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CORRECTIVE MEASURES STUDY ADDENDUM SOLID WASTE MANAGEMENT UNITS 1, 23, 24 AND 25 (SWMU1) (SWMU23) (SWMU24) (SWMU25) NS MAYPORT FL
6/28/2007
TETRA TECH

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Naval Facilities Engineering Command
Southeast
ATTN: Adrienne Wilson (Code OPAEVR)
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North Charleston, South Carolina 29406

Reference: CLEAN IV Contract Number N62467-04-D-0055
Contract Task Order Number 0033

Subject: Corrective Measure Study Addendum
SWMUs 1, 23, 24, and 25
Naval Station Mayport, Mayport, Florida.

Dear Ms. Wilson:

Tetra Tech NUS, Inc. (TtNUS) is pleased to submit the Corrective Measures Study (CMS) Report Addendum for Solid Waste Management Units (SWMUs) 1, 23, 24, and 25, Naval Station (NAVSTA) Mayport in Mayport, Florida. This report was prepared for the United States Navy, Naval Facilities Engineering Command Southeast under Contract Task Order (CTO) 0033 for the Comprehensive Long-term Environmental Action Navy (CLEAN) IV Contract Number N62467-04-D-0055. This letter report is an addendum to the CMS Report for SWMUs 1, 23, 24, and 25 which was issued on November 10, 2004.

Purpose

Additional information to be amended to the CMS for SWMUs 1, 23, 24, and 25 are as follows:

1) Revised SWMU chemicals of concern (COCs) and volumes of contaminated media.
2) Amended corrective measure alternatives.
3) Defined Land Use Control (LUC) boundaries in compliance with the revised SWMU COCs.

Background

Between March and October 1995, ABB Environmental Services, Inc. (ABB-ES) conducted the Resource Conservation and Recovery Act Facility Investigation (RFI) for the Shipyard Area which included SWMUs 1, 23, 24, and 25. Soil sampling was conducted individually for each SWMU, and groundwater sampling was conducted collectively for SWMUs 1, 23, 24, and 25. Table 1 summarizes the RFI exceedances of initial industrial target levels for each SWMU in surface soil, subsurface soil, and groundwater.

The RFI recommended that SWMUs 1, 23, 24, and 25 areas should be designated for industrial use only. Interim measures (IMs) were recommended to eliminate "hot spots" thereby reducing the risk under current use for trespassers, occupational workers, and hypothetical residents. Additional investigation of surface soil was recommended to delineate horizontal and vertical extent of "hot spots."

TABLE 1: SUMMARY OF RFI EXCEEDANCES

SWMU(s)	Media of Concern	RFI Exceedances
SWMU 1	Surface Soil	• Aroclor-1254 • Aroclor-1260 • Antimony • Beryllium • Arsenic
	Subsurface Soil	• Arsenic
SWMU 23	Surface Soil	• Benzo(a)pyrene • Dibenzo(a,h)anthracene • Aroclor-1254 • Aroclor-1260
	Subsurface Soil	• Arsenic
SWMU 24	Surface Soil	• Benzo(a)pyrene • Dibenzo(a,h)anthracene • Aroclor-1260
	Subsurface Soil	• Arsenic • Copper
SWMU 25	Surface Soil	• Dieldrin
	Subsurface Soil	• Dieldrin
SWMUs 1, 23, 24, and 25	Groundwater	• Antimony • Arsenic • Iron • Magnesium • Manganese • Sodium • Vanadium • 1,2,-Dichloroethane • Bis(2-ethylhexyl)phthalate

Since no analyte detected in the subsurface soil at SWMUs 1, 23, 24, or 25 exceeded industrial cleanup goals, the RFI concluded that no further investigation of subsurface soil was required under a current industrial use setting.

IM Performance Specifications were conducted at SWMUs 23, 24, and 25 for the collection of surface or subsurface soil samples for contaminant analysis. Based on the IM Performance Specification, Bechtel Environmental, Inc. further delineated the "hot spots" by collecting additional soil samples near locations where exceedances in surface soil samples were previously observed at SWMUs 23, 24, and 25. The contaminated areas were excavated, removed, then backfilled with clean soil. Approximately 412 tons and 918 tons of soil at SWMUs 23 and 24, respectively, were removed during excavation.

The IM Performance Specification concluded that an IM was not warranted at SWMU 25 because aldrin and dieldrin were likely applied legally as a termiticide under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended by the Federal Pesticide Control Act of 1972.

In November, 2004, TtNUS completed a CMS for SWMUs 1, 23, 24, and 25. The CMS report identified the contaminants and media that presented unacceptable risk to human and ecological receptors. Additionally,

the CMS evaluated and recommended a preferred alternative for addressing those risks. The Executive Summary from the CMS is included as Attachment 1 of this document.

At SWMU 1, arsenic and benzo(a)pyrene were the only contaminants that exceeded residential Soil Cleanup Target Levels (SCTLs) in surface soil samples. There were no exceedances observed in subsurface soil at SWMU 1. Contaminants present at SWMU 23 that were determined to exceed residential SCTLs included benzo(a)pyrene; benzo(b)fluoranthene; indeno(1,2,3-cd)pyrene; aroclor-1254; aroclor-1260; antimony; arsenic; chromium; copper; lead; and nickel in surface soil. The only contaminant observed in subsurface soil at SWMU 23 was arsenic. At SWMU 24, the contaminants present in surface soil in exceedance of residential SCTLs included aroclor-1260; arsenic; benzo(a)anthracene; benzo(a)pyrene; copper; and dibenzo(a,h)anthracene. In subsurface soil, arsenic was the only contaminant present in excess of residential SCTLs.

At SWMU 25, contaminants found in surface soil samples that exceeded residential SCTLs included aldrin, dieldrin, arsenic, and vanadium. In subsurface soil at SWMU 25, dieldrin was found to exceed industrial SCTLs. Contaminated soil thickness ranged from 1 to 2 feet. The aerial extent of surface soil contamination consisted of three separate areas for a combined estimate of 1,280 square feet (ft^2). The aerial extent of subsurface soil contamination was estimated at 1,080 ft^2. The volume estimate indicates a total of 95 cubic yards (yd^3) of surface soil and 120 yd^3 of subsurface soil that are contaminated in excess of the Media Clean-up Standard (MCS).

The groundwater for these SWMUs were grouped together as the Group III SWMUs during the RFI because of their common geographic location, common drainage to the St. Johns River, similarity of past waste disposal activities, and the potential for similar or related corrective actions. Per the CMS, the COCs in groundwater at the SWMUs include the metals antimony, arsenic, iron, manganese, silver, and zinc. In the CMS, the estimated volume of groundwater contamination was determined to be approximately 1,900,000 gallons.

Discrepancies exist between the RFI and CMS reports and within the CMS report regarding COCs present in soil and groundwater at the Shipyard Area SWMUs. Additionally, the CMS did not clarify or define LUC boundaries and volumes of contaminated media were not calculated for SWMUs 1, 23, and 24. Also, after the completion of the CMS, the FDEP SCTLs were updated in April 2005. Therefore, an addendum to the CMS is warranted to clarify and update COCs for SWMUs 1, 23, 24, and 25; to define LUC boundaries; and to calculate the volume of contaminated media at SWMUs 1, 23, and 24.

Revised SWMU COCs and Volumes of Contaminated Media

In the CMS, COC designation of soil contaminants was based upon concentrations above the industrial direct exposure SCTLs. However, full delineation based upon residential direct exposure should have been utilized. Therefore, the contaminants of potential concern (COPCs) as determined in the CMS for each SWMU have been re-evaluated and compared to current residential direct exposure SCTLs. The COPCs for each SWMU as presented in the CMS are included as Attachment 2 of this document.

Based on the current FDEP SCTLs, maximum observed concentrations of arsenic in soil samples from SWMUs 1, 23, 24, and 25 have been re-evaluated. This re-evaluation was made based upon the current residential direct exposure SCTL for arsenic, 2.1 milligrams per kilogram (mg/kg), and the current industrial direct exposure SCTL for arsenic, 12 mg/kg. In addition, site concentrations for carcinogenic polycyclic aromatic hydrocarbons (PAHs) have been converted to benzo(a)pyrene equivalents for comparison with the appropriate direct exposure SCTL for benzo(a)pyrene using the approach describe in the February 2005 "Final Technical Report: Development of Cleanup Target Levels (CTLS) for Chapter 62-777, F.A.C." This re-evaluation was made based upon the current residential direct exposure SCTL for benzo(a)pyrene, 0.1 mg/kg, and the current industrial direct exposure SCTL for benzo(a)pyrene, 0.7 mg/kg. Benzo(a)pyrene equivalent calculations for each SWMU are included as Attachment 3 of this document. Also, any contaminants identified as COCs for surface soil, subsurface soil, and groundwater in the executive

summary of the CMS were re-evaluated against FDEP residential direct exposure SCTLs and FDEP GCTLs as appropriate.

At SWMU 1, the maximum arsenic concentration observed in surface soil samples are above the residential direct exposure SCTL while below the industrial direct exposure SCTL. Arsenic remains a COC for surface soil at SWMU 1. Subsurface soil samples at SWMU 1 exhibited arsenic concentrations that were below the residential direct exposure SCTL. Based upon benzo(a)pyrene equivalency calculations, the following PAHs are designated as COCs in surface soil for SWMU 1: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene. The benzo(a)pyrene equivalency calculations for these PAHs is 0.12 mg/kg. It was determined that approximately 2,340 yd^3 of surface soil contaminated in excess of the residential direct exposure SCTLs comprises the LUC boundary for SWMU 1 (see Attachment 4).

