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FINAL SITE ASSESSMENT REPORT ADDENDUM FOR UNDERGROUND STORAGE TANK
SITE 245 NS MAYPORT FL
5/1/2002
ELLIS ENVIRONMENTAL GROUP, LC

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FINAL

**Site Assessment Report
Addendum**

for

**Underground Storage Tank
Site 245**

at

**U.S. Naval Station
Mayport, FL**

Contract No. N62467-01-C-8826



Prepared for
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND

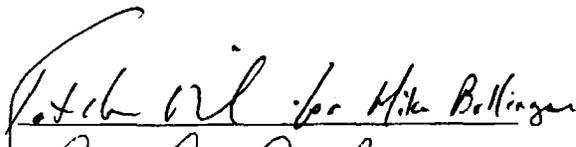
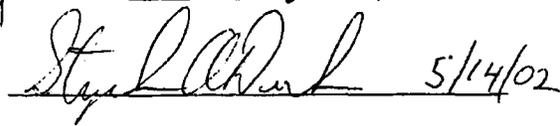
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May 2002

**Underground Storage Tank Site 245
U.S. Naval Station, Mayport, FL**

**FINAL
Site Assessment Report Addendum**

**Independent Technical Review (ITR)
Certification**

<u>Name</u> <u>Responsibility</u>	<u>Company</u>	<u>Signature & Date</u>
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The ITR signature indicates that he or she has reviewed and found the final version of this plan to be complete and correct to the best of his or her knowledge.

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Abbreviations & Acronyms

µg	microgram
ft-bls	feet below land surface
kg	kilogram
L	liter
mg	milligram
mL	milliliter
ppm	parts per million
BEA	Bhate Environmental Associates, Inc.
EEG	Ellis Environmental Group, LC
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
MCL	maximum contaminant level
MSL	mean sea level
NAVSTA	Naval Station
OVA	organic vapor analyzer
PAH	polynuclear aromatic hydrocarbon
PRO	petroleum residual organics
QC	quality control
SOUTHNAVFACENGCOM	Southern Division Naval Facilities Engineering Command
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

1.0 Introduction

Ellis Environmental Group, LC (EEG) has been contracted (Contract No. N62467-01-C-8826) by the Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to provide environmental services at U.S. Naval Station (NAVSTA) Mayport. Harding ESE, Inc. has been subcontracted by EEG to participate in the contract. The environmental services described in this report are for assessment activities at Underground Storage Tank (UST) Site 245 located at NAVSTA Mayport, Florida.

2.0 Location and Site Description

The following section provides a brief description of the site. Figure 1 presents the location of Site 245 at NAVSTA Mayport. The subject site is located at NAVSTA Mayport in Mayport, Florida. A 2,000-gallon UST that had contained fuel oil was removed from a location adjacent to Building 245.

The UST was located adjacent to an electrical switch room and a wing of Building 245. Piping from the UST traveled approximately 20 feet underground before entering the building. The ground in the immediate area of the former UST pit is not covered. The surface between Building 245 and the switch room is covered with an 8-inch-thick concrete pad. The ground surface at the assessment site is relatively flat but slopes slightly northward. Access to the former UST location is restricted by a wooden board walkway and wooden fencing. Surface water drainage is through surface drainage ditches. Some water does remain ponded at several low areas near the site following heavy rains. This site is located less than 100 yards from the Atlantic Ocean.

3.0 Site History

In April 1995, UST-245 was removed by excavation. The fuel oil supply and return piping were also removed. A water sample collected from a temporary well was found to contain low concentrations of benzene, toluene, ethylbenzene, xylenes (BTEX) and polynuclear aromatic hydrocarbon (PAH). A headspace analysis of soils from the pit detected elevated petroleum concentrations. Contamination was encountered along the north excavation wall, at depths of 3 and 6 feet. Contaminated soils were measured on the south, east, and west side walls, at depths of about 6 feet. No other excavation of contaminated soils was conducted.

A replacement UST was installed at a location approximately 20 feet from the excavated UST. Double wall piping was also installed. The piping does not cross the old tank pit area. The new UST was installed with overfill protection and leak detection.

Bhate Environmental Associates, Inc. (BEA) conducted a contamination assessment at the site during the period May through July of 1997. The following is a summary of site conditions based on the results of field and laboratory investigations made during the contamination assessment.

- Soil borings indicated that soils beneath the site consist of well-sorted fine sands with shell fragments. These materials were found down to boring terminations at an approximate depth of 13.5 feet below land surface (ft-bl).

- Groundwater was encountered at depths of approximately 3.5 to 6 ft-bls across the site. The direction of groundwater movement on the two dates of measurement appears to define a north-directed radial pattern, away from Building 245.
- An organic vapor analyzer-flame ionization detector (OVA-FID) headspace concentration of 68 parts per million (ppm) was encountered in one soil sample collected from the 1-to-3-foot depth range. The sample was taken at a location near the former UST. Excessively contaminated soils are apparently restricted to an area on the northern end of the UST.
- Laboratory analyses of soil samples collected from depths of 4 ft-bls to 6 ft-bls indicated Florida petroleum residual organics (FL-PRO) concentrations above the regulatory limit of 2,500 ppm. These occurred at the Geoprobe® sampling points nearest the former UST location (S-1, S-2, and S-3). Concentrations were below laboratory detection limits elsewhere.
- Laboratory analyses of groundwater samples from five permanent monitoring wells installed at the site indicated that only well MW-4 contained benzene petroleum constituents above the Primary Guidance Maximum Contaminant Level (MCL) limit of 1 microgram per liter ($\mu\text{g/L}$) (ppb). In well MW-4, naphthalene concentrations exceeded Chapter 62-777 Florida Administrative Code (FAC) standard of 20 ppb.
- Lead concentrations in the groundwater exceeded the MCL in wells MW-2 and MW-5.

A Contamination Assessment Report was submitted to the Florida Department of Environmental Protection (FDEP). The FDEP subsequently requested additional sampling activities in a letter dated June 22, 1998.

BEA conducted an additional investigation and prepared a Contamination Assessment Report Addendum dated September 10, 1999. BEA concluded the following:

- Excessively contaminated soil is present.
- Groundwater contamination is present and may be migrating from the UST location.

BEA recommends the preparation of a Remedial Action Plan.

4.0 Scope and Objectives

EEG and Harding ESE reviewed the previous data presented in the FDEP-approved Site Assessment Report (and the addendum) and it appeared that the groundwater contaminant concentrations were decreasing over time. With that in mind, groundwater flow determination, soil sampling, and groundwater sampling were conducted at this site to provide present site conditions and determine if natural attenuation would be an appropriate remedial alternative.

It is important to note that prior to this effort, the most recent analytical data for this site was over the 270-day threshold and could not be used to make remedial decisions under Chapter 62-770 FAC.

4.1 Groundwater Flow Direction Determination

Water level measurements were conducted in accordance with the methodology presented in the work plan prepared by EEG entitled “Site Assessment Underground Storage Tank Sites 245, 1343, and 1388, Mayport Naval Station, Mayport, Florida (EEG, 2001).” The methodology sections of this work plan are presented in Appendix A.

During the sampling event, the water levels in each of the Site 245 monitoring wells was measured at the time they were sampled and the day after the groundwater sampling event to determine groundwater elevations in the morning, afternoon, and evening. At least four hours elapsed between each measurement to help determine if the groundwater elevation is tidally influenced. Mayport inlet tidal information was obtained for the day water levels were obtained.

4.2 Soil Sampling

Soil sampling was conducted to provide analytical data that represents current site conditions. The evaluation of soil contamination in this report is based on visual observations, olfactory indicators, and/or headspace concentrations greater than 10 ppm. The hand auger soil-sampling grid was based on locations previously sampled by BEA (BEA, 1997) and included one boring located within the former tank pit location (Figure 2). Eleven locations were sampled and 41 hand auger soil samples were collected. Headspace analysis was performed in the field on each sample with a flame OVA.

The soil sampling and headspace analysis procedures were conducted in accordance with the work plan prepared by EEG entitled “Site Assessment Underground Storage Tank Sites 245, 1343, and 1388, Mayport Naval Station, Mayport, Florida” (EEG, 2001). Soil sampling procedures are provided in Appendix A. Soil sampling forms are provided in Appendix B.

Because shallow groundwater was encountered at the site (3 to 6 ft-bls), field screening soil samples were collected at approximately 1-foot intervals to allow the collection of samples within the vadose zone and to define “wet” soils that indicate the beginning of the capillary fringe (smear zone). Because light non-aqueous phase liquid (LNAPL) is present at the location of monitoring well MW-8, soil samples were collected in the capillary fringe zone immediately above the water table. Because of the presence of the LNAPL and groundwater contamination, the capillary fringe (smear zone) is expected to have petroleum-related compounds at concentrations that could lead to an invalid assumption that soil contamination that exceeds State of Florida criteria under Chapter 62-777 FAC is present in the vadose zone.

The discrimination of the vadose and capillary fringe (smear zones) is important for Site 245 because some of the previous soil samples collected by BEA (BEA, 1997) were over a 1-to-3-foot interval. One of the soil samples (S-1 collected from 1 to 3 ft-bls) was determined to be excessively contaminated based on an OVA measurement of 68 ppm.

Based on the results of the soil sample field screening, three confirmatory soil samples and associated quality control (QC) samples were collected and analyzed at an offsite laboratory (ELAB, Inc., of Ormond Beach, Florida) for volatile organic compounds (VOCs) (Method 8021), PAHs (Method 8310), and total recoverable petroleum hydrocarbons (TRPH) (FL-PRO method).

4.3 Groundwater Sampling

The purging of the monitoring wells, groundwater sampling, and handling of investigation-derived waste was conducted in accordance with the methodology presented in the work plan prepared by EEG entitled "Site Assessment Underground Storage Tank Sites 245, 1343, and 1388, Mayport Naval Station, Mayport, Florida (EEG, 2001)." The methodology sections of this work plan are presented in Appendix A.

In accordance with the work plan, groundwater samples were collected from monitoring wells MW-1 through MW-8 (Figure 2) and a QC sample (duplicate) was collected at monitoring well MW-6. The samples were analyzed for VOCs by U.S. Environmental Protection Agency (USEPA) Method 8021, PAHs by USEPA Method 8310, and PRO by the FL-PRO Method. USEPA Method 8270 had been proposed for PAHs in the work plan for Site 245 (EEG, 2001); however, USEPA Method 8310 was used to achieve detection limits that are within the State of Florida regulatory criteria. EEG notified SOUTHNAVFACENGCOM of this modification prior to conducting the sampling event. The groundwater sampling forms are presented in Appendix B.

5.0 Results

Following are the results of the water level measurements, soil samples, and groundwater samples that were collected for the sampling event at Site 245 between July 30 and August 1, 2001.

5.1 Water Level Measurements

Groundwater level measurements were made on July 31, 2001, and on August 1, 2001 (Table 1). Table 1 also includes historical measurements made by BEA (BEA, 1997 and 1999). Measurements made on July 31, 2001, and August 1, 2001, included each of the Site 245 wells (MW-1 through MW-8). Measurements were made in the morning, afternoon, and evening of August 1, 2001, approximately four hours apart. The purpose of the measurements was to assess whether tidal influences affected the groundwater flow direction at Site 245.

Based on the water level measurements made on July 31, 2001, and August 1, 2001, the groundwater flow direction appears to be in a general southeasterly direction (Figures 3 through 6).

Tidal information was obtained for the St. Johns River entrance gauging station located near the NAVSTA Mayport Degaussing Station (Appendix C). The tides for August 1, 2001, were a low tide of 0.4 feet mean sea level (MSL) at 0120 hours, a high tide of 4.1 feet MSL at 0731 hours, a low tide of 0.1 feet MSL at 1316 hours, and a high tide of 5 feet MSL at 2002 hours. Rainfall data obtained for the Jacksonville area indicates that rainfall amounts of 0.26, 1.1, and 0.6 inches were recorded for July 30 and 31, 2001, and August 1, 2001, respectively.

The groundwater level measurements made on August 1, 2001, at 0825 to 0832 hours (Figure 4), 1210 to 1220 hours (Figure 5), and 1620 to 1630 hours (Figure 6) indicate the development of a potentiometric surface high northwest of Building 245. This feature is located beneath the grassy area adjacent to the facility parking lot. Because of the presence of free-phase product (a bailer contained approximately 3 inches of LNAPL and subsequent bailers contained approximately 2

inches), water levels were made only at monitoring well MW-8 during the 0825 to 0832 hours measurement event. It is possible that the potentiometric surface high observed northwest of Building 245 (Figures 4, 5, and 6) may be related to the infiltration of surface water runoff (e.g., possible runoff from the parking lot adjacent [west and north] to Building 245, or the Building 245 roof drains).

With the exception of monitoring well MW-5, the water levels in the monitoring wells appeared to decrease in elevation by approximately 0.01 to 0.04 feet (Table 1). The water level measured at monitoring well MW-5 decreased 0.02 feet from the 0825 hour measurement (Figure 4) to the 1210 hour measurement (Figure 5), and subsequently increased 0.03 feet at the 1620 measurement (Figure 6).

Interpretation of the water level measurements suggests that there may be a slight tidal influence, as a decline was measured from the morning high tide to the early afternoon low tide. However, with the exception of monitoring well MW-5, an increase in water level was not observed during the afternoon high tide.

Based on the above information, it would appear that tidal and rainfall events are likely to cause fluctuations in the water level that would result in smearing effects (e.g., residual petroleum contamination being exported to and left in the unsaturated zone). The events observed do not suggest a significant change to the groundwater flow direction by tidal or precipitation events. Interpretation of each of the water level measurement events (Figures 3 through 6) suggests a general groundwater flow direction towards the southeast.

5.2 Soil Sample Analytical Results

The soil borings encountered tan, brown, and white sands from the land surface to the explored depth of 4 ft-bls (Table 2). In general, the sands were dry (vadose zone) from the land surface to a depth of approximately 3 ft-bls. Wet or saturated sands indicative of the capillary fringe (smear zone) were encountered in the 3-to-4-foot sample intervals. Organic vapors were not present in the majority of the soil samples collected from the 0-to-1-ft-bls and 1-to-2-ft-bls intervals (Table 2 and Figure 7). Low concentrations of organic vapors (1 ppm) were present in the majority of the samples collected from the interval 2 to 3 ft-bls. Two of the samples, collected from 3-to-4-foot interval (in the smear zone), had OVA measurements of 100 ppm (SS-7 collected from 3 to 4 ft-bls) and 75 ppm (SS-9 collected from 3 to 4 ft-bls).

In general, the OVA measurements are similar to those obtained by BEA (BEA, 1997) in 1997, which indicated (with exception to sample SS-1) that organic vapors were not present in the vadose zone soils (refer to Table 2 in the 1997 BEA report). The OVA measurements appear to support an assumption that contaminated soils are not present in the vadose zone.

Based on the results of the OVA measurements, three soil samples were collected for laboratory analysis—two samples from the vadose zone and one sample from the capillary fringe (smear zone) (SS-7 and SS-10 from 2 to 3 ft-bls, and SS-9 from 3 to 4 ft-bls, respectively). A duplicate was collected from the location of sample SS-7.

None of the target analytes, if present, were at concentrations above their respective detection limits in the soil samples collected from the vadose zone (Table 3). These results are similar to those obtained by BEA for soil sample S\245-S-9b collected from 1 to 3 ft-bls. The BEA sample, which was collected near the former UST, did not contain detectable concentrations of petroleum-related constituents (BEA, 1999).

The soil sample (SS-9 from 3 to 4 ft-bls) collected from the capillary fringe (smear zone) contained concentrations of PRO, ethylbenzene, 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, acenaphthylene, benzo(a)anthracene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene. PRO, 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, benzo(a)anthracene, and naphthalene were detected at concentrations that exceed soil cleanup target levels (SCTLs) under Chapter 62-777 FAC (Table 3 and Figure 7). Because soil sample SS-9 (3 to 4 ft-bls) was collected within the capillary fringe (smear zone), the petroleum-related constituents detected in this sample are a result of the groundwater contamination present at the site. Soil sample location SS-9 is near monitoring well MW-8, which is located hydraulically downgradient from the former UST. At the time the soil samples were collected, a bailer was used to assess whether LNAPL was present in monitoring well MW-8. One-quarter inch of LNAPL was measured in the bailer.

The OVA measurements and soil sample analytical results do not support the assumption that excessively contaminated soil is present in vadose zone soils at Site 245; therefore, remediation of the vadose zone soils does not appear to be warranted.

5.3 Groundwater Analytical Results

Groundwater analytical results for VOCs are provided in Table 4, and PAH and PRO results are provided in Table 5. A groundwater sample was not collected from monitoring well MW-8 because of the presence of free-phase liquid (LNAPL). BEA previously sampled the well and indicated the presence of a sheen on the water surface (BEA, 1999). Tables 4 and 5 also include historical analytical results for VOCs and PAHs by BEA (BEA, 1997; and 1999). Groundwater samples collected previous to July 30, 2001, had not been analyzed for PRO.

Only one VOC—benzene—was detected in the groundwater sample collected from monitoring well MW-1 (Table 4). None of the other samples contained VOCs at detectable concentrations. The concentration of benzene detected in the groundwater sample from monitoring well MW-1 exceeds its Florida groundwater guidance concentration and natural attenuation perimeter concentration promulgated under Chapter 62-777 FAC.

PAHs detected in the groundwater sample collected from monitoring well MW-1 were 1-methylnaphthalene, 2-methylnaphthalene, acenaphthylene, and naphthalene (Table 5). None of the other samples contained PAHs at detectable concentrations. The PAHs that were detected in the groundwater sample from monitoring well MW-1 did not exceed their respective guidance concentrations under Chapter 62-777 FAC.

The VOC and PAH plume appears to extend from the location of the former UST in a southeasterly direction (Figures 8 and 9), which is consistent with the groundwater flow direction (Figures 3 through 6).

PROs were detected in the groundwater samples collected from monitoring wells MW-1, MW-4, MW-5, and MW-7 (Table 5). The highest concentration of PRO was detected in the groundwater sample collected from monitoring well MW-1. Lower concentrations of PRO were detected in the other groundwater samples (Figure 9). Based on the groundwater flow directions, monitoring well MW-1 is directly hydraulic downgradient from the former UST. None of the detected concentrations of PRO exceed Florida guidance concentrations under Chapter 62-777 FAC. Prior to this sampling event (July 31, 2001, and August 1, 2001), VOCs had not been detected at the location of monitoring well MW-1, nor have they been detected in the groundwater samples from monitoring wells MW-2, MW-3, MW-5, MW-6, and MW-7. VOCs have been detected in the groundwater samples collected previously from monitoring wells MW-4 and MW-8. The concentrations of VOCs detected in groundwater samples collected from monitoring well MW-4 appear to have decreased over time (Table 4). Groundwater samples collected on February 16, 1999, from monitoring well MW-8 contained benzene, ethylbenzene, and xylenes. Because of the presence of free-phase liquid, a groundwater sample was not collected from this well during this field event.

Prior to this sampling event (July 31, 2001, and August 1, 2001), PAHs had not been detected at the location of monitoring well MW-1 or MW-3, nor have they been detected in the groundwater samples collected from monitoring wells MW-2, MW-3, MW-5, and MW-6. VOCs have been detected in the groundwater samples collected previously from monitoring wells MW-4, MW-7, and MW-8. The concentrations of PAHs detected in groundwater samples collected from monitoring wells MW-4 and MW-7 appear to have decreased over time (Table 4). Groundwater samples collected on February 16, 1999, from monitoring well MW-8 contained 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, and fluorene. Because of the presence of free-phase liquid, a groundwater sample was not collected from this well during the July and August 2001 sampling event.

