

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION
FINAL SAMPLING AND ANALYSIS PLAN
FOR SITE 38 — BUILDING 71
NAVAL AIR STATION
PENSACOLA, FLORIDA**



SOUTEDIV-CONTRACT NUMBER:
N62467-89-3-0318
CTO-058

Prepared for:
**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN)
NAVAL SUPPORT ACTIVITY
NAVAL AIR STATION
PENSACOLA, FLORIDA**



Prepared by:
**ENSAFE/ALLEN & HOSHALL
5724 Summer Trees Drive
Memphis, Tennessee 38134
(901) 372-7962**

May 1993

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

Table of Contents

1.0	INTRODUCTION	1
2.0	BACKGROUND INFORMATION	3
2.1	Site Description	3
2.2	Site History	4
2.3	Physical Setting	4
3.0	PHYSICAL SURVEYS	5
3.1	Contaminant Source Survey	5
3.2	Physical Reconnaissance Survey	5
3.3	Soil Gas Survey	6
3.4	Radiation Survey	7
3.5	Habitat/Biota Survey	7
4.0	FIELD SAMPLING PLAN	8
4.1	Sampling Objectives	14
4.2	General Sampling Requirements	14
4.3	Sample Management	14
4.4	Collection of Auxiliary Data	14
4.5	Sampling Procedures	15
4.6	Decontamination	18
4.7	Sample Management	18
4.8	Sample Custody	18
4.9	Investigation-Derived Wastes	18
4.10	Quality Assurance/Quality Control	18
5.0	ANALYSIS	19
5.1	Field Measurements	19
5.2	Laboratory Analysis	19
6.0	QUALITY ASSURANCE PLAN	20
7.0	DATA MANAGEMENT PLAN	21
8.0	REFERENCES	22
9.0	FLORIDA PROFESSIONAL GEOLOGIST SEAL	23

List of Figures

Figure 4-1 **Sample Locations** **12**

List of Tables

Table 4-1 **Site 38 RI Sampling and Analytical Requirements** **8**

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 **38** — Building **7L**, located at the Naval Air Station Pensacola, (NASP), Pensacola, Florida. This Sampling and Analysis Plan (**SAP**) has been developed by E/A&H for this investigation, as tasked by the Southern Division, U.S. Navy, Naval Facilities Engineering Command (SOUTHDIV) under Contract Number **N62467-89-D-0318/058**.

Primary references for this *SAP* include the *Comprehensive Sampling and Analysis Plan for the 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 Investigation Work Plan for Group P (Site 38)* completed by Ecology & Environment, Inc. (**E&E 1992**). Reference to these documents **is** made throughout this *SAP* and they should accompany this document during review or use. The investigation of Site **38** **will** be completed to fulfill requirements set forth in the work plan and in accordance with this site-specific *SAP*, the CSAP and the SOP/QAM.

The Site 38 RI will assess the **nature** and extent of **potential contamination**. [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 USEPA and FDER for notification.] In order to perform this investigation in a comprehensive and timely manner, both **Phase I** and **Phase II** activities proposed in the work plan (**E&E 1992**) will be incorporated into this RI.

Field activities will include a **soil gas** survey, physical surveys, installation of **soil borings** and **monitoring** wells, and **the collection** of sediment, **soil**, and groundwater samples for analysis. **Analytical tasks will be performed by a [laboratory approved by the Naval Energy and Environmental Support Activity (NEESA)] using Contract Laboratory Program (CLP) protocol.** Field sampling, analytical methods, and **reporting will be** conducted **at** EPA Level IV protocol.

Upon completion **of** the investigative **work** and **laboratory** analysis, an RI **report will** be submitted to **[the Navy, USEPA and FDER]** summarizing the activities, results and conclusions of the investigation. The **report will** provide **the** basis for a baseline **risk** assessment (BRA) and a **FS** to be completed **for** the site.

This **SAP**, **[in conjunction with the CSAP]**, will provide guidelines for sampling and analytical procedures **to** be used during the RI and outline proper documentation procedures **for** the investigation.

2.0 BACKGROUND INFORMATION

2.1 Site Description

Site 38 encompasses an approximate 1-acre **area** occupied by **Building 71**. It **is** located **near the** southeast NASP shore, approximately **50** feet from the concrete **seawall** adjacent to Pensacola Bay. The site elevation is approximately 5 feet above msl.

Building 71 is approximately 100 x 160 feet in **area** and **20** feet in height. It rests **on a** concrete slab floor approximately 8 to **12** inches thick which covers most of the site **area**. The building is divided **in** two by an interior concrete block wall. The northern portion of the **building** contains several concrete curbs which form **six** separate storage bays. The southern portion of the building is presently closed off due to suspected asbestos contamination.

