COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION FINAL SAMPLING AND ANALYSIS PLAN FOR SITE 25 — RADIUM SPILL SITE NAVAL AIR STATION PENSACOLA, FLORIDA

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COMPREHENSIVE LONG-TERM
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PENSACOLA, FLORIDA

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Release of this document requires the prior notification of the Commanding Officer of the Naval Air Station, Pensacola, Florida.

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1.0 INTRODUCTION

As part of the U.S. Navy Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, a Remedial Investigation/Feasibility Study (RI/FS) will be completed by EnSafe/Allen & Hoshall (E/A&H) at Site 25 under Contract Task Order (CTO) 059. This document will serve as the Sampling and Analysis Plan (SAP) for the investigation. Primary references for this SAP include the *[Comprehensive Sampling* and *Analysis Plan for Naval Air Station Pensacola (CSAP])* (E/A&H, 1993), the EPA Region IV *Standard Operating Procedures and Quality Assurance Manual* (SOP/QAM), and the *Contamination Assessment/Remedial Activities* (CA/RA) *Investigation Work Plan[s for] Group G,* Ecology & Environment (E & E 1992a). These documents will be referred to throughout this SAP and should accompany this document during review or use. The investigation of Site 25 will fulfill requirements set forth in the Work Plan and the other references cited above.

The investigation will delineate the nature, magnitude, and extent of any contamination identified in work previously conducted by E&E as Phase I of the Work Plan. [Any additional sources or previously undetected contamination will be investigated by the collection of additional samples from any given media, sampling of additional media not included in this SAP, installation of monitoring wells to delineate extent and depth of contaminants, and performance of aquifer response tests to characterize subsurface hydrologic conditions. Prior to the initiation of additional field activities, a field change request will be submitted to the Navy for approval, and the FDER and EPA will be notified.] Data collected during the Phase I has been presented as an Interim Data Report (IDR). Proposed work for the RI has taken into consideration all previous work completed at Site 25, including Phase I activities.

Sampling during the RI will include soil and groundwater. The analytical tasks will be completed a [laboratory that is approved by the Naval Energy and Environmental Support

[Bold items enclosed in brackets denote changes to last version of document.]

Activity (NEESA) using EPA Contract Laboratory Program (CLP) protocol.] Field sampling, analytical methods, and reporting will be conducted at EPA [Data Quality Objective] Level IV protocol.

An RI report will be submitted to SOUTHDIV upon completion of the investigative **work** and laboratory analysis, summarizing the activities, results and conclusions of the investigation. The report will provide [the basis/]supporting **data** for an **FS** [and a Baseline **Risk** Assessment (BRA)] to be completed at the site.

This ***SAP*** will provide guidelines for sampling and analytical techniques to be used at the site and to outline proper documentation procedures for the investigation.

2.0 BACKGROUND INFORMATION

This section will provide a condensed description of the site, previous work completed at the site, and environmental setting.

2.1 Site 25 Description and History

The following description of Site 25 has been prepared from a more comprehensive version contained in Section 2, page 2-1 of the Work Plan. Site 25 is a reported radium spill area, paved with concrete, immediately east of the radium decontamination building (Building 780). An unpaved area containing scrapped helicopters is located approximately 35 feet east of the building.

The spill reportedly occurred in 1978 on the concrete-paved area when a corroded drum broke open, spilling approximately 25 gallons of radioactive waste. Drainage from this area appears to flow east, toward the unpaved scrap yard. There are currently no groundwater monitoring wells at site 25, but two are located 100 feet to the west, at site 27.

2.2 Previous Work Completed

This section will provide a condensed description of the studies completed to date for Site 25. Comprehensive versions of the above may be found in Section 3, page 3-1 of the Work Plan. Results of **[the]** three previous studies listed below are currently available for Site 25.

Previous Studies:

- 1983 Initial Assessment Study (NEESA 1983)
- 1992 Phase I Interim Data Report of the Contamination Assessment/Remedial Activities Work Plan, (E & E 1992a)
- 1992 Site Investigation (E & E 1992b)

2.3 Environmental Setting

The environmental setting of Site 25, including climatological **data,** habitat/biota survey, **and** geologic/hydrogeologic setting, has been previously described in Sections **4** through 7 of the Work Plan (E & E 1992).

3.0 PHYSICAL SURVEY

Procedures for conducting physical surveys of the site, including a preliminary site survey, radiation survey, habitat/biota survey, and soil gas survey, are in accordance with those described in Section 3.0 of the *CSAP.* Physical surveys have already been conducted at Site 25 during Phase I activities; the results can be found in Section 3, page 3-1 of the IDR. Applicable points have been taken into account in planning the RI. [A Phase I habitat/biota survey will be completed for Site 25.]

