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SAMPLING AND ANALYSIS PLAN FOR SITE ASSESSMENT AND CONFIRMATORY
SAMPLING OF VARIOUS UST AND AST SITES NAS CECIL FIELD FL
3/1/2000
TETRA TECH

P.C.

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**Sampling and Analysis Plan
for
Site Assessment and Confirmatory
Sampling at Various
UST and AST Sites**

**Naval Air Station Cecil Field
Jacksonville, Florida**



**Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order CTO-0121**

March 2000

**SAMPLING AND ANALYSIS PLAN
FOR
SITE ASSESSMENT AND CONFIRMATORY SAMPLING
AT VARIOUS UST AND AST SITES**

**NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

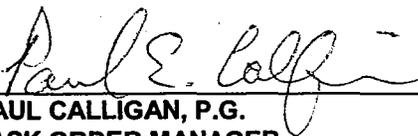
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1.0 INTRODUCTION

Tetra Tech NUS (TiNUS) has prepared this Site Assessment Plan (SAP) for the following sites: Site 271, Site 312, Tank Sites G825LS, G880-A, G16-A, G327-A, G360PS, 370G, G808, G1847 A, B & C, G222, G290-A, G1826 A, B & C, 180 A, B & C, 370K, 81, 384, and H. This SAP was prepared for the U.S. Navy (Navy) Southern Division (SouthDiv) Naval Facilities Engineering Command (NAVFAC) under Contract Task Order (CTO) 121, for the Comprehensive Long-Term Environmental Action Navy (CLEAN III) Contract Number N62467-94-D-0888.

The SAP provides the rationale and methodology for performing field activities to evaluate petroleum hydrocarbons in the subsurface at the referenced site(s). Data collected during the site assessments will be used to prepare various reports as indicated below.

1.1 GENERAL SITE DESCRIPTION

The 18 sites covered by this sampling and analysis plan are located at Naval Air Station Cecil Field (NASCF) in Jacksonville, Florida.

1.2 OBJECTIVE

The objective of the proposed field investigation is to evaluate the extent of petroleum hydrocarbons in surface and subsurface soils and/or groundwater. The data collected during the investigations for Sites 271 and 312 will be used to prepare Site Assessment Reports (SARs) as required by Chapter 62-770.630, FAC, and to evaluate the need for future remedial action, long term monitoring, or for no further action proposal (TiNUS, 2000). The data collected during the investigations at Tank Sites G825LS, G880-A, G16-A, G327-A, G360PS, 370G, G808, G1847 A, B & C, G222, G290-A, G1826 A, B & C will be used to confirm previous confirmatory sampling report (CSR) results that recommended "No Further Action" (NFA) at the time of the report. At the time of the CSRs, the tanks had to remain in operation and could not be taken out of service. Now that Cecil Field has been transferred, these tanks are required to be re-evaluated to confirm the NFA designation. From the data collected during the investigations at Tank Sites 180 A, B & C, 370K, 81, 384 and Quarters H, CSRs will be written for those sites with recommendations for an NFA or a SAR, where appropriate.

2.0 SCOPE OF PROPOSED ASSESSMENT

The sampling activities and procedures as described in this SAP will be performed in accordance with the United States Environmental Protection Agency (U.S. EPA) Region 4 Environmental Investigation Standard Operating Procedures and Quality Assurance Manual (EISOPQAM) and the Base-Wide Generic Work Plan for NAS Cecil Field. Specifically, the SOPs are in the Project Operations Plan in Volume II. Investigative Derived Waste (IDW) will be handled in accordance with Volume I of the Base-Wide Generic Work Plan, with the exception that TTNUS will discharge groundwater directly to the surface at the well heads where possible.

The proposed scope of work for SAR sites will be conducted in two phases. Phase 1 will consist of the installation of soil borings (and/or monitoring wells, as necessary) at each site. The numbers and location of these wells and borings are discussed in Section 3. Groundwater and soil samples will be collected and analyzed for constituents as explained in the site specific plans listed in Section 3. The results from the sampling will be presented to the Navy and the Cecil Field Base Closure Team (BCT) to propose locations of future soil borings and monitoring wells if needed before preparing a Site Assessment Report (SAR). Phase 2 will depend on the Phase 1 field and lab results and the resulting recommendations for each site. The permanent monitoring wells installed during these assessment activities will be surveyed with respect to horizontal and vertical datum.

The proposed scope of work for CSR sites will require one phase of drilling and sampling. The numbers and locations of these wells and borings are discussed in Section 4. Groundwater and soil samples will be collected and analyzed for constituents as explained in the site specific plans listed in Section 4. The results from the samples will be presented to the Navy and the BCT with recommendations for either an NFA program or a SAR.

Prior to any machine-assisted ground penetrations at any site, utility clearance permits will be obtained, and any possible utility line conflicts will be resolved. The proposed site and sample nomenclature is described in Section 2.6.

The relative top of casing elevation and horizontal location of all the newly installed monitoring wells and removal and disposal of investigative-derived waste generated during the Phase 1 and Phase 2 field investigations will be performed as part of the Phase 2 field investigation. The horizontal locations of the monitoring wells will be surveyed in accordance with the Florida Plane Coordinate System, UTM or base coordinator grid system as deemed appropriate by the Navy's Remedial Project Engineer (RPM). The monitoring well top of casing elevations will be surveyed in accordance with USGS NAD'83.

2.1 SOIL INVESTIGATION

Soil samples will be collected using a stainless steel hand auger. Soil samples will be collected continuously from the ground surface to the water table. Vadose zone soil samples will be screened with an OVA following procedures for headspace analysis specified in Chapter 62-770 F.A.C. If soil contamination is identified above the 50 ppm threshold for "excessively contaminated soil" (as defined by Chapter 62-770, F.A.C.) at any proposed boring location, additional soil borings will be advanced to assess the areal extent of soil contamination at each site.

In accordance with Rule 62-770.600(3)(e), soil samples will be collected from select soil borings at each site for fixed base laboratory analysis to confirm the OVA results. The boring locations and sample intervals will be selected to coincide with samples that exhibit high, medium and low field screening results during the soil vapor survey. The samples will be analyzed for constituents of the Kerosene Analytical Group as defined in Chapter 62-770, F.A.C.

Each soil boring will be backfilled with Type 1 Portland Cement. All locations drilled through asphalt or concrete will be completed with similar material and finished flush to existing grade. The on-site geologist, in accordance with TTNUS Standard Operating Procedure (SOP) GH 1.5, will maintain a complete log of each boring. At a minimum, the boring log will contain the following information:

- Sample Numbers and Types
 - Sample Depths
 - Soil Density or Cohesiveness
 - Soil Color
 - Unified Soil Classification System (USCS) Material Description
- OVA-FID Measurements

2.2 GROUNDWATER INVESTIGATION

Permanent monitoring wells will be installed using hollow stem auger drilling techniques. Monitoring wells will be constructed of 2-inch inside diameter (ID) Schedule 40, flush-joint polyvinyl chloride (PVC) riser and flush-joint 0.01-inch factory-slotted well screen. Shallow monitoring well screen sections will be 10 feet in length and positioned to intersect the water table. It is estimated that the depth of these wells will vary between 7 and 14 feet below land surface. After the borings are drilled to the desired depth, each well will be installed through the augers. A complete monitoring well log will be recorded for each well installed. A shallow well construction diagram indicating the well style is presented on Figure 2-1.

The monitoring wells will be developed no sooner than 24 hours after installation to remove fine sediment material from around the monitored interval of the well. Wells will be developed by bailing and surging, or by pumping, as determined by the field geologist. The pH, temperature, and specific conductance measurements will be collected from the development water. Wells will be developed up to a maximum of one hour or until these measurements become stable and the development water is visibly clear. Water quality stabilization will be determined using the following criteria: temperature +/- 1.0°C (plus or minus one degree Celsius), pH +/- 0.1 standard unit, and specific conductivity +/- 10 percent.

Groundwater sample collection will be in accordance with the EISOPQAM and the Base-Wide Generic Work Plan (TtNUS, 1998). Based upon the need to sample for lead at the site, TtNUS will use quiescent sampling methods in accordance with the Florida Department of Environmental Protection's definition.

Prior to obtaining samples, water levels and total well depths will be measured and the wells will be purged using methods determined by the on-site geologist. Three to five well volumes will be purged from each well. If the wells are purged dry with less than three well volumes removed, the water level in the well will be allowed to recover at least 80 percent, then a sample will be collected. Field measurements of pH, temperature, and specific conductance will be taken periodically or after each approximate well volume of water is purged from each well. The same stabilization criteria defined in the previous paragraph will be used during purging. If these parameters do not stabilize after three volumes, then five volumes of groundwater will be removed.

Before purging, a clear bailer or an oil/water interface probe will be used to check for free product. No samples will be collected from a well that exhibits greater than 0.01 foot of free product. The thickness of the free product will be measured and recorded. The samples will be transferred directly into the appropriate (lab preserved) sample bottles for analyses. Samples to be analyzed for volatile constituents will be collected first and immediately sealed in the vial so that no headspace exists. The sample constituents analyzed for each of the sites are summarized in Table 2-1. The pertinent field and sampling data will be recorded using a TtNUS groundwater sample form.

2.3 EQUIPMENT DECONTAMINATION

The equipment involved in soil and groundwater assessment activities will be decontaminated prior to and during the respective field activities in accordance with TtNUS's SOPs and the Base-wide Generic Work Plan (TtNUS, 1998). Personal protection equipment and other waste trash (e.g., disposable trowels) will not be considered hazardous and will be disposed of in a municipal landfill. Such trash will be collected in

TABLE 2-1

**FIELD INVESTIGATION
ENVIRONMENTAL SAMPLE SUMMARY
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Analyte	Proposed Method (1)	Env. Samples	IDW Samples (2)	Duplicate Samples	Rinsate Blanks (Aqueous)	Field Blank (Aqueous)	Trip Blanks (Aqueous)	Total Samples
GROUNDWATER								
VOA/VOH	EPA 8021	10	2	2	1	1	0	16
PAH	EPA 8310	10	2	2	1	1	0	16
LEAD	EPA 239.2	10	2	2	1	1	0	16
TRPH	FL-PRO	10	2	2	1	1	0	16
EDB	EPA 504.1	10	2	2	1	1	0	16
SOIL								
VOA/VOH	EPA 8021	17	2	2	1	0	0	22
PAH	EPA 8310	17	2	2	1	0	0	22
TRPH	FL-PRO	17	2	2	1	0	0	22
8 RCRA Metals	8 RCRA Metals	0	2	0	0	0	0	2
Encore Samplers		51	6	0	0	0	0	57

VOH - Volatile Organic Halocarbons

VOA - Volatile Organic Aromatics

PAH - Polynuclear Aromatic Hydrocarbons

TRPH - Total Recoverable Petroleum Hydrocarbons

EDB - Ethylene Dibromide

(1) Method referenced reflects FDEP requirements.

(2) IDW samples are based on collecting one composite soil sample and one composite liquid sample per 10 drums.

All analyses are based on a standard 30-day laboratory turn around time.

a plastic bag and disposed of in a suitable trash receptacle. Soil removed during soil boring activities in excess of sampling volume requirements will be placed back in the ground, and turf will be replaced or repaired.

2.4 WASTE HANDLING

Investigative Derived Waste (IDW) will be handled in accordance with Volume I of the Base-Wide Generic Work Plan (TtNUS, 1998), with the exception that TtNUS will discharge groundwater directly to the surface at the well heads where possible. An estimated 12 drums of contaminated soil, 2 drums of decontamination water, and 1 drum of disposable personal protective equipment (PPE) will be generated. A composite soil sample will be collected for every ten drums of soil IDW generated. The decontamination water will be categorized for disposal based on the highest concentrations observed from all the sites. PPE will be double-bagged and disposed of in a waste receptacle.

2.5 SAMPLE HANDLING

Sample handling includes the selection of sample containers, preservatives, allowable holding times and analytical methods. In addition, sample identification, packaging, and shipping will be addressed. The sampling activities and procedures as described in this sampling and analysis plan will be performed in accordance with the United States Environmental Protection Agency (U.S. EPA) Region 4 Environmental Investigation Standard Operating Procedures and Quality Assurance Manual (EISOPQAM) and the Base-Wide Generic Work Plan for NAS Cecil Field. A summary of bottleware requirements, preservation requirements, and sample holding times are provided in Table 2-2.

2.6 SAMPLE PACKAGING, SHIPPING AND NOMENCLATURE

Samples will be packaged and shipped in accordance with TtNUS SOPs. The field operations leader will be responsible for completion of the following forms when samples are collected for shipping.

- Sample labels
- Chain-of-Custody labels
- Appropriate labels applied to shipping coolers
- Chain-of Custody Forms
- Federal Express Air Bills

TABLE 2-2

**SUMMARY OF ANALYSIS, BOTTLEWARE REQUIREMENTS, PRESERVATION REQUIREMENTS,
AND HOLDING TIMES
NAVAL AIR STATION CECIL FILED
JACKSONVILLE, FLORIDA**

Analysis	Analytical Method	Bottleware	Preservation	Holding Time¹
Groundwater				
BTEX, MTBE, VOHs	SW-846 8021B	2-40 ml vials	PH <2 with HCl, Cool to 4° C	14 days to extraction and analysis
EDB	SW-846 504.1	2-40 ml vials	Cool to 4° C	14 days to extraction; 40 days to analysis
TRPH	FL-PRO	1-1 liter glass amber	PH <2 with H2SO4, Cool to 4° C	7 days to extraction; 40 days to analysis
Total Lead	SW-846 6010B	1-1 liter polyethylene	PH <2 with HNO3, Cool to 4° C	6 months to analysis
PAHs	SW-846 8310	1-1 liter glass amber	Cool to 4° C	7 days to extraction; 40 days to analysis

¹ Holding times are measured from the date/time of sample collection

Proposed samples will be assigned a unique sample identification number. The unique label system established for this sampling event is as follows:

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Site Code	Type	Location	Depth

Where:

- 1 Site Code** Cecil Field, Building No. (for example Building 437, CEF-B437)
- 2 Type** SB (Soil Boring), GW (Monitoring Well),
TW (Temporary Monitoring Well).
- 3 Location** For soils, an ascending sequential number of sample locations.
For groundwater, the well number.
- 4 Depth** For soils, bottom of subsurface sample interval.
For groundwater, number sequentially starting at 01 for each sampling round.

For example, a soil sample collected at Building 271, from the soil boring SB 003, at the 3 to 4 foot interval bls, would have the following nomenclature:

CEF-B271-SB-003-04

The first groundwater sample collected at Building 271 from monitoring well 01S would have the following nomenclature:

CEF-B271-GW-01S-01

2.7 SAMPLE CUSTODY

The chain-of-custody begins with the release of the sample bottles from the laboratory and must be documented and maintained from that point forward. To maintain custody of the sample bottles or samples, they must be in someone's physical possession, in a locked room or vehicle, or sealed with an intact custody seal. When the possession of the bottles or samples is transferred from one person to another it will be documented in the field logbook and on the chain-of-custody record form.

2.8 QUALITY CONTROL (QC) SAMPLES

In addition to periodic calibration of field equipment and appropriate documentation, quality control samples will be collected or generated during environmental sampling activities. Quality control samples will be collected in accordance with the "Proposal for Reduction of QA Sample Collection and Data Validation" memo authored by Harding-Lawson Associates in 1996, which is simplified in Table 2-3 below.

TABLE 2-3

Quality Control Sample Frequency

Type of samples	Frequency	Samples to be collected
Field Duplicate	1/10 samples/matrix	1
Lab MS/MSD	1/20 samples	1 ⁽¹⁾

(1) MS/MSD is a laboratory QA/QC requirement, separate sample not required, only additional volume.

As agreed upon by the BCT, formal data validation has been eliminated from the installation restoration program at NAS Cecil Field. However, TtNUS personnel will review the analytical data packages generated by the analytical laboratory to eliminate false positive and false negative results.

2.9 SITE MANAGEMENT AND BASE SUPPORT

TtNUS will perform this project with support from the Navy. This section of the Work Plan describes the project contacts, support personnel, project milestones and time frames of all major events.

Throughout the duration of the investigation activities, work at NASCF will be coordinated through SouthDiv and NASCF personnel. The primary contacts are as follows:

1. SouthDiv Engineer in Charge
Mr. Nick Ugolini
(843) 820-5896
2. NASCF Caretaker Site Officer
Mr. Dave Kruzicki
(904) 778 - 5620

NASCF personnel will provide the following support functions

- Provide TtNUS with requirements for locating underground utilities prior to the commencement of drilling operations.

- Provide a sufficient supply of potable water for drilling and decontamination use.
- Provide electricity for decontamination purposes.