Based on the above, free-phase liquid is likely present at or in the vicinity of the former UST, as evidenced by its detection at monitoring well MW-8. Benzene was detected at a concentration that exceeds its groundwater guidance concentration at a monitoring well (MW-1) that is located hydraulically downgradient from the former UST. However, none of the PAHs or PRO were detected at concentrations that exceed regulatory criteria (Chapter 62-777 FAC) for groundwater or discharge to marine waters. Because of the presence of free-phase liquid at a source location, natural attenuation is not recommended at this time for Site 245.

It is recommended that a remedial action plan should be prepared to recover the LNAPL. Based on the similarities at UST Site 245 to UST Sites 1343 and 1388, it is likely that, after the removal of the free-phase liquid, NA monitoring may be appropriate for the site. Also, an interim measure to pump water and LNAPL from monitoring well MW-8 to remove the LNAPL should be considered.

6.0 Summary

Based on the water level measurements and analytical results, the groundwater flow direction appears to be predominantly in a southeasterly direction. The water level measurements also suggest that there is some tidal influence. Also, it appears that rainfall events may result in a potentiometric surface high northwest of Building 245.

Based on the water level information, it would appear that tidal and rainfall events are likely to cause fluctuations in the water level that would result in smearing effects (e.g., residual petroleum contamination being exported to and left in the unsaturated zone). The events observed do not indicate a significant change to the groundwater flow direction. Additional measurements to characterize tidal fluctuation are not necessary.

Organic vapors were not present in the majority of the soil samples collected from the 0-to-1-ft-bls and 1-to-2-ft-bls intervals. Low concentrations of organic vapors (1 ppm) were present in the majority of the samples collected from the interval 2 to 3 ft-bls. Two of the samples collected from 3-to-4-foot interval had OVA measurements of 100 ppm (SS-7 from 3 to 4 ft-bls) and 75 ppm (SS-9 from 3 to 4 ft-bls). Petroleum-related compounds were not detected in two soil samples collected from vadose zone soils 2 to 3 ft-bls. The OVA measurements and soil sample analytical results do not support the assumption that excessively contaminated soil is present in vadose zone soils at Site 245; therefore, remediation of the vadose zone soils does not appear to be warranted.

VOC target analytes have not been detected in groundwater samples collected from monitoring wells MW-2, MW-3, MW-5, MW-6, and MW-7. VOC target analytes have not been detected in the groundwater samples collected previously from monitoring well MW-1. However, during this field event, benzene was detected at the location of monitoring well MW-1 at a concentration that exceeds its Florida groundwater guidance concentration under Chapter 62-777 FAC. Previously, benzene had also been detected in groundwater samples from monitoring well MW-4 at concentrations exceeding its Florida groundwater guidance concentration under Chapter 62-777 FAC. However, this recent sampling event (July and August 2001) suggests that benzene was not detected at this location. In addition, benzene and ethylbenzene were detected in groundwater samples collected from monitoring well MW-8 at concentrations exceeding their respective Florida groundwater guidance concentrations under Chapter 62-777 FAC. Free-phase liquid was detected at this monitoring well location during the July and August 2001 sampling event and was not sampled.

PAH target analytes have not been detected in groundwater samples collected from monitoring wells MW-2, MW-5, and MW-6. PAH analytes were detected in groundwater samples collected during July and August 2001 from monitoring wells MW-1 and MW-3 but had not been detected during previous sampling events. PAHs had been detected in previous samples collected from monitoring wells MW-4 and MW-7 but were not detected in the samples collected from these wells during the July and August 2001 sampling event. In addition, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were detected in groundwater samples collected on February 2, 1999, from monitoring well MW-8 at concentrations exceeding their respective Florida groundwater guidance concentrations under chapter 62-777 FAC. Free-phase liquid was detected at this monitoring well location well during the July and August 2001 sampling event and was not sampled.

Interpretation of analytical results for groundwater samples collected on July 31, 2001, and August 1, 2001, suggest that under the current site conditions, natural attenuation monitoring is not appropriate for Site 245. A free-phase liquid source removal action in accordance with Rule 62-770.300(1)(b) FAC should begin immediately. Based on the proximity to the ocean, the fact

that the groundwater affected by the contamination is a non-potable source, and the immobile nature of the fuel oil compounds, it is likely that after the removal of the free-phase liquid, natural attenuation monitoring may be appropriate for this site.

An interim remedial should be implemented to recover the LNAPL discovered at MW-8. Bail down tests have not been conducted to estimate product thickness; therefore, it is assumed that the LNAPL is approximately 7 feet in diameter and may range from 0.02 to 3 inches thick (approximately 0.2 to 33 gallons of LNAPL). Based on the similarities of UST Site 245 to UST Sites 1343 and 1388, it is likely that, after the removal of the LNAPL (Chapter 62-770.300 FAC), natural attenuation monitoring (Chapter 62-770.690 FAC) may be appropriate for the site. Source removal may be implemented without FDEP approval (Chapter 62-770.300[1][b] FAC) using absorbent pads, skimmer pumps, hand or mechanical bailing, or fluid vacuum techniques.

It is recommended that the LNAPL found at monitoring well MW-8 be recovered by means of a vacuum tanker truck operated by a licensed waste hauler. MW-8 is a microwell. It is recommended that this well be abandoned and replaced by a 2-inch-diameter monitoring well that would also be used for the LNAPL interim measure.

A drop tube should be deployed to a depth just above the elevation of the LNAPL. The vacuum exerted by the tanker truck will pull the LNAPL up and into the drop tube. A clear piece of tubing should be connected in-line between the drop tube and tanker truck at the surface of the well to ensure that mostly product is being recovered from the drop tube. Since product foams under vacuum conditions in tubing, vacuum application on the wells should cease when foaming observed in the clear tubing significantly decreases. Under Chapter 62-770.300(1)(b)(4)(b) FAC, the volume of groundwater recovered is not to exceed two times the volume of LNAPL recovered. The first 1,000 gallons of total fluid recovered is exempt from this requirement.

LNAPL removal by vacuum truck extraction should occur over one to three days until LNAPL thicknesses in the monitoring wells decrease below 0.01 feet. LNAPL and/or groundwater collected by vacuum truck should be transported by the waste hauler to a licensed disposal facility or the NAVSTA Mayport Oily Wastewater Treatment Facility. Aquifer properties have not been measured for well MW-8; however, assuming a recovery rate of 1 gallon per minute for an oil and water emulsion over 12 hours per day for 3 days, the volume of the water and LNAPL emulsion is estimated to be 2,160 gallons.

Once the LNAPL has been removed to less than 0.01 feet, the condition for natural attenuation under Chapter 62-770.690(1)(a) will be met. Currently, the site appears to meet the other conditions for natural attenuation as contaminated soil is not present (Chapter 62-770.690[1][b] FAC), petroleum-related contaminants do not appear to be migrating beyond the proposed point of compliance well (MW-7) (Chapter 62-770.690[1][c] FAC), the site conditions are suitable for natural attenuation (Chapter 62-770.690[1][d]), and the analytical results suggest that the petroleum-related constituents have decreased over time (Chapter 62-770.690[1][e]).

Natural attenuation monitoring should be implemented at Site 245 when it is confirmed that the LNAPL in MW-8 is less than 0.01 feet thick. It is recommended that water level measurements and a groundwater sampling event be conducted approximately two to three months after the

interim source removal action for the LNAPL to confirm the LNAPL has been removed and provide a baseline sampling event for the proposed monitored natural attenuation program.

Monitoring wells MW-1, MW-4, MW-6, MW-8, and MW-7 are proposed for the monitoring program. Monitoring well MW-6 is proposed to be the background monitoring well. Monitoring wells MW-4 and MW-8 are proposed to be the source wells. Monitoring wells MW-1 and MW-7 are proposed to be the perimeter wells. Monitoring well MW-1 is proposed to be the hydraulic downgradient point of compliance well.

The five monitoring wells and associated QC samples should be sampled and analyzed quarterly for PAHs (Method 8310) and TRPH (FL-PRO Method). Water levels should be collected quarterly from monitoring wells MW-1 through MW-7. Following is a summary of groundwater samples to be collected and analyzed for the natural attenuation monitoring program at this site.

Site 245 Proposed Natural Attenuation Monitoring Analytical Summary

Analyte	Groundwater Samples	Duplicate Sample	Total
PAHs	5	1	6
TRPH	5	1	6

Four quarterly sampling reports should be generated and submitted to NAVSTA Mayport for comment(s). The fourth quarter sampling report will be an annual summary report. Groundwater sampling data forms, a figure depicting the groundwater sampling analyses (i.e., plume map), and a figure depicting the groundwater flow direction will be included in each quarterly report. Upon resolution of the NAVSTA Mayport comments, a final quarterly/annual report will be submitted to FDEP.

The monitoring period should be a minimum of one year, unless two consecutive quarterly sampling events indicate that applicable cleanup target levels have been met and the site meets the No Further Action criteria under Chapter 62-770.680 FAC.

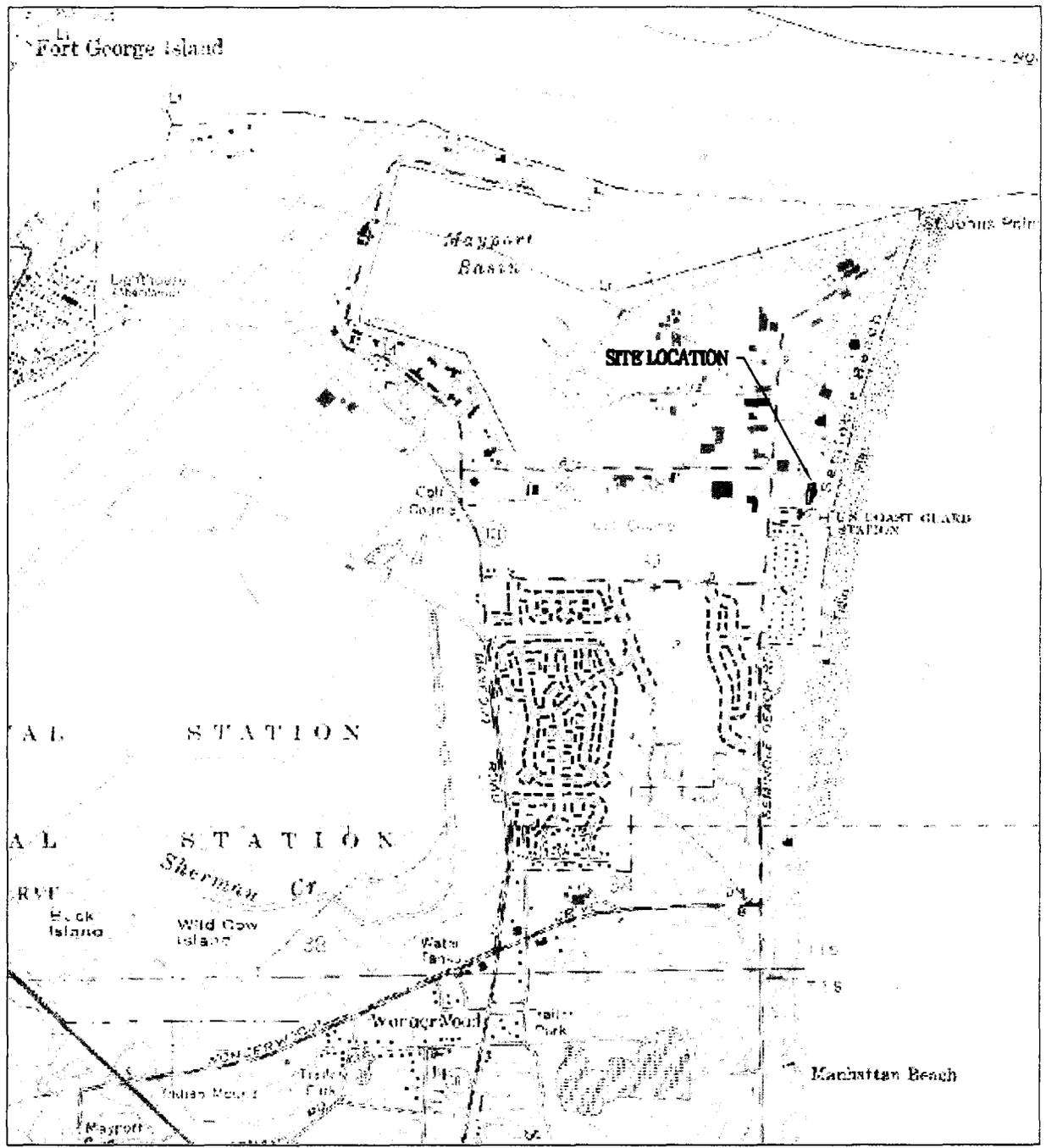
7.0 References

Bhate Environmental Associates, Inc. (BEA), 1997. Contamination Assessment Report, Tank Site 245, Naval Station Mayport, Mayport, Florida. Prepared for Department of Navy, Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina.

BEA, 1999. Addendum to the Contamination Assessment Report, Tank Site 245, Naval Station Mayport, Mayport, Florida. Prepared for Department of Navy, Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina (September).

Ellis Environmental Group, LC (EEG), 2001. Site Assessment Underground Storage Tank Sites 245, 1343, and 1388, Mayport Naval Station, Mayport, Florida. Prepared for Department of Navy, Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina (June).

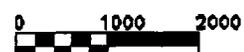
Figures



Source:

USGS Quadrangle
MAYPORT, FLA.
1964
Photorevised 1987

USGS Quadrangle
JACKSONVILLE BEACH, FLA.
1964
Revised 1992



SCALE: 1 INCH = 2000 FEET

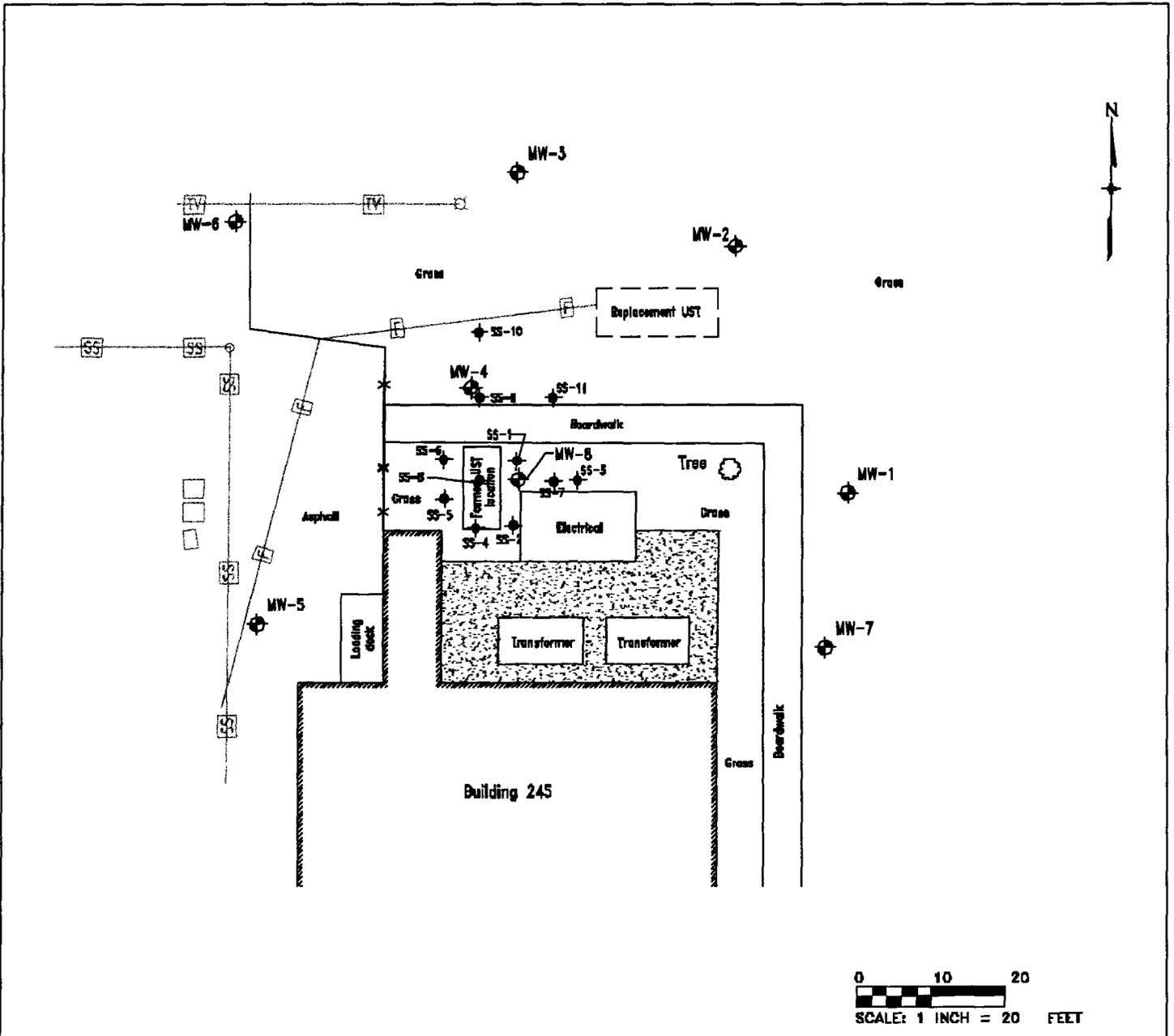
FIGURE: 1
Site Location Map



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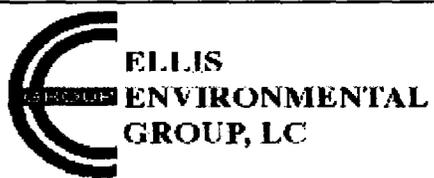


0 10 20
SCALE: 1 INCH = 20 FEET

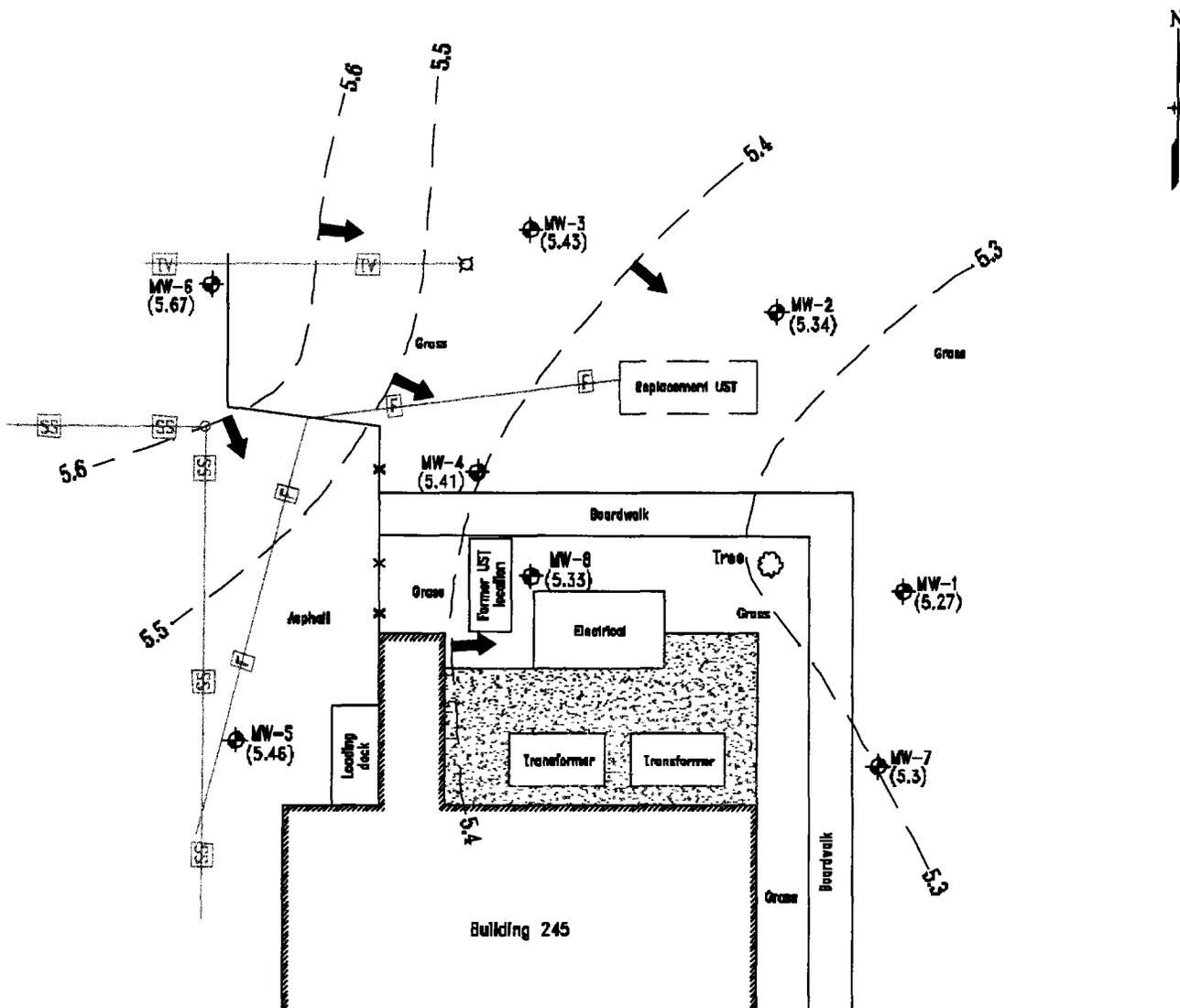
LEGEND	
	MW-1 Monitoring well location and designation
	SS-1 Soil sample location and designation
	Power pole
	Overhead utilities
	Sanitary sewer
	Fuel
	Concrete
	Fence