Habitat/Biota Survey

[A Phase I habitat/biota survey will be performed at Site *25* as outlined in Section 8 of the *CSAP.* Data obtained during the Site *25* investigation will also be used to help assess ecological risk. The Site 25 Phase I habitat/biota survey will use the information collected during the previous E&E Site 25 Phse I investigation. This will help assess any onsite terrestrial and aquatic habitats or any surrounding habitats potentially affected by contaminant migration. If ecological impacts are suspected at Site 25 after the Phase I survey, Phase II sampling will be implemented as outlined in Section *8* of the *CSAP.]*

4.0 FIELD SAMPLING PLAN

The field sampling plan details the sampling and field measurement procedures to be used during the RI. The field investigation includes advancing soil borings, installing groundwater monitoring wells, and the collection of soil and groundwater samples using various techniques. A summary of sampling and analytical requirements is presented in Table **4-1.**

The EPA Contract Laboratory Program (CLP), Target **Analyte** List (TAL), and Target Compound List (TCL) will be used to provide a legally defensible **full** spectrum contaminant analysis. Soil and groundwater samples will be analyzed for the **full** TAL/TCL list, with additional non-CLP analysis also being conducted.

Table 4-1
Site 25
RI Sampling and Analytical Requirements

Medium	No. of Samples[a]	[DQO Level]	Analytical Parameter
Soil[b]	[88] (3) ([4])	[IV]	FSA PPS ST
Groundwater[c]	[11] (6)	[IV]	FSA PPW
TOTAL	[99] (6) (3) ([4])		FSA PPW PPS ST

Source: Modified from Ecology and Environment, Inc., 1992

Notes:
a The number of samples shown in parentheses will be analyzed for the additional parameters indicated.
b Number of soil samples = 11 total boring locations; [11 boring locations x [8] depth intervals = [88].
c Number of groundwater samples = [11]; [10] new onsite shallow wells + [1] new onsite intermediate well.

Analytical Parameters
Full Scan Analysis (FSA) = TCL VOCs; TCL base-neutrallacid extractable organic compounds (BNAs); TCL pesticides and TCL polychlorinated biphenyls (PCBs); TAL metals total (i.e., unfiltered) (water only); TCL cyanide; and gross alpha [**and**] beta radioactivity screen **[with selected gamma spectrometry].**

[Bold items enclosed in brackets denote changes to last version of document.]

Physical Parameters
Water (PPW) = 5-day biological oxygen demand (BOD), chemical oxygen demand (COD), hardness, total suspended solids, alkalinity, total phosphorus, nitrate-N, total Kjeldahl nitrogen (TKN), and heterotrophic plate count.

Physical Parameters
Soil (PPS) = Total phosphorus, nitrate-N, TKN, heterotrophic plate count, total organic carbon (TOC), cation exchange capacity.

Physical Parameters
Soil (ST) = Permeability, porosity, **[bulk density, particle sue, percent moisture, and specific gravity]** (taken with Shelby tube).

Organization of the RI analytical parameters has been changed from "suites" A through E, proposed in the Work Plan, to four subdivisions explained below.

- **Full Scan Analysis (FSA)** A full scan will be run for **all** designated sample points. The **full** scan consists of analysis for TCL volatile organic compounds (VOCs), base/neutral acids extractables (BNAs), polychlorinated biphenyls (PCBs), pesticides, cyanide, **TAL** metals **[(unfiltered)],** and gross alpha **[and]** beta radioactivity. ***[All* water samples will be analyzed with gamma spectrometry. Soil samples will be screened for gamma radiation in the field; soils with gamma radiation]** exceeding the background level **[also will be analyzed with gamma spectrometry.]**

- **Physical Parameters, Water** (PPW) will be run (in addition to the FSA) for selected locations where surface water or groundwater will be sampled. **[The PPW analyses will be used to determine the physical characteristics of the groundwater at the site and for the feasibility study.]** The parameters include **5-day** biological oxygen demand (BOD), chemical oxygen demand (COD), hardness, suspended solids, alkalinity, total phosphorus, nitrate-N, total Kjeldahl nitrogen (TKN), and heterotrophic plate count.

