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REMEDIAL DESIGN FOR SOILS AT OPERABLE UNIT 6 (OU 6) SITE 11 NAS CECIL FIELD FL

8/1/1998

TETRA TECH NUS INC

Remedial Design for Soils
at
Operable Unit 6 - Site 11

Naval Air Station (NAS)
Cecil Field
Jacksonville, Florida

Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0039

August 1998

Sent 12/10/98

Summary of Soil Remedial Action at Site 11

The activities conducted at Site 11 included the excavation of soils at two locations. These two locations were identified as anomaly 4 and anomaly 7.

Anomaly 7 was being excavated based on elevated levels of Arsenic detected in soil samples and anomaly 4 was excavated to remove DBCP that was detected in soil samples. The limits of the excavation were marked based on pre-removal confirmation sampling conducted by TtNUS and the areas were marked with wooden stakes and cord.

Prior to excavation activities, the perimeter fence at anomaly 4 was knocked into the pit and collected with the low permeable liner for disposal with the soils during excavation activities. After obtaining permission from the Cecil Field Public Works, five trees were removed to move the tree line northeast of anomaly 4. CH_2MHill abandoned monitoring well CEF-11-7S, which was located in the center of anomaly 7.

Site participants were as follows:

Company	Site Contact	Responsibilities
Charleston Environmental Detachment	Terry Lewis	Excavation activities
Tetra Tech NUS, Inc.	Blake Svendsen	Remedial Design Oversight
PWC Jacksonville	John Brummett	Hazardous Waste Owner
ACT Environmental	Holly Fortune	Hazardous Waste Contractor
C + W Transport	Various	Hazardous Waste Hauler

The equipment used during the excavation at Site 11 included a track mounted backhoe with a 1.25 cubic yard bucket, a vibratory roller, 13 trucks with 20-ton soil hauling capacity, and three 5-ton dump trucks. Site personnel during excavation activities wore level D PPE.

During the excavation and removal of the soils, TtNUS followed a load inspection report checklist to record information on the conditions of the transporting equipment, transport drivers, transport company permits, and the manifests for each load. Thirteen 20-ton capacity trailers were filled and weighed at the on base weigh station. John Brummett supervised the completion of the manifests and the weight of each trailer prior to departure from the base. At the completion of the excavation, temporary orange plastic net fencing enclosed the perimeters of the pits.

The second day, temporary fencing was removed from the perimeter of the pits. A vibratory compaction roller was used to repair the dirt trail leading to the site. This activity resulted in a portion of the north wall falling into the bottom of the excavation. The soils from the north wall included 3 containers that were not observed the previous day. The containers were removed and placed on visqueen near the excavation.

While attempting to remove the soils that fell into the excavation, the backhoe contacted the north wall of the excavation again and revealed several more containers. The containers were locted in the wall of the excavation at a depth of approximately 1.5 feet below land surface. The Charleston Environmental Detachment then removed any containers that were visible from the excavation and associated soils and placed them on the visqueen with the other materials.

The total amount of material removed and placed on visqueen included approximately 1.5 yds of soils and 10 containers. Four drums were obtained for the containment of the additional materials removed from anomaly four. These drums were filled, and the remaining material covered with visqueen. The next day three more drums were obtained for the containment of the remaining materials. One 55-gallon drum holds the containers and the other six hold the visqueen and soils. The location where the containers were discovered has been marked with four stakes

and caution tape. The 55-gallon drums were labeled by the Charleston Environmental Detachment.

Several types of containers were identified, including 5-gallon plastic buckets with lids, 5-gallon metal cans, and 2-gallon plastic containers. Markings were identified on two of the three types of containers. One of the 5-gallon buckets was marked as liquid herbicide DAL-E-RAD 120, and one of the 2-gallon plastic containers was marked as TurfCare, turf and ornamental fungicide and had the ingredients of 40% Tetrachloroisophthalonitrile and 60% inert ingredients. The containers appeared empty of their original contents.

The bottom one-foot of each excavation was filled with gravel and compacted with the bucket of the track-mounted backhoe. Fill soil was transported to the site from the BioCell using three 5-ton dump trucks. The fill material in the excavation was compacted using the bucket of the track mounted backhoe until the vibratory compaction roller could enter each excavation on a slope of fill soils. The remaining soils transported to the site from the BioCell were compacted using the vibratory compaction roller.

On Saturday 12/5/98, one grab sample was collected from the 55-gallon drum containing the containers and one composite sample was collected from the six the 55-gallon drums containing the soil. The samples were submitted for full TCLP, Pesticides/Herbicides, and DBCP analysis. Analytical results were requested from the laboratory on a 7-day turn around time.

Charleston Detachment has arranged with ACT Environmental (subcontractor used to dispose of the other Site 11 soil) to dispose of the drums. The results of the drum analysis is expected no later than Monday 12/14/98 and will be provided to PWC Jax for approval and signing of the manifest. It is anticipated the drums will be shipped off site on Tuesday (12/15/98) or Wednesday (12/16/98).

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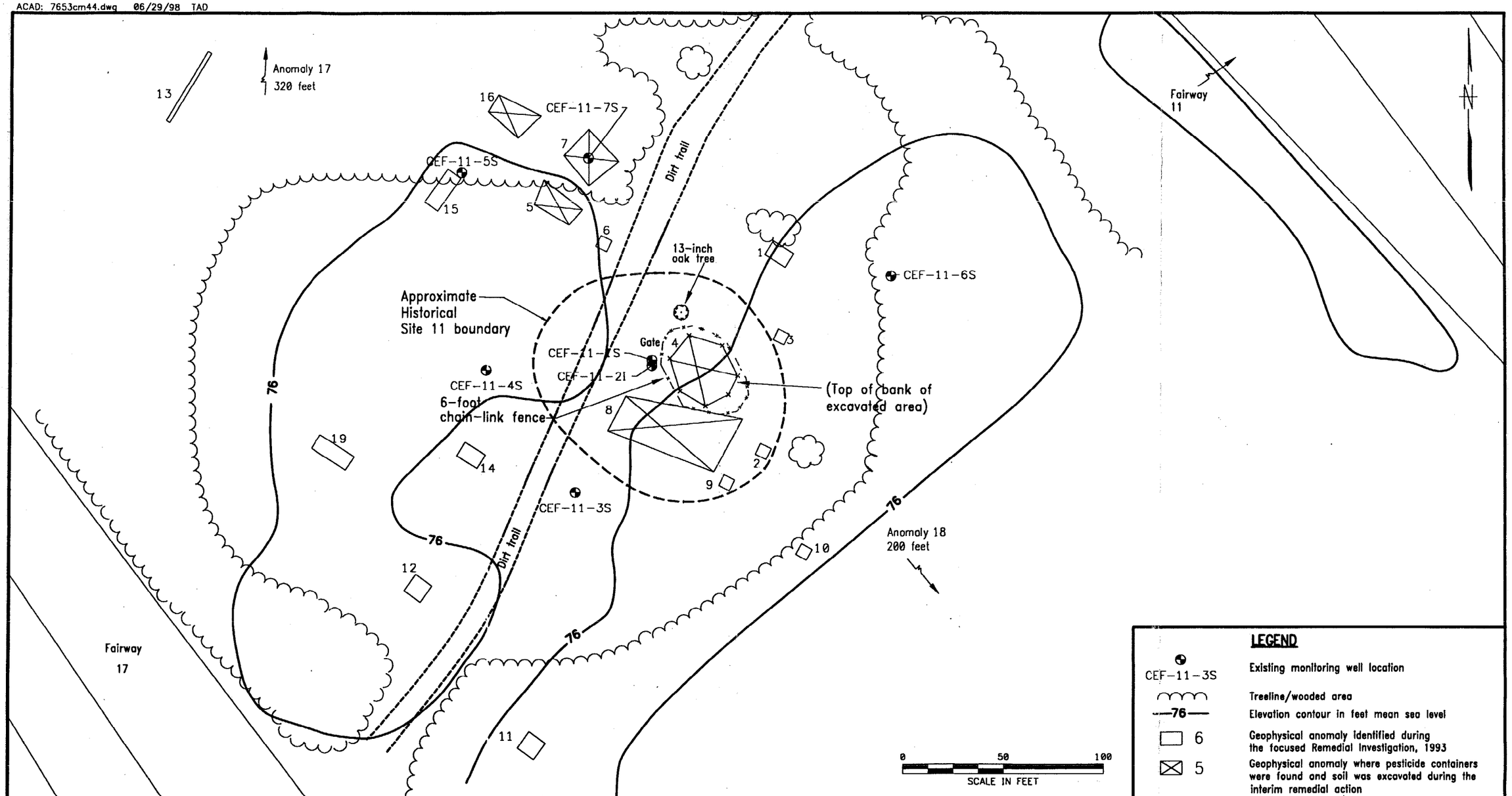