NOTE:
The information shown on this map was obtained in part by others. This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

FIGURE: 2
Site Map
and Sampling Locations
EEG No. 7034.100 Date: 4-25-02



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0 10 20
SCALE: 1 INCH = 20 FEET

LEGEND	
⊕ MW-1 (5.43)	Monitoring well location and designation Potentiometric surface elevation
--- 5.4	Potentiometric surface elevation contour
➔	Potentiometric surface flow direction
⊠	Power pole
— TV —	Overhead utilities
— SS —	Sanitary sewer
— F —	Fuel
▨	Concrete
— x —	Fence

NOTE:

The information shown on this map was obtained in part by others. This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

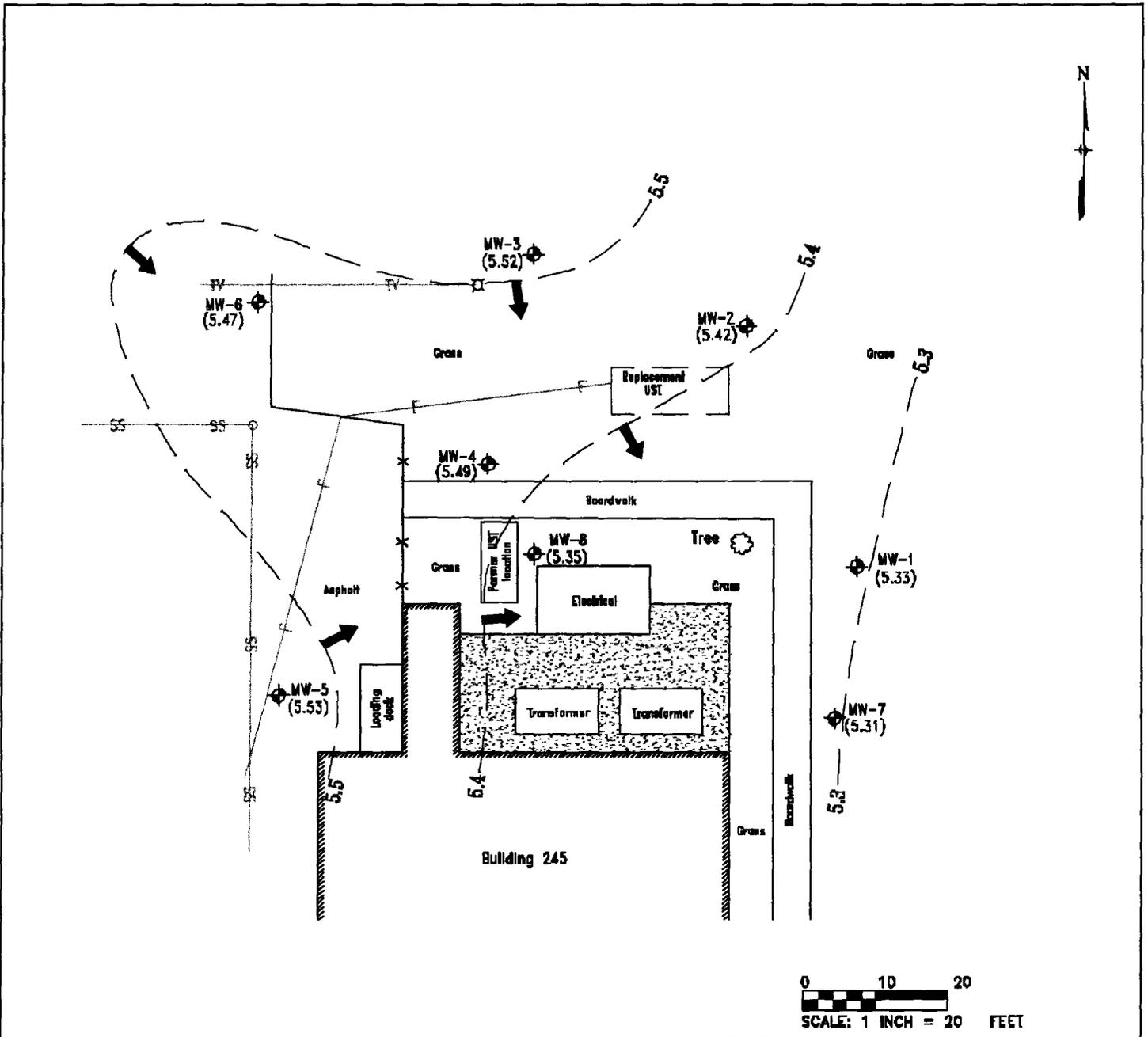
FIGURE: 3
Potentiometric Surface
on 7-31-01



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0 10 20
SCALE: 1 INCH = 20 FEET

LEGEND	
	MW-1 Monitoring well location and designation (5.43)
	5.4 Potentiometric surface elevation contour
	Potentiometric surface flow direction
	Power pole
	Overhead utilities
	Sanitary sewer
	Fuel
	Concrete
	Fence

NOTE:
The information shown on this map was obtained in part by others. This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

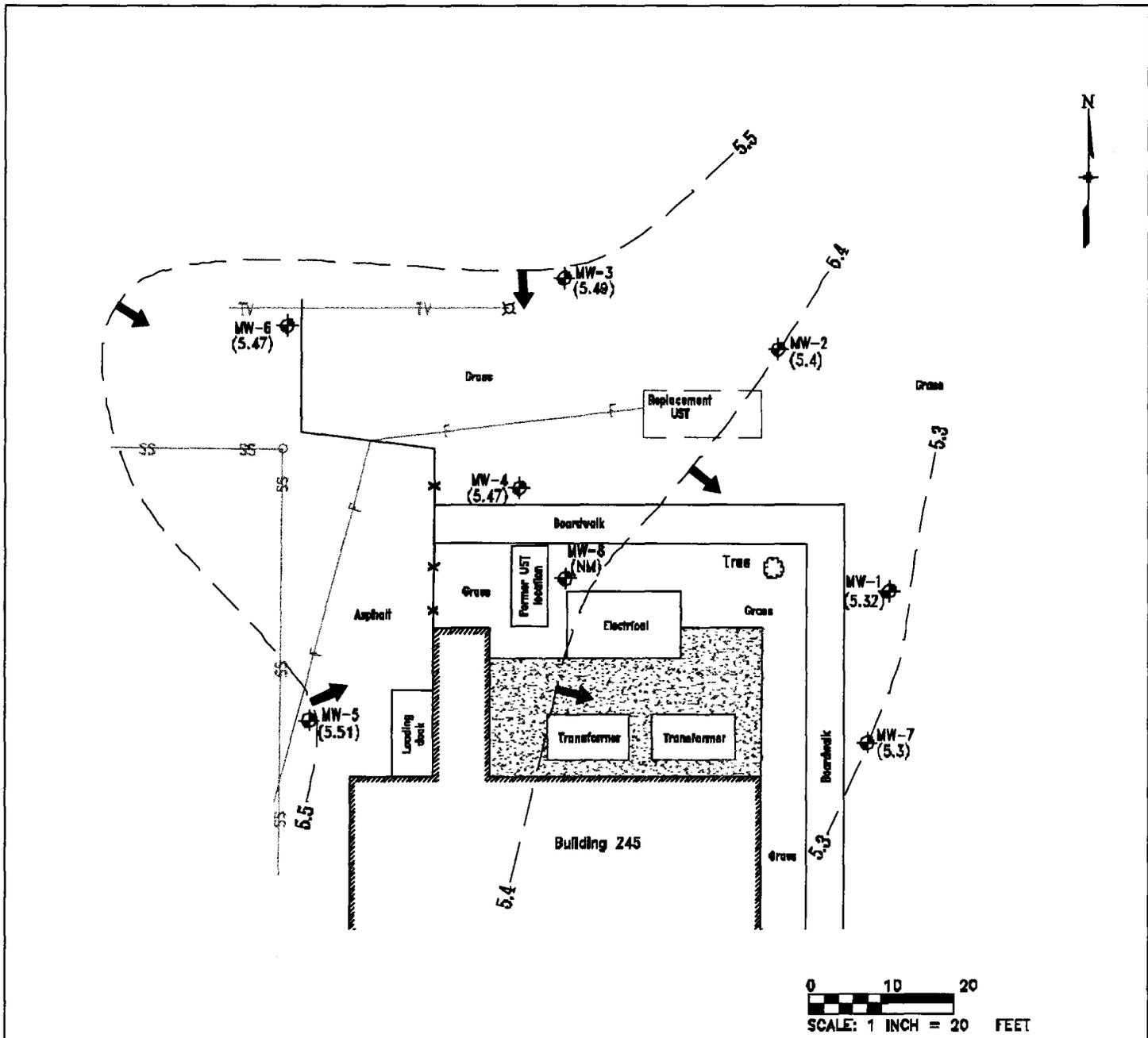
FIGURE: 4
Potentiometric Surface
on 8-1-01 at 08:00



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0 10 20
SCALE: 1 INCH = 20 FEET

LEGEND	
⊕ MW-1 (5.43)	Monitoring well location and designation
--- 5.4	Potentiometric surface elevation contour
➔	Potentiometric surface flow direction
⊠	Power pole
TV	Overhead utilities
SS	Sanitary sewer
□	Fuel
▨	Concrete
— x —	Fence

NOTE:

The information shown on this map was obtained in part by others. This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

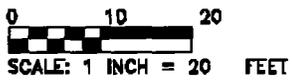
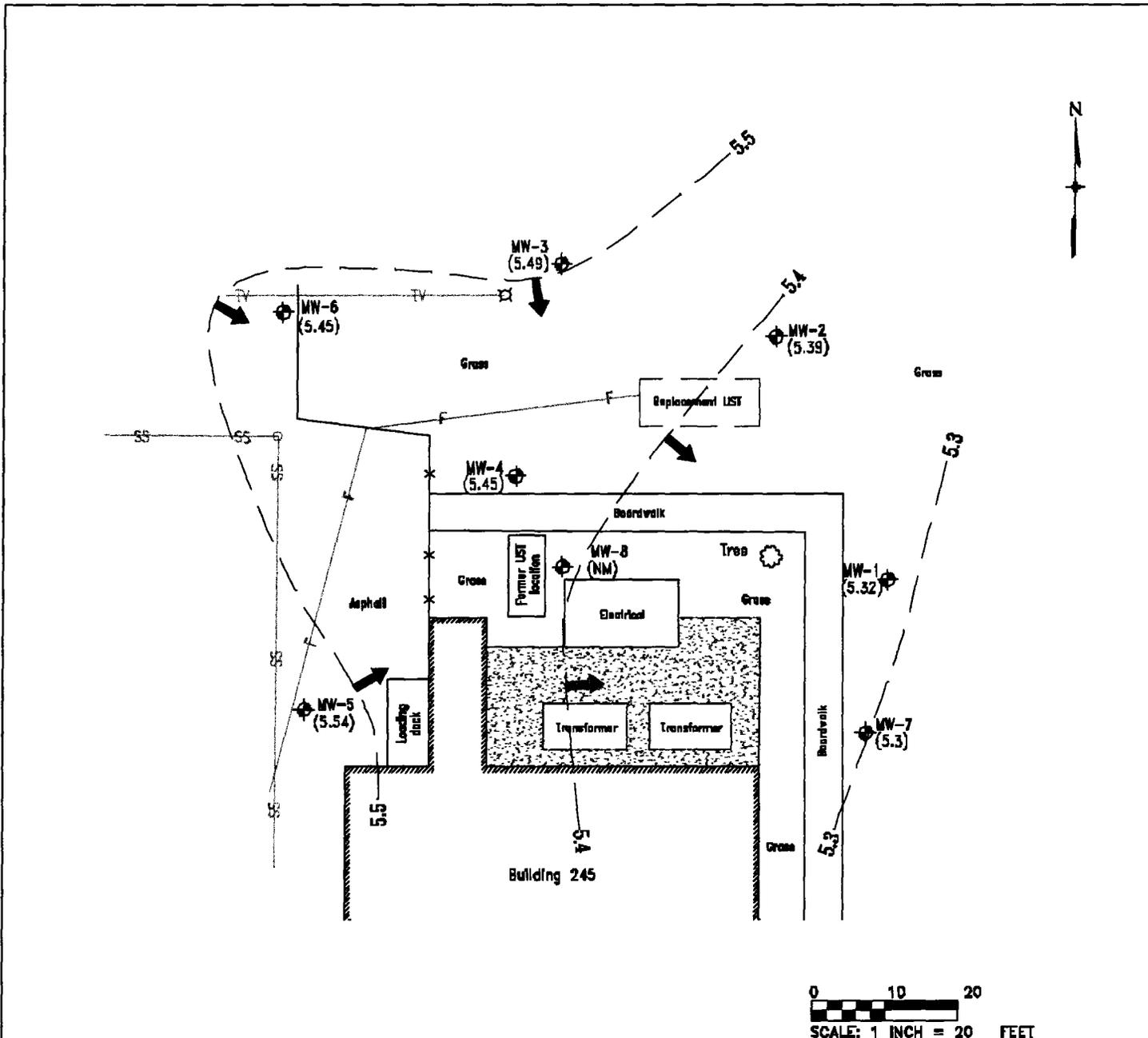
FIGURE: 5
Potentiometric Surface
at B-1-01 at 12:00



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LEGEND	
	MW-1 (5.43) Monitoring well location and designation Potentiometric surface elevation
	5.4 Potentiometric surface elevation contour
	Potentiometric surface flow direction
	Power pole
	Overhead utilities
	Sanitary sewer
	Fuel
	Concrete
	Fence

NOTE:
 The information shown on this map was obtained in part by others. This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

FIGURE: 6
 Potentiometric Surface
 on 8-1-01 at 16:00

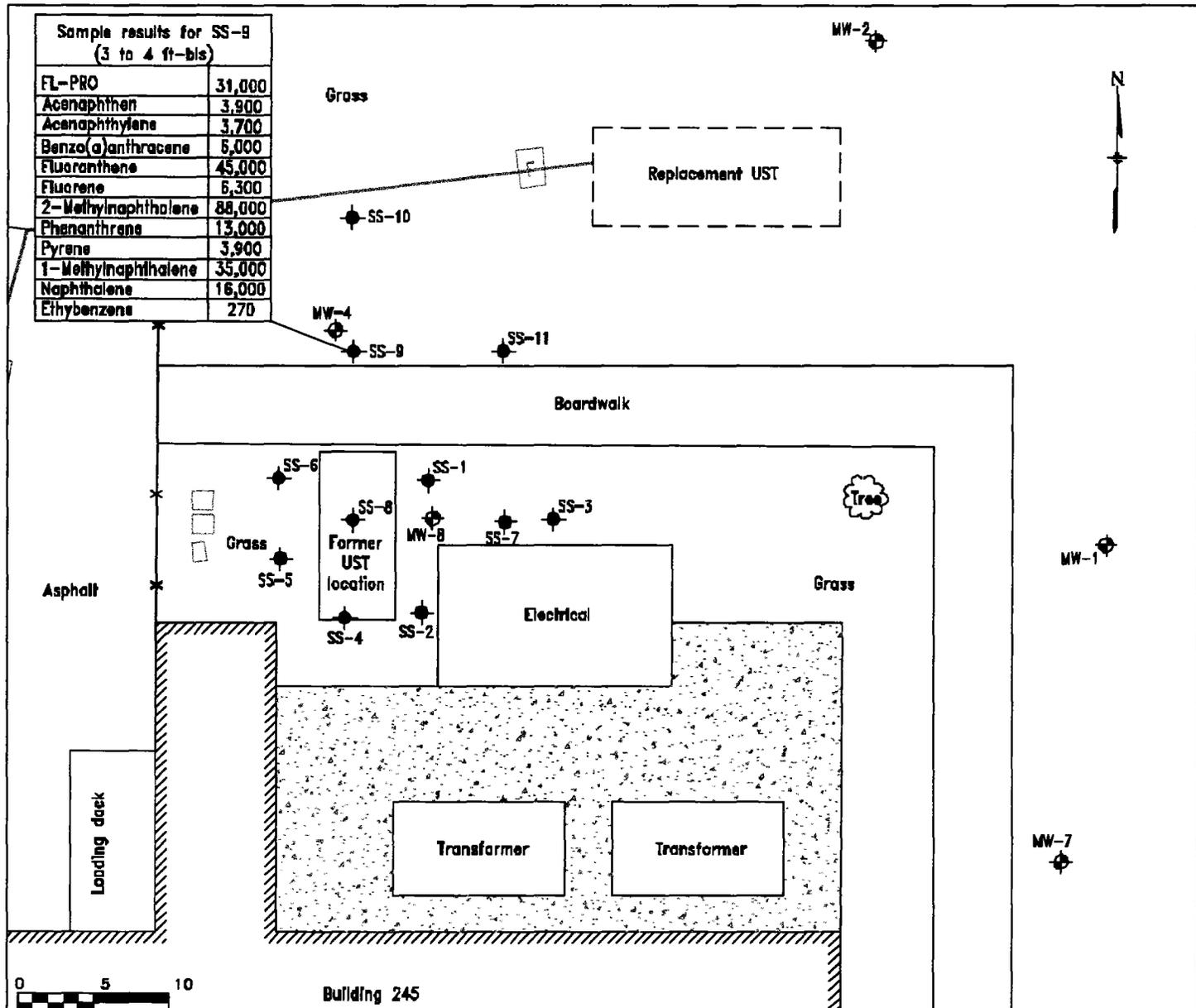


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Sample results for SS-9
(3 to 4 ft-bis)

FL-PRO	31,000
Acenaphthen	3,900
Acenaphthylene	3,700
Benzo(a)anthracene	6,000
Fluoranthene	45,000
Fluorene	6,300
2-Methylnaphthalene	88,000
Phenanthrene	13,000
Pyrene	3,900
1-Methylnaphthalene	35,000
Naphthalene	16,000
Ethylbenzene	270



0 5 10
SCALE: 1 INCH = 10 FEET
NOTES:

- All concentrations for SS-9 are in micrograms per kilogram except FL-PRO which is in milligrams per kilogram.
- The information shown on this map was obtained in part by others. This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

