediments in the entire wetland are likely to have very high TOC levels. The high TOC levels of the soil/sediment in the wetland may be the reason that the area does not appear to be impacted by metals. Because high TOC concentrations may reduce the bioavailability of metals and because of the possible bioaccumulation effects of the PCBs, PCBs were chosen as the contaminant that might pose the most ecological risk. PCBs were then used to determine an initial proposed excavation area.

In lieu of site-specific ecological cleanup levels, the Navy proposal is to propose an initial excavation area, and then evaluate the residual contamination. If the risk posed by the residual contamination area is unacceptable, a larger excavation area would be proposed. The Navy's proposed initial excavation area would remove soil with PCB concentrations greater than 0.49 mg/kg outside the wetland (matching the NJDEP soil cleanup criterion) and would remove soil/sediment within the wetland, where the majority of the highest PCB and metals contamination is found. Figure 3 shows total PCB contours at the 0.49 mg/kg level and at the 1.0 mg/kg level. Figure 4 shows the proposed excavation areas at the landfill washout area. The blue area on Figure 4 corresponds to an excavation area extending to the wetland boundary. The yellow area on Figure 4 shows the additional excavation area in the wetland to be considered. The amount of residual risk from the remaining chemical concentrations will be evaluated to determine the amount of risk reduction for the environment.

Risk Evaluation after the Proposed Removal Action in the Landfill Washout Area

Although the proposed removal areas are based on PCB concentrations, they will also result in a significant reduction in chemical concentrations for metals because most of the elevated metals concentrations are collocated with the elevated PCB concentrations. As can be seen in Table 6 there is no significant difference between the average chemical concentrations assuming no removal of soil and assuming excavation to the wetland boundary. However, there is a large reduction in chemical

concentration when the soil/sediment is excavated in the wetland to the boundary shown on Figure 4. Most of the average chemical concentrations are less than the screening levels and are close to or less than background levels.

Tables 3 and 4 present the chemical data compared to soil and sediment screening levels, respectively. The samples proposed for removal as part of the remedial action are shaded blue and yellow to correspond to the areas shaded blue and yellow, respectively, on Figure 4. Some samples that will remain after the proposed excavation will have chemicals with concentrations that exceed screening levels. Most of these samples are located in the wetland area where the TOC is very high and metals are not expected to be bioavailable or toxic. Therefore, any potential risks to ecological receptors in this area are not great enough to warrant further removal actions in the wetlands.

An evaluation was also conducted to determine if the levels of PCBs and bioaccumulative metals remaining in the soil are causing a potential risk to small mammals and birds that forage in the area. Attachment B contains the food chain model and supporting documentation for the American robin and short-tailed shrew. The following paragraphs describe how the food chain model was calculated.

The first step of the food chain model was to calculate the exposure point concentrations of PCBs and metals in the soil. It was assumed that shrews and robins would forage over a 1-acre area based on information in USEPA (1993). An assumed 1-acre area is shown on Figure 4. Average chemical concentrations over the 1-acre area were calculated using a weighted average in the excavated area of 0 mg/kg for PCBs and the maximum background soil levels for metals (see Attachment B). Three average chemical concentrations were calculated: (1) assuming no removal action, (2) assuming excavation to 0.49 mg/kg PCBs in soil but not excavating the soil/sediment in the wetland, and (3) assuming excavation to 0.49 mg/kg PCBs in soil and excavating soil/sediment in the wetland as shown on Figure 4. A food chain model was then conducted for the short-tailed shrews and American robin based on the following:

- The average PCB and metals concentrations were used as the exposure point concentrations
- The shrew and robin forage exclusively in the one acre area
- Average exposure parameters (i.e., ingestion rates, body weights)
- 100-percent bioavailability of the chemicals
- Literature-based soil-to-earthworm bioaccumulation factors

Table 7 presents the results of the food chain modeling for the shrew and robin using soil concentrations assuming excavation to 0.49 mg/kg PCBs in soil but not excavating the soil/sediment

in the wetland. As can be seen from the table, the ecological effects quotients (EEQs) exceeded 1.0 based on both the no-observed-adverse-effects-level (NOAEL) and lowest-observed-adverse-effects-level (LOAEL) for both the shrew and robin for PCBs. Additionally, the robin LOAEL EEQ was greater than 1.0 for mercury. Six other metals only exceeded NOAEL EEQs in either the shrew or robin model.

Table 8 presents the results of the food chain modeling for the receptor species using soil concentrations assuming excavation to 0.49 mg/kg PCBs in soil and excavating the soil/sediment in the wetland as shown on Figure 4. Risks under this scenario are significantly lower, especially for receptors exposed to PCBs. Both NOAEL and LOAEL EEQs for PCBs are less than 1.0, and no LOAEL EEQs for metals exceed 1.0. Only five metals have NOAEL EEQs exceeding 1.0. EEQs greater than 1.0 based on the NOAEL do not indicate that an impact to wildlife will occur, only that an impact is possible, because the NOAEL is a "no-effects" level. The actual effects dose lies somewhere between the NOAEL and LOAEL, so chemicals with EEQs greater than 1.0 based on the LOAEL are more likely to potentially impact wildlife. Additionally, although the home ranges of the shrew and robin are small, the models assume that the receptors' foraging area includes the entire area where chemical concentrations are the greatest. It is more likely that their foraging area will only occupy a certain percentage of the area with the greatest concentrations. For these reasons and the fact that the assumptions of the food chain models are conservative and may estimate a higher dose to the wildlife than is actually occurring at the site, the potential risks to small mammals from metals in the soil are expected to be low under the excavation of the wetlands to the boundary shown on Figure 4.

5.0 Conclusions and Proposed Remediation Strategy

Ditch Area

The proposed remediation area in the ditch is shown on Figure 1. It is anticipated that initially the top 1 foot of material would be excavated from this area. The excavated material would be placed under the proposed low permeability landfill cover system to be constructed at Site 13. The process of collecting verification samples, evaluating the verification samples, and the required actions associated with the evaluation results will be discusses in a separate document.

Landfill Washout Area

Based on the risk evaluation in Section 4.0, it is proposed that the yellow and blue areas on Figure 4 be excavated. It is felt that this approach will provide the greatest reduction in risk while still limiting

the disturbance of the wetland habitat. It is anticipated that the depth of excavation will be between 1 and 2 feet. The process of collecting verification samples, evaluating the verification samples, and the required actions associated with the evaluation results, will be discusses in a separate document.

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Photograph 1: Palustrine Forested Wetland, Site, 13 facing away from the landfill

Photograph 2: Shallow Root Systems and Hummocking at Red Maple and Black Gum Trees in Palustrine Forested Wetlands, Site, 13 facing away from the landfill.

TABLE 1

SUMMARY OF ECOLOGICAL AND HUMAN HEALTH SCREENING VALUES
NWS, COLTS NECK, NEW JERSEY

Chemical	Soil				Sediment		
	Ecological[1]			Human Health	Ecological[2]		
	Screening Value	Endpoint	Source	Residential Direct Contact[4]	Lower Effects	Higher Effects	Source
PCBs (ug/kg)							
Total PCBs	371	shrew	Efroymson et al.[7]	490	59.8	676	MacDonald et al.[11]
Inorganics (mg/kg)							
Aluminum	NA[3]	--	--	--	--	18,000	Buchmann[12]
Antimony	78	soil inverts	USEPA[8]	14	--	3	Buchmann[12]
Arsenic	10	plant	Efroymson et al.[7]	20	6	33	OMOE[13]
Barium	330	soil inverts	USEPA[8]	700	--	48	Buchmann[12]
Beryllium	40	soil inverts	USEPA[8]	2	--	--	--
Cadmium	32	plants	USEPA[8]	39	0.99	4.98	MacDonald et al.[11]
Chromium	0.4	earthworm	Efroymson et al.[9]	270[5]	43.4	111	MacDonald et al.[11]
Cobalt	13	plants	USEPA[8]	--	--	10	Buchmann[12]
Copper	50	earthworm	Efroymson et al.[9]	600[6]	31.6	149	MacDonald et al.[11]
Iron	NA[3]	--	--	--	20,000	40,000	OMOE[13]
Lead	115	plants	USEPA[8]	400	35.8	128	MacDonald et al.[11]
Manganese	100	plant	Efroymson et al.[9]	--	460	1,100	OMOE[13]
Mercury	0.1	earthworm	Efroymson et al.[10]	14	0.18	1.06	MacDonald et al.[11]
Nickel	30	plant	Efroymson et al.[7]	250	22.7	48.6	MacDonald et al.[11]
Selenium	1	plant	Efroymson et al.[7]	63	--	1	Buchmann[12]
Silver	2	plant	Efroymson et al.[9]	110	1	3.7	Long et al.[14]
Thallium	1	plant	Efroymson et al.[9]	2	--	--	--
Vanadium	2	plant	Efroymson et al.[9]	370	--	57	Buchmann[12]
Zinc	50	plant	Efroymson et al.[7]	1500[6]	121	459	MacDonald et al.[11]

Footnotes:

1 - The ecological PRGs are based on the protection of receptors in direct contact with soil. In cases where an Eco PRG was based on risks to wildlife, the ORNL number was used instead, except in the case of PCBs. The Eco PRG based on risks to the shrew was used for total PCBs due to the uncertainty of other literature values. Risks to terrestrial wildlife through PCBs and other inorganics are evaluated through food chain modeling (see Tables 7 and 8).

2 - Freshwater criteria were used, except where noted.

3 - The soil screening value is pH dependent.

4 - NJDEP soil clean up criteria, revised May 12, 1999 (web page updated January 30, 2003).

5 - The criterion is based on the dermatitis exposure pathway for hexavalent chromium.

TABLE 1

SUMMARY OF ECOLOGICAL AND HUMAN HEALTH SCREENING VALUES
NWS, COLTS NECK, NEW JERSEY

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TABLE 2
SUMMARY OF ANALYTICAL RESULTS DITCH AREA
PRE-DESIGN INVESTIGATION
NWS EARLE
COLTS NECK, NEW JERSEY

Constituent	Sediment Criteria[1]	13SD09 0 TO 6 " 6/26/2003	13SD10 0 TO 6 " 6/26/2003	13SD11 0 TO 6 " 6/26/2003	13SD12 0 TO 6 " 6/26/2003	13SD13 0 TO 6 " 6/26/2003	13SD14 0 TO 6 " 6/26/2003	13SD14-D 0 TO 6 " 6/26/2003	13SD15 0 TO 6 " 6/26/2003	13SD16 0 TO 6 " 6/26/2003	13SD17 0 TO 6 " 6/26/2003	13SD18 0 TO 6 " 6/26/2003	13SD19 0 TO 6 " 6/26/2003
Polychlorinated Biphenyls (PCBs) (ug/kg)													
AROCLOR-1016		37 U	42 U	44 U	44 U	42 U	42 U	43 U	45 U	43 U	43 U	42 U	42 U
AROCLOR-1221		74 U	84 U	87 U	87 U	84 U	84 U	86 U	90 U	86 U	85 U	83 U	84 U
AROCLOR-1232		37 U	42 U	44 U	44 U	42 U	42 U	43 U	45 U	43 U	43 U	42 U	42 U
AROCLOR-1242		37 U	42 U	44 U	44 U	42 U	42 U	43 U	45 U	43 U	43 U	42 U	42 U
AROCLOR-1248		37 U	42 U	44 U	44 U	42 U	42 U	43 U	45 U	43 U	43 U	42 U	42 U
AROCLOR-1254		37 U	42 U	44 U	44 U	42 U	42 U	43 U	45 U	43 U	43 U	42 U	42 U
AROCLOR-1260		37 U	42 U	44 U	44 U	42 U	42 U	43 U	45 U	43 U	43 U	42 U	42 U
AROCLOR-1268													
TOTAL AROCLORS	676	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Inorganics (mg/kg)													
ALUMINUM	18000	4180 J	3150 J	1710 J	944 J	823 J	818 J	686 J	1120 J	443 J	635 J	753 J	975 J
ANTIMONY	3	0.85 J	0.55 J	0.55 J	0.40 J	0.25 UJ	0.25 UJ	0.36 J	0.27 UJ	0.27 UJ	0.22 UJ	0.23 UJ	0.26 UJ
ARSENIC	33	11.1	4.9	2.0	1.3	0.65	0.86	1.2	1.0	0.56	0.60	0.52	0.99
BARIUM	48	3.9	5.5	1.3	1.3	1.9	2.4	0.85	0.95	0.95	0.96	1.2	3.6
BERYLLIUM		0.60 J	0.30	0.29	0.21	0.15	0.16	0.15	0.14	0.07	0.07	0.10	0.06
CADMIUM	4.98	0.04 UJ	0.04 UJ	0.04 UJ	0.05 UJ	0.04 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.04 UJ	0.04 UJ	0.05 J
CALCIUM		73.8	92.3	20.1	41.6	81.4	524	20.2	25.9	21.8	23.3	135	275
CHROMIUM	111	110	46.1	45.0	27.9	34.8	29.7	39.4	26.8	9.6	13.5	12.5	6.1
COBALT	10	0.23	0.25	0.11 U	0.12 U	0.38	0.11 U	0.13 U	0.12 U	0.12 U	0.10 U	0.17	0.78
COPPER	149	3.2 J	4.4 J	1.5 J	1.0 J	0.70 J	0.64 J	0.49 J	1.3 J	0.45 J	0.72 J	0.87 J	2.9 J
IRON	40000	16200	8920	4940	3380	2990	2430	2520	4010	1350	2030	2190	3490
LEAD	128	13.4 J	14.5 J	7.4 J	3.1 J	360 J	3.3 J	3.0 J	3.4 J	1.6 J	2.7 J	2.4 J	4.2 J
MAGNESIUM		956	491	368	176	139	184	153	259	74.7	119	172	163
MANGANESE	1100	8.1	18.7	2.1	2.9	4.4	5.9	3.5	4.5	1.8	4.7	9.7	27.0
MERCURY	1.06	0.03	0.08	0.02	0.04	0.02 U	0.03	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02
NICKEL	48.6	1.8 J	1.4 J	0.91 J	0.66 J	0.87 J	0.42 J	0.34 J	0.82 J	0.34 J	0.45 J	0.64 J	1.5 J
POTASSIUM		2730	1360	1200	574	366	436	444	756	210	330	450	201
SELENIUM	1	0.55	0.46 U	0.46 U	0.50 U	0.47 U	0.48 U	0.53 U	0.51 U	0.52 U	0.43 U	0.45 U	0.49 U
SILVER	3.7	0.73	0.34	0.13 U	0.14 U	0.13 U	0.14 U	0.15 U	0.15 U	0.15 U	0.12 U	0.13 U	3.4
SODIUM		18.9	17.1	16.8	30.3	18.9	17.1	15.8	14.2	15.4	10.8	13.4	18.3
THALLIUM		0.48 U	0.50 U	0.50 U	0.53 U	0.50 U	0.51 U	0.57 U	0.55 U	0.56 U	0.46 U	0.48 U	0.53 U
VANADIUM	57	64.6	39.7	23.7	13.6	8.2	10.4	14.6	14.5	7.0	9.3	9.3	6.0
ZINC	459	16.5	10.5	5.9	5.2	20.6	3.4	3.8	5.2	3.5	4.0	6.4	16.3
Miscellaneous Parameter (%)													
TOTAL ORGANIC CARBON													

Results presented for June 2003 sampling event.
Total Aroclors represents the calculated sum of the detected values for Aroclors-1016, -1221, -1232, -1242, -1248, -1254, -1260, and -1268.
Highlighted results exceed the associated criteria.
ND - Not Detected
J - Value is estimated due to technical noncompliance.
U - Value is non-detected as reported by the laboratory.
UJ - Non-detected value is estimated due to technical noncompliance.
1 Table 1 presents the source of the sediment criteria.

TABLE 3
SUMMARY OF ANALYTICAL RESULTS - LANDFILL WASHOUT AREA
PRE-DESIGN INVESTIGATION
NWS EARLE
COLTS NICK, NEW JERSEY

NSAMPLE DEPTH RANGE SAMPLE DATE	Sediment Criteria[1]	13SD04 0 TO 6" 6/26/2003	13SD05 0 TO 6" 6/26/2003	13SD06 0 TO 6" 6/26/2003	13SD06-D 0 TO 6" 6/26/2003	13SD07 0 TO 6" 6/26/2003	13SD08 0 TO 6" 6/26/2003	13SD200006 0 TO 6" 9/25/2003	13SD210006 0 TO 6" 9/25/2003	13SD211218 12 TO 18" 9/25/2003	13SD220006 0 TO 6" 9/25/2003 Wetland
Pesticides PCBs (ug/kg)											
AROCLOR-1016		370 U	370 U	400 U	390 U	360 U	36 U	38 U	360 U	420 U	520 U
AROCLOR-1221		750 U	730 U	750 U	780 U	730 U	71 U	38 U	360 U	420 U	520 U
AROCLOR-1232		370 U	370 U	400 U	390 U	360 U	36 U	38 U	360 U	420 U	520 U
AROCLOR-1242		370 U	370 U	400 U	390 U	360 U	36 U	38 U	360 U	420 U	520 U
AROCLOR-1248		370 U	370 U	400 U	390 U	360 U	36 U	38 U	360 U	420 U	520 U
AROCLOR-1254		1000	2000	940	860	360 U	36 U	38 U	360 U	420 U	520 U
AROCLOR-1260		370 U	370 U	400 U	390 U	1800	36 U	250	970	2500	4400
AROCLOR-1268											
TOTAL AROCLORS	676	1000	2000	940	860	1800	ND	250	970	2500	4400
Inorganics (mg/kg)											
ALUMINUM	18000	1360 J	2150 J	1340 J	1460 J	2180 J	2650 J	2080	1500	6090	22000
ANTIMONY	3	1.1 J	2.3 J	1.3 J	0.65 J	1.2 J	0.53 J	0.56 J	0.46 J	1.8 J	7.9 J
ARSENIC	33	2.5	4.5	3.3	2.6	3.5	4.1	2.9 J	2.5 J	8.1 J	37 J
BARIUM	48	4.6	35.3	3.4	8.3	3.2	3.4	4	2.4	12.5	32.8
BERYLLIUM		0.15	0.2	0.21	0.21	0.31	0.42 J	0.26	0.18	0.62 J	1.8 J
CADMIUM	4.98	0.14 J	3.1 J	0.16 J	0.04 UJ	0.04 UJ	0.04 J	0.14	0.07	0.63	2.2
CALCIUM		49.4	88.6	33.6	32.5	34.5	88.2	51.4	29.8	157	133
CHROMIUM	111	19.1	30.1	21.7	22.8	43.8	59.5	36.9	30.9	88.2	284
COBALT	10	0.1 U	2.9	0.25	0.1 U	0.29	0.22	0.36	0.3	0.99	2.6
COPPER	149	10.7 J	61.9 J	11.2 J	10.4 J	8.5 J	1.8 J	3.8	3.6	25.2	109
IRON	40000	5900	14300	7370	6590	10700	11400	9080	7300	21700	69200
LEAD	128	30.8 J	112 J	30.5 J	28.5 J	37.2 J	7.2 J	11.5	14.9	106	302
MAGNESIUM		254	269	258	285	497	740	467	363	1310	3870
MANGANESE	1100	12.4	28.8	16.6	10.1	22.4	9.3	9.7	6.12	22.8	48.7
MERCURY	1.06	0.12	0.23	0.11	0.08	0.15	0.01 U	0.36 J	0.06 J	0.33 J	2 J
NICKEL	48.6	1.2 J	14.3 J	2.1 J	1.3 J	2.2 J	1.5 J	1.4	1.1	4.2	13.4
POTASSIUM		741	821	788	1120	1500	2290	1420 J	1100 J	3650 J	11100 J
SELENIUM	1	0.41 U	0.72	0.5 U	0.41 U	0.49	0.34 U	0.25 U	0.3 U	0.85 U	1.4
SILVER	3.7	10.9	34.3	20.9	9.7	13.1	1.6	14.3	4.5	18.2	55.8
SODIUM		18.6	17	14	15.1	15.7	13.1	15	9.3	24.3	57
THALLIUM		0.44 U	0.32 U	0.53 U	0.43 U	0.46 U	0.36 U	0.47 U	0.58 U	0.67 U	0.85 U
VANADIUM	57	18.4	24.9	18.3	20.3	44.2	61.7	39.4 J	32.9 J	87 J	253 J
ZINC	459	14.8	47.9	18.2	11.4	13.4	59.8	16.5	8.5	33.2	108
Miscellaneous Parameters (mg/kg)											
MISC TOTAL ORGANIC CARBON									25500 J		

Results presented for June, September, and December 2003 sampling events.
Total Aroclors represents the calculated sum of the detected values for Aroclors-1016, -1221, -1232, -1242, -1248, 1254, -1260, and -1268.
Highlighted results exceed the associated criteria.
ND - Not Detected.
J - Value is estimated due to technical noncompliance.
U - Value Is non-detected as reported by the laboratory.
UJ - Non-detected value is estimated due to technical noncompliance.
BJ - Value is a positive result that was detected in a laboratory blank and was also detected in this sample at a concentration between 3 and 10 times the maximum concentration found in the laboratory blank.
1 Table 1 presents the source of the sediment criteria.

