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PROPOSED PLAN
for
SITE 13 (OU-5)

NAVAL WEAPONS STATION EARLE
Colts Neck, New Jersey

Northern Division
Naval Facilities Engineering Command
Contract No. N62467-94-D-0888
Contract Task Order 822

JANUARY 2003

TETRA TECH NUS, INC.

Department of the Navy

Proposed Remedial Action Plan for OU-5

Naval Weapons Station (NWS) Earle
Colts Neck, New Jersey

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NAVY ANNOUNCES PROPOSED REMEDIAL ACTION PLAN

This Proposed Plan summarizes the findings of the Operable Unit 5 (OU-5) **feasibility study** (FS) report, identifies the clean-up alternative preferred by the Navy and the United States Environmental Protection Agency (EPA), and explains the reasons for this preference. In addition, this Proposed Plan explains how the public can participate in the decision-making process and provides addresses for the appropriate Navy contacts.

The preferred alternative, consisting of placement of a low permeability cap over the former landfill, institutional controls and long term monitoring is d scribed in this document.

The Department of the Navy has completed an FS for OU-5 to address contamination associated with Site 13 at Naval Weapons Station (NWS) Earle in Colts Neck, New Jersey. The purpose of the FS was to evaluate the clean-up alternatives available for Site 13. The FS was completed as part of the Navy's Installation Restoration Program (IRP) and the **Superfund Remedial Program (Comprehensive Environmental Response, Compensation, and Liability Act; CERCLA).** IRP sites at NWS Earle have been grouped into operable units (OUs), which are sites with similar site characteristics, to save time and money by processing similar sites simultaneously. OU-5 consists of Site 13 only. Prior to the FS, the Navy performed a **remedial investigation** (RI) and a human health and ecological risk assessment.

PUBLIC PARTICIPATION IS ENCOURAGED

This Proposed Plan is issued by the Navy, the lead agency for the IRP and Superfund activities at the NWS Earle facility, and by EPA, the support agency for CERCLA activities.

The public is encouraged to comment on this Proposed Plan. Procedures for public comment are discussed at the end of this Plan. After the public comment period has ended and after all comments have been reviewed and considered, the Navy and EPA will select the remedy for Site 13.

NOTE: A glossary of relevant technical and regulatory terms is provided at the end of this Proposed Plan. Terms included in the Glossary are initially indicated in **boldface** within th Proposed Plan.

NAVY'S RESPONSIBILITY

The Navy is issuing this Proposed Plan as part of its public participation responsibilities under CERCLA (commonly referred to as Superfund) in particular, Sections 113(k), 117(a), and 121(f) of CERCLA, as amended by the **Superfund Amendments and Reauthorization Act (SARA)**.

This document summarizes information that can be found in greater detail in the RI and FS reports for OU-5 at NWS Earle, as well as in other site documents contained in the **Administrative R cord** file for this site. The Navy invites the public to review the available materials and to comment on this Proposed Plan during the public comment period.

The Administrative Record file is available at the Monmouth County Library, Eastern Branch on Route 35 in Shrewsbury, New Jersey

PUBLIC MEETING

A public meeting to discuss this Proposed Plan will be held on January 15, 2003 at 7:00 PM at the Colts Neck Library Meeting Room, 1 Winthrop Drive (near Town Hall), Colts Neck, New Jersey. The meeting date will also be published in the *Asbury Park Press*.

The Navy, with EPA, may modify the selected remedy presented in this Proposed Plan for OU-5 based on new information from the public comments. **The public is encouraged to revi w and comment on the recommendati n identified here.**

SITE BACKGROUND

NWS Earle is located in Monmouth County, New Jersey, approximately 47 miles south of New York City. The station consists of two areas, the 10,248-acre Main Base (Mainside area), located inland, and the 706-acre Waterfront area (see Figure 1). The two areas are connected by a Navy-controlled right-of-way.

Commissioned in 1943, the facility's primary mission is to supply ammunition to the naval fleet. An estimated 1,500 people either work or live at the NWS Earle station.

The Mainside area is located in Colts Neck Township, which has a population of approximately 12,300 people. The surrounding area includes agricultural land, vacant land, and low-density housing. The Mainside area consists of a large, undeveloped portion associated with ordnance operations, production, and storage; this portion is encumbered by **explosive saf ty quantity distance (ESQD)** arcs. Other land use in the Mainside area consists of residences, offices, workshops, warehouses, recreational space, open space, and undeveloped land.

The Waterfront area is located in Middletown Township, which has a population of approximately 68,200 people.

Site 13 is located in the Mainside area (Figure 2). A brief description of this site follows.

Sit 13 - Def nse Property Disposal Office (DPDO) Yard

The Defense Property Disposal Office yard (DPDO yard) is an area of fill material extending into a marsh near the rail classification yards (Figure 3). Observations of historical aerial photographs and current site features, combined with findings from twelve test pits installed in 1995 were used to estimate the approximate landfill boundary as shown on Figure 5. The approximate former landfill covered 1.7 acres, with total landfill volume estimated at approximately 4000 cubic yards. There is an existing fence on the former landfill that encloses the northern portion of the Navy DPDO yard operating over part of the former landfill. Activities at the site included storage of scrap metals and batteries and the burial of material, such as cars, trucks, electronic equipment, clothing and shoes, sheet metal, furniture, scrap metal, and batteries. Additionally, batteries were broken open at the site for lead recovery, and acid was drained onto the ground. Obvious fill material is present at the ground surface at several places across the site. NWS Earle public works employees performed a partial removal of exposed debris in the summer of 1997.

The top of the site is flat, and there is little topographic relief. Runoff from the site drains to the marsh to the north and west, to a perennial drainage that flows to Hockhockson Brook. A fence surrounds the DPDO yard, although this fence is not located at the edge of the landfill. The toe of the landfill extends into the marsh area and is clearly defined by an abrupt decrease in elevation of several feet between the top of the landfill slope and the marsh.

REGULATORY STATUS

In 1990, NWS Earle was placed on the **National Priorities List** (NPL), which is a list of sites where uncontrolled hazardous substance releases may potentially present serious threats to human health and the environment.

STUDIES AND RESULTS

Potential hazardous substance releases at NWS Earle were addressed in an **Initial Assessment Study** (IAS) in 1982, a **Site Inspection** (SI) in 1986, and a Phase I RI in 1993. These were preliminary investigations to determine the number of sources, compile histories of waste-handling and disposal practices at the sites, and acquire data on the types of contaminants present and the potential human health and/or environmental receptors.

IAS Results

The 1983 IAS, which consisted of interviews, concluded minimal impact from site 13 based on site use as a storage area. No sampling was performed under the IAS investigation.

SI Results

During the 1993 SI, six soil, three sediment, and three surface water samples were collected from site 13. Low levels of pesticides, **polychlorinated biphenyls (PCBs)**, and **semivolatile organic compounds (SVOCs)** were detected. Surface water samples were analyzed for SVOCs, PCBs, pesticides, metals, and cyanide. Elevated levels of several metals were present in samples. No SVOCs, pesticides, or PCBs were detected in surface water. Sediment samples were analyzed for SVOCs, pesticides, and PCBs. Low levels of pesticides, PCBs and SVOCs were detected in sediments. Low levels of metals, pesticides,

PCBs, and SVOCs were detected in soil samples. Elevated levels of only two semivolatile compounds, benzo(a)pyrene (2.4 mg/kg) and dibenz(a,h)anthracene (0.88 mg/kg) were detected in site soils at concentrations above New Jersey Department of Environmental Protection (NJDEP) nonresidential cleanup criteria (both 0.25 mg/kg).

RI Results

The Phase II RI was initiated in 1995 and completed in July 1996, when the final RI report was released. The Phase II RI investigation at OU-5 included the installation of monitoring wells, and sampling of groundwater, surface water and sediment. Test pits were excavated to observe wastes and delineate the extent of fill. Based on the results from the SI, which found only petroleum-type compounds at relatively low levels exceeding cleanup criteria in site soils, no soil samples were collected or analyzed for site related compounds in the Phase II RI. It was assumed at the RI planning stage, that the EPA presumptive remedy (landfill capping) would apply to Site 13, so investigations were concentrated on the unknown impacts to surface water, sediments and groundwater.

Between June and October 1995, Brown & Root Environmental conducted the following field investigation activities at Site 13:

- Excavation of 12 test pits.
- Sampling and analysis of surface water.
- Sampling and analysis of sediment.
- Drilling and installation of five shallow permanent monitoring wells.
- Sampling and analysis of groundwater from the wells.
- Measurement of static water levels in the wells.
- Performance of slug tests in two of the wells.

Tables 1 through 5 compare the results of background sample analyses to concentrations of compounds found in samples collected at Site 13. Figure 4 shows sample locations and the concentrations of compounds found above screening levels. There were no organic compounds found in surface water.

A wide variety of metals and volatile, semivolatile, and pesticide compounds were detected in Site 13 groundwater. PCBs, metals, semivolatiles, and pesticides were found in sediment, and limited metals were detected in surface water. An addendum remedial investigation, consisting of additional hydrogeological investigations and groundwater sampling and analysis was performed between October 1996 and January 1997 to further characterize the nature and extent of **volatile organic compounds (VOCs)** in groundwater downgradient of Site 13.

Results from the final RI and Addendum RI report were used to develop the FS.

GROUNDWATER MODELING

As part of the FS, computer modeling of the groundwater contaminant distribution associated with Site 13 was prepared to help assess the fate and transport of contaminants. The model is used to estimate the theoretical concentration of compounds in groundwater at the nearest potential groundwater discharge point. In this case, the nearest potential exposure point would be groundwater surfacing at the perennial stream located approximately 500 feet downgradient (north) of Site 13. The model estimates that any potential groundwater originating from the Site 13 area that eventually surfaces at the stream would contain contaminants at concentrations well below the state **groundwater quality standards (GWQS)**.

These results indicate that the site contaminants, VOCs and metals, are unlikely to migrate very far from Site 13, and their concentrations would be below either GWQS or background levels within a relatively short distance from Site 13. Surface water and sediment samples obtained from the stream confirm that there is no significant impact from Site 13.

