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FINAL WORK PLAN FOR SITE ASSESSMENT REPORT UNDERGROUND STORAGE TANK SITES 245, 1343 AND 1388 NS MAYPORT FL

7/1/2001

ELLIS ENVIRONMENTAL GROUP, LC

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FINAL

Work Plan

for

Site Assessment
Underground Storage Tank Sites
245, 1343, and 1383

Prepared for
NAVAL FACILITIES ENGINEERING COMMAND
Southern Division

Prepared by
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Contents

1.0 Introduction

Ellis Environmental Group (EEG) has been contracted (Contract No. N624667-01-C-8826) by the Southern Division Naval Facilities Engineering Command (South Div) to provide environmental services at Naval Station Mayport. The environmental services described in this work plan will be conducted at three former underground storage tank sites (USTs) located at Naval Station Mayport, Mayport, Florida. The three sites are Site 245, Site 1343, and Site 1388.

1.1 Location and Site Description

The following section provides a brief description of each site. Figure 1-1 presents the location of each site at Naval Station Mayport.

1.1.1 Site 245

The subject site is located at the Mayport Naval Station in Mayport, Florida. A 2,000-gallon underground storage tank (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 eight (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.

1.1.2 Site 1343

The subject site is located at the Mayport Naval Station in Mayport, Florida. A 10,000-gallon UST that had contained fuel oil was closed in place in June of 1995.

The UST is located adjacent to Building 1343. A fenced security area to the northeast contains electrical transformers and a replacement above ground fuel tank. Two above ground storage tanks, situated on a concrete pad, are located immediately north of the site, also within a fenced area. The ground surface at the immediate area of the UST is not covered and is relatively flat with poor surface water drainage. Surface water drainage outside of the area is toward surface drainage ditches to the southeast.

1.1.3 Site 1388

The subject site is located at the Mayport Naval Station in Mayport, Florida. A 1,000-gallon UST was located within an uncovered grassed area west of Building 1355. The UST supplied Building 1388 which was approximately 120 feet north of the UST.

The ground surface in the immediate area of the UST is grassed and uncovered. An asphalt sidewalk is adjacent to the UST location. Concrete covers the ground surface west of the UST. Surface water generally drains to the northwest across the site.

An above ground storage tank (AST) is approximately eight feet to the northwest of the excavated UST. The AST is on a concrete pad. Electrical lines and product piping for the AST are buried from the AST to a location north of Building 1388.

1.2 Site History

1.2.1 Site 245

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 BTEX and PAH. A headspace analysis of soils from the pit detected elevated petroleum concentrations. Contamination was encountered along the north excavation wall, at depths of three and six feet. Contaminated soils were measured on the south, east, and west side walls, at depths of about six feet. No over excavation of contaminated soils was conducted.

A replacement UST was installed at a location approximately twenty 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 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 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, bls.
- Groundwater was encountered at depths of approximately 3.5 to 6.0 feet 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 OVA-FID headspace concentration of 68 ppm was encountered in one soil sample collected from the one to three foot depth range. The sample was taken at a location near the former UST location. 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 4.0 to 6.0 feet bls indicated FL-PRO concentrations above the regulatory limit of 2500 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 three permanent monitoring wells installed at the site indicated one well, MW-1, contained detectable PAH constituents. PAH concentrations were below the regulatory limits. BTEX was not detected.
- Lead concentrations were above the regulatory limit at well 1343-MW-1. The elevated concentrations may be a result of the sampling method employed.
- Free petroleum product was not measurable on June 13, 1997 during groundwater sample collection. Approximately 3/8 inch of product was measured in 1343-MW-1 on August 8, 1997.

A CAR dated February 2, 1998 was submitted to the Florida Department of Environmental Protection (FDEP). The FDEP subsequently requested additional sampling activities in a letter dated June 4, 1998.

BHATE conducted an additional investigation and prepared a CAR Addendum (CARA) dated June 25, 1999. BHATE concluded the following:

- Free product is present at the site.
- Excessively contaminated soil is present at the site. The soil contamination is limited to soils at the northwest end of the UST.
- Recommended the preparation of a RAP.