The project will be staffed with personnel from the TtNUS's Jacksonville, Florida offices. During field activities, TtNUS will provide a senior level geologist acting as the Field Operations Leader. Additionally, TtNUS will supply one drill crew/rig, and a staff geologist to aid the senior geologist.

Mr. Paul Calligan is the Task Order Manager (TOM) for CTO-121 and will be the primary point of contact. He is responsible for cost and schedule control as well as technical performance and will provide senior level review and oversight during field activities. Mr. Calligan will be the primary point of contact for the Field Operations Leader.

2.9.1 Contingency Plan

In the event of problems that may be encountered during site activities, the SouthDiv point of contact will be notified immediately, followed by the TtNUS project manager and the NASCF point of contact. The project manager will determine a course of action which will not adversely effect either the schedule or the budget. All contingency plans will be approved through the SouthDiv point of contact before being implemented.

2.9.2 Weekly Status Reports

TtNUS will provide the BCT and selected RAB members weekly status updates via electronic mail. The reports will include the following:

- Accomplishments - Any field activities or planning completed that week.
- Issues - Any problems and implemented solutions encountered during the week.
- Additional Assessments - Documents sites that may need additional assessments as dictated by lab results.

3.0 SITE SPECIFIC SCOPE OF WORK - SAR SITES

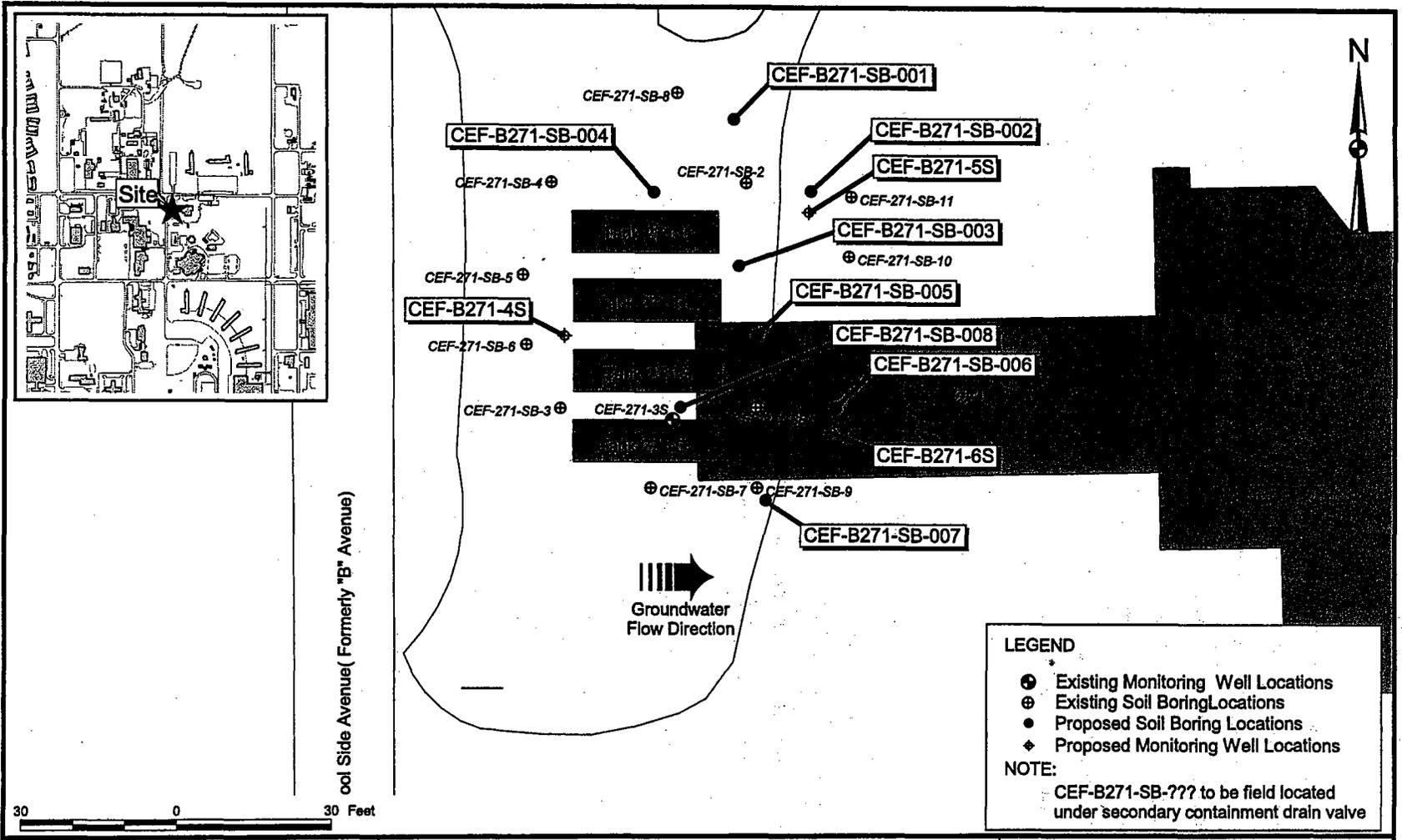
TiNUS, in accordance with the Final Negotiated POA Statement (TiNUS, 2000), will perform site assessments at Building 271 and Building 312 to further characterize the extent of soil and groundwater contamination. The work will include field screening, the collection and analyses of soil and groundwater samples and the installation of groundwater monitoring wells. Based on the results of previous investigations, soil and groundwater will be investigated at Building 271, and groundwater only will be investigated at Building 312. Site investigation activities will be performed in accordance with Section 3.7 of the Final POA (TiNUS, 2000). The site specific scope of work for each of the Site Assessment Report (SAR) sites is described in the following sections.

3.1 SITE 271

Tanks 271SUL/R/UL/D were USTs located on the west side of Building 271. Building 271 was the former Base Exchange Gas Station. USTs 271SUL, 271UL and 271R were used to store super unleaded, unleaded and regular gasoline, respectively. UST 271D was used to store diesel fuel. Results of confirmatory sampling performed by HLA indicate that petroleum impacted soil was detected at two locations downgradient of the tanks, (HLA CEF-271-SB-1 and CEF-271-SB-2), (ABB-ES, 1999).

Approximately eight soil borings will be advanced to the water table to delineate the extent of petroleum impacted soil. In addition, approximately three shallow monitoring wells will be installed. One monitoring well will be installed upgradient of the tanks and two monitoring wells will be installed downgradient of the tanks. The proposed soil boring and monitoring well locations are shown on Figure 3-1. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table as described in Table 3-1. The samples will be screened for hydrocarbon vapors with an OVA-FID.

Soil samples will be collected from select soil borings and groundwater samples will be collected from newly installed monitoring wells for laboratory analysis for constituents of the Kerosene Analytical Group.



LEGEND

- ⊕ Existing Monitoring Well Locations
- ⊙ Existing Soil Boring Locations
- Proposed Soil Boring Locations
- ◆ Proposed Monitoring Well Locations

NOTE:
 CEF-B271-SB-??? to be field located under secondary containment drain valve

DRAWN BY	DATE
MJJ	23Mar00
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



PROPOSED SOIL BORING AND MONITORING WELL LOCATIONS
 BUILDING 271, TANKS 271 UL/R/SUL/D
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 121	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 3-1	REV 0

Table 3-1

**Proposed Soil Sample Summary
Building 271
Tanks 271SUL/R/UL/D**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B271-SB-001-XX	10 feet north of HLA boring CEF-271-SB-2	1 to ∇	OVA-FID
CEF-B271-SB-002-XX	10 feet east of HLA boring CEF-271-SB-2	1 to ∇	OVA-FID
CEF-B271-SB-003-XX	10 feet south of HLA boring CEF-271-SB-2	1 to ∇	OVA-FID
CEF-B271-SB-004-XX	10 feet west of HLA boring CEF-271-SB-2	1 to ∇	OVA-FID
CEF-B271-SB-005-XX	10 feet north of HLA boring CEF-271-SB-1	1 to ∇	OVA-FID
CEF-B271-SB-006-XX	10 feet east of HLA boring CEF-271-SB-1	1 to ∇	OVA-FID
CEF-B271-SB-007-XX	10 feet south of HLA boring CEF-271-SB-1	1 to ∇	OVA-FID
CEF-B271-SB-008-XX	10 feet west of HLA boring CEF-271-SB-1	1 to ∇	OVA-FID
CEF-B271-SB-00Y-XX	To be determined by field geologist	TBD	KAG
CEF-B271-GW-4S-01	West of tanks (upgradient)	Mid-screen	KAG
CEF-B271-GW-5S-01	NE of tanks (downgradient)	Mid-screen	KAG
CEF-B271-GW-6S-01	SE of tanks (downgradient)	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Y = Boring location number.

TBD = To Be Determined

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

3.2 SITE 312

Building 312 housed administrative offices and two paint booths. Other associated structures included and abandoned hydraulic lift, an aircraft washrack, an oil-water separator, and an underground storage tank. Results of sampling and analysis performed by HLA indicate that naphthalene was detected in groundwater at HLA monitoring well CEF-312-01 (ABB-ES, 1996).

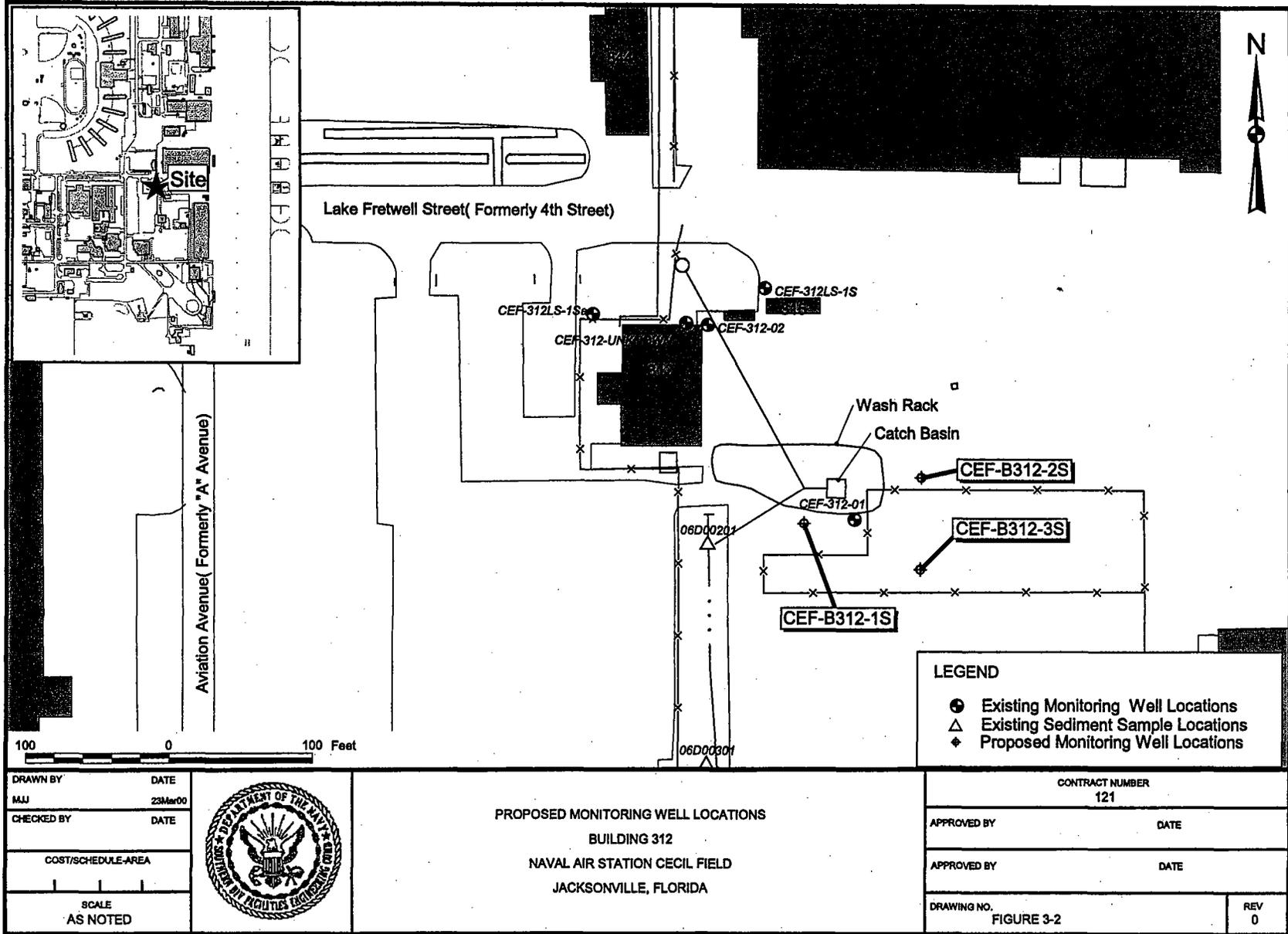
Approximately three shallow monitoring wells will be installed. One monitoring well will be installed upgradient of HLA CEF-312-01 and two monitoring wells will be installed downgradient of HLA CEF-312-01. The proposed monitoring well locations are shown on Figure 3-2. Groundwater samples will be collected from newly installed monitoring wells for laboratory analysis for constituents of the Kerosene Analytical Group. Sample locations are described in Table 3-2.

Table 3-2
Proposed Soil Sample Summary
Building 312

Sample ID	Location	Sample Depth ⁽¹⁾ (feet bls)	Analyses
CEF-B312-GW-1S-01	West of HLA MW CEF-312-01 (upgradient)	Mid-screen	KAG
CEF-B312-GW-2S-01	NE of HLA MW CEF-312-01 (downgradient)	Mid-screen	KAG
CEF-B312-GW-3S-01	SE of HLA MW CEF-312-01 (downgradient)	Mid-screen	KAG

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)



4.0 SITE SPECIFIC SCOPE OF WORK - CSR SITES

TtNUS, in accordance with the Final Negotiated POA (TtNUS, 2000), will perform confirmatory sampling and analysis of surface soils, subsurface soils and groundwater at Tank Sites 825, G880A, G16A, G327A, G360PS, 370G, G808, G1847A/B/C, G222, G290A, 1826A/B/C, 180A/B/C, 370K, 81A/B/C and 384. Site investigation activities will be performed in accordance with Section 3.7 of the Final POA (TtNUS, 2000). The site specific scope of work for each of the Confirmatory Sampling Report (CSR) sites is described in the following sections.

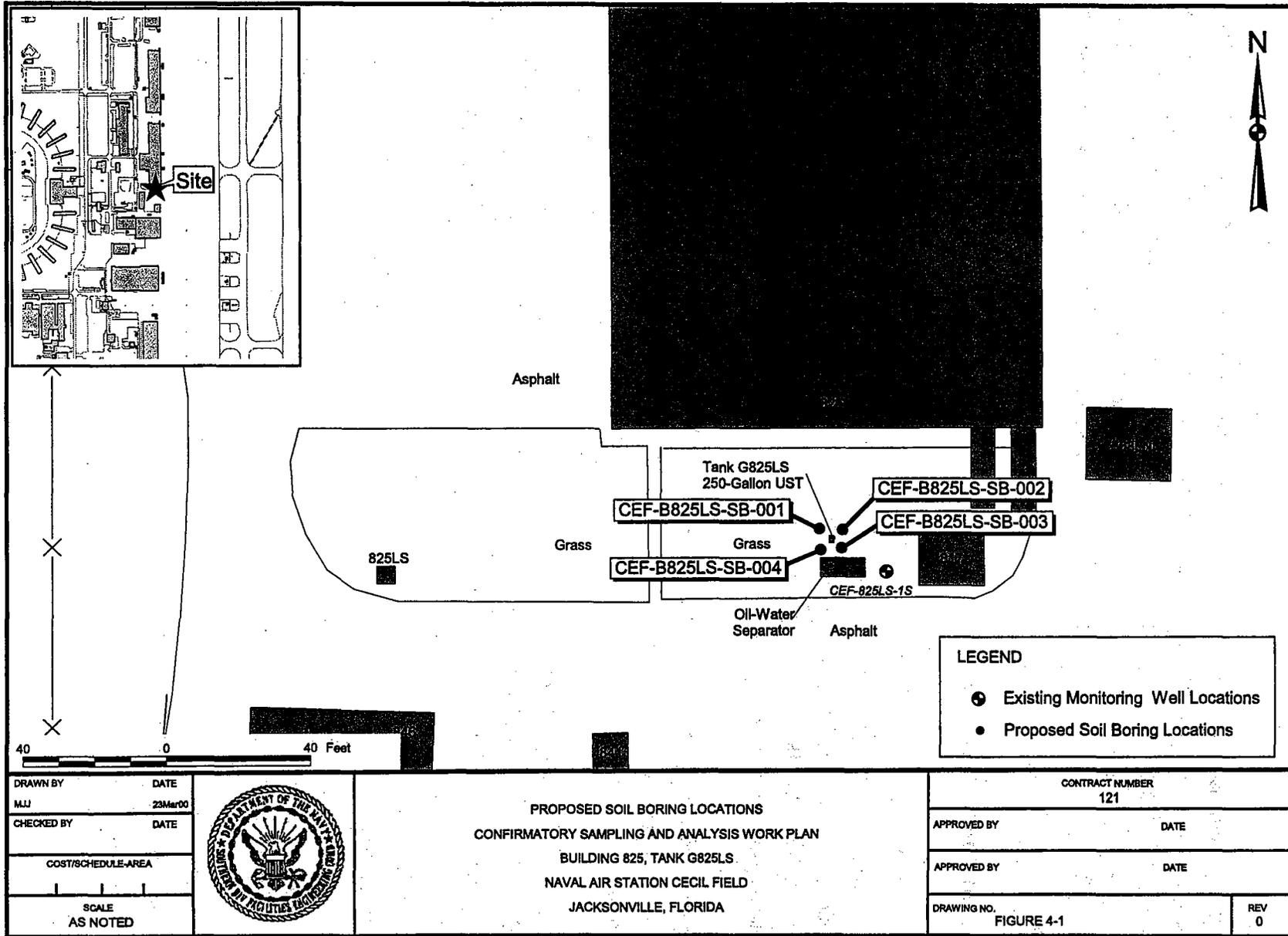
4.1 BUILDING 825, TANK G825LS

Tank G825LS is an UST located just north of an oil-water separator on the south side of Building 825 and east of Building 825LS (Figure 4-1). Building 825 was used as a hangar to house four separate fighter squadrons, and Building 825LS was operated as a lift station, which received wastewater from aircraft wash racks (ABB-ES, 1994). The UST has a 250-gallon capacity and was used to store diesel fuel for the lift station generator (ABB-ES, 1997).