SUMMARY OF SITE RISKS

As part of the Phase II RI, a human health risk assessment and an ecological risk assessment were performed.

Human Health Risks

The human health risk assessment estimated the potential risks to human health posed by exposure to soil, contaminated groundwater, surface water, and sediment at the sites. To assess these risks, the exposure scenarios listed below were assumed:

- Ingestion of groundwater as a drinking water source.
- Inhalation of contaminants in groundwater (i.e., volatile compounds emitted during showering).
- Dermal exposure to contaminants in groundwater (i.e., showering, hand washing, bathing).
- Dermal contact from contaminated soils.
- Inhalation or incidental ingestion of contaminants in soil (e.g., fugitive dusts).
- Incidental ingestion of surface water and sediment.
- Dermal contact with contaminated surface water and sediment.

These scenarios were applied to various site use categories, including future industrial, residential, and recreational receptors.

Potential human health risks were categorized as **carcinogenic** or **noncarcinogenic**. A hypothetical carcinogenic risk increase from exposure should ideally fall below a risk range of 1 x 10E-6 (an increase of one case of cancer for one million people exposed) to 1 x 10E-4 (an increase of one case of cancer per 10,000 people exposed).

Noncarcinogenic risks were estimated using **Hazard Indices (HI)**, where an HI exceeding one is considered an unacceptable health risk.

In addition, results were compared to applicable federal and/or state standards such as federal **Maximum Contaminant Levels (MCLs)** for drinking water, NJDEP GWQS, or other published lists of reference values.

The estimated theoretical reasonable maximum exposure (RME) cancer risks associated with the future hypothetical residential scenario (1.1 x 10E-03) and the future hypothetical industrial scenario (2.5 x 10E-04) exceeded 1 x 10E-04, the upper end of the target risk range. Arsenic (via ingestion of and dermal contact with groundwater) and vinyl chloride (via ingestion and inhalation) were the principal chemicals of potential concern (COPCs) that contributed to the cancer risks for these exposure scenarios.

RME estimates for noncarcinogenic HIs, associated with hypothetical future industrial (groundwater) exposure scenarios exceeded 1.0, the cutoff point below which advers noncarcinogenic effects are not expected to occur. Arsenic (1.3 - skin) and iron (1.9 - liver

and digestive system) were the COPCs that exceeded 1.0 for these exposure scenarios.

RME estimates for noncarcinogenic HIs, associated with hypothetical future residential (groundwater) exposure scenarios exceeded 1.0, the cutoff point below which adverse noncarcinogenic effects are not expected to occur. Antimony (1.6 – cardiovascular system), arsenic (8.4 - skin), cadmium (5.2 – kidney) and iron (12 - liver and digestive system) were the COPCs that exceeded 1.0 for these exposure scenarios.

For all other media and all other pathways there are no unacceptable cancer or non-cancer risks.

Ecological Risk Assessment

The ecological risk assessment estimated the risk posed to ecological receptors, such as aquatic and terrestrial biota, from Site 13 contamination.

Grass and bare areas, with a minor amount of exposed landfill debris cover most of the former landfill. Formerly, abandoned automobiles and various other equipment and machinery were stored on the southern portion of the landfill, inside the fenced area. A large railroad bed and Normandy Road are located east of the site. A channelized stream runs along the western boundary of the fenced area between the road and the fence, and drainage flows to the north. This drainageway eventually empties into Hockhockson Brook approximately 2,500 feet north of the site.

Forested wetland areas are located north and west of the landfill. The forested wetlands are several feet lower in elevation than the landfill; the edge of the landfill slopes down into the forested area, and runoff from the landfill flows into the forested area and stream.

Although habitat on the landfill is limited, the forested wetland areas north and west of the landfill provide excellent habitat, primarily for terrestrial receptors. The channelized stream contains marginal aquatic habitat, although it connects with Hockhockson Brook several hundred feet north of the site. Runoff from the landfill drains to the wetlands and stream, and groundwater at the site flows toward the stream and wetlands, indicating potential groundwater to surface water contaminant migration.

The RI concluded that **Hazard Quotient (HQ)** values for metals in both surface water and sediment were indicative of low potential risk, with the exception of silver in both media. No organics were detected in surface waters, and HQs for organics in sediments were indicative of low potential risk, except for PCBs. Overland runoff appears to be the dominant migration pathway from Site 13 to the wetlands and stream; however, it does not appear that silver is migrating or that PCBs have the potential to migrate to better habitats downstream in Hockhockson Brook. Under the proposed preferred remedial alternative, impacted soils and sediments near current erosion areas would be excavated and placed within the area to be capped.

REMEDIAL ACTION OBJECTIVES (RAOs)

The overall objective for the remedy at Site 13 is to protect human health and the environment.

Based on the baseline human health risk assessment, the ecological risk assessment, and the RI results, **RAOs** were develop d to address contaminated environmental media at Site 13:

Protection of Human Health RAO

- Prevent potential human exposure to metals and VOCs in groundwater.
- Prevent contact with landfill contents.

Protection of the Environment RAO

- Minimize migration of landfill contaminants to the adjacent wetlands.
- Prevent contact with landfill contents.

ALTERNATIVES DEVELOPMENT AND SCREENING

The purpose of the alternatives development and screening process is to assemble an appropriate range of possible remedial options to achieve the RAOs identified for the site. In this process, technically feasible technologies are combined to form remedial alternatives that provide varying levels of risk reduction that comply with federal (EPA) and state (NJDEP) guidelines for site remediation.

The following eight criteria, as established by the NCP, were used for the detailed analysis of alternatives:

- Overall protection of human health and the environment.
- Compliance with **Applicable or Relevant and Appropriate Requirements (ARARs)**.
- Long-term effectiveness and permanence.
- Reduction of toxicity, mobility, and volume through treatment.
- Short-term effectiveness.
- Implementability.
- Cost.
- State concurrence.

The other evaluation criterion, community acceptance, will be addressed in the **Record of Decision (ROD)** following the receipt of public comments.

Based on the nature of contamination and site conditions, the standards that will be used to gauge the achievement of remedial action objectives will be the New Jersey GWQS.

Engineering technologies capable of eliminating the unacceptable risks associated with exposure to site-related soils or groundwater were identified, and those alternatives determined to best meet RAOs after screening were evaluated in detail. Table 6 presents the considered alternatives and the results of screening.

Detailed Summary of Alternatives

Summaries of the remedial alternatives that passed the screening step for Site 13 are presented in the following sections.

Alternative 1: No Action

The no-action alternative was developed as a baseline to which other alternatives may be compared, as required by the **National Contingency Plan (NCP)**. No remedial actions would be taken to protect human health or the environment. The purpose of this alternative is to evaluate the overall human health and environmental protection provided by the site in its present state. No measures would be implemented to remove or contain the suspected contaminant source (the landfill), to prevent potential human exposure to site groundwater, or to mitigate contaminant migration in the environment. Three new monitoring wells would be installed and sampled to monitor groundwater quality downgradient of the former landfill. Annual sampling and analysis of surface water

and sediments would be performed in conjunction with groundwater evaluations in six existing monitoring wells and the three new wells. Periodic review of site conditions, every 5 years, would include evaluation of the long-term sampling and analysis program.

Cost

Capital costs associated with the no-action alternative are estimated to be $41,400, including the cost to install additional monitoring wells. The average annual operation and maintenance (O&M) cost for long-term monitoring is $23,900, and 5-year reviews are $15,500 per event. Over a 30-year period, the net present-worth cost is $371,000 (a discount rate of 7 percent was used in all cost calculations).

Alternative 2: Institutional Controls and Long-Term Monitoring

Alternative 2 relies on institutional controls to limit exposures to site-related contaminants. This alternative does not employ engineered treatment or containment to address groundwater contamination; however, the groundwater contaminant concentrations are expected to decline naturally over time.

Institutional controls would be enacted to limit potential contact to the former landfill. Restricted activities would include excavation, excessive vehicular traffic, and use of untreated groundwater for drinking water.

Existing fence (of the DPDO area) over Site 13 landfill areas would be removed and replaced at a new location further to the south to deter human and vehicular entry onto the landfill area beyond the current hard-packed surface of the DPDO yard. A locking gate would be installed to allow controlled access to the site north of the fenced DPDO yard.

Land use restrictions would be incorporated into the Base Master Plan to restrict the future use of Site 13 groundwater until natural processes have reduced contaminant concentrations to acceptable levels. Use of untreated Site 13 groundwater for drinking water would be prohibited. Because site groundwater does not meet New Jersey groundwater quality standards (GWQs), a **Classification Exception Ar a (CEA)** pursuant to N.J.A.C 7:9-6 would be established. The CEA would provide the state official notice that the constituent standards will not be met for a specified duration and ensure that use of groundwater in the affected area is suspended until standards are achieved.

Long-term periodic monitoring would be conducted to assess the ongoing effectiveness of institutional controls to contain potential threats to human health and the environment. Since wastes would be left in place, site conditions and risks would be reviewed every 5 years.

Cost

The capital costs for Alternative 2 total $88,900. The average annual O&M costs are $23,900, and 5-year reviews are $15,500 per event. Over a 30-year period, the net present-worth cost is $419,000 (at a 7 percent discount rate).

Alternative 3: Capping, Institutional Controls, and Long-Term Monitoring

Alternative 3 relies on containment and institutional controls to limit exposures to hazardous substances and minimize migration of contaminants to groundwater and surface water. Active treatment is not employed to address site

contamination. Over time, the contaminants in groundwater will likely gradually decrease naturally through physical, biological, and chemical processes. Contaminant concentrations in groundwater will also decrease as a result of reduced infiltration of precipitation through contaminated landfill materials.

Under Alternative 3, a low-permeability cover system that complies with federal and state regulatory requirements would be used to prevent potential human and animal contact with contaminants in landfill materials. Impacted soils and sediments near current erosion areas would be excavated and placed within the area to be capped. The cover system would limit contaminant leaching to groundwater and minimize contaminant migration via surface runoff and erosion. The cover system would be installed over the former landfill area of the site (Figure 5). The cover system would include a minimum of 1.5 feet of clean soil (Figure 6). Access restrictions, including fencing, would be enacted to limit future uses of the site that may result in disturbance of the cover or direct contact with contaminated media.