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SCALE AS NOTED

SURFACE FEATURES AND SITE TOPOGRAPHY
OPERABLE UNIT 6, SITE 11
NAVAL AIR STATION, CECIL FIELD
JACKSONVILLE, FLORIDA

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REMEDIAL DESIGN FOR SOILS

AT

OPERABLE UNIT 6
SITE 11
NAVAL AIR STATION (NAS) CECIL FIELD
JACKSONVILLE, FLORIDA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

Submitted by:
Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220

CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0039

AUGUST 1998

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The engineering design and professional opinions rendered in this planning document for Site 11, Remedial Design for Soils, Naval Air Station Cecil Field, Jacksonville, Florida, were conducted or developed in accordance with commonly accepted procedures, consistent with applicable standards of practice. If conditions during implementation are determined to be different than those described in this document, then the undersigned professional engineer should be notified to evaluate the effects the additional information has on the design described in this report.

Mark P. Speranza

Mark P. Speranza, P.E.
Professional Engineer No. PE0050304

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ACRONYM LIST

bls	below land surface
BCT	Base Closure Team
BRAC	Base Realignment and Closure
CLEAN	Comprehensive Long-Term Environmental Action Navy
COCs	Chemicals of Concern
CTO	Contract Task Order
cy	cubic yards
DBCP	1,2-dibromo - 3 - chloropropane
FDEP	Florida Department of Environmental Protection
HDPE	High Density Polyethylene
IDW	Investigation Derived Waste
IRA	Interim Remedial Action
mg/kg	milligrams per kilogram
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
OU	Operable Unit
RAC	Remedial Action Contractor
RAOs	Remedial Action Objectives
RD	Remedial Design
RI	Remedial Investigation
SOUTHDIV	Southern Divison
TtNUS	Tetra Tech NUS, Inc.
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

This remedial design (RD) work plan for Naval Air Station (NAS) Cecil Field, Operable Unit (OU) 6, Site 11 has been prepared by Tetra Tech NUS, Inc. (TtNUS) for the Southern Division (SOUTHDIV) Naval Facilities Engineering Command (NAVFAC) under the Navy CLEAN Program, Contract Number N62467-94-D-0888, Contract Task Order (CTO) 0039. The purpose of this RD for soils at NAS Cecil Field, OU 6-Site 11, is to provide information on how to implement the NAS Cecil Field Base Realignment and Closure (BRAC) Team's selected remedial alternative for soils at Site 11. The Record of Decision (ROD) for Site 11 requires the excavation and off-site disposal of soils that have been found to exceed established site-specific cleanup levels.

A focused RI/FS in 1993 and 1994 resulted in the identification of 19 anomalies. An IRA was performed in 1995 to remove buried materials identified in the focused RI/FS. Some contaminants remained; an RI/FS for the entire site was performed by ABB-ES in 1997/1998. Based on the results of the RI, and the Feasibility Study (FS) conducted by ABB Environmental (January 1998), the BRAC Closure Team (BCT) proposed excavation and off-site disposal of contaminated soils at Site 11 and a ROD was signed to that effect.

This work plan has six sections. Section 1.0 provides this brief introduction. Section 2.0 identifies the previous investigations conducted at this site. Section 3.0 identifies the remedial action objectives (RAOs) and establishes site-specific cleanup levels. Section 4.0 discusses pre-excavation sampling methods and procedures. Section 5.0 describes the proposed remedial action. Section 6.0 discusses the remedial action sequence.

2.0 PREVIOUS ACTIONS

A focused RI/FS was performed in 1993 to 1994. A geophysical survey was performed to identify buried waste during the first phase of the IRA. Nineteen anomalies were found. Test pits were dug at all anomalies and anomalies 4, 5, 7, 8, and 16 were found to be associated with buried pesticide containers. The anomalies are delineated in Figure 2-1.

Based on the results of the focused RI/FS, an interim removal action (IRA) was performed in 1995. The first phase of the IRA fieldwork included the excavation of 417 cubic yards (cy) of soil from the five anomalies. The soils were excavated from ground surface to one (1) foot below the groundwater table unless undisturbed and/or uncontaminated soils were encountered. The soil was temporarily stockpiled on site, sampled, and analyzed to determine hazardous classification for disposal. Based on analytical results, a total of 309 cy were disposed as hazardous waste, and the remaining 108 cy were determined to be nonhazardous and placed back into the excavation. Post excavation samples from Anomaly 4 showed the presence of DCBP so additional excavation was performed.

Following the additional excavation, soil samples were again collected from the sidewalls of the anomaly 4 excavation. One sample was taken from the northern, southern, eastern and western walls, for a total of four samples. The only COC detected from the four samples was 1,2-dibromo-3-chloropropane, at concentrations of 2 µg/kg and 230 µg/kg in the southern and eastern walls, respectively. The samples collected from the northern and western side walls were below detection limits. The decision was made by BCT to stop excavation and assess the extent of contamination. A high density polyethylene (HDPE) liner was placed at the bottom of the Anomaly 4 excavation and then backfilled to several feet below grade. A chain-link fence was erected around the perimeter of the excavation to restrict access. Because the excavation was not backfilled to grade, water accumulated in the excavation. The water was sampled and found to contain 24 micrograms per liter (µg/L) of 1,2-dibromo-3-chloropropane (DBCP).