Since this site is on the airport apron that is operated by Jaxport, this sampling must be coordinated with Jaxport Air Operations and the building tenants in the nearby hangars. Ramp safety requirements must be followed. At least one field crewmember will have ramp training.

The tank will be visually inspected to determine whether it is empty or not, and a visual inspection of the area around the tank will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then four soil borings will be advanced to the water table. The proposed soil boring sampling plan will be conducted as identified in Figure 4-1 and on Table 4-1. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID. As agreed upon in the Final POA (TtNUS, 2000), no soil samples will be collected for laboratory analysis at this time.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then existing monitoring well CEF-825LS-1S will be sampled and analyzed for the KAG constituents listed on Table 2-1. The location of the monitoring well is shown on Figure 4-1.



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SCALE AS NOTED	



PROPOSED SOIL BORING LOCATIONS
 CONFIRMATORY SAMPLING AND ANALYSIS WORK PLAN
 BUILDING 825, TANK G825LS
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

LEGEND	
⊙	Existing Monitoring Well Locations
●	Proposed Soil Boring Locations

CONTRACT NUMBER 121	
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APPROVED BY	DATE
DRAWING NO. FIGURE 4-1	REV 0

Table 4-1

**Proposed Soil Sample Summary
Building 825
Tank G825LS**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B825LS-SB-001-XX	5 feet northeast of Tank G825LS	1 to ∇	OVA-FID
CEF-B825LS-SB-002-XX	5 feet northeast of Tank G825LS	1 to ∇	OVA-FID
CEF-B825LS-SB-003-XX	5 feet southeast of Tank G825LS	1 to ∇	OVA-FID
CEF-B825LS-SB-004-XX	5 feet southwest of Tank G825LS	1 to ∇	OVA-FID
CEF-B825LS-GW-1S-01	At well CEF-825LS-1S	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

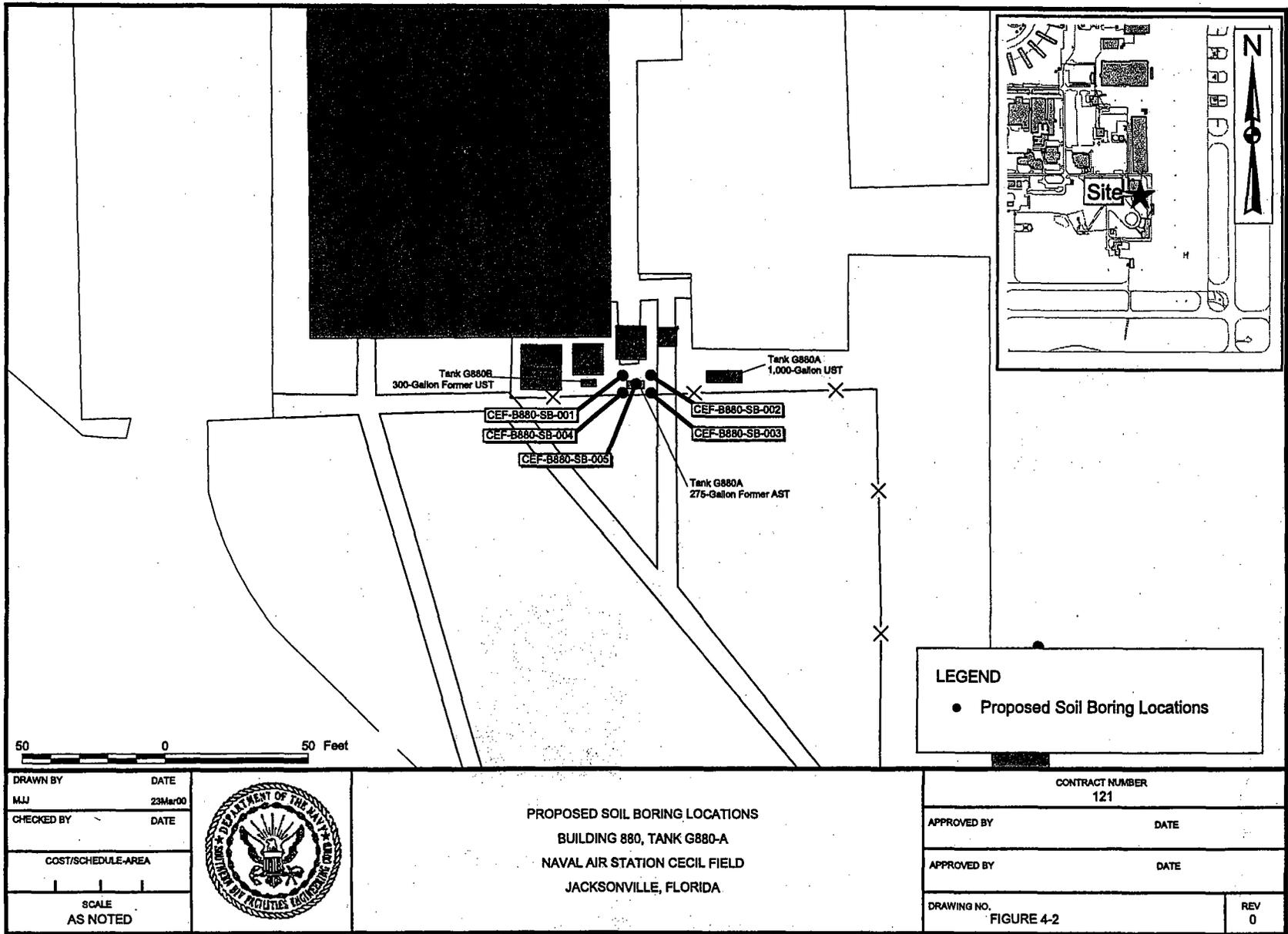
KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

4.2 BUILDING 880, TANK G880-A

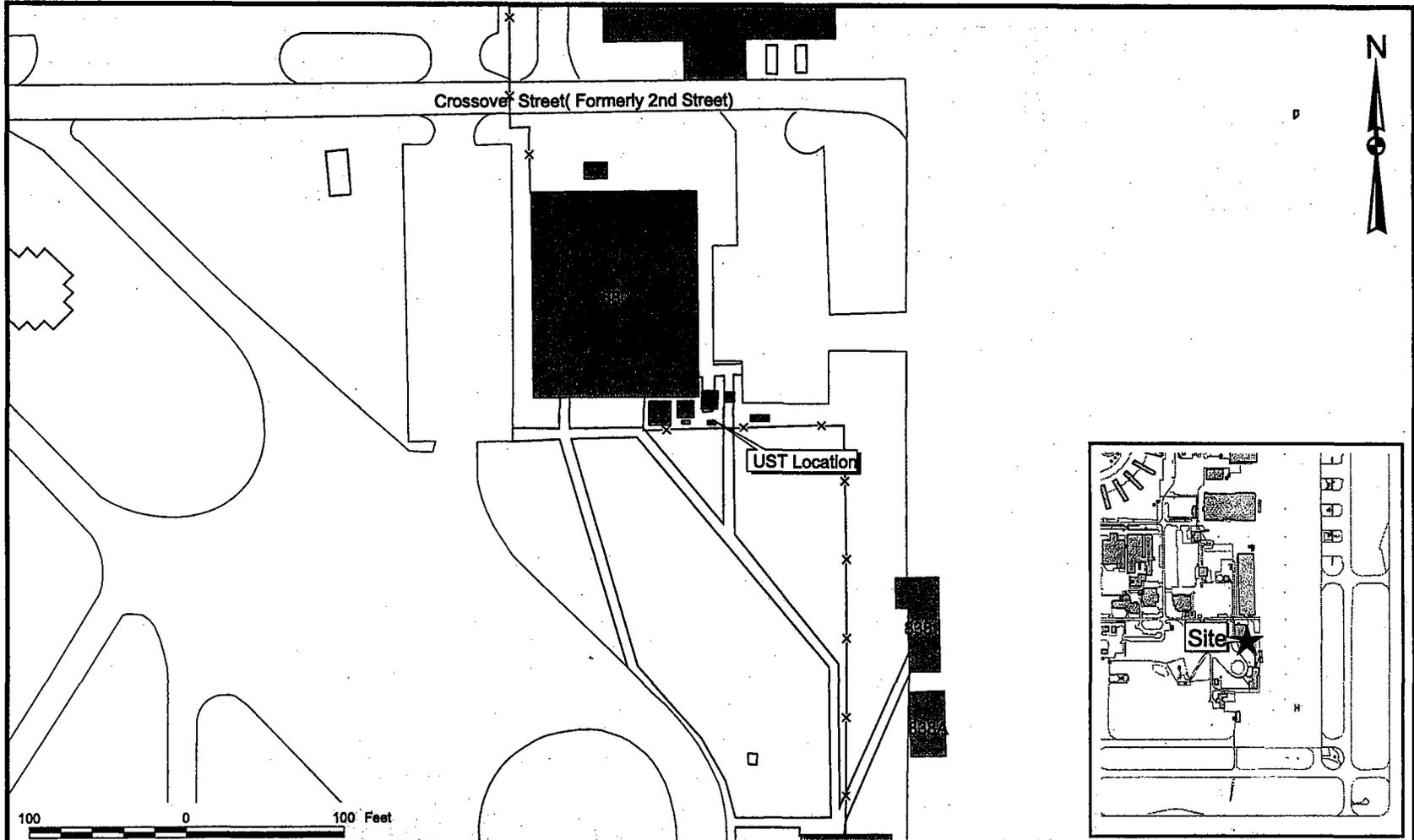
Tank G880-A is a former above ground storage tank (AST) located southeast of Building 880 (Figure 4-2). Building 880 is located south of Crossover Street and north-northwest of the Control Tower (Figure 4-3). The facility housed electronic equipment and operations for Radar Air Traffic Control (ABB-ES, 1994). The AST has a 275-gallon capacity and it was used to store diesel fuel for the boilers located in the mechanical maintenance room in the building (ABB-ES, 1994).

TtNUS personnel will field locate the former center of the AST and make a visual inspection of the area around the former tank site for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then five soil borings will be advanced to the water table. The proposed soil boring sampling plan will be conducted as identified in Figure 4-2 and on Table 4-2. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID. As agreed upon in the Final POA (TtNUS, 2000), no soil samples will be collected for laboratory analysis at this time.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then a monitoring well will be installed, sampled and analyzed for the KAG constituents listed on Table 2-1. The proposed monitoring well, CEF-B880-1S, will be located at the soil boring with the highest reading or as close to that location as site conditions will allow.



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SITE LOCATION MAP
 BUILDING 880, TANK G880-A
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 121	
APPROVED BY	DATE
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DRAWING NO. FIGURE 4-3	REV 0

Table 4-2

**Proposed Soil Sample Summary
Building 880
Tank G880-A**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B880-SB-001-XX	5 feet off northwest corner of SC of Tank G880-A	1 to ∇	OVA-FID
CEF-B880-SB-002-XX	5 feet off northeast corner of SC of Tank G880-A	1 to ∇	OVA-FID
CEF-B880-SB-003-XX	5 feet off southeast corner of SC of Tank G880-A	1 to ∇	OVA-FID
CEF-B880-SB-004-XX	5 feet off southwest corner of SC of Tank G880-A	1 to ∇	OVA-FID
CEF-B880-SB-005-XX	Under former ASTs center	1 to ∇	OVA-FID
CEF-B880-GW-1S-01	To be determined by field geologist	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

4.3 BUILDING 16, TANK G16-A

Tank G16-A is an AST located just west of Building 16 (Figure 4-4). Building 16 is located on Authority Avenue just north of Lake Fretwell Street. Building 16 was used as one of the water treatment plants for the NAS Cecil Field potable water distribution system. The AST has a 1,000-gallon capacity and was used to store diesel fuel for the water plant generator (ABB-ES, 1997).

The tank will be visually inspected to determine whether it is empty or not, and a visual inspection of the area around the tank will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then four soil borings will be advanced to the water table. The proposed soil boring sampling plan will be conducted as identified in Figure 4-4 and on Table 4-3. Soil samples will be collected at depth intervals of 1 foot b1s and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID. As agreed upon in the Final POA (TINUS, 2000), no soil samples will be collected for laboratory analysis at this time.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then existing monitoring well CEF-16-1S will be sampled and analyzed for the KAG constituents listed on Table 2-1. The location of the monitoring well is shown on Figure 4-4.