Existing fence (of the DPDO area) over Site 13 landfill areas would be removed and replaced at a new location further to the south to deter human and vehicular entry onto the cap area north of the hard-packed surface of the DPDO yard. A locking gate would be installed to allow controlled access to the fenced site north of the DPDO yard.

After construction of the cover and installation of the fencing elements of Alternative 3, access restrictions would significantly limit the future activities that could result in intrusion into and possible damage of the cover and accidental exposure to the landfill wastes. Restricted activities would include excavation, excessive vehicular traffic, and use of untreated groundwater for drinking water.

Because site groundwater does not meet New Jersey groundwater quality standards, a CEA pursuant to N.J.A.C 7:9-6 would be established. The CEA would provide the state official notice that the constituent standards will not be met for a specified duration and ensure that use of groundwater in the affected area is suspended until standards are achieved.

Long-term, periodic monitoring would be conducted to assess contaminant status and potential threats to human health and the environment. Since wastes would be left in place, site conditions and risks would be reviewed every 5 years.

Cost for Alternative 3

The capital costs for Alternative 3 total $1,290,100. The average annual O&M costs are $26,800, and 5-year reviews are $15,500 per event. Over a 30-year period, the net present-worth cost is $1,657,000 (at a 7 percent discount rate).

EVALUATION OF ALTERNATIVES

The remedial alternatives were compared to one another based on the first seven selection criteria to identify differences among the alternatives and how site contaminant threats are addressed.

Analysis

Overall protection of human health and the environment

Because no actions would be taken under Alternative 1 to contain contaminants or prevent deterioration of the landfill surface, health risks

and adverse impacts to the environment are expected to remain the same or increase as existing landfill cover erodes over time.

Alternative 2 includes access restrictions and establishment of a groundwater CEA, which would reduce human health and ecological risks posed by contact with landfill contents. Institutional controls would provide assurance that untreated contaminated groundwater is not used as a potable water source in the future. This would significantly reduce the human health risks by eliminating potential exposure to contaminated groundwater (the driving concern in the human risk assessment).

Alternative 3 is most protective of human health and the environment. The cover system would reduce human health and ecological risks posed by contact with landfill contents and impacted sediments or surface soil. The cover system would reduce infiltration through landfill materials and leaching of contaminants to groundwater, thereby reducing contaminant migration into the environment. Routine maintenance of the landfill cover system would ensure its long-term protectiveness. Institutional controls would provide assurance that untreated contaminated groundwater is not used as a potable water source in the future.

Compliance with ARARs

Because Alternatives 1 and 2 do not include any remedial actions, they would not comply with state and federal ARARs pertaining to post-closure of municipal landfills [40 CFR 258.60 & 258.61and N.J.A.C. 7:26-2A.9]. Alternative 3 would comply with these requirements since a cover system would be installed and a long-term maintenance and repair program would be implemented.

All three alternatives would comply with federal and state long-term monitoring requirements through periodic monitoring and evaluation of groundwater, surface water, and sediments.

Alternative 1 would not comply with state ARARs for attainment of groundwater quality standards [N.J.A.C. 7:9-6]. Alternatives 2 and 3 would comply by seeking a temporary exemption (CEA) from these requirements until the GWQS are achieved.

Long-term effectiveness and permanence

Potential future users of site groundwater may be at risk under Alternative 1 because it lacks institutional controls that would prohibit use of untreated contaminated groundwater.

Alternatives 2 and 3 would mitigate long-term risks due to ingestion of site groundwater by implementing institutional controls to prohibit use of untreated, contaminated groundwater.

Alternative 3 would reduce human and ecological risks due to direct exposure to landfill contents or impacted sediments and surface soil by eliminating the potential for exposure and would reduce contaminant leaching into groundwater.

Reduction of toxicity, mobility, and volume through treatment

Because none of the alternatives includes treatment, they would not reduce the toxicity, mobility, or volume through treatment. Alternative 3 would reduce the mobility of landfill contaminants by reducing precipitation infiltration and by placing impacted surface soil and sediments beneath the cap.

Short-term effectiveness

Long-term monitoring, which would provide little opportunity for short-term impact, is the only on-site action proposed under Alternative 1.

Alternative 2 would present a greater opportunity for short-term impact due to site preparation and installation of the fencing. Alternative 3 would present a greatest opportunity for short-term impact due to site preparation, grading, and either placing additional cover or constructing the enhanced cover system.

Impacts to the environment are not anticipated under Alternatives 1 and 2 since minimal activities would be conducted. Impacts to the environment would be minimized under Alternative 3 by use of erosion and stormwater control measures during site work.

Implementability

Alternative 1 is easily implemented since the only activities proposed are long-term monitoring and 5-year reviews. Alternative 2 is also easily implemented since the only on-site activities would be installation of the fencing, long-term monitoring, and 5-year reviews. Alternative 3 would be most difficult to implement since it involves the construction of a cover system over the former landfill area estimated at 1.7 acres; however, no difficulties are anticipated, since common construction techniques are required and cover materials are available from several vendors.

If additional actions are warranted, they could be easily implemented under Alternatives 1 and 2. Additional actions could be implemented under Alternative 3; however, opening the cover system to access contaminated materials may be required.

Cost

The present-worth cost associated with each alternative is provided below for comparison. Alternative 1, no action, would be the least expensive to implement and Alternative 3 would be the most expensive to implement.

Alternative 1	$371,000
Alternative 2	$419,000
Alternative 3	$1,657,000

State and Community Acceptance

The state of New Jersey supports the preferred alternative. Community acceptance of the preferred alternative will be evaluated at the conclusion of the public comment period and will be described in the ROD. Public comments on this Proposed Plan will help address state acceptance and community acceptance.

PREFERRED ALTERNATIVE SUMMARY

The Navy, with EPA and NJDEP, has proposed Alternative 3 as its selection of the preferred alternative. The range of technologies included in Alternative 3 offer the maximum of protection to human health and the environment of all of the alternatives. The Navy, EPA, and the state propose Alternatives 3. A vegetative cover would be placed over the entire impermeable landfill cap over the former landfill area. Figure 7 shows a plan view of the preferred alternative landfill cap.

Under Alternative 3, a low-permeability cover system that complies with federal and state regulatory requirements would be used to prevent potential human and animal contact with contaminants in landfill materials. The cover system would limit contaminant leaching to groundwater and minimize contaminant migration via surface runoff and erosion. The cover system would be installed over all former landfill areas of the site. Soils and sediments located in landfill erosion areas that may have been impacted by the landfill would be

excavated and placed in an area to be capped. The cover system would include a minimum of 1.5 feet of vegetated soil cover (Figure 6) over the entire proposed impermeable cap (see Figure 7). Access restrictions would be enacted to limit future uses of the site that may result in disturbance of the cover or direct contact with contaminated media.

The existing fence (of the DPDO area) over Site 13 landfill areas would be removed and replaced to deter human and vehicular entry onto the proposed vegetative cap adjacent to the DPDO yard. Two locking gates would be installed to allow controlled access into the fenced enclosure over the vegetative cap north of the fenced DPDO yard.

After construction of the cover, access restrictions would limit future activities that could result in intrusion into and possible damage of the cover and accidental exposure to the landfill wastes. Restricted activities would include excavation, excessive vehicular traffic, and use of untreated groundwater for drinking water.

Because site groundwater does not meet New Jersey groundwater quality standards, a CEA pursuant to N.J.A.C 7:9-6 would be established. The CEA would provide the state official notice that the constituent standards will not be met for a specified duration and ensure that use of groundwater in the affected area is suspended until standards are achieved.

Long-term, periodic monitoring would be conducted to assess contaminant status and potential threats to human health and the environment. In addition to the existing wells, sentinel wells would be installed north of the site pursuant to CEA guidelines. Since wastes would be left in place, site conditions and risks would be reviewed every 5 years.

The estimated cost for the preferred alternative is the cost estimated for Alternative 3, $1,657,000.

THE COMMUNITY ROLE IN THE SELECTION PROCESS

The Navy solicits written comments from th community on the Proposed Plan for OU-5. The Navy has set a public comment period from **December 16, 2002** through **January 31, 2003** to encourage public participation in the decision process for OU-5.

The Navy will hold a public meeting during the comment period. At the public meeting, the Navy, along with EPA, will present the Proposed Plan, answer questions, and solicit both oral and written questions. **The public meeting is scheduled f r 7:00 p.m. on January 15, 2003 at the Colts Neck Library Meeting Room, 1 Winthrop Drive (near Town Hall),** Colts Neck, New Jersey.

Comments received during the public comment period will be summarized and responses will be provided in the Responsiveness Summary section of the ROD. The ROD is the document that will present the Navy's decision for OU-5.

To send written comments, or to obtain further information, contact

Commanding Officer
Naval Weapons Station Earle
Environmental Department, Lawrence Burg
201 Highway 34 South
Colts Neck, New Jersey 07722-5014

For further information, contact Michele DiGeambeardino, Remedial Project Manager
Phone: (610) 595-0567 ext. 117

Pleas not that all comments must b submitt d and postmarked on r befor January 31, 2003.

TERMS USED IN THE PROPOSED PLAN

Applicable or Relevant and Appropriate R quirements (ARARs): The federal and state requirements that a selected remedy must attain. These requirements may vary among sites and remedial activities.

Administrative Record: An official compilation of site-related documents, data, reports, and other information that are considered important to the status of and decisions made relative to a Superfund site. The public has access to this material.

Carcinogenic: A type of risk resulting from exposure to chemicals that may cause cancer in one or more organs.

Classification Exception Area (CEA): In the event that groundwater quality does not meet New Jersey Quality Standards (N.J.A.C. 7:9-6), a temporary exception area may be granted to ensure groundwater from the defined zone is not used as a drinking water source.

Compr hensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). The Act created a trust fund, known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous substance facilities.

Explosive safety quantity distance (ESQD): A restrictive design and land use criterion for military explosives safe handling and operational controls to ensure personnel and facilities maintain sufficient separation from potential explosive hazards.