At SWMU 23, surface and subsurface soil samples exhibited arsenic concentrations that exceeded the residential SCTL, but were below the industrial SCTL. Based on comparison to residential direct exposure SCTLs, copper, lead, and nickel are also COCs for surface soil at SWMU 23. Per the benzo(a)pyrene equivalent calculations, benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; dibenzo(a,h)anthracene; and indeno(1,2,3-cd)pyrene are COCs for surface soil at SWMU 23. The benzo(a)pyrene equivalency calculations for these PAHs is 0.31 mg/kg. Approximately 27,956 yd^3 of surface and subsurface soil that is contaminated in excess of the residential direct SCTLs comprises the LUC boundary for SWMU 23 (see Attachment 4).

While arsenic concentrations observed in subsurface soil at SWMU 24 had previously been in exceedance of the Florida Department of Environmental Protections industrial direct exposure SCTL, the maximum concentration is below the current FDEP industrial direct exposure SCTL but above the current residential direct exposure SCTL. Surface soil concentrations of arsenic remain below the residential SCTL. The following PAHs are designated as COCs for surface soil at SWMU 24: benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; dibenzo(a,h)anthracene; and indeno(1,2,3-cd)pyrene. The benzo(a)pyrene equivalency calculations for these PAHs is 0.30 mg/kg. Approximately 16,821 yd^3 of surface and subsurface soil that is contaminated in excess of the residential direct exposure SCTLs comprises the LUC boundary for SWMU 24 (see Attachment 4).

At SWMU 25, concentrations of arsenic are below the residential SCTL for surface and subsurface soil. Arsenic is not a COC in surface or subsurface soil at SWMU 25. Aldrin and dieldrin remain COCs for surface and subsurface soil at SWMU 25. Contaminated soil thickness at the SWMU ranges from 1 to 2 feet. As determined in the CMS, the aerial extent of surface soil contamination still consists of three separate areas for a combined estimate of 1,280 ft^2. The aerial extent of subsurface soil contamination was estimated at 1,080 ft^2. The volume estimate indicates a total of 95 yd^3 of surface soil and 120 yd^3 of subsurface soil that are contaminated in excess of the MCS.

Based upon the groundwater sampling event conducted for the RFI, iron and manganese were observed in excess of FDEP Groundwater Cleanup Target Levels (GCTLs). The RFI concluded that concentrations of iron were observed to be below the essential nutrient screening concentration. As such, the RFI removed iron as a groundwater COC for SWMUs 1, 23, 24, and 25. In addition, the manganese levels detected in groundwater at SWMUs 1, 23, 24, and 25 appear to be characteristic for the contaminant over the entire base. Manganese is not believed to have been associated with any past or present activities at SWMUs 1, 23, 24, and 25. Therefore, manganese is not considered groundwater COC for these SWMUs. Since the conditions of iron and manganese observed during the RFI investigations at the Shipyard Area SWMUs still exists at NAVSTA Mayport today, it was concluded that iron and manganese are not COCs for groundwater at the Shipyard Area SWMUs. Based upon these revisions, it was concluded that antimony, arsenic, silver, and zinc are the only COCs for groundwater at SWMUs 1, 23, 24, and 25. As determined in the CMS, the estimated volume of groundwater contamination was determined to be approximately 1,900,000 gallons.

Amended Corrective Measure Alternatives

The CMS determined that LUC boundaries were necessary at SWMUs 1, 23, 24, and 25 to address the presence of COCs in exceedance of FDEP residential SCTLs and GCTLs at these SWMUs. In addition to LUC boundaries, capping was proposed for SWMU 25. While capping of impacted surface soils is planned at SWMU 25, LUC boundaries were not defined in the CMS for SWMUs 1, 23, 24, and 25. A re-evaluation of COCs for soil and groundwater at SWMUs 1, 23, 24, and 25 concluded that LUCs are still warranted. The figures found in Attachment 4 clearly define the LUC boundaries for these SWMUs.

LUCs would provide long-term effectiveness or permanence at SWMUs 1, 23, 24, and 25 restricting residential use and prohibiting soil disturbance/removal of the areas at and around observed contamination at each SWMU until such time as it can be determined there are no longer any residential exceedances at the SWMU. Present worth costs for the implementation of LUC boundaries would be approximately $85,000 for each of SWMUs 1, 23, and 24. The combination of capping with LUCs at SWMU 25 will involve an approximate present worth cost of $155,000.

LUC Boundaries

For SWMUs 1, 23, 24, and 25, the proposed LUC boundaries are identical to the SWMU boundaries and are presented in Attachment 4. The proposed LUC boundaries encompass areas of approximately 63,160 ft^2; 94,350 ft^2; 75,690 ft^2; and 95,730 ft^2 for SWMUs 1, 23, 24, and 25, respectively.

The LUCs for surface and subsurface soil at SWMUs 1, 23, and 24 will restrict use of the parcel to non-residential use and prevent any uncontrolled removal or disturbance of the soil exceeding FDEP direct residential exposure SCTLs (unless previously approved by FDEP and the Navy). The LUCs for soil at SWMU 25 will restrict use of the parcel to non-residential use, prevent any unauthorized removal or disturbance of the soil exceeding FDEP direct residential exposure SCTLs, and ensure that no unauthorized disturbance of any concrete or asphalt covered areas occurs. Prohibited uses of the SWMU will include any form of housing, child-care facilities, pre-schools, elementary schools, secondary schools, playgrounds, or full-time adult convalescent or nursing care facilities. Allowable uses shall include commercial and/or industrial land use only.

LUCs for groundwater at SWMUs 1, 23, 24, and 25 will serve to prohibit groundwater extraction or use, and any interference with the groundwater monitoring systems at the SWMUs. The LUCs at SWMUs 1, 23, 24 and 25 will be monitored, maintained, reported on, and enforced by the Navy.

Conclusions

In order to address discrepancies between the RFI and CMS regarding COCs present and to allow COC designation to reflect the current FDEP SCTLs, the COPCs, as defined in the CMS, were re-evaluated in this document. Additionally, site concentrations for carcinogenic PAHs have been converted to benzo(a)pyrene equivalents for comparison with the appropriate direct exposure SCTL for benzo(a)pyrene using the approach describe in the February 2005 "Final Technical Report: Development of Cleanup Target Levels (CTLS) for Chapter 62-777, F.A.C.'" Table 2 summarizes the final COCs for surface soil, subsurface soil and groundwater at SWMUs 1, 23, 24, and 25.

LUCs were recommended as the corrective measure alternative for soil at SWMUs 1, 23, 24, and 25. At these SWMUs, the LUCs for soil will restrict use of the parcel to non-residential use and prevent any uncontrolled removal or disturbance of the soil exceeding FDEP direct residential exposure SCTLs. In addition, capping is also planned for SWMU 25 and the LUCs at SWMU 25 will ensure that no digging into or disturbance of any concrete or asphalt area occurs. Proposed LUC boundaries have been established at SWMUs 1, 23, 24, and 25 in this addendum. Each LUC boundary is proposed to be identical to its respective SWMU boundary (see Attachment 4). The Navy will notify FDEP, per permit requirement, of any removal or disturbance at these LUC areas.

TABLE 2: FINAL COCs for SWMUs 1, 23, 24, and 25

SWMU(s)	Media of Concern	Final COCs
SWMU 1	Surface Soil	• Arsenic • Benzo(a)anthracene • Benzo(a)pyrene • Benzo(b)fluoranthene • Benzo(k)fluoranthene • Chrysene
SWMU 23	Surface Soil	• Arsenic • Benzo(a)anthracene • Benzo(a)pyrene • Benzo(b)fluoranthene • Benzo(k)fluoranthene • Chrysene • Dibenzo(a,h)anthracene • Indeno(1,2,3-cd)pyrene • Copper • Lead • Nickel
	Subsurface Soil	• Arsenic
SWMU 24	Surface Soil	• Benzo(a)anthracene • Benzo(a)pyrene • Benzo(b)fluoranthene • Benzo(k)fluoranthene • Chrysene • Dibenzo(a,h)anthracene • Indeno(1,2,3-cd)pyrene
	Subsurface Soil	• Arsenic
SWMU 25	Surface Soil	• Aldrin • Dieldrin
	Subsurface Soil	• Aldrin • Dieldrin
SWMUs 1, 23, 24, and 25	Groundwater	• Antimony • Arsenic • Silver • Zinc

It has been determined that iron and manganese are no longer COCs for groundwater at SWMUs 1, 23, 24, and 25. The RFI concluded that concentrations of iron were observed to be below the essential nutrient screening concentration. As such, the RFI removed iron as a groundwater COC for SWMUs 1, 23, 24, and 25. In addition, the manganese levels detected in groundwater at SWMUs 1, 23, 24, and 25 appear to be characteristic for the contaminant over the entire base. Manganese is not believed to have been associated with any past or present activities at SWMUs 1, 23, 24, and 25. Therefore, manganese is not considered

groundwater COC for these SWMUs either. It was concluded that antimony, arsenic, silver, and zinc are the only COCs for groundwater at SWMUs 1, 23, 24, and 25. LUCs for groundwater at SWMUs 1, 23, 24, and 25 will ensure there is no human consumption of contaminated groundwater, there is no tampering or damage to the any monitoring or remediation systems, and that assessments of contaminant migration are occurring and reports summarizing the findings of each monitoring event and annual analytical results are being submitted to the Navy and FDEP.