The anomalies, except for 4, were backfilled with soil that was determined by analyses to be nonhazardous.

Additional sampling was conducted at Site 11 as part of the RI in 1997. The results from the RI indicated that arsenic was detected at 29.6 mg/kg within Anomaly 4 at sample location CF11SS/SB5 and at 449 mg/kg within Anomaly 7 at sample location CF11SS/SB2 and at 5.7 mg/kg at location CF11SS/SB2. Figure 2-2 provides the locations of these exceedances.

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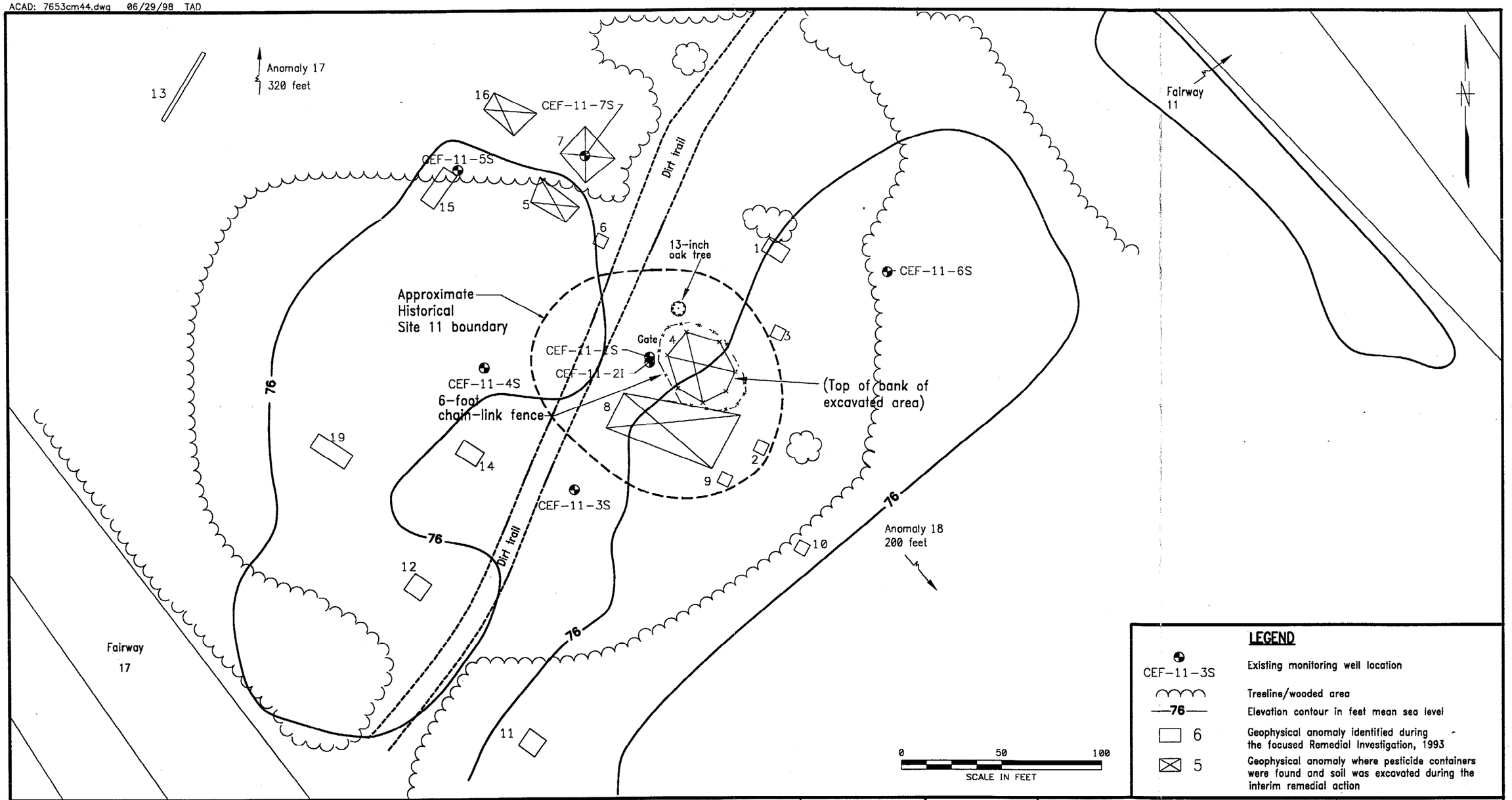

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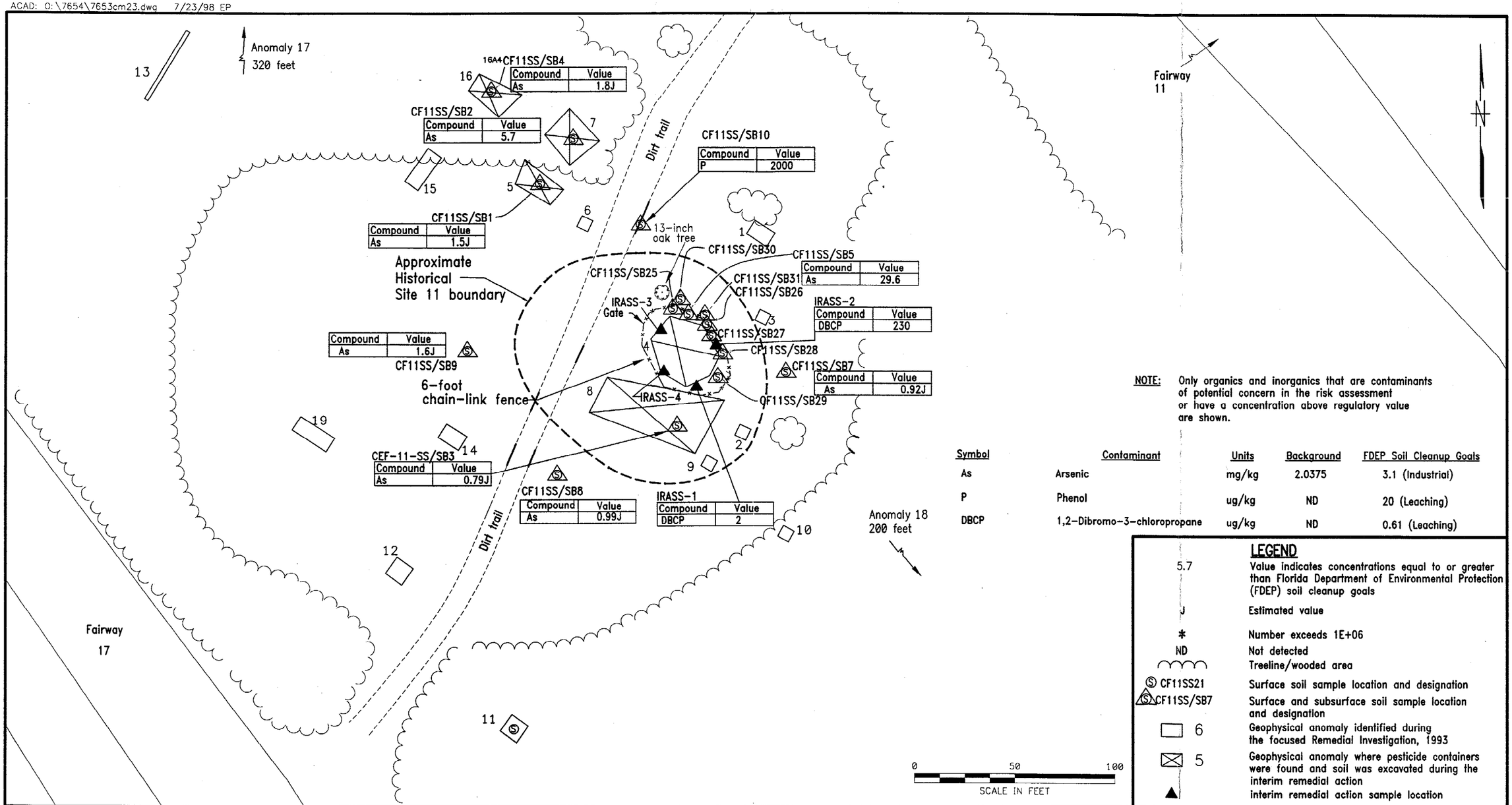