Feasibility Study (FS): Report identifying and evaluating alternatives for addressing the contamination present at a site or group of sites.

Groundwater Quality Standards (GWQS): New-Jersey-promulgated groundwater-quality requirements, N.J.A.C. 7:9-6.

Hazard Index (HI): The sum of chemical-specific Hazard Quotients. A Hazard Index of greater than 1 is associated with an increased level of concern about adverse non-cancer health effects.

Hazard Quotient (HQ): A comparison of the level of exposure to a substance in contact with the body per unit time to a chemical-specific **Reference Dose** to evaluate potential non-cancer health effects. Exceedence of a Hazard Quotient of 1 is associated with an increased level of concern about adverse non-cancer health effects.

IEUBK Lead Model: Accounts for multi-media nature of lead exposure to determine the risk likely to occur at a site.

Initial Assessment Study (IAS): Preliminary investigation usually consisting of review of available data and information of a site, interviews, and a non-sampling site visit to observe areas of potential waste disposal and migration pathways.

Maximum Contaminant Level (MCL): EPA-published (promulgated as law) maximum concentration level for compounds found in water in a public water supply system.

Noncarcinogenic: A type of risk resulting from the exposure to chemicals that may cause systemic human health effects.

National Contingency Plan (NCP): The basis for the nationwide environmental restoration program known as Superfund; administered by EPA under the direction of the U.S. Congress.

National Priorities List (NPL): EPA's list of the nation's top priority hazardous substance disposal facilities that may be eligible to receive federal money for response under CERCLA.

No Further Action (NFA): Determination for a site based on compliance with applicable regulatory guidelines for cleanup. If the results of remedial investigations and/or remedial actions determine that contamination levels are below regulatory guidelines, an NFA declaration is prepared.

Polychlorinated Biphenyls (PCBs): Class of chlorinated aromatic compounds (typically used as cooling fluids in electrical transformers) that are strongly adsorbed on solid particles.

Presumptive Remedy: Preferred technologies for common categories of sites based on historical patterns of remedy selection and EPA's scientific and engineering evaluation of performance data on technology implementation. Presumptive remedies ensure the consistent selection of remedial actions.

Record of Decision (ROD): A legal document that describes the remedy selected for a Superfund facility, why the remedial actions were chosen and others not, how much they are expected to cost, and how the public responded.

Reference Dose (RD): An estimate with an uncertainty spanning an order of magnitude or greater of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a portion of a lifetime.

Remedial Action Objectiv (RAO): An objective selected in the FS, against which all potential remedial actions are judged.

Remedial Investigation (RI): Study that determines the nature and extent of contamination at a site.

Superfund Amendments and Reauthorization Act (SARA). Legislation passed by Congress in 1986 to amend and reauthorize CERCLA, commonly known as the Superfund program.

Superfund Remedial Program (CERCLA): A federal program arising from legislation passed in 1980 and modified in 1986 (**SARA**). The Superfund program investigates and cleans up the environment at abandoned or uncontrolled hazardous substance facilities.

Site Inspection (SI): Sampling investigation with the goal of identifying potential sources of contamination, types of contaminants, and potential migration of contaminants. The SI is conducted prior to the RI.

Semivolatile Organic Compounds (SVOC): Organic chemicals [e.g., phthalates or polycyclic aromatic hydrocarbons (PAHs)] that do not readily evaporate under atmospheric conditions.

Trichloroethene (TCE): Volatile organic solvent formerly used for cleaning, degreasing, or other uses in commerce and industry.

Volatile Organic Compounds (VOCs): Organic liquids [e.g., vinyl chloride or TCE] that readily evaporate under atmospheric conditions.

FOR FURTHER INFORMATION

MAILING LIST

If you did not receive this Proposed Plan in the mail and wish to be placed on the mailing list for future information pertaining to this site, please fill out, detach, and mail this form to:

Commanding Officer
Naval Weapons Station Earle
Environmental Department, Lawrence Burg
201 Highway 34 South
Colts Neck, New Jersey 07722-5014

Name: _____

Affiliation: _____

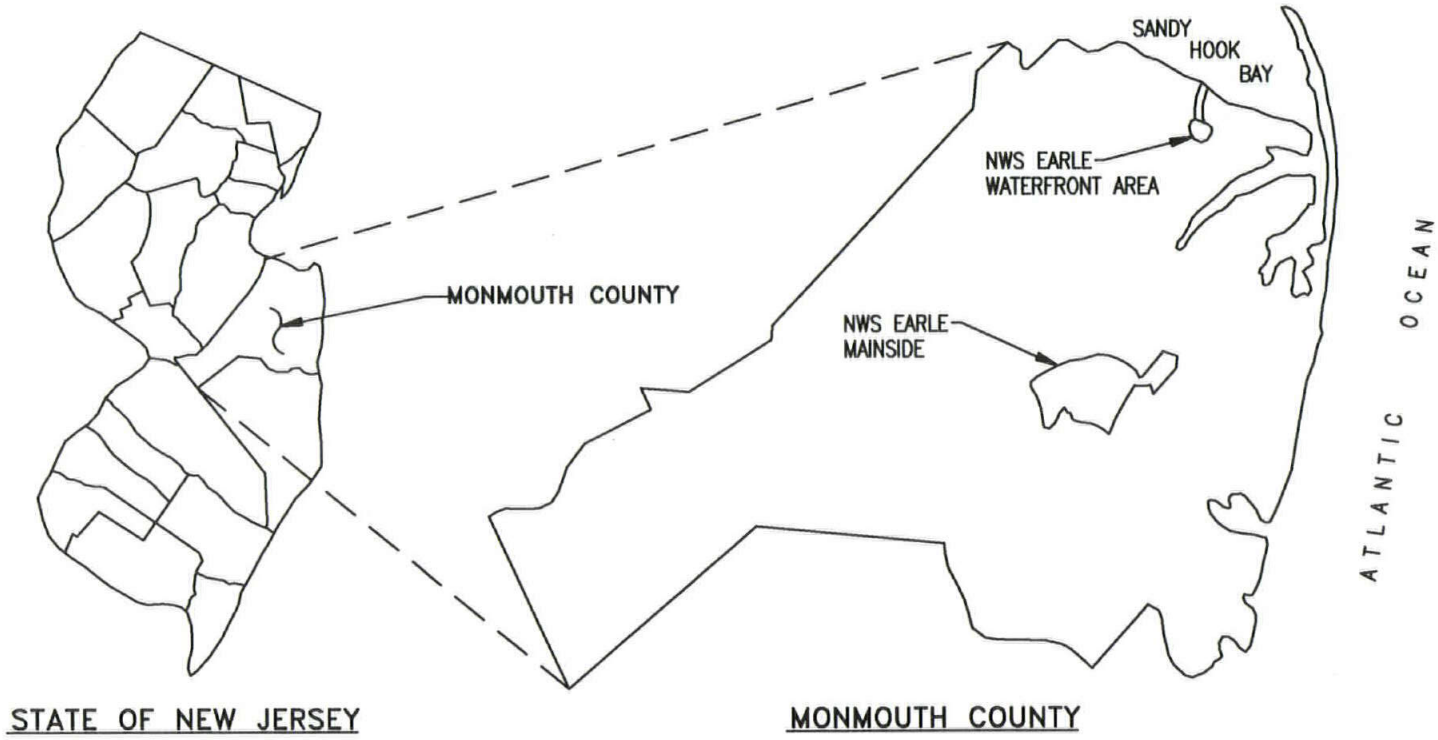
Address: _____
_____

Phone: ( )_____

_____

FIGURES

PP OU-5/4079cm01.dwg 6/21/02 LDL



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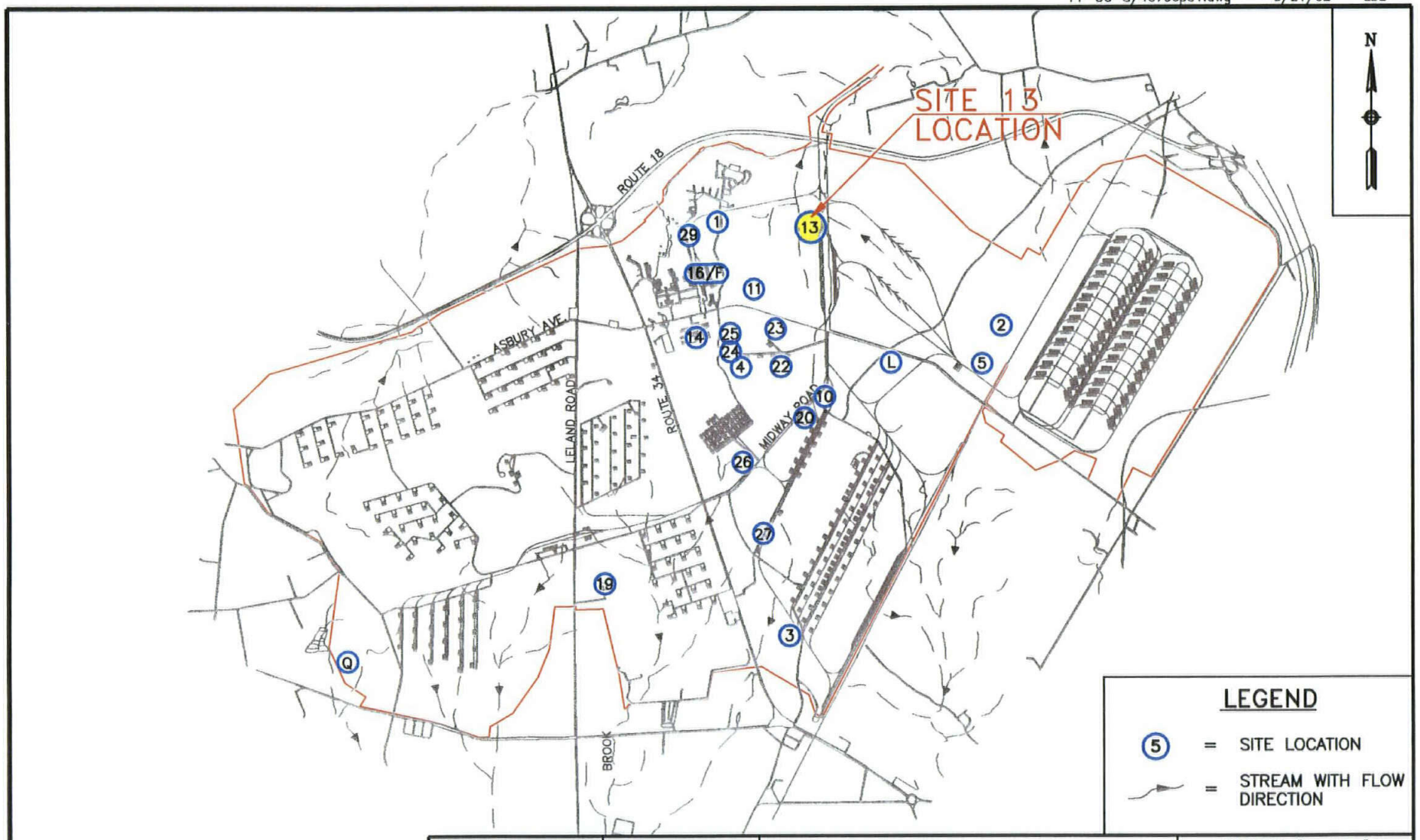
CHECKED BY DATE			FILE NUMBER: 4079cm01.dwg LDL PHL
REVISED BY DATE			APPROVED BY DATE
SCALE NOT TO SCALE			DRAWING NO. FIGURE 1 REV.