If you have any questions with regard to this submittal, please contact me at (904) 636-6125 or via e-mail at shina.ballard@ttnus.com.

Sincerely,

Shina A. Ballard

Shina A. Ballard
Task Order Manager

SB/jf

Attachments (5)

c: Mr. J. Cason P.G., FDEP (2 copies)
Mr. C. Benedikt, USEPA
Ms. D. Racine, NAVSTA Mayport
Mr. M. Halil P.E., CH2M Hill
Ms. D. Humbert, TtNUS (cover letter only)
Mr. M. Perry, TtNUS (unbound copy)
CTO 0033 Project File

This document, *Corrective Measures Study Addendum for Solid Waste Management Units 1, 23, 24, and 25, Naval Station Mayport, Mayport, Florida*, has been prepared under the direction of a Florida Registered Professional Engineer. The work and professional opinions rendered in this report were conducted or developed in accordance with commonly accepted procedures consistent with applicable standards of practice. This document was prepared for Naval Station Mayport, Mayport, Florida, and should not be construed to apply to any other site.

June 28, 2007
Michael F. Albert, P.E.
State of Florida License No. 55239
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ATTACHMENT 1

CMS EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

A Corrective Measures Study (CMS) has been conducted for Solid Waste Management Units (SWMUs) 1, 23, 24, and 25 at Naval Station (NAVSTA) Mayport in Mayport, Florida, by the Southern Division, Naval Facilities Engineering Command, pursuant to the Resource Conservation and Recovery Act (RCRA). This CMS was conducted in accordance with the Hazardous and Solid Waste Amendments (HSWA) permit FL9 170 024 260, issued by the U.S. Environmental Protection Agency (USEPA) on March 25, 1988, and revised and reissued on June 15, 1993. The HSWA/RCRA program is designed to identify and clean up releases of hazardous substances at RCRA-permitted facilities. RCRA ensures that solid and hazardous wastes are managed in an environmentally sound manner. The law applies primarily to facilities that generate or handle hazardous waste.

The RCRA program is conducted in the following three stages.

1. The RCRA Facility Assessment (RFA) identifies SWMUs, evaluates the potential for releases of contaminants, and determines the need for future investigations.
2. The RCRA Facility Investigation (RFI) then determines the nature, extent, and fate of contaminant releases.
3. The CMS identifies and recommends measures to correct the releases.

The RFA report for SWMUs 1, 23, 24, and 25 was issued in April 1988. The RFI report for these SWMUs was issued in December 1996. This report presents the results of the CMS, including the following:

1. Determination of the Media Cleanup Standards (MCSs) using the recently approved regulation Chapter 62-777, *Florida Administrative Code* (F.A.C.).
2. Selection of Contaminants of Concern (COCs).
3. Determination of areas and volumes of impacted media exceeding the MCSs.
4. Development, screening, and evaluation of corrective measure alternatives.
5. Recommendation of corrective action to address contaminated media.

This CMS report contains the results of the identification, screening, and evaluation of corrective measure alternatives for all media at the following sites:

- SWMU 1, Landfill A
- SWMU 23, Jacksonville Shipyard, Inc.
- SWMU 24, North Florida Shipyards, Inc.
- SWMU 25, Atlantic Marine, Inc.

SWMU 1, Landfill A

SWMU 1 is the former Landfill A that was operated by the Navy from 1942 to 1960. The landfill is reported to have covered a 4-acre area where a series of trenches approximately 15 feet wide, 400 feet long, and 8 feet deep were excavated and filled. Industrial and sanitary wastes were disposed in the landfill and included waste oils, paints, solvents, sanitary garbage, and construction rubble. Burning of the wastes was conducted on a weekly schedule. When filled, the trenches were covered with soil.

SWMU 1 is located in the vicinity of the Jacksonville Shipyard Inc., Administrative Building along BonHomme Richard Avenue. The landfill is approximately 600 feet south of the entrance to the Mayport Turning Basin.

Arsenic and benzo(a)pyrene are the only contaminants in the soil that exceed standards for a hypothetical resident at SWMU 1. The future use of the SWMU is to remain industrial; therefore, a resident is considered unlikely. No COCs were identified for industrial use at SWMU 1 for surface soil or subsurface soil. Therefore, the volume of contaminated soil was not calculated.

Although there were no industrial use COCs for soil, arsenic and benzo(a)pyrene did exceed the residential standards. Therefore, two alternatives were developed to ensure that SWMU 1 future use remains industrial. The alternatives are as follows:

Soil Alternative 1: No Action
Soil Alternative 2: Land Use Control (LUCs) and Site Monitoring

The recommended corrective measure alternative for soil at SWMU 1 is Alternative 2, which involves implementing LUCs at the site. The current levels of contaminant concentrations were within the acceptable levels defined by the Florida Department of Environmental Protection (FDEP). Because the screening levels used for the assessment of soil conditions are based on an industrial scenario, LUCs should be implemented. Monitoring of LUCs will ensure that LUCs are implemented to make the site available for industrial purposes only. Alternative 2 will provide the required protection by implementing LUCs at the site. In the absence of COCs, LUCs would provide adequate and cost-effective protection of human health and the environment.

SWMU 23, Jacksonville Shipyard, Inc.

SWMU 23 is formerly the Jacksonville Shipyard, Inc. (JSI) and was operational from 1961 to 1992. NAVSTA Mayport leased this 4-acre property to JSI to conduct maintenance and repair on Navy ships. Activities at JSI included abrasive media blasting, fabrication of metal parts, metal working, degreasing,

paint stripping, welding, automotive maintenance and repair, as well as other ship support operations. Contaminants could have potentially been released from oils used in milling of parts, heavy metals in paint, solvents used in cleaning parts, and fuel storage.

Black Beauty™, an abrasive blasting compound, was used in the southeastern portion of SWMU 23 and was observed to cover most of the ground in this area (Kearney, 1989). Petroleum fuels were stored in several areas throughout the site in underground and aboveground storage tanks (ABB-ES, 1995). A 55-gallon aboveground storage tank containing fuel oil is located on the west side of Building 47 (Kearney, 1989).

SWMU 23 is located in the northwestern part of the Station. The site is bordered to the north by SWMU 44 and 45, on the east by BonHomme Richard Street, on the west by a dirt road and parking lot, and on the south by North Florida Shipyard, Inc. and Atlantic Marine, Inc. (SWMU 24 and 25).

Benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, Aroclor-1254, Aroclor-1260, antimony, arsenic, chromium, copper, lead, and nickel are the contaminants that exceed residential standards. The future use of the SWMU is to remain industrial; therefore, a resident is considered unlikely. No COCs were identified for industrial use at SWMU 23 for surface soil or subsurface soil. Therefore, the volume of contaminated soil was not calculated.

Although there were no industrial use COCs for soil, several contaminants did exceed the residential standards. Therefore, two alternatives were developed to ensure that SWMU 23 future use remains industrial. The alternatives are as follows:

Soil Alternative 1: No Action
Soil Alternative 2: LUCs and Site Monitoring

The recommended corrective measure alternative for soil at SWMU 23 is Alternative 2, which involves implementing LUCs at the site. The current levels of contaminant concentrations were within the acceptable levels defined by the FDEP. Because the screening levels used for the assessment of soil conditions are based on an industrial scenario, LUCs should be implemented. Monitoring of LUCs will ensure that LUCs are implemented to make the site available for industrial purposes only. Alternative 2 will provide the required protection by implementing LUCs at the site. In the absence of COCs, LUCs would provide adequate and cost-effective protection of human health and the environment.

SWMU 24, North Florida Shipyards, Inc.

SWMU 24, formerly the North Florida Shipyards, Inc. (NFS), has been operational since 1982. NAVSTA Mayport leases this 1.5-acre property to NFS to conduct maintenance and repair on Navy ships. Activities at NFS include abrasive media blasting, fabrication of metal parts, metal working, degreasing, paint stripping, welding, automotive maintenance and repair, as well as other ship support operations. Contaminants could have potentially been released from oils used in milling parts, heavy metals in paint, solvents used in cleaning parts, and fuel storage. Currently, a hazardous waste storage shed is located along the fence north of the NFS Administration Building.

SWMU 24 is located in the southeastern part of the Station. The site is bordered on the north by SWMU 24, on the east by BonHomme Richard Street, on the west by SWMU 25, and on the south by Bailey Avenue.

Aroclor-1260, arsenic, benzo(a)anthracene, benzo(a)pyrene, copper and dibenzo(a,h)anthracene are the contaminants that exceed residential standards at SWMU 24. The future use of the SWMU is to remain industrial; therefore, a resident is considered unlikely. No COCs were identified for industrial use at SWMU 24 for surface soil or subsurface soil. Therefore, the volume of contaminated soil was not calculated.