FDEP requested an additional Site Assessment Addendum in a letter dated July 20, 1999. FDEP requires the following items be addressed (paraphrased from the letter):

- Groundwater flow direction needs to be determined. The wells are not placed optimally for groundwater flow determination. New wells may be required.
- The extent of free product nor possible groundwater contamination has not been determined. New wells may be required.
- The extent of soil contamination has not been determined. Place the first soil boring in the area south-southeast of S-1 and as close as possible to the fill port. Conduct additional borings to sufficiently characterize the extent of soil contamination.
- Use soil sampling requirements in Chapter 62-770, F.A.C.
- Sample the new and existing wells.

1.2.3 Site 1388

A 1,000-gallon underground storage tank (UST) that had contained fuel oil was removed by excavation in June 1995. Strong petroleum odors were reported within the groundwater during excavation. No excavated soils were removed from the site. Soil samples collected from the excavation and analyzed by OVA-FID field screening methods detected elevated soil gases in the bottom an on the west wall of the excavation pit. Samples collected along the product line did not indicate contamination.

During May through July of 1997, Bhate conducted a contamination assessment at the site. The following is a summary of site conditions based on the results of field and laboratory investigations made during the contamination assessment:

2.0 Scope and Objectives

2.1 Site 245

This site was previously investigated and a FDEP approved Site Assessment Report has been approved that recommends that a Remedial Action Plan (RAP) be prepared. EEG has reviewed the Site Assessment Report (and the addendum) and it appears that the groundwater concentrations are decreasing over time. If this is true, this site could be a candidate for natural attenuation and monitoring only.

EEG will conduct the following investigation at this site to determine the present site conditions:

Groundwater Flow Direction Determination
Survey (relative elevation) all existing monitor wells. Groundwater elevations in each well will be measured in the morning, afternoon, and evening with at least four hours having elapsed between each measurement to help determine if the groundwater elevation is tidally influenced. This should be conducted the day prior to sampling or one or two days after the sampling event in order to allow the groundwater to equilibrate. Mayport inlet tidal information will be obtained for the day water levels are taken and will include time of high and low tides with the respective height in feet (msl) of each.

Groundwater Sampling
Sample the existing eight monitoring wells in order to obtain recent groundwater data. FDEP requires that the groundwater sampling data used for a RAP be within 270 days of submittal of the RAP. The most recent data is from February 1999, which is greater than 270 days. Figure 2-1 presents the groundwater sampling locations.

The eight monitor wells and associated quality control samples will be sampled and analyzed for VOCs (Method 8021), PAHs (Method 8270), and TRPH (FL PRO Method). Table 2-1 is a breakdown of groundwater samples to be collected and analyzed at this site.

Table 2-1. Site 245 Groundwater Sample Summary

Analyte	Groundwater Samples	Duplicate Sample	Trip Blank	Total
VOCs	8	1	1	10
PAHs	8	1		9
TRPH	8	1		9

Data Comparison and Report
The new data will be compared with the existing data in an attempt to determine if a downward trend is observed as suspected. If a downward trend is observed, a letter report proposing a Monitoring Only Plan (MOP) will be generated. This letter report will be submitted to Mayport for approval. Upon resolution of the Mayport comments, a final letter report will be submitted to FDEP. If a downward trend is not observed, a RAP will need to be prepared. The final report will include an indexed "living CD" for this site.

2.2 Site 1343

This site was previously investigated, however, additional assessment activities are required. According to the FDEP Letter dated July 20, 1999, the extent of soil and groundwater petroleum contamination has not been adequately defined and groundwater flow direction needs to be determined. In order to accomplish this, additional soil sampling, installation of monitor wells, and groundwater sampling will be required.

EEG will conduct the following investigation at this site to determine the present site conditions:

Initial Groundwater Flow Direction Determination
Survey (relative elevation) the existing three monitor wells and one additional monitor well identified during the site visit. Measure the x/y coordinates of the additional well by measuring with a tape measure to known fixed points. Plot the additional well on a site map.