- **Physical Parameters, Soil** (PPS) will be run (in addition to the FSA) for selected locations where sediment or soil will be sampled. The parameters include total phosphorus, nitrate-N,

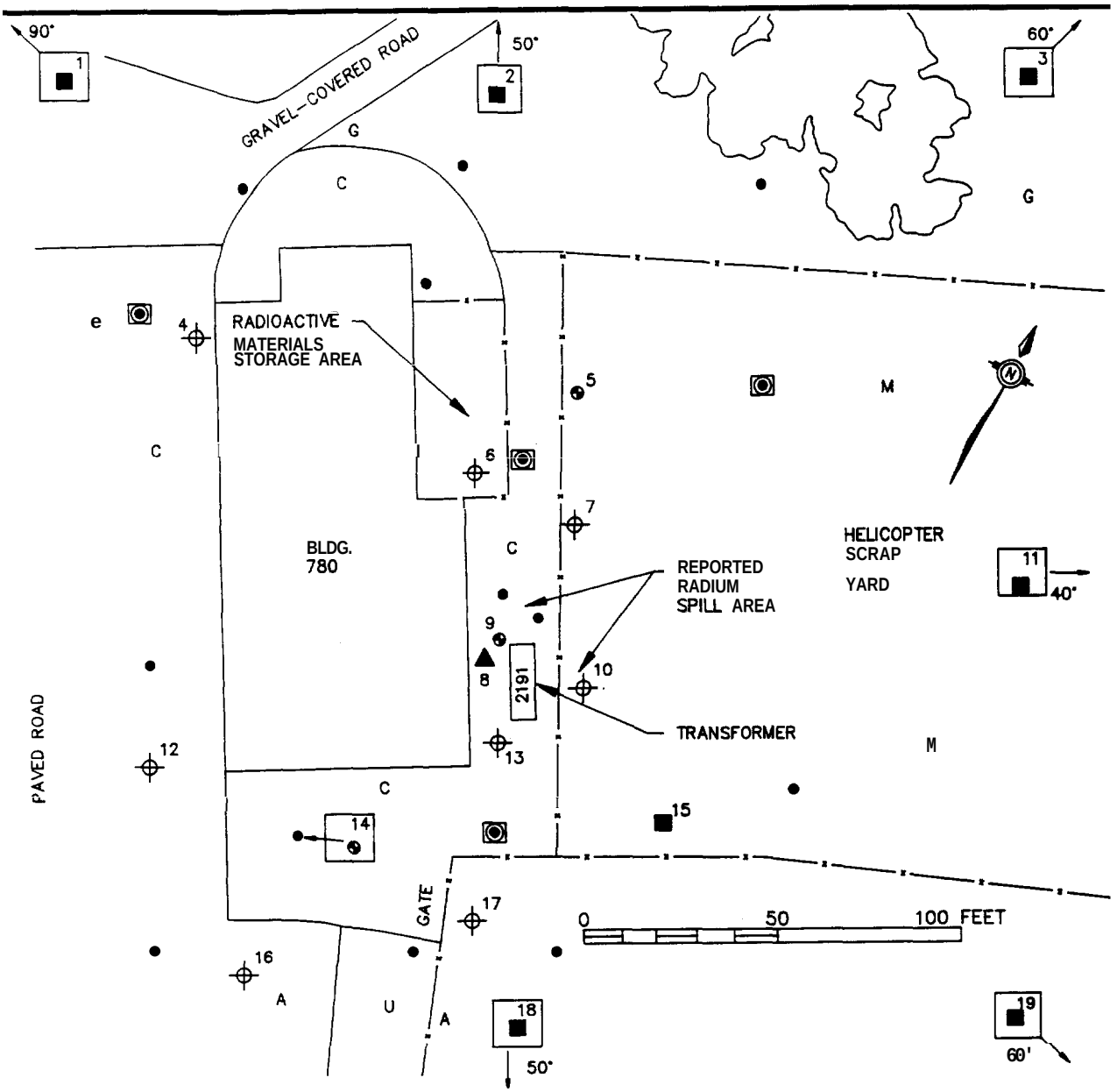
TKN, heterotrophic plate count, and cation exchange capacity. [These parameters **will be** used to characterize the physical properties of the soil at the site and for the completion of the feasibility study.]

- Physical Parameters, Soil (ST) Shelby tubes will be collected at selected locations where soil is to be sampled. The analysis will be in addition to the FSA at some locations and will be the only sample type at other locations. Shelby tubes will be analyzed for permeability, porosity **[**, bulk density, particle size, percent moisture, and specific gravity].

The changes in analytical organization were made to conform to CERCLA as opposed to **RCRA** requirements, for simplification, and to acquire additional information about physical parameters for the upcoming Feasibility Study.

FSA analysis will be conducted for **all** sample locations, sample intervals, and sample media designated on Figure **4-1.** At Site 25, **[99]** FSA analyses **are** currently projected.