Although there were no industrial use COCs for soil, several contaminants did exceed the residential standards. Therefore, two alternatives were developed to ensure that SWMU 24 future use remains industrial. The alternatives are as follows:

Soil Alternative 1: No Action
Soil Alternative 2: LUCs and Site Monitoring

The recommended corrective measure alternative for soil at SWMU 24 is Alternative 2, which involves implementing LUCs at the site. The current levels of contaminant concentrations were within the acceptable levels defined by the FDEP. Because the screening levels used for the assessment of soil conditions are based on an industrial scenario, LUCs should be implemented. Monitoring of LUCs will ensure that LUCs are implemented to make the site available for industrial purposes only. Alternative 2 will provide the required protection by implementing LUCs at the site. In the absence of COCs, LUCs would provide adequate and cost-effective protection of human health and the environment.

SWMU 25, Atlantic Marine, Inc.

SWMU 25, the Atlantic Marine, Inc. (AMI), has been operational since 1980. NAVSTA Mayport leased this 1.5-acre property to AMI to conduct maintenance and repair of Navy ships under contract to the SUPSHIPs. Activities at AMI include abrasive media stripping, fabrication of metal parts, metal working, degreasing, paint stripping, welding, automotive maintenance and repair, as well as other ship support operations. Contaminants could have potentially been released from oils used in milling of parts, heavy metals in paints, solvents used in cleaning parts and fuel storage.

SWMU 25 is located in the southwestern part of the Station. The site is bordered to the north by SWMU 23, on the east by SWMU 24, on the south by Bailey Avenue, and on the west by a dirt road and parking lot.

Contaminants that exceed residential standards are aldrin, dieldrin, arsenic, and vanadium at SWMU 25. The future use of the SWMU is to remain industrial; therefore, a resident is considered unlikely. Aldrin, dieldrin, and arsenic were identified for industrial use at SWMU 25 for surface soil or subsurface soil. Contaminated soil thickness ranged from 1 to 2 feet. The areal extent of surface soil contamination consisted of three separate areas for a combined estimate of 1,280 ft^2. The areal extent of subsurface soil contamination was estimated at 1,080 ft^2. The volume estimate indicates a total of 95 yd^3 of surface soil and 120 yd^3 of subsurface soil that are contaminated in excess the MCS.

Four alternatives were developed to address soil contamination at SWMU 25. The alternatives are as follows:

Soil Alternative 1:	No Action
Soil Alternative 2:	LUCs and Site Monitoring
Soil Alternative 3:	Capping, LUCs, and Site Monitoring
Soil Alternative 4:	Excavation, Offsite Disposal, and LUCs

The recommended corrective measure alternative for soil at SWMU 25 is Alternative 3, which involves capping and implementing LUCs at the site. The recommended corrective measure alternative involves placing LUCs at the site and monitoring the groundwater quality for the presence of potential contaminants. Alternative 3 would provide a cover, which would minimize infiltration, thus minimizing contaminant leaching. There are only three surface soil COCs (aldrin, arsenic, and dieldrin), and none of these contaminants were detected in groundwater near the site at concentrations of concern. Because the COCs cause potential direct exposure to surface soil and the leaching potential of surface and

subsurface soil contaminants, LUCs, groundwater monitoring, and a cover would provide adequate and cost-effective protection of human health and the environment.

SWMUs 1, 23, 24, and 25 Groundwater

SWMUs 1, 23, 24, and 25 consist of a landfill, three shipyards, and portions of the wastewater treatment facility that are located adjacent to each other in the northeastern part of the Station. The locations and site descriptions for each of these sites are provided in Sections 2, 3, 4, and 5 of this CMS wherein the soils were evaluated for each of the SWMUs. The groundwater for these SWMUs were grouped together as the Group III SWMUs during the RFI because of their common geographic location, common drainage to the St. Johns River, similarity of past waste disposal activities, and the potential for similar or related corrective actions.

The COCs in groundwater at the SWMUs include metals (antimony, arsenic, iron, manganese, silver, and zinc) and miscellaneous parameters (ammonia, chloride, sodium, and total dissolved solids). The estimated volume of groundwater contamination is approximately 1,900,000 gallons. The miscellaneous parameters are only found in the intermediate and deep groundwater area and are not believed to result from activities at the SWMUs.

Three alternatives were developed to address the combined groundwater contamination at SWMUs 1, 23, 24, and 25. The alternatives are as follows:

Groundwater Alternative 1:	No Action
Groundwater Alternative 2:	LUCs and Monitoring
Groundwater Alternative 3:	Groundwater Extraction, Ex Situ Treatment using Precipitation, Filtration, and Carbon Adsorption, Discharge to a Local Publicly Owned Treatment Works (POTW), LUCs, and Monitoring

The recommended corrective measure alternative for groundwater at SWMUs 1, 23, 24, and 25 is Alternative 2, which involves LUCs and monitoring to address limited groundwater contamination at the site. Any elaborate treatment system would not be justified because the Surficial Aquifer is not currently used as a potable water source and the impact to the ecological receptors was minimal. Once the source of contamination is addressed, the volume and extent of contamination to be addressed would be limited. Alternative 2 relies on natural attenuation whose progress would be monitored by periodic sampling. Natural attenuation has been successfully implemented at many sites. Because of the low level of contamination, Alternative 2 would offer a cost-effective corrective action in a reasonable amount of time.

ATTACHMENT 2

CMS COPCs

TABLE 3-9

SWMU 23, SURFACE SOIL COCs - INDUSTRIAL DIRECT CONTACT
NAVSTA MAYPORT, FLORIDA

COPC	Chemical Abstract Number	Maximum Concentration (mg/kg)	Representative Concentration[1] (mg/kg)	SCTL Industrial[2] (mg/kg)	Background Concentration[3] (mg/kg)	Target Organ/System or Effect	Cumulative Cancer or Target Organ/System Analysis[4]			Adjustment Divisor[5]	Media Cleanup Standard Direct Exposure[6] (mg/kg)	COC Based on Industrial Direct Exposure[7]
							Carcinogen	Cardiovascular	Skin			
Semivolatile Organics												
Benzo(a)pyrene	50-32-8	0.19	0.19	0.5	-	Carcinogen	0.38			1	0.5	No
Inorganics												
Arsenic	7440-38-2	3.2	1.37	3.7	-	Carcinogen - Cardiovascular -Skin	0.34	0.34	0.34	1	3.7	No
						Cumulative Sum[8] =	0.72	0.34	0.34			

Notes:
1 - The representative concentration is the 95% UCL (where appropriate) or the maximum detected concentration, whichever is less.
2 - SCTL - Soil Cleanup Target Level for Industrial - Chapter 62-777 F.A.C., May 1999.
3 - Mayport background screening value (Tetra Tech NUS, 2000).
4 - The ratio of the maximum detected concentration to the SCTL is shown for each COPC; a ratio or sum of ratios greater than 1 for carcinogens or for any organ/system indicates an exceedance of FDEP guidance.
5 - Adjusted Divisor is determined by the number of carcinogens or chemicals that affect the same target organ. If the Cumulative Sum is less than 1, then the Adjustment Divisor is equal to 1.
6 - The Media Cleanup Standard (MCS) Direct Exposure is the Industrial SCTL divided by Adjustment Divisor or the background concentration, whichever is greater.
7 - A COPC is selected as a COC if the representative concentration exceeds the Media Cleanup Standard - Direct Exposure. (Site specific SCTL).
8 – Cumulative Sum is the summation of the ratios for contaminants that affect the same target organ or that are carcinogens (cumulative effect).

TABLE 3-10

SWMU 23, SURFACE SOIL COCs - LEACHING
NAVSTA MAYPORT, FLORIDA

COPC	Chemical Abstract Number	Maximum Concentration (mg/kg)	Representative Concentration[1] (mg/kg)	SCTL Leaching to Groundwater[2] (mg/kg)	SCTL Leaching to Surface Water[3] (mg/kg)	Background Concentration[4] (mg/kg)	Media Cleanup Standard Leaching[5] (mg/kg)	Leaching COC[6]
Inorganics								
Antimony	7440-36-0	14.8	1.42	5	N/A	-	5	No
Nickel	7440-02-0	587	21	130	N/A	-	130	No

Notes:
[1] - The representative concentration is the 95% UCL (where appropriate) or the maximum detected concentration, whichever is less.
[2] - SCTL - Soil Cleanup Target Level for Leaching to Groundwater - Chapter 62-777 F.A.C., May 1999.
[3] - SCTL - Soil Cleanup Target Level for Soil leaching to surface water - Chapter 62-777 F.A.C, May 1999.
[4] - Mayport background screening value (Tetra Tech NUS, 2000).
[5] - The Media Cleanup Standard (MCS) Leaching is the Leaching to Groundwater SCTL or the background screening value, whichever is greater.
[6] - A COPC is selected as a COC if the representative concentration exceeds the MCS.