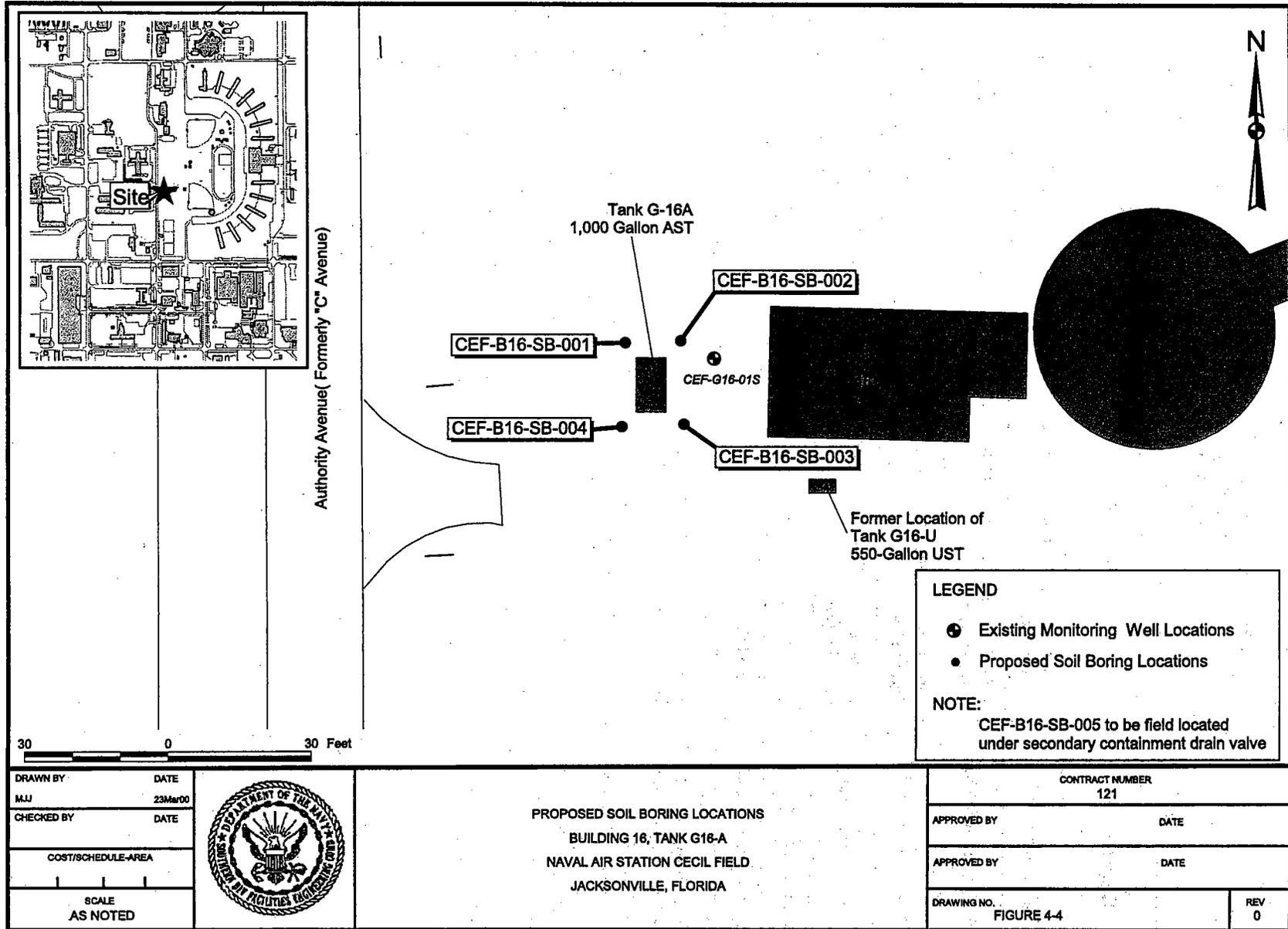


Table 4-3

**Proposed Soil Sample Summary
Building 16
Tank G16-A**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B16-SB-001-XX	5 feet off northwest corner of SC of Tank G16-A	1 to ∇	OVA-FID
CEF-B16-SB-002-XX	5 feet off northeast corner of SC of Tank G16-A	1 to ∇	OVA-FID
CEF-B16-SB-003-XX	5 feet off southeast corner of SC of Tank G16-A	1 to ∇	OVA-FID
CEF-B16-SB-004-XX	5 feet off southwest corner of SC of Tank G16-A	1 to ∇	OVA-FID
CEF-B16-SB-005-XX	Under SC drain valve	1 to ∇	OVA-FID
CEF-B16-GW-1S-01	At well CEF-16-1S	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

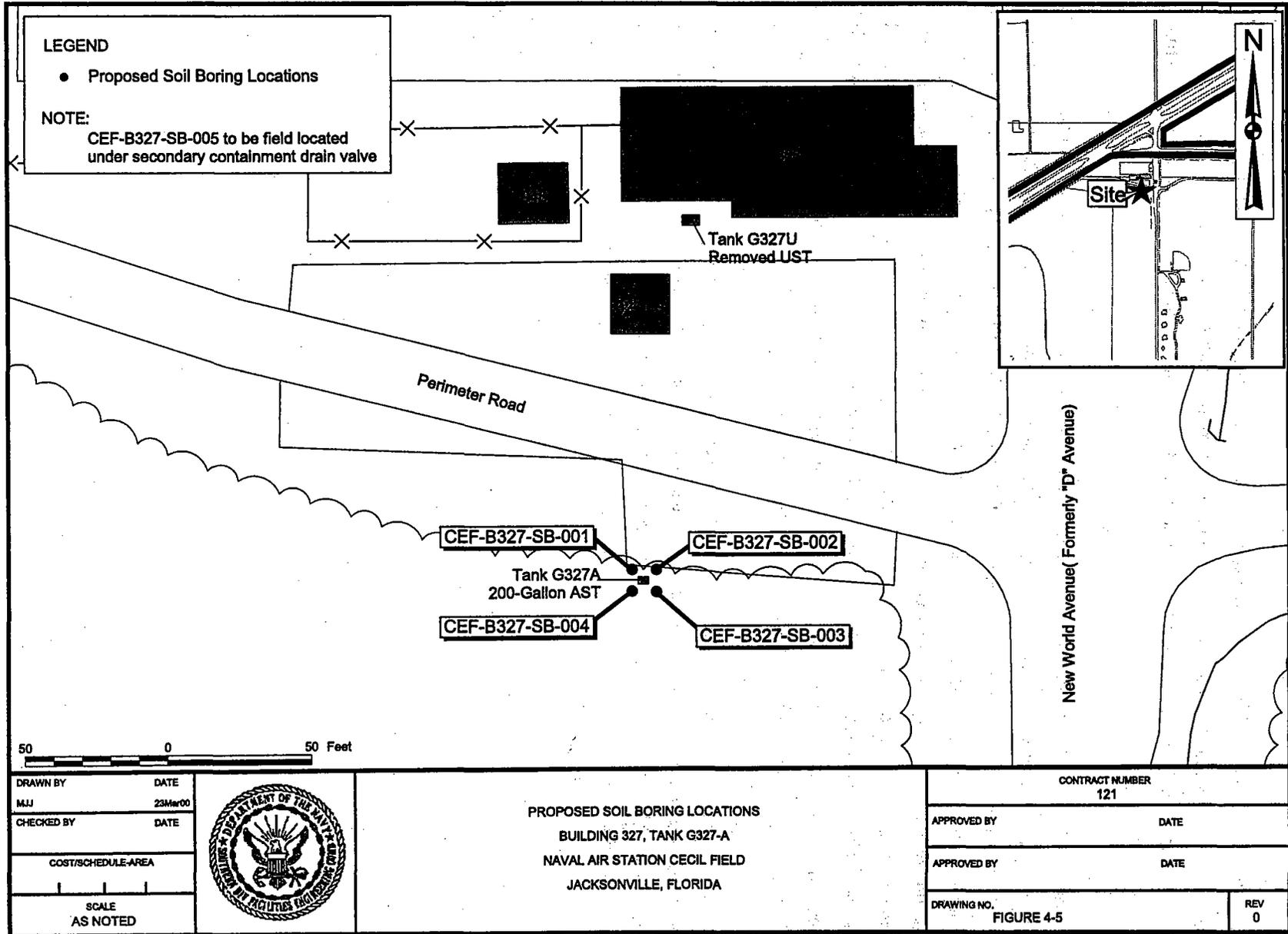
KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

4.4 BUILDING 327, TANK G327-A

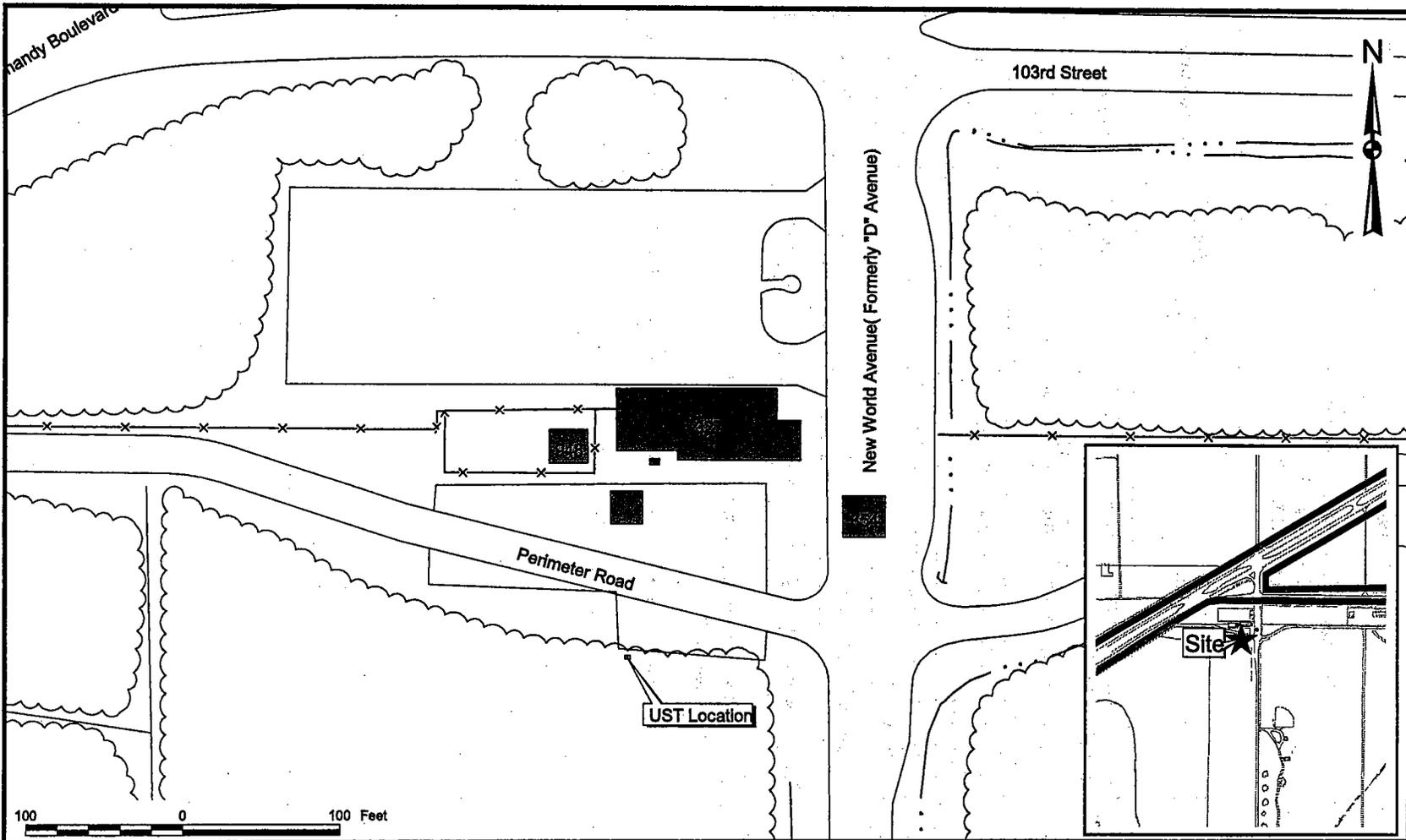
Tank G327-A is an AST located on a concrete pad in the southern parking lot of Building 327 (Figure 4-5). Building 327 was the police station and main office for the NASCF Security Department (Figure 4-6). The AST has a 200-gallon capacity and was used to store diesel fuel for the emergency generator (ABB-ES, 1994).

The tank will be visually inspected to determine whether it is empty or not, and a visual inspection of the area around the tank will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then four soil borings will be advanced to the water table. The proposed soil boring sampling plan will be conducted as identified in Figure 4-5 and on Table 4-4. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID. As agreed upon in the Final POA (TINUS, 2000), no soil samples will be collected for laboratory analysis at this time.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then a monitoring well will be installed, sampled and analyzed for the KAG constituents listed on Table 2-1. The proposed monitoring well, CEF-B327-1S, will be located at the soil boring with the highest reading or as close to that location as site conditions will allow.



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SITE LOCATION MAP
 BUILDING 327, TANK G327-A
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

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Table 4-4

**Proposed Soil Sample Summary
Building 327
Tank G327-A**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B327-SB-001-XX	5 feet off northwest corner of SC of Tank G327-A	1 to ∇	OVA-FID
CEF-B327-SB-002-XX	5 feet off northeast corner of SC of Tank G327-A	1 to ∇	OVA-FID
CEF-B327-SB-003-XX	5 feet off southeast corner of SC of Tank G327-A	1 to ∇	OVA-FID
CEF-B327-SB-004-XX	5 feet off southwest corner of SC of Tank G327-A	1 to ∇	OVA-FID
CEF-B327-SB-005-XX	Under SC drain valve	1 to ∇	OVA-FID
CEF-B327-GW-1S-01	To be determined by field geologist	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

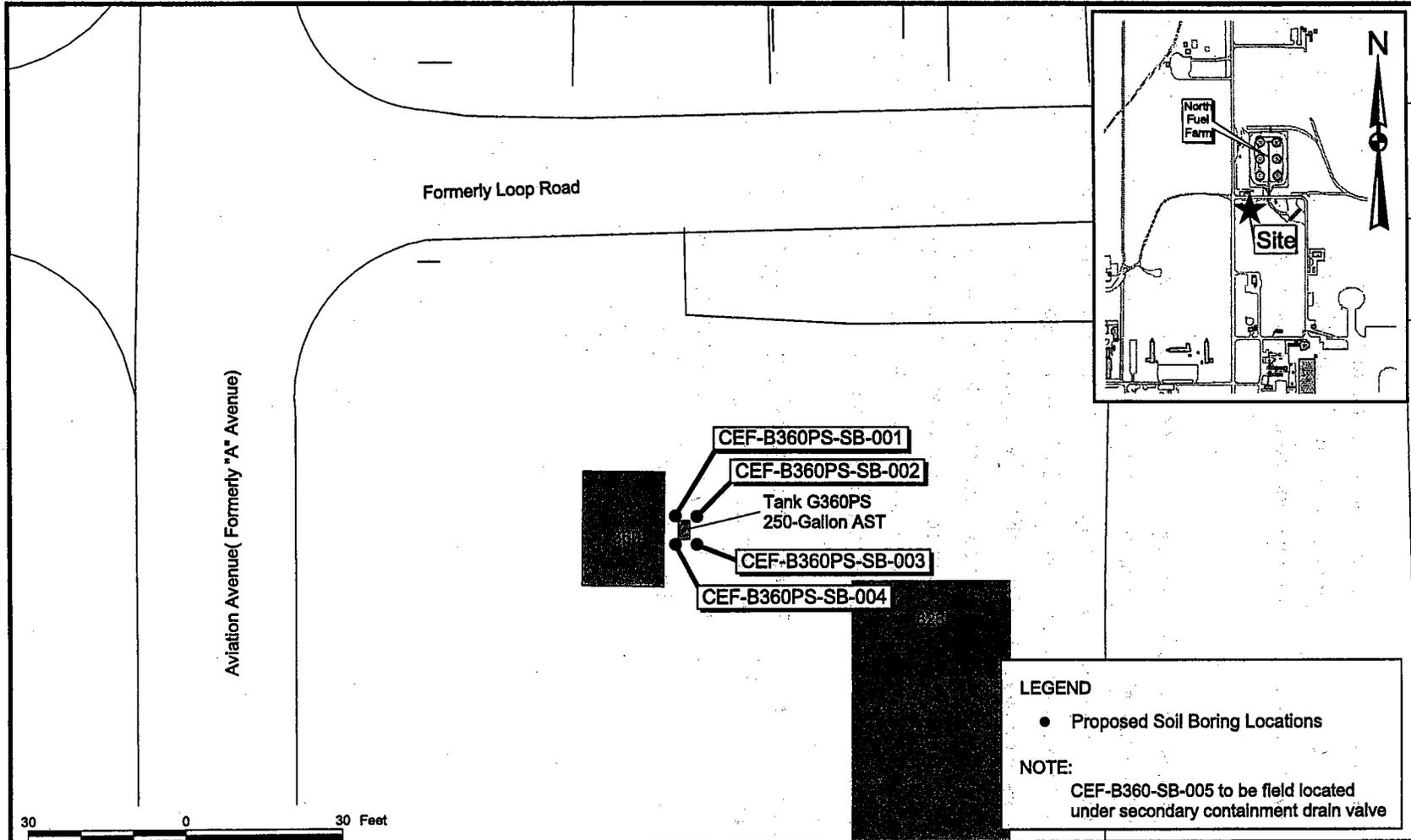
KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

4.5 BUILDING 360, TANK G360PS

Tank G360PS is an AST located in a concrete containment structure on the east side of Building 360 (Figure 4-7). Building 360 was used as a groundwater pump station (ABB-ES, 1994). The AST has a 250-gallon capacity and was used to store diesel fuel for the pump station's emergency generator (ABB-ES, 1994).

The tank will be visually inspected to determine whether it is empty or not, and a visual inspection of the area around the tank will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then five soil borings will be advanced to the water table. The proposed soil boring sampling plan will be conducted as identified in Figure 4-7 and on Table 4-5. Soil samples will be collected at depth intervals of 1 foot below land surface (bls) and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID. As agreed upon in the Final POA (TTNUS, 2000), no soil samples will be collected for laboratory analysis at this time.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then a monitoring well will be installed, sampled and analyzed for the KAG constituents listed on Table 2-1. The proposed monitoring well, CEF-B360-1S, will be located at the soil boring with the highest reading or as close to that location as site conditions will allow.