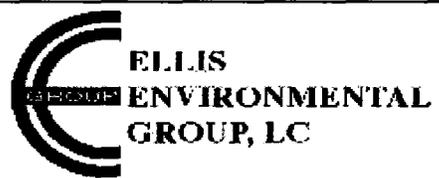
OVA at Depth (feet bis, in ppm)

Boring ID	0-1	1-2	2-3	3-4
SS-1	0	0	1	0
SS-2	0	0	1	1
SS-3	0	0	0	NC
SS-4	0	0	1	0
SS-5	0	0	1	1
SS-6	1	1	1	1
SS-7	0	1	1	100
SS-8	0	0	1	NC
SS-9	0	0	0	75
SS-10	0	0	1	0
SS-11	0	0	1	NC

LEGEND

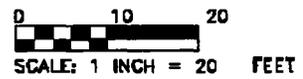
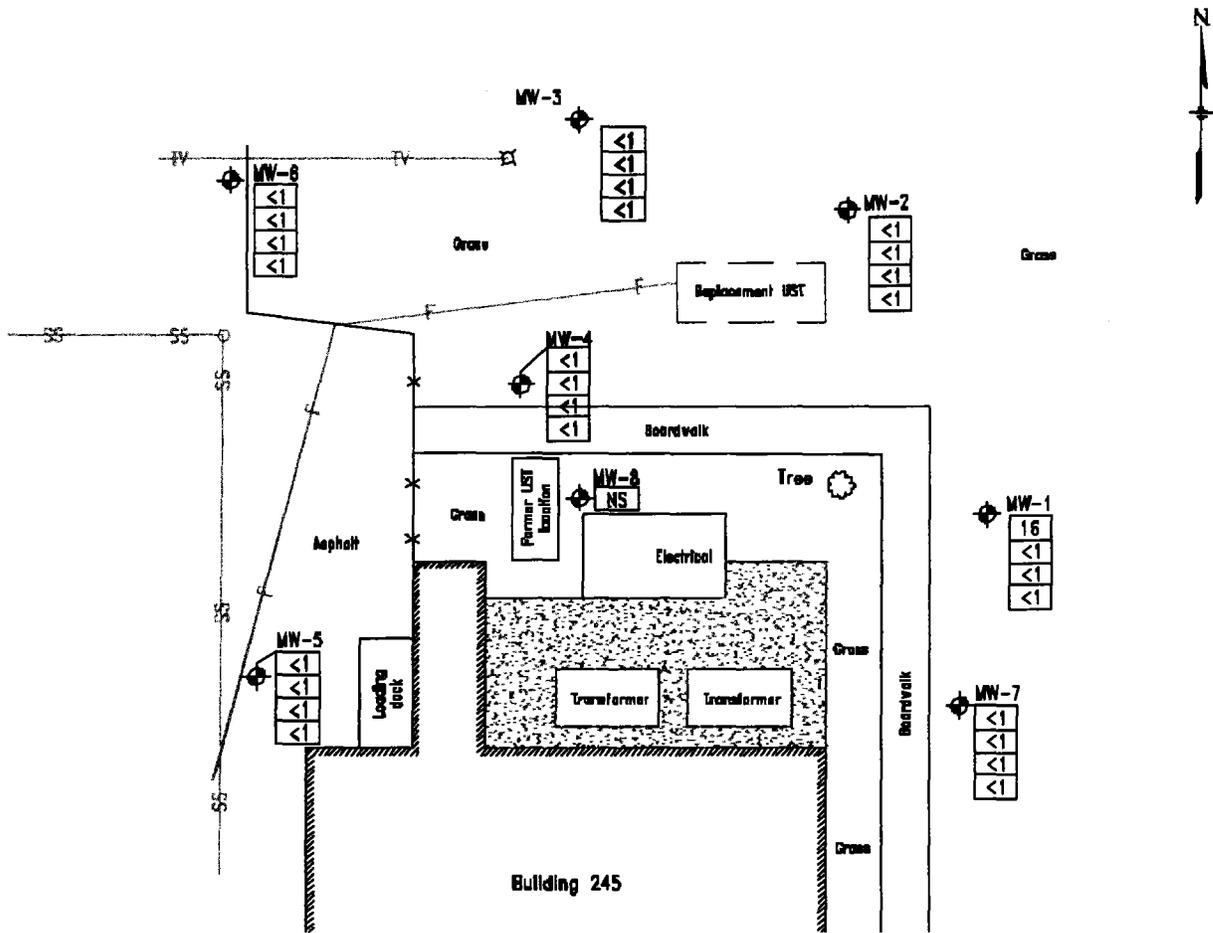
- MW-1 Monitoring well location and designation
- SS-1 Soil sample location and designation
- Power pole
- Overhead utilities
- Sanitary sewer
- Fuel
- Concrete
- Fence
- NC Not collected
- ppm Parts per million

FIGURE: 7
Soil Sample Locations
and Results



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LEGEND	
	Monitoring well location and designation
	Benzene Toluene Ethylbenzene Xylenes
	Not sampled
	Power pole
	Overhead utilities
	Sanitary sewer
	Fuel
	Concrete
	Fence

NOTE:

The information shown on this map was obtained in part by others. This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

FIGURE: 8

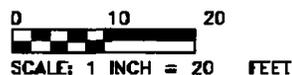
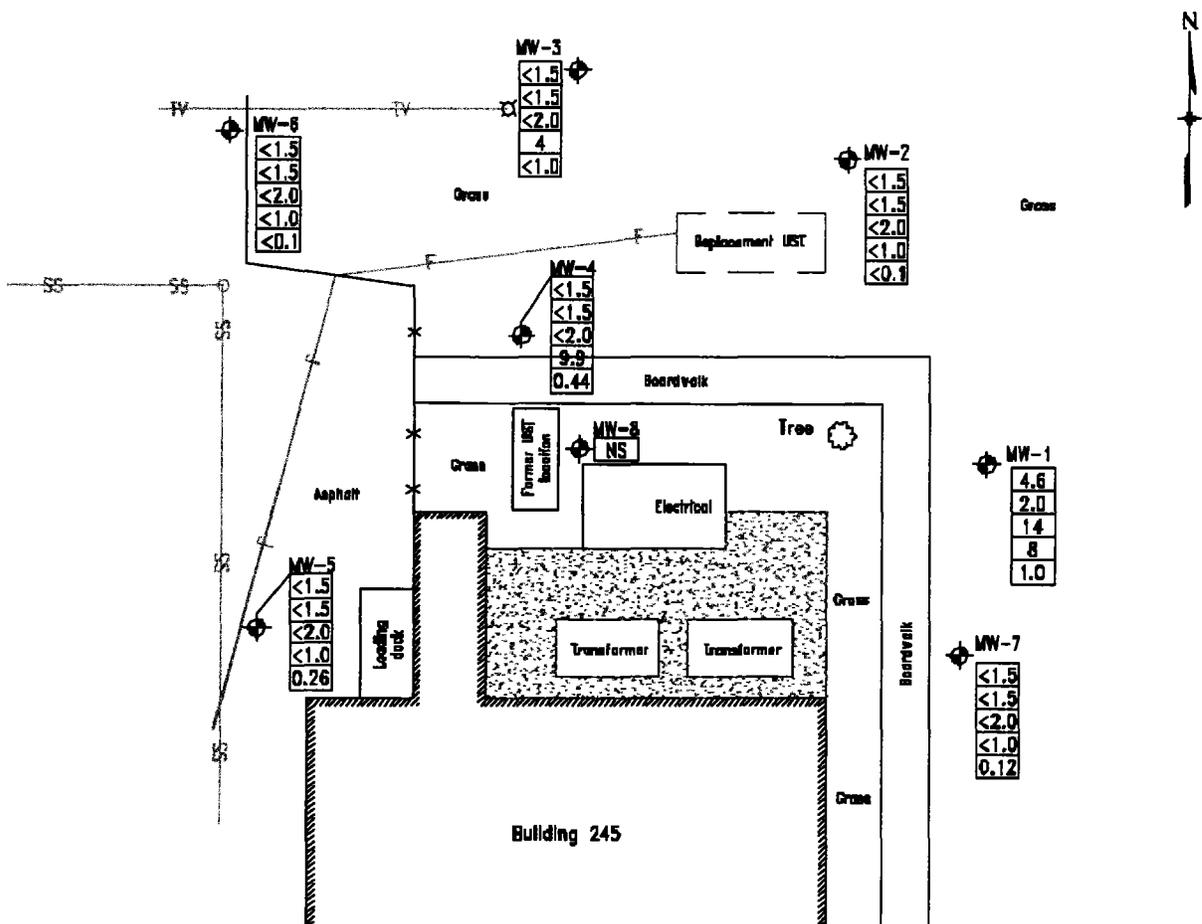
Volatile Organic Analytes
Detected in Groundwater
Samples Collected
on 7-31-01



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LEGEND	
	MW-1 Monitoring well location and designation
	1-Methylnaphthalene
	2-Methylnaphthalene
	Acenaphthylene
	Naphthalene
	FL-Pro
	NS Not sampled
	Power pole
	Overhead utilities
	Sanitary sewer
	Fuel
	Concrete
	Fence

NOTE:
 The information shown on this map was obtained in part by others. This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

FIGURE: 9
 Semi-Volatile Organic Analytes
 Detected in Groundwater
 Samples Collected
 on 7-31-01



Contamination Assessment Report Addendum
 UST SITE 245
 Mayport, Florida

Contract No. N62467-01-C-8826 Client: SOUTHERN DIVISION
 NAVAL FACILITIES ENGINEERING COMMAND

Tables

Table 1. Groundwater Elevation Summary

WELL NO.	MW-1			MW-2			MW-3			MW-4		
DIAMETER	2-Inches			2-Inches			2-Inches			2-Inches		
WELL DEPTH (ft)	13.21			13.02			13.26			13.32		
SCREEN INTERVAL	2.99 to 12.49			2.81 to 12.31			3.05 to 12.55			3.11 to 12.61		
TOC ELEVATION	11.57			10.27			10.15			10.31		
DATE	ELEV	DTW	FP									
06/10/97	6.42	5.15	NO	6.45	3.82	NO	6.47	3.68	NO	6.99	3.32	NO
07/24/97	5.57	6.00	NO	6.15	4.12	NO	5.70	4.45	NO	5.70	4.61	NO
02/16/99	5.75	5.82	NO	5.75	4.52	NO	5.82	4.33	NO	5.80	4.51	NO
07/01/99	4.92	6.65	NO	5.01	5.26	NO	5.07	5.08	NO	5.06	5.25	NO
07/31/01	5.27	6.30	NO	5.34	4.93	NO	5.43	4.72	NO	5.41	4.90	NO
8/1/2001 (0800)	5.33	6.24	NO	5.42	4.85	NO	5.52	4.63	NO	5.49	4.82	NO
8/1/2001 (1200)	5.32	6.25	NO	5.40	4.87	NO	5.49	4.66	NO	5.47	4.84	NO
8/1/2001 (1600)	5.32	6.25	NO	5.39	4.88	NO	5.49	4.66	NO	5.45	4.86	NO
WELL NO.	MW-5			MW-6			MW-7			MW-8		
DIAMETER	2-Inches			3/4-Inches			3/4-Inches			3/4-Inches		
WELL DEPTH (ft)	13.03			12.80			13.60			13.60		
SCREEN INTERVAL	2.82 to 12.32			3.3 to 12.8			4.1 to 13.1			4.1 to 13.1		
TOC ELEVATION	9.76			9.15			12.48			10.07		
DATE	ELEV	DTW	FP									
06/10/97	5.92	3.84	NO	NI	NI	NO	NI	NI	NO	NI	NI	NO
07/24/97	5.63	4.13	NO	NI	NI	NO	NI	NI	NO	NI	NI	NO
02/16/99	5.82	3.94	NO	5.69	3.46	NO	5.73	6.75	NO	5.80	4.27	NO
07/01/99	5.09	4.67	NO	5.08	4.07	NO	4.91	7.57	NO	4.67	5.40	NO
07/31/01	5.46	4.30	NO	5.67	3.48	NO	5.30	7.18	NO	5.33	4.74	Yes
8/1/2001 (0800)	5.53	4.23	NO	5.47	3.68	NO	5.31	7.17	NO	5.35	4.72	Yes
8/1/2001 (1200)	5.51	4.25	NO	5.47	3.68	NO	5.30	7.18	NO	NM	NM	NM
8/1/2001 (1600)	5.54	4.22	NO	5.45	3.7	NO	5.30	7.18	NO	NM	NM	NM
Notes:												
Measurements made prior to July 31, 2001, were by Bhate Environmental Associates (Bhate, 1997, 1999)												
DTW = Measurement of depth to groundwater in feet												
FP = Observation/measurement of free phase liquid												
ELEV = Groundwater elevation (NGVD)												
NO = Free phase liquid observed												
NGVD = National Geodetic Vertical Datum												
NM = Not measured												
TOC = Top of the well casing												
NI = Not installed												

Table 2. Soil Sample Field Screening Results

Sample Location / Date	Depth	OVA Measurements (parts per million)			Comments
		Direct Measurement	With Charcoal Filter	Corrected	
SS-1 3/5/02	0 to 1	0	--	0	Tan Sand
	1 to 2	0	--	0	Tan Sand
	2 to 3	1	--	1	Tan Sand
	3 to 4	0	--	0	Wet – Tan Sand
SS-2 3/5/02	0 to 1	0	--	0	Tan Sand
	1 to 2	0	--	0	Tan Sand
	2 to 3	1	--	1	Tan Sand with little Clay
	3 to 4	1	--	1	Wet – Tan Sand
SS-3 3/5/02	0 to 1	0	--	0	Tan Sand & Clay, Little Shells
	1 to 2	0	--	0	Tan Sand & Clay, with Shells
	2 to 3	0	--	0	Wet – Tan Clayey Sand
SS-4 3/5/02	0 to 1	0	--	0	Very Fine Brown Sand
	1 to 2	0	--	0	Very Fine Brown Sand
	2 to 3	1	--	1	Very Fine Brown Sand
	3 to 4	0	--	0	Wet - Very Fine Brown Sand
SS-5 3/5/02	0 to 1	0	--	0	White to Brown fine Sand
	1 to 2	0	--	0	White to Brown fine Sand
	2 to 3	1	--	1	Damp – White Sand
	2 to 3	1	--	1	Wet – Brown and White Sand
SS-6 3/5/02	0 to 1	1	--	1	Brown and Tan Sand
	1 to 2	1	--	1	Brown and Tan Sand
	2 to 3	1	--	1	Tan Sand
	3 to 4	1	--	1	Damp - Brown Sand
SS-7 3/5/021	0 to 1	0	--	0	Brown Sand
	1 to 2	1	--	1	White and Brown Sand with Shells
	2 to 3	1	--	1	White and Tan Sand with Shells
	3 to 4	100	0	100	Wet – Black Sand
SS-8 3/5/02	0 to 1	0	--	0	Very Fine Brown Sand
	1 to 2	0	--	0	Very Fine Brown Sand
	2 to 3	1	--	1	Damp – Very Fine Brown Sand
	3 to 4	--	--	--	Saturated
SS-9 3/5/02	0 to 1	0	--	0	Tan Sand with Shells
	1 to 2	0	--	0	Tan Sand
	2 to 3	0	--	0	Tan Sand
	3 to 4	75	0	75	Fine Gray Sand
SS-10 3/5/02	0 to 1	0	--	0	Tan Sand
	1 to 2	0	--	0	Tan Sand
	2 to 3	1	--	1	Tan Sand
	3 to 4	0	--	0	Brown Sand
SS-11 3/5/02	0 to 1	0	--	0	Tan and Brown Sand, and Shells
	1 to 2	0	--	0	Tan Shells and Sand
	2 to 3	1	--	1	Damp – Tan Sand
	3 to 4	--	--	--	Saturated

Notes:
 OVA = Organic Vapor Analyzer; -- = measurement not obtained due to low measurement or no organic vapors present.

Table 3. Analytical Results for Soil Sample SS-9 Collected 3 to 4 ft-bls

Parameter	SS-7 2 to 3 ft-bls	SS-9 3 to 4 ft-bls	SS-10 2 to 3 ft-bls	Unit	Soil Cleanup Target Levels			
					Residential	Industrial	Leachability to Groundwater	Leachability to Marine Water
Total Recoverable Petroleum Hydrocarbons								
Petroleum Residual Organics	0.1 U	31,000	0.1 U	mg/kg	340	2,500	340	340
<u>Volatile Organics</u>								
Ethylbenzene	5 U	270	5 U	µg/kg	1,100,000	8,400,000	600	12,000
<u>Polynuclear Aromatic Hydrocarbons</u>								
1-Methylnaphthalene	35 U	35,000	35 U	µg/kg	68,000	470,000	2,200	10,000
2-Methylnaphthalene	35 U	88,000	35 U	µg/kg	80,000	560,000	6,100	9,100
Acenaphthene	35 U	3,900	35 U	µg/kg	1,900,000	18,000,000	2,100	700
Acenaphthylene	35 U	3,700	35 U	µg/kg	1,100,000	11,000,000	27,000	700
Benzo(a)anthracene	35 U	6,000	35 U	µg/kg	1,400	5,000	3,200	700
Fluoranthene	35 U	45,000	35 U	µg/kg	2,900,000	48,000,000	1,200,000	1,300
Fluorene	35 U	6,300	35 U	µg/kg	2,200,000	28,000,000	160,000	17,000
Naphthalene	35 U	16,000	35 U	µg/kg	40,000	270,000	1,700	2,200
Phenanthrene	35 U	13,000	35 U	µg/kg	2,000,000	30,000,000	250,000	700
Pyrene	35 U	3,900	35 U	µg/kg	2,200,000	37,000,000	880,000	1,300
Notes: ft-bls = feet beneath the land surface Soil Cleanup Target Levels from Chapter 62-777, Florida Administrative Code mg/kg = milligrams per kilogram µg/kg = micrograms per kilogram U = analyte, if present, was at a concentration less than the detection limit. Bold = analyte concentration exceed regulatory screening criteria								

Table 4. Groundwater Analytical Results – Volatile Organic Compounds

Sample Location	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	EDB (µg/L)
MW-1	06/10/97	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA
	02/16/99	NS	NS	NS	NS	NS	NS
	07/01/99	NS	NS	NS	NS	NS	NS
	07/31/01	16.0	< 1.0	< 1.0	< 1.0	NA	NA
MW-2	06/10/97	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA
	02/16/99	NS	NS	NS	NS	NS	NS
	07/01/99	NS	NS	NS	NS	NS	NS
	07/31/01	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA
MW-3	06/10/97	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA
	02/16/99	NS	NS	NS	NS	NS	NS
	07/01/99	NS	NS	NS	NS	NS	NS
	07/31/01	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA
MW-4	06/10/97	6.5	< 1.0	22.0	18.0	< 1.0	NA
	02/16/99	1.8	< 1.0	1.8	< 1.0	< 1.0	< 1.0
	(Duplicate) 02/16/99	1.4	< 1.0	1.2	< 1.0	< 1.0	< 1.0
	07/01/99	NA	NA	NA	NA	NA	< 0.02
(Duplicate) MW-5	07/01/99	NA	NA	NA	NA	NA	< 0.02
	07/31/01	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA
	06/10/97	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA
	02/16/99	NS	NS	NS	NS	NS	NS
MW-6	07/01/99	NS	NS	NS	NS	NS	NS
	07/31/01	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA
	06/10/97	NI	NI	NI	NI	NI	NI
	02/16/99	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
(Duplicate) MW-7	07/01/99	NA	NA	NA	NA	NA	< 0.02
	08/01/01	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA
	08/01/01	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA
	08/01/01	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA
MW-8	06/10/97	NI	NI	NI	NI	NI	NI
	02/16/99	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	07/01/99	NA	NA	NA	NA	NA	< 0.02
	07/31/01	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA
MW-8	06/10/97	NI	NI	NI	NI	NI	NI
	02/16/99	17.5	< 5.0	59.0	7.5	< 1.0	< 5.0
	07/01/99	NA	NA	NA	NA	NA	< 0.02
	08/01/01	FP	FP	FP	FP	FP	FP
Groundwater		1	40	30	20	50	0.02
Marine		10	400	300	200	500	0.2
NA source		100	400	300	200	500	2
NA parameter		1	40	30	20	50	0.02
Notes:							
Analytical results obtained prior to July 31, 2001, were by Bhate Environmental Associates (BEA, 1997, 1999)							
FP = Free-phase liquid present, groundwater sample not collected; NA = Not analyzed; NI = Not installed; NS = Not sampled							
NA source = Natural attenuation source guidance concentration; NA parameter = Natural attenuation parameter guidance concentration							
µg/L = Micrograms per liter							