TABLE 3-11

SWMU 23, SUBSURFACE SOIL COCs - INDUSTRIAL DIRECT CONTACT
NAVSTA MAYPORT, FLORIDA

COPC	Chemical Abstract Number	Maximum Concentration (mg/kg)	Representative Concentration[1] (mg/kg)	SCTL Industrial[2] (mg/kg)	Background Concentration[3] (mg/kg)	Target Organ/System or Effect	Cumulative Cancer or Target Organ/System Analysis[4]			Adjustment Divisor[5]	Media Cleanup Standard Direct Exposure[6] (mg/kg)	Coc Based On Industrial Direct Exposure[7]
							Carcinogen	Cardiovascular	Skin			
Inorganics												
Arsenic	7440-38-2	4.4	2.3	3.7	-	Carcinogen - Cardiovascular –Skin	0.62	0.62	0.62	1	3.7	No

Notes:
[1] - The representative concentration is the 95% UCL (where appropriate) or the maximum detected concentration, whichever is less.
[2] - SCTL - Soil Cleanup Target Level for Industrial - Chapter 62-777 F.A.C., May 1999.
[3] - Mayport background screening value (Tetra Tech NUS, 2000).
[4] - The ratio of the maximum detected concentration to the SCTL is shown for each COPC; a ratio or sum of ratios greater than 1 for carcinogens or for any organ/system indicates an exceedance of FDEP guidance.
[5] - Adjusted Divisor is determined by the number of carcinogens or chemicals that affect the same target organ. If the Cumulative Sum is less than 1, then the Adjustment Divisor is equal to 1.
[6] - The Media Cleanup Standard (MCS) Direct Exposure is the Industrial SCTL divided by Adjustment Divisor or the background concentration, whichever is greater.
[7] - A COPC is selected as a COC if the representative concentration exceeds the Media Cleanup Standard - Direct Exposure. (Site specific SCTL).

TABLE 4-9

SWMU 24, SURFACE SOIL COCs - INDUSTRIAL DIRECT CONTACT
NAVSTA MAYPORT, FLORIDA

COPC	Chemical Abstract Number	Maximum Concentration (mg/kg)	Representative Concentration[1] (mg/kg)	SCTL Industrial[2] (mg/kg)	Background Concentration[3] (mg/kg)	Target Organ/System or Effect	Cumulative Cancer or Target Organ/System Analysis[4]			Adjustment Divisor[5]	Media Cleanup Standard Direct Exposure[6] (mg/kg)	COC Based on Industrial Direct Exposure[7]
							Carcinogen	Cardiovascular	Skin			
Semivolatile Organics												
Benzo(a)pyrene	50-32-8	0.19	0.19	0.5	-	Carcinogen	0.38			1	0.5	No
Inorganics												
Arsenic	7440-38-2	2.0	2.0	3.7	-	Carcinogen - Cardiovascular -Skin	0.54	0.54	0.54	1	3.7	No
						Cumulative Sum[8] =	0.92	0.54	0.54			

Notes:
[1] - The representative concentration is the 95% UCL (where appropriate) or the maximum detected concentration, whichever is less.
[2] - SCTL - Soil Cleanup Target Level for Industrial - Chapter 62-777 F.A.C., May 1999.
[3] - Mayport background screening value (Tetra Tech NUS, 2000).
[4] - The ratio of the maximum detected concentration to the SCTL is shown for each COPC; a ratio or sum of ratios greater than 1 for carcinogens or for any organ/system indicates an exceedance of FDEP guidance.
[5] - Adjusted Divisor is determined by the number of carcinogens or chemicals that affect the same target organ. If the Cumulative Sum is less than 1, then the Adjustment Divisor is equal to 1.
[6] - The Media Cleanup Standard (MCS) Direct Exposure is the Industrial SCTL divided by Adjustment Divisor or the background concentration, whichever is greater.
[7] - A COPC is selected as a COC if the representative concentration exceeds the Media Cleanup Standard - Direct Exposure (Site specific SCTL).
[8] – Cumulative Sum is the summation of the ratios for contaminants that affect the same target organ or that are carcinogens (cumulative effect).

TABLE 4-10

SWMU 24, SURFACE SOIL COCs - LEACHING
NAVSTA MAYPORT, FLORIDA

COPC	Chemical Abstract Number	Maximum Concentration (mg/kg)	Representative Concentration[1] (mg/kg)	SCTL Leaching to Groundwater[2] (mg/kg)	SCTL Leaching to Surface Water[3] (mg/kg)	Background Concentration[4] (mg/kg)	Media Cleanup Standard Leaching[5] (mg/kg)	Leaching COC[6]
Inorganics								
Antimony	7440-36-0	11.3	11.3	5	NA	-	5	No[7]

Notes:
[1] - The representative concentration is the 95% UCL (where appropriate) or the maximum detected concentration, whichever is less.
[2] - SCTL - Soil Cleanup Target Level for Leaching to Groundwater - Chapter 62-777 F.A.C., May 1999.
[3] - SCTL - Soil Cleanup Target Level for Soil leaching to surface water - Chapter 62-777 F.A.C, May 1999.
[4] - Mayport background screening value (Tetra Tech NUS, 2000).
[5] - The Media Cleanup Standard (MCS) Leaching is the Leaching to Groundwater SCTL or the background screening value, whichever is greater.
[6] - A COPC is selected as a COC if the representative concentration exceeds the MCS.
[7] - See Section 4.2.3.1 for explanation.
NA - Not Applicable

TABLE 4-11

SWMU 24, SUBSURFACE SOIL COCs - INDUSTRIAL DIRECT CONTACT
NAVSTA MAYPORT, FLORIDA

COPC	Chemical Abstract Number	Maximum Concentration (mg/kg)	Representative Concentration[1] (mg/kg)	SCTL Industrial[2] (mg/kg)	Background Concentration[3] (mg/kg)	Target Organ/System or Effect	Cumulative Cancer or Target Organ/System Analysis[4]			Adjustment Divisor[5]	Media Cleanup Standard Direct Exposure[6] (mg/kg)	Coc Based on Industrial Direct Exposure[7]
							Carcinogen	Cardiovascular	Skin			
Inorganics												
Arsenic	7440-38-2	9.6	2.7	3.7	-	Carcinogen - Cardiovascular -Skin	0.730	0.730	0.730	1	3.7	No

Notes:
1 - The representative concentration is the 95% UCL (where appropriate) or the maximum detected concentration, whichever is less.
2 - SCTL - Soil Cleanup Target Level for Industrial - Chapter 62-777 F.A.C., May 1999.
3 - Mayport background screening value (Tetra Tech NUS, 2000).
4 - The ratio of the maximum detected concentration to the SCTL is shown for each COPC; a ratio or sum of ratios greater than 1 for carcinogens or for any organ/system indicates an exceedance of FDEP guidance.
5 - Adjusted Divisor is determined by the number of carcinogens or chemicals that affect the same target organ. If the Cumulative Sum is less than 1, then the Adjustment Divisor is equal to 1.
6 - The Media Cleanup Standard (MCS) Direct Exposure is the Industrial SCTL divided by Adjustment Divisor or the background concentration, whichever is greater.
7 - A COPC is selected as a COC if the representative concentration exceeds the Media Cleanup Standard - Direct Exposure (Site specific SCTL).

TABLE 5-9

SWMU 25, SURFACE SOIL COCs - INDUSTRIAL DIRECT CONTACT
NAVSTA MAYPORT, FLORIDA

COPC	Chemical Abstract Number	Maximum Concentration (mg/kg)	Representative Concentration[1] (mg/kg)	SCTL Industrial[2] (mg/kg)	Background Concentration[3] (mg/kg)	Target Organ/System or Effect	Cumulative Cancer or Target Organ/System Analysis[4]				Adjustment Divisor[5]	Media Cleanup Standard Direct Exposure[6] (mg/kg)	COC Based on Industrial Direct Exposure[7]
							Carcinogen	Cardiovascular	Liver	Skin			
Pesticides/PCBs													
Aldrin	309-00-2	0.52	0.179	0.3	-	Carcinogen -Liver	1		1		3	0.1	Yes
Dieldrin	60-57-1	3.1	1.80	0.3	-	Carcinogen -Liver	6		6		3	0.1	Yes
Inorganics													
Arsenic	7440-38-2	1.3	1.3	3.7	-	Carcinogen - Cardiovascular - Skin	0.35	0.35		0.35	3	1.2	Yes
						Cumulative Sum =	7	0.35	7	0.35			

Notes:
1 - The representative concentration is the 95% UCL (where appropriate) or the maximum detected concentration, whichever is less.
2 - SCTL - Soil Cleanup Target Level for Industrial - Chapter 62-777 F.A.C., May 1999.
3 - Mayport background screening value (Tetra Tech NUS, 2000).
4 - The ratio of the maximum detected concentration to the SCTL is shown for each COPC; a ratio or sum of ratios greater than 1 for carcinogens or for any organ/system indicates an exceedance of FDEP guidance.
5 - Adjusted Divisor is determined by the number of carcinogens or chemicals that affect the same target organ. If the Cumulative Sum is less than 1, then the Adjustment Divisor is equal to 1.
6 - The Media Cleanup Standard (MCS) Direct Exposure is the Industrial SCTL divided by Adjustment Divisor or the background concentration, whichever is greater.
7 - A COPC is selected as a COC if the representative concentration exceeds the Media Cleanup Standard - Direct Exposure (Site specific SCTL).