Proposed to be excavated outside wetland
Considered for excavation in the wetland

TABLE 3
SUMMARY OF ANALYTICAL RESULTS - LANDFILL WASHOUT AREA
PRE-DESIGN INVESTIGATION
NWS EARLE
COLTS NICK, NEW JERSEY

NSAMPLE DEPTH RANGE SAMPLE DATE	Sediment Criteria[1]	13SD230006 0 TO 6" 9/25/2003	13SD240006 0 TO 6" 9/25/2003	13SD240006-D 0 TO 6" 9/25/2003	13SD241218 12 TO 18" 9/25/2003	13SD250006 0 TO 6" 9/25/2003	13SD260006 0 TO 6" 9/25/2003	13SD261218 12 TO 18" 9/25/2003	13SD270006 0 TO 6" 9/25/2003	13SD281218 12 TO 18" 9/25/2003	13SD290006 0 TO 6" 12/11/2003
						Wetland	Wetland	Wetland			Wetland
Pesticides PCBs (ug/kg)											
AROCLOR-1016		380 U	380 U	380 U	550 U	77 U	3700 U	40 U	2600 U	380 U	1700 U
AROCLOR-1221		380 U	380 U	380 U	550 U	77 U	3700 U	40 U	2600 U	380 U	1700 U
AROCLOR-1232		380 U	380 U	380 U	550 U	77 U	3700 U	40 U	2600 U	380 U	1700 U
AROCLOR-1242		380 U	380 U	380 U	550 U	77 U	3700 U	40 U	2600 U	380 U	1700 U
AROCLOR-1248		380 U	380 U	380 U	550 U	77 U	3700 U	40 U	2600 U	380 U	1700 U
AROCLOR-1254		380 U	380 U	380 U	550 U	77 U	3700 U	40 U	2600 U	380 U	1700 U
AROCLOR-1260		2400 J	860 J	700 J	4900 J	520	9600 J	46	7200 J	780 J	8200
AROCLOR-1268											
TOTAL AROCLORS	676	2400 J	860 J	700 J	4900 J	500	9600 J	46	7200 J	780	8200
Inorganics (mg/kg)											
ALUMINUM	18000	1800	3360	1520	12400	5150 J	12000 J	1260	16800	13800	14000
ANTIMONY	3	2 J	1.1 J	1 J	8.1 J	2.7 J	7.7 J	1.2 J	4.8 J	1.5 J	9.1 J
ARSENIC	33	5.3 J	7.5 J	4.1 J	217 J	10 J	28.7 J	1.7 J	23.6 J	1.8 J	24.7
BARIUM	48	6.9	5.1	6.2	38.2	41.4 J	47.2 J	7.2	36	8	49.7
BERYLLIUM		0.2	0.36	0.21	0.8	0.53 J	0.8 J	0.14	0.92 J	0.22	1.1
CADMIUM	4.98	0.46	0.46	0.51	3.3	2.2 J	6.8 J	0.84	2.9	0.07	8
CALCIUM		60	106	137	221	235 J	303 J	41.6	123	38.1	250
CHROMIUM	111	31.3	84.5	41.3	122	39 J	118 J	292	132	26.9	138
COBALT	10	0.82	0.32	0.49	1.9	0.83 J	2.5 J	0.22	1.7	0.55	2.2 J
COPPER	149	42.8	12.4	15.7	114	36.9 J	96.8 J	7.6	91.5	18.3	110
IRON	40000	16600	15700	9330	37700	12500 J	33600 J	2540	40300	8500	43100
LEAD	128	116	33.7	33	435	88.4 J	290 J	23.8	231	118	436 J
MAGNESIUM		379	623	287	1420	315 J	1320 J	126	1590	249	1880
MANGANESE	1100	49.9	9	17.4	49.1	12.6 J	25.9 J	4.9	24.5	30.7	30.1
MERCURY	1.06	0.51 J	0.19 J	0.16 U	2.6 J	0.46 J	1.8 J	0.37 J	1.8 J	0.11 J	2.6
NICKEL	48.6	4.1	2.3	2.8	10.3	5.8 J	14.6 J	1.5	9.8	2.9	14.7
POTASSIUM		812 J	2080 J	872 J	3930 J	874 J	3800 J	378 J	4420 J	788 J	5150
SELENIUM	1	0.27 U	0.49	0.33 U	1.6	1.7 J	2.7 J	0.68	2.4	0.33 U	2.9
SILVER	3.7	42.3	7.6	11.6	76.6	12.3 J	60.7 J	4.4	79.5	8.3	52.6 J
SODIUM		15.2	14	14.4	49.1	34.8 J	87.8 J	13.3	42.3	12.7	57 J
THALLIUM		0.51 U	0.48 U	0.62 U	0.89 U	1.3 U	1.2 U	0.6 U	0.82 U	0.63 U	1.4 U
VANADIUM	57	25.4 J	44.1 J	24.8 J	112 J	31.4 J	118 J	9.9 J	120 J	28.2 J	134
ZINC	459	86.5	22.4	22.8	110	53.7 J	175 J	17.7	73	12.7	109
Miscellaneous Parameters (mg/kg)											
MISC TOTAL ORGANIC CARBON		42000 J					212000 J				

Results presented for June, September, and December 2003 sampling events.
Total Aroclors represents the calculated sum of the detected values for Aroclors-1016, -1221, -1232, -1242, -1248, 1254, -1260, and -1268.
Highlighted results exceed the associated criteria.
ND - Not Detected.
J - Value is estimated due to technical noncompliance.
U - Value is non-detected as reported by the laboratory.
UJ - Non-detected value is estimated due to technical noncompliance.
BJ - Value is a positive result that was detected in a laboratory blank and was also detected in this sample at a concentration between 3 and 10 times the maximum concentration found in the laboratory blank.
1 Table 1 presents the source of the sediment criteria.
Proposed to be excavated outside wetland
Considered for excavation in the wetland

TABLE 3
SUMMARY OF ANALYTICAL RESULTS - LANDFILL WASHOUT AREA
PRE-DESIGN INVESTIGATION
NWS EARLE
COLTS NICK, NEW JERSEY

NSAMPLE DEPTH RANGE SAMPLE DATE	Sediment Criteria[1]	13SD300006 0 TO 6" 12/11/2003	13SD310006 0 TO 6" 12/11/2003	13SD320006 0 TO 6" 12/11/2003 Wetland	13SD330006 0 TO 6" 12/11/2003 Wetland	13SD360006 0 TO 6" 12/11/2003	13SD370006 0 TO 6" 12/11/2003	13SD371218 12 TO 18" 12/11/2003	13SD380006 0 TO 6" 12/11/2003 Wetland	13SD390006 0 TO 6" 12/11/2003 Wetland	13SD391218 12 TO 18" 12/11/2003 Wetland	13SD400006 0 TO 6" 12/11/2003 Wetland
Pesticides PCBs (ug/kg)												
AROCLOR-1016		1900 U	680 U	340 U	520 U	46 UJ	38 UJ	45 UJ	85 UJ	170 UJ	130 UJ	820 U
AROCLOR-1221		1900 U	680 U	340 U	520 U	46 U	38 U	45 U	85 U	170 U	130 U	820 U
AROCLOR-1232		1900 U	680 U	340 U	520 U	46 U	38 U	45 U	85 U	170 U	130 U	820 U
AROCLOR-1242		1900 U	680 U	340 U	520 U	46 U	38 U	45 U	85 U	170 U	130 U	820 U
AROCLOR-1248		1900 U	680 U	340 U	520 U	46 U	38 U	45 U	85 U	170 U	130 U	820 U
AROCLOR-1254		13000	680 U	340 U	520 U	46 U	38 U	45 U	85 U		130 U	820 U
AROCLOR-1260		1900 U	970	860	630	46 UJ	38 UJ	45 UJ	110 J		420 J	2600 J
AROCLOR-1268			680 U	340 U	520 U							
TOTAL AROCLORS	676	13000	970	860	630	ND	ND	ND	110 J	ND	420	2600
Inorganics (mg/kg)												
ALUMINUM	18000	10700	5880 J	10700	12100	1360	2960	7880	6650	1270 J	10800 J	16600
ANTIMONY	3	9 J	4.3 BJ	3.5 BJ	4.9 BJ	1 J	0.29 UJ	0.39 UJ	1.5 J	1.4 UJ	1 UJ	5 J
ARSENIC	33	28	9.6 J	27.3	20.1	4.2	4		10.6	2.5 J	3.7 J	29.4
BARIUM	48	66.2	40.4 J	38.3	45.5	13.6	1.9	7.8	29.4	23.5 J	25.6 J	28
BERYLLIUM		0.81	0.24 J	0.48	0.54	0.08	0.43	0.64	0.32	0.19 UJ	0.4 J	0.89
CADMIUM	4.98	5.9	1.9 J	0.39 J	1.3	0.19	0.04 UJ	0.05 UJ	0.38	1.4 J	0.73 J	1.9 J
CALCIUM		1030	1800 J	143	1420	62.7	15.5	19.5	348	2130 J	229 J	103
CHROMIUM	111	112	43.3 J	73.6	81	10.9	68.3	101	44.7	7.3 BJ	215 J	229
COBALT	10	3.7 J	0.72 J	0.97 J	1.6	0.28	0.15 J	0.28 J	0.98	1.1 J	0.67 J	1.6 J
COPPER	149	197	29.2 J	43.7	49.9	13.3	1.7 BJ	5.1	25.2	18.2 J	9.9 BJ	67
IRON	40000	36400	224500 J	29700 J	29100 J	3660	11000	19500	15700	2620 J	2810 J	46800
LEAD	128	604 J	123 J	107	176	70 J	7.6 J	7 J	86.9 J	53.3 J	43 J	219 J
MAGNESIUM		1480	537 J	684	1030	145	769	1100	536	730 J	106 J	1600
MANGANESE	1100	40.3	54.5 J	14.6	42.8	5.7	4.1	11	16.2	37.1 J	4.2 J	21.2
MERCURY	1.06	4.2	1 J	0.52	0.93	0.09	0.02 U	0.02	0.21	0.51 J	0.15 J	1.6
NICKEL	48.6	20.8	6.5 J	4.9	10.6	2.7	1.2	2.4	7.8	11.4 J	10.7 J	9
POTASSIUM		3830	1500 J	2100	2980	428	2370	3260	1370	360 J	311 J	4670
SELENIUM	1	2.1	2.6 J	3.4	3.2	0.9	0.38	0.8	1.8	1.4 UJ	5.4 J	5
SILVER	3.7	147 J	2.1 BJ	4.4	8.4	0.39 J	0.08 U	0.17 J	0.57 J	1.5 J	2.8 J	15.8 J
SODIUM		97	78.1 J	46.8 J	71.6 J	19.9	14.5 BJ	22.7 J	57.2	131 J	60.7 J	54.8 J
THALLIUM		1.4 U	2.1 UJ	1.1 U	1.8 U	0.61 U	0.54 U	0.73 U	1.3 U	2.6 UJ	2 UJ	1.3 U
VANADIUM	57	105	34.7 J	70.2	90.4	15.2	44.7	71	47.1	9.1 J	14.4 J	139
ZINC	459	205	81.5 J	32.5	68.3	12.7	9.5	13.4	38.7	101 J	23.4 J	57.6
Miscellaneous Parameters (mg/kg)												
MISC TOTAL ORGANIC CARBON			265000 J								354000 J	

Results presented for June, September, and December 2003 sampling events.
Total Aroclors represents the calculated sum of the detected values for Aroclors-1016, -1221, -1232, -1242, -1248, 1254, -1260, and -1268.
Highlighted results exceed the associated criteria.
ND - Not Detected.
J - Value is estimated due to technical noncompliance.
U - Value is non-detected as reported by the laboratory.
UJ - Non-detected value is estimated due to technical noncompliance.
BJ - Value is a positive result that was detected in a laboratory blank and was also detected in this sample at a concentration between 3 and 10 times the maximum concentration found in the laboratory blank.
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Proposed to be excavated outside wetland
Considered for excavation in the wetland

TABLE 3
SUMMARY OF ANALYTICAL RESULTS - LANDFILL WASHOUT AREA
PRE-DESIGN INVESTIGATION
NWS EARLE
COLTS NICK, NEW JERSEY

NSAMPLE DEPTH RANGE SAMPLE DATE	Sediment Criteria[1]	13SD400006-D 0 TO 6" 12/11/2003	13SD410006 0 TO 6" 12/11/2003	13SD410006-D 0 TO 6" 12/11/2003	13SD411216 12 TO 16" 12/11/2003	13SD440006 0 TO 6" 12/11/2003	13SD450006 0 TO 6" 12/11/2003	13SD450006-D 0 TO 6" 12/11/2003	13SD460006 0 TO 6" 12/11/2003
		Wetland				Wetland			
Pesticides PCBs (ug/kg)									
AROCLOR-1016		8300 U	1000 U	1000 U	180 U	60 U	54 U	51 U	28 U
AROCLOR-1221		8300 U	1000 U	1000 U	180 U	60 U	54 U	51 U	28 U
AROCLOR-1232		8300 U	1000 U	1000 U	180 U	60 U	54 U	51 U	28 U
AROCLOR-1242		8300 U	1000 U	1000 U	180 U	60 U	54 U	51 U	28 U
AROCLOR-1248		8300 U	1000 U	1000 U	180 U	60 U	54 U	51 U	28 U
AROCLOR-1254		8300 U	1000 U	1000 U	180 U	60 U	54 U	51 U	28 U
AROCLOR-1260		4400 J	1200	1800	490	350	110 J	200 J	28 U
AROCLOR-1268						60 U	54 U	51 U	28 U
TOTAL AROCLORS	676	4400	1200	1800	490	350	110 J	200 J	ND
Inorganics (mg/kg)									
ALUMINUM	18000	20500	12200	19800	16100 J	4700 J	18900	18100	18300
ANTIMONY	3	4.3	3.6 J	3.4	3.1 J	4.9 BJ	4.1 BJ	3.4 BJ	3 BJ
ARSENIC	33	27.3	16.7	23.6	11.2 J	14.1 J	36.1	15.5	21.8
BARIUM	48	35.6	26.4	30.7	17 J	49.2 J	25.4	24.3	17.7
BERYLLIUM		0.95	0.55	0.73	0.56 J	0.23 J	0.7	0.67	1.5
CADMIUM	4.98	1.8	1.7	0.85	2.6 J	1.2 J	0.46 J	0.53	0.04 U
CALCIUM		176	254	167	252 J	465 J	87.8	73.5	67.8
CHROMIUM	111	234	138 J	232 J	774 J	24.1 J	408	422	225
COBALT	10	2.1 J	3.2	2.6 J	1.2 J	1.5 J	0.9 J	0.96	2.1 J
COPPER	149	63.1	53.4	55.5	38.7 J	49.2 J	30.2	26.4	23.2
IRON	40000	46200	29400	41000	9390 J	10100 J	43000 J	23400 J	48300 J
LEAD	128	190	194 J	214	153 J	175 J	112	96.8	99.4
MAGNESIUM		2150	1300	1690	510 J	516 J	1230	1120	2790
MANGANESE	1100	28.5	19.4	22.6	7.8 J	19.9 J	12.9	12.8	16.7
MERCURY	1.06	1.4	0.91	1.3	0.39 J	0.8 J	0.75	0.86	0.27
NICKEL	48.6	11.6	12.1	13	10.8 J	12.6 J	6.7	6.4	7.9
POTASSIUM		6070	3220	4760	1490 J	690 J	3660	3330	7500
SELENIUM	1	4.5 J	3.8	4.3 J	13 J	3.8 J	6.5	5.9	2.4
SILVER	3.7	20.5	31.9 J	19.4	6.2 J	2.7 J	1.3 BJ	1.9 BJ	0.84 BJ
SODIUM		66.3 BJ	58	63.7 BJ	67.5 BJ	69.2 J	44.9 J	40.5 J	33.7 J
THALLIUM		1.3 UJ	1.6 U	1.7 UJ	2.9 UJ	2 UJ	1.8 U	1.6 U	0.84 U
VANADIUM	57	154	98.1	138	52.4 J	37.3 J	118	85.9	204
ZINC	459	73.8	74.3	61.4	35.8 J	59 J	25.8	25.7	39
Miscellaneous Parameters (mg/kg)									
MISC TOTAL ORGANIC CARBON						214000 J			

Results presented for June, September, and December 2003 sampling events.
Total Aroclors represents the calculated sum of the detected values for Aroclors-1016, -1221, -1232, -1242, -1248, 1254, -1260, and -1268.
Highlighted results exceed the associated criteria.
ND - Not Detected.
J - Value is estimated due to technical noncompliance.
U - Value is non-detected as reported by the laboratory.
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Proposed to be excavated outside wetland
Considered for excavation in the wetland