LEGEND

- Proposed Soil Boring Locations

NOTE:
 CEF-B360-SB-005 to be field located under secondary containment drain valve

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PROPOSED SOIL BORING LOCATIONS
 BUILDING 360, TANK G360PS
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 121	
APPROVED BY	DATE
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DRAWING NO. FIGURE 4-7	REV 0

PAGIS/CECIL/tank_360ps.apr 29Mar00 MJJ Layout1

Table 4-5

**Proposed Soil Sample Summary
Building 360
Tank G360PS**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B360PS-SB-001-XX	5 feet off northwest corner of SC of Tank G360PS	1 to ∇	OVA-FID
CEF-B360PS-SB-002-XX	5 feet off northeast corner of SC of Tank G360PS	1 to ∇	OVA-FID
CEF-B360PS-SB-003-XX	5 feet off southeast corner of SC of Tank G360PS	1 to ∇	OVA-FID
CEF-B360PS-SB-004-XX	5 feet off southwest corner of SC of Tank G360PS	1 to ∇	OVA-FID
CEF-B360PS-SB-005-XX	Under SC drain valve	1 to ∇	OVA-FID
CEF-B360PS-GW-1S-01	To be determined by field geologist	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

4.6 BUILDING 370, TANK 370G

Tank 370G is an AST located north of Building 370 (Figure 4-8). Building 370 was the golf course maintenance shop for NASCF. The AST has a 200-gallon capacity and was used to store diesel fuel for the emergency generator (ABB-ES, 1994).

The tank will be visually inspected to determine whether it is empty or not, and a visual inspection of the area around the tank will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then five soil borings will be advanced to the water table. The proposed soil boring sampling plan will be conducted as identified in Figure 4-8 and on Table 4-6. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID. As agreed upon in the Final POA (TtNUS, 2000), no soil samples will be collected for laboratory analysis at this time.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then a monitoring well will be installed, sampled and analyzed for the KAG constituents listed on Table 2-1. The proposed monitoring well, CEF-B370-1S, will be located at the soil boring with the highest reading or as close to that location as site conditions will allow.

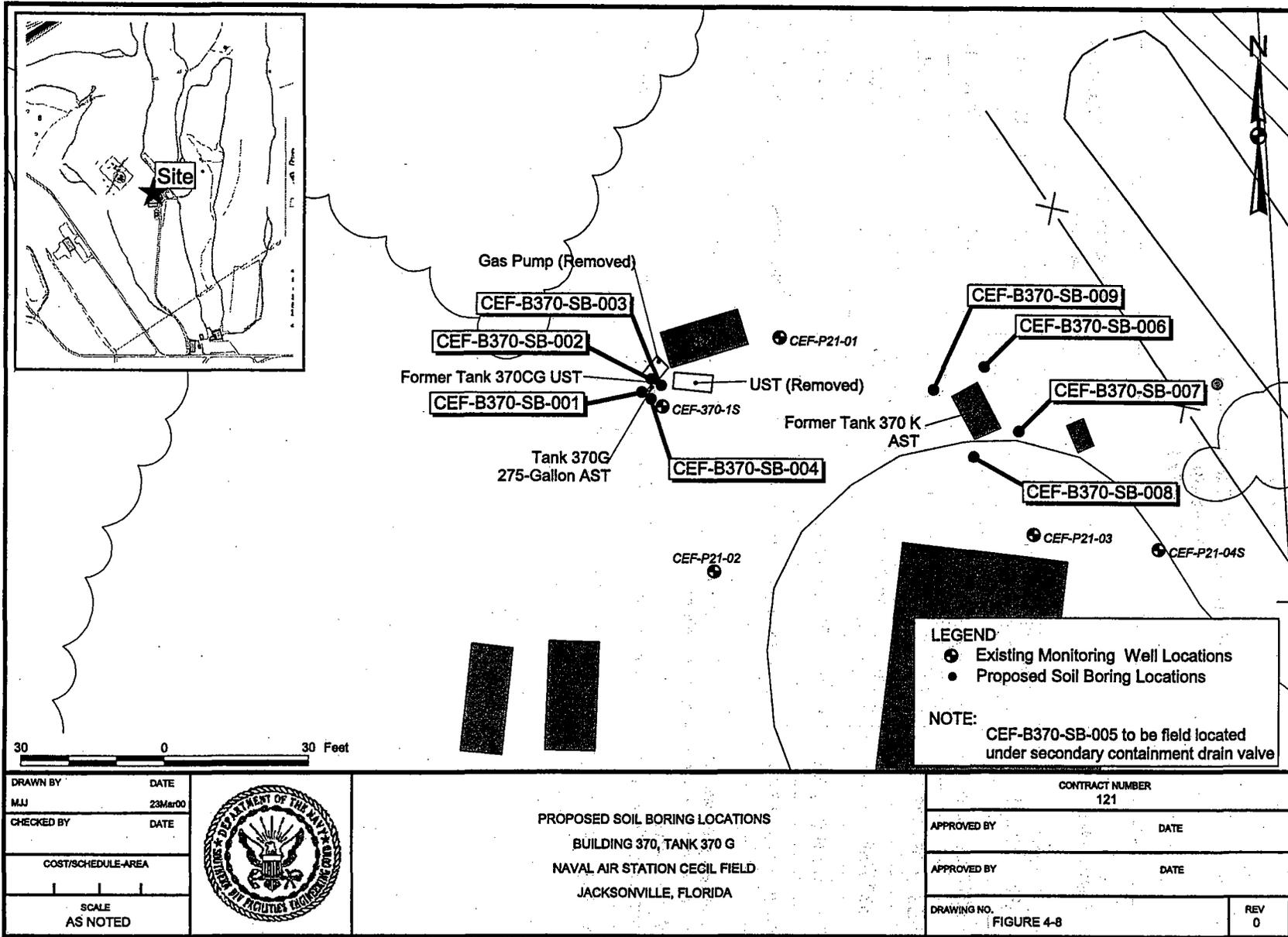


Table 4-6

Proposed Soil Sample Summary
Building 370
Tank 370G

Sample ID	Location	Sample Depth ⁽¹⁾ (feet bls)	Analyses
CEF-B370-SB-001-XX	5 feet off northwest corner of SC of Tank 370G	1 to ∇	OVA-FID
CEF-B370-SB-002-XX	5 feet off northeast corner of SC of Tank 370G	1 to ∇	OVA-FID
CEF-B370-SB-003-XX	5 feet off southeast corner of SC of Tank 370G	1 to ∇	OVA-FID
CEF-B370-SB-004-XX	5 feet off southwest corner of SC of Tank 370G	1 to ∇	OVA-FID
CEF-B370-SB-005-XX	Under SC drain valve	1 to ∇	OVA-FID
CEF-B370-GW-1S-01	To be determined by field geologist	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

4.7 BUILDING 808, TANK G808

Tank G808 is an UST located east of Building 808 (Figure 4-9). Building 808 is located on New World Avenue between Lake Fretwell and Lake Newnan Streets. The building housed the dental offices and equipment, a pharmacy, and other medically related functions. The UST has a 6,000-gallon capacity and it was used to store fuel oil for heating (ABB-ES, 1997).

The tank will be visually inspected to determine whether it is empty or not, and a visual inspection of the area around the tank will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then four soil borings will be advanced to the water table. The proposed soil boring sample plan will be as identified in Figure 4-9 and on Table 4-7. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID. As agreed upon in the Final POA (TtNUS, 2000), no soil samples will be collected for laboratory analysis at this time.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then existing monitoring well, CEF-808-1S, will be sampled and analyzed for the KAG constituents listed on Table 2-1. The location of the well is shown on Figure 4-9.

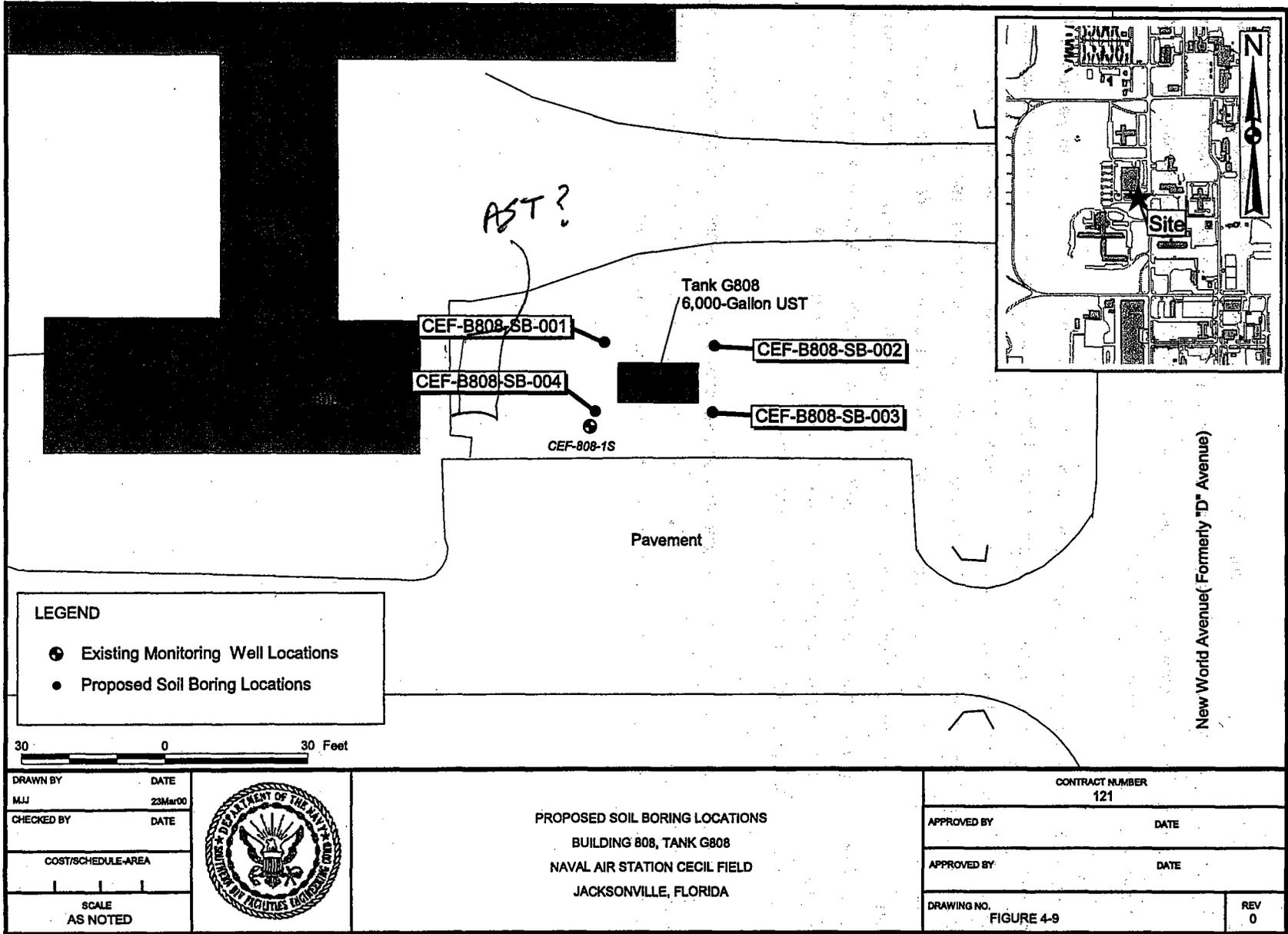


Table 4-7

**Proposed Soil Sample Summary
Building 808
Tank G808**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B808-SB-001-XX	5 feet northwest of Tank G808	1 to ∇	OVA-FID
CEF-B808-SB-002-XX	5 feet northeast of Tank G808	1 to ∇	OVA-FID
CEF-B808-SB-003-XX	5 feet southeast of Tank G808	1 to ∇	OVA-FID
CEF-B808-SB-004-XX	5 feet southwest of Tank G808	1 to ∇	OVA-FID
CEF-B808-GW-1S-01	At well CEF-808-1S	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

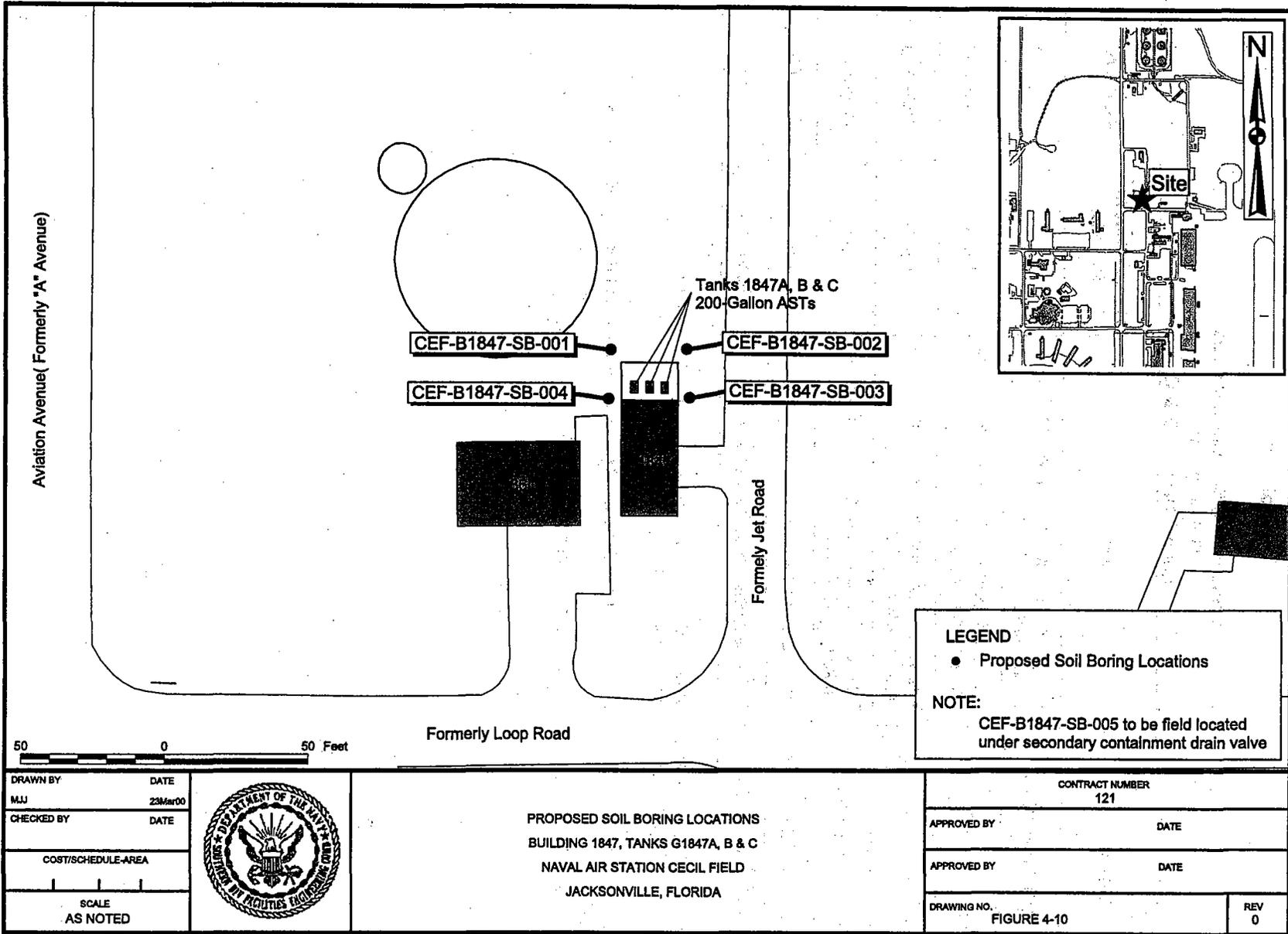
KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

4.8 BUILDING 1847, TANKS G1847 A, B & C

Tanks G1847 A, B & C are AST located north of Building 1847 (Figure 4-10). Building 1847 is located near the northeast corner of Aviation Avenue and Loop Road. The facility was designed to pump nonpotable water from the Building 361 reservoir to firefighting equipment on the flightline (ABB-ES, 1994). Each AST has a 200-gallon capacity and they were used to store diesel fuel for the emergency backup power for three firemain pumps (ABB-ES, 1994).

The tanks will be visually inspected to determine whether they are empty or not, and a visual inspection of the area around the tanks will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then five soil borings will be advanced to the water table. The proposed soil boring sample plan will be as identified in Figure 4-10 and on Table 4-8. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID. As agreed upon in the Final POA (TTNUS, 2000), no soil samples will be collected for laboratory analysis at this time.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then a monitoring well will be installed, sampled and analyzed for the KAG constituents listed on Table 2-1. The proposed monitoring well, CEF-B1847-1S, will be located at the soil boring with the highest reading or as close to that location as site conditions will allow.