TABLE 5-10

SWMU 25, SURFACE SOIL COCs - LEACHING
NAVSTA MAYPORT, FLORIDA

COPC	Chemical Abstract Number	Maximum Concentration (mg/kg)	Representative Concentration[1] (mg/kg)	SCTL Leaching to Groundwater[2] (mg/kg)	SCTL Leaching to Surface Water[3] (mg/kg)	Background Concentration[4] (mg/kg)	Media Cleanup Standard Leaching[5] (mg/kg)	Leaching COCs[6]
Pesticides/PCBs								
Aldrin	309-00-2	0.52	0.179	0.5	NA	-	0.5	No
Dieldrin	60-57-1	3.1	1.8	0.004	NA	-	0.004	Yes

Notes:
[1] - The representative concentration is the 95% UCL (where appropriate) or the maximum detected concentration, whichever is less.
[2] - SCTL - Soil Cleanup Target Level for Leaching to Groundwater - Chapter 62-777 F.A.C., May 1999.
[3] - SCTL - Soil Cleanup Target Level for Soil leaching to surface water - Chapter 62-777 F.A.C, May 1999.
[4] - Mayport background screening value (Tetra Tech NUS, 2000).
[5] - The Media Cleanup Standard (MCS) Leaching is the Leaching to Groundwater SCTL or the background screening value, whichever is greater.
[6] - A COPC is selected as a COC if the representative concentration exceeds the MCS.
NA - Not Applicable

TABLE 5-11

SWMU 25, SUBSURFACE SOIL COCs - INDUSTRIAL DIRECT CONTACT
NAVSTA MAYPORT, FLORIDA

COPC	Chemical Abstract Number	Maximum Concentration (mg/kg)	Representative Concentration[1] (mg/kg)	SCTL Industrial[2] (mg/kg)	Background Concentration[3] (mg/kg)	Target Organ/System or Effect	Cumulative Cancer or Target Organ/System Analysis[4]		Adjustment Divisor[5]	Media Cleanup Standard Direct Exposure[6] (mg/kg)	COC Based on Industrial Direct Exposure[7]
							Carcinogen	Liver			
Pesticides/PCBs											
Dieldrin	60-57-1	3	3.00	0.3	-	Carcinogen -Liver	10	10	1	0.3	Yes
						Cumulative Sum =	10	10			

Notes:
1 - The representative concentration is the 95% UCL (where appropriate) or the maximum detected concentration, whichever is less.
2 - SCTL - Soil Cleanup Target Level for Industrial - Chapter 62-777 F.A.C., May 1999.
3 - Mayport background screening value (Tetra Tech NUS, 2000).
4 - The ratio of the maximum detected concentration to the SCTL is shown for each COPC; a ratio or sum of ratios greater than 1 for carcinogens or for any organ/system indicates an exceedance of FDEP guidance.
5 - Adjusted Divisor is determined by the number of carcinogens or chemicals that affect the same target organ. If the Cumulative Sum is less than 1, then the Adjustment Divisor is equal to 1.
6 - The Media Cleanup Standard (MCS) Direct Exposure is the Industrial SCTL divided by Adjustment Divisor or the background concentration, whichever is greater.
7 - A COPC is selected as a COC if the representative concentration exceeds the Media Cleanup Standard - Direct Exposure (Site specific SCTL).

TABLE 5-12

SWMU 25, SUBSURFACE SOIL COCs - LEACHING
NAVSTA MAYPORT, FLORIDA

COPC	Chemical Abstract Number	Maximum Concentration (mg/kg)	Representative Concentration[1] (mg/kg)	SCTL Leaching to Groundwater[2] (mg/kg)	SCTL Leaching to Surface Water[3] (mg/kg)	Background Concentration[4] (mg/kg)	Media Cleanup Standard Leaching[5] (mg/kg)	Leaching COCs[6]
Pesticides/PCBs								
Dieldrin	60-57-1	3	3	0.004	NA	-	0.004	Yes

Notes:
[1] - The representative concentration is the 95% UCL (where appropriate) or the maximum detected concentration, whichever is less.
[2] - SCTL - Soil Cleanup Target Level for Leaching to Groundwater - Chapter 62-777 F.A.C., May 1999.
[3] - SCTL - Soil Cleanup Target Level for Soil leaching to surface water - Chapter 62-777 F.A.C, May 1999.
[4] - Mayport background screening value (Tetra Tech NUS, 2000).
[5] - The Media Cleanup Standard (MCS) Leaching is the Leaching to Groundwater SCTL or the background screening value, whichever is greater.
[6] - A COPC is selected as a COC if the representative concentration exceeds the MCS.
NA - Not Applicable.

TABLE 5-13

SWMU 25, SURFACE SOIL COCs - INDUSTRIAL DIRECT CONTACT AND LEACHING (COMBINED)
NAVSTA MAYPORT, FLORIDA

COCs	Chemical Abstract Number	Maximum Concentration (mg/kg)	Representative Concentration[1] (mg/kg)	Background Concentration[2] (mg/kg)	Site-Specific SCTL - Industrial Direct Exposure[3] (mg/kg)	Site-Specific SCTL - Leaching to Groundwater[4] (mg/kg)	Media Cleanup Standard[5] (mg/kg)	Media Cleanup Standard Basis[6]
Pesticides/PCBs								
Aldrin	309-00-2	0.52	0.179	-	0.1	0.5	0.1	Direct Contact
Dieldrin	60-57-1	3.1	1.80	-	0.1	0.004	0.004	Leaching
Inorganics								
Arsenic	7440-38-2	1.3	1.3	-	1.2	29	1.2	Direct Contact

Notes:
[1] - The representative concentration is the 95% UCL (where appropriate) or the maximum detected concentration, whichever is less.
[2] - Mayport background concentration (Tetra Tech NUS, 2000).
[3] - The Site specific SCTL - Direct Exposure is the Industrial SCTL divided by the Adjustment Divisor or the background concentration, whichever is greater.
[4] - The Site Specific SCTL - Leaching to Groundwater is the Leaching to Groundwater SCTL or the background concentration, whichever is greater.
[5] - Media Cleanup Standard is the Minimum of the Site Specific SCTL - Direct Exposure or Site Specific SCTL - Leaching to Groundwater.
[6] - Media Cleanup Standard Basis is either Background, Direct Exposure or Leaching (Leaching to Groundwater or Leaching to Surface Water, if applicable.

TABLE 5-14

SWMU 25, SUBSURFACE SOIL COCs - INDUSTRIAL DIRECT CONTACT AND LEACHING (COMBINED)
NAVSTA MAYPORT, FLORIDA

COCs	Chemical Abstract Number	Maximum Concentration (mg/kg)	Representative Concentration[1] (mg/kg)	Background Concentration[2] (mg/kg)	Site-Specific SCTL - Industrial Direct Exposure[3] (mg/kg)	Site-Specific SCTL - Leaching to Groundwater[4] (mg/kg)	Media Cleanup Standard[5] (mg/kg)	Media Cleanup Standard Basis[6]
Pesticides/PCBs								
Dieldrin	60-57-1	3	3.00	-	0.3	0.004	0.004	Leaching

Notes:
[1] - The representative concentration is the 95% UCL (where appropriate) or the maximum detected concentration, whichever is less.
[2] - Mayport background concentration (Tetra Tech NUS, 2000).
[3] - The Site specific SCTL - Direct Exposure is the Industrial SCTL divided by the Adjustment Divisor or the background concentration, whichever is greater.
[4] - The Site Specific SCTL - Leaching to Groundwater is the Leaching to Groundwater SCTL or the background concentration, whichever is greater.
[5] - Media Cleanup Standard is the Minimum of the Site Specific SCTL - Direct Exposure or Site Specific SCTL - Leaching to Groundwater.
[6] - Media Cleanup Standard Basis is either Background, Direct Exposure or Leaching (Leaching to Groundwater or Leaching to Surface Water, if applicable.

ATTACHMENT 3

BENZO(A)PYRENE EQUIVALENT CALCULATIONS

TABLE 5 - 1
SWMU 1, BENZO(A)PYRENE EQUIVALENT CALCULATIONS
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

	Concentration	Leachability based on GCTLs (mg/kg)
SEMIVOLATILES (mg/kg)		
BENZO(A)ANTHRACENE	0.100	0.8
BENZO(A)PYRENE	0.096	8
BENZO(B)FLUORANTHENE	0.120	2
BENZO(K)FLUORANTHENE	0.130	24
CHRYSENE	0.130	77
DIBENZO(A,H)ANTHRACENE		0.7
INDENO(1,2,3-CD)PYRENE		7

CALCULATED BENZO(A)PYRENE EQUIVALENT	0.11943

BENZO(A)PYRENE EQUIVALENT SCTLs	0.1R and 0.7C/I	8

TABLE 5 - 2
SWMU 23, BENZO(A)PYRENE EQUIVALENT CALCULATIONS
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

	Concentration	Leachability based on GCTLs (mg/kg)
SEMIVOLATILES (mg/kg)		
BENZO(A)ANTHRACENE	0.100	0.8
BENZO(A)PYRENE	0.190	8
BENZO(B)FLUORANTHENE	0.170	2
BENZO(K)FLUORANTHENE	0.270	24
CHRYSENE	0.150	77
DIBENZO(A,H)ANTHRACENE	0.0690	0.7
INDENO(1,2,3-CD)PYRENE	0.1800	7