NOTE: Only organics and inorganics that are contaminants of potential concern in the risk assessment or have a concentration above regulatory value are shown.

Symbol	Contaminant	Units	Background	FDEP Soil Cleanup Goals
As	Arsenic	mg/kg	2.0375	3.1 (Industrial)
P	Phenol	ug/kg	ND	20 (Leaching)
DBCP	1,2-Dibromo-3-chloropropane	ug/kg	ND	0.61 (Leaching)

LEGEND

5.7	Value indicates concentrations equal to or greater than Florida Department of Environmental Protection (FDEP) soil cleanup goals
J	Estimated value
*	Number exceeds 1E+06
ND	Not detected
	Treeline/wooded area
CF11SS21	Surface soil sample location and designation
CF11SS/SB7	Surface and subsurface soil sample location and designation
6	Geophysical anomaly identified during the focused Remedial Investigation, 1993
5	Geophysical anomaly where pesticide containers were found and soil was excavated during the interim remedial action
▲	interim remedial action sample location

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PREVIOUS INVESTIGATIONS
ORGANICS AND INORGANICS
IN SOIL SAMPLES
OPERABLE UNIT 6, SITE 11
NAVAL AIR STATION, CECIL FIELD
JACKSONVILLE, FLORIDA

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3.0 REMEDIAL ACTION OBJECTIVES

In August 1997, ABB Environmental conducted a RI at the site to evaluate site conditions following the IRA. As a result of the RI, arsenic and 1,2-dibromo-3-chloropropane were identified as chemicals of concern (COCs) in soil that required remediation.

The Remedial Action Objectives (RAOs) for contaminated soil at Site 11 are as follows:

- Reduce human health risk associated with exposure to surface soil containing arsenic concentrations in excess of the risk-based action levels.

- Reduce human health risk associated with exposure to subsurface soil containing arsenic and 1,2-dibromo-3-chloropropane above action levels developed for contaminant leaching.

Site-specific cleanup levels were developed for the COCs shown in Tables 3-1 and 3-2 for surface soil and subsurface soil, respectively. The site-specific cleanup level for surface soil was established based on a residential scenario for ingestion of soil. The site-specific cleanup level for subsurface soil was established based on contaminants leaching from soil to groundwater.

TABLE 3-1

**SURFACE SOIL ACTION LEVEL
OPERABLE UNIT 6, SITE 11
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

ANALYTE	SITE-SPECIFIC CLEANUP LEVEL
Arsenic	2.1 mg/kg(1)

1 Cecil Field established background level (high-cut value)

TABLE 3-2

**SUBSURFACE SOIL ACTION LEVEL
OPERABLE UNIT 6, SITE 11
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

ANALYTE	SITE-SPECIFIC CLEANUP LEVEL
1,2-dibromo-3-chloropropane	0.2 µg/kg(2)
Arsenic	29 mg/kg(3)

2 Minimum method detection limit is 2.0 µg/kg
3 Brownfield draft 62 - 785

4.0 PRE-EXCAVATION SAMPLING

Soil sampling will be conducted to pre-determine the boundaries of excavation at Anomalies 4 and 7 and to classify the waste for disposal purposes prior to excavation. The water in the Anomaly 4 excavation will be analyzed for disposal classification purposes prior to excavation. The sampling procedures will conform with Chapter 4.0, Section 4.3, of the Florida Department of Environmental Protection (FDEP), "DEP Standard Operating Procedures for Laboratory Operations and Sample Collection Activities" (September 30, 1992).

Previous investigations identified arsenic and 1,2-dibromo-3-chloropropane (DBCP) as COCs at Anomalies 4 and 7 that require remediation. The proposed sampling and analysis for the pre-excavation sampling effort are presented in Table 4-1. Figure 4-1 provides the locations where these samples are to be collected.

TABLE 4-1

**SUMMARY OF FIELD INVESTIGATION ACTIVITIES
OPERABLE UNIT 6, SITE 11
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Media	Location	Investigation Activity	Number of Locations	Samples per Location	Analysis
Surface Soil	Anomaly 7	Collect surface soil samples for delineation	4	1	Arsenic
Subsurface Soil	Anomaly 4	Collect subsurface soil samples for delineation	3	1	Arsenic; DBCP
Subsurface Soil	Anomaly 7	Collect subsurface soil samples for delineation	5	1	Arsenic
Soil	Anomaly 4	Waste classification	2	1 (Composite)	TCLP (Full); DBCP
Soil	Anomaly 7	Waste classification	2	1 (Composite)	TCLP (Full)
Water	Anomaly 4 excavation	Waste classification	1	1	TCLP (Full); DBCP