Table 5. Groundwater Analytical Results – Polynuclear Aromatics & Hydrocarbons

Sample Location	Date	1-Methyl-naphthalene (µg/L)	2-Methyl-naphthalene (µg/L)	Acenaphthene (µg/L)	Acenaphthylene (µg/L)	Naphthalene (µg/L)	Fluorene (µg/L)	Phenanthrene µg/L	FL-PRO (mg/L)
MW-1	06/13/97	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	NA
	02/16/99	NA	NA	NA	NA	NA	NA	NA	< 0.202
	07/31/01	4.6	2.0	< 1.0	14	8	< 1.0	< 1.0	1.0
MW-2	06/13/97	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA
	02/16/99	NA	NA	NA	NA	NA	NA	NA	< 0.202
	07/31/01	< 1.5	< 1.5	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 0.10
MW-3	06/13/97	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA
	02/16/99	NA	NA	NA	NA	NA	NA	NA	< 0.206
	07/31/01	< 1.5	< 1.5	< 1.0	< 2.0	4	< 1.0	< 1.0	< 0.10
MW-4	06/13/97	41	42	3.4	< 1.0	33	3.9	3.7	NA
	02/16/99	< 10.1 *	< 10.1 *	< 5.1 *	10.1 *	37 *	0.5	< 0.6	0.790
	07/31/01	< 1.5	< 1.5	< 1.0	< 2.0	9.9	< 1.0	< 1.0	0.44
MW-5	06/13/97	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA
	02/16/99	NA	NA	NA	NA	NA	NA	NA	< 0.004
	07/31/01	< 1.5	< 1.5	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	0.26
MW-6	02/16/99	< 2.1	< 2.1	< 1.0	< 2.1	< 1.0	< 0.2	< 0.7	< 0.202
	08/01/01	< 1.5	< 1.5	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 0.10
	(Duplicate)	08/01/01	< 1.5	< 1.5	< 1.0	< 2.0	< 1.0	< 1.0	< 0.10
MW-7	02/16/99	12.3 *	< 10.2 *	< 5.1 *	< 10.2 *	32.8 *	1.3 *	< 0.7	0.440
	07/01/99	NA	NA	< 1.1	< 2.1	< 1.1	< 0.2	< 0.7	NA
	07/31/01	< 1.5	< 1.5	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	0.12
MW-8	02/16/99	75.2 *	76.0 *	< 21.1 *	< 42.1 *	164 *	4.8 *	< 13.5 *	2.830
	08/01/01	FP	FP	FP	FP	FP	FP	FP	FP
Groundwater		20	20	20	210	20	280	210	5
Marine		95	30	3	0.031	26	30	0.031	5
NA source		200	200	200	2,100	200	2,800	2,100	50
NA parameter		20	20	20	210	20	280	210	5

Notes:

Analytical results obtained prior to July 30, 2001, were by Bhatte Environmental Associates (BEA, 1997, 1999)

* = Dilution factor used in determining analytical reporting limits

FP = Free-phase liquid present, groundwater sample not collected; NA = Not analyzed

NA source = Natural attenuation source guidance concentration; NA parameter = Natural attenuation parameter guidance concentration

mg/L = Milligrams per liter; ug/L = Micrograms per liter

APPENDIX A

Field Methodology

Groundwater Sampling

The following procedures will be followed to purge and sample monitoring wells.

1. The pH, turbidity, specific conductivity, and temperature meters will be calibrated in accordance with the manufacturers' instructions before sampling and documented on calibration forms in the field notebook.
2. The volume of water in each well, including the saturated pore volume (assumed at 30 percent) of the sand-packed annulus, will be calculated based on the static water level and the well construction information. Well volume calculations will be recorded on well sampling forms in the field notebook.
3. A new disposable Teflon® bailer will be used to purge the well.
4. Begin purging the well.
5. Record initial measurements of indicator parameters (pH, turbidity, specific conductance, and temperature).
6. Purge a minimum of three well volumes and until pH, conductivity, turbidity, and temperature measurements stabilize to within 10 percent of the previous reading for at least three readings obtained at least 0.5 well volumes apart.
7. The total amount of water purged and measurements of pH, conductivity, turbidity, and temperature will be recorded on well sampling forms in the field notebook.
8. Wells that recharge very slowly will be purged dry, allowed to recharge at least 80 percent of initial water column, and sampled.
9. Monitoring wells will be sampled using new pre-decontaminated disposable Teflon® bailers. The bailer will be rinsed at least once with well water (i.e., the first bail of water is discarded) prior to collecting a sample.
10. VOC analytical fractions will be collected first, followed by diesel range organics (DRO), total organic carbon (TOC), PAHs, and metals.
11. Metals samples will be filtered (an unfiltered sample will also be analyzed), and all fractions will be preserved.
12. Samples will be placed on ice in a cooler.

All sampling equipment will be protected from coming into contact with contaminated soil surfaces to prevent cross contamination of the samples (e.g., equipment may be placed on disposable polyethylene plastic sheeting). A new pre-decontaminated disposable Teflon® bailer will be used to purge and sample each well.

Decontamination

A personnel and small-equipment decontamination area will be constructed at each work area to provide a decontamination facility in close proximity to the work area. Water collected from these facilities will be containerized.

The standard EEG decontamination solvent will be pesticide-grade isopropanol. Disposal of solvent rinses must be performed in an approved manner (depending upon the volume, either evaporated onsite or containerized for disposal through a disposal contract). The following decontamination procedures are for sampling equipment that contacts sample matrices.

Field Sampling Equipment

1. Clean with Liquinox and tap water (a higher grade of water always may be substituted for tap water). Use a brush to remove particulate matter and surface films, if necessary.
2. Rinse thoroughly with tap water.
3. Rinse thoroughly with 10 percent nitric acid (HNO₃). HNO₃ is not to be used to decontaminate metallic sampling equipment.
4. Rinse thoroughly with de-ionized water.
5. Rinse with pesticide-grade isopropanol.
6. Allow to air-dry.
7. For overnight storage, wrap in new aluminum foil, if appropriate, to prevent contamination.

Drilling Equipment

1. Hollow-stem augering and Geoprobe® drilling equipment will be steam-cleaned prior to shipment to the site.
2. Before drilling and between borings, hollow-stem augering drilling equipment will be steam-cleaned with tap water to remove traces of soil, rock, and other contaminants.
3. Between each boring location, Geoprobe® rods will be cleaned with Liquinox and tap water (a higher grade of water always may be substituted for tap water). Use a brush to remove particulate matter and surface films, if necessary. Then rinse thoroughly with tap water.

Sampling equipment that cannot be efficiently decontaminated due to heavy organic contamination will be discarded.

Groundwater Purging and Monitoring Equipment

1. Rinse water level tapes with tap water and Liquinox followed by de-ionized water. Place in a polyethylene bag to prevent contamination during storage or transit.
2. Groundwater purging and sampling bailers will be new, pre-decontaminated, and individually wrapped prior to shipment to the site.

Surveying

Each horizontal (x/y) sample location will be measured by tape measure to fixed locations and recorded in the field logbook or on site maps. Each new and existing monitoring well elevation at all three sites will be surveyed to a relative elevation and recorded in the field logbook.

Investigation-Derived Waste

All soil cuttings, purge water, and decontamination fluids collected will be contained for disposal in 55-gallon drums. Each drum will be labeled with the appropriate site information. The label will include a description of the waste matrix, the sample location (i.e., monitoring well identification), and the date the drum was sealed. A record of the number of drums filled at each site will be recorded on a log form in the logbook before leaving that site. The drums will be moved to a holding area designated by Mayport personnel prior to determining disposal methodology.

Soils from shallow hand auger borings that are not excessively contaminated as determined by visual, olfactory indicators and/or OVA concentrations will be placed back into the borehole. Excessively contaminated soil will be drummed and disposed through disposal contractor.

Drill cuttings will be screened with an OVA during the drilling process. Drill cuttings that are not excessively contaminated as determined by visual, olfactory indicators and/or OVA concentrations will be distributed onsite at areas designated by Mayport personnel. Excessively contaminated soil will be drummed and disposed of through disposal contractor.

Disposal options for groundwater purging waste will be determined based on the groundwater sample data associated with the drummed purge water. If it is found that the purge water waste meets local criteria, it could be transported to the local publicly owned treatment works for disposal. If the overall concentration of certain contaminants is elevated to unacceptable levels, the water will be disposed of through a disposal contractor.

Decontamination fluids will be collected and segregated based on waste stream type. Decontamination wash water will be drummed separately from alcohol waste. These wastes will be assumed to be contaminated and will be disposed of through a disposal contractor.

At the conclusion of the field effort, all of the derived waste streams that have been containerized in 55-gallon drums will be stored at one location. Mayport personnel will designate the drum storage location prior commencing the field effort. A review of all the drums will determine the number and type. A disposal contractor will be notified of a date to remove the drums. EEG will

prepare a manifest for the proper handling of these waste drums. A Mayport representative will sign the manifest for shipment. Once the papers are in order, the drums will be removed from the site and transported to the appropriate disposal/treatment facility.

Solid domestic waste such as cardboard boxes, writing paper, paper food wrappers, drink containers, and the like will be collected and kept separate from all other waste streams. Incidental waste, including decontaminated personal protective equipment and disposable sampling supplies, will be sent to a solid waste landfill for disposal. This is done to minimize the disposal of regulated waste streams. These domestic-type wastes will be disposed of in a local refuse collection system at Mayport. Prior to the disposal of this waste, the EEG field team leader will obtain permission from the appropriate personnel to place this waste in their refuse system.

Drums that contain soil cuttings or fluids that have been determined to require special disposal actions will be co-located at the drum storage area until a disposal contractor can remove the waste. Drums containing contaminated soils or water will be properly manifested and shipped to an appropriate landfill/treatment facility for disposal.

Mayport personnel will designate sanitary facilities (i.e., restrooms) to be used by the field team prior to commencing the field effort.

Analytical

This section details the analytical parameters to be quantified by laboratory analysis in samples collected during the investigations performed at the three sites. An estimated number of QC samples and the analyses to be performed on them are also presented. The number of QC samples associated with the sampling program may vary from these estimates based on the estimated duration of the field program.

The actual number of QC samples will be determined in the field based on the following:

- Ten percent duplicates.
- One trip blank per shipment (i.e., per cooler) of samples to be analyzed for VOCs.
- One equipment blank will be collected for the three confirmatory soil samples collected. The remainder of soil samples collected are for screening and do not require equipment blanks.
- No equipment blanks are required for the groundwater sampling effort because only new pre-decontaminated one-time use bailers will be used.

APPENDIX B

Sampling Data Forms



Ellis
Environmental
Group, LC

Monitor Well Water Level Measurements

Southern Division
Naval Facilities Engineering
Command

Contract Number :
N62467-01-C-8826

Mayport Naval Station
Mayport, Florida

Top of Well Casing _____
Ground Surface _____
Page _____ of _____
Date: 7/31/01
Day: Tuesday

Well	Date	Time	Stat Length	Wat Length	Depth to Water	Comments
MW-1	7/31/01	800			6.30	Site 245
MW-2	7/31/01	803			4.93	Site 245
MW-3	7/31/01	806			4.72	Site 245
MW-4	7/31/01	809			4.90	Site 245
MW-5	7/31/01	812			4.30	Site 245
MW-6	7/31/01	815			3.48	Site 245
MW-7	7/31/01	818			7.18	Site 245
MW-8	7/31/01	821			4.74	Site 245 - Free Product found in well

Recorded By: *[Signature]*

Date: 8/17/01

Reviewed By: _____

Date: _____

Quality Control Representative



Ellis
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Group, LC

Well Sampling Data Form

Southern Division
Naval Facilities Engineering
Command

Contract Number :
N62467-01-C-8826

Mayport Naval Station
Mayport, Florida
Site 245

Well No. MW-1
Page _____ of _____
Date: 7/31/01
Day: Tuesday

Well Depth 13.21 Well Casing Diameter 4 in
Boring Diameter 2 in Annular Space Length _____
Time 845 Stickup _____

Held _____ Casing Length 13.21
Cut _____ DTW Top of Casing 6.30
DTW 6.30 Top of Casing Column of Water in Well 6.91

Gallons per foot of A.S. (from chart)	=	<u>0.39</u>
Column of Water or length of A.S (whichever is less)	x	<u>6.91</u>
Volume of Annular Space	=	<u>2.6949</u>
Gallons per foot of Casing	=	<u>0.1632</u>
Column of Water	x	<u>6.91</u>
Volume of Casing	=	<u>1.128</u>
Total Volume (Volume of A.S. + Volume of Casing)	=	<u>3.82</u>
Number of Volumes to be Excavated	x	<u>3</u> to <u>5</u>
Total Volume to be Excavated	=	<u>11.46</u> to <u>19.1</u>

Method of Purging (pump, bailer, etc.) Bailer

	Start	Mid I	Mid II	Mid III	End
Time	<u>1745</u>	<u>1750</u>			<u>1800</u>
PH	<u>6.70</u>	<u>6.95</u>			<u>7.04</u>
Conductivity	<u>9600</u>	<u>9000</u>			<u>8750</u>
Temp. (°C)	<u>25.7</u>	<u>25.0</u>			<u>25.0</u>
Turbidity	<u>450</u>	<u>80</u>			<u>33</u>
Vol. Purged	<u>0</u>	<u>7.5</u>			<u>15</u>

Total Volume Purged 15 gallons
Sample Time/Date 1810 7/31/01 Sample Number MW-1

Recorded By: [Signature] Date: 8/17/01
Reviewed By: _____ Date: _____



Ellis
Environmental
Group, LC

Well Sampling Data Form

Southern Division
Naval Facilities Engineering
Command

Contract Number :
N62467-01-C-8826

Mayport Naval Station
Mayport, Florida
Site 245

Well No. MW-2
Page of
Date: 7/31/01
Day: Tuesday

Well Depth 13.02 Well Casing Diameter 2in
Boring Diameter 4in Annular Space Length
Time 8:45 Stickup

Held Casing Length 13.02
Cut DTW Top of Casing 4.93
DTW 4.93 Top of Casing Column of Water in Well 8.09

Gallons per foot of A.S. (from chart)	=	<u>0.39</u>
Column of Water or length of A.S. (whichever is less)	x	<u>8.09</u>
Volume of Annular Space	=	<u>3.1551</u>
Gallons per foot of Casing	=	<u>0.1632</u>
Column of Water	x	<u>8.09</u>
Volume of Casing	=	<u>1.32</u>
Total Volume (Volume of A.S. + Volume of Casing)	=	<u>4.475</u>
Number of Volumes to be Excavated	x	<u>3</u> to <u>5</u>
Total Volume to be Excavated	=	<u>13.425</u> to <u>22.375</u>

Method of Purging (pump, bailer, etc.) Bailer

	Start	Mid I	Mid II	Mid III	Final
Time	1705	1710	1720		1720
PH	7.08	7.24	7.27		7.27
Conductivity	5000	5000	5000		5000
Temp. (°C)	26.4	26.4	26.6		26.6
Turbidity	50	24	20		20
Vol. Purged	5	10	15		15

Total Volume Purged 15 gallons
Sample Time/Date 1725 7/31/01 Sample Number MW-2

Recorded By: _____ Date: _____
Reviewed By: _____ Date: _____



Ellis
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Well Sampling Data Form

Southern Division
Naval Facilities Engineering
Command

Contract Number :
N62467-01-C-8826

Mayport Naval Station
Mayport, Florida
Site 245

Well No. MW-3
Page of
Date: 7/31/01
Day: Tuesday

Well Depth 13.26 Well Casing Diameter 2in
Boring Diameter 4in Annular Space Length
Time 845 Stickup

Held Casing Length 13.26
Cut DTW Top of Casing 4.72
DTW 4.72 Top of Casing Column of Water in Well 8.54

Gallons per foot of A.S. (from chart)	=	<u>0.39</u>
Column of Water or length of A.S (whichever is less)	x	<u>8.54</u>
Volume of Annular Space	=	<u>3.331</u>
Gallons per foot of Casing	=	<u>0.1632</u>
Column of Water	x	<u>8.54</u>
Volume of Casing	=	<u>1.3937</u>
Total Volume (Volume of A.S. + Volume of Casing)	=	<u>4.725</u>
Number of Volumes to be Excavated	x	<u>3</u> to <u>5</u>
Total Volume to be Excavated	=	<u>14.175</u> to <u>23.625</u>

Method of Purging (pump, bailer, etc.) Bailer

	Start	Mid I	Mid II	Mid III	End
Time	1620	1625	1630		1640
PH	7.54	7.37	7.42		7.40
Conductivity	4100	3800	3800		3500
Temp. (°C)	27.9	26.3	26.3		26.0
Turbidity	360	110	160		55
Vol. Purged	0	5	10		15

Total Volume Purged 15 gallons
Sample Time/Date 1645 7/31/01 Sample Number MW-3

Recorded By: [Signature] Date: 8/17/01
Reviewed By: Date:



Ellis Environmental Group, LC

Well Sampling Data Form

Southern Division
Naval Facilities Engineering Command

Contract Number :
N62467-01-C-8826

Mayport Naval Station
Mayport, Florida
Site 245

Well No. MW-4
Page of
Date: 7/31/01
Day: Tuesday

Well Depth 13.32
Boring Diameter 4in
Time 845

Well Casing Diameter 2in
Annular Space Length
Stickup

Held
Cut
DTW 4.90 Top of Casing

Casing Length 13.32
DTW Top of Casing 4.90
Column of Water in Well 8.42

Gallons per foot of A.S. (from chart)
Column of Water or length of A.S (whichever is less)
Volume of Annular Space
Gallons per foot of Casing
Column of Water
Volume of Casing
Total Volume (Volume of A.S. + Volume of Casing)
Number of Volumes to be Excavated
Total Volume to be Excavated
Method of Purging (pump, bailer, etc.) Bailer

$$\begin{array}{r}
 = \quad 0.39 \\
 \times \quad 8.42 \\
 = \quad 3.2838 \\
 = \quad 0.632 \\
 \times \quad 8.42 \\
 = \quad 1.374 \\
 = \quad 4.66 \\
 \times \quad -13.983 \text{ to } 5 \\
 = \quad 13.98 \text{ to } 23.3
 \end{array}$$

	Start	Mid I	Mid II	Mid III	Final
Time	1400	1405	1415		1425
PH	6.78	7.06	7.08		7.00
Conductivity	7400	6200	6000		6200
Temp. (°C)	27.9	26.6	26.1		26.3
Turbidity	9.9	2.9	2.3		3.0
Vol. Purged	0	5	10		15

Total Volume Purged 15 gallons
Sample Time/Date 1430 7/31/01 Sample Number MW-4

Recorded By: [Signature] Date: 8/17/01
Reviewed By: Date:



Ellis
Environmental
Group, LC

Well Sampling Data Form

Southern Division
Naval Facilities Engineering
Command

Contract Number :
N62467-01-C-8826

Mayport Naval Station
Mayport, Florida
Site 245

Well No. MW-5
Page _____ of _____
Date: 7/31/01
Day: Tuesday

Well Depth 13.03
Boring Diameter 4in
Time 945

Well Casing Diameter 2in
Annular Space Length _____
Stickup _____

Held _____
Cut _____
DTW 4.30 Top of Casing

Casing Length 13.03
DTW Top of Casing 4.30
Column of Water in Well 8.73

Gallons per foot of A.S. (from chart)
Column of Water or length of A.S (whichever is less)
Volume of Annular Space
Gallons per foot of Casing
Column of Water
Volume of Casing
Total Volume (Volume of A.S. + Volume of Casing)
Number of Volumes to be Excavated
Total Volume to be Excavated
Method of Purging (pump, bailer, etc.) Bailer

$$\begin{array}{r}
 = \quad \underline{0.39} \\
 \times \quad \underline{8.73} \\
 = \quad \underline{3.4047} \\
 = \quad \underline{0.1632} \\
 \times \quad \underline{8.73} \\
 = \quad \underline{1.425} \\
 = \quad \underline{4.83} \\
 \times \quad \underline{3} \quad \text{to} \quad \underline{5} \\
 = \quad \underline{14.49} \quad \text{to} \quad \underline{24.15}
 \end{array}$$

	Start	Mid 1	Mid 2	Mid 3	End
Time	1255	1300	1315		1320
PH	6.99	7.04	7.08		7.17
Conductivity	6400	5200	5200		5100
Temp. (°C)	27.4	26.9	27.4		27.0
Turbidity	32	8.6	9.5		3.3
Vol. Purged	0	5	10		15

Total Volume Purged 15 gallons
Sample Time/Date 1335 7/31/01 Sample Number MW-5

Recorded By: [Signature] Date: _____
Reviewed By: _____ Date: _____



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Environmental
Group, LC

Well Sampling Data Form

Southern Division
Naval Facilities Engineering
Command

Contract Number :
N62467-01-C-8826

Mayport Naval Station
Mayport, Florida
Site 245

Well No. MW-6
Page of
Date: 7/31/01
Day: Tuesday

Well Depth 12.8
Boring Diameter 2.12
Time 945

Well Casing Diameter 3/4 in
Annular Space Length
Stickup

Held
Cut
DTW 3.48 Top of Casing

Casing Length 12.8
DTW Top of Casing 3.48
Column of Water in Well 9.32

Gallons per foot of A.S. (from chart)
Column of Water or length of A.S. (whichever is less)
Volume of Annular Space
Gallons per foot of Casing
Column of Water
Volume of Casing
Total Volume (Volume of A.S. + Volume of Casing)
Number of Volumes to be Excavated
Total Volume to be Excavated
Method of Purging (pump, bailer, etc.) Barber-ISCO Pump

$$\begin{aligned}
 &= 0.1632 \\
 &\times 9.32 \\
 &= 1.521 \\
 &= 0.023 \\
 &\times 9.32 \\
 &= 0.21436 \\
 &= 1.735 \\
 &\times 3 \quad \text{to } 5 \\
 &= 5.205 \quad \text{to } 8.675
 \end{aligned}$$

	Start	Mid I	Mid II	Mid III	End
Time	1007	1017	1025	1030	1025
PH	6.10	6.30	6.43		6.43
Conductivity	600	600	600		600
Temp. (°C)	26.7	26.4	26.4		26.4
Turbidity	12	2.1	1.1		1.1
Vol. Purged	0	3	5		5

Total Volume Purged 5 gallons
Sample Time/Date 1030 8/1/01 Sample Number MW-6

Jan Bovier granted permission to use ISCO Pump

Recorded By: *[Signature]*

Date: 8/17/01

Reviewed By:

Date:



Ellis
Environmental
Group, LC

Well Sampling Data Form

Southern Division
Naval Facilities Engineering
Command

Contract Number :
N62467-01-C-8826

Mayport Naval Station
Mayport, Florida
Site 245

Well No. MW-7
Page of
Date: 7/31/01
Day: Tuesday

Well Depth 13.6 Well Casing Diameter 3/4 in
Boring Diameter 2 in Annular Space Length
Time 845 Stickup

Held Casing Length 13.6
Cut DTW Top of Casing 7.18
DTW 7.18 Top of Casing Column of Water in Well 6.42

Gallons per foot of A.S. (from chart)	=	<u>0.1632</u>
Column of Water or length of A.S (whichever is less)	x	<u>6.42</u>
Volume of Annular Space	=	<u>1.048</u>
Gallons per foot of Casing	=	<u>0.023</u>
Column of Water	x	<u>6.42</u>
Volume of Casing	=	<u>0.1477</u>
Total Volume (Volume of A.S. + Volume of Casing)	=	<u>1.2</u>
Number of Volumes to be Excavated	x	<u>3.6</u> to <u>6.0</u>
Total Volume to be Excavated	=	<u>3.6</u> to <u>6.0</u>
Method of Purging (pump, bailer, etc.) <u>Bailer</u>		

	Start	Mid I	Mid II	Mid III	End
Time	<u>2010</u>	<u>2030</u>	<u>2055</u>		<u>2055</u>
PH	<u>7.08</u>	<u>7.21</u>	<u>7.25</u>		<u>7.25</u>
Conductivity	<u>6000</u>	<u>5900</u>	<u>5800</u>		<u>5800</u>
Temp. (°C)	<u>24.5</u>	<u>24.1</u>	<u>23.9</u>		<u>23.9</u>
Turbidity	<u>55</u>	<u>6.9</u>	<u>1.3</u>		<u>1.3</u>
Vol. Purged	<u>0</u>	<u>1.5</u>	<u>3</u>		<u>3</u>

Total Volume Purged 3 gallons
Sample Time/Date 2120 7/31/01 Sample Number MW-7

Recorded By: [Signature] Date: 8/17/01
Reviewed By: Date:



Ellis Environmental Group, LC

Well Sampling Data Form

Southern Division
Naval Facilities Engineering Command

Contract Number :
N62467-01-C-8826

Mayport Naval Station
Mayport, Florida
Site 245

Well No. MW-8
Page of
Date: 7/31/01
Day: Tuesday

Well Depth 13.6
Boring Diameter 2.10
Time 845

Well Casing Diameter 3/4 in
Annular Space Length
Stickup

Held
Cut
DTW 4.74 Top of Casing

Casing Length 13.6
DTW Top of Casing 4.74
Column of Water in Well 8.86

Gallons per foot of A.S. (from chart)
Column of Water or length of A.S. (whichever is less)
Volume of Annular Space
Gallons per foot of Casing
Column of Water
Volume of Casing
Total Volume (Volume of A.S. + Volume of Casing)
Number of Volumes to be Excavated
Total Volume to be Excavated
Method of Purging (pump, bailer, etc.) Bailer

= 0.1632
x 8.86
= 1.446
= 0.023
x 8.86
= 0.204
= 1.65
x 3 to 5
= 4.95 to 8.25

	Start	Mid	Mid	Mid	End
Time					
PH					
Conductivity					
Temp. (°C)					
Turbidity					
Vol. Purged					

Total Volume Purged gallons

Sample Time/Date Sample Number MW-8

Free product found upon bailing. No sample taken.

Recorded By: [Signature] Date: 8/17/01

Reviewed By: Date:

 Ellis Environmental Group, LC	Monitor Well Water Level Measurements	Southern Division Naval Facilities Engineering Command
	Contract Number : N62467-01-C-8826	Mayport Naval Station Mayport, Florida

Well	Date	Time	Held Length	Wet Length	Depth to Water	Comments
MW-1	8/11/01	800			4.36	Site 1388
MW-2	8/11/01	802			4.16	Site 1388
MW-3	8/11/01	804			3.87	Site 1388
MW-4	8/11/01	806			4.19	Site 1388
MW-5	8/11/01	808			3.22	Site 1388
MW-6	8/11/01	810			3.72	Site 1388
MW-1	8/11/01	825			6.24	Site 245
MW-2	8/11/01	826			4.85	Site 245
MW-3	8/11/01	827			4.63	Site 245
MW-4	8/11/01	828			4.82	Site 245
MW-5	8/11/01	829			4.23	Site 245
MW-6	8/11/01	830			3.68	Site 245
MW-7	8/11/01	831			7.17	Site 245
MW-8	8/11/01	832			4.72	Site 245

Recorded By: *[Signature]*

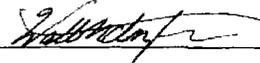
Date: 8/11/01

Reviewed By: _____
 Quality Control Representative

Date: _____

 Ellis Environmental Group, LC	Monitor Well Water Level Measurements	Southern Division Naval Facilities Engineering Command
	Contract Number : N62467-01-C-8826	Mayport Naval Station Mayport, Florida

Well	Date	Time	Head Length	Wet Length	Depth to Water	Comments
MW-1	8/11/01	1200			3.85	Site 1388
MW-2	8/11/01	1201			4.17	Site 1388
MW-3	8/11/01	1202			4.35	Site 1388
MW-4	8/11/01	1203			4.18	Site 1388
MW-5	8/11/01	1204			3.29	Site 1388
MW-6	8/11/01	1205			3.88	Site 1388
MW-1	8/11/01	1210			6.25	Site 245
MW-2	8/11/01	1211			4.87	Site 245
MW-3	8/11/01	1212			4.66	Site 245
MW-4	8/11/01	1214			4.84	Site 245
MW-5	8/11/01	1216			4.25	Site 245
MW-6	8/11/01	1218			3.68	Site 245
MW-7	8/11/01	1220			7.18	Site 245
MW-8	8/11/01	1220			NR	Free Product ^{Site} 245

Recorded By: 

Date: 8/17/01

Reviewed By: _____
 Quality Control Representative

Date: _____

 Ellis Environmental Group, LC	Monitor Well Water Level Measurements	Southern Division Naval Facilities Engineering Command
	Mayport Naval Station Mayport, Florida	Top of Well Casing _____ Ground Surface _____ Page _____ of _____ Date: <u>8/1/01</u> Day: <u>Wednesday</u>
Contract Number : N62467-01-C-8826		

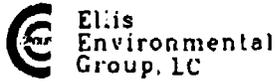
Well	Date	Time	Held Length	Wet Length	Depth to Water	Comments
MW-1	8/1/01	1600			3.85	Site 1388
MW-2	8/1/01	1601			4.17	Site 1388
MW-3	8/1/01	1602			4.35	Site 1388
MW-4	8/1/01	1603			4.18	Site 1388
MW-5	8/1/01	1604			3.32	Site 1388
MW-6	8/1/01	1605			3.88	Site 1388
MW-1	8/1/01	1615			6.25	Site 245
MW-2	8/1/01	1617			4.88	Site 245
MW-3	8/1/01	1620			4.66	Site 245
MW-4	8/1/01	1622			4.86	Site 245
MW-5	8/1/01	1624			4.22	Site 245
MW-6	8/1/01	1627			3.70	Site 245
MW-7	8/1/01	1630			7.18	Site 245
MW-8	8/1/01	1630			NR	Free Product Site 245

Recorded By: 

Date: 8/17/01

Reviewed By: _____
 Quality Control Representative

Date: _____



Soil Headspace Analysis Form

Southern Division
Naval Facilities Engineering
Command

Contract Number :
N62467-01-C-8826

Mayport Naval Station
Mayport, Florida

Page 1 of 3
Date: 3/5/02
Day: Tuesday

SS-1	3/5/02	0945	0-1	0	NC	0	Tan Sand
SS-1			1-2	0		0	As Above
SS-1			2-3	1		1	As Above
SS-1			3-4	0		0	Wet Sample
SS-2			0-1	0		0	Tan Sand
SS-2			1-2	0		0	As Above
SS-2			2-3	1		1	Tan Sand with Clay
SS-2			3-4	1		1	Wet Sample
SS-3			0-1	0		0	Tan Sand / Clay with Shells
SS-3			1-2	0		0	As Above
SS-3			2-3	0		0	Wet Sample
SS-3			3-4	NC		NC	Saturated Sample
SS-4			0-1	0		0	Very fine Brown Sand
SS-4			1-2	0		0	As Above
SS-4			2-3	1		1	As Above
SS-4	✓	✓	3-4	0	✓	0	Wet Sample

Recorded By: [Signature]

Date: 3/5/02

Reviewed By: _____
Quality Control Representative

Date: _____



Ellis
Environmental
Group, LC

Soil Headspace Analysis Form

Southern Division
Naval Facilities Engineering
Command

Contract Number :
N62467-01-C-8826

Mayport Naval Station
Mayport, Florida

Page 2 of 3

Date: 3/5/02

Day: Tuesday

Sample ID	Date	Time	Depth	Moisture	Temp	Pressure	Notes
SS-5	3/5/02	0945	0-1	0		NC	White to Brown Fine Sand
SS-5			1-2	0			As Above
SS-5			2-3	1			Damp White Sand
SS-5			3-4	1			Wet Brown + White Sand
SS-6			0-1	1			Brown + Tan Sand
SS-6			1-2	1			As Above
SS-6			2-3	1			Tan Sand
SS-6			3-4	1			Damp Brown Sand (Odor m/ble)
SS-7			0-1	0			Brown Sand
SS-7			1-2	1			White + Brown Sand w/ Shells
SS-7			2-3	1		↓	White + Tan Sand w/ Shells
SS-7			3-4	100		0	100 Wet Sampled ^(strong) odor
SS-8			0-1	0		NC	Very Fine Brown Sand
SS-8			1-2	0			As Above
SS-8			2-3	1			As Above
SS-8	↓	↓	3-4	NC		↓	Saturated Sample

Recorded By: [Signature]

Date: 3/5/02

Reviewed By: _____
Quality Control Representative

Date: _____



Ellis Environmental Group, LC

Soil Headspace Analysis Form

Southern Division
Naval Facilities Engineering
Command

Contract Number :
N62467-01-C-8826

Mayport Naval Station
Mayport, Florida

Page 3 of 3
Date: 3/5/02
Day: Tuesday

Sample ID	Date	Time	Depth	Moisture	Headspace	Gas	Notes
SS-9	3/5/02	1130	0-1	0	NC	0	Tan Sand w/ Shells
SS-9			1-2	0		0	As Above
SS-9			2-3	0	↓	0	As Above
SS-9			3-4	75	0	75	Fine Gray Sand
SS-10			0-1	0	NC	0	Tan Sand
SS-10			1-2	0		0	As Above
SS-10			2-3	1		1	As Above
SS-10			3-4	0		0	Brown Sand
SS-11			0-1	0		0	Tan + Brown Sand w/ Shells
SS-11			1-2	0		0	Tan Sand and Shell
SS-11			2-3	1		1	Damp Tan Sand
SS-11	↓	↓	3-4	NC	↓	NC	Seiwacked Sample

Recorded By: [Signature]

Date: 3/5/02

Reviewed By: _____
Quality Control Representative

Date: _____

APPENDIX C

Tidal and Rainfall Information

30 Sa 515am H 4.2 1109am L -0.3 552pm H 4.9 1158pm L 0.1

Mayport, Florida
Tide Predictions (High and Low Waters) July, 2001
NOAA, National Ocean Service

Daylight Saving Time

Day	Time	Ht.	Time	Ht.	Time	Ht.	Time	Ht.
1 Su	612am H	4.1	1201pm L	-0.3	646pm H	5.0		
2 M	1251am L	0.0	705am H	4.1	1249pm L	-0.3	736pm H	5.0
3 Tu	140am L	-0.1	754am H	4.0	135pm L	-0.3	822pm H	5.0
4 W	226am L	-0.1	840am H	4.0	219pm L	-0.3	906pm H	5.0
5 Th	310am L	-0.1	923am H	3.9	301pm L	-0.3	947pm H	4.9
6 F	351am L	-0.1	1003am H	3.9	341pm L	-0.1	1026pm H	4.8
7 Sa	430am L	0.0	1043am H	3.9	420pm L	0.0	1104pm H	4.7
8 Su	508am L	0.1	1121am H	3.9	458pm L	0.2	1141pm H	4.6
9 M	545am L	0.2	1200pm H	3.9	536pm L	0.5		
10 Tu	1217am H	4.5	621am L	0.4	1239pm H	4.0	616pm L	0.7
11 W	1254am H	4.4	657am L	0.5	119pm H	4.0	700pm L	0.9
12 Th	132am H	4.2	736am L	0.6	202pm H	4.1	751pm L	1.0
13 F	214am H	4.1	819am L	0.6	249pm H	4.2	848pm L	1.1
14 Sa	301am H	4.0	908am L	0.5	342pm H	4.4	950pm L	1.0
15 Su	355am H	3.9	1000am L	0.4	439pm H	4.5	1053pm L	0.8
16 M	455am H	3.9	1055am L	0.2	540pm H	4.7	1153pm L	0.5
17 Tu	558am H	3.9	1150am L	-0.1	640pm H	4.9		
18 W	1249am L	0.2	700am H	4.0	1245pm L	-0.4	738pm H	5.2
19 Th	143am L	-0.1	759am H	4.1	140pm L	-0.6	834pm H	5.4
20 F	236am L	-0.4	855am H	4.3	234pm L	-0.8	927pm H	5.5
21 Sa	328am L	-0.7	950am H	4.5	329pm L	-0.9	1020pm H	5.5
22 Su	420am L	-0.8	1044am H	4.6	425pm L	-0.8	1113pm H	5.5
23 M	512am L	-0.8	1138am H	4.7	522pm L	-0.6		
24 Tu	1205am H	5.3	604am L	-0.7	1233pm H	4.8	622pm L	-0.4
25 W	1258am H	5.1	658am L	-0.5	130pm H	4.9	725pm L	-0.1
26 Th	153am H	4.9	754am L	-0.3	228pm H	4.9	831pm L	0.2
27 F	250am H	4.6	851am L	-0.2	328pm H	4.9	936pm L	0.4
28 Sa	349am H	4.3	948am L	0.0	429pm H	4.9	1039pm L	0.5
29 Su	449am H	4.2	1044am L	0.1	529pm H	4.9	1138pm L	0.5
30 M	547am H	4.1	1138am L	0.1	625pm H	5.0		
31 Tu	1232am L	0.4	642am H	4.1	1229pm L	0.1	716pm H	5.0

Mayport, Florida
Tide Predictions (High and Low Waters) August, 2001
NOAA, National Ocean Service

Daylight Saving Time

Day	Time	Ht.	Time	Ht.	Time	Ht.	Time	Ht.
1 W	120am L	0.4	732am H	4.1	116pm L	0.1	802pm H	5.0
2 Th	205am L	0.3	817am H	4.1	200pm L	0.1	845pm H	5.0
3 F	247am L	0.2	859am H	4.1	241pm L	0.1	925pm H	5.0
4 Sa	326am L	0.2	939am H	4.2	320pm L	0.1	1002pm H	5.0
5 Su	402am L	0.2	1016am H	4.2	357pm L	0.2	1038pm H	4.9
6 M	435am L	0.2	1053am H	4.3	431pm L	0.4	1112pm H	4.8
7 Tu	507am L	0.3	1128am H	4.3	506pm L	0.5	1144pm H	4.7
8 W	538am L	0.4	1203pm H	4.4	543pm L	0.7		
9 Th	1217am H	4.6	611am L	0.5	1239pm H	4.4	624pm L	0.9
10 F	1252am H	4.5	647am L	0.6	118pm H	4.5	711pm L	1.1
11 Sa	131am H	4.3	730am L	0.7	204pm H	4.6	806pm L	1.2
12 Su	217am H	4.2	821am L	0.7	258pm H	4.7	911pm L	1.2
13 M	314am H	4.1	919am L	0.6	401pm H	4.8	1019pm L	1.1
14 Tu	419am H	4.1	1021am L	0.5	510pm H	5.0	1126pm L	0.8
15 W	530am H	4.1	1125am L	0.2	618pm H	5.2		
16 Th	1227am L	0.4	638am H	4.3	1226pm L	-0.1	720pm H	5.4
17 F	123am L	0.1	740am H	4.5	125pm L	-0.4	817pm H	5.6
18 Sa	216am L	-0.3	837am H	4.8	221pm L	-0.6	910pm H	5.8
19 Su	307am L	-0.6	932am H	5.0	317pm L	-0.7	1002pm H	5.8
20 M	357am L	-0.7	1025am H	5.2	412pm L	-0.7	1053pm H	5.7
21 Tu	447am L	-0.7	1117am H	5.4	507pm L	-0.5	1143pm H	5.5
22 W	537am L	-0.6	1210pm H	5.4	605pm L	-0.2		
23 Th	1234am H	5.3	629am L	-0.3	104pm H	5.4	704pm L	0.2
24 F	127am H	5.0	722am L	0.0	200pm H	5.3	807pm L	0.5
25 Sa	222am H	4.7	819am L	0.3	259pm H	5.2	911pm L	0.8
26 Su	320am H	4.5	918am L	0.5	401pm H	5.1	1015pm L	1.0
27 M	421am H	4.3	1017am L	0.7	502pm H	5.1	1114pm L	1.0
28 Tu	521am H	4.3	1115am L	0.7	559pm H	5.1		
29 W	1207am L	1.0	616am H	4.3	1208pm L	0.7	651pm H	5.1
30 Th	1256am L	0.9	706am H	4.4	1256pm L	0.6	738pm H	5.2