CALCULATED BENZO(A)PYRENE EQUIVALENT	0.30685	

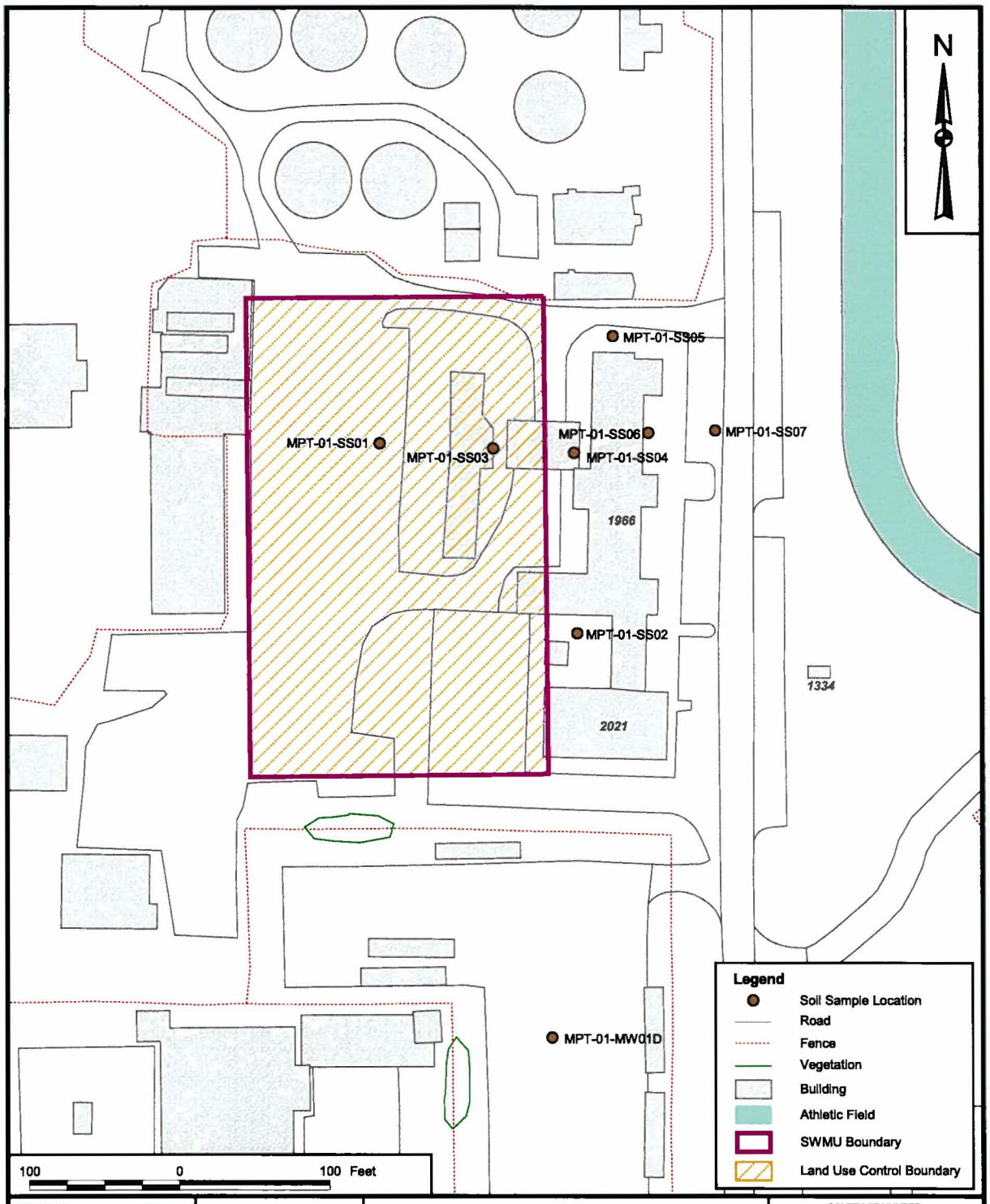
BENZO(A)PYRENE EQUIVALENT SCTLs	0.1R and 0.7C/I	8

TABLE 5 - 3
SWMU 24, BENZO(A)PYRENE EQUIVALENT CALCULATIONS
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

	Concentration	Leachability based on GCTLs (mg/kg)
SEMIVOLATILES (mg/kg)		
BENZO(A)ANTHRACENE	0.230	0.8
BENZO(A)PYRENE	0.190	8
BENZO(B)FLUORANTHENE	0.190	2
BENZO(K)FLUORANTHENE	0.200	24
CHRYSENE	0.250	77
DIBENZO(A,H)ANTHRACENE	0.0540	0.7
INDENO(1,2,3-CD)PYRENE	0.1500	7
CALCULATED BENZO(A)PYRENE EQUIVALENT	0.30325	
BENZO(A)PYRENE EQUIVALENT SCTLs	0.1R and 0.7C/I	8

ATTACHMENT 4

FIGURES



DRAWN BY	DATE
S. PAXTON	1/12/07
CHECKED BY	DATE
J. FOSTER	1/12/07
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

SOIL SAMPLE LOCATION MAP
SWMU 01 - LANDFILL A
NAVAL STATION MAYPORT
MAYPORT, FL

CONTRACT NUMBER	
CTO 033	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1	REV 0

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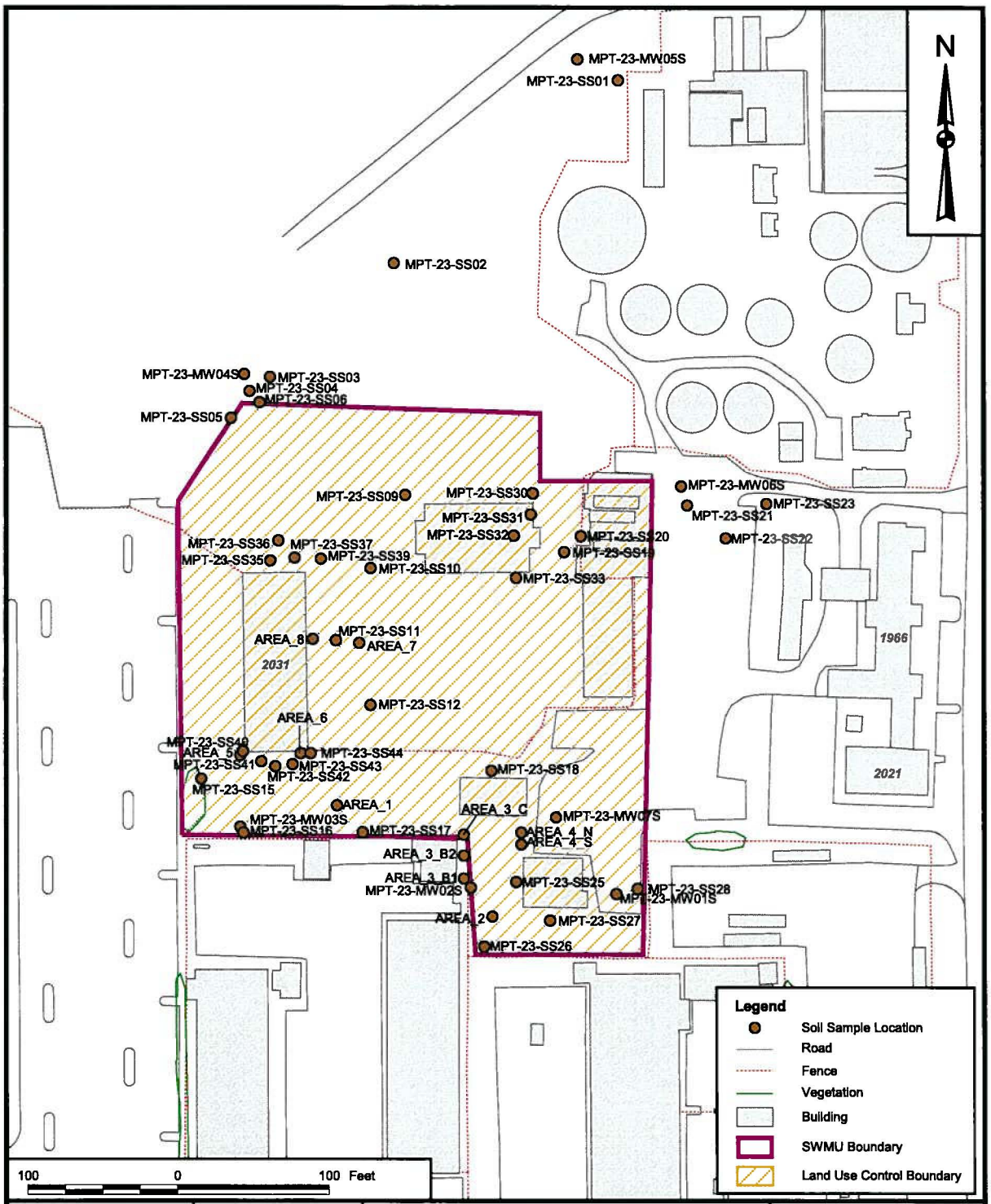

DRAWN BY	DATE
S. PAXTON	1/12/07
CHECKED BY	DATE
J. FOSTER	1/12/07
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

SOIL SAMPLE LOCATION MAP
SWMU 23 - JSI AREA
NAVAL STATION MAYPORT
MAYPORT, FL

CONTRACT NUMBER	
CTO 033	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 2	REV 0