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Table 4-8

**Proposed Soil Sample Summary
Building 1847
Tanks G1847- A, B & C**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B1847-SB-001-XX	5 feet off northwest corner of SC of Tanks G1847 A, B & C	1 to ∇	OVA-FID
CEF-B1847-SB-002-XX	5 feet off northeast corner of SC of Tanks G1847 A, B & C	1 to ∇	OVA-FID
CEF-B1847-SB-003-XX	5 feet off southeast corner of SC of Tanks G1847 A, B & C	1 to ∇	OVA-FID
CEF-B1847-SB-004-XX	5 feet off southwest corner of SC of Tanks G1847 A, B & C	1 to ∇	OVA-FID
CEF-B1847-SB-005-XX	Under SC drain valve	1 to ∇	OVA-FID
CEF-B1847-GW-1S-01	To be determined by field geologist	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

4.9 BUILDING 222LS, TANK G222

Tank G222 is an AST in a bermed concrete containment structure, which is attached to the southeastern end of Building 222 (Figure 4-11). Building 222LS is located near the southeast corner of Poolside Avenue and Lake Newnan Street. Building 222LS was used as a pump station to house electric and diesel powered pumps. The AST has a 150-gallon capacity and was used to store diesel fuel for the pumps (ABB-ES, 1994).

The tank will be visually inspected to determine whether it is empty or not, and a visual inspection of the area around the tank will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then four soil borings will be advanced to the water table. The proposed soil boring sample plan will be as identified in Figure 4-11 and on Table 4-9. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID. As agreed upon in the Final POA (TTNUS, 2000), no soil samples will be collected for laboratory analysis at this time.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then a monitoring well will be installed, sampled and analyzed for the KAG constituents listed on Table 2-1. The proposed monitoring well, CEF-B222LS-1S, will be located at the soil boring with the highest reading or as close to that location as site conditions will allow.

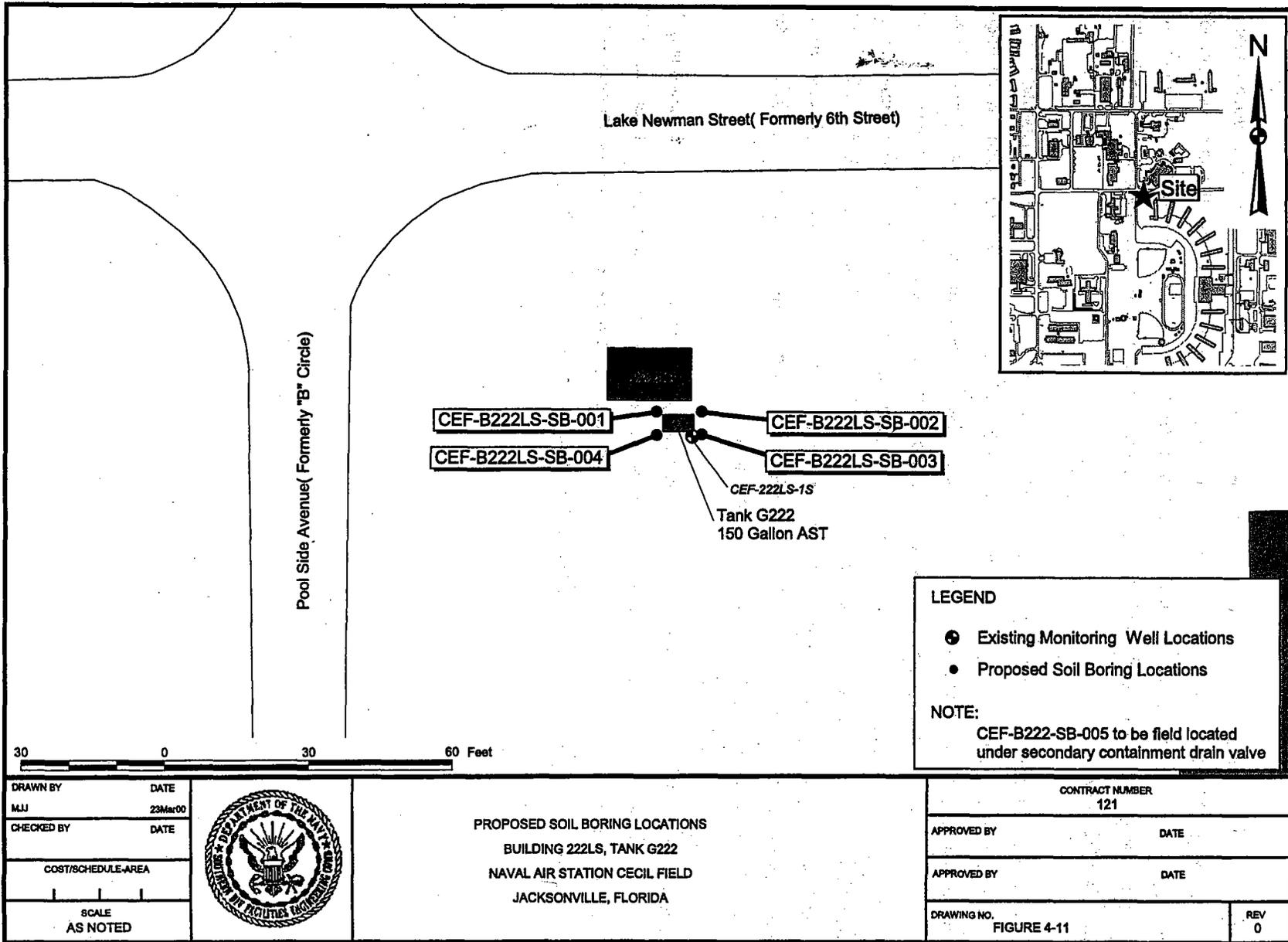


Table 4-9

**Proposed Soil Sample Summary
Building 222LS
Tank G222**

Sample ID	Location	Sample Depth ⁽¹⁾ (feet bls)	Analyses
CEF-B222LS-SB-001-XX	5 feet off northwest corner of SC of Tank G222	1 to ∇	OVA-FID
CEF-B222LS-SB-002-XX	5 feet off northeast corner of SC of Tank G222	1 to ∇	OVA-FID
CEF-B222LS-SB-003-XX	5 feet off southeast corner of SC of Tank G222	1 to ∇	OVA-FID
CEF-B222LS-SB-004-XX	5 feet off southwest corner of SC of Tank G222	1 to ∇	OVA-FID
CEF-B222LS-SB-005-XX	Under SC drain valve	1 to ∇	OVA-FID
CEF-B222LS-GW-1S-01	To be determined by field geologist	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

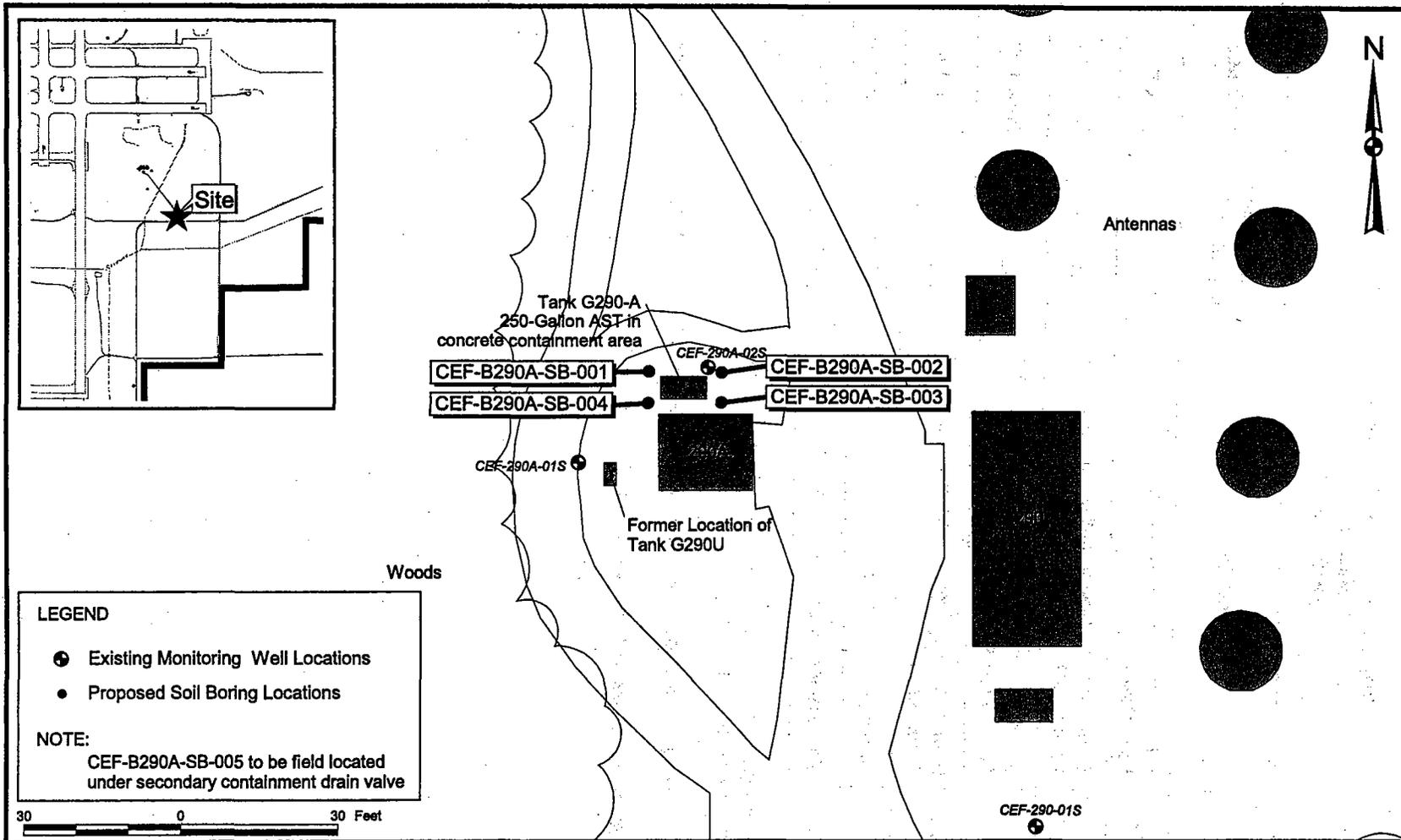
4.10 BUILDING 290A, TANK G290-A

Tank G290-A is an AST located immediately north of Building 290A (Figure 4-12). Building 290A is located southeast of the intersection of the north-south and east-west runways, and it houses a standby generator for Building 290 (ABB-ES, 1994). The AST has a 250-gallon capacity and was used to store diesel fuel for the standby generator (ABB-ES, 1994).

Since this site is on the airport apron that is operated by Jaxport, this sampling must be coordinated with Jaxport Air Operations and the building tenants in the nearby hangars. Ramp safety requirements must be followed. At least one field crewmember will have ramp training.

The tank will be visually inspected to determine whether it is empty or not, and a visual inspection of the area around the tank will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then five soil borings will be advanced to the water table. The proposed soil boring sampling plan will be conducted as identified in Figure 4-12 and on Table 4-10. Soil samples will be collected at depth intervals of 1 foot bis and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID. As agreed upon in the Final POA (TtNUS, 2000), no soil samples will be collected for laboratory analysis at this time.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then existing monitoring well CEF-290-2S will be sampled and analyzed for the KAG constituents listed on Table 2-1. The location of the monitoring well is shown on Figure 4-12.



LEGEND

- Existing Monitoring Well Locations
- Proposed Soil Boring Locations

NOTE:
CEF-B290A-SB-005 to be field located under secondary containment drain valve

30 0 30 Feet

DRAWN BY	DATE
MJJ	23Mar00
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	



PROPOSED SOIL BORING LOCATIONS
BUILDING 290A, TANK G290-A
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER	
121	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	REV
FIGURE 4-12	0

Table 4-10

**Proposed Soil Sample Summary
Building 290A
Tank G290-A**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B290A-SB-001-XX	5 feet off northwest corner of SC of Tank G290-A	1 to ∇	OVA-FID
CEF-B290A-SB-002-XX	5 feet off northeast corner of SC of Tank G290-A	1 to ∇	OVA-FID
CEF-B290A-SB-003-XX	5 feet off southeast corner of SC of Tank G290-A	1 to ∇	OVA-FID
CEF-B290A-SB-004-XX	5 feet off southwest corner of SC of Tank G290-A	1 to ∇	OVA-FID
CEF-B290A-SB-005-XX	Under SC drain valve	1 to ∇	OVA-FID
CEF-B290-GW-2S-01	To be determined by field geologist	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

4.11 BUILDING 1826, TANKS 1826 A, B & C

Tanks G1826- A, B & C are AST located on concrete on the south side of Building 1826 (Figure 4-13). Building 1826 is located west of the runway complex in the midst of Aviation Avenue, Skillside Street, and Lake Fretwell Street. It houses the water heating and cooling systems for Aircraft Hangar 1820 (ABB-ES, 1994). Each AST has a 275-gallon capacity and they were used to store diesel fuel for the emergency backup power for three firemain pumps (ABB-ES, 1994).

Since this site is adjacent to the property that is operated by Boeing, this sampling must be coordinated with Boeing security. It also appears from the last CSR (ABB-ES, 1997) that the tanks are in an area paved with asphalt or concrete. This work will require coordination with concrete cutting services for up to five 6-inch circular holes to be cut at the designated locations (Figure 4-13). Following soil boring activities, the holes should be backfilled with native material to the same level as the existing native material while allowing enough room to complete the hole with asphalt patch or concrete patch material. If a monitoring well will be required at the site, the borehole for the well (as determined by the field geologist) will be left without a patch. If the monitoring well installation is scheduled for more than a day from performing the soil boring activity, then the borehole will be backfilled with native soil, topped with a plastic plug made of visqueen, and top that with the pavement "cookie". A small traffic cone will be left in place over this location until drilling activities begin.

The tanks will be visually inspected to determine whether they are empty or not, and a visual inspection of the area around the tanks will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then five soil borings will be advanced to the water table. The proposed soil boring plan will be as identified on Figure 4-13 and on Table 4-11. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID. As agreed upon in the Final POA (TtNUS, 2000), no soil samples will be collected for laboratory analysis at this time.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then a monitoring well will be installed, sampled and analyzed for the KAG constituents listed on Table 2-1. The monitoring well will be located at the soil boring with the highest reading or as close to that location as site conditions will allow.