Measure groundwater elevations in these four monitor wells and determine the groundwater flow direction. MW-01 may contain LNAPL. The groundwater elevation from MW-1 will not be used if LNAPL is present.

Groundwater elevations in each well will be measured in the morning, afternoon, and evening with at least four hours having elapsed between each measurement to help determine if the groundwater elevation is tidally influenced.

Mayport inlet tidal information will be obtained for the day water levels are taken and will include time of high and low tides with the respective height in feet (msl) of each.

Soil Sampling and Headspace Analysis
Obtain up to 20 hand auger soil samples and perform headspace analysis on each sample collected to further define the extent of soil contamination. Soil sampling and headspace analysis procedures will be conducted in accordance with Chapter 62-770 F.A.C.

The hand auger soil-sampling grid will be based on three initial locations (SS-1, SS-6, and SS-9) spaced at 10-foot intervals through the tank excavation area. The grid starting point (SS-1) will be from the area south-southeast of S-1 and as close as possible to the fill port. Each subsequent location will be at five intervals away from the three initial locations. Figure 2-2 presents the proposed soil sampling locations. These locations may need to be adjusted based on known site obstructions (i.e. underground utilities, buildings, tanks, etc.). If soil contamination is encountered at a location, the grid will be extended radially at 5-foot intervals until no soil contamination is observed. Soil contamination will be based on visual observations, olfactory indicators, and/or headspace concentrations greater than 10 ppm.

Shallow groundwater is expected (less than six feet to water), so soil samples will be collected at one to two foot intervals in order to collect at least two samples from the vadose zone. Since groundwater contamination is suspected (LNAPL in MW-1), soil samples will not be collected in the capillary fringe zone immediately above the water table because this zone will potentially have high soil gas concentrations from the groundwater and will lead to invalid soil contamination assumptions.

Three confirmatory soil samples and associated quality control samples will be analyzed at an offsite laboratory for VOCs (Method 8021), PAHs (Method 8270), and TRPH (FL PRO Method). Table 2-2 is a breakdown of samples to be collected and analyzed at this site.

Table 2-2. Site 1343 Confirmatory Soil Sample Summary

Analyte	Confirmatory Soil Samples	Duplicate Sample	Equipment Blank	Trip Blank	Total
VOCs	3	1	1	1	6
PAHs	3	1	1		5
TRPH	3	1	1		5

Confirmatory soil samples will be collected that represent soil with high, medium, and low field screening headspace analysis results. Because soil borings will be shallow, these samples will be collected from new boreholes located immediately adjacent to each of the respective high, medium, and low soil screening sample locations.

Geoprobe Groundwater Screening

Perform up to two days (20 samples per day) of Geoprobe groundwater screening utilizing an onsite mobile GC laboratory to further define the horizontal extent of groundwater contamination. The target analytes will be BTEX, Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene. This task will also be used to help determine additional monitor well locations.

The initial groundwater screening grid will be based on locations at 25 feet intervals (Figure 2-3). The grid starting point will be from MW-1 (LNAPL observed) and will extend in radial directions away from MW-1 at 25 feet centers. These locations may need to be adjusted based on known site obstructions (i.e. underground utilities, buildings, tanks, etc.). If groundwater contamination is encountered at a location, the grid will be extended radially at 25 feet intervals until no groundwater contamination is observed. If groundwater contamination is not observed at a location, the grid intervals will be reduced to approximately 10 feet and will be moved closer towards MW-1.Groundwater analytical data will be compared to the cleanup target levels referenced in Chaper 62-777, F.A.C. and presented in Table 2-3.