TABLE 4
SUMMARY OF ANALYTICAL RESULTS - LANDFILL WASHOUT AREA
PRE-DESIGN INVESTIGATION
NWS EARLE
COLTS NICK, NEW JERSEY

NSAMPLE DEPTH RANGE SAMPLE DATE	Soil Criteria[1]	13SD04 0 TO 6" 6/26/2003	13SD05 0 TO 6" 6/26/2003	13SD06 0 TO 6" 6/26/2003	13SD06-D 0 TO 6" 6/26/2003	13SD07 0 TO 6" 6/26/2003	13SD08 0 TO 6" 6/26/2003	13SD200006 0 TO 6" 9/25/2003	13SD210006 0 TO 6" 9/25/2003	13SD211218 12 TO 18" 9/25/2003	13SD220006 0 TO 6" 9/25/2003
											Wetland
Pesticides PCBs (ug/kg)											
AROCLOR-1016		370 U	370 U	400 U	390 U	360 U	36 U	38 U	360 U	420 U	520 U
AROCLOR-1221		750 U	730 U	790 U	780 U	730 U	71 U	38 U	360 U	420 U	520 U
AROCLOR-1232		370 U	370 U	400 U	390 U	360 U	36 U	38 U	360 U	420 U	520 U
AROCLOR-1242		370 U	370 U	400 U	390 U	360 U	36 U	38 U	360 U	420 U	520 U
AROCLOR-1248		370 U	370 U	400 U	390 U	360 U	36 U	38 U	360 U	420 U	520 U
AROCLOR-1254		1000	2000	940	860	360 U	36 U	38 U	360 U	420 U	520 U
AROCLOR-1260		370 U	370 U	400 U	390 U	1800	36 U	250	970	2500	4400
AROCLOR-1268											
TOTAL AROCLORS	371	1000	2000	940	860	1800	ND	250	970	2500	4400
Inorganics (mg/kg)											
ALUMINUM		1360 J	2150 J	1340 J	1460 J	2180 J	2650 J	2080	1500	6890	22000
ANTIMONY	78	1.1 J	2.3 J	1.3 J	0.65 J	1.2 J	0.53 J	0.56 J	0.46 J	1.8 J	7.9 J
ARSENIC	10	2.5	4.5	3.3	2.8	3.5	4.1	2.9 J	2.5 J	8.1 J	37 J
BARIUM	330	4.6	85.3	3.4	3.3	3.2	3.4	4	2.4	12.5	32.8
BERYLLIUM	2	0.15	0.2	0.21	0.21	0.31	0.42 J	0.26	0.18	0.52	1.8 J
CADMIUM	32	0.14 J	3.1 J	0.16 J	0.04 UJ	0.04 UJ	0.04 J	0.14	0.07	0.69	2.2
CALCIUM		49.4	89.6	33.8	532.5	84.5	88.2	51.4	29.8	157	133
CHROMIUM	0.4	19.1	30.1	21.7	22.8	43.8	59.5	36.9	30.9	88.2	284
COBALT	13	0.1 U	2.9	0.25	0.1 U	0.29	0.22	0.36	0.3	0.98	2.6
COPPER	50	10.7 J	61.9 J	11.2 J	10.4 J	8.5 J	1.8 J	3.8	3.6	25.2	109
IRON		5900	14300	7370	6590	10700	11400	9080	7300	21700	69200
LEAD	115	30.8 J	112 J	30.5 J	28.6 J	37.2 J	7.2 J	11.5	14.9	106	302
MAGNESIUM		254	289	258	295	497	740	467	353	1310	3870
MANGANESE	100	12.4	28.8	16.5	10.1	22.4	9.3	9.7	6.1	22.3	48.7
MERCURY	0.1	0.12	0.23	0.11	0.08	0.15	0.01 U	0.36 J	0.06 J	0.38 J	2 J
NICKEL	30	1.2 J	14.3 J	2.1 J	1.3 J	2.2 J	1.5 J	1.4	1.1	4.2	13.4
POTASSIUM		741	821	788	1120	1500	2290	1420 J	1100 J	3650 J	11100 J
SELENIUM	1	0.41 U	0.72	0.5 U	0.41 U	0.49	0.34 U	0.25 U	0.3 U	0.35 U	1.4
SILVER	2	10.9	34.3	20.9	9.7	13.1	1.6	14.3	4.5	18.2	55.8
SODIUM		18.6	17	14	15.1	15.7	13.1	15	9.3	24.3	57
THALLIUM	1	0.44 U	0.32 U	0.53 U	0.43 U	0.46 U	0.36 U	0.47 U	0.58 U	0.67 U	0.85 U
VANADIUM	2	18.4	24.9	18.3	20.3	44.2	61.7	39.4 J	32.9 J	87 J	253 J
ZINC	50	14.8	47.9	18.2	11.4	13.4	59.8	16.5	8.5	33.2	108
Miscellaneous Parameters (mg/kg)											
MISC TOTAL ORGANIC CARBON									26500 J		

Results presented for June, September, and December 2003 sampling events.
Total Aroclors represents the calculated sum of the detected values for Aroclors-1016, -1221, -1232, -1242, -1248, 1254, -1260, and -1268.
Highlighted results exceed the associated criteria.
ND - Not Detected.
J - Value is estimated due to technical noncompliance.
U - Value is non-detected as reported by the laboratory.
UJ - Non-detected value is estimated due to technical noncompliance.
BJ - Value is a positive result that was detected in a laboratory blank and was also detected in this sample at a concentration between 3 and 10 times the maximum concentration found in the laboratory blank.
1 The soil screening value is the lower of the human health or ecological soil criteria from Table 1.

Proposed to be excavated outside wetland
Considered for excavation in the wetland

TABLE 4
SUMMARY OF ANALYTICAL RESULTS - LANDFILL WASHOUT AREA
PRE-DESIGN INVESTIGATION
NWS EARLE
COLTS NICK, NEW JERSEY

NSAMPLE DEPTH RANGE SAMPLE DATE	Soil Criteria[1]	13SD230006 0 TO 6" 9/25/2003	13SD240006 0 TO 6" 9/25/2003	13SD240006-D 0 TO 6" 9/25/2003	13SD241218 12 TO 18" 9/25/2003	13SD250006 0 TO 6" 9/25/2003 Wetland	13SD260006 0 TO 6" 9/25/2003 Wetland	13SD261218 12 TO 18" 9/25/2003 Wetland	13SD270006 0 TO 6" 9/25/2003	13SD281218 12 TO 18" 9/25/2003	13SD290006 0 TO 6" 12/11/2003 Wetland
Pesticides PCBs (ug/kg)											
AROCLOR-1016		380 U	380 U	380 U	550 U	77 U	3700 U	40 U	2600 U	380 U	1700 U
AROCLOR-1221		380 U	380 U	380 U	550 U	77 U	3700 U	40 U	2600 U	380 U	1700 U
AROCLOR-1232		380 U	380 U	380 U	550 U	77 U	3700 U	40 U	2600 U	380 U	1700 U
AROCLOR-1242		380 U	380 U	380 U	550 U	77 U	3700 U	40 U	2600 U	380 U	1700 U
AROCLOR-1248		380 U	380 U	380 U	550 U	77 U	3700 U	40 U	2600 U	380 U	1700 U
AROCLOR-1254		380 U	380 U	380 U	550 U	77 U	3700 U	40 U	2600 U	380 U	1700 U
AROCLOR-1260		2400 J	860 J	700 J	4900 J	520	9600 J	46	7200 J	780	8200
AROCLOR-1268											
TOTAL AROCLORS	371	2400 J	860 J	700 J	4900 J	500	9600 J	46	7200 J	780	8200
Inorganics (mg/kg)											
ALUMINUM		1800	3360	1520	12400	5150	12000 J	1260	16800	1360	14000
ANTIMONY	78	2 J	1.1 J	1 J	8.1 J	2.7 J	7.7 J	1.2 J	4.8 J	1.5 J	9.1 J
ARSENIC	10	5.8 J	7.5 J	4.1 J	21.7 J	10 J	28.7 J	1.7 J	23.4 J	1.8 J	24.7
BARIUM	330	6.9	5.1	6.2	98.2	41.4 J	47.2 J	7.2	36	3	49.7
BERYLLIUM	2	0.2	0.36	0.21	0.8	0.53 J	0.8 J	0.14	0.92 J	0.22	1.1
CADMIUM	32	0.46	0.46	0.51	3.3	2.2 J	6.8 J	0.84	2.3	0.07	8
CALCIUM		60	106	137	221	235 J	303 J	41.6	123	38.1	250
CHROMIUM	0.4	31.3	84.5	41.3	122	39 J	118 J	292	132	28.9	138
COBALT	13	0.62	0.32	0.45	1.9	0.83 J	2.5 J	0.22	1.7	0.55	2.2 J
COPPER	50	42.8	12.4	15.7	114	36.9 J	96.8 J	7.6	91.5	18.3	110
IRON		18600	15700	9330	37700	12500 J	33600 J	2540	40300	8500	43100
LEAD	115	116	33.7	33	435	88.4 J	290 J	23.8	231	118	436 J
MAGNESIUM		379	623	287	1420	315 J	1320 J	126	1530	249	1880
MANGANESE	100	49.8	9	17.4	49.1	12.6 J	25.9 J	4.9	24.5	30.7	30.1
MERCURY	0.1	0.51 J	0.19 J	0.16 J	2.6 J	0.46 J	1.8 J	0.37 J	1.8 J	0.11 J	2.6
NICKEL	30	4.1	2.3	2.8	10.3	5.8 J	14.6 J	1.5	9.8	2.9	14.7
POTASSIUM		912 J	2080 J	872 J	3830 J	874 J	3800 J	378 J	4420 J	788 J	5150
SELENIUM	1	0.27 U	0.49	0.33 U	1.6	1.7 J	2.7 J	0.68	2.4	0.33 U	2.9
SILVER	2	42.3	7.6	11.6	76.6	12.3 J	60.7 J	4.4	79.5	8.3	52.6 J
SODIUM		15.2	14	14.4	49.1	34.8 J	87.8 J	13.3	42.8	12.7	57 J
THALLIUM	1	0.51 U	0.48 U	0.62 U	0.89 U	1.3 U	1.2 U	0.6 U	0.32 U	0.63 UJ	1.4 U
VANADIUM	2	25.4 J	44.1 J	24.8 J	112 J	31.4 J	118 J	9.9 J	120 J	29.2 J	134
ZINC	50	86.5	22.4	22.8	110	53.7 J	175 J	17.7	73	12.7	109
Miscellaneous Parameters (mg/kg)											
MISC TOTAL ORGANIC CARBON		42000 J					212000 J				

Results presented for June, September, and December 2003 sampling events.
Total Aroclors represents the calculated sum of the detected values for Aroclors-1016, -1221, -1232, -1242, -1248, 1254, -1260, and -1268.
Highlighted results exceed the associated criteria.
ND - Not Detected.
J - Value is estimated due to technical noncompliance.
U - Value is non-detected as reported by the laboratory.
UJ - Non-detected value is estimated due to technical noncompliance.
BJ - Value is a positive result that was detected in a laboratory blank and was also detected in this sample at a concentration between 3 and 10 times the maximum concentration found in the laboratory blank.
1 The soil screening value is the lower of the human health or ecological soil criteria from Table 1.
Proposed to be excavated outside wetland
Considered for excavation in the wetland

TABLE 4
SUMMARY OF ANALYTICAL RESULTS - LANDFILL WASHOUT AREA
PRE-DESIGN INVESTIGATION
NWS EARLE
COLTS NICK, NEW JERSEY

NSAMPLE DEPTH RANGE SAMPLE DATE	Soil Criteria[1]	13SD300006 0 TO 6" 12/11/2003	13SD310006 0 TO 6" 12/11/2003	13SD320006 0 TO 6" 12/11/2003 Wetland	13SD330006 0 TO 6" 12/11/2003 Wetland	13SD360006 0 TO 6" 12/11/2003	13SD370006 0 TO 6" 12/11/2003	13SD371218 12 TO 18" 12/11/2003	13SD380006 0 TO 6" 12/11/2003 Wetland	13SD390006 0 TO 6" 12/11/2003 Wetland	13SD391218 12 TO 18" 12/11/2003 Wetland	13SD400006 0 TO 6" 12/11/2003 Wetland
Pesticides PCBs (ug/kg)												
AROCLOR-1016		1900 U	680 U	340 U	520 U	46 UJ	38 UJ	45 UJ	85 UJ	170 UJ	130 UJ	820 U
AROCLOR-1221		1900 U	680 U	340 U	520 U	46 U	38 U	45 U	85 U	170 U	130 U	820 U
AROCLOR-1232		1900 U	680 U	340 U	520 U	46 U	38 U	45 U	85 U	170 U	130 U	820 U
AROCLOR-1242		1900 U	680 U	340 U	520 U	46 U	38 U	45 U	85 U	170 U	130 U	820 U
AROCLOR-1248		1900 U	680 U	340 U	520 U	46 U	38 U	45 U	85 U	170 U	130 U	820 U
AROCLOR-1254		13000	680 U	340 U	520 U	46 U	38 U	45 U	85 U		130 U	820 U
AROCLOR-1260		1900 U	970	860	630	46 UJ	38 UJ	45 UJ	110 J		420 J	2600 J
AROCLOR-1268			680 U	340 U	520 U							
TOTAL AROCLORS	371	13000	970	860	630	ND	ND	ND	110 J	ND	420	2600
Inorganics (mg/kg)												
ALUMINUM		10700	5880 J	10700	12100	1360	2960	7880	6650	1270 J	10800 J	16600
ANTIMONY	78	9 J	4.3 BJ	3.5 BJ	4.9 BJ	1 J	0.29 UJ	0.39 UJ	1.5 J	1.4 UJ	1 UJ	5 J
ARSENIC	10	28	9.6 J	27.3	20.1	4.2	4		10.6	2.5 J	3.7 J	29.4
BARIUM	330	66.2	40.4 J	38.3	45.5	13.6	1.9	7.8	29.4	23.5 J	25.6 J	28
BERYLLIUM	2	0.81	0.24 J	0.48	0.54	0.08	0.43	0.64	0.32	0.19 UJ	0.4 J	0.89
CADMIUM	32	5.9	1.9 J	0.39 J	1.3	0.19	0.04 UJ	0.05 UJ	0.38	1.4 J	0.73 J	1.9 J
CALCIUM		1030	1600 J	143	1420	62.7	15.5	19.5	348	2130 J	229 J	103
CHROMIUM	0.4	112	43.3 J	73.6	81	10.9	68.3	101	44.7	7.3 BJ	215 J	229
COBALT	13	3.7 J	0.72 J	0.97 J	1.6	0.28	0.15 J	0.28 J	0.98	1.1 J	0.67 J	1.6 J
COPPER	50	197	292 J	43.7	49.9	13.3	1.7 BJ	5.1	25.2	18.2 J	9.9 BJ	67
IRON		36400	24500 J	29700 J	29100 J	3660	11000	19500	15700	2620 J	2810 J	46800
LEAD	115	604 J	123 J	107	176	70 J	7.6 J	7 J	86.9 J	53.3 J	43 J	219 J
MAGNESIUM		1480	637 J	684	1030	145	769	1100	536	730 J	106 J	1600
MANGANESE	100	40.3	54.5 J	14.6	42.8	5.7	4.1	11	16.2	37.1 J	4.2 J	21.2
MERCURY	0.1	4.2	1 J	0.52	0.93	0.09	0.02 U	0.02	0.21	0.51 J	0.15 J	1.6
NICKEL	30	20.8	6.5 J	4.9	10.6	2.7	1.2	2.4	7.8	11.4 J	10.7 J	9
POTASSIUM		3830	1500 J	2100	2980	428	2370	3260	1370	360 J	311 J	4670
SELENIUM	1	2.1	2.6 J	3.4	3.2	0.9	0.38	0.8	1.8	1.4 UJ	5.4 J	5
SILVER	2	147 J	2.1 BJ	4.4	8.4	0.39 J	0.08 U	0.17 J	0.57 J	1.5 J	2.8 J	15.8 J
SODIUM		97	76.1 J	46.8 J	71.6 J	19.9	14.5 BJ	22.7 J	57.2	131 J	60.7 J	54.8 J
THALLIUM	1	1.4 U	2.1 UJ	1.1 U	1.8 U	0.61 U	0.54 U	0.73 U	1.3 U	2.6 UJ	2 UJ	1.3 U
VANADIUM	2	105	34.7 J	70.2	90.4	15.2	44.7	71	47.1	9.1 J	14.4 J	139
ZINC	50	205	81.5 J	32.5	68.3	12.7	9.5	13.4	38.7	101 J	23.4 J	57.6
Miscellaneous Parameters (mg/kg)												
MISC TOTAL ORGANIC CARBON			265000 J								354000 J	

Results presented for June, September, and December 2003 sampling events.
Total Aroclors represents the calculated sum of the detected values for Aroclors-1016, -1221, -1232, -1242, -1248, 1254, -1260, and -1268.
Highlighted results exceed the associated criteria.
ND - Not Detected.
J - Value is estimated due to technical noncompliance.
U - Value is non-detected as reported by the laboratory.
UJ - Non-detected value is estimated due to technical noncompliance.
BJ - Value is a positive result that was detected in a laboratory blank and was also detected in this sample at a concentration between 3 and 10 times the maximum concentration found in the laboratory blank.
1 The soil screening value is the lower of the human health or ecological soil criteria from Table 1.
Proposed to be excavated outside wetland.
Considered for excavation in the wetland.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS - LANDFILL WASHOUT AREA
PRE-DESIGN INVESTIGATION
NWS EARLE
COLTS NICK, NEW JERSEY