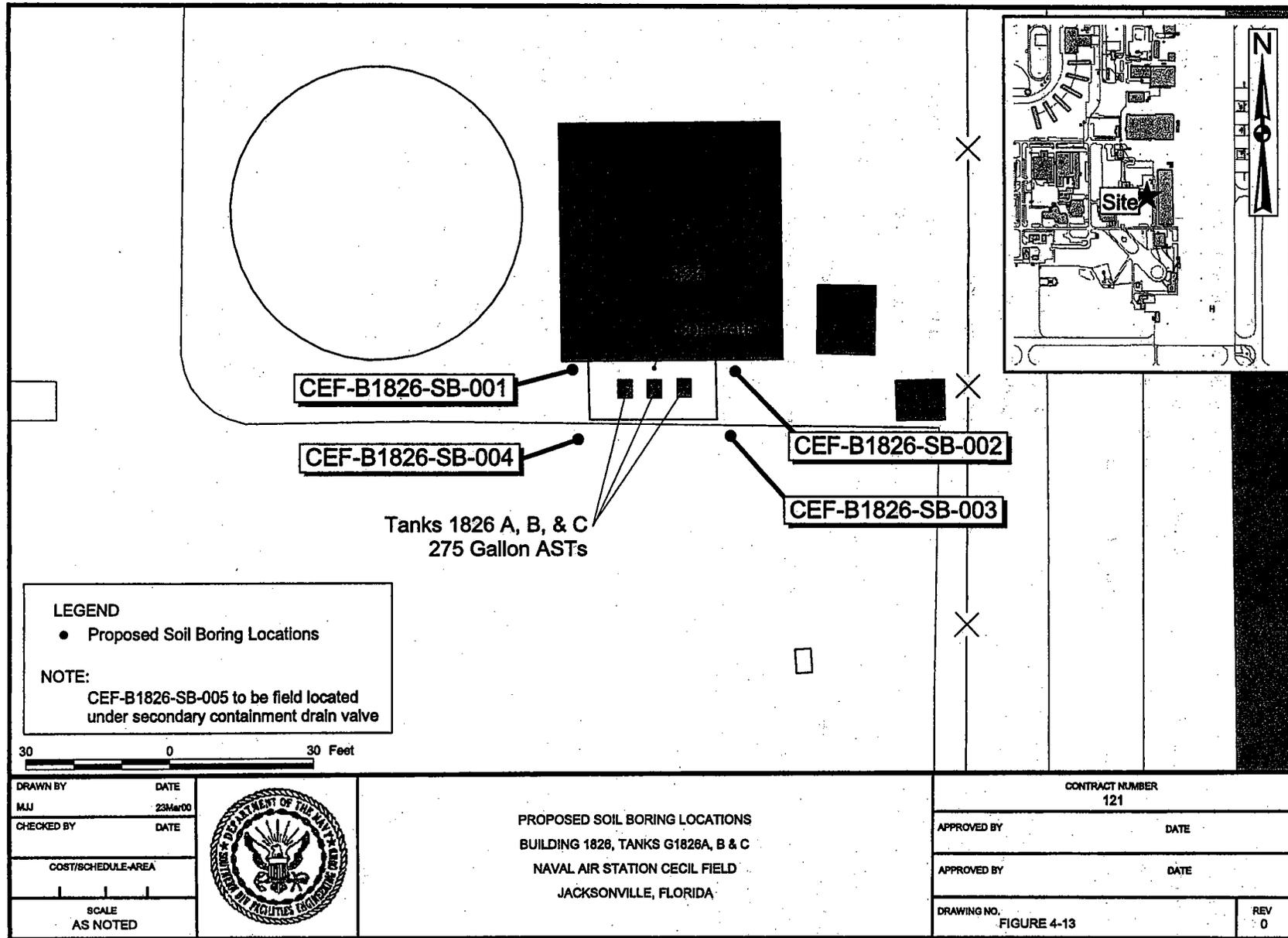


Table 4-11

**Proposed Soil Sample Summary
Building 1826
Tanks G1826 A, B & C**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B1826-SB-001-XX	5 feet off northwest corner of SC of Tanks G1826- A, B & C	1 to ∇	OVA-FID
CEF-B1826-SB-002-XX	5 feet off northeast corner of SC of Tanks G1826- A, B & C	1 to ∇	OVA-FID
CEF-B1826-SB-003-XX	5 feet off southeast corner of SC of Tanks G1826- A, B & C	1 to ∇	OVA-FID
CEF-B1826-SB-004-XX	5 feet off southwest corner of SC of Tanks G1826- A, B & C	1 to ∇	OVA-FID
CEF-B1826-SB-005-XX	Under SC drain valve	1 to ∇	OVA-FID
CEF-B1826-GW-1S-01	To be determined by field geologist	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

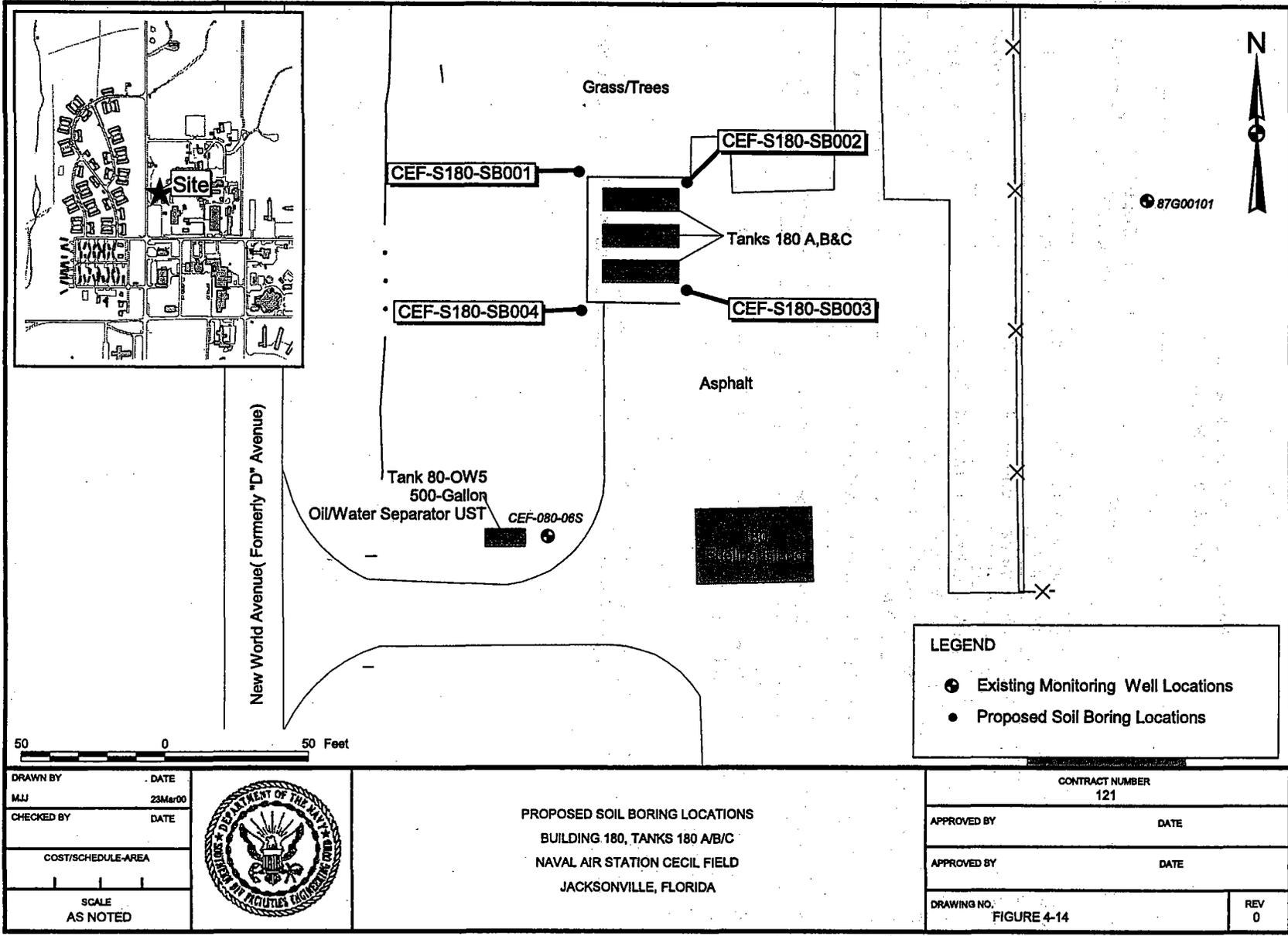
4.12 BUILDING 180, TANKS 180 A, B & C

Tanks 180 A, B & C consists of three AST located northwest of Building 80 (Figure 4-14). Each AST has a 10,000-gallon capacity. One AST was used to store diesel fuel and the other two were used to store gasoline.

The tank will be visually inspected to determine whether it is empty or not, and a visual inspection of the area around the tank will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then four soil borings will be advanced to the water table. The proposed soil boring plan will be as identified in Figure 4-14 and on Table 4-12. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID.

In accordance with Section 3.7.2 of the Final POA (TTNUS, 2000), the sample with the highest OVA-FID reading will be analyzed for KAG constituents. The particular KAG analytical methods that will be collected are listed on Table 2-1. If the OVA-FID readings are all below 50 ppm, then no samples will be collected for laboratory analysis.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then a monitoring well will be installed, sampled and analyzed for the KAG constituents listed on Table 2-1. The proposed monitoring well, CEF-80-15S, will be located at the soil boring with the highest reading or as close to that location as site conditions will allow.



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SCALE AS NOTED	



PROPOSED SOIL BORING LOCATIONS
 BUILDING 180, TANKS 180 A/B/C
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

LEGEND	
●	Existing Monitoring Well Locations
●	Proposed Soil Boring Locations

CONTRACT NUMBER 121	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 4-14	REV 0

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Table 4-12

**Proposed Soil Sample Summary
Tanks 180 A, B & C**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-S180-SB-001-XX	5 feet off northwest corner of SC of Tanks 180 A, B & C	1 to ∇	OVA-FID
CEF-S180-SB-002-XX	5 feet off northeast corner of SC of Tanks 180 A, B & C	1 to ∇	OVA-FID
CEF-S180-SB-003-XX	5 feet off southeast corner of SC of Tanks 180 A, B & C	1 to ∇	OVA-FID
CEF-S180-SB-004-XX	5 feet off southwest corner of SC of Tanks 180 A, B & C	1 to ∇	OVA-FID
CEF-S180-SB-00Y-XX	To be determined by field geologist	TBD	KAG
CEF-80-GW-15S-01	To be determined by field geologist	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Y = Boring location number.

TBD = To Be Determined

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

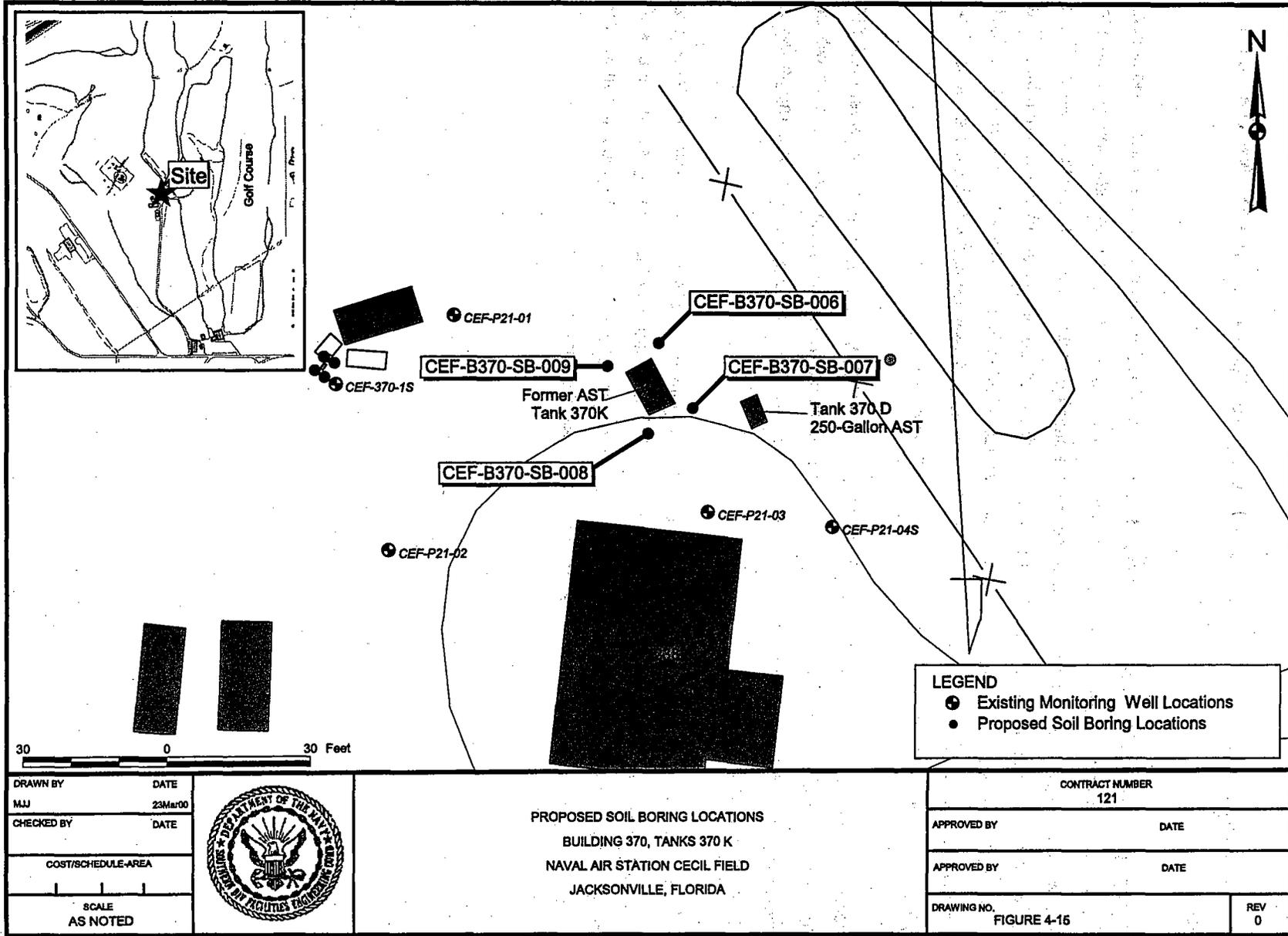
4.13 BUILDING 370, TANK 370 K

Tank 370 K consisted of one AST located north of Building 370 (Figure 4-15). The AST was used to store diesel fuel.

The former tank area will be visually inspected to for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then four soil borings will be advanced to the water table. The proposed soil boring sampling plan will be conducted as identified in Figure 4-15 and on Table 4-13. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID.

In accordance with Section 3.7.2 of the Final POA (TTNUS, 2000), the sample with the highest OVA-FID reading will be analyzed for KAG constituents. The particular KAG analytical methods that will be collected are listed on Table 2-1. If the OVA-FID readings are all below 50 ppm, then no samples will be collected for laboratory analysis.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then a monitoring well will be installed, sampled and analyzed for the KAG constituents listed on Table 2-1. The proposed monitoring well, CEF-B370-2S, will be located at the soil boring with the highest reading or as close to that location as site conditions will allow.



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Table 4-13

**Proposed Soil Sample Summary
Building 370
Tank 370K**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B370-SB-006-XX	5 feet off northwest corner of Tank 370K	1 to ∇	OVA-FID
CEF-B370-SB-007-XX	5 feet off northeast corner of Tank 370K	1 to ∇	OVA-FID
CEF-B370-SB-008-XX	5 feet off southeast corner of Tank 370K	1 to ∇	OVA-FID
CEF-B370-SB-009-XX	5 feet off southwest corner of Tank 370K	1 to ∇	OVA-FID
CEF-B370-SB-00Y-XX	To be determined by field geologist	TBD	KAG
CEF-B370-GW-2S-01	To be determined by field geologist	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Y = Boring location number.

TBD = To Be Determined

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

4.14 BUILDING 81, TANK 81

Former Tank 81 consisted of one UST located east of Building 81 (Figure 4-16). The UST was used to store diesel fuel. Figure 4-17 indicates the location of the site.

This work will require coordination with concrete cutting services for four 6-inch circular holes to be cut at the designated locations (Figure 4-16). Following soil boring activities, the holes should be backfilled with native material to the same level as the existing native material while allowing enough room to complete the hole with asphalt patch or concrete patch material.

A visual inspection of the area around the former tank area will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then four soil borings will be advanced to the water table. The proposed soil boring sampling plan will be conducted as identified in Figure 4-16 and on Table 4-14. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID.

In accordance with Section 3.7.2 of the Final POA (TTNUS, 2000), the sample with the highest OVA-FID reading will be analyzed for KAG constituents. The particular KAG analytical methods that will be collected are listed on Table 2-1. If the OVA-FID readings are all below 50 ppm, then no samples will be collected for laboratory analysis.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then existing monitoring well CEF-81-5S (Figure 4-16) will be sampled and analyzed for the KAG constituents listed on Table 2-1.