4079cm01.dwg

PP OU-5/4079cp01.dwg 6/21/02 LDL



0 5,000 10,000

SCALE IN FEET

DRAWN BY LDL	DATE 6/28/02	
CHECKED BY	DATE	
REVISED BY	DATE	
SCALE AS SHOWN		

Tetra Tech NUS, Inc.

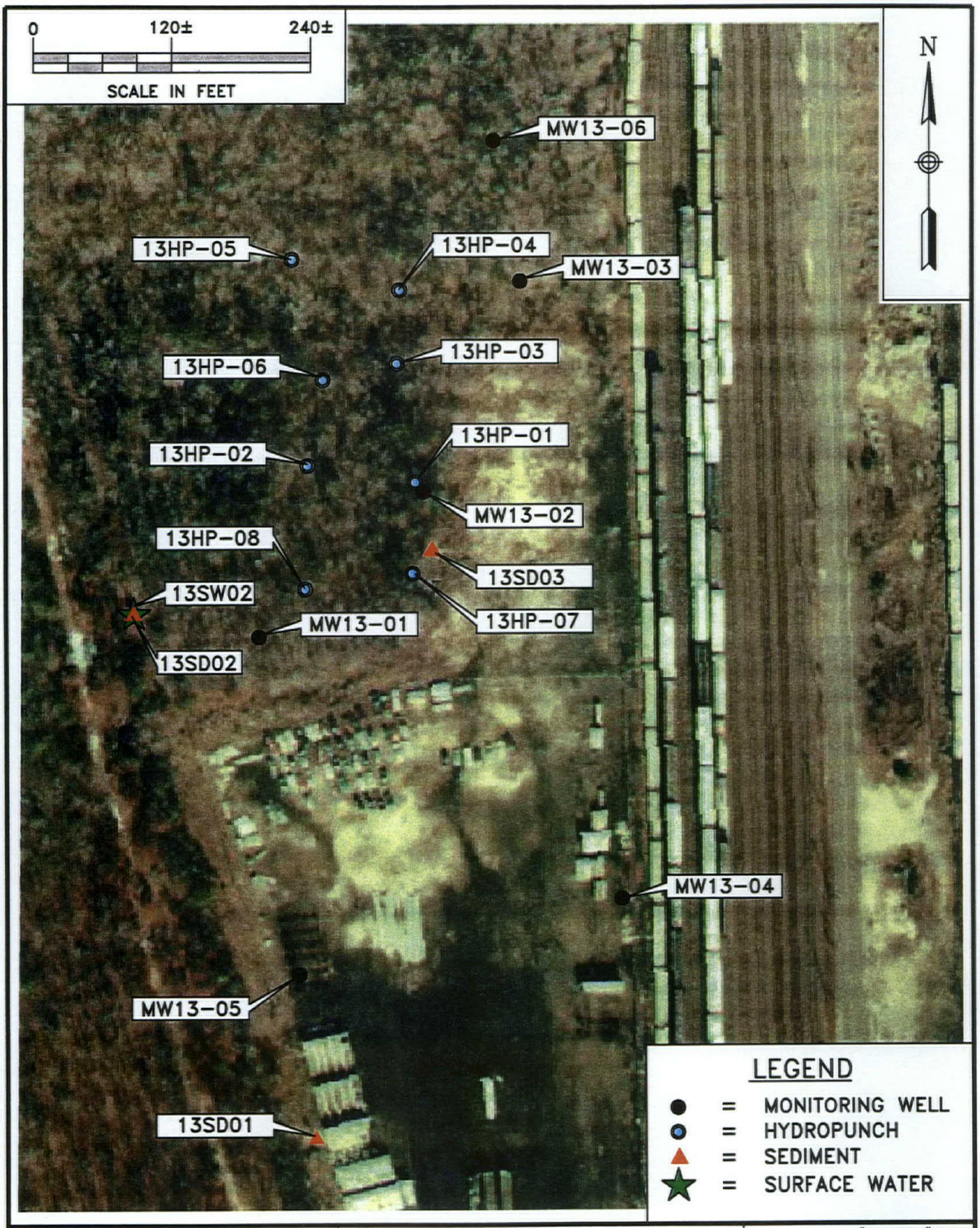
SITE 13 LOCATION

NAVAL WEAPONS STATION EARLE

COLTS NECK, NEW JERSEY

CONTRACT # – CTO #	4079 – 822
FILE NUMBER:	4079cp01.dwg LDL PHL
APPROVED BY	DATE
DRAWING NO.	FIGURE 2
REV.	

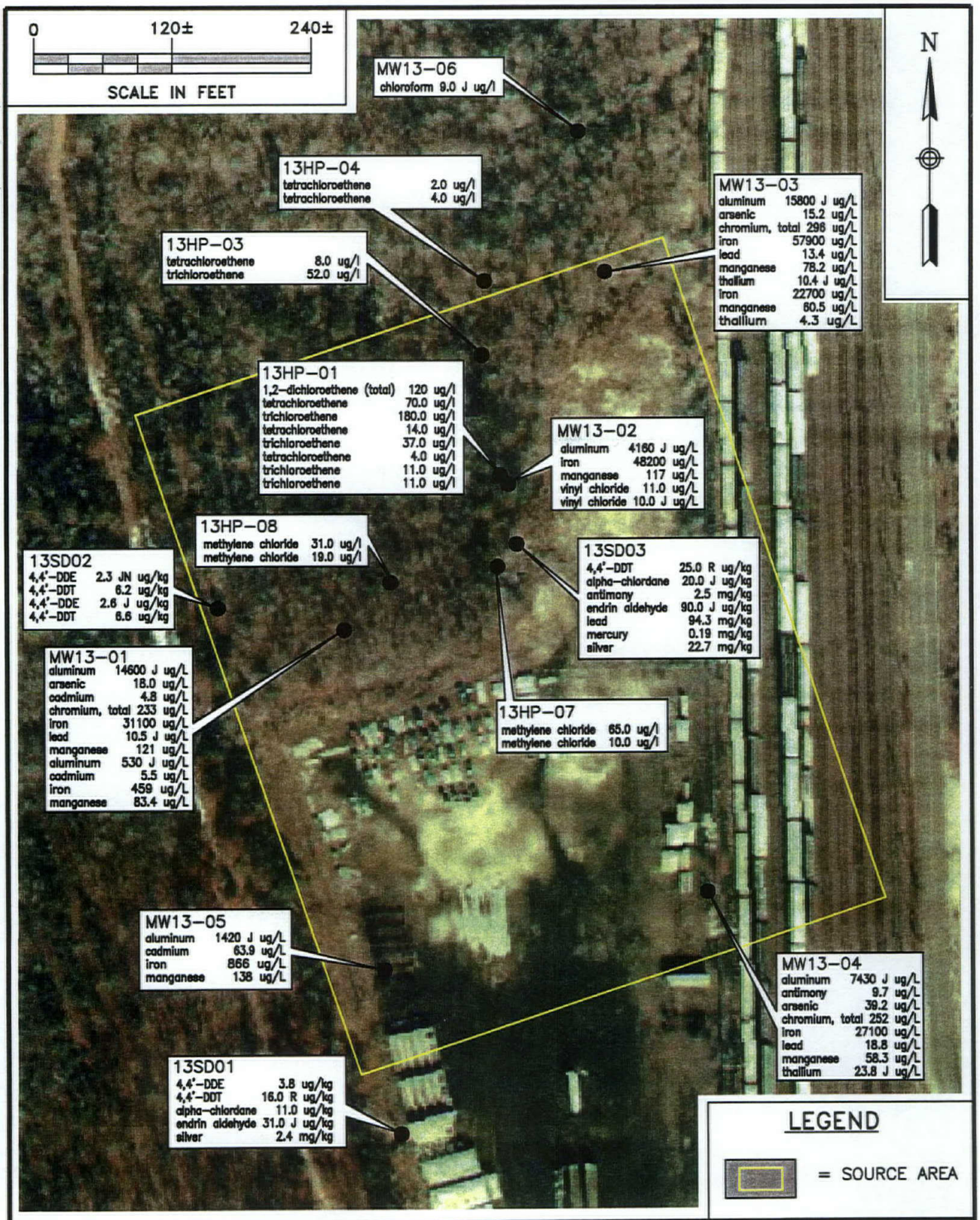
4079cp01.dwg



ACAD: 4079cp06.dwg 6/21/02 LDL

DRAWN BY LDL DATE 6/21/02	Tetra Tech NUS, Inc.	SAMPLE LOCATIONS SITE 13 – DPDO YARD NAVAL WEAPONS STATION EARLE COLTS NECK, NEW JERSEY	CONTRACT # – CTO # 4079-0822
CHECKED BY DATE			FILE NUMBER: 4079cp06.dwg LDL PHL
REVISED BY DATE			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3 REV.