For soil, FSA sampling will be conducted at locations **4-[7], [9-10], [12-14],** and **[16-17]** (total of **[11]** locations[;] see Figure 4-1). For planning purposes, the depth to groundwater is assumed to be **14** feet. [Surface soil samples will be collected from 0-1' using a decontaminated hand auger or Xi-Tech sampler prior to advancement of the soil boring. The remaining soil samples to be collected from the soil boring will be collected from **1-3', 3-5',** etc. to reduce the risk of cross contamination by allocating one sample interval per **2** foot long split barrel sampler.] **All** locations will be sampled continuously from the ground surface to the top of the water table, an estimated [eight] sample points per location. The total number of soil samples for FSA analysis is therefore **[88]**. [In the hand-augered interval from **0-1',** samples **used** for radiation analysis will be obtained from **0-15** cm below ground surface (bgs) in order



LEGEND

- ● PHASE I SOIL BORING
- PHASE I TEMPORARY MONITORING WELL
- PROPOSED SOIL BORING
- e PROPOSED SOIL BORING AND SHALLOW MONITORING WELL
- ■ PROPOSED SHALLOW MONITORING WELL
- ▲ PROPOSED INTERMEDIATE MONITORING WELL
- A ASPHALT–PAVED AREA
- C CONCRETE PAVED AREA
- G GRASS–COVERED AREA
- M METAL–COVERED/UNPAVED AREA
- U UNPAVED AREA
- TREES
- FENCE
- 2191 BUILDING
- 40° APPROXIMATE DISTANCE AND DIRECTION TO LOCATION OF PROPOSED MONITORING WELL

SOURCE : E&E 1991, [MODIFIED]

RI/FS SAMPLING AND ANALYSIS PLAN (SAP)
NAS PENSACOLA CAT. II
PENSACOLA FL.

FIGURE 4–1
SITE 25

DWG DATE: 04/02/93 DWG NAME: 059SIT25

to compare to EPAs benchmark of **5** pCi/g in this interval. In addition, if physical evidence of contamination is observed below the water table, a sample **will** be collected for **FSA** analyses for characterization and delineation of the source material.]

For groundwater, FSA sampling will be conducted at a total of [11] groundwater wells (total of [11] samples, see Figure 4-1).

Groundwater Sampling Locations ([11] total):

- [Eleven] onsite monitoring wells have been proposed for the following locations:
  - [Ten] shallow wells at locations:

    1 2 3 [5 91
    [11 14 **15** 18 19]
  - [One] intermediate well at location:

    8

- One shallow and one intermediate well will be clustered with each of three existing, deep supply wells during the RI for Site 1, and will be sampled as offsite background wells. The analysis will serve as offsite background for the Site **25** RI.

PPW Analysis

PPW analysis will be conducted at **six** groundwater sample locations **(Figure4-1).** Groundwater samples will be taken from [five] shallow wells and [one] intermediate well. The specific locations will be determined in the field during FSA sampling, using available physical **data** and best professional judgement. In this way, field personnel will be able to identify locations that offer the most representative sample, or a sample in a contaminated **area.**

PPS Analysis

PPS analysis will be conducted at three soil sample locations (Figure **4-1)** determined in the same manner as **PPW** sample locations. Varying soil depth intervals will be selected for **PPS** analysis.

Shelby Tube Analysis

Shelby tube analysis (ST) will be conducted at three surficial soil sampling locations ([**1-3**] feet) and in the low permeability zone at [one] location, to be determined **as** outlined above. [A] Shelby tube from the low permeability zone will be collected during installation of [the] intermediate well at location **[8]**.

4.1 Sampling Objectives

Sampling objectives applicable to this site are presented in section [2.0] of the [C]SAP.

4.2 General Sampling Requirements

General sampling requirements applicable to this site are presented in section **[2.2]** of the **[C]SAP**.

4.3 Sample Processing

Sample processing procedures to be followed are presented in section **4** of the [C]SAP.

4.4 Collection of Auxiliary Data

[Auxiliary data collection applicable to the Site 11RI **is in** accordance with Section 9 of the ***CSAP.*** Pumping tests will be performed at the site if groundwater remediation **is required.** Prior to initiating the pumping tests, slug tests will be performed at selected monitoring wells. The results of the slug tests will be used to **design** the appropriate pumping tests.

Pumping tests will be performed in accordance with the procedures provided in Section 9.6.2 of the CSAP.]