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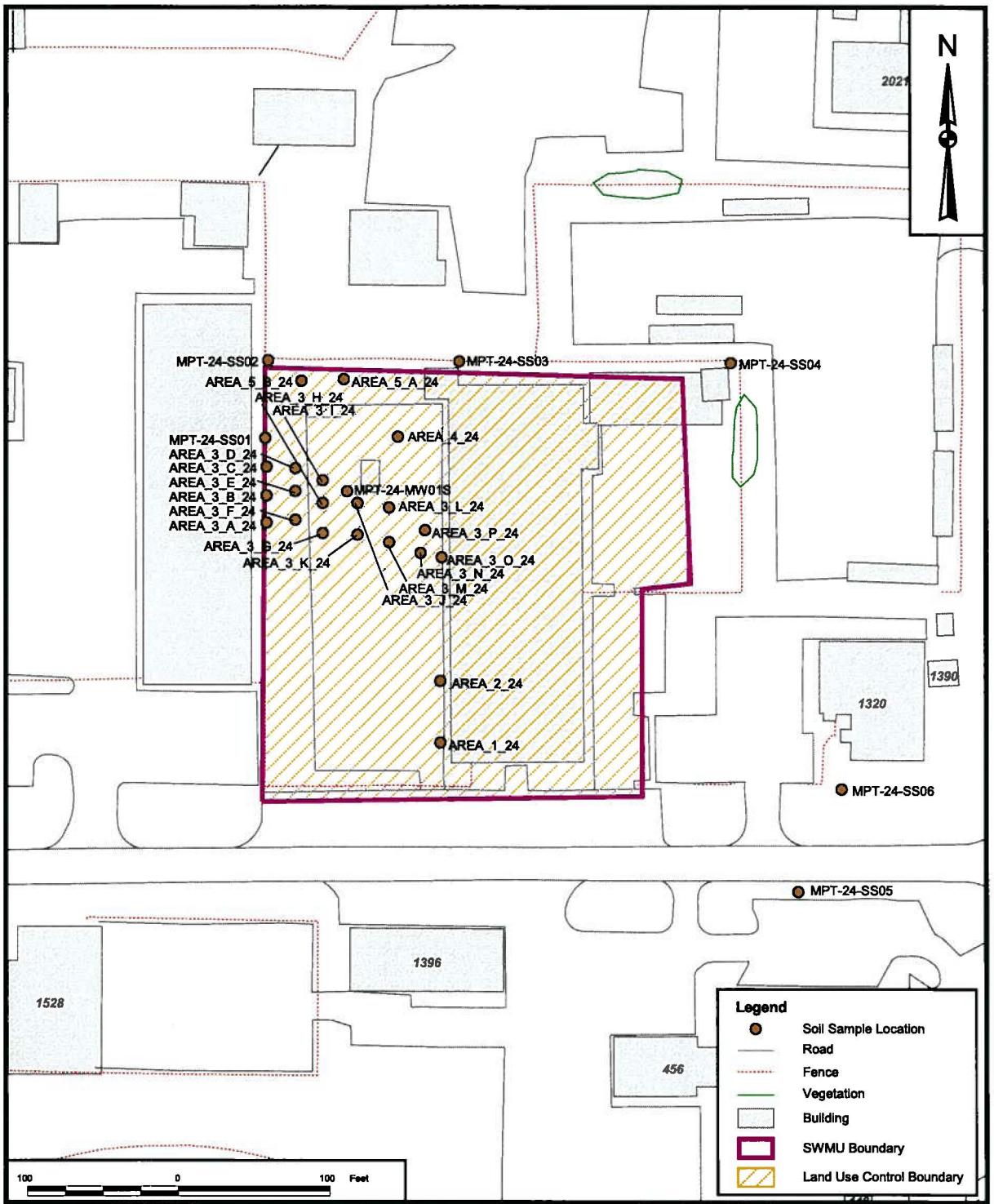

DRAWN BY S. PAXTON	DATE 1/12/07	SOIL SAMPLE LOCATION MAP SWMU 24 - NFSI AREA NAVAL STATION MAYPORT MAYPORT, FL	CONTRACT NUMBER CTO 033
CHECKED BY J. FOSTER	DATE 1/12/07		APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 3 / REV 0

NAVFAC

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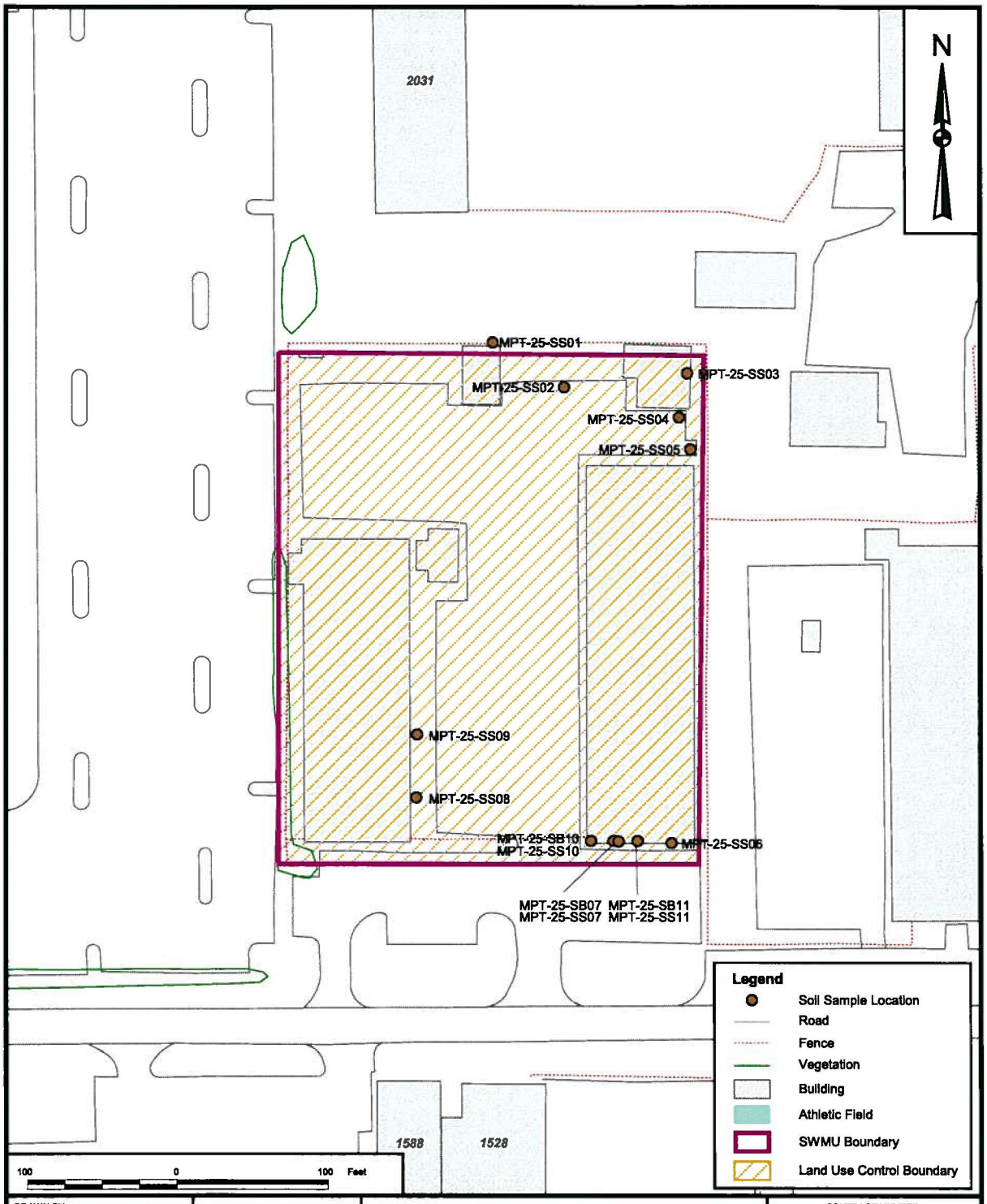

DRAWN BY S. PAXTON	DATE 1/12/07	SOIL SAMPLE LOCATION MAP SWMU 25 - AMI AREA NAVAL STATION MAYPORT MAYPORT, FL	CONTRACT NUMBER CTO 033
CHECKED BY J. FOSTER	DATE 1/12/07		APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 4 / REV 0

NAVFAC

P:\GIS\MAYPORT_NS\MAPDOCS\APR SWMU01_23_24_25.APR SWMU 25 SOIL SAMPLE LOCATION MAP 1/12/07 SP

ATTACHMENT 5

ESTIMATED VOLUMES OF CONTAMINATED MEDIA

TABLE 5 - 1
SWMUs 1, 23 & 24; AREAS AND VOLUME - SOIL[1]
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

Locations	Number of Areas	Soil Area (ft^2)	Impacted Soil Thickness[2] (ft)	Soil Volume (yd^3)
SHIPYARD AREA SWMUs	3			
SWMU 1		63,158	1	2,339
SWMU 23		94,350	8	27,956
SWMU 24		75,693	6	16,821
TOTALS	**5**	**233,201**	**15**	**47,115**

Notes:
[1] Refer to Figures 1, 2, and 3 of Attachment 4 for additional information regarding impacted surface and subsurface soil areas.

[2] Impacted soil thickness is based on the depth of surface and subsurface soil contamination as determined by laboratory data.