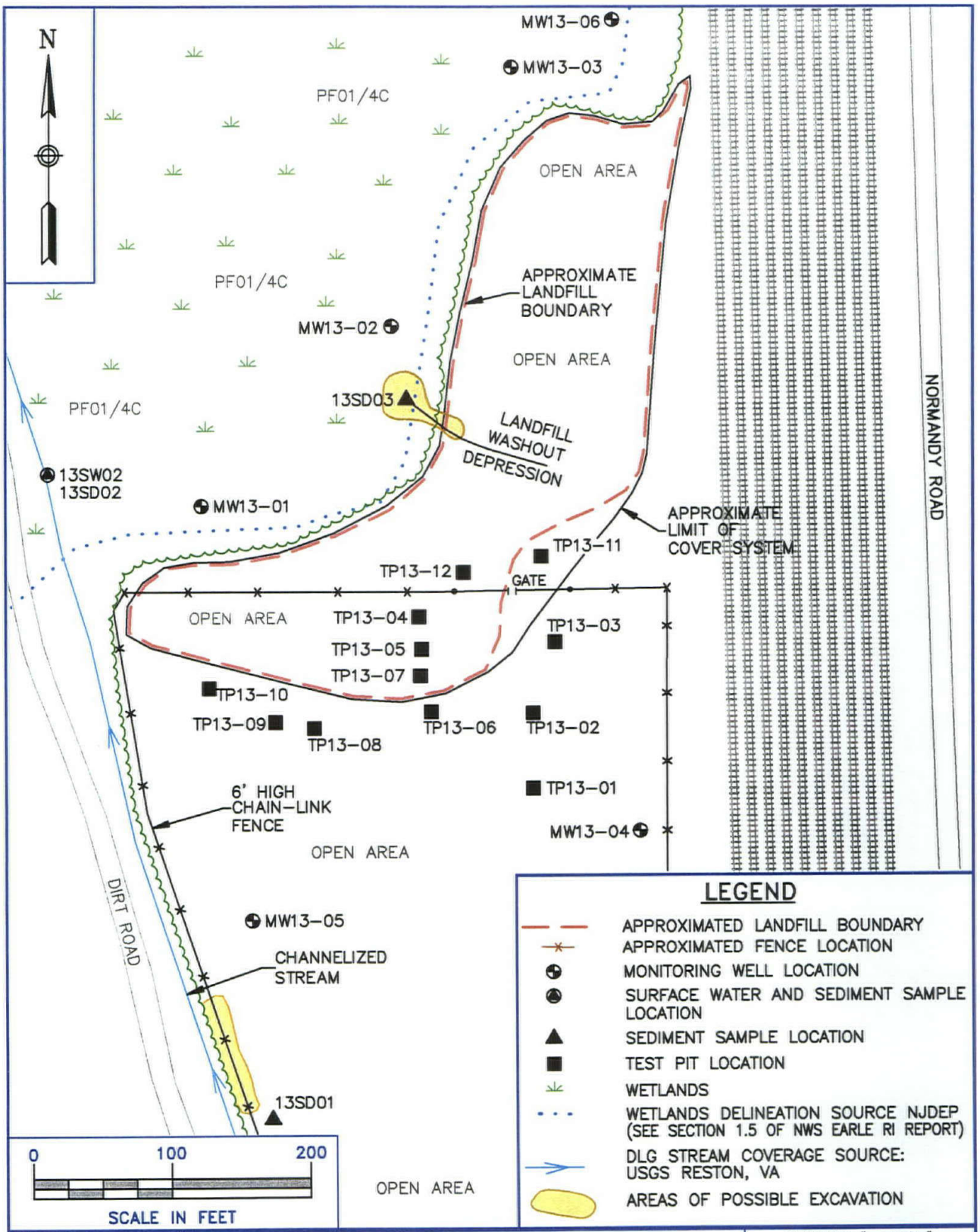
4079cp06.dwg



ACAD: 4079cp07.dwg 6/21/02 LDL

DRAWN BY LDL DATE 6/25/02	Tetra Tech NUS, Inc.	CONCENTRATIONS ABOVE SCREENING LEVELS SITE 13 – DPDO YARD NAVAL WEAPONS STATION EARLE COLTS NECK, NEW JERSEY	CONTRACT # – CTO # 4079 – 822
CHECKED BY DATE			FILE NUMBER: 4079cp07.dwg LDL PHL
REVISED BY DATE			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 4 REV.

4079cp0 .dwg

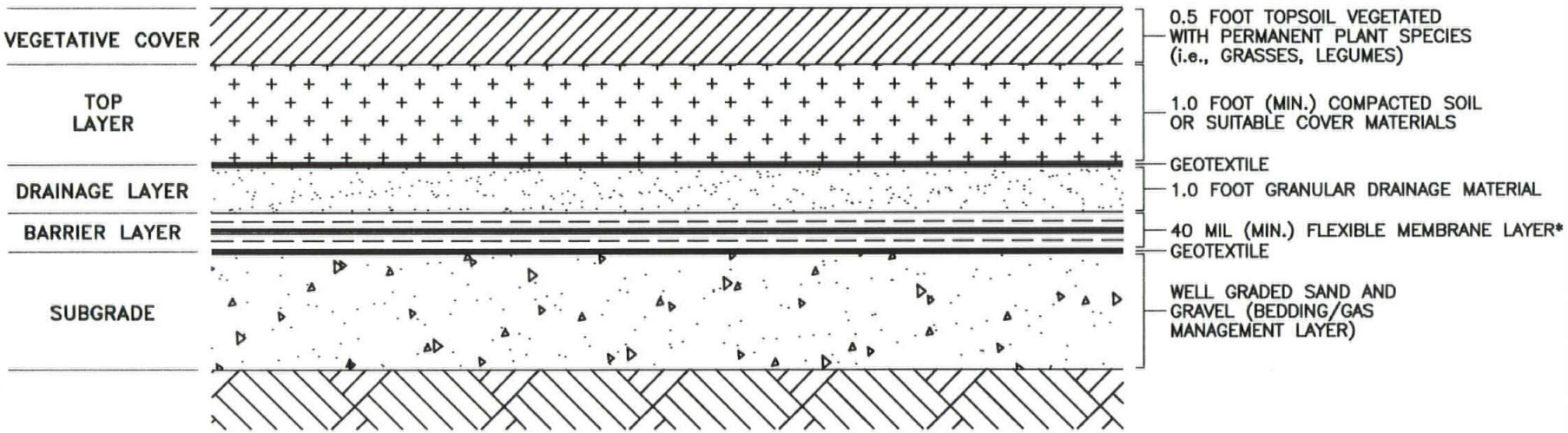


PP OU-5/4079cp02.dwg 6/21/02 LDL

DRAWN BY LDL	DATE 6/21/02	Tetra Tech NUS, Inc.	ALTERNATIVE 3
CHECKED BY	DATE		SITE 13 – DRMO YARD
REVISED BY	DATE		NAVAL WEAPONS STATION EARLE
SCALE AS NOTED			COLTS NECK, NEW JERSEY

CONTRACT # – CTO #	4079 – 822
FILE NUMBER:	4079cp02.dwg LDL PHL
APPROVED BY	DATE
DRAWING NO.	FIGURE 5
REV.	

4079cp02.dwg



* MAY SUBSTITUTE ONE FOOT OF CLAY OR EQUAL WITH MAX. PERMEABILITY OF 1.0E-07 CM/SEC

CROSS-SECTIONAL VIEW

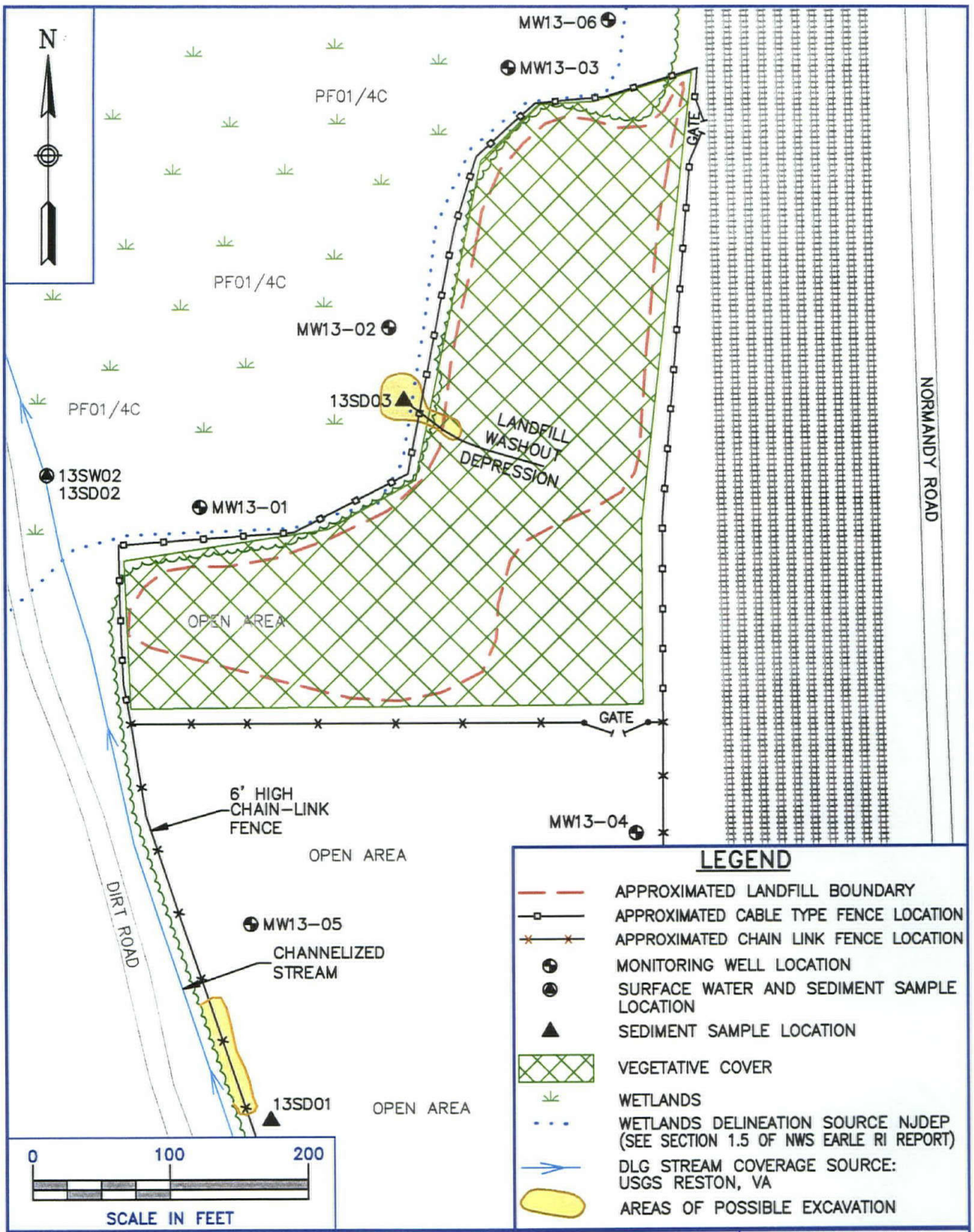
NOTE:

NOT FOR DESIGN.