Table 2-3. Groundwater Cleanup Target Levels

Analyte	Groundwater Criteria (ug/L)	Groundwater of Low Yield/Poor Quality Criteria (ug/L)
Benzene	1	10
Toluene	1	10
Ethylbenzene	700	7000
Xylene (total)	10000	100000
Naphthalene	20	200
1-Methylnaphthalene	20	200
2-Methylnaphthalene	20	200

Monitor Well Installation, Development, and Sampling

Install up to three monitor wells at locations to be determined based on the above tasks and the data from previous investigations. The monitor wells will be installed by utilizing a drill rig equipped to drill with 4 ¼ inch ID hollowstem augers. The wells will be installed to screen the surficial aquifer (not to exceed 20 feet below ground surface). Each well will be constructed with two-inch diameter Schedule 40 PVC with 10 feet of 0.01-inch factory slotted screen. A 20/30-grain sand pack will be placed in the annulus around the screen. A one-foot bentonite seal will be placed above the sand pack. The remainder of the annular space will be grouted to the surface. The well will be completed at the surface by manhole type flush mount construction.

Each newly installed well will be developed after completion.

Water levels will be obtained from the wells to be sampled prior to purging for groundwater sampling.

Each of the three newly installed monitor wells, the three existing monitor wells, and one monitor well discovered during the site visit will be sampled. Each groundwater sample and associated quality control samples will be analyzed at an offsite laboratory for VOCs (Method 8021), PAHs (Method 8270), TRPH (FL PRO Method), and total lead (Method 6010). Table 2-4 is a breakdown of groundwater samples to be collected and analyzed at this site. The existing monitor well locations can be viewed in Figure 2-3.

Table 2-4. Site 1343 Groundwater Sample Summary

Analyte	Groundwater Samples	Duplicate Sample	Trip Blank	Total
VOCs	7	1	2	10
PAHs	7	1		8
TRPH	7	1		8
Lead (total)	7	1		8

All new and existing monitor wells will be surveyed for relative elevation to help determine the groundwater flow direction. Measure groundwater elevations in each well in the morning, afternoon, and evening with at least four hours having elapsed between each measurement to help determine if the groundwater elevation is tidally influenced. This should be conducted the day prior to sampling or one or two days after the sampling event in order to allow the groundwater to equilibrate. Mayport inlet tidal information will be obtained for the day water levels are taken and will include time of high and low tides with the respective height in feet (msl) of each.

The groundwater elevations obtained during the groundwater sampling effort will be converted to relative elevations and used to determine the groundwater flow direction.

Site Assessment Report Addendum (SARA)

A SARA will be prepared describing to above tasks. The SARA will be submitted to Naval Station Mayport for comments. Upon resolution of the Mayport comments, a final SARA will be submitted to FDEP.