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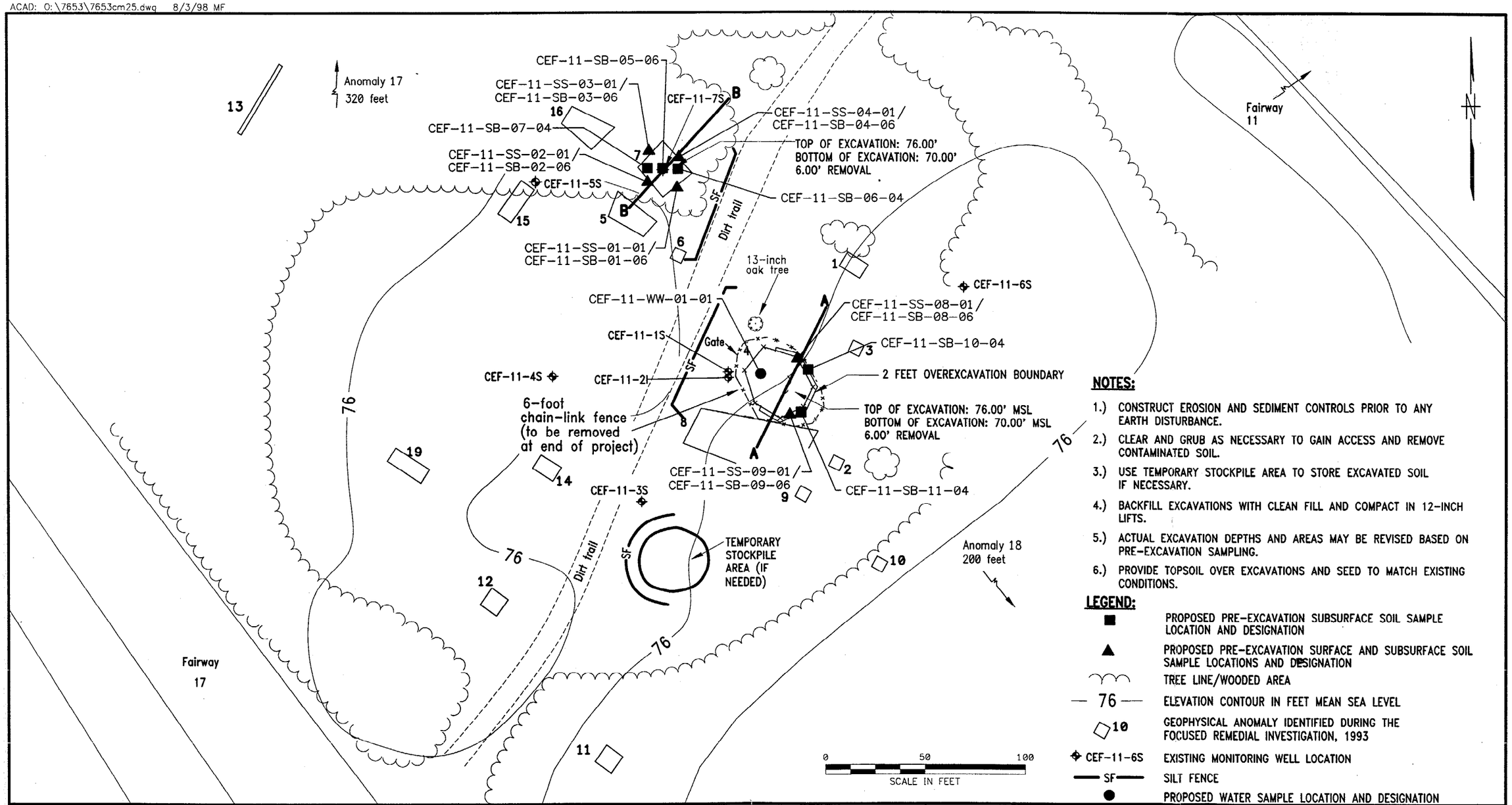

NOTES:

1.) CONSTRUCT EROSION AND SEDIMENT CONTROLS PRIOR TO ANY EARTH DISTURBANCE.

2.) CLEAR AND GRUB AS NECESSARY TO GAIN ACCESS AND REMOVE CONTAMINATED SOIL.

3.) USE TEMPORARY STOCKPILE AREA TO STORE EXCAVATED SOIL IF NECESSARY.

4.) BACKFILL EXCAVATIONS WITH CLEAN FILL AND COMPACT IN 12-INCH LIFTS.

5.) ACTUAL EXCAVATION DEPTHS AND AREAS MAY BE REVISED BASED ON PRE-EXCAVATION SAMPLING.

6.) PROVIDE TOPSOIL OVER EXCAVATIONS AND SEED TO MATCH EXISTING CONDITIONS.

LEGEND:

- ■ PROPOSED PRE-EXCAVATION SUBSURFACE SOIL SAMPLE LOCATION AND DESIGNATION
- ▲ PROPOSED PRE-EXCAVATION SURFACE AND SUBSURFACE SOIL SAMPLE LOCATIONS AND DESIGNATION
- TREE LINE/WOODED AREA
- — 76 — ELEVATION CONTOUR IN FEET MEAN SEA LEVEL
- ◇10 GEOPHYSICAL ANOMALY IDENTIFIED DURING THE FOCUSED REMEDIAL INVESTIGATION, 1993
- CEF-11-6S EXISTING MONITORING WELL LOCATION
- —SF— SILT FENCE
- ● PROPOSED WATER SAMPLE LOCATION AND DESIGNATION

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DEPARTMENT OF THE NAVY · SOUTHERN DIV FACILITIES ENGINEERING COMD

PROPOSED PRE-EXCAVATION SAMPLING LOCATIONS AND LIMITS OF SOIL EXCAVATION
OPERABLE UNIT 6, SITE 11
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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4.1 SURFACE SOIL SAMPLING - DELINEATION

A total of four surface soil grab samples plus one field duplicate sample will be collected from Anomaly 7 at the locations shown on Figure 4-1. Sample designations are provided in Table 4-2. All surface soil samples will be collected at a depth of 0 to 1 foot with a disposable hand trowel.

4.2 SUBSURFACE SOIL SAMPLING - DELINEATION

A total of seven subsurface soil samples will be collected from Anomalies 4 and 7. Two samples will be collected from Anomaly 4, plus one field duplicate sample. Five samples will be collected from Anomaly 7. All subsurface soil samples will be collected in the location shown on Figure 4-1. The sample designations and sample depths are provided in Figure 4-1.

4.3 SOIL SAMPLING - WASTE CLASSIFICATION

Two soil samples for waste characterization will be collected from the soil within Anomaly 4 that will be excavated. Each sample location will be halfway between the delineation sample location and the face of the excavation. The samples will be taken from a depth of 3 to 4 feet bgs. The two samples will be composited and submitted for analysis.

Two soil samples for waste characterization will be collected from the soil within Anomaly 7 that will be excavated. Each sample location will be 3 feet from the center of the proposed limits of excavation. The sample locations will be 180° opposite each other, relative to the center of the proposed limits. The samples will be collected from a depth of 3 to 4 feet bgs. The samples will be composited and submitted for analysis.

The subsurface soil waste characterization samples will be collected in the locations shown on Figure 4-1. Sample designations and depths are provided in Figure 4-1.

4.4 WATER SAMPLING - ANOMALY 4 WASTE CHARACTERIZATION

One sample of the water in the Anomaly 4 Excavation Pit will be collected. The sample will be collected using a dipper, bucket or pump. The water sample will be analyzed for full regulatory list TCLP and DBCP.