NSAMPLE DEPTH RANGE SAMPLE DATE	Soil Criteria[1]	13SD400006-D 0 TO 6" 12/11/2003	13SD410006 0 TO 6" 12/11/2003	13SD410006-D 0 TO 6" 12/11/2003	13SD411218 12 TO 18" 12/11/2003	13SD440006 0 TO 6" 12/11/2003	13SD450006 0 TO 6" 12/11/2003	13SD450006-D 0 TO 6" 12/11/2003	13SD460006 0 TO 6" 12/11/2003
		Wetland				Wetland			
Pesticides PCBs (ug/kg)									
AROCLOR-1016		8300 U	1000 U	1000 U	180 U	60 U	54 U	51 U	28 U
AROCLOR-1221		8300 U	1000 U	1000 U	180 U	60 U	54 U	51 U	28 U
AROCLOR-1232		8300 U	1000 U	1000 U	180 U	60 U	54 U	51 U	28 U
AROCLOR-1242		8300 U	1000 U	1000 U	180 U	60 U	54 U	51 U	28 U
AROCLOR-1248		8300 U	1000 U	1000 U	180 U	60 U	54 U	51 U	28 U
AROCLOR-1254		8300 U	1000 U	1000 U	180 U	60 U	54 U	51 U	28 U
AROCLOR-1260		4400 J	1200	1800	490	350	110 J	200 J	28 U
AROCLOR-1268						60 U	54 U	51 U	28 U
TOTAL AROCLORS	371	4400	1200	1800	490	350	110 J	200 J	ND
Inorganics (mg/kg)									
ALUMINUM		20500	12200	19800	16100 J	4700 J	18900	18100	18300
ANTIMONY	78	4.3	3.6 J	3.4	3.1 J	4.9 BJ	4.1 BJ	3.4 BJ	3 BJ
ARSENIC	10	27.3	16.7	23.6	11.2 J	14.1 J	36.1	15.5	21.8
BARIUM	330	35.6	26.4	30.7	17 J	49.2 J	25.4	24.3	17.7
BERYLLIUM	2	0.95	0.55	0.73	0.56 J	0.23 J	0.7	0.67	1.5
CADMIUM	32	1.8	1.7	0.85	2.6 J	1.2 J	0.46 J	0.53	0.04 U
CALCIUM		176	254	157	252 J	465 J	87.8	73.5	67.8
CHROMIUM	0.4	234	138 J	232 J	774 J	24.1 J	408	422	225
COBALT	13	2.1 J	3.2	2.6 J	1.2 J	1.5 J	0.9 J	0.96	2.1 J
COPPER	50	63.1	53.4	55.5	33.7 J	49.2 J	30.2	26.4	23.2
IRON		46200	29400	41000	9390 J	10100 J	43000 J	23400 J	48300 J
LEAD	115	190	194 J	214	153 J	175 J	112	96.8	99.4
MAGNESIUM		2150	1300	1690	510 J	516 J	1230	1120	2790
MANGANESE	100	28.5	19.4	22.6	7.8 J	19.9 J	12.9	12.8	16.7
MERCURY	0.1	1.4	0.91	1.3	0.39 J	0.8 J	0.75	0.86	0.27
NICKEL	30	11.6	12.1	13	10.8 J	12.6 J	6.7	6.4	7.9
POTASSIUM		6070	3220	4760	1490 J	690 J	3660	3330	7500
SELENIUM	1	4.5 J	3.8	4.3 J	13 J	3.8 J	6.5	5.9	2.4
SILVER	2	20.5	31.9 J	19.4	6.2 J	2.7 J	1.3 BJ	1.9 BJ	0.84 BJ
SODIUM		66.3 BJ	58	63.7 BJ	67.6 BJ	69.2 J	44.9 J	40.5 J	33.7 J
THALLIUM	1	1.3 UJ	1.6 U	1.7 UJ	2.8 UJ	2 UJ	1.8 U	1.6 U	0.84 U
VANADIUM	2	154	98.1	138	52.4 J	37.3 J	118	85.9	204
ZINC	50	73.8	74.3	61.4	35.8 J	59 J	25.8	25.7	39
Miscellaneous Parameters (mg/kg)									
MISC TOTAL ORGANIC CARBON						214000 J			

Results presented for June, September, and December 2003 sampling events.
Total Aroclors represents the calculated sum of the detected values for Aroclors-1016, -1221, -1232, -1242, -1248, 1254, -1260, and -1268.
Highlighted results exceed the associated criteria.
ND - Not Detected.
J - Value is estimated due to technical noncompliance.
U - Value is non-detected as reported by the laboratory.
UJ - Non-detected value is estimated due to technical noncompliance.
BJ - Value is a positive result that was detected in a laboratory blank and was also detected in this sample at a concentration between 3 and 10 times the maximum concentration found in the laboratory blank
1 The soil screening value is the lower of the human health or ecological soil criteria from Table 1.
Proposed to be excavated outside wetland
Considered for excavation in the wetland

TABLE 5

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

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 5

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

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.

TABLE 6

SUMMARY OF SURFACE SOIL AND SEDIMENT CONCENTRATIONS
NWS EARLE, COLTS NECK, NEW JERSEY

Chemical	Criteria		Background		Avg. Conc. Over Home Range of Shrew (1 acre)		
	Soil Criteria[1]	Sediment Criteria[2]	Soil Background[3]	Sediment Background[4]	No Excavation	Excavate to Wetland Boundary	Excavate to 1.0 PCB Line
PCBs (ug/kg)							
Total PCBs	371	676	--	--	3,806	2,207	86.5
Inorganics (mg/kg)							
Aluminum	--	18,000	6,153	5,460	9,057	8,439	4,249
Antimony	78	3	--	--	4.21	2.95	0.525
Arsenic	10	33	13.4	11.2	16.4	16.7	10.2
Barium	330	48	22.5	16.8	27.8	26.7	18.6
Beryllium	2	--	0.39	0.72	0.623	0.721	0.528
Cadmium	32	4.98	0.67	0.93	2.41	1.98	0.576
Chromium	0.4	111	69.1	40.4	103	99.2	54
Cobalt	13	10	3.15	2.85	1.53	1.94	1.87
Copper	50	149	10.1	9.08	60	43.2	16.1
Iron	--	40,000	52,403	23,589	27,462	29,209	20,398
Lead	115	128	37.3	21.1	185	136	45.4
Manganese	100	1,100	128	36.2	26.5	45.7	55.9
Mercury	0.1	1.06	0.18	0.09	1.14	0.798	0.164
Nickel	30	48.6	5.18	6.9	8.87	8.55	6.16
Selenium	1	1	--	--	1.33	1.28	0.373
Silver	2	3.7	--	1.13	9.42	5.6	1.24
Thallium	1	--	1.64	--	0.508	0.335	0.139
Vanadium	2	57	70.1	39.4	97.2	83.4	43.5
Zinc	50	459	22.8	41.2	75.5	65.6	39.3

Footnotes:

1 - The soil criteria is the lower of the human health or ecological soil criteria from Table 1.

2 - The sediment criteria is the higher effects level from Table 1.

3 - Two times the average background soil concentration is shown (B& R Environmental, 1996).

4 - Two times the average background sediment concentration is shown (TtNUS, 2000).

Cell is shaded if the average concentration exceeds both soil numbers (criteria and background) and both sediment numbers (criteria and background).

Cell is shaded if the average concentration exceeds the soil criteria and soil background.

Cell is shaded if the average sediment concentration exceeds the sediment criteria and sediment background.

TABLE 7

TERRESTRIAL FOOD CHAIN MODEL - AVERAGE SCENARIO EEQS
WETLANDS NOT EXCAVATED
NSW EARLE
COLTS NECK, NEW JERSEY

Chemical	Short-Tailed Shrew EEQ_{NOAEL}	Short-Tailed Shrew EEQ_{LOAEL}	American Robin EEQ_{NOAEL}	American Robin EEQ_{LOAEL}
PCBs				
Total PCBs	1.9E+01	1.9E+00	1.2E+01	1.2E+00
Metals				
Arsenic	2.8E+00	2.8E-01	2.4E-01	8.0E-02
Cadmium	1.4E+00	1.4E-01	1.6E+00	1.1E-01
Chromium	8.6E-01	2.1E-01	4.7E+00	9.4E-01
Copper	1.7E-01	1.3E-01	7.2E-02	5.5E-02
Lead	4.2E-01	4.2E-02	5.0E+00	5.0E-01
Mercury	3.8E+00	7.5E-01	3.1E+01	3.1E+00
Nickel	2.0E-02	1.0E-02	1.8E-02	1.3E-02
Selenium	5.9E-01	3.6E-01	5.0E-01	2.5E-01
Silver	1.3E+00	1.3E-01	9.3E-01	9.3E-02
Zinc	1.2E-01	5.8E-02	2.2E+00	2.4E-01

Notes:
- Cells are shaded if the EEQ is greater than 1.0

EEQ - Ecological Effects Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level

TABLE 8

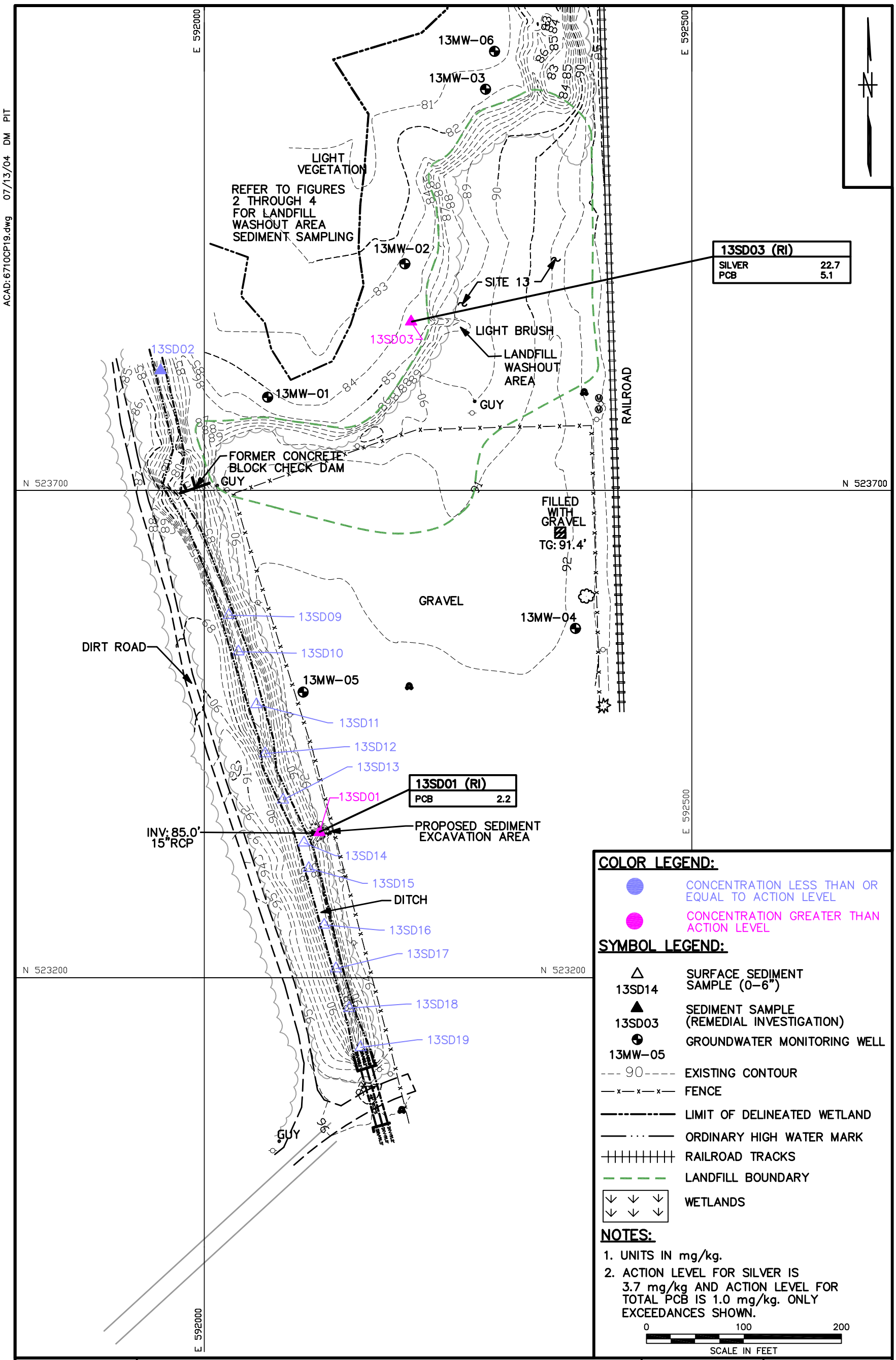
TERRESTRIAL FOOD CHAIN MODEL - AVERAGE SCENARIO EEQS
WETLANDS EXCAVATED
NSW EARLE
COLTS NECK, NEW JERSEY

Chemical	Short-Tailed Shrew EEQ_{NOAEL}	Short-Tailed Shrew EEQ_{LOAEL}	American Robin EEQ_{NOAEL}	American Robin EEQ_{LOAEL}
PCBs				
Total PCBs	7.5E-01	7.5E-02	4.7E-01	4.7E-02
Metals				
Arsenic	1.7E+00	1.7E-01	1.5E-01	4.9E-02
Cadmium	3.9E-01	3.9E-02	4.5E-01	3.3E-02
Chromium	4.7E-01	1.2E-01	2.6E+00	5.1E-01
Copper	6.5E-02	5.0E-02	2.7E-02	2.0E-02
Lead	1.4E-01	1.4E-02	1.7E+00	1.7E-01
Mercury	7.8E-01	1.6E-01	6.5E+00	6.5E-01
Nickel	1.5E-02	7.3E-03	1.3E-02	9.1E-03
Selenium	1.7E-01	1.0E-01	1.4E-01	6.9E-02
Silver	9.5E-02	9.5E-03	6.9E-02	6.9E-03
Zinc	7.0E-02	3.5E-02	1.3E+00	1.4E-01

Notes:
- Cells are shaded if the EEQ is greater than 1.0

EEQ - Ecological Effects Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level

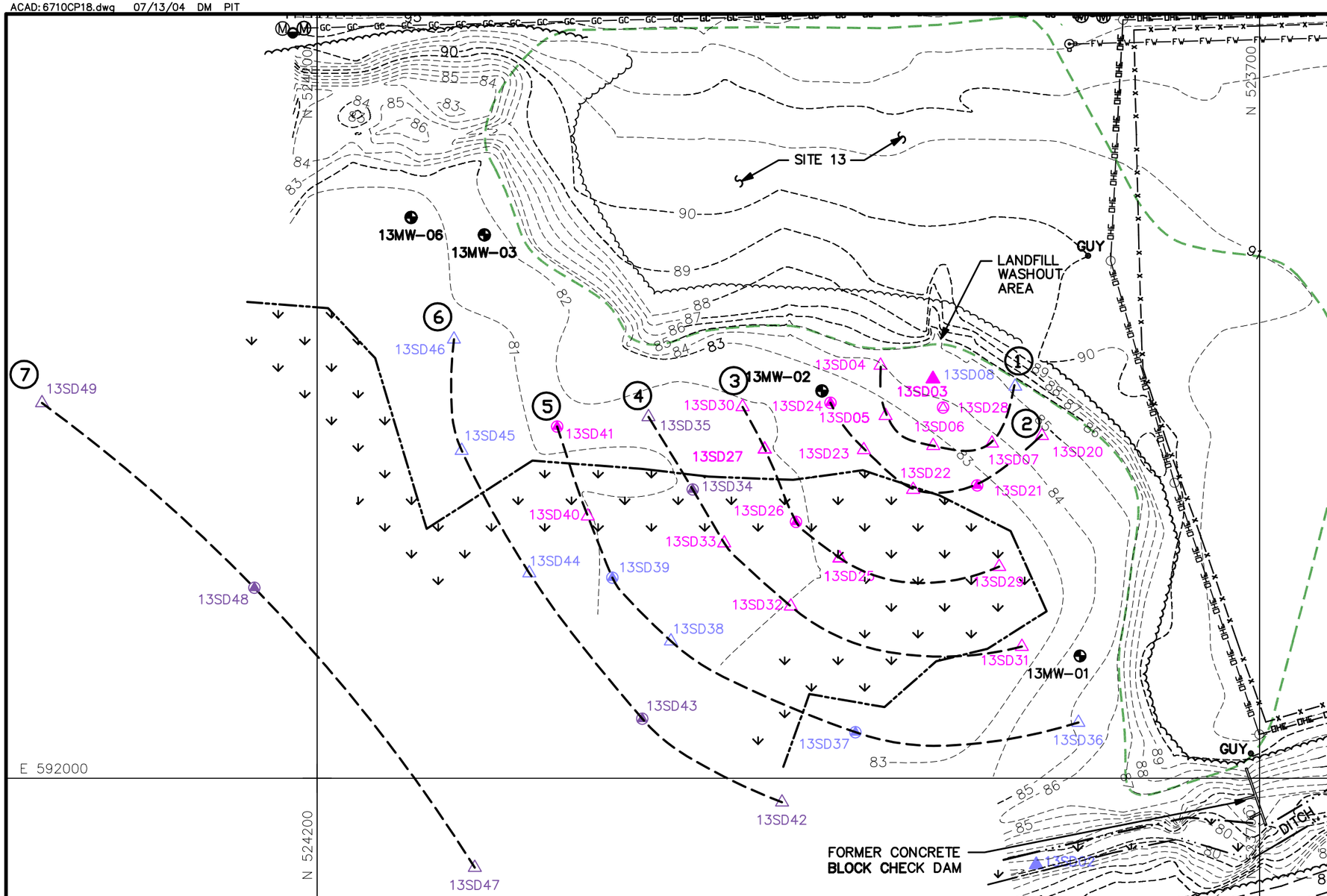
ACAD:6710CP19.dwg 07/13/04 DM PIT



DRAWN BY DM DATE 2/4/04	Tetra Tech NUS, Inc.	CONTRACT NO. 0851	OWNER NO. 6710
CHECKED BY RCM DATE 2/4/04	DITCH SEDIMENT SAMPLE LOCATION EXCEEDANCES SITE 13 – DPDO YARD NAVAL WEAPONS STATION EARLE COLTS NECK, NEW JERSEY	APPROVED BY DATE	
COST/SCHED-AREA		APPROVED BY DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 1	REV. 0

FORM CADD NO. TtNUS_BV.DWG - REV 0 - 1/20/98

ACAD: 6710CP18.dwg 07/13/04 DM PIT



COLOR LEGEND:

- SILVER AND PCB CONCENTRATION LESS THAN OR EQUAL TO ACTION LEVEL
- SILVER AND PCB CONCENTRATION GREATER THAN ACTION LEVEL
- SEDIMENT SAMPLE COLLECTED BUT NOT TESTED

SYMBOL LEGEND:

- 13SD35 — SURFACE SEDIMENT SAMPLE (0–6")
- 13SD28 — DEEP SEDIMENT SAMPLE (12–18")
- 13SD43 — SURFACE AND DEEP SEDIMENT SAMPLES (0–6" & 12–18")
- 13SD03 — SEDIMENT SAMPLE (REMEDIAL INVESTIGATION)
- 3 — SEDIMENT SAMPLING RING I.D.
- 13MW-01 — GROUNDWATER MONITORING WELL
- 90 — EXISTING CONTOUR
- FENCE
- LIMIT OF DELINEATED WETLAND
- ORDINARY HIGH WATER MARK
- RAILROAD TRACKS
- LANDFILL BOUNDARY
- WETLANDS

NOTES:

1. THE LOWEST ACTION LEVEL FOR SILVER IS 3.7 mg/kg & THE LOWEST ACTION LEVEL FOR TOTAL PCB IS 0.49 mg/kg.

0 60 120
SCALE IN FEET

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY DM DATE 2/3/04
CHECKED BY RCM DATE 2/3/04
COST/SCHED-AREA
SCALE AS NOTED