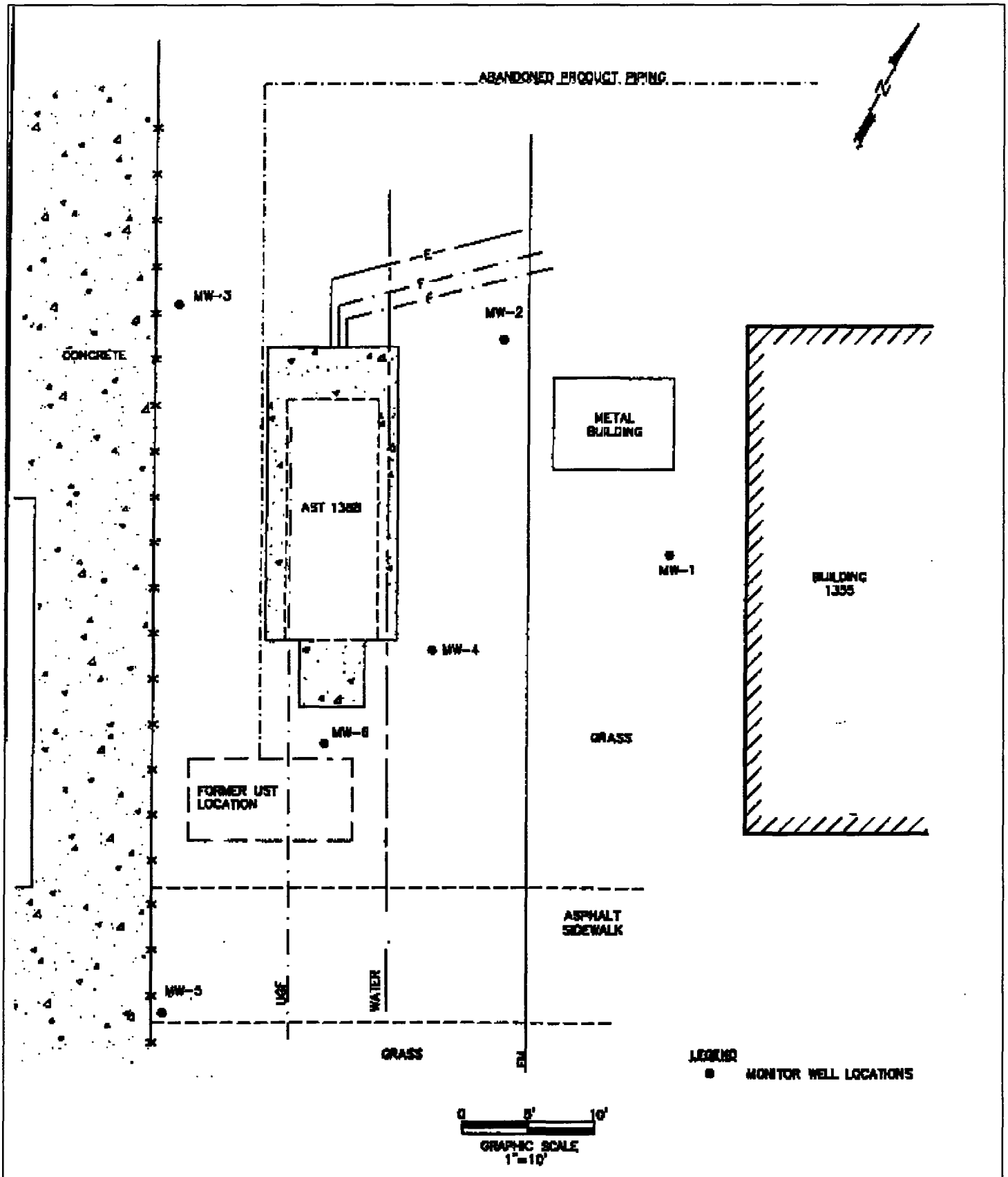


FIGURE: 2-4

Site 1388
Monitor Well Locations

EEG Project No. 7034.100

ELLIS ENVIRONMENTAL GROUP, LC

UST Site Assessment
(SITES 245, 1345, AND 1388)
Mayport, Florida

Contract No. N62467-01-C-8826

Client:
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND

3.2 Geoprobe Groundwater Sampling

A Geoprobe® rig utilizes a percussion hammer to advance the drive casing and sampling screen. The reactive weight (i.e., the weight of the sampling rig) assists the hydraulic hammer to push down on the direct-push rods. The advantage of using the direct-push sampling technique allows for multiple quality samples to be collected in a quick and cost effective manner.

Groundwater samples will be collected with the Geoprobe® Screen Point 15 groundwater sampling system. The Geoprobe® Screen Point 15 groundwater sampling system consists of a sampling sheath attached to the Geoprobe® rods. When the rod is driven to the desired depth, the sheath is retracted, exposing a stainless steel screen to the formation for groundwater sampling.

Groundwater samples will be collected as grab samples using the following procedures:

1. Prior to groundwater sampling, the direct-push rods and sampling equipment will be thoroughly decontaminated following the decontamination procedures described in Section 3.4.
2. The Geoprobe® Screen Point 15 groundwater sampling tool will be fitted to the end of the Geoprobe® pipe.
3. The Geoprobe® Screen Point 15 groundwater sampling tool will be advanced by pushing the steel pipe into the existing soil sampling borehole using the Geoprobe® rig.
4. Four-foot lengths of pipe are continually added as the tool is advanced deeper into the ground to the sampling depth.
5. Once the Geoprobe® Screen Point 15 groundwater sampling tool is pushed to just beneath the top of the water table, the outer casing of the sampling tool will be retracted exposing the sampling screen.
6. New small diameter tubing will be lowered through the Geoprobe® pipe down to the sampling screen. New tubing will be used at each sample location.
7. The shallow groundwater samples are collected using a peristaltic suction-lift pump.
8. Samples will be collected in 40 ml glass vials
9. Groundwater sampling information and measured field indicator parameters (turbidity, Specific Conductance, pH, and temperature) will be recorded on the sampling log form (Appendix A) prior to collecting the sample.
10. Once a sample is collected in the 40 ml vials, the Geoprobe® Screen Point 15 groundwater sampling tool will be removed from the borehole.
11. The 40 ml glass sample vials will be labeled and taken directly to the on-site laboratory for analysis.