DRAWN BY LDL	DATE 6/21/02	Tetra Tech NUS, Inc.	CONCEPTUAL COVER SYSTEM DESIGN SITE 13 – ALTERNATIVE 3 FEASABILITY STUDY REPORT NAVAL WEAPONS STATION EARLE COLTS NECK, NEW JERSEY
CHECKED BY	DATE		
REVISED BY	DATE		
SCALE NOT TO SCALE			

CONTRACT # – CTO #	4079 – 1220
FILE NUMBER:	4079cp04.dwg
9/24/02 LDL PHL	
APPROVED BY	DATE
DRAWING NO.	REV.
FIGURE 6	1

4079cp04.dwg



PP OU-5/4079cp05.dwg 6/21/02 LDL

DRAWN BY LDL	DATE 6/21/02	Tetra Tech NUS, Inc.	CONTRACT # - CTO # 4079 - 1220
CHECKED BY	DATE		FILE NUMBER: 4079cp05.dwg 9/24/02 LDL PHL
REVISED BY	DATE		APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 7 REV. 1

PREFERRED ALTERNATIVE
SITE 13 - OU-5
NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

4079cp05.dwg

TABLES

TABLE 1

OCCURRENCE AND DISTRIBUTION OF INORGANICS IN SEDIMENT AT SITE 13
OU-5 FEASIBILITY STUDY
NWS EARLE, COLTS NECK, NEW JERSEY
(mg/kg)

	BACKGROUND***				SITE-RELATED					
SUBSTANCE	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTION	UTL**	2 X AVERAGE CONCENTRATION	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTION	AVERAGE CONCENTRATION	MEAN > 2 X BKGD	MEAN > ACK UTL	REPRESENTATIVE CONCENTRATION
ALUMINUM	6 / 6	839 - 3940	8.1E+07	5459.67	3 / 3	1150 - 2170	1728.33	NO	NO	2170.00
ANTIMONY *	0 / 6	-	1.4E+01	-	2 / 3	0.56 - 2.5	2.12	YES	-	2.50
ARSENIC *	5 / 6	2.4 - 9.9	2.9E+02	11.23	3 / 3	2.3 - 4.2	3.53	NO	NO	4.20
BARIUM	6 / 6	3.2 - 15.8	2.9E+02	16.80	3 / 3	5.6 - 9.3	7.27	NO	NO	9.30
BERYLLIUM	4 / 6	0.34 0.57	3.3E-01	0.72	2 / 3	0.12 - 0.32	0.18	NO	NO	0.32
CADMIUM	2 6	0.44 - 0.46	1.1E+00	0.93	2 / 3	0.35 - 0.47	0.40	NO	NO	0.47
CALCIUM	6 / 6	179 - 518	6.7E+05	690.83	3 / 3	81.1 - 347.25	201.45	NO	NO	347.25
CHROMIUM	6 / 6	4.3 - 56	2.6E+03	40.42	3 / 3	23.2 - 72.5	42.97	YES	NO	72.50
COBALT	4 / 6	0.51 2.1	6.4E+00	2.85	2 / 3	0.43 - 0.57	0.58	NO	NO	0.57
COPPER	6 / 6	1 - 13	1.9E+01	9.08	3 / 3	2.9 - 32.7	14.40	YES	NO	32.70
IRON	6 / 6	228 - 21400	7.2E+09	23589.33	3 / 3	4355 - 9180	6921.67	NO	NO	9180.00
LEAD	6 / 6	4 - 34.3	4.8E+01	21.07	3 / 3	10.1 - 94.3	45.57	YES	NO	94.30
MAGNESIUM	6 / 6	60.7 - 880	2.0E+06	809.90	3 / 3	156 - 441	253.00	NO	NO	441.00
MANGANESE	6 / 6	3.9 - 63.1	8.9E+01	36.22	3 / 3	10.9 - 21.9	14.78	NO	NO	21.90
MERCURY *	1 / 6	0.068 0.068	8.5E-03	0.09	3 / 3	0.0295 - 0.19	0.10	YES	YES	0.19
NICKEL	5 / 6	1.6 - 6	3.4E+01	6.90	2 / 3	2.4 - 3	2.22	NO	NO	3.00
POTASSIUM	5 / 6	86.1 - 2900	1.4E+07	1892.03	3 / 3	308 - 1530	763.00	NO	NO	1530.00
SILVER *	2 / 6	0.1125 0.15	2.8E+00	1.13	2 / 3	2.4 - 22.7	8.58	YES	YES	22.70
SODIUM	4 / 6	26.6 - 2280	2.9E+03	876.80	3 / 3	18.1 - 39.45	27.02	NO	NO	39.45
VANADIUM	6 / 6	5.9 - 42.7	2.1E+03	39.42	3 / 3	19.1 - 37.9	25.67	NO	NO	37.90
ZINC	6 / 6	12.5 - 34.7	1.5E+03	41.23	3 / 3	8.75 - 54.7	31.32	NO	NO	54.70

* - Selected as a COPC.

** - Upper Tolerance Limit = UTL is the concentration that is estimated to contain a designated portion (95%) of all possible sample measurements.

*** - Background samples are as follows: BGSD01, BGSD02, BGSD04 through BGSD07.

TABLE 2

OCCURRENCE AND DISTRIBUTION OF ORGANICS IN SEDIMENT AT SITE 13
OU-5 FEASIBILITY STUDY
NWS EARLE, COLTS NECK, NEW JERSEY
(ug/kg)

SUBSTANCE	BACKGROUND**			SITE-RELATED		
	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTION	REPRESENTATIVE CONCENTRATION	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTION	REPRESENTATIVE CONCENTRATION
4,4'-DDE *	1 / 6	1.7 - 1.7	1.7	1 / 3	2.45 - 2.45	2.45
4,4'-DDT *	1 / 6	19 - 19	10.63992	1 / 3	6.4 - 6.4	6.4
ALPHA-CHLORDANE *	NOT DETECTED	-	-	2 / 3	11 - 20	20
AROCLOR-1254 *	NOT DETECTED	-	-	3 / 3	58 - 3900	3900
AROCLOR-1260 *	NOT DETECTED	-	-	2 / 3	33 - 1200	1200
BENZO(B)FLUORANTHENE	3 / 6	150 - 490	346.54105	1 / 1	48 - 48	48
CHRYSENE *	3 / 6	130 - 940	577.8735	1 / 1	56 - 56	56
DIETHYLPHTHALATE *	1 / 3	44 - 44	44	1 / 1	51 - 51	51
ENDOSULFAN SULFATE *	NOT DETECTED	-	-	1 / 3	0.3 - 0.3	0.3
ENDRIN ALDEHYDE *	NOT DETECTED	-	-	2 / 3	31 - 90	90
FLUORANTHENE *	3 / 6	240 - 1800	1024.31285	1 / 1	81 - 81	81
GAMMA-CHLORDANE *	1 / 6	0.095 - 0.095	0.095	1 / 3	0.16 - 0.16	0.16
PYRENE *	3 / 6	200 - 1900	1076.74355	1 / 1	67.5 - 67.5	67.5

* - Selected as a COPC.
** - Background samples are as follows: BGSD01, BGSD02, BGSD04 through BGSD07.

TABLE 3

OCCURRENCE AND DISTRIBUTION F INORGANICS IN GROUNDWATER AT SITE 13
OU-5 FEASIBILITY STUDY
NWS EARLE, COLTS NECK, NEW JERSEY
(ug/L)