TABLE 4-2

**SAMPLE SUMMARY
OPERABLE UNIT 6, SITE 11
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Location	Sample No.	Depth, feet	Analyses			Rationale
			As	DBCP	TCLP (Full)	
Anomaly 7	CEF-11-SS-01-01	0-1	X			Delineation
	CEF-11-SB-01-06	5-6	X			Delineation
	CEF-11-SS-02-01	0-1	X			Delineation
	CEF-11-SB-02-06	5-6	X			Delineation
	CEF-11-SS-03-01	0-1	X			Delineation
	CEF-11-SB-03-06	5-6	X			Delineation
	CEF-11-SS-04-01	0-1	X			Delineation
	CEF-11-SB-04-06	5-6	X			Delineation
	CEF-11-SB-05-06	5-6	X			Delineation
	CEF-11-SB-06-04	3-4			C(1)	Classification
	CEF-11-SB-07-04	3-4			C(1)	Classification
Anomaly 4	CEF-11-SS-08-01	0-1	X	X		Delineation
	CEF-11-SB-08-06	5-6	X	X		Delineation
	CEF-11-SS-09-01	0-1	X	X		Delineation
	CEF-11-SB-09-06	5-6	X	X		Delineation
	CEF-11-SB-10-04	3-4		C(2)	C(2)	Classification
	CEF-11-SB-11-04	3-4		C(2)	C(2)	Classification
	CEF-11-WW-01-01	--		X	X	Classification

Notes:

X - Analysis required
C(1) Composite SB-06-04 and SB-07-04 into one sample for single analysis.
C(2) Composite SB-10-04 and SB-11-04 into one sample for single analysis.

4.5 SAMPLE HANDLING

4.5.1 Sample Containers, Preservation, Holding Times, and Analyses

Sample handling includes proper selection of sample containers, preservation, allowable holding times, and analyses. The FDEP, "DEP Standard Operating Procedures for Laboratory Operations and Sample Collection Activities", (September 30, 1992), Section 4.4, summarizes the sample handling requirements for this investigation.

4.5.2 Sample Nomenclature

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

1	2	3	4
CEF - 11	AA	EEE	NN

where:

1 Site Code - Cecil Field, Operable Unit 6 - Site 11.

2 Type - SS - Surface Soil Sample
SB - Subsurface Soil Sample
WW - Wastewater Sample

3 Location - An ascending sequential number of sample locations.

4 Type - Bottom of subsurface sample interval, or sequential number for surface samples.

Table 4-2 summarizes the samples to be collected.

4.5.3 Sample Documentation, Packaging, and Shipping

Matrix-specific sample logsheets will be maintained for each sample collected. In addition, sample collection information will be recorded in field notebooks and the site logbook.

Samples will be packaged and shipped according to Chapter 5.0 of the FDEP, "DEP Standard Operating Procedures for Laboratory and Sample Collection Activities", (September 30, 1992).

4.5.4 Sample Custody

Sample custody will be maintained and documented at all times. Custody begins at the time of bottleware receipt and ends at the time of disposal by the laboratory. The procedures for custody are described in Chapter 5.0 of the FDEP, "DEP Standard Operating Procedures for Laboratory Operations and Sample Collection Activities", (September 30, 1992). These procedures will be implemented for this investigation.

4.6 DATA QUALITY REQUIREMENTS

4.6.1 Laboratory Analyses

Analytical methods are described in Table 4-3. Chapter 10.0 of the FDEP, "DEP Standard Operating Procedures for Laboratory Operations and Sample Collection Activities", (September 30, 1992) describes the data reporting requirements for this investigation. The laboratory selected to perform the work at this site must be Florida State certified.

4.6.2 External (Field) QC Samples

4.6.2.1 Field QC Samples Types and Frequencies

Per an agreement between the Navy, U.S. EPA, and State of Florida, the collection of rinsate and trip blanks have been eliminated from investigations at installation restoration sites at NAS Cecil Field. Additionally, the collection frequency of field blanks have been reduced from 1 per event per source to one every 6 months or if the source of water changes. No field blank will be collected in this sampling program.

In accordance with these changes, Table 4-4 summarizes the frequency and type of field QA/QC samples to be collected for this investigation.

Field blanks consist of the potable waters used in decontamination and steam cleaning activities. They are collected to determine whether the source waters have introduced contaminants to the environmental samples collected. Field duplicates are a single sample split into two portions for a determination of the precision at the sampling and analysis method employed.

TABLE 4-3

SUMMARY OF BOTTLEWARE, PRESERVATION, AND HOLDING TIMES
OPERABLE UNIT 6, SITE 11
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analysis	Analytical Method	Sample Volume(1)	Bottleware	Preservation	Holding Time(2)
Arsenic (Soil)	SW-846 6010B/7000A Series	8 oz.	Glass; Wide-mouth; Teflon-lined cap	Cool to 4°C	6 months
1,2-dibromo-3-chloropropane (Soil)	SW-846 8081A	4 oz.	Glass; Wide-mouth; Teflon-lined cap	Cool to 4°C	14 days to extraction; 40 days from extraction to analysis
TCLP Full Regulatory List (Soil)	SW-846, 8260B, 8270C, 8081A, 8151A, 6010B/7000A Series	16 oz.	Glass; Wide-mouth; Teflon-lined cap	Cool to 4°C	Volatile: 14 days to TCLP Extraction Semivolatile/ Pesticides/ Herbicides: 14 days to TCLP Extraction Metals: 180 days to TCLP Extraction
TCLP Full Regulatory List (Water)	SW-846, 8260B, 8270C, 8081A, 8151A, 6010B/7000A Series	4 - 1 L	Amber glass, Teflon-lined cap	Cool to 4°C	Volatile: 14 days to TCLP Extaction Semivolatile/ Pesticides/ Berbicides: 7 days to TCLP Extraction Metals: 180 days to TCLP Extraction
1,2-dibromo-3 chloropropane (Water)	SW 846 8081 A	1 L	Amber glass, Teflon-lined cap	Cool to 4°C	7 days to extraction 40 days from extraction to analysis

1 Confirm sample volume with the selected laboratory
2 Holding times are measured from the date of sample collection.

TABLE 4-4

FREQUENCY OF FIELD QC SAMPLES
OPERABLE UNIT 6, SITE 11
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Type Of Samples	Frequency
Field Duplicate	1/10 samples/matrix
MS/MSD	1/20 samples/matrix

4.6.2.2 Matrix Spike/Duplicate Sample Aliquots

The field sampling team will provide the appropriate additional sample volume as prescribed by the laboratory requirements for laboratory duplicate and matrix spike samples. The additional sample aliquots required for analysis of matrix spike/duplicates will be collected with a frequency of 1 per 20 samples per matrix.

4.6.3 Bottleware requirements

The bottleware, preservation requirements, and holding times for the analyses proposed for this investigation are provided in Table 4-3. Pre-preserved, certified clean bottleware will be supplied by the laboratory subcontractor.

4.6.4 Internal (Laboratory) QC Checks

Descriptions of the internal (laboratory) QC check types are provided in Chapter 9.0 of the FDEP, "DEP Standard Operating Procedures for Laboratory Operations and Sample Collection Activities", (September 30, 1992).

4.6.5 Data Reduction, Validation, and Reporting

Per an agreement between Navy, U.S. EPA, and State of Florida, formal offsite data validation has been eliminated from the installation restoration program. However, the analytical data packages generated by the analytical laboratory will be reviewed by TtNUS personnel to eliminate false positive and negative results.