Preliminary Local Climatological Data (F6) for Jacksonville, FL

Please note: Hit page back button to return to climate page.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: JACKSONVILLE
 MONTH: JULY
 YEAR: 2001
 LATITUDE: 30 30 N
 LONGITUDE: 81 42 W

TEMPERATURE IN F:					:PCPN:			SNOW:			WIND			:SUNSHINE:			SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18		
=====																				
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR		
=====																				
1	90	72	81	0	0	16	T	0.0	0	4.6	22	150	M	82	1 3	26	150			
2	92	70	81	0	0	16	0.00	0.0	0	4.0	15	140	M	78	0	18	140			
3	91	71	81	0	0	16	0.00	0.0	0	5.3	15	120	M	89	0	20	110			
4	88	73	81	0	0	16	0.05	0.0	0	2.8	17	330	M	90	1 31	20	340			
5	94	72	83	2	0	18	0.03	0.0	0	5.6	14	190	M	89	1 13	16	180			
6	93	73	83	2	0	18	T	0.0	0	6.0	15	290	M	88	1	18	310			
7	94	72	83	2	0	18	0.00	0.0	0	4.8	15	90	M	88	2 3	17	80			
8	94	74	84	3	0	19	0.08	0.0	0	4.9	21	140	M	86	2 31	24	140			
9	95	75	85	4	0	20	0.00	0.0	0	6.7	14	300	M	81	0 1	20	270			
10	94	74	84	3	0	19	T	0.0	0	8.3	20	190	M	83	1 18	25	230			
11	95	73	84	3	0	19	T	0.0	0	8.3	23	230	M	80	2	28	230			
12	96	77	87	6	0	22	0.00	0.0	0	10.0	21	250	M	89	1 1	25	250			
13	95	74	85	3	0	20	2.17	0.0	0	8.9	23	330	M	81	5 183	30	330			
14	85	70	78	-4	0	13	0.15	0.0	0	8.4	21	70	M	95	4 18	24	70			
15	86	67	77	-5	0	12	0.00	0.0	0	6.4	18	90	M	91	1 18	24	80			
16	86	67	77	-5	0	12	0.00	0.0	0	8.1	21	80	M	91	4 8	25	80			
17	87	71	79	-3	0	14	T	0.0	0	8.1	20	60	M	91	2	23	80			
18	90	70	80	-2	0	15	0.52	0.0	0	4.0	17	150	M	76	4 13	20	150			
19	91	72	82	0	0	17	0.00	0.0	0	2.3	14	80	M	74	2 13	17	80			
20	92	71	82	0	0	17	1.39	0.0	0	4.0	22	10	M	72	2 13	26	30			
21	85	71	78	-4	0	13	0.01	0.0	0	6.6	18	80	M	86	6 1	22	80			
22	87	73	80	-2	0	15	0.34	0.0	0	7.0	21	40	M	83	3 1	23	40			
23	89	72	81	-1	0	16	0.13	0.0	0	7.5	26	200	M	84	4 13	33	200			
24	84	74	79	-3	0	14	0.01	0.0	0	9.2	25	240	M	90	3	30	220			
25	91	72	82	0	0	17	0.75	0.0	0	6.0	20	320	M	92	2 13	23	320			
26	91	73	82	0	0	17	0.20	0.0	0	4.0	20	210	M	82	1 138	22	210			
27	90	72	81	-1	0	16	1.12	0.0	0	4.1	32	190	M	80	2 31	46	190			
28	92	71	82	0	0	17	0.00	0.0	0	2.9	14	110	M	96	1	16	120			
29	93	72	83	1	0	18	0.00	0.0	0	3.8	13	290	M	95	1	16	280			
30	91	74	83	1	0	18	0.26	0.0	0	5.8	26	280	M	76	1 31	32	280			
31	87	72	80	-2	0	15	1.10	0.0	0	5.6	24	80	M	82	4 13	30	80			
=====																				
SM	2808	2234			0	513	8.31		0.0	184.0			M		66					
=====																				
AV	90.6	72.1								5.9	FASTST		PSBL	%	2	MAX(MPH)				
										MISC	---->	32	190			46	190			
=====																				

NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: JACKSONVILLE
 MONTH: JULY
 YEAR: 2001
 LATITUDE: 30 30 N
 LONGITUDE: 81 42 W

[TEMPERATURE DATA] [PRECIPITATION DATA] SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 81.3	TOTAL FOR MONTH: 8.31	1 = FOG
DPTR FM NORMAL: -0.6	DPTR FM NORMAL: 2.71	2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
HIGHEST: 96 ON 12	GRTST 24HR 2.32 ON 13-14	3 = THUNDER
LOWEST: 67 ON 15,16		4 = ICE PELLETS
	SNOW, ICE PELLETS, HAIL	5 = HAIL
	TOTAL MONTH: 0.0 INCH	6 = GLAZE OR RIME
	GRTST 24HR ON	7 = BLOWING DUST OR SAND: VSBY 1/2 MILE OR LESS
	GRTST DEPTH: 0 ON M	8 = SMOKE OR HAZE

[NO. OF DAYS WITH] [WEATHER - DAYS WITH]

MAX 32 OR BELOW: 0	0.01 INCH OR MORE: 16
MAX 90 OR ABOVE: 21	0.10 INCH OR MORE: 11
MIN 32 OR BELOW: 0	0.50 INCH OR MORE: 6
MIN 0 OR BELOW: 0	1.00 INCH OR MORE: 4

[HDD (BASE 65)]	
TOTAL THIS MO. 0	CLEAR (SCALE 0-3) 24
DPTR FM NORMAL 0	PTCLDY (SCALE 4-7) 7
SEASONAL TOTAL 0	CLOUDY (SCALE 8-10) 0
DPTR FM NORMAL 0	

[CDD (BASE 65)]		[PRESSURE DATA]
TOTAL THIS MO. 513		HIGHEST SLP M ON M
DPTR FM NORMAL -2		LOWEST SLP M ON M
SEASONAL TOTAL 1439		
DPTR FM NORMAL 47		

[REMARKS]

Preliminary Local Climatological Data (F6) for Jacksonville, FL

Please note: Hit page back button to return to climate page.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: JACKSONVILLE
 MONTH: AUGUST
 YEAR: 2001
 LATITUDE: 30 30 N
 LONGITUDE: 81 42 W

TEMPERATURE IN F:					:PCPN:			SNOW:			WIND			:SUNSHINE:			SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18		
=====																				
AVG MX 2MIN																				
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR		
=====																				
1	87	73	80	-2	0	15	0.60	0.0	0	5.8	18	50	M	72	6	13	22	50		
2	84	71	78	-4	0	13	0.05	0.0	0	6.4	17	110	M	94	5	1	20	110		
3	85	70	78	-4	0	13	0.01	0.0	0	6.8	20	90	M	76	3		25	100		
4	88	68	78	-4	0	13	0.00	0.0	0	4.4	14	80	M	81	3	12	15	150		
5	79	72	76	-6	0	11	1.15	0.0	0	3.3	18	190	M	60	5	13	21	190		
6	90	71	81	-1	0	16	0.15	0.0	0	4.3	29	250	M	56	1	3	33	240		
7	93	73	83	1	0	18		T 0.0	0	3.9	15	120	M	85	1		17	140		
8	93	72	83	1	0	18	0.00	0.0	0	5.5	10	270	M	93	1		15	320		
9	93	73	83	2	0	18	0.00	0.0	0	5.8	14	270	M	92	1		17	300		
10	94	73	84	3	0	19		T 0.0	0	6.3	28	280	M	87	2	38	38	280		
11	92	73	83	2	0	18		T 0.0	0	4.7	23	270	M	88	1	381	28	270		
12	92	72	82	1	0	17	0.01	0.0	0	3.7	16	140	M	90	2	3	21	150		
13	93	72	83	2	0	18		T 0.0	0	4.4	13	170	M	94	2	31	15	170		
14	92	73	83	2	0	18	0.01	0.0	0	6.1	20	260	M	96	2	3	23	270		
15	87	74	81	0	0	16	0.17	0.0	0	4.9	16	100	M	91	4	13	18	100		
16	92	73	83	2	0	18	0.00	0.0	0	3.5	13	80	M	89	2	1	16	80		
17	94	75	85	4	0	20	0.00	0.0	0	4.5	21	200	M	88	2	1	25	200		
18	94	72	83	2	0	18	1.02	0.0	0	7.5	25	190	M	92	3	31	31	190		
19	91	72	82	1	0	17	0.02	0.0	0	5.2	15	270	M	88	2		17	300		
20	92	74	83	2	0	18	0.00	0.0	0	4.4	15	260	M	93	0	1	20	280		
21	93	72	83	2	0	18	0.00	0.0	0	4.4	16	90	M	93	2		18	80		
22	89	73	81	0	0	16	0.00	0.0	0	6.3	18	90	M	92	2	18	22	90		
23	88	70	79	-2	0	14	0.00	0.0	0	4.5	16	100	M	93	1	1	18	100		
24	91	66	79	-2	0	14	0.00	0.0	0	2.8	12	310	M	91	0	1	15	320		
25	89	72	81	0	0	16	0.00	0.0	0	5.5	16	90	M	99	2	18	20	80		
26	89	69	79	-2	0	14	0.00	0.0	0	4.6	16	80	M	99	1	18	20	90		
27	92	69	81	0	0	16	0.00	0.0	0	4.3	12	150	M	94	0	18	14	150		
28	93	73	83	2	0	18	0.04	0.0	0	3.7	14	220	M	95	2	13	16	200		
29	93	71	82	1	0	17	0.00	0.0	0	2.9	14	130	M	95	1	18	17	110		
30	92	71	82	2	0	17	0.03	0.0	0	2.6	13	210	M	88	1	13	15	200		
31	93	71	82	2	0	17	0.32	0.0	0	4.9	24	190	M	85	3	31	28	200		
=====																				
SM	2807	2223			0	509	3.58		0.0	147.9			M		60					
=====																				
AV	90.5	71.7								4.8	FASTST		PSBL	%	2		MAX(MPH)			
											MISC	---->	29	250			38	280		
=====																				

NOTES:
 # LAST OF SEVERAL OCCURRENCES
 COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: JACKSONVILLE
 MONTH: AUGUST
 YEAR: 2001
 LATITUDE: 30 30 N
 LONGITUDE: 81 42 W

[TEMPERATURE DATA] [PRECIPITATION DATA] SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 81.1	TOTAL FOR MONTH: 3.58	1 = FOG
DPTR FM NORMAL: -0.2	DPTR FM NORMAL: -4.35	2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
HIGHEST: 94 ON 10,17	GRTST 24HR 1.16 ON 31- 1	3 = THUNDER
LOWEST: 66 ON 24		4 = ICE PELLETS
	SNOW, ICE PELLETS, HAIL	5 = HAIL
	TOTAL MONTH: 0.0 INCH	6 = GLAZE OR RIME
	GRTST 24HR ON	7 = BLOWING DUST OR SAND: VSBY 1/2 MILE OR LESS
	GRTST DEPTH: 0 ON M	8 = SMOKE OR HAZE

[NO. OF DAYS WITH]	[WEATHER - DAYS WITH]
MAX 32 OR BELOW: 0	0.01 INCH OR MORE: 13
MAX 90 OR ABOVE: 21	0.10 INCH OR MORE: 6
MIN 32 OR BELOW: 0	0.50 INCH OR MORE: 3
MIN 0 OR BELOW: 0	1.00 INCH OR MORE: 2

[HDD (BASE 65)]	
TOTAL THIS MO. 0	CLEAR (SCALE 0-3) 27
DPTR FM NORMAL 0	PTCLDY (SCALE 4-7) 4
SEASONAL TOTAL 0	CLOUDY (SCALE 8-10) 0
DPTR FM NORMAL 0	

[CDD (BASE 65)]		[PRESSURE DATA]
TOTAL THIS MO. 509		HIGHEST SLP M ON M
DPTR FM NORMAL 7		LOWEST SLP M ON M
SEASONAL TOTAL 1948		
DPTR FM NORMAL 54		

[REMARKS]

APPENDIX D

Analytical Results



MR. MIKE BOLLINGER
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GAINESVILLE, FL 32669

ANALYTICAL REPORT

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Submission Number: 203000144 Client's P.O. Number:
Date Received: 03/05/02 Project Number: 53908-113
Date Reported: 03/26/02 Project Name: MAYPORT BLDG. 245 #13 & 8
Elab Report Name: Finalnew->Final2.RP1

Lab Sample Number: 0203144 5 Date Sampled: 03/05/02
Client Sample Number: SS-9-3-4 Sample Matrix: SOLID
Sample Description: SOIL

Method	Analyte	Result	Q	Units	Reporting		Date Analyzed	Prepared
					Limit	Analyst		
<u>PETROLEUM RESIDUAL ORGANICS</u>								
FL-PRO	PETROLEUM RESIDUAL ORGANICS	31000		mg/kg	0.10	MBM 03	03/14/02	03/08/02
<u>POLYNUCLEAR AROMATIC HYDROCARBONS</u>								
8310	ACENAPHTHENE	3900		ug/kg	3500	LB	03/11/02	03/08/02
8310	ACENAPHTHYLENE	3700		ug/kg	170	LB	03/11/02	03/08/02
8310	ANTHRACENE	170	U	ug/kg	170	LB	03/11/02	03/08/02
8310	BENZO (A) ANTHRACENE	6000		ug/kg	690	LB	03/11/02	03/08/02
8310	BENZO (A) PYRENE	170	U	ug/kg	170	LB	03/11/02	03/08/02
8310	BENZO (B) FLUORANTHENE	170	U	ug/kg	170	LB	03/11/02	03/08/02
8310	BENZO (G, H, I) PERYLENE	170	U	ug/kg	170	LB	03/11/02	03/08/02
8310	BENZO (K) FLUORANTHENE	170	U	ug/kg	170	LB	03/11/02	03/08/02
8310	CHRYSENE	690	U	ug/kg	690	LB	03/11/02	03/08/02
8310	DIBENZO (A, H) ANTHRACENE	170	U	ug/kg	170	LB	03/11/02	03/08/02
8310	FLUORANTHENE	45000		ug/kg	690	LB	03/11/02	03/08/02
8310	FLUORENE	6300		ug/kg	170	LB	03/11/02	03/08/02
8310	INDENO (1, 2, 3-CD) PYRENE	170	U	ug/kg	170	LB	03/11/02	03/08/02
8310	1-METHYLNAPHTHALENE	35000		ug/kg	170	LB	03/11/02	03/08/02
8310	2-METHYLNAPHTHALENE	88000		ug/kg	340	LB	03/11/02	03/08/02
8310	NAPHTHALENE	16000		ug/kg	170	LB	03/11/02	03/08/02
8310	PHENANTHRENE	13000		ug/kg	340	LB	03/11/02	03/08/02
8310	PYRENE	3900		ug/kg	170	LB	03/11/02	03/08/02
<u>GC/MS VOLATILES (8010-8020 LIST)</u>								
8260	BROMODICHLOROMETHANE	100	U	ug/kg	100	LGO	03/12/02	
8260	BROMOFORM	100	U	ug/kg	100	LGO	03/12/02	
8260	BROMOMETHANE	100	U	ug/kg	100	LGO	03/12/02	
8260	CARBON TETRACHLORIDE	100	U	ug/kg	100	LGO	03/12/02	
8260	CHLOROENZENE	100	U	ug/kg	100	LGO	03/12/02	
8260	CHLOROETHANE	100	U	ug/kg	100	LGO	03/12/02	
8260	CHLOROFORM	100	U	ug/kg	100	LGO	03/12/02	
8260	2-CHLOROETHYL VINYL ETHER	100	U	ug/kg	100	LGO	03/12/02	
8260	CHLOROMETHANE	100	U	ug/kg	100	LGO	03/12/02	
8260	DIBROMOCHLOROMETHANE	100	U	ug/kg	100	LGO	03/12/02	

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ANALYTICAL REPORT

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Submission Number: 203000144 Client's P.O. Number:
 Date Received: 03/05/02 Project Number: 53908-113
 Date Reported: 03/26/02 Project Name: MAYPORT BLDG. 245 413 & 8
 Elab Report Name: Finalnew->Final2.RP1

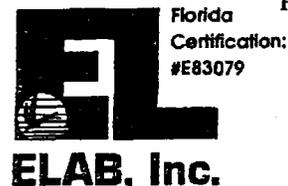
Lab Sample Number: 0203144 5 Date Sampled: 03/05/02
 Client Sample Number: SS-9-3-4 Sample Matrix: SOLID
 Sample Description: SOIL

Method	Analyte	Result	Q	Units	Reporting Limit	Analyst	Date Analyzed	Prepared
<u>GC/MS VOLATILES (8010-8020 LIST)</u>								
8260	1,2-DICHLOROBENZENE	100	U	ug/kg	100	LGO	03/12/02	
8260	1,3-DICHLOROBENZENE	100	U	ug/kg	100	LGO	03/12/02	
8260	1,4-DICHLOROBENZENE	100	U	ug/kg	100	LGO	03/12/02	
8260	DICHLORODIFLUOROMETHANE	100	U	ug/kg	100	LGO	03/12/02	
8260	1,1-DICHLOROETHANE	100	U	ug/kg	100	LGO	03/12/02	
8260	1,2-DICHLOROETHANE	100	U	ug/kg	100	LGO	03/12/02	
8260	1,1-DICHLOROETHENE	100	U	ug/kg	100	LGO	03/12/02	
8260	trans-1,2-DICHLOROETHENE	100	U	ug/kg	100	LGO	03/12/02	
8260	1,2-DICHLOROPROPANE	100	U	ug/kg	100	LGO	03/12/02	
8260	trans-1,3-DICHLOROPROPENE	100	U	ug/kg	100	LGO	03/12/02	
8260	METHYLENE CHLORIDE	100	U	ug/kg	100	LGO	03/12/02	
8260	1,1,2,2-TETRACHLOROETHANE	100	U	ug/kg	100	LGO	03/12/02	
8260	TETRACHLOROETHENE	100	U	ug/kg	100	LGO	03/12/02	
8260	1,1,1-TRICHLOROETHANE	100	U	ug/kg	100	LGO	03/12/02	
8260	1,1,2-TRICHLOROETHANE	100	U	ug/kg	100	LGO	03/12/02	
8260	TRICHLOROETHENE	100	U	ug/kg	100	LGO	03/12/02	
8260	TRICHLOROFLUOROMETHANE	100	U	ug/kg	100	LGO	03/12/02	
8260	VINYL CHLORIDE	100	U	ug/kg	100	LGO	03/12/02	
8260	BENZENE	100	U	ug/kg	100	LGO	03/12/02	
8260	ETHYLBENZENE	270		ug/kg	100	LGO	03/12/02	
8260	METHYL TERT-BUTYL ETHER	100	U	ug/kg	100	LGO	03/12/02	
8260	TOLUENE	100	U	ug/kg	100	LGO	03/12/02	
8260	o-XYLENE	100	U	ug/kg	100	LGO	03/12/02	
8260	m&p-XYLENES	100	U	ug/kg	100	LGO	03/12/02	