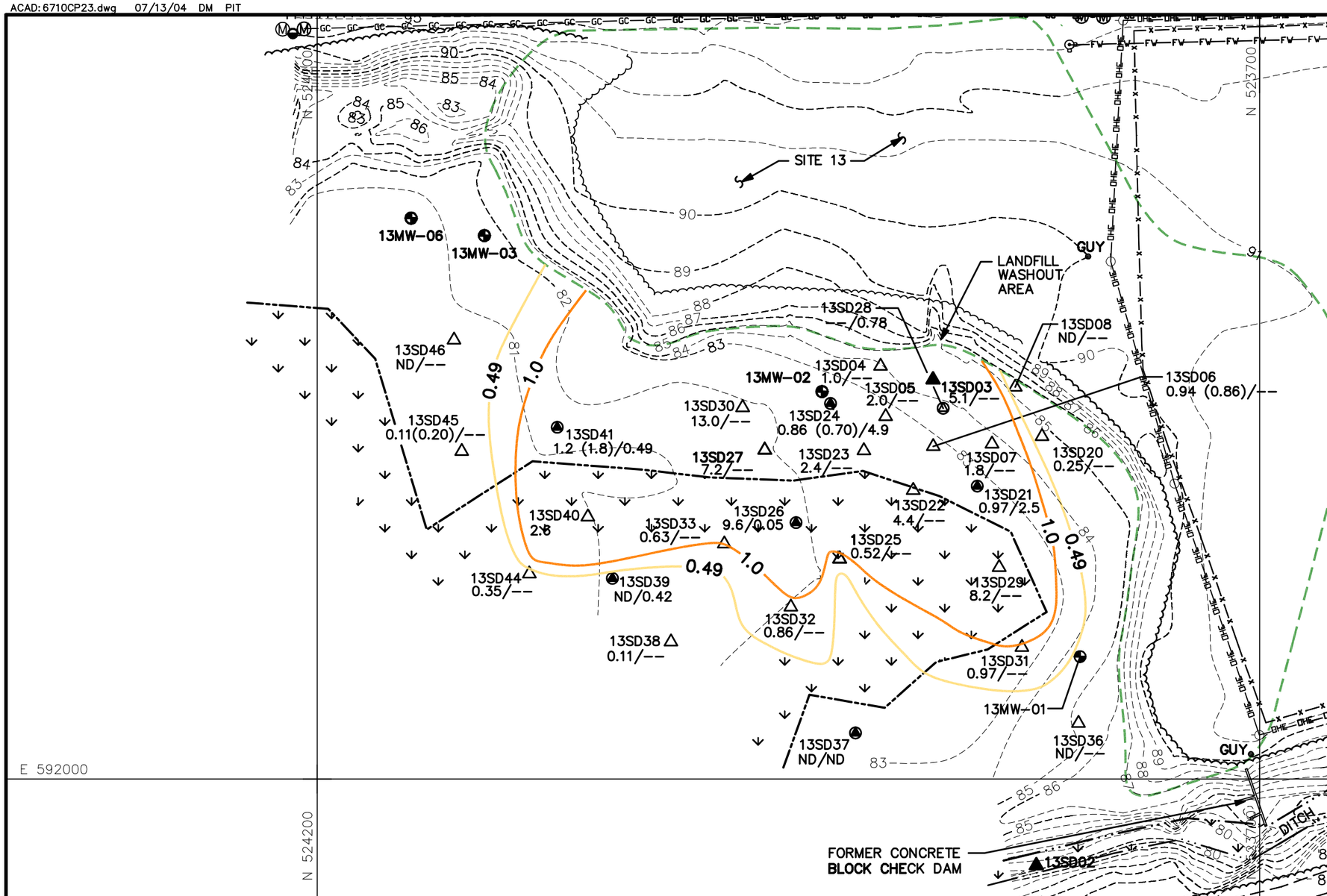
Tetra Tech NUS, Inc.

SEDIMENT SAMPLE LOCATION EXCEEDANCES
SITE 13 – DPDO YARD
NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

CONTRACT NO. 0851
OWNER NO. 6710
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 2
REV. 0

FORM CADD NO. T+NUS_BH.DGN – REV 0 – 1/20/98

ACAD: 6710CP23.dwg 07/13/04 DM PIT



LEGEND:

- 13SD35 — SURFACE SEDIMENT SAMPLE (0–6")
- 13SD28 — DEEP SEDIMENT SAMPLE (12–18")
- 13SD43 — SURFACE AND DEEP SEDIMENT SAMPLES (0–6" & 12–18")
- 13SD03 — SEDIMENT SAMPLE (REMEDIAL INVESTIGATION)
- 1.0 mg/kg TOTAL PCB CONCENTRATION CONTOUR
- 0.49 mg/kg TOTAL PCB CONCENTRATION CONTOUR
- 13MW-01 — GROUNDWATER MONITORING WELL
- 90 — EXISTING CONTOUR
- FENCE
- LIMIT OF DELINEATED WETLAND
- ORDINARY HIGH WATER MARK
- RAILROAD TRACKS
- LANDFILL BOUNDARY
- WETLANDS

NOTES:

1. UNITS IN mg/kg.
2. ACTION LEVEL FOR TOTAL PCB IS 1.0 mg/kg.
3. TOTAL PCB CONCENTRATION AT 0 TO 6 INCHES FOLLOWED BY CONCENTRATION AT 12 TO 18 INCHES IF APPLICABLE. DUPLICATE RESULTS INDICATED IN (PARENTHESIS).

0 60 120
SCALE IN FEET

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY DM DATE 2/3/04
CHECKED BY RCM DATE 2/3/04
COST/SCHED-AREA
SCALE AS NOTED

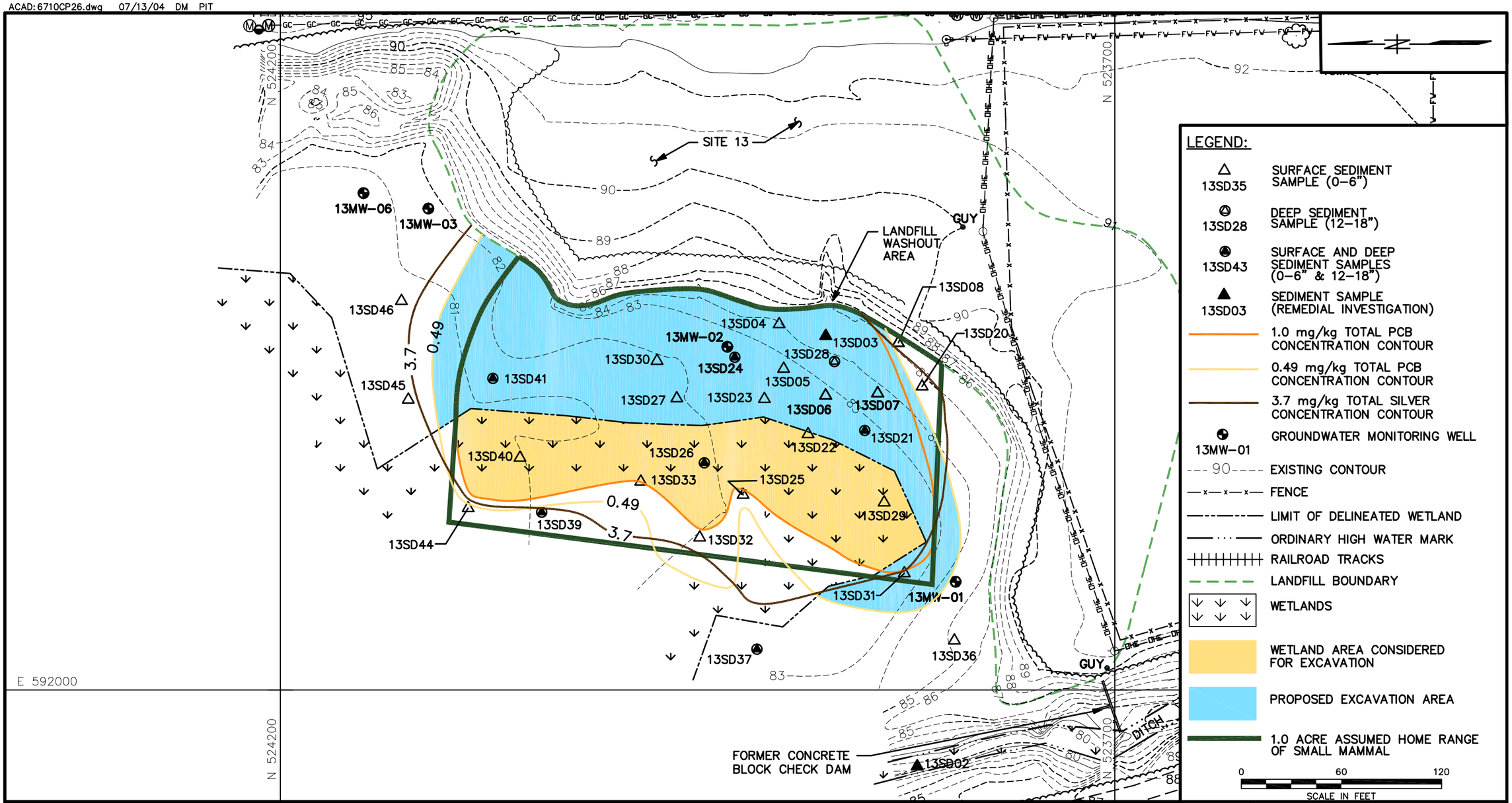
Tetra Tech NUS, Inc.

SEDIMENT SAMPLE PCB EXCEEDANCES
SITE 13 – DPDO YARD
NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

CONTRACT NO. 0851
OWNER NO. 6710
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 3
REV. 0

FORM CADD NO. TtNUS_BH.DGN – REV 0 – 1/20/98

ACAD:6710CP26.dwg 07/13/04 DM PIT



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY MF DATE 2/19/04
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

Tetra Tech NUS, Inc.

PROPOSED EXCAVATION – LANDFILL WASHOUT AREA
SITE 13 – DPDO YARD
NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

CONTRACT NO. 6710
OWNER NO.
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 4
REV. 0

FORM CADD NO. TtNUS_BH.DGN - REV 0 - 1/20/98

ATTACHMENT A

WETLAND FUNCTION-VALUE EVALUATION FORM

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

ES

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.

ATTACHMENT B

FOOD CHAIN MODEL SPREADSHEETS

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION				
Average PCB Concentration over a 1 acre area of Site 13				
	Excavated Area (outside Wetland Area)	Wetland PCB contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (ug/kg)	Sample	Conc. (ug/kg)	Sample	Conc. (ug/kg)
13SD03	5100	13SD40	3500	13SD44	350
13SD04	1000	13SD26	9600	13SD39	65
13SD05	2000	13SD22	4400	13SD33	630
13SD06	900	13SD29	8200	13SD32	860
13SD07	1800	---		13SD25	500
13SD21	970	---		13SD31	970
13SD23	2400	---		13SD08	18
13SD24	780	---		13SD20	250
13SD27	7200	---		---	
13SD28	---	---		---	
13SD30	13000	---		---	
13SD41	1500	---		---	

Average Conc. (mg/kg) =	3332	6425	455	
			Overall Average (mg/kg) =	3806

EXCAVATION TO THE WETLAND BOUNDARY				
Average PCB Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Wetland PCB contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (ug/kg)	Sample	Conc. (ug/kg)	Sample	Conc. (ug/kg)
13SD03	5100	13SD40	3500	13SD44	350
13SD04	1000	13SD26	9600	13SD39	65
13SD05	2000	13SD22	4400	13SD33	630
13SD06	900	13SD29	8200	13SD32	860
13SD07	1800	---		13SD25	500
13SD21	970	---		13SD31	970
13SD23	2400	---		13SD08	18
13SD24	780	---		13SD20	250
13SD27	7200	---		---	
13SD28	---	---		---	
13SD30	13000	---		---	
13SD41	1500	---		---	

Average Conc. (mg/kg) =	0	6425	455	
			Overall Average (mg/kg) =	2207

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET				
Average PCB Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Excavated Area Wetland PCB contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (ug/kg)	Sample	Conc. (ug/kg)	Sample	Conc. (ug/kg)
13SD03	5100	13SD40	3500	13SD44	350
13SD04	1000	13SD26	9600	13SD39	65
13SD05	2000	13SD22	4400	13SD33	630
13SD06	900	13SD29	8200	13SD32	860
13SD07	1800	---		13SD25	500
13SD21	970	---		13SD31	970
13SD23	2400	---		13SD08	18
13SD24	780	---		13SD20	250
13SD27	7200	---		---	
13SD28	---	---		---	
13SD30	13000	---		---	
13SD41	1500	---		---	

Average Conc. (mg/kg) =	0	0	455	
			Overall Average (mg/kg) =	86.52

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Aluminum Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland Al contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	1150	13SD40	18550	13SD44	4700
13SD04	1380	13SD26	12000	13SD39	1270
13SD05	2150	13SD22	22000	13SD33	12100
13SD06	1400	13SD29	14000	13SD32	10700
13SD07	2180	---		13SD25	5150
13SD21	1500	---		13SD31	5880
13SD23	1800	---		13SD08	2650
13SD24	2440	---		13SD20	2080
13SD27	16800	---		---	
13SD28	---	---		---	
13SD30	10700	---		---	
13SD41	16000	---		---	

Average Conc. (mg/kg) =	5227	16638	5566

Overall Average (mg/kg) = 9057

EXCAVATION TO THE WETLAND BOUNDARY

Average Aluminum Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland Al contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	1150	13SD40	18550	13SD44	4700
13SD04	1380	13SD26	12000	13SD39	1270
13SD05	2150	13SD22	22000	13SD33	12100
13SD06	1400	13SD29	14000	13SD32	10700
13SD07	2180	---		13SD25	5150
13SD21	1500	---		13SD31	5880
13SD23	1800	---		13SD08	2650
13SD24	2440	---		13SD20	2080
13SD27	16800	---		---	
13SD28	---	---		---	
13SD30	10700	---		---	
13SD41	16000	---		---	

Average Conc. (mg/kg) =	3940	16638	5566

Overall Average (mg/kg) = 8439

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Aluminum Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Excavated Area Wetland Al contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	1150	13SD40	18550	13SD44	4700
13SD04	1380	13SD26	12000	13SD39	1270
13SD05	2150	13SD22	22000	13SD33	12100
13SD06	1400	13SD29	14000	13SD32	10700
13SD07	2180	---		13SD25	5150
13SD21	1500	---		13SD31	5880
13SD23	1800	---		13SD08	2650
13SD24	2440	---		13SD20	2080
13SD27	16800	---		---	
13SD28	---	---		---	
13SD30	10700	---		---	
13SD41	16000	---		---	

Average Conc. (mg/kg) =	3940	3940	5566

Overall Average (mg/kg) = 4249

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Antimony Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland Sb contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	2.5	13SD40	4.65	13SD44	4.9
13SD04	1.1	13SD26	7.7	13SD39	0.7
13SD05	2.3	13SD22	7.9	13SD33	4.9
13SD06	0.975	13SD29	9.1	13SD32	3.5
13SD07	1.2	---		13SD25	2.7
13SD21	0.46	---		13SD31	4.3
13SD23	2	---		13SD08	0.53
13SD24	1.05	---		13SD20	0.56
13SD27	4.8	---		---	
13SD28	---	---		---	
13SD30	9	---		---	
13SD41	3.5	---		---	
Average Conc. (mg/kg) =	2.63	7.34		2.76	

Overall Average (mg/kg) = 4.21

EXCAVATION TO THE WETLAND BOUNDARY

Average Antimony Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland Sb contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	2.5	13SD40	4.65	13SD44	4.9
13SD04	1.1	13SD26	7.7	13SD39	0.7
13SD05	2.3	13SD22	7.9	13SD33	4.9
13SD06	0.975	13SD29	9.1	13SD32	3.5
13SD07	1.2	---		13SD25	2.7
13SD21	0.46	---		13SD31	4.3
13SD23	2	---		13SD08	0.53
13SD24	1.05	---		13SD20	0.56
13SD27	4.8	---		---	
13SD28	---	---		---	
13SD30	9	---		---	
13SD41	3.5	---		---	
Average Conc. (mg/kg) =	0	7.34		2.76	

Overall Average (mg/kg) = 2.95

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Antimony Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Excavated Area Wetland Sb contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	2.5	13SD40	4.65	13SD44	4.9
13SD04	1.1	13SD26	7.7	13SD39	0.7
13SD05	2.3	13SD22	7.9	13SD33	4.9
13SD06	0.975	13SD29	9.1	13SD32	3.5
13SD07	1.2	---		13SD25	2.7
13SD21	0.46	---		13SD31	4.3
13SD23	2	---		13SD08	0.53
13SD24	1.05	---		13SD20	0.56
13SD27	4.8	---		---	
13SD28	---	---		---	
13SD30	9	---		---	
13SD41	3.5	---		---	
Average Conc. (mg/kg) =	0	0		2.76	

Overall Average (mg/kg) = 0.525

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Arsenic Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland As contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	4.2	13SD40	28.35	13SD44	14.1
13SD04	2.5	13SD26	28.7	13SD39	2.5
13SD05	4.5	13SD22	37	13SD33	20.1
13SD06	3.05	13SD29	24.7	13SD32	27.3
13SD07	3.5	---		13SD25	10
13SD21	2.5	---		13SD31	9.6
13SD23	5.3	---		13SD08	4.1
13SD24	5.8	---		13SD20	2.9
13SD27	23.4	---		---	
13SD28	---	---		---	
13SD30	28	---		---	
13SD41	20.15	---		---	

Average Conc. (mg/kg) =	9.35	29.7	11.3
		Overall Average (mg/kg) =	**16.4**

EXCAVATION TO THE WETLAND BOUNDARY

Average Arsenic Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland As contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	4.2	13SD40	28.35	13SD44	14.1
13SD04	2.5	13SD26	28.7	13SD39	2.5
13SD05	4.5	13SD22	37	13SD33	20.1
13SD06	3.05	13SD29	24.7	13SD32	27.3
13SD07	3.5	---		13SD25	10
13SD21	2.5	---		13SD31	9.6
13SD23	5.3	---		13SD08	4.1
13SD24	5.8	---		13SD20	2.9
13SD27	23.4	---		---	
13SD28	---	---		---	
13SD30	28	---		---	
13SD41	20.15	---		---	

Average Conc. (mg/kg) =	9.90	29.7	11.3
		Overall Average (mg/kg) =	**16.7**

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Arsenic Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Excavated Area Wetland As contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	4.2	13SD40	28.35	13SD44	14.1
13SD04	2.5	13SD26	28.7	13SD39	2.5
13SD05	4.5	13SD22	37	13SD33	20.1
13SD06	3.05	13SD29	24.7	13SD32	27.3
13SD07	3.5	---		13SD25	10
13SD21	2.5	---		13SD31	9.6
13SD23	5.3	---		13SD08	4.1
13SD24	5.8	---		13SD20	2.9
13SD27	23.4	---		---	
13SD28	---	---		---	
13SD30	28	---		---	
13SD41	20.15	---		---	