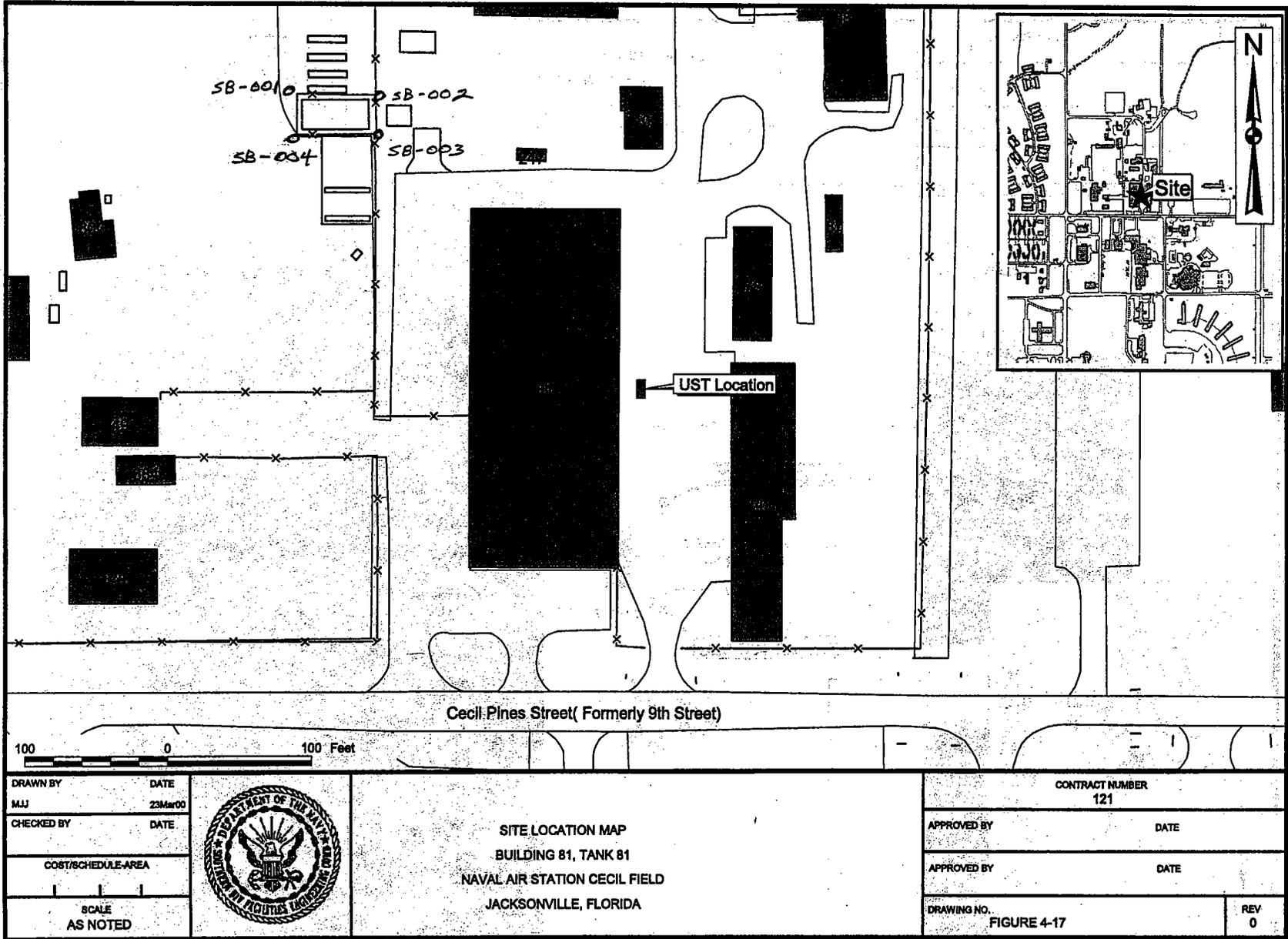


Table 4-14

**Proposed Soil Sample Summary
Building 81
Tank 81**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B81-SB-001-XX	5 feet off northwest corner of Tank 81	1 to ∇	OVA-FID
CEF-B81-SB-002-XX	5 feet off northeast corner of Tank 81	1 to ∇	OVA-FID
CEF-B81-SB-003-XX	5 feet off southeast corner of Tank 81	1 to ∇	OVA-FID
CEF-B81-SB-004-XX	5 feet off southwest corner of Tank 81	1 to ∇	OVA-FID
CEF-B81-SB-00Y-XX	To be determined by field geologist	TBD	KAG
CEF-81-GW-5S-01	At well CEF-81-5S	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

Y = Boring location number.

TBD = To Be Determined

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

4.15 BUILDING 384, TANK 384

Tank 384 consists of one former AST located south of Building 384 (Figure 4-18). The AST was used to store diesel fuel.

This work will require coordination with concrete cutting services for four 6-inch circular holes to be cut at the designated locations (Figure 4-18). Following soil boring activities, the holes should be backfilled with native material to the same level as the existing native material while allowing enough room to complete the hole with asphalt patch or concrete patch material.

The tank will be visually inspected to determine whether it is empty or not, and a visual inspection of the area around the tank will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then four soil borings will be advanced to the water table. The proposed soil boring sampling plan will be as identified in Figure 4-18 and on Table 4-15. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID.

In accordance with Section 3.7.2 of the Final POA (TtNUS, 2000), the sample with the highest OVA-FID reading will be analyzed for KAG constituents. The particular KAG analytical methods that will be collected are listed on Table 2-1. If the OVA-FID readings are all below 50 ppm, then no samples will be collected for laboratory analysis.

If a visual inspection reveals soil staining and/or stressed vegetation or a soil vapor reading exceeding 50 ppm is encountered, then existing monitoring well CEF-80-5S (Figure 4-18) will be sampled and analyzed for the KAG constituents listed on Table 2-1.

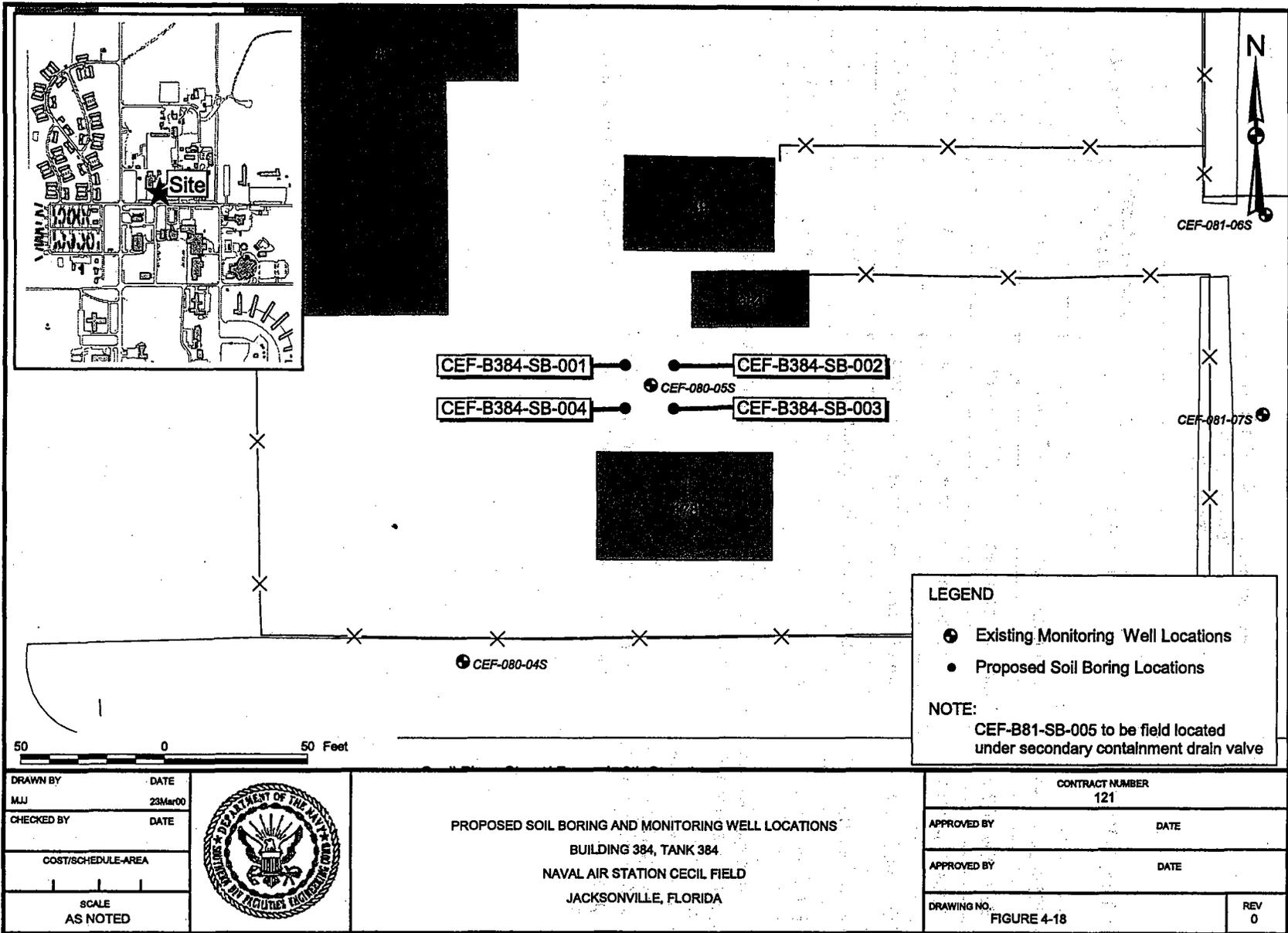


Table 4-15

**Proposed Soil Sample Summary
Building 384
Tank 384**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-B384-SB-001-XX	5 feet off northwest corner of Tank 384	1 to ∇	OVA-FID
CEF-B384-SB-002-XX	5 feet off northeast corner of Tank 384	1 to ∇	OVA-FID
CEF-B384-SB-003-XX	5 feet off southeast corner of Tank 384	1 to ∇	OVA-FID
CEF-B384-SB-004-XX	5 feet off southwest corner of Tank 384	1 to ∇	OVA-FID
CEF-B384-SB-00Y-XX	To be determined by field geologist	TBD	KAG
CEF-80-GW-5S-01	At well CEF-80-5S	Mid-screen	KAG

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected

∇ = Water Table

Y = Boring location number.

TBD = To Be Determined

KAG = Kerosene Analytical Group (as defined by Chapter 62-770, F.A.C.)

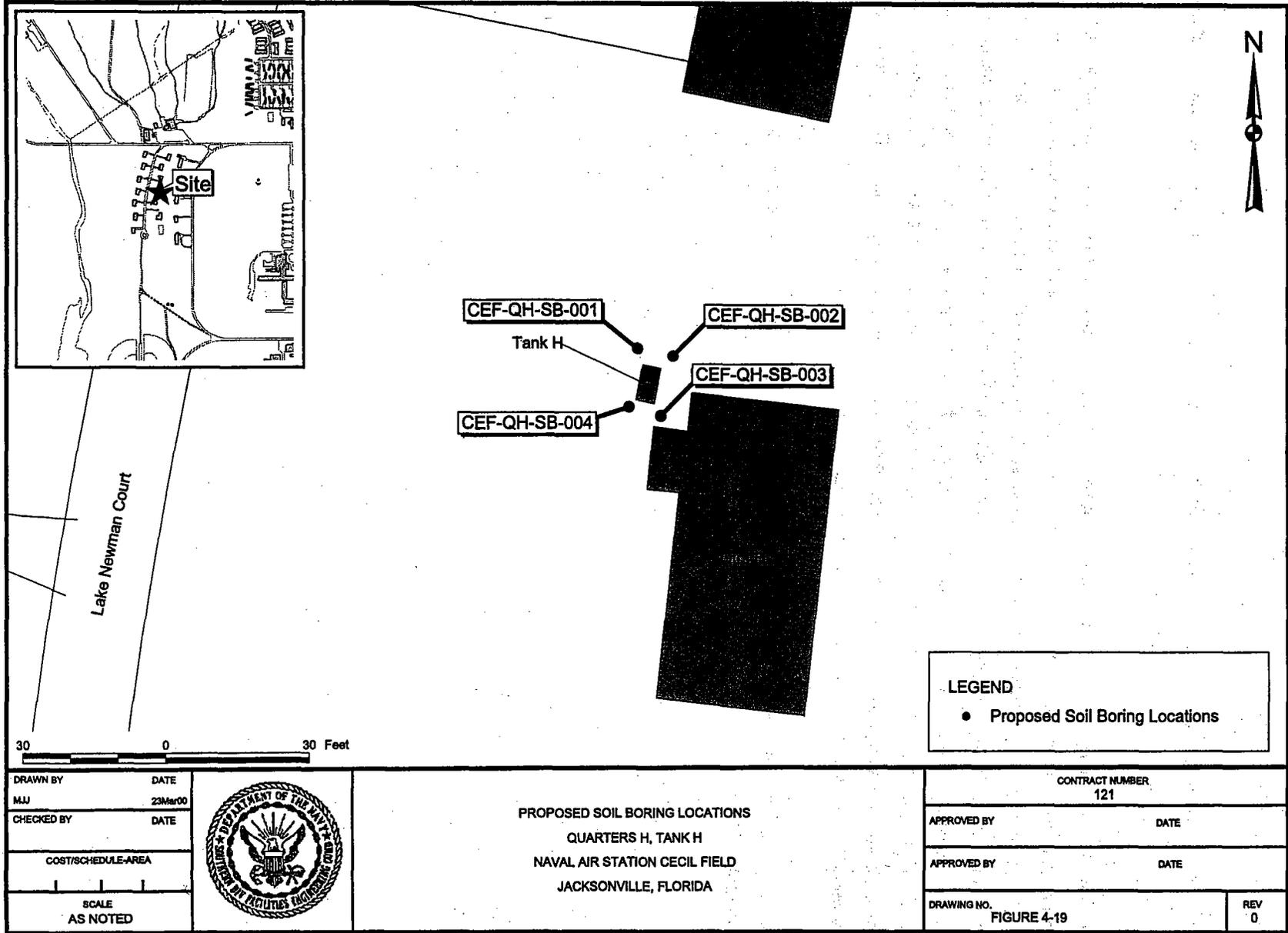
Mid-screen indicates the tubing for groundwater collection is to be set about the middle of the screened interval.

4.16 QUARTERS H, TANK H

Tank H consisted of one UST located northwest of Quarters H (Figure 4-19). The UST was used to store heating oil.

The tank will be visually inspected to determine whether it is empty or not, and a visual inspection of the area around the tank area will be made for signs of soil staining and/or stressed vegetation, which might indicate a fuel spill. If the inspection indicates a fuel spill, the proposed soil boring closest to the spill will be adjusted to go through the center of the staining and/or stressed vegetation area. If the inspection does not indicate a release, then four soil borings will be advanced to the water table. The proposed soil boring sampling plan will be conducted as identified in Figure 4-19 and on Table 4-16. Soil samples will be collected at depth intervals of 1 foot bls and every 2 feet thereafter to the water table. The samples will be screened for hydrocarbon vapors with an OVA-FID.

In accordance with Section 3.7.2 of the Final POA (TTNUS, 2000), no soil samples will be collected for laboratory analyses.



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COST/SCHEDULE-AREA	
SCALE AS NOTED	



PROPOSED SOIL BORING LOCATIONS
 QUARTERS H, TANK H
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 121	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 4-19	REV 0

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Table 4-16

**Proposed Soil Sample Summary
Quarters H
Tank H**

Sample ID	Location	Sample Depth⁽¹⁾ (feet bls)	Analyses
CEF-QH-SB-001-XX	5 feet off northwest corner of Tank H	1 to ∇	OVA-FID
CEF-QH-SB-002-XX	5 feet off northeast corner of Tank H	1 to ∇	OVA-FID
CEF-QH-SB-003-XX	5 feet off southeast corner of Tank H	1 to ∇	OVA-FID
CEF-QH-SB-004-XX	5 feet off southwest corner of Tank H	1 to ∇	OVA-FID

1 - Soil samples will be collected at 2 ft. intervals from 1 ft. bls to the water table.

XX = Depth bls at which sample is collected.

∇ = Water Table

5.0 PROPOSED LABORATORY ANALYSIS

Soil samples for laboratory analysis will be collected from borings conducted during the soil vapor assessment (Phase I field investigation). Groundwater samples for laboratory analysis will be collected from newly installed and select existing monitoring wells (Phase 2 field investigation). The groundwater and soil samples will be analyzed in accordance with Chapter 62-770, F.A.C. (see Sections 5.1 and Section 5.2 below for specific sampling requirements regarding soil and groundwater).

5.1 SOIL INVESTIGATION

In accordance with Rule 62-770.600(3)(e), soil samples will be collected from select soil borings for fixed base laboratory analysis to confirm the OVA results. The boring locations and sample intervals will be selected to coincide with samples that exhibit high, medium and low field screening results during the soil vapor survey. The samples will be analyzed for constituents of the Kerosene Analytical Group as defined in Rule 62-770.600, F.A.C. The parameters and laboratory methods to be used are summarized in Table 2-1.

5.2 GROUNDWATER INVESTIGATION

Groundwater samples will be collected from each newly installed and select existing permanent monitoring wells and analyzed for parameters of the Kerosene Analytical Group in accordance with Rule 62-770.600, F.A.C.

6.0 PROPOSED SCHEDULE

Phase 1 of the fieldwork is proposed to begin 30 days after BCT approval of the SAP. Phase 2 of the fieldwork will begin following review and approval of the analytical results and recommendations for further assessments (if any) by the FDEP and Navy. A Final SAR or CSR will be developed after the completion of Phase 2 field activities (if any). The SAR will be submitted to the BCT for review approximately 120 days after BCT approval of sampling results is received.

7.0 REFERENCES

ABB-ES, 1997. *Base Realignment and Closure Tank Management Plan, Naval Air Station Cecil Field, Jacksonville, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina, (January).

ABB Environmental Services, Inc., (ABB-ES), 1994. *Base Realignment and Closure Environmental Baseline Survey Report, Naval Air Station Cecil Field, Jacksonville, Florida*. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), North Charleston, South Carolina (November).

ABB Environmental Services, Inc., (ABB-ES), 1997. *Confirmatory Sampling Report, Building 1826, Tanks G1826-A, G1826-B, and G1826-C, Naval Air Station Cecil Field, Jacksonville, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina, (December).

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