3.3 Monitor Well Installation

The monitor wells will be installed by 6 inch outside diameter hollow-stem augering techniques. Well construction materials will be clean and meet standard industry specifications as described in this subsection. The materials used will ensure the longevity of the wells for the life of the required monitoring.

The riser and well screen will be comprised of 2-inch schedule 40 PVC. The PVC well riser shall consist of new machine-threaded flush-joint pipe. The screen filter pack will consist of 20/30

3.5 Groundwater Sampling

The following procedures will be followed to purge and sample monitor 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 (Appendix A).
2. The volume of water in each well, including the saturated pore volume (assumed at 30%) 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 (Appendix A).
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 ten 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 (Appendix A).
8. Wells that recharge very slowly will be purged dry, allowed to recharge at least 80% of initial water column, and sampled.
9. Monitor 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 DRO, 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.

3.6 Decontamination

A personnel and small equipment decontamination area will be constructed at each work area to provide a decontamination facilities 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.

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 assumed to be contaminated and will be disposed 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 PPE 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 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

3.9 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.

purpose of this work plan, only commercially available notebooks such as record books, composition notebooks, and surveyor's logbooks will be accepted.

The time log will be used to record the activity and the time that the activity occurred including meeting minutes, phone conversations, weather changes, general site activities, site observations, QC notes, safety observations, conversations, field orders, directions, etc. The arrival times of any visitors to the site, whether it is project or non-project related, must be identified in the field notes. The date and day of the week will be clearly marked at the top of each page, and the records will follow chronologically with the time and description of the activity.

ID of the field team will also be made in the daily time logbook. Identifications will include the field team's full names, initials, and responsibilities. References to the field team using first person (I, we) or second person (he, she, they) is not acceptable. All references to the field team members or on-site contacts must be recorded using full names or initials. Throughout the field notes, initials of people on-site must be consistent with those recorded at the beginning of each day's entry in the field time logbook. Each Field Team Leader will be required to keep a field time logbook.

At the end of each day, the recorder will sign and date the time log, and the remainder of the page will be marked to prevent additional notes being recorded that day. If a team leader's legal signature is not legible, it must be accompanied by their printed name. The next day's time log will continue on the top of the next page.

3.10.1.2 Field Data Logbooks

Field data logbooks are bound compilations of field data sheets used to record field data. The use of loose pages clamped together in a clipboard or bound with staples is not acceptable. Each field activity will have its own formatted data sheet for the completion of that task. Copies of the log sheets for this project are included in Appendix A of this work plan. All blanks on each data sheet must be completely filled out as appropriate. Each field data sheet will contain spaces for the signature of the Field Team Leader.

Field data logbooks must be bound in a manner that will prevent them from coming apart in the field. Spiral binding will be used to secure field data sheets on this project.

The field data logbooks will be kept to a manageable size. Since this project has multiple tasks, the field notebooks will be subdivided into several smaller fields. Each will be labeled and numbered sequentially so that the Field Team Leader will be able to keep track of the data. When there is more than one field team performing the same task at different locations, each team will have its own field data logbook.

3.10.2 Photographs

During the field effort, digital or film photographs may be taken of completed wells, final purge water, and other items that affect the outcome or performance of the project. A photograph log will be maintained describing each photograph taken. All photographs will be produced as

4.0 Project Schedule

4.1 Field Effort

EEG anticipates the start of the field phase to begin in the Summer 2001. We anticipate that work will be performed Monday through Friday between the hours of 0700 and 1800 with a one hour lunch break. It is assumed that there will be at least one crew present for most of the field effort, and that there may be additional crews on-site to assist with well development, surveying, and/or sampling.