Average Conc. (mg/kg) =	9.90	9.90	11.3
		Overall Average (mg/kg) =	**10.2**

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Barium Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland Ba contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	6.9	13SD40	31.8	13SD44	49.2
13SD04	4.6	13SD26	47.2	13SD39	23.5
13SD05	35.3	13SD22	32.8	13SD33	45.5
13SD06	3.35	13SD29	49.7	13SD32	38.3
13SD07	3.2	---		13SD25	41.4
13SD21	2.4	---		13SD31	40.4
13SD23	6.9	---		13SD08	3.4
13SD24	5.65	---		13SD20	4
13SD27	36	---		---	
13SD28	---	---		---	
13SD30	66.2	---		---	
13SD41	28.55	---		---	

Average Conc. (mg/kg) =	18.1	40.4	30.7
			Overall Average (mg/kg) = 27.8

EXCAVATION TO THE WETLAND BOUNDARY

Average Barium Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland Ba contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	6.9	13SD40	31.8	13SD44	49.2
13SD04	4.6	13SD26	47.2	13SD39	23.5
13SD05	35.3	13SD22	32.8	13SD33	45.5
13SD06	3.35	13SD29	49.7	13SD32	38.3
13SD07	3.2	---		13SD25	41.4
13SD21	2.4	---		13SD31	40.4
13SD23	6.9	---		13SD08	3.4
13SD24	5.65	---		13SD20	4
13SD27	36	---		---	
13SD28	---	---		---	
13SD30	66.2	---		---	
13SD41	28.55	---		---	

Average Conc. (mg/kg) =	15.8	40.4	30.7
			Overall Average (mg/kg) = 26.7

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Barium Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Excavated Area Wetland Ba contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	6.9	13SD40	31.8	13SD44	49.2
13SD04	4.6	13SD26	47.2	13SD39	23.5
13SD05	35.3	13SD22	32.8	13SD33	45.5
13SD06	3.35	13SD29	49.7	13SD32	38.3
13SD07	3.2	---		13SD25	41.4
13SD21	2.4	---		13SD31	40.4
13SD23	6.9	---		13SD08	3.4
13SD24	5.65	---		13SD20	4
13SD27	36	---		---	
13SD28	---	---		---	
13SD30	66.2	---		---	
13SD41	28.55	---		---	

Average Conc. (mg/kg) =	15.8	15.8	30.7
			Overall Average (mg/kg) = 18.6

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Beryllium Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland Be contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.12	13SD40	0.92	13SD44	0.23
13SD04	0.15	13SD26	0.8	13SD39	0.095
13SD05	0.2	13SD22	1.8	13SD33	0.54
13SD06	0.21	13SD29	1.1	13SD32	0.48
13SD07	0.31	---		13SD25	0.53
13SD21	0.18	---		13SD31	0.24
13SD23	0.2	---		13SD08	0.42
13SD24	0.285	---		13SD20	0.26
13SD27	0.92	---		---	
13SD28	---	---		---	
13SD30	0.81	---		---	
13SD41	0.64	---		---	

Average Conc. (mg/kg) =	0.366	1.16	0.349

Overall Average (mg/kg) = 0.623

EXCAVATION TO THE WETLAND BOUNDARY

Average Beryllium Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland Be contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.12	13SD40	0.92	13SD44	0.23
13SD04	0.15	13SD26	0.8	13SD39	0.095
13SD05	0.2	13SD22	1.8	13SD33	0.54
13SD06	0.21	13SD29	1.1	13SD32	0.48
13SD07	0.31	---		13SD25	0.53
13SD21	0.18	---		13SD31	0.24
13SD23	0.2	---		13SD08	0.42
13SD24	0.285	---		13SD20	0.26
13SD27	0.92	---		---	
13SD28	---	---		---	
13SD30	0.81	---		---	
13SD41	0.64	---		---	

Average Conc. (mg/kg) =	0.570	1.16	0.349

Overall Average (mg/kg) = 0.721

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Beryllium Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Excavated Area Wetland Be contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.12	13SD40	0.92	13SD44	0.23
13SD04	0.15	13SD26	0.8	13SD39	0.095
13SD05	0.2	13SD22	1.8	13SD33	0.54
13SD06	0.21	13SD29	1.1	13SD32	0.48
13SD07	0.31	---		13SD25	0.53
13SD21	0.18	---		13SD31	0.24
13SD23	0.2	---		13SD08	0.42
13SD24	0.285	---		13SD20	0.26
13SD27	0.92	---		---	
13SD28	---	---		---	
13SD30	0.81	---		---	
13SD41	0.64	---		---	

Average Conc. (mg/kg) =	0.570	0.570	0.349

Overall Average (mg/kg) = 0.528

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Cadmium Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland Cd contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.47	13SD40	1.85	13SD44	1.2
13SD04	0.14	13SD26	6.8	13SD39	1.4
13SD05	3.1	13SD22	2.2	13SD33	1.3
13SD06	0.09	13SD29	8	13SD32	0.39
13SD07	0.02	---		13SD25	2.2
13SD21	0.07	---		13SD31	1.9
13SD23	0.46	---		13SD08	0.04
13SD24	0.485	---		13SD20	0.14
13SD27	2.9	---		---	
13SD28	---	---		---	
13SD30	5.9	---		---	
13SD41	1.275	---		---	

Average Conc. (mg/kg) =	1.36	4.71	1.07	
			Overall Average (mg/kg) =	2.41

EXCAVATION TO THE WETLAND BOUNDARY

Average Cadmium Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland Cd contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.47	13SD40	1.85	13SD44	1.2
13SD04	0.14	13SD26	6.8	13SD39	1.4
13SD05	3.1	13SD22	2.2	13SD33	1.3
13SD06	0.09	13SD29	8	13SD32	0.39
13SD07	0.02	---		13SD25	2.2
13SD21	0.07	---		13SD31	1.9
13SD23	0.46	---		13SD08	0.04
13SD24	0.485	---		13SD20	0.14
13SD27	2.9	---		---	
13SD28	---	---		---	
13SD30	5.9	---		---	
13SD41	1.275	---		---	

Average Conc. (mg/kg) =	0.460	4.71	1.07	
			Overall Average (mg/kg) =	1.98

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Cadmium Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Excavated Area Wetland Cd contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.47	13SD40	1.85	13SD44	1.2
13SD04	0.14	13SD26	6.8	13SD39	1.4
13SD05	3.1	13SD22	2.2	13SD33	1.3
13SD06	0.09	13SD29	8	13SD32	0.39
13SD07	0.02	---		13SD25	2.2
13SD21	0.07	---		13SD31	1.9
13SD23	0.46	---		13SD08	0.04
13SD24	0.485	---		13SD20	0.14
13SD27	2.9	---		---	
13SD28	---	---		---	
13SD30	5.9	---		---	
13SD41	1.275	---		---	

Average Conc. (mg/kg) =	0.460	0.460	1.07	
			Overall Average (mg/kg) =	0.576

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Chromium Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland Cr contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	23.2	13SD40	231.5	13SD44	24.1
13SD04	19.1	13SD26	118	13SD39	7.3
13SD05	30.1	13SD22	284	13SD33	81
13SD06	22.25	13SD29	138	13SD32	73.6
13SD07	43.8	---		13SD25	39
13SD21	30.9	---		13SD31	43.3
13SD23	31.3	---		13SD08	59.5
13SD24	62.9	---		13SD20	36.9
13SD27	132	---		---	
13SD28	---	---		---	
13SD30	112	---		---	
13SD41	185	---		---	

Average Conc. (mg/kg) =	63.0	193	45.6

Overall Average (mg/kg) = 103

EXCAVATION TO THE WETLAND BOUNDARY

Average Chromium Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland Cr contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	23.2	13SD40	231.5	13SD44	24.1
13SD04	19.1	13SD26	118	13SD39	7.3
13SD05	30.1	13SD22	284	13SD33	81
13SD06	22.25	13SD29	138	13SD32	73.6
13SD07	43.8	---		13SD25	39
13SD21	30.9	---		13SD31	43.3
13SD23	31.3	---		13SD08	59.5
13SD24	62.9	---		13SD20	36.9
13SD27	132	---		---	
13SD28	---	---		---	
13SD30	112	---		---	
13SD41	185	---		---	

Average Conc. (mg/kg) =	56.0	193	45.6

Overall Average (mg/kg) = 99.2

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Chromium Concentration over a 1 acre area of Site 13 (2)

	Excavated Area (outside Wetland Area)	Excavated Area Wetland Cr contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	23.2	13SD40	231.5	13SD44	24.1
13SD04	19.1	13SD26	118	13SD39	7.3
13SD05	30.1	13SD22	284	13SD33	81
13SD06	22.25	13SD29	138	13SD32	73.6
13SD07	43.8	---		13SD25	39
13SD21	30.9	---		13SD31	43.3
13SD23	31.3	---		13SD08	59.5
13SD24	62.9	---		13SD20	36.9
13SD27	132	---		---	
13SD28	---	---		---	
13SD30	112	---		---	
13SD41	185	---		---	

Average Conc. (mg/kg) =	56.0	56.0	45.6

Overall Average (mg/kg) = 54.0

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION				
Average Cobalt Concentration over a 1 acre area of Site 13				
	Excavated Area (outside Wetland Area)	Wetland Co contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.57	13SD40	1.85	13SD44	1.5
13SD04	0.05	13SD26	2.5	13SD39	1.1
13SD05	2.9	13SD22	2.6	13SD33	1.6
13SD06	0.15	13SD29	2.2	13SD32	0.97
13SD07	0.29	---		13SD25	0.83
13SD21	0.3	---		13SD31	0.72
13SD23	0.82	---		13SD08	0.22
13SD24	0.4	---		13SD20	0.36
13SD27	1.7	---		---	
13SD28	---	---		---	
13SD30	3.7	---		---	
13SD41	2.9	---		---	

Average Conc. (mg/kg) =	1.25	2.29	0.913	
			Overall Average (mg/kg) =	1.53

EXCAVATION TO THE WETLAND BOUNDARY				
Average Cobalt Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Wetland Co contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.57	13SD40	1.85	13SD44	1.5
13SD04	0.05	13SD26	2.5	13SD39	1.1
13SD05	2.9	13SD22	2.6	13SD33	1.6
13SD06	0.15	13SD29	2.2	13SD32	0.97
13SD07	0.29	---		13SD25	0.83
13SD21	0.3	---		13SD31	0.72
13SD23	0.82	---		13SD08	0.22
13SD24	0.4	---		13SD20	0.36
13SD27	1.7	---		---	
13SD28	---	---		---	
13SD30	3.7	---		---	
13SD41	2.9	---		---	

Average Conc. (mg/kg) =	2.10	2.29	0.913	
			Overall Average (mg/kg) =	1.94

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET				
Average Cobalt Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Excavated Area Wetland Co contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.57	13SD40	1.85	13SD44	1.5
13SD04	0.05	13SD26	2.5	13SD39	1.1
13SD05	2.9	13SD22	2.6	13SD33	1.6
13SD06	0.15	13SD29	2.2	13SD32	0.97
13SD07	0.29	---		13SD25	0.83
13SD21	0.3	---		13SD31	0.72
13SD23	0.82	---		13SD08	0.22
13SD24	0.4	---		13SD20	0.36
13SD27	1.7	---		---	
13SD28	---	---		---	
13SD30	3.7	---		---	
13SD41	2.9	---		---	

Average Conc. (mg/kg) =	2.10	2.10	0.913	
			Overall Average (mg/kg) =	1.87

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION				
Average Copper Concentration over a 1 acre area of Site 13				
	Excavated Area (outside Wetland Area)	Wetland Cu contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	32.7	13SD40	65.05	13SD44	49.2
13SD04	10.7	13SD26	96.8	13SD39	18.2
13SD05	61.9	13SD22	109	13SD33	49.9
13SD06	10.8	13SD29	110	13SD32	43.7
13SD07	8.5	---		13SD25	36.9
13SD21	3.6	---		13SD31	29.2
13SD23	42.8	---		13SD08	1.8
13SD24	14.05	---		13SD20	3.8
13SD27	91.5	---		---	
13SD28	---	---		---	
13SD30	197	---		---	
13SD41	54.45	---		---	

Average Conc. (mg/kg) =	48.0	95.2	29.1	
			Overall Average (mg/kg) =	60.0

EXCAVATION TO THE WETLAND BOUNDARY				
Average Copper Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Wetland Cu contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	32.7	13SD40	65.05	13SD44	49.2
13SD04	10.7	13SD26	96.8	13SD39	18.2
13SD05	61.9	13SD22	109	13SD33	49.9
13SD06	10.8	13SD29	110	13SD32	43.7
13SD07	8.5	---		13SD25	36.9
13SD21	3.6	---		13SD31	29.2
13SD23	42.8	---		13SD08	1.8
13SD24	14.05	---		13SD20	3.8
13SD27	91.5	---		---	
13SD28	---	---		---	
13SD30	197	---		---	
13SD41	54.45	---		---	

Average Conc. (mg/kg) =	13.0	95.2	29.1	
			Overall Average (mg/kg) =	43.2

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET				
Average Copper Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Excavated Area Wetland Cu contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	32.7	13SD40	65.05	13SD44	49.2
13SD04	10.7	13SD26	96.8	13SD39	18.2
13SD05	61.9	13SD22	109	13SD33	49.9
13SD06	10.8	13SD29	110	13SD32	43.7
13SD07	8.5	---		13SD25	36.9
13SD21	3.6	---		13SD31	29.2
13SD23	42.8	---		13SD08	1.8
13SD24	14.05	---		13SD20	3.8
13SD27	91.5	---		---	
13SD28	---	---		---	
13SD30	197	---		---	
13SD41	54.45	---		---	

Average Conc. (mg/kg) =	13.0	13.0	29.1	
			Overall Average (mg/kg) =	16.1

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION				
Average Iron Concentration over a 1 acre area of Site 13				
	Excavated Area (outside Wetland Area)	Wetland Fe contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	9180	13SD40	46500	13SD44	10100
13SD04	5900	13SD26	33600	13SD39	2620
13SD05	14300	13SD22	69200	13SD33	29100
13SD06	6980	13SD29	43100	13SD32	29700
13SD07	10700	---		13SD25	12500
13SD21	7300	---		13SD31	24500
13SD23	16600	---		13SD08	11400
13SD24	12515	---		13SD20	9080
13SD27	40300	---		---	
13SD28	---	---		---	
13SD30	36400	---		---	
13SD41	35200	---		---	

Average Conc. (mg/kg) =	17761	48100	16125	
			Overall Average (mg/kg) =	27462

EXCAVATION TO THE WETLAND BOUNDARY				
Average Iron Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Wetland Fe contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	9180	13SD40	46500	13SD44	10100
13SD04	5900	13SD26	33600	13SD39	2620
13SD05	14300	13SD22	69200	13SD33	29100
13SD06	6980	13SD29	43100	13SD32	29700
13SD07	10700	---		13SD25	12500
13SD21	7300	---		13SD31	24500
13SD23	16600	---		13SD08	11400
13SD24	12515	---		13SD20	9080
13SD27	40300	---		---	
13SD28	---	---		---	
13SD30	36400	---		---	
13SD41	35200	---		---	

Average Conc. (mg/kg) =	21400	48100	16125	
			Overall Average (mg/kg) =	29209

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET				
Average Iron Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Excavated Area Wetland Fe contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	9180	13SD40	46500	13SD44	10100
13SD04	5900	13SD26	33600	13SD39	2620
13SD05	14300	13SD22	69200	13SD33	29100
13SD06	6980	13SD29	43100	13SD32	29700
13SD07	10700	---		13SD25	12500
13SD21	7300	---		13SD31	24500
13SD23	16600	---		13SD08	11400
13SD24	12515	---		13SD20	9080
13SD27	40300	---		---	
13SD28	---	---		---	
13SD30	36400	---		---	
13SD41	35200	---		---	

Average Conc. (mg/kg) =	21400	21400	16125	
			Overall Average (mg/kg) =	20398

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Lead Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland Pb contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	94.3	13SD40	204.5	13SD44	175
13SD04	30.8	13SD26	290	13SD39	53.3
13SD05	112	13SD22	302	13SD33	176
13SD06	29.5	13SD29	436	13SD32	107
13SD07	37.2	---		13SD25	88.4
13SD21	14.9	---		13SD31	123
13SD23	116	---		13SD08	7.2
13SD24	33.35	---		13SD20	11.5
13SD27	231	---		---	
13SD28	---	---		---	
13SD30	604	---		---	
13SD41	204	---		---	

Average Conc. (mg/kg) =	137	308	92.7

Overall Average (mg/kg) = 185

EXCAVATION TO THE WETLAND BOUNDARY

Average Lead Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland Pb contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	94.3	13SD40	204.5	13SD44	175
13SD04	30.8	13SD26	290	13SD39	53.3
13SD05	112	13SD22	302	13SD33	176
13SD06	29.5	13SD29	436	13SD32	107
13SD07	37.2	---		13SD25	88.4
13SD21	14.9	---		13SD31	123
13SD23	116	---		13SD08	7.2
13SD24	33.35	---		13SD20	11.5
13SD27	231	---		---	
13SD28	---	---		---	
13SD30	604	---		---	
13SD41	204	---		---	

Average Conc. (mg/kg) =	34.3	308	92.7

Overall Average (mg/kg) = 136

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Lead Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Excavated Area Wetland Pb contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	94.3	13SD40	204.5	13SD44	175
13SD04	30.8	13SD26	290	13SD39	53.3
13SD05	112	13SD22	302	13SD33	176
13SD06	29.5	13SD29	436	13SD32	107
13SD07	37.2	---		13SD25	88.4
13SD21	14.9	---		13SD31	123
13SD23	116	---		13SD08	7.2
13SD24	33.35	---		13SD20	11.5
13SD27	231	---		---	
13SD28	---	---		---	
13SD30	604	---		---	
13SD41	204	---		---	

Average Conc. (mg/kg) =	34.3	34.3	92.7

Overall Average (mg/kg) = 45.4

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Manganese Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland Mn contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	21.9	13SD40	24.85	13SD44	19.9
13SD04	12.4	13SD26	25.9	13SD39	37.1
13SD05	28.8	13SD22	48.7	13SD33	42.8
13SD06	13.3	13SD29	30.1	13SD32	14.6
13SD07	22.4	---		13SD25	12.6
13SD21	6.1	---		13SD31	54.5
13SD23	49.9	---		13SD08	9.3
13SD24	13.2	---		13SD20	9.7
13SD27	24.5	---		---	
13SD28	---	---		---	
13SD30	40.3	---		---	
13SD41	21	---		---	

Average Conc. (mg/kg) =	23.1	32.4	25.1

Overall Average (mg/kg) = 26.5

EXCAVATION TO THE WETLAND BOUNDARY

Average Manganese Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland Mn contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	21.9	13SD40	24.85	13SD44	19.9
13SD04	12.4	13SD26	25.9	13SD39	37.1
13SD05	28.8	13SD22	48.7	13SD33	42.8
13SD06	13.3	13SD29	30.1	13SD32	14.6
13SD07	22.4	---		13SD25	12.6
13SD21	6.1	---		13SD31	54.5
13SD23	49.9	---		13SD08	9.3
13SD24	13.2	---		13SD20	9.7
13SD27	24.5	---		---	
13SD28	---	---		---	
13SD30	40.3	---		---	
13SD41	21	---		---	