	BACKGROUND***				SITE-RELATED					
SUBSTANCE	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTION	UTL**	2 X AVERAGE CONCENTRATION	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTION	AVERAGE CONCENTRATION	MEAN > 2 X BKGD	MEAN > ACK UTL	REPRESENTATIVE CONCENTRATION
ALUMINUM	11 / 11	287 - 7870	9.6E+06	5097.82	5 / 5	1420 - 15800	8682.00	YES	NO	15800.00
ANTIMONY *	NOT DETECTED	-	-	-	1 / 5	9.7 9.7	3.02	YES	-	9.70
ARSENIC *	1 / 11	5.8 - 5.8	6.6E+00	4.05	3 / 5	15.2 - 39.2	15.14	YES	YES	39.20
BARIUM	11 / 11	2.6 - 518	5.8E+02	229.60	5 / 5	10 - 285	102.84	NO	NO	285.00
BERYLLIUM	4 / 11	0.21 - 1.6	1.3E+00	0.49	4 / 5	0.67 - 1.6	0.87	YES	NO	1.60
CADMIUM *	5 / 11	0.6 - 1.9	2.3E+00	1.21	5 / 5	1 - 63.9	14.50	YES	YES	40.87
CALCIUM	11 / 11	506 - 17200	1.7E+04	8306.55	5 / 5	3170 - 11900	6570.00	NO	NO	11900.00
CHROMIUM*	9 11	1.3 - 43.5	6.0E+01	29.36	5 / 5	26.3 - 296	176.34	YES	YES	296.00
COBALT	6 / 11	0.7 - 10.1	9.6E+00	4.06	5 / 5	2.1 - 8.4	4.96	YES	NO	8.40
COPPER	9 / 11	0.79 - 13.5	1.4E+01	6.53	5 / 5	2.6 - 14.2	6.32	NO	NO	14.20
IRON *	11 / 11	153 - 7690	8.5E+03	4197.09	5 / 5	866 - 57900	33033.20	YES	YES	57900.00
LEAD *	3 / 11	2.1 - 3	3.1E+00	2.44	5 / 5	3.4 - 18.8	10.58	YES	YES	18.80
MAGNESIUM	11 / 11	273 - 27400	2.3E+04	8449.64	5 / 5	2120 - 4040	2888.00	NO	NO	3950.12
MANGANESE	11 / 11	3.3 - 65	1.2E+03	46.18	5 / 5	58.3 - 138	102.50	YES	NO	138.00
MERCURY	11 / 11	0.005 - 0.12	2.0E-01	0.12	5 / 5	0.047 - 0.11	0.06	NO	NO	0.09
NICKEL	10 / 11	0.81 - 25.5	2.6E+01	11.98	4 / 5	11.5 - 35.7	14.90	YES	NO	35.70
POTASSIUM	11 / 11	350 - 3245	2.5E+06	2810.55	5 / 5	2620 - 9330	6288.00	YES	NO	9330.00
SILVER *	1 11	5.3 - 5.3	8.6E+00	4.96	3 / 5	4.6 39.9	10.84	YES	YES	26.39
SODIUM	NOT DETECTED	-	-	-	1 / 5	1 - 1	0.58	YES	-	0.88
THALLIUM	11 / 11	1850 - 11650	1.3E+04	8449.09	5 / 5	3520 - 9780	6966.00	NO	NO	9780.00
VANADIUM	3 / 11	4 - 5.1	1.1E+01	5.15	2 / 5	10.4 - 23.8	7.92	YES	NO	17.10
ZINC *	10 / 11	0.69 - 42.25	4.0E+01	16.48	5 / 5	2.6 - 152	89.44	YES	YES	152.00

* - Selected as a COPC.
** - Upper Tolerance Limit = UTL is the concentration that is estimated to contain a designated portion (95%) of all possible sample measurements.
*** - Background samples are as follows: MW4-04, BGMW-02, BGMW-01, MW26-03, MW3-06, MW5-02, MW5-03, MW19-01, MW1-03, MW5-08, MW11-03.

TABLE 4

OCCURRENCE AND DISTRIBUTION OF ORGANICS IN GROUNDWATER AT SITE 13
OU-5 FEASIBILITY STUDY
NWS EARLE, COLTS NECK, NEW JERSEY
(ug/L)

SUBSTANCE	BACKGROUND**			SITE-RELATED		
	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTION	REPRESENTATIVE CONCENTRATION	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTION	REPRESENTATIVE CONCENTRATION
4,4'-DDT *	NOT DETECTED	-	-	2 / 5	0.029 - 0.051	0.051
DIELDRIN *	NOT DETECTED	-	-	1 / 5	0.022 - 0.022	0.02
ENDOSULFAN I *	NOT DETECTED	-	-	1 / 5	0.028 - 0.028	0.03
HEPTACHLOR *	NOT DETECTED	-	-	2 / 5	0.0052 - 0.011	0.01
4-METHYLPHENOL *	NOT DETECTED	-	-	1 / 5	2 - 2	2.00
VOLATILE HYDROCARBONS *	NOT DETECTED	-	-	16 20	2 1300	210.46
1,1,1-TRICHLOROETHANE *	NOT DETECTED	-	-	4 / 28	0.02 - 5	2.68
1,1-DICHLOROETHENE *	NOT DETECTED	-	-	6 / 28	0.01 - 2	2.00
1,2-DICHLOROETHENE (TOTAL)	NOT DETECTED	-	-	6 / 28	0.1 - 120	14.4758
CARBON DISULFIDE *	NOT DETECTED	-	-	1 / 14	1 - 1	1
CARBON TETRACHLORIDE *	NOT DETECTED	-	-	1 / 28	0.001 - 0.001	0.001
CHLOROFORM *	1 / 11	2 - 2	2	11 / 28	0.01 - 9	2.73609
METHYLENE CHLORIDE *	1 / 11	1 - 1	1	9 / 28	0.5 - 35	8.54
TETRACHLOROETHENE *	NOT DETECTED	-	-	17 / 28	0.004 - 70	9.51804
TRICHLOROETHENE *	NOT DETECTED	-	-	7 / 28	0.2 - 180	23.13233
VINYL CHLORIDE *	NOT DETECTED	-	-	2 / 14	10 - 11	6.63

* - Selected as a COPC.

** - Background samples are as follows: MW4-04, BGMW-02, BGMW-01, MW26-03, MW3-06, MW5-02, MW5-03, MW19-01, MW1-03, MW5-08, MW11-03.

TABLE 5

OCCURRENCE AND DISTRIBUTION OF INORGANICS IN SURFACE WATER AT SITE 13
OU-6 FEASIBILITY STUDY
NWS EARLE, COLTS NECK, NEW JERSEY
(ug/L)

	BACKGROUND***				SITE-RELATED					
SUBSTANCE	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTION	UTL **	2 X AVERAGE CONCENTRATION	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTION	AVERAGE CONCENTRATION	MEAN > 2 X BKGD	MEAN > ACK UTL	REPRESENTATIVE CONCENTRATION
ALUMINUM	5 / 6	102 - 1540	2.2E+03	904.20	1 / 1	932 - 932	932.00	YES	NO	932.00
BARIUM	6 / 6	16.3 - 36.4	2.4E+03	55.05	1 / 1	28.45 - 28.45	28.45	NO	NO	28.45
BERYLLIUM	3 / 6	0.22 - 1.2	1.7E+00	0.70	1 / 1	0.28 - 0.28	0.28	NO	NO	0.28
CADMIUM *	1 / 6	0.18 0.18	3.2E-01	0.23	1 / 1	0.555 - 0.555	0.56	YES	YES	0.56
CALCIUM	6 / 6	462 - 177000	2.3E+05	71114.00	1 / 1	3010 - 3010	3010.00	NO	NO	3010.00
CHROMIUM *	3 / 5	0.72 - 2.6	4.4E+00	1.78	1 / 1	11 - 11	11.00	YES	YES	11.00
COBALT	6 / 6	0.81 - 2	5.2E+00	3.10	1 / 1	2.55 - 2.55	2.55	NO	NO	2.55
COPPER	5 / 6	1.1 - 17.8	3.0E+02	11.92	1 / 1	1.2 - 1.2	1.20	NO	NO	1.20
IRON	6 / 6	160 - 23100	3.0E+04	9576.67	1 / 1	1695 - 1695	1695.00	NO	NO	1695.00
LEAD	2 / 6	4.4 - 16	2.2E+01	7.31	1 / 1	1.85 - 1.85	1.85	NO	NO	1.85
MAGNESIUM	6 / 6	369 - 559000	7.0E+05	190702.67	1 / 1	1940 - 1940	1940.00	NO	NO	1940.00
MANGANESE	6 / 6	14 - 203	3.8E+02	172.43	1 / 1	41.3 - 41.3	41.30	NO	NO	41.30
NICKEL	6 / 6	2.1 - 7.9	8.2E+01	10.23	1 / 1	8.95 - 8.95	8.95	NO	NO	8.95
POTASSIUM	5 / 6	251 - 259000	3.2E+05	88922.83	1 / 1	1720 - 1720	1720.00	NO	NO	1720.00
SILVER *	1 / 6	0.86 - 0.86	1.3E+00	0.75	1 / 1	1.4 - 1.4	1.40	YES	YES	1.40
SODIUM	3 / 3	11150 - 4340000	1.3E+07	2912233.33	1 / 1	4405 - 4405	4405.00	NO	NO	4405.00
VANADIUM	4 / 6	0.225 - 9	1.2E+01	3.79	1 / 1	0.405 - 0.405	0.41	NO	NO	0.41

* - Selected as a COPC

** - Upper Tolerance Limit = UTL is the concentration that is estimated to contain a designated portion (95%) of all possible sample measurements.

*** - Background samples are as follows: BGSW01, BGSW02, BGSW04 through BGSW07.

TABLE 6

SITE 13 - SCREENING OF REMEDIAL ALTERNATIVES
OU-5 FEASIBILITY STUDY
NWS EARLE, COLTS NECK, NEW JERSEY

	ALTERNATIVE	EFFECTIVENESS	IMPLEMENTABILITY	COST	COMMENTS
1	No Action: (long-term monitoring, 5 year reviews)	Provides no additional protection of human health or the environment. Does not reduce potential for human exposure to landfill or groundwater contaminants. Does not reduce contaminant migration in the environment. No reduction in toxicity, mobility, or volume of contaminants.	Readily implementable. No technical or administrative difficulties.	Capital: none O&M: low	Retained as baseline alternative in accordance with NCP. Retained.
2	Limited Action (Institutional controls, access restrictions, long-term monitoring, 5-year reviews)	Provides added protection of human health through fencing and institutional controls. Groundwater use would be restricted. Does not reduce contaminant migration to the environment. No reduction in toxicity, mobility, or volume of contaminants.	Readily implementable. No technical or administrative difficulties.	Capital: low O&M: low	Relative to Alt. 1, provides significant additional protectiveness for little additional cost. Retained.
3	Capping, Institutional Controls, and Long-Term Monitoring	Protects human health and the environment. Capping landfill materials prevents direct contact exposure and minimizes contaminant migration to the environment. Groundwater use would be restricted. Groundwater contaminants will gradually decrease over time. No reduction of toxicity or volume of contaminants.	Readily implementable. No technical or administrative difficulties. Personnel and materials necessary to implement alternative are widely available.	Capital: moderate O&M: moderate	Retained.