The project field effort schedule is broken out below for each site below:

Site 245		
Groundwater Flow Direction Determination	=	1 Day
Groundwater Sampling	=	1 Day
Total	=	2 Work Days
Site 1343		
Groundwater Flow Direction Determination	=	1 Day
Soil Screening and Sampling	=	1 Day
Geoprobe Groundwater Sampling	=	2 Days
Monitor Well Installation & Development	=	2 Days
Groundwater Sampling	=	2 Days
Total	=	8 Work Days
Site 1388		
Groundwater Flow Direction Determination	=	1 Day(Initial Quarter Only)
Groundwater Sampling	=	1 Day (Per Quarter)
Total	=	2 Work Days

Thus, we estimate the initial Site Assessment (excluding subsequent quarterly 1 day efforts at Site 1388) field effort for all three sites will approximately take two and a half weeks.

4.2 Data Interpretation and Reports

Data interpretation will begin while in the field. Data interpreted in the field will be needed to decide groundwater flow determination, additional boring locations, Geoprobe locations, and monitor well installation locations.

A report for each site will be generated. The lab analysis, office data interpretation, and report schedule for each site is presented below:

APPENDIX A
Field Forms

Ellis Environmental Group, LC

Monitor Well and Soil Boring Log

Southern Division Naval Facilities Engineering Command

Depth (feet bgs)	Sample Type	Sample I.D.	Blows / 6"	Sample Recovery (in)	Headspace Reading (ppm)	Well Details	Sample Description	Remarks	

Well Legend: Bentonite ☒ Well Screen ▤ Grout ■ Lithology change —— Gradational change.....

Ellis Environmental Group, LC	**Confirmatory Soil Sampling Log Form**	**Southern Division Naval Facilities Engineering Command**
Contract Number : N62467-01-C-8826	**UST Site Assessment** Mayport Naval Station Mayport, Florida	Time _____ Page _____ of _____ Date: _____ Day: _____

SAMPLE METHOD:
DEPTH OF SAMPLE:
SAMPLE NUMBER:
FRACTIONS:
REMARKS:

Recorded By: _____ Date: _____

Reviewed By: _____ Date: _____

Quality Control Representative

Ellis Environmental Group, LC	**Organic Vapor Detection Equipment Calibration** FID or PID	**Southern Division Naval Facilities Engineering Command**
Contract Number : N62467-01-C-8826	**Mayport Naval Station** Mayport, Florida	Page _____ of _____

Instrument Type	Instrument Serial Number	Date	Time military	Calibr. Gas Conc. (ppm)	Instrument Response (ppm)	Comments

*1 Initials of Person Performing Calibration

Recorded By:_____ Date:_____

Reviewed By:_____ Date:_____

Quality Control Representative

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 _____ of _____ Date: _____ Day: _____

Recorded By:_____ Date:_____

Reviewed By:_____ Date:_____

Quality Control Representative

Ellis Environmental Group, LC	**Well Development Record**	**Southern Division Naval Facilities Engineering Command**
Contract Number : N62467-01-C-8826	Mayport Naval Station Mayport, Florida	Well No._____ Page _____ of _____ Date: _____ Day: _____

Borehole Diameter_____ Static Water Level _____
Well Diameter _____ Casing Volume_____
Well Depth_____ Annual Space Volume_____
Screen Length Total Volume