Average Conc. (mg/kg) =	63.1	32.4	25.1

Overall Average (mg/kg) = 45.7

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Manganese Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Excavated Area Wetland Mn contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	21.9	13SD40	24.85	13SD44	19.9
13SD04	12.4	13SD26	25.9	13SD39	37.1
13SD05	28.8	13SD22	48.7	13SD33	42.8
13SD06	13.3	13SD29	30.1	13SD32	14.6
13SD07	22.4	---		13SD25	12.6
13SD21	6.1	---		13SD31	54.5
13SD23	49.9	---		13SD08	9.3
13SD24	13.2	---		13SD20	9.7
13SD27	24.5	---		---	
13SD28	---	---		---	
13SD30	40.3	---		---	
13SD41	21	---		---	

Average Conc. (mg/kg) =	63.1	63.1	25.1

Overall Average (mg/kg) = 55.9

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Mercury Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland Hg contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.19	13SD40	1.5	13SD44	0.8
13SD04	0.12	13SD26	1.8	13SD39	0.51
13SD05	0.23	13SD22	2	13SD33	0.93
13SD06	0.095	13SD29	2.6	13SD32	0.52
13SD07	0.15	---		13SD25	0.46
13SD21	0.06	---		13SD31	1
13SD23	0.51	---		13SD08	0.005
13SD24	0.175	---		13SD20	0.36
13SD27	1.8	---		---	
13SD28	---	---		---	
13SD30	4.2	---		---	
13SD41	1.105	---		---	

Average Conc. (mg/kg) =	0.785	1.98	0.573

Overall Average (mg/kg) = 1.14

EXCAVATION TO THE WETLAND BOUNDARY

Average Mercury Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland Hg contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.19	13SD40	1.5	13SD44	0.8
13SD04	0.12	13SD26	1.8	13SD39	0.51
13SD05	0.23	13SD22	2	13SD33	0.93
13SD06	0.095	13SD29	2.6	13SD32	0.52
13SD07	0.15	---		13SD25	0.46
13SD21	0.06	---		13SD31	1
13SD23	0.51	---		13SD08	0.005
13SD24	0.175	---		13SD20	0.36
13SD27	1.8	---		---	
13SD28	---	---		---	
13SD30	4.2	---		---	
13SD41	1.105	---		---	

Average Conc. (mg/kg) =	0.0680	1.98	0.573

Overall Average (mg/kg) = 0.793

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Mercury Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Excavated Area Wetland Hg contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.19	13SD40	1.5	13SD44	0.8
13SD04	0.12	13SD26	1.8	13SD39	0.51
13SD05	0.23	13SD22	2	13SD33	0.93
13SD06	0.095	13SD29	2.6	13SD32	0.52
13SD07	0.15	---		13SD25	0.46
13SD21	0.06	---		13SD31	1
13SD23	0.51	---		13SD08	0.005
13SD24	0.175	---		13SD20	0.36
13SD27	1.8	---		---	
13SD28	---	---		---	
13SD30	4.2	---		---	
13SD41	1.105	---		---	

Average Conc. (mg/kg) =	0.0680	0.0680	0.573

Overall Average (mg/kg) = 0.164

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Nickel Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland Ni contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	3	13SD40	10.3	13SD44	12.6
13SD04	1.2	13SD26	14.6	13SD39	11.4
13SD05	14.3	13SD22	13.4	13SD33	10.6
13SD06	1.7	13SD29	14.7	13SD32	4.9
13SD07	2.2	---		13SD25	5.8
13SD21	1.1	---		13SD31	6.5
13SD23	4.1	---		13SD08	1.5
13SD24	2.55	---		13SD20	1.4
13SD27	9.8	---		---	
13SD28	---	---		---	
13SD30	20.8	---		---	
13SD41	12.55	---		---	

Average Conc. (mg/kg) =	6.66	13.3	6.84

Overall Average (mg/kg) = 8.87

EXCAVATION TO THE WETLAND BOUNDARY

Average Nickel Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland Ni contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	3	13SD40	10.3	13SD44	12.6
13SD04	1.2	13SD26	14.6	13SD39	11.4
13SD05	14.3	13SD22	13.4	13SD33	10.6
13SD06	1.7	13SD29	14.7	13SD32	4.9
13SD07	2.2	---		13SD25	5.8
13SD21	1.1	---		13SD31	6.5
13SD23	4.1	---		13SD08	1.5
13SD24	2.55	---		13SD20	1.4
13SD27	9.8	---		---	
13SD28	---	---		---	
13SD30	20.8	---		---	
13SD41	12.55	---		---	

Average Conc. (mg/kg) =	6.00	13.3	6.84

Overall Average (mg/kg) = 8.55

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Nickel Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Excavated Area Wetland Ni contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	3	13SD40	10.3	13SD44	12.6
13SD04	1.2	13SD26	14.6	13SD39	11.4
13SD05	14.3	13SD22	13.4	13SD33	10.6
13SD06	1.7	13SD29	14.7	13SD32	4.9
13SD07	2.2	---		13SD25	5.8
13SD21	1.1	---		13SD31	6.5
13SD23	4.1	---		13SD08	1.5
13SD24	2.55	---		13SD20	1.4
13SD27	9.8	---		---	
13SD28	---	---		---	
13SD30	20.8	---		---	
13SD41	12.55	---		---	

Average Conc. (mg/kg) =	6.00	6.00	6.84

Overall Average (mg/kg) = 6.16

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Selenium Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland Se contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.45	13SD40	4.75	13SD44	3.8
13SD04	0.205	13SD26	2.7	13SD39	0.7
13SD05	0.72	13SD22	1.4	13SD33	3.2
13SD06	0.2275	13SD29	2.9	13SD32	3.4
13SD07	0.49	---		13SD25	1.7
13SD21	0.15	---		13SD31	2.6
13SD23	0.135	---		13SD08	0.17
13SD24	0.3275	---		13SD20	0.125
13SD27	2.4	---		---	
13SD28	---	---		---	
13SD30	2.1	---		---	
13SD41	4.05	---		---	

Average Conc. (mg/kg) =	1.02	2.94	1.96

Overall Average (mg/kg) = 1.83

EXCAVATION TO THE WETLAND BOUNDARY

Average Selenium Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland Se contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.45	13SD40	4.75	13SD44	3.8
13SD04	0.205	13SD26	2.7	13SD39	0.7
13SD05	0.72	13SD22	1.4	13SD33	3.2
13SD06	0.2275	13SD29	2.9	13SD32	3.4
13SD07	0.49	---		13SD25	1.7
13SD21	0.15	---		13SD31	2.6
13SD23	0.135	---		13SD08	0.17
13SD24	0.3275	---		13SD20	0.125
13SD27	2.4	---		---	
13SD28	---	---		---	
13SD30	2.1	---		---	
13SD41	4.05	---		---	

Average Conc. (mg/kg) =	0	2.94	1.96

Overall Average (mg/kg) = 1.34

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Selenium Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Excavated Area Wetland Se contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.45	13SD40	4.75	13SD44	3.8
13SD04	0.205	13SD26	2.7	13SD39	0.7
13SD05	0.72	13SD22	1.4	13SD33	3.2
13SD06	0.2275	13SD29	2.9	13SD32	3.4
13SD07	0.49	---		13SD25	1.7
13SD21	0.15	---		13SD31	2.6
13SD23	0.135	---		13SD08	0.17
13SD24	0.3275	---		13SD20	0.125
13SD27	2.4	---		---	
13SD28	---	---		---	
13SD30	2.1	---		---	
13SD41	4.05	---		---	

Average Conc. (mg/kg) =	0	0	1.96

Overall Average (mg/kg) = 0.373

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION

Average Silver Concentration over a 1 acre area of Site 13

	Excavated Area (outside Wetland Area)	Wetland Ag contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	22.7	13SD40	18.15	13SD44	2.7
13SD04	10.9	13SD26	60.7	13SD39	1.5
13SD05	34.3	13SD22	55.8	13SD33	8.4
13SD06	15.3	13SD29	52.6	13SD32	4.4
13SD07	13.1	---		13SD25	12.3
13SD21	4.5	---		13SD31	2.1
13SD23	42.3	---		13SD08	1.6
13SD24	9.6	---		13SD20	14.3
13SD27	79.5	---		---	
13SD28	---	---		---	
13SD30	147	---		---	
13SD41	25.65	---		---	

Average Conc. (mg/kg) =	36.8	46.8	5.91
			Overall Average (mg/kg) = 34.2

EXCAVATION TO THE WETLAND BOUNDARY

Average Silver Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Wetland Ag contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	22.7	13SD40	18.15	13SD44	2.7
13SD04	10.9	13SD26	60.7	13SD39	1.5
13SD05	34.3	13SD22	55.8	13SD33	8.4
13SD06	15.3	13SD29	52.6	13SD32	4.4
13SD07	13.1	---		13SD25	12.3
13SD21	4.5	---		13SD31	2.1
13SD23	42.3	---		13SD08	1.6
13SD24	9.6	---		13SD20	14.3
13SD27	79.5	---		---	
13SD28	---	---		---	
13SD30	147	---		---	
13SD41	25.65	---		---	

Average Conc. (mg/kg) =	0.150	46.8	5.91
			Overall Average (mg/kg) = 16.6

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET

Average Silver Concentration over a 1 acre area of Site 13[2]

	Excavated Area (outside Wetland Area)	Excavated Area Wetland Ag contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	22.7	13SD40	18.15	13SD44	2.7
13SD04	10.9	13SD26	60.7	13SD39	1.5
13SD05	34.3	13SD22	55.8	13SD33	8.4
13SD06	15.3	13SD29	52.6	13SD32	4.4
13SD07	13.1	---		13SD25	12.3
13SD21	4.5	---		13SD31	2.1
13SD23	42.3	---		13SD08	1.6
13SD24	9.6	---		13SD20	14.3
13SD27	79.5	---		---	
13SD28	---	---		---	
13SD30	147	---		---	
13SD41	25.65	---		---	

Average Conc. (mg/kg) =	0.150	0.150	5.91
			Overall Average (mg/kg) = 1.24

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION				
Average Thallium Concentration over a 1 acre area of Site 13				
	Excavated Area (outside Wetland Area)	Wetland Th contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.37	13SD40	0.65	13SD44	1
13SD04	0.22	13SD26	0.6	13SD39	1.3
13SD05	0.16	13SD22	0.425	13SD33	0.9
13SD06	0.24	13SD29	0.7	13SD32	0.55
13SD07	0.23	---		13SD25	0.65
13SD21	0.28	---		13SD31	1.05
13SD23	0.255	---		13SD08	0.18
13SD24	0.275	---		13SD20	0.235
13SD27	0.41	---		---	
13SD28	---	---		---	
13SD30	0.7	---		---	
13SD41	0.825	---		---	

Average Conc. (mg/kg) =	0.360	0.594	0.733
		Overall Average (mg/kg) =	0.508

EXCAVATION TO THE WETLAND BOUNDARY				
Average Thallium Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Wetland Th contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.37	13SD40	0.65	13SD44	1
13SD04	0.22	13SD26	0.6	13SD39	1.3
13SD05	0.16	13SD22	0.425	13SD33	0.9
13SD06	0.24	13SD29	0.7	13SD32	0.55
13SD07	0.23	---		13SD25	0.65
13SD21	0.28	---		13SD31	1.05
13SD23	0.255	---		13SD08	0.18
13SD24	0.275	---		13SD20	0.235
13SD27	0.41	---		---	
13SD28	---	---		---	
13SD30	0.7	---		---	
13SD41	0.825	---		---	

Average Conc. (mg/kg) =	0	0.594	0.733
		Overall Average (mg/kg) =	0.335

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET				
Average Thallium Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Excavated Area Wetland Th contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	0.37	13SD40	0.65	13SD44	1
13SD04	0.22	13SD26	0.6	13SD39	1.3
13SD05	0.16	13SD22	0.425	13SD33	0.9
13SD06	0.24	13SD29	0.7	13SD32	0.55
13SD07	0.23	---		13SD25	0.65
13SD21	0.28	---		13SD31	1.05
13SD23	0.255	---		13SD08	0.18
13SD24	0.275	---		13SD20	0.235
13SD27	0.41	---		---	
13SD28	---	---		---	
13SD30	0.7	---		---	
13SD41	0.825	---		---	

Average Conc. (mg/kg) =	0	0	0.733
		Overall Average (mg/kg) =	0.139

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION				
Average Vanadium Concentration over a 1 acre area of Site 13				
	Excavated Area (outside Wetland Area)	Wetland V contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	20	13SD40	146.5	13SD44	37.3
13SD04	18.4	13SD26	118	13SD39	9.1
13SD05	24.9	13SD22	253	13SD33	90.4
13SD06	19.3	13SD29	134	13SD32	70.2
13SD07	44.2	---		13SD25	31.4
13SD21	32.9	---		13SD31	34.7
13SD23	25.4	---		13SD08	61.7
13SD24	34.45	---		13SD20	39.4
13SD27	120	---		---	
13SD28	---	---		---	
13SD30	105	---		---	
13SD41	118.05	---		---	

Average Conc. (mg/kg) =	51.1	163	46.8	
			Overall Average (mg/kg) =	87.2

EXCAVATION TO THE WETLAND BOUNDARY				
Average Vanadium Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Wetland V contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	20	13SD40	146.5	13SD44	37.3
13SD04	18.4	13SD26	118	13SD39	9.1
13SD05	24.9	13SD22	253	13SD33	90.4
13SD06	19.3	13SD29	134	13SD32	70.2
13SD07	44.2	---		13SD25	31.4
13SD21	32.9	---		13SD31	34.7
13SD23	25.4	---		13SD08	61.7
13SD24	34.45	---		13SD20	39.4
13SD27	120	---		---	
13SD28	---	---		---	
13SD30	105	---		---	
13SD41	118.05	---		---	

Average Conc. (mg/kg) =	42.7	163	46.8	
			Overall Average (mg/kg) =	83.1

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET				
Average Vanadium Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Excavated Area Wetland V contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	20	13SD40	146.5	13SD44	37.3
13SD04	18.4	13SD26	118	13SD39	9.1
13SD05	24.9	13SD22	253	13SD33	90.4
13SD06	19.3	13SD29	134	13SD32	70.2
13SD07	44.2	---		13SD25	31.4
13SD21	32.9	---		13SD31	34.7
13SD23	25.4	---		13SD08	61.7
13SD24	34.45	---		13SD20	39.4
13SD27	120	---		---	
13SD28	---	---		---	
13SD30	105	---		---	
13SD41	118.05	---		---	

Average Conc. (mg/kg) =	42.7	42.7	46.8	
			Overall Average (mg/kg) =	43.5

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-1
AVERAGE CHEMICAL CONCENTRATIONS OVER ONE ACRE AREA[1]
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

NO EXCAVATION				
Average Zinc Concentration over a 1 acre area of Site 13				
	Excavated Area (outside Wetland Area)	Wetland Zn contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	54.7	13SD40	65.7	13SD44	59
13SD04	14.6	13SD26	175	13SD39	101
13SD05	47.9	13SD22	108	13SD33	68.3
13SD06	14.8	13SD29	109	13SD32	32.5
13SD07	13.4	---		13SD25	53.7
13SD21	8.5	---		13SD31	81.5
13SD23	86.5	---		13SD08	59.8
13SD24	22.6	---		13SD20	16.5
13SD27	73	---		---	
13SD28	---	---		---	
13SD30	205	---		---	
13SD41	67.85	---		---	

Average Conc. (mg/kg) =	55.4	114.4	59.04	
			Overall Average (mg/kg) =	75.5

EXCAVATION TO THE WETLAND BOUNDARY				
Average Zinc Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Wetland Zn contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	54.7	13SD40	65.7	13SD44	59
13SD04	14.6	13SD26	175	13SD39	101
13SD05	47.9	13SD22	108	13SD33	68.3
13SD06	14.8	13SD29	109	13SD32	32.5
13SD07	13.4	---		13SD25	53.7
13SD21	8.5	---		13SD31	81.5
13SD23	86.5	---		13SD08	59.8
13SD24	22.6	---		13SD20	16.5
13SD27	73	---		---	
13SD28	---	---		---	
13SD30	205	---		---	
13SD41	67.85	---		---	

Average Conc. (mg/kg) =	34.7	114.425	59.0375	
			Overall Average (mg/kg) =	65.6

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

EXCAVATION TO 1.0 PCB CONCENTRATION CONTOUR SET				
Average Zinc Concentration over a 1 acre area of Site 13[2]				
	Excavated Area (outside Wetland Area)	Excavated Area Wetland Zn contamination in excess of 1.0 PCBs	Rest of the area	Total
Area (ac.) =	0.48	0.33	0.19	1.0

Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)	Sample	Conc. (mg/kg)
13SD03	54.7	13SD40	65.7	13SD44	59
13SD04	14.6	13SD26	175	13SD39	101
13SD05	47.9	13SD22	108	13SD33	68.3
13SD06	14.8	13SD29	109	13SD32	32.5
13SD07	13.4	---		13SD25	53.7
13SD21	8.5	---		13SD31	81.5
13SD23	86.5	---		13SD08	59.8
13SD24	22.6	---		13SD20	16.5
13SD27	73	---		---	
13SD28	---	---		---	
13SD30	205	---		---	
13SD41	67.85	---		---	

Average Conc. (mg/kg) =	34.7	34.7	59.0375	
			Overall Average (mg/kg) =	39.32

(1) Concentrations consider the 0-6" samples of an assumed 1.0 acre area (see Figure 4).
(2) The bolded concentrations represent excavated areas that were replaced with assumed backfill concentration based on the maximum background sediment concentration for NWS Earle

TABLE B-2

TERRESTRIAL FOOD CHAIN MODELING EXPOSURE FACTORS
SITE 13 DPDO YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

	Data from EPA (1993)			Derivation of Factors for Modeling		
Species/Factor	**Age/Sex/ Cond./Seas.**	**Value**	**Study Average**	**Calculation of Values**		**Notes**
American Robin						
Body Weight (g)	A B	77.3	77.3	Minimum Value	0.0773 kg	
				Maximum Value	0.0862 kg	
	A M nonbreeding	86.2		Overall Study Average	0.0804 kg	
	A F nonbreeding	83.6	84.9			
	A M breeding	77.4				
	A F breeding	80.6	79			
Food Ingestion Rate (g/g-day)				Average Value	0.01188 kg/day	Used average body weight in below equation Food ingestion rates were calculated from Nagy et al., (1999) for insectivores as follows: $FI = (9.7*BW(g)^{0.705})/18kJ/g/1000$
Short-Tailed Shrew						
Body Weight (g)	A B	15	15	Minimum Value	0.0150 kg	
				Maximum Value	0.01921 kg	
	M summer	19.21	17.27	Overall Study Average	0.01613 kg	
	F summer	17.4				
	M fall	16.87				
	M fall	15.58				
Food Ingestion Rate (g/g-day)	A B	0.49		Average value	0.00143 kg/day	Average ingestion rate * Average Body weight * 0.16[1] [1] - 0.16 = percent solids in earthworms to convert to a dry weight ingestion rate
	A B	0.62				
	Overall Study Average		0.555			

Notes:
A = Adult
F = Female, M = Male, B = Both
BW = Body Weight

TABLE B-3

TOXICITY REFERENCE VALUES
NWS EARLE, COLTS NECK, NEW JERSEY

PARAMETER	Mammal		Bird	
	NOAEL	LOAEL	NOAEL	LOAEL
PESTICIDES/PCBs (mg/kg)				
Aroclor-1232	0.068	0.68	0.18	1.8
Aroclor-1242	0.069	0.69	0.41	4.1
Aroclor-1248	0.01	0.1	NV	NV
Aroclor-1254	0.068	0.68	0.18	1.8
Aroclor-1260	0.068	0.68	0.18	1.8
INORGANICS (mg/kg)				
Arsenic	0.126	1.26	2.46	7.38
Cadmium	1	10	1.45	20
Chromium	3.28	13.14	1	5
Hexavalent Chromium	3.28	13.14	1	5
Copper	11.71	15.14	46.97	61.72
Lead	8	80	1.13	11.3
Mercury	0.032	0.16	0.0064	0.064
Nickel	40	80	77.4	107
Selenium	0.2	0.33	0.4	0.8
Silver	2.38	23.8	5.44	54.4
Zinc	160	320	14.49	130.9

Notes:
The sources of these NOAELS and LOAELS are presented in Table B-4.