Data Qualifier Code Key:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

MR. MIKE BOLLINGER
 ELLIS ENVIRONMENTAL GROUP
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 GAINESVILLE, FL 32669



ANALYTICAL REPORT

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Submission Number: 203000144 Client's P.O. Number:
 Date Received: 03/05/02 Project Number: 53908-113
 Date Reported: 03/26/02 Project Name: MAYPORT BLDG. 245 & 13 & 8
 Elab Report Name: Finalnew->Final2.RP1

Lab Sample Number: 0203144 6 Date Sampled: 03/05/02
 Client Sample Number: SS-10-2-3 Sample Matrix: SOLID
 Sample Description: SOIL

Method	Analyte	Result	Q	Units	Reporting Limit	Analyst	Date Analyzed	Prepared
SM2540G	PERCENT SOLID	93.2		%	0.0	MMA	03/18/02	
	<u>PETROLEUM RESIDUAL ORGANICS</u>							
FL-PRO	PETROLEUM RESIDUAL ORGANICS	0.10	U	mg/kg	0.10	MBM	03/14/02	03/08/02
	<u>POLYNUCLEAR AROMATIC HYDROCARBONS</u>							
8310	ACENAPHTHENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	ACENAPHTHYLENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	ANTHRACENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (A) ANTHRACENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (A) PYRENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (B) FLUORANTHENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (G, H, I) PERYLENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (K) FLUORANTHENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	CHRYSENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	DIBENZO (A, H) ANTHRACENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	FLUORANTHENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	FLUORENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	INDENO (1, 2, 3-CD) PYRENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	1-METHYLNAPHTHALENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	2-METHYLNAPHTHALENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	NAPHTHALENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	PHENANTHRENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	PYRENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
	<u>GC/MS VOLATILES (8010-8020 LIST)</u>							
8260	BROMODICHLOROMETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	BROMOFORM	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	BROMOMETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	CARBON TETRACHLORIDE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	CHLOROBENZENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	CHLOROETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	CHLOROFORM	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	2-CHLOROETHYL VINYL ETHER	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	CHLOROMETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	



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ANALYTICAL REPORT

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Submission Number: 203000144 Client's P.O. Number:
 Date Received: 03/05/02 Project Number: 53908-113
 Date Reported: 03/26/02 Project Name: MAYPORT BLDG. 245 #13 & 8
 Elab Report Name: Finalnew->Final2.RP1

Lab Sample Number: 0203144 6 Date Sampled: 03/05/02
 Client Sample Number: SS-10-2-3 Sample Matrix: SOLID
 Sample Description: SOIL

Method	Analyte	Result	Q	Units	Reporting Limit	Analyst	Date Analyzed	Prepared
<u>GC/MS VOLATILES (8010-8020 LIST)</u>								
8260	DIBROMOCHLOROMETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,2-DICHLOROBENZENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,3-DICHLOROBENZENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,4-DICHLOROBENZENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	DICHLORODIFLUOROMETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,1-DICHLOROETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,2-DICHLOROETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,1-DICHLOROETHENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	trans-1,2-DICHLOROETHENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,2-DICHLOROPROPANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	trans-1,3-DICHLOROPROPENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	METHYLENE CHLORIDE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,1,2,2-TETRACHLOROETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	TETRACHLOROETHENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,1,1-TRICHLOROETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,1,2-TRICHLOROETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	TRICHLOROETHENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	TRICHLOROFLUOROMETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	VINYL CHLORIDE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	BENZENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	ETHYLBENZENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	METHYL TERT-BUTYL ETHER	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	TOLUENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	o-XYLENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	m&p-XYLENES	5.0	U	ug/kg	5.0	LGO	03/11/02	

Data Qualifier Code Key:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.



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ANALYTICAL REPORT

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Submission Number: 203000144 Client's P.O. Number:
 Date Received: 03/05/02 Project Number: 53908-113
 Date Reported: 03/26/02 Project Name: MAYPORT BLDG. 245 #13 & 8
 Elab Report Name: Finalnew->Final2.RP1

Lab Sample Number: 0203144 7 Date Sampled: 03/05/02
 Client Sample Number: SS-7-2-3 Sample Matrix: SOLID
 Sample Description: SOIL

Method	Analyte	Result	Q	Units	Reporting Limit	Analyst	Date Analyzed	Prepared
SM2S40G	PERCENT SOLID	95.0		%	0.0	MMA	03/18/02	
	<u>PETROLEUM RESIDUAL ORGANICS</u>							
FL-PRO	PETROLEUM RESIDUAL ORGANICS	0.10	U	mg/kg	0.10	MBM	03/14/02	03/08/02
	<u>POLYNUCLEAR AROMATIC HYDROCARBONS</u>							
8310	ACENAPHTHENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	ACENAPHTHYLENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	ANTHRACENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (A) ANTHRACENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (A) PYRENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (B) FLUORANTHENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (G, H, I) PERYLENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (K) FLUORANTHENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	CHRYSENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	DIBENZO (A, H) ANTHRACENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	FLUORANTHENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	FLUORENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	INDENO (1, 2, 3-CD) PYRENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	1-METHYLNAPHTHALENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	2-METHYLNAPHTHALENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	NAPHTHALENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	PHENANTHRENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	PYRENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
	<u>GC/MS VOLATILES (8010-8020 LIST)</u>							
8260	BROMODICHLOROMETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	BROMOFORM	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	BROMOMETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	CARBON TETRACHLORIDE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	CHLOROBENZENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	CHLOROETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	CHLOROFORM	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	2-CHLOROETHYL VINYL ETHER	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	CHLOROMETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	

MR. MIKE BOLLINGER
ELLIS ENVIRONMENTAL GROUP
304 SW 140TH TERRACE
GAINESVILLE, FL 32669



ANALYTICAL REPORT

Submission Number: 203000144 Client's P.O. Number:
Date Received: 03/05/02 Project Number: 53908-113
Date Reported: 03/26/02 Project Name: MAYPORT BLDG. 245 #13 & 8
Elab Report Name: Finalnew->Final2.RP1

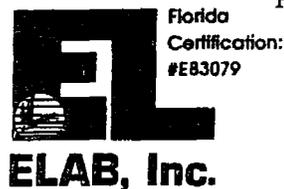
Lab Sample Number: 0203144 7 Date Sampled: 03/05/02
Client Sample Number: SS-7-2-3 Sample Matrix: SOLID
Sample Description: SOIL

Method	Analyte	Result	Q	Units	Reporting Limit	Analyst	Date Analyzed	Prepared
<u>GC/MS VOLATILES (8010-8020 LIST)</u>								
8260	DIBROMOCHLOROMETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,2-DICHLOROBENZENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,3-DICHLOROBENZENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,4-DICHLOROBENZENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	DICHLORODIFLUOROMETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,1-DICHLOROETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,2-DICHLOROETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,1-DICHLOROETHENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	trans-1,2-DICHLOROETHENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,2-DICHLOROPROPANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	trans-1,3-DICHLOROPROPENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	METHYLENE CHLORIDE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,1,2,2-TETRACHLOROETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	TETRACHLOROETHENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,1,1-TRICHLOROETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	1,1,2-TRICHLOROETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	TRICHLOROETHENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	TRICHLOROFLUOROMETHANE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	VINYL CHLORIDE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	BENZENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	ETHYLBENZENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	METHYL TERT-BUTYL ETHER	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	TOLUENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	o-XYLENE	5.0	U	ug/kg	5.0	LGO	03/11/02	
8260	m&p-XYLENES	5.0	U	ug/kg	5.0	LGO	03/11/02	

Data Qualifier Code Key:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

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ANALYTICAL REPORT

Submission Number: 203000144 Client's P.O. Number:
 Date Received: 03/05/02 Project Number: 53908-113
 Date Reported: 03/26/02 Project Name: MAYPORT BLDG. 245 #13 & 8
 Elab Report Name: Finalnew->Final2.RP1

Lab Sample Number: 0203144 8 Date Sampled: 03/05/02
 Client Sample Number: DUP Sample Matrix: SOLID
 Sample Description: SOIL

Method	Analyte	Result	Q	Units	Reporting Limit	Analyst	Date Analyzed	Prepared
SM2540G	PERCENT SOLID	93.1		%	0.0	MMA	03/18/02	
	<u>PETROLEUM RESIDUAL ORGANICS</u>							
FL-PRO	PETROLEUM RESIDUAL ORGANICS	0.10	U	mg/kg	0.10	MBM	03/14/02	03/08/02
	<u>POLYNUCLEAR AROMATIC HYDROCARBONS</u>							
8310	ACENAPHTHENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	ACENAPHTHYLENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	ANTHRACENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (A) ANTHRACENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (A) PYRENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (B) FLUORANTHENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (G, H, I) PERYLENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	BENZO (K) FLUORANTHENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	CHRYSENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	DIBENZO (A, H) ANTHRACENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	FLUORANTHENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	FLUORENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	INDENO (1, 2, 3-CD) PYRENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	1-METHYLNAPHTHALENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	2-METHYLNAPHTHALENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	NAPHTHALENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	PHENANTHRENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
8310	PYRENE	35	U	ug/kg	35	LB	03/11/02	03/08/02
	<u>GC/MS VOLATILES (8010-8020 LIST)</u>							
8260	BROMODICHLOROMETHANE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	BROMOFORM	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	BROMOMETHANE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	CARBON TETRACHLORIDE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	CHLOROBENZENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	CHLOROETHANE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	CHLOROFORM	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	2-CHLOROETHYL VINYL ETHER	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	CHLOROMETHANE	5.4	U	ug/kg	5.4	LGO	03/12/02	

MR. MIKE BOLLINGER
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ANALYTICAL REPORT

Submission Number: 203000144 Client's P.O. Number:
 Date Received: 03/05/02 Project Number: 53908-113
 Date Reported: 03/26/02 Project Name: MAYPORT BLDG. 245 & 13 & 8
 Elab Report Name: Finalnew->Final2.RP1

Lab Sample Number: 0203144 8 Date Sampled: 03/05/02
 Client Sample Number: DUP Sample Matrix: SOLID
 Sample Description: SOIL

Method	Analyte	Result	Q	Units	Reporting Limit	Analyst	Date Analyzed	Prepared
<u>GC/MS VOLATILES (8010-8020 LIST)</u>								
8260	DIBROMOCHLOROMETHANE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	1,2-DICHLOROENZENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	1,3-DICHLOROENZENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	1,4-DICHLOROENZENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	DICHLORODIFLUOROMETHANE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	1,1-DICHLOROETHANE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	1,2-DICHLOROETHANE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	1,1-DICHLOROETHENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	trans-1,2-DICHLOROETHENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	1,2-DICHLOROPROPANE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	trans-1,3-DICHLOROPROPENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	METHYLENE CHLORIDE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	1,1,2,2-TETRACHLOROETHANE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	TETRACHLOROETHENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	1,1,1-TRICHLOROETHANE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	1,1,2-TRICHLOROETHANE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	TRICHLOROETHENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	TRICHLOROFUOROMETHANE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	VINYL CHLORIDE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	BENZENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	ETHYLBENZENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	METHYL TERT-BUTYL ETHER	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	TOLUENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	o-XYLENE	5.4	U	ug/kg	5.4	LGO	03/12/02	
8260	m&p-XYLENES	5.4	U	ug/kg	5.4	LGO	03/12/02	

Data Qualifier Code Key:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

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 GAINESVILLE, FL 32669



ANALYTICAL REPORT

Page 23

Submission Number: 203000144 Client's P.O. Number:
 Date Received: 03/05/02 Project Number: 53908-113
 Date Reported: 03/26/02 Project Name: MAYPORT BLDG. 245 & 13 & 8
 Elab Report Name: Finalnew->Final2.RP1

Lab Sample Number: 0203144 9 Date Sampled: 03/05/02
 Client Sample Number: TRIP BLANK Sample Matrix: GROUND WATER
 Sample Description: TRIP BLANK

Method	Analyte	Result	Q	Units	Reporting	Date	
					Limit	Analyst	Analyzed

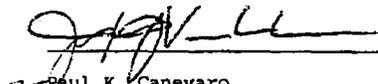
GC VOLATILE ORGANICS (FULL LIST)

Data Qualifier Code Key:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

CERTIFICATION: All analytical data reported above were obtained using the specified methods and were validated by our laboratory quality control system. This laboratory follows an approved quality assurance program.

Respectfully submitted:


 Paul K. Canevaro
 Laboratory Director

Soil Matrix Spike/Matrix Spike Duplicate Recovery

EPA Method 8260B



Batch ID SVGA02031101
Sample ID LFB

Analysis Date: 03/11/02

Compound <i>Laboratory Recovery Limit</i>	Conc. Spike Added (µg/kg)	Sample	Conc. LFB (µg/kg)	%REC
1,1-Dichloroethene 46 - 148	40.0	ND	40.80	102
Trichloroethene 67 - 145	40.0	ND	40.46	101
Chlorobenzene 49 - 149	40.0	ND	38.28	95.7
Toluene 31 - 163	40.0	ND	38.60	96.5
Benzene 52 - 142	40.0	ND	40.82	102

Volatiles: 0 out of 5 ;outside QC limits

Sample ID 02-03-181-1+40ug/kg MS 5035/8260 4.39g

Analysis Date: 03/11/02

Compound <i>Laboratory Recovery Limit</i>	Conc. Spike Added (µg/kg)	Sample	Conc. MS (µg/kg)	%REC	Conc. MSD (µg/kg)	%REC	RPD
1,1-Dichloroethene 24 - 162	40.0	ND	41.80	105	36.81	92.0	12.70
Trichloroethene 42 - 162	40.0	ND	41.08	103	34.50	86.3	17.41
Chlorobenzene 48 - 126	40.0	ND	37.17	92.9	30.50	76.3	19.71
Toluene 14 - 206	40.0	ND	39.45	98.6	32.76	81.9	18.53
Benzene 60 - 138	40.0	ND	41.16	103	35.53	88.8	14.68

Volatiles: 0 out of 15 ;outside QC limits

Comments: _____

V:\Public\Volatile\8260sms.xls

Soil Matrix Spike/Matrix Spike Duplicate Recovery

EPA Method 8260B



Batch ID SVGA02031201
Sample ID LFB

Analysis Date: 03/12/02

Compound <i>Laboratory Recovery Limit</i>	Conc. Spike Added (µg/kg)	Sample	Conc. LFB (µg/kg)	%REC
1,1-Dichloroethene 46 - 148	40.0	ND	41.14	103
Trichloroethene 67 - 145	40.0	ND	39.88	100
Chlorobenzene 49 - 149	40.0	ND	38.16	95.4
Toluene 31 - 163	40.0	ND	38.24	95.6
Benzene 52 - 142	40.0	ND	40.34	101

Volatiles: 0 out of 5; outside QC limits

Sample ID 02-03-276-2+40ug/kg MS 8260 4.60g

Analysis Date: 03/12/02

Compound <i>Laboratory Recovery Limit</i>	Conc. Spike Added (µg/kg)	Sample	Conc. MS (µg/kg)	%REC	Conc. MSD (µg/kg)	%REC	RPD
1,1-Dichloroethene 24 - 162	40.0	ND	38.41	96.0	32.74	81.9	15.94
Trichloroethene 42 - 162	40.0	ND	36.24	90.6	29.69	74.2	19.87
Chlorobenzene 48 - 126	40.0	ND	34.63	86.6	27.16	67.9	24.18
Toluene 14 - 206	40.0	ND	35.95	89.9	28.72	71.8	22.36
Benzene 60 - 138	40.0	ND	37.46	93.7	31.85	79.6	16.19

Volatiles: 0 out of 15; outside QC limits

Comments: _____

V:\Public\Volatile\8260sms.xls

CLIENT: Ellis Environmental Group
 Work Order: F0203144
 Project: Mayport bldg. 245 + 1388/53908-113

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015M-FLPRO_S

Sample ID: F0203181-001AMS	SampType: MS	TestCode: 8015M-FLPR	Units: mg/Kg-dry	Prep Date: 3/8/02	Run ID: SVGCFID-E_020314B
Client ID: ZZZZZ	Batch ID: 1129	TestNo: FLPRO		Analysis Date: 3/14/02	SeqNo: 21529

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Petroleum Range Organics	167.5	5.2	207.5	0	0	51	115	0	0		
Surr: C-39	2.631	0	6.226	0	42.3	12	126	0	0		
Surr: p-Terphenyl-d14	1.536	0	2.075	0	74	54	121	0	0		

Sample ID: F0203181-001AMSD	SampType: MSD	TestCode: 8015M-FLPR	Units: mg/Kg-dry	Prep Date: 3/8/02	Run ID: SVGCFID-E_020314B
Client ID: ZZZZZ	Batch ID: 1129	TestNo: FLPRO		Analysis Date: 3/14/02	SeqNo: 21530

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Petroleum Range Organics	166.1	5.2	208.4	0	0	51	115	0	0	20	
Surr: C-39	1.976	0	6.253	0	31.6	12	126	0	0	0	
Surr: p-Terphenyl-d14	1.517	0	2.084	0	72.8	54	121	0	0	0	

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CLIENT: Ellis Environmental Group
Work Order: F0203144
Project: Mayport bldg. 245 + 1388/53908-113

ANALYTICAL QC SUMMARY REPORT

TestCode: PMOIST

Sample ID: F0203144-005BDUP		SampType: DUP		TestCode: PMOIST		Units: wt%		Prep Date:		Run ID: WC_020318F		
Client ID: 559-3-4		Batch ID: R1544		TestNo: D2216				Analysis Date: 3/18/02		SeqNo: 22710		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Percent Moisture	4.47	0	0	0	0	0	0	4.32	3.41	0		

Sample ID: F0203521-001ADUP		SampType: DUP		TestCode: PMOIST		Units: wt%		Prep Date:		Run ID: WC_020318F		
Client ID: ZZZZZ		Batch ID: R1544		TestNo: D2216				Analysis Date: 3/18/02		SeqNo: 22721		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Percent Moisture	87.16	0	0	0	0	0	0	87.21	0.0573	0		

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

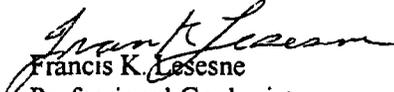
APPENDIX E

Certification

May 13, 2002

This document, "Site Assessment Report Addendum, Underground Storage Tank Site 245, U.S. Naval Station, Mayport, Florida," has been prepared under the direction of a Florida registered professional geologist. The work and professional opinions rendered in this report were conducted or developed in accordance with commonly accepted protocols and procedures. If conditions are discovered or determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of any additional information on the findings and recommendations in this document. This document was prepared to provide information for the assessment of petroleum hydrocarbons related to released from an abandoned underground storage tank at Underground Storage Tank Site 245, located at U.S. Naval Station Mayport, Florida, and should not be construed to apply for any other purpose or site.

Harding ESE, Inc., A MACTEC Company
2533 Greer Road, Suite 6
Tallahassee, Florida 32308


Francis K. Lesesne
Professional Geologist
State of Florida License No. 1020