4.5 Specific Sampling Procedures

Sampling procedures proposed for the Site 25 RI will be conducted in accordance with those in sections [4 and 6] of the [C]SAP, with the following exceptions listed below.

Changes to the Original Work Plan:

- It has been determined that sampling saturated soil below the water table at NAS Pensacola would not offer any conclusive chemical analysis. Therefore, soil sampling below the water table will be limited to the collection of Shelby tubes. [In addition, if physical evidence of contamination is observed below the water table, a sample will be collected for FSA analyses for characterization and delineation of the source material.] Sampling and analysis at Site 25 will be conducted at the remaining locations designated on Figure 4-1 in accordance with Section[s 4 and 6] of the [C]SAP.

- Soil sample intervals have been changed from 0.0-1.0, 1.0-2.5, 2.5-5.0, etc. feet bgs to [hand augering from 0-1' and] continuous split-spoon sampling from ground surface to the water table ([1-3, 3-51, etc. feet bgs). This change has been made to ensure a regular and consistent sampling interval. Specific subsurface soil sampling procedures can be found in Section 4 of the [C]SAP.

- Surface casing will no longer be required for the installation of intermediate wells. [Instead, the hollow stem auger will be used as a temporary casing during soil sample collection and monitoring well installation.] Information regarding practical

drilling procedures at NAS Pensacola indicates that surface casing is only needed for deep wells **[penetrating the confining unit.]**

4.6 Decontamination

Decontamination procedures to be followed during the RI are described in Section **[11]** of the [C]SAP.

4.7 Sample Management

Sample management procedures to be followed during the RI **are** described in Section **[12]** of the [C]SAP.

4.8 Sample Custody

Sample custody procedures to be followed during the RI **are** described in Section **[12.5]** of the [C]SAP.

4.9 Investigation Derived Waste

Procedures to be followed for the handling of investigation-derived waste during the RI **are** described in Section [13] of the [C]SAP.

4.10 Quality Assurance/Quality Control

Quality assurance/quality control procedures to be followed during the investigation **are** described in Section [15] of the [C]SAP. Trip blank, field blank, **and** rinsate blank numbers will be determined in accordance with Section [15] of the [C]SAP. Matrix spike **and** matrix spike duplicate samples will be taken every 20th sample regardless of sample matrix or type. **This** will be accomplished by doubling the volume of **all** aliquots of the 20th sample.

5.0 ANALYSIS

Field measurements will be collected and laboratory analysis will be conducted as outlined in the **[C]**SAP.

[Bold items enclosed in brackets denote changes to last version of document.]

6.0 QUALITY ASSURANCE PLAN

The comprehensive Quality Assurance Plan **[contained in Section 15 of]** the [C]SAP **will** be used for this investigation.

[Bold items enclosed in brackets denote changes to last version of document.]

7.0 DATA MANAGEMENT PLAN

The comprehensive Data Management Plan **[contained in Section 15 of]** the [C]SAP **will** be used for this investigation.

8.0 REFERENCES

Ecology & Environment, Inc. (1992a). *Contamination Assessment/Remedial Activities Investigation Work Plan [for] Group G, Naval Air Station Pensacoh,* Pensacola, Florida. E & E, Inc. Pensacola, Florida.

Ecology & Environment, Inc. (1992b). *Contamination Assessment/Remedial Activities Investigation, Naval Air Station Pensacoh, Pensacola, Florida, Data Summary and Preliminary Scoping Report for Ecological Risk Assessment Work Plans,* November 1992: E & E, Inc. Pensacola, Florida.

[EnSafe/Allen & Hoshall (1993). *Comprehensive Sampling and Analysis Plan for Naval Air Station Pensacola.* E/A&H: Memphis, Tennessee.]

Naval Energy and Environmental Support Activity (NEESA). (1983). *Initial Assessment Study of Naval Air Station, Pensacola, Florida.* NEESA 13-015.

U.S. Environmental Protection Agency. (1991). *Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual,* U.S. Environmental Protection Agency Region IV, Environmental Services Division.

9.0 FLORIDA PROFESSIONAL GEOLOGIST SEAL

I have read and approve of the Final Sampling and Analysis Plan for the Site 25 — Radium Spill Site and seal it in accordance with Chapter 492 of the Florida Statutes. In sealing this document, I certify that the geological information contained in it is true to the best of my knowledge and that the geological methods and procedures included in this plan are consistent with currently accepted geological practices.

Name:	Brian E. Caldwell
License Number:	1330
State:	Florida
Expiration Date:	July 31, 1994

B E Caldwell

Brian E. Caldwell

5-7-93

Date

[Bold items enclosed in brackets denote changes to last version of document.]