_____Bailer _____Submersible Pump _____Surge Block
_____Centrifugal Pump _____Manual Piston Pump _____Other

Date_____
Time Start _____ Flow Rate_____
Time End Total Volume Discharged

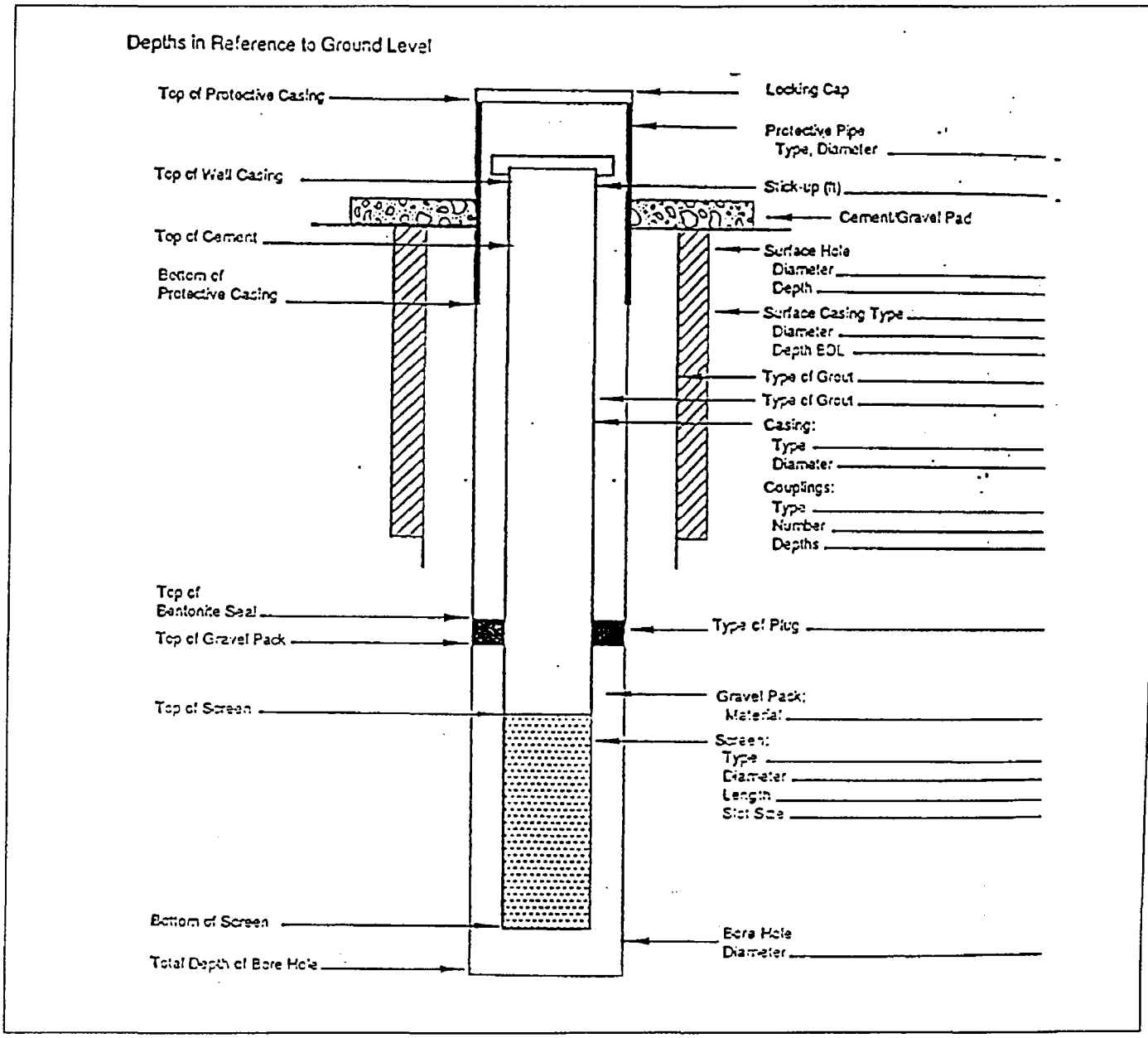
	Initial	During (2)		Final
Time				
Conductivity				
PH				
Temperature				
Turbidity				

Start_____ Time_____
Midpoint_____ Time_____
End _____ Time_____
Photograph Taken Yes No

Recorded By:_____ Date:_____

Reviewed By:_____ Date:_____
Quality Control Representative

Ellis Environmental Group, LC	**Monitor Well Construction Log**	**Southern Division Naval Facilities Engineering Command**
Contract Number : N62467-01-C-8826	**Mayport Naval Station** Mayport, Florida	Boring No._____ Page _____ of _____ Date: _____ Day: _____



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Quality Control Representative