4.6.6 Corrective Actions

In the event there are discrepancies in field activities from the established procedures and/or requirements or modifications to the proposed work plan, the procedures established in Chapter 11.0 of the FDEP, "DEP Standard Operating Procedures for Laboratory Operations and Sample Collection Activities", (September 30, 1992) for documenting nonconformances will be implemented.

5.0 REMEDIAL ACTION DESCRIPTION

The proposed remedial action to be conducted at Site 11 includes the following:

- Pre-excavation sampling and analysis of the soil to identify the limits of removal and hazardous characteristics.
- Sampling and analysis of water contained in Anomaly 4 pit for disposal evaluation.
- Removal and disposal of Anomaly 4 pit water (the estimated volume is 12,000 gallons).
- Excavation of approximately 200 cy of contaminated soil.
- Disposal of excavated soil off-site at either a solid waste or hazardous waste landfill based on the analytical results.

5.1 SURFACE SOIL

Based on an assumed excavation of three (3) feet in depth around the Anomaly 7 perimeter, approximately 45 cy of soil require excavation from Anomaly 7. Refer to the volumes of excavation summarized in Table 5-1.

5.2 SUBSURFACE SOIL

Based on previous investigation results, the area of arsenic contamination in Anomaly 4 encompasses the area of 1,2-dibromo-3-chloropropane contamination detected in the eastern wall of the IRA excavation of Anomaly 4.

Based on an assumed excavation to the water table, which is six (6) feet below land surface (bls), and an overexcavation of approximately two (2) feet in each horizontal direction to fully encompass the area of contamination, the approximate volume of contaminated subsurface soil is 106 cy in Anomaly 4. The subsurface soil contamination for Anomaly 7 is approximately 45 cy, based on an assumed excavation from a depth of three (3) feet bls to six (6) feet bls. The excavation depth constraints are based on the assumption that the first three (3) feet bls were removed as surface soil. Refer to the volumes of excavation summarized in Table 5-1. Typical excavation cross sections have been provided on Figure 5-1 for Anomaly 4 and 7. The locations of the cross sections are shown in Figure 4-1. Refer to Appendix A for the excavation volume calculations.

TABLE 5-1

**VOLUMES OF EXCAVATION
OPERABLE UNIT 6, SITE 11
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Anomaly	Medium	Volume (cy)
7	Surface Soil	45
7	Subsurface Soil	45
4	Subsurface Soil	106

The estimated excavation volumes, based on existing analytical results, from Anomalies 4 and 7 are summarized in Table 5-1. Refer to Appendix A for the excavation volume calculations; however, based on the results of the pre-excavation sampling, these volumes may be refined.

5.3 DISPOSAL

The soil in the upper portion of Anomaly 7 is anticipated to be non-hazardous. DBCP was not detected in previous sampling events.

The soil and wastewater from Anomaly 4 is known to contain DBCP. Because of the presence of DBCP, soil and wastewater is anticipated to be disposed of as a hazardous waste.

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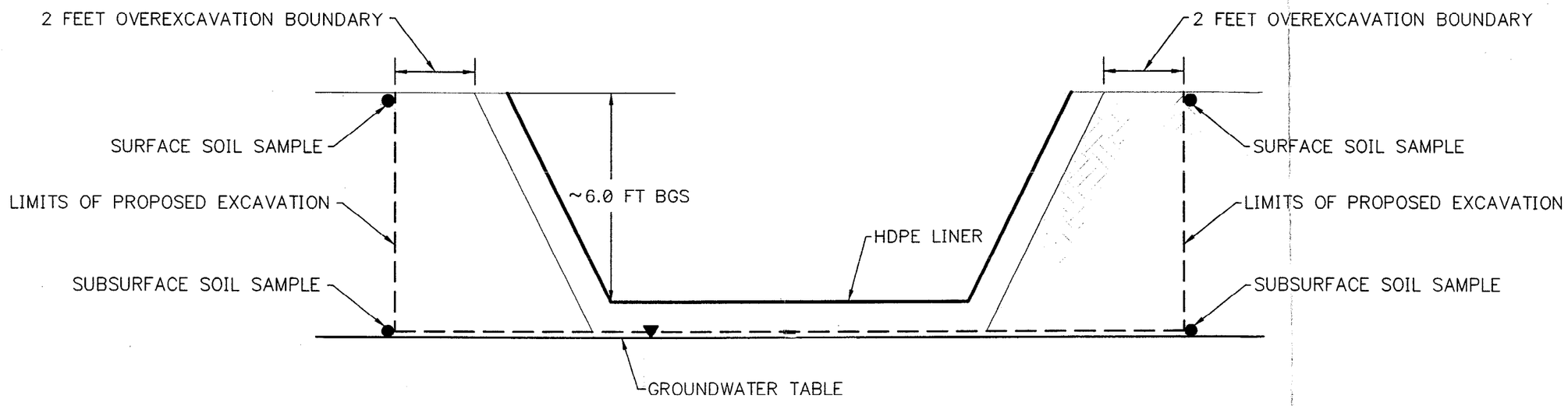
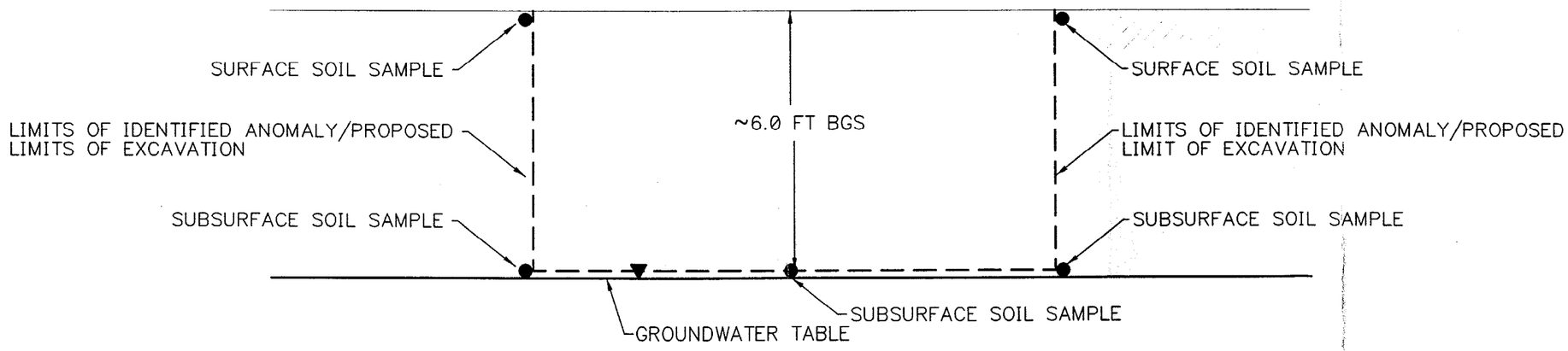


ANOMALY 4
CROSS SECTION A–A'
NTS



ANOMALY 7
CROSS SECTION B–B'
NTS

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY MF DATE 7/10/98
CHECKED BY BR DATE 7/10/98
COST/SCHED–AREA
SCALE AS NOTED

SOIL EXCAVATION CROSS SECTIONS
FOR ANOMALY 4 AND 7
OPERABLE UNIT 6, SITE 11
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NO. 7363
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 5–1 REV. 0

FORM CADD NO SDIV_BH.DWG – REV 0 – 1/20/98

6.0 REMEDIAL ACTION SEQUENCE

Following determination of the excavation limits through the pre-excavation sampling, the remedial action will be initiated in the following sequence:

1. The water in the excavation at Anomaly 4 will be sampled and analyzed for disposal classification. Confirm the volume of water present.