The NOAELS and LOAELS in the source table were divided by 10 if a subchronic study was the basis for the value. Also, if only a NOAEL was available, the value was multiplied by 10 to estimate the LOAEL. If only a LOAEL was available, the value was divided by 10 to estimate the NOAEL.

TABLE B-4

SOURCES AND ENDPOINTS FOR TOXICITY REFERENCE VALUES FOR TERRESTRIAL WILDLIFE
NWS EARLE, COLTS NECK, NEW JERSEY

Parameters	Concentration (mg/kg-day)	Endpoint	Effect	Chronic/ Subchronic	Species	Primary Reference	Source of Reference
PCBs							
Aroclor-1242	0.685	LOAEL	reproduction	chronic	mink	Bleavins et al., 1980	Sample et.al., 1996
Aroclor-1242	0.41	NOAEL	reproduction	chronic	screech owl	McLane and Hughes, 1980	Sample et.al., 1996
Aroclor-1248	0.1	LOAEL	reproductive	chronic	rhesus monkey	Barsotti et al., 1976	Sample et.al., 1996
Aroclor-1254	1.8	LOAEL	reproductive	chronic	pheasant	Dahlgren et al., 1972	Sample et.al., 1996
Aroclor-1254	0.68	LOAEL	reproduction	chronic	mouse	McCoy et al., 1995	Sample et.al., 1996
Inorganics							
Arsenic	1.261	LOAEL	reproductive	chronic	mouse	Schroeder and Mitchner, 1971	Sample et.al., 1996
Arsenic	2.46	NOAEL	mortality	chronic	brown-headed cowbird	USFWS, 1969	Sample et.al., 1996
Arsenic	7.38	LOAEL	mortality	chronic	brown-headed cowbird	USFWS, 1969	Sample et.al., 1996
Cadmium	1	NOAEL	reproductive	chronic	rat	Sutou et al., 1980	Sample et.al., 1996
Cadmium	10	LOAEL	reproductive	chronic	rat	Sutou et al., 1980	Sample et.al., 1996
Cadmium	1.45	NOAEL	reproductive	chronic	mallard duck	White and Finely, 1978	Sample et.al., 1996
Cadmium	20	LOAEL	reproductive	chronic	mallard duck	White and Finely, 1978	Sample et.al., 1996
Chromium(III)	1	NOAEL	reproductive	chronic	black duck	Haseltine et al., unpubl.	Sample et.al., 1996
Chromium(III)	5	LOAEL	reproductive	chronic	black duck	Haseltine et al., unpubl.	Sample et.al., 1996
Chromium(VI)	3.28	NOAEL	BW/food cons.	chronic	rat	Mackenzie et al., 1958	Sample et.al., 1996
Chromium(VI)	131.4	LOAEL	mortality	subchronic	rat	Steven et al., 1976	Sample et.al., 1996
Cobalt	12	LOAEL	growth	chronic	rat	Domingo et al., 1985	Eng. Field Activity,1998
Copper	11.71	NOAEL	reproductive	chronic	mink	Aulerich et al., 1982	ATSDR, 1989
Copper	15.14	LOAEL	reproductive	chronic	mink	Aulerich et al., 1982	ATSDR, 1989
Copper	46.97	NOAEL	mortality	chronic	chicks	Mehring et al., 1960	Sample et.al., 1996
Copper	61.72	LOAEL	mortality	chronic	chicks	Mehring et al., 1960	Sample et.al., 1996
Lead	8	NOAEL	reproductive	chronic	rat	Azar et al., 1973	Sample et.al., 1996
Lead	80	LOAEL	reproductive	chronic	rat	Azar et al., 1973	Sample et.al., 1996
Lead	1.13	NOAEL	reproductive	chronic	Japanese quail	Edens et al., 1976	Sample et.al., 1996
Lead	11.3	LOAEL	reproductive	chronic	Japanese quail	Edens et al., 1976	Sample et.al., 1996
Mercury	0.064	LOAEL	reproductive	chronic	mallard duck	Heinz, 1979	Sample et.al., 1996
Mercury	0.032	NOAEL	reproductive	chronic	rat	Verschuuren et al., 1976	Sample et.al., 1996
Mercury	0.16	LOAEL	reproductive	chronic	rat	Verschuuren et al., 1976	Sample et.al., 1996
Nickel	40	NOAEL	reproductive	chronic	rat	Ambrose et al., 1976	Sample et.al., 1996
Nickel	80	LOAEL	reproductive	chronic	rat	Ambrose et al., 1976	Sample et.al., 1996
Nickel	77.4	NOAEL	mortality	chronic	mallard duck	Cain and Pafford, 1981	Sample et.al., 1996
Nickel	107	LOAEL	mortality	chronic	mallard duck	Cain and Pafford, 1981	Sample et.al., 1996
Selenium	0.4	NOAEL	reproductive	chronic	mallard duck	Heinz et al., 1989	Sample et.al., 1996
Selenium	0.8	LOAEL	reproductive	chronic	mallard duck	Heinz et al., 1989	Sample et.al., 1996
Selenium	0.2	NOAEL	reproductive	chronic	rat	Rosenfeld and Beath, 1954	Sample et.al., 1996
Selenium	0.33	LOAEL	reproductive	chronic	rat	Rosenfeld and Beath, 1954	Sample et.al., 1996
Silver	54.4	LOAEL	survival	chronic	chicks	Petersen and Jensen, 1975	
Silver	23.81	LOAEL	weight loss	chronic	mouse	Rungby and Danscher, 1984	
Zinc	160	NOAEL	reproductive	chronic	rat	Schlicker and Cox, 1968	Sample et.al., 1996
Zinc	320	LOAEL	reproductive	chronic	rat	Schlicker and Cox, 1968	Sample et.al., 1996
Zinc	14.49	NOAEL	reproductive	chronic	white leghorn hen	Stahl et al., 1990	Sample et.al., 1996
Zinc	130.9	LOAEL	reproductive	chronic	white leghorn hen	Stahl et al., 1990	Sample et.al., 1996

TABLE B-5
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
SHORT-TAILED SHREW - AVERAGE INPUT PARAMETERS AND CONCENTRATIONS EXCAVATING TO THE WETLAND BOUNDARY
SITE 13 DEFENSE PROPERTY DISPOSAL OFFICE (DPDO) YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

Chemical	Avg Soil Concentration (mg/kg)(1)	Avg Biotransfer Factor (soil to inv.)(2)	Earthworm Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)(3)	LOAEL (mg/kg/day)(3)	NOAEL EEQn	LOAEL EEQl
PCBs								
Total PCBs	2.21E+00	6.67E+00	1.47E+01	1.31E+00	6.80E-02	6.80E-01	1.92E+01	1.92E+00
Metals								
Arsenic	1.67E+01	2.24E-01	3.74E+00	3.54E-01	1.26E-01	1.26E+00	2.81E+00	2.81E-01
Cadmium	1.98E+00	7.71E+00	1.53E+01	1.36E+00	1.00E+00	1.00E+01	1.36E+00	1.36E-01
Chromium	9.92E+01	3.06E-01	3.04E+01	2.82E+00	3.28E+00	1.31E+01	8.61E-01	2.15E-01
Copper	4.32E+01	5.15E-01	2.22E+01	2.03E+00	1.17E+01	1.51E+01	1.73E-01	1.34E-01
Lead	1.36E+02	2.66E-01	3.62E+01	3.39E+00	8.00E+00	8.00E+01	4.24E-01	4.24E-02
Mercury	7.93E-01	1.69E+00	1.34E+00	1.20E-01	3.20E-02	1.60E-01	3.75E+00	7.50E-01
Nickel	8.55E+00	1.06E+00	9.05E+00	8.14E-01	4.00E+01	8.00E+01	2.04E-02	1.02E-02
Selenium	1.34E+00	9.85E-01	1.32E+00	1.19E-01	2.00E-01	3.30E-01	5.94E-01	3.60E-01
Silver	1.66E+01	2.05E+00	3.39E+01	3.03E+00	2.38E+00	2.38E+01	1.27E+00	1.27E-01
Zinc	6.56E+01	3.20E+00	2.10E+02	1.87E+01	1.60E+02	3.20E+02	1.17E-01	5.84E-02

Body Weight = (BW)	1.613E-02	kg
Food Ingestion Rate = (If)	1.430E-03	kg/day
Soil Ingestion Rate = (Is)	2.145E-05	kg/day

Dose=(If*Ce+Is*Cs)/BW
Cs = Contaminant concentration in soil
Ce = Contaminant concentration in earthworm (=soil conc.* BF)
BF = Soil to invertebrate biotransfer factor

Footnotes:
(1) See Table 6 for source of soil concentrations. Concentration is the average concentration when excavating to the wetland boundary.
(2) Source of Biotransfer Factors is ORNL (September, 1998) for all chemicals; value used is median value.
(3) See Tables B-3 for a summary of the NOAELs and LOAELs and their sources.

TABLE B-6
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
AMERICAN ROBIN - AVERAGE INPUT PARAMETERS AND CONCENTRATIONS EXCAVATING TO THE WETLAND BOUNDARY
SITE 13 DEFENSE PROPERTY DISPOSAL OFFICE (DPDO) YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

Chemical	Avg Soil Concentration (mg/kg)(1)	Avg Biotransfer Factor (soil to inv.)(2)	Earthworm Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)(3)	LOAEL (mg/kg/day)(3)	NOAEL EEQn	LOAEL EEQl
PCBs								
Total PCBs	2.21E+00	6.67E+00	1.47E+01	2.18E+00	1.80E-01	1.80E+00	1.21E+01	1.21E+00
Metals								
Arsenic	1.67E+01	2.24E-01	3.74E+00	5.90E-01	2.46E+00	7.38E+00	2.40E-01	7.99E-02
Cadmium	1.98E+00	7.71E+00	1.53E+01	2.26E+00	1.45E+00	2.00E+01	1.56E+00	1.13E-01
Chromium	9.92E+01	3.06E-01	3.04E+01	4.71E+00	1.00E+00	5.00E+00	4.71E+00	9.41E-01
Copper	4.32E+01	5.15E-01	2.22E+01	3.38E+00	4.70E+01	6.17E+01	7.20E-02	5.48E-02
Lead	1.36E+02	2.66E-01	3.62E+01	5.65E+00	1.13E+00	1.13E+01	5.00E+00	5.00E-01
Mercury	7.93E-01	1.69E+00	1.34E+00	2.00E-01	6.40E-03	6.40E-02	3.13E+01	3.13E+00
Nickel	8.55E+00	1.06E+00	9.05E+00	1.36E+00	7.74E+01	1.07E+02	1.75E-02	1.27E-02
Selenium	1.34E+00	9.85E-01	1.32E+00	1.98E-01	4.00E-01	8.00E-01	4.95E-01	2.48E-01
Silver	1.66E+01	2.05E+00	3.39E+01	5.05E+00	5.44E+00	5.44E+01	9.29E-01	9.29E-02
Zinc	6.56E+01	3.20E+00	2.10E+02	3.12E+01	1.45E+01	1.31E+02	2.15E+00	2.38E-01

Body Weight = (BW)	8.040E-02 kg	Dose=(If*Ce+Is*Cs)/BW
Food Ingestion Rate = (If)	1.188E-02 kg/day	Cs = Contaminant concentration in soil
Soil Ingestion Rate = (Is)	1.782E-04 kg/day	Ce (Contaminant concentration in earthworm) =soil conc.* BF
		BF = Soil to invertebrate biotransfer factor

Footnotes:
(1) See Table 6 for source of soil concentrations. Concentration is the average concentration when excavating to the wetland boundary.
(2) Source of Biotransfer Factors is ORNL (September, 1998) for all chemicals; value used is median value.
(3) See Tables B-3 for a summary of the NOAELs and LOAELs and their sources.

TABLE B-7
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
SHORT-TAILED SHREW - AVERAGE INPUT PARAMETERS AND CONCENTRATIONS EXCAVATING TO 1.0 PCB LINE
SITE 13 DEFENSE PROPERTY DISPOSAL OFFICE (DPDO) YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

Chemical	Avg Soil Concentration (mg/kg)(1)	Avg Biotransfer Factor (soil to inv.)(2)	Earthworm Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)(3)	LOAEL (mg/kg/day)(3)	NOAEL EEQn	LOAEL EEQl
PCBs								
Total PCBs	8.65E-02	6.67E+00	5.77E-01	5.13E-02	6.80E-02	6.80E-01	7.54E-01	7.54E-02
Metals								
Arsenic	1.02E+01	2.24E-01	2.28E+00	2.16E-01	1.26E-01	1.26E+00	1.72E+00	1.72E-01
Cadmium	5.76E-01	7.71E+00	4.44E+00	3.94E-01	1.00E+00	1.00E+01	3.94E-01	3.94E-02
Chromium	5.40E+01	3.06E-01	1.65E+01	1.54E+00	3.28E+00	1.31E+01	4.69E-01	1.17E-01
Copper	1.61E+01	5.15E-01	8.29E+00	7.56E-01	1.17E+01	1.51E+01	6.46E-02	5.00E-02
Lead	4.54E+01	2.66E-01	1.21E+01	1.13E+00	8.00E+00	8.00E+01	1.41E-01	1.41E-02
Mercury	1.64E-01	1.69E+00	2.78E-01	2.48E-02	3.20E-02	1.60E-01	7.76E-01	1.55E-01
Nickel	6.16E+00	1.06E+00	6.52E+00	5.87E-01	4.00E+01	8.00E+01	1.47E-02	7.33E-03
Selenium	3.73E-01	9.85E-01	3.67E-01	3.31E-02	2.00E-01	3.30E-01	1.65E-01	1.00E-01
Silver	1.24E+00	2.05E+00	2.54E+00	2.26E-01	2.38E+00	2.38E+01	9.52E-02	9.52E-03
Zinc	3.93E+01	3.20E+00	1.26E+02	1.12E+01	1.60E+02	3.20E+02	7.01E-02	3.50E-02

Body Weight = (BW)	1.613E-02	kg
Food Ingestion Rate = (If)	1.430E-03	kg/day
Soil Ingestion Rate = (Is)	2.145E-05	kg/day

Dose=(If*Ce+Is*Cs)/BW
Cs = Contaminant concentration in soil
Ce = Contaminant concentration in earthworm (=soil conc.* BF)
BF = Soil to invertebrate biotransfer factor

Footnotes:
(1) See Table 6 for source of soil concentrations. Concentration is the average concentration when excavating to the 1.0 PCB line.
(2) Source of Biotransfer Factors is ORNL (September, 1998) for all chemicals; value used is median value.
(3) See Tables B-3 for a summary of the NOAELs and LOAELs and their sources.

TABLE B-8
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
AMERICAN ROBIN - AVERAGE INPUT PARAMETERS AND CONCENTRATIONS EXCAVATING TO 1.0 PCB LINE
SITE 13 DEFENSE PROPERTY DISPOSAL OFFICE (DPDO) YARD, COLTS NECK, NJ
NAVAL WEAPONS CENTER EARLE

Chemical	Avg Soil Concentration (mg/kg)(1)	Avg Biotransfer Factor (soil to inv.)(2)	Earthworm Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)(3)	LOAEL (mg/kg/day)(3)	NOAEL EEQn	LOAEL EEQl
PCBs								
Total PCBs	8.65E-02	6.67E+00	5.77E-01	8.54E-02	1.80E-01	1.80E+00	4.75E-01	4.75E-02
Metals								
Arsenic	1.02E+01	2.24E-01	2.28E+00	3.60E-01	2.46E+00	7.38E+00	1.46E-01	4.88E-02
Cadmium	5.76E-01	7.71E+00	4.44E+00	6.57E-01	1.45E+00	2.00E+01	4.53E-01	3.29E-02
Chromium	5.40E+01	3.06E-01	1.65E+01	2.56E+00	1.00E+00	5.00E+00	2.56E+00	5.12E-01
Copper	1.61E+01	5.15E-01	8.29E+00	1.26E+00	4.70E+01	6.17E+01	2.68E-02	2.04E-02
Lead	4.54E+01	2.66E-01	1.21E+01	1.89E+00	1.13E+00	1.13E+01	1.67E+00	1.67E-01
Mercury	1.64E-01	1.69E+00	2.78E-01	4.14E-02	6.40E-03	6.40E-02	6.47E+00	6.47E-01
Nickel	6.16E+00	1.06E+00	6.52E+00	9.78E-01	7.74E+01	1.07E+02	1.26E-02	9.14E-03
Selenium	3.73E-01	9.85E-01	3.67E-01	5.51E-02	4.00E-01	8.00E-01	1.38E-01	6.89E-02
Silver	1.24E+00	2.05E+00	2.54E+00	3.77E-01	5.44E+00	5.44E+01	6.94E-02	6.94E-03
Zinc	3.93E+01	3.20E+00	1.26E+02	1.87E+01	1.45E+01	1.31E+02	1.29E+00	1.43E-01

Body Weight = (BW)	8.040E-02	kg
Food Ingestion Rate = (If)	1.188E-02	kg/day
Soil Ingestion Rate = (Is)	1.782E-04	kg/day

Dose=(If*Ce+Is*Cs)/BW
Cs = Contaminant concentration in soil
Ce (Contaminant concentration in earthworm) =soil conc.* BF
BF = Soil to invertebrate biotransfer factor

Footnotes:
(1) See Table 6 for source of soil concentrations. Concentration is the average concentration when excavating to the 1.0 PCB line.
(2) Source of Biotransfer Factors is ORNL (September, 1998) for all chemicals; value used is median value.
(3) See Tables B-3 for a summary of the NOAELs and LOAELs and their sources.