2. Soil and subsurface soil will be sampled and analyzed for delineation and classification.

3. If the results from the pre-excavation sampling indicate that the soil is not contaminated beyond the limits identified in this report, then the soil shall be excavated to the pre-determined boundaries as described in Sections 5.1 and 5.2. If the results from the pre-excavation sampling indicate that the soil contains concentrations greater than the action levels, then new sample locations will be selected to determine the limits of excavation.

4. Prior to any earth disturbance activities, erosion and sediment controls, such as silt fence, shall be constructed in the locations shown on Figure 4-1.

5. Clear and grub the area as necessary. Remove existing fence, as needed for access.

6. Based on the waste classification analytical results, arrange for disposal of the water and soil at an appropriate facility. The liner in Anomaly 4 shall be disposed of with the Anomaly 4 soil. If the characterization shows TCLP concentrations above the regulatory limits or if DBCP is detected, the soil is classified as hazardous.

7. Pump out Anomaly 4 excavation and dispose of as hazardous if DBCP is present. Pump out only the volume measured in Step 1. Any groundwater re-entering the excavation will <u>not</u> be removed.

8. Soil shall then be excavated to the pre-determined boundaries. The excavated soil and liner may be loaded directly into trucks for disposal or maybe stockpiled on site, prior to disposal. Stockpiled soil shall be stored on plastic sheeting and covered with plastic sheeting. The soil and liner shall be disposed off-site at either a solid waste or hazardous waste landfill, as determined by the analyses.

9. The excavations shall be backfilled with clean fill and compacted in 12-inch lifts to within 6 inches of grade. Six inches of topsoil shall be placed on top of the backfill and the disturbed areas shall be

regraded to match existing contour elevations. Irregularities in finished surfaces shall be corrected to eliminate depressions. Complete removal of existing fences.

10. All disturbed areas shall be stabilized by seeding. Seed type shall match existing vegetation. Seed at 5 pounds per 1,000 square feet, mulch, and water will be provided to establish an acceptable stand of grass. A uniform erosion resistant perennial vegetative cover of at least 70% shall be achieved.

11. All temporary erosion and sediment control measures shall then be removed.

REFERENCES

ABB Environmental Services, Inc., 1998. Feasibility Study for Operable Unit 6 at Naval Air Station Cecil Field, Jacksonville, Florida.

ABB Environmental Services, Inc., 1997. Remedial Investigation for Naval Air Station Cecil Field, Operable Unit 6, Site 11.

B&R Environmental, 1998. Proposed Plan for Operable Unit 6, Site 11, Naval Air Station Cecil Field, Jacksonville, Florida.

FDEP, September 30, 1992. DEP Standard Operating Procedures for Laboratory Operations and Sample Collection Activities.

APPENDIX A

SOIL EXCAVATION VOLUMES

CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT NAS CECIL FIELD	JOB NUMBER
SUBJECT SOIL CONTAMINATION VOLUMES	
BASED ON	DRAWING NUMBER

BY	CHECKED BY	APPROVED BY	DATE
BER	[signature] 04/10 [signature] 7/9		4/9/98

REVISED 7/7/98

THE FOLLOWING VOLUME CALCULATIONS ARE BASED ON APPROXIMATE EXTENTS OF CONTAMINATION.

SURFACE SOIL VOLUME CALCULATIONS:

ASSUMING THE SITE SPECIFIC CLEANUP LEVEL CRITERIA FOR ARSENIC TO BE 2.1 mg/kg, THE APPROXIMATE AREA OF SURFACE SOIL CONTAMINATION IS SHOWN ON FIGURE 4-2.

ANOMALY 7:

BASED ON MEASURING THE SURFACE AREA WITH A PLANIMETER:

- SURFACE AREA = 400 SF
- DEPTH OF SURFACE SOIL = 3 FT
- VOLUME = 400 SF x 3 FT
  VOLUME = 1200 CF x CY / 27 CF
  VOLUME = 45 CY
- TOTAL SURFACE SOIL TO BE EXCAVATED = 45 CY

@ 1.2 TONS/CY = 54 TONS

CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT NAS CECIL FIELD	JOB NUMBER
SUBJECT SOIL CONTAMINATION VOLUMES	
BASED ON	DRAWING NUMBER
BY BER / CHECKED BY JHP 04/10, JHP 7/9	APPROVED BY / DATE 4/9/98

REVISED 7/7/98

SUBSURFACE SOIL VOLUME CALCULATIONS:

ASSUMING THE SITE SPECIFIC CLEANUP LEVEL CRITERIA FOR ARSENIC TO BE 29 mg/kg AND 1,2-DIBROMO-3-CHLOROPROPANE TO BE 0.2 ug/kg, THE APPROXIMATE AREA OF SUBSURFACE SOIL CONTAMINATION IS SHOWN ON FIGURE 4-2.

ANOMALY 7:

BASED ON MEASURING THE SURFACE AREA WITH A PLANIMETER:

- SURFACE AREA = 400 SF
- DEPTH OF SUBSURFACE SOIL = 3 - 6 FT BLS = 3 FT
- VOLUME = 400 SF × 3 FT
  VOLUME = 1200 CF × CY/27 CF
  VOLUME = 45 CY

ANOMALY 4:

BASED ON MEASURING THE SURFACE AREA WITH A PLANIMETER:

- SURFACE AREA = 475 SF
- DEPTH OF SUBSURFACE SOIL = 6 FT BLS
- VOLUME = 475 SF × 6 FT
  VOLUME = 2850 CF × CY/27 CF
  VOLUME = 106 CY

CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT NAS CECIL FIELD	JOB NUMBER
SUBJECT SOIL CONTAMINATION VOLUMES	
BASED ON	DRAWING NUMBER

BY	CHECKED BY	APPROVED BY	DATE
BER	JFP 04/10 JFP 7/9		4/9/98

REVISED 7/7/98

- TOTAL SUBSURFACE SOIL TO BE EXCAVATED = 45 CY + 106 CY = 151 CY

@ 1.2 $\frac{\text{TONS}}{\text{CY}}$ = 182 TONS

SUMMARY OF EXCAVATION QUANTITIES :

SURFACE SOIL : 45 CY (ANOMALY 7)

SUBSURFACE SOIL : 45 CY (ANOMALY 7)
106 CY (ANOMALY 4)
196 CY