A storage yard approximately 90 x **145** feet in **area** is located in an open **area** between Buildings **71** and **72**. The yard is paved by an extension of the concrete **slab** forming Building 71's floor. A loading apron and storage shed **are** located in the northeast corner of the storage yard.

The concrete slab forming the floor of the building and storage **yard** contains a system of interconnected grated drains and trenches reportedly connected to the NASP industrial waste sewer system. Additionally, two drainage grates of unknown connection **are** located approximately **15** feet east of Building 71.

The **area** surrounding Site 38 is a developed zone consisting of storage, maintenance **and** operations support facilities. Impervious surfaces (concrete or asphalt) **are** present throughout the area (**E&E 1992**).

2.2 Site History

A discussion of the historical setting of Site 38 is contained in Section 3 of the associated work plan for this site (E&E 1992). Previous site activities and investigations are reported as they relate to the existence of known or suspected site contaminants.

2.3 Physical Setting

Climatology, biological resources, surface water hydrology, physiography and hydrogeology for NASP are detailed in Sections 4 through 7 of the associated work plan for this site (E&E 1992).

3.0 PHYSICAL SURVEYS

[The physical surveys for Site 38 will include a] contamination source survey, physical reconnaissance survey, [soil gas survey,] radiation survey and [a habitat and biota survey. The surveys] will be conducted at EPA Level II protocol to collect screening data.

3.1 Contaminant Source Survey

A preliminary survey will be conducted to determine any potential contaminant sources and any present or past waste streams at the site. This survey **will** include a review of previous investigative reports, interviews with present and/or former NASP personnel, aerial photo analysis, and a utility survey.

The contaminant source survey will identify:

- The location of previous and current underground and overhead piping and utilities.
- The nature of past and/or present site activities that may have contributed to site contamination (e.g., types of substances used and waste disposal practices).
- Locations of any known surface spills or leaks.
- Locations of any existing or known historical outfalls.
- The locations and contents of any known present or former underground storage tanks (USTs).

3.2 Physical Reconnaissance Survey

An overall physical reconnaissance survey will be conducted at Site 38 in conjunction with the contaminant source survey. During this survey, a field team **will** visually inspect the site to locate surface features and to note surface conditions, **stressed** vegetation, surface drainage patterns, and **stained** surfaces. Additionally, **areas** that are most suitable for the establishment

of a grid system base line **will be** identified during the survey. **This** grid system **will be used** during the [soil **gas**] survey and radiation survey **to be performed later in the investigation.**

Air monitoring equipment such as a photoionization detector or organic vapor analyzer (OVA) will be utilized during walkovers of the site to screen the area for volatile organic emissions. Areas exhibiting readings above background levels **will be** flagged and identified on a site map for future reference. **All** findings of the **reconnaissance** survey **will be** mapped **in detail** and recorded in the field logbook.

[3.3 Soil Gas Survey

A soil gas survey will be performed across Sites 38 **to** delineate the extent of the **soil** gas and groundwater contaminant plume. The **soil** gas survey results will be **used** to select the **soil** and groundwater sampling points in order to monitor the extent and movement of the contaminant plume. A 50-foot interval sampling grid will be established **across** the site. The boundaries of the sampling grid are shown on **Figure 4-1**. The two baselines of the grid will be established by E/A&H personnel using a hand level. The baselines will be flagged at 50-foot intervals. Soil gas analysis will be collected at each of the grid **points**. At grid points with elevated soil gas readings, a groundwater sample will be collected and analyzed using the heated headspace method. **All** measurements will be recorded in the field logbook. Areas of elevated soil gas **readings** will be further investigated by redefining the grid to a 10-foot interval. Additional soil gas **readings** will then be collected. The baselines and other key elements of the **grid** will be documented by a **Florida** registered surveyor for inclusion on report maps. Soil **gas** sampling procedures will be **performed** in accordance with Section **32** of the CSAP.]

3.4 Radiation Survey

This survey [will be performed using the] grid ~~system~~ established across the site [for the soil gas survey.] The radiation survey is proposed due to the historical use of radioactive materials at NASP. A sodium iodide (NaI) type scintillation detector will be used to collect readings at each grid node location as described in [Section 9.7 of the CSAP.]

3.5 Habitat/Biota Survey

[A Phase I habitat/biota survey will be performed at Site 38 as outlined in Section 8 of the CSAP. Data obtained during the Site 38 RI investigation will also be used to help assess ecological risk. Because of the proximity of Site 38 to Site 2, the Site 38 Phase I habitat/biota survey will use the information collected during the previous E&E Site 2 investigation (E&E 1992). 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 38 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 collecting sediment, soil and groundwater samples using various techniques. The sampling and analytical requirements for this investigation are summarized in Table 4-1.

Table 4-1 Site 38 RI Sampling and Analytical Requirements				
Medium	No. of Samples ^a	Analytical Parameters	[DQO Levels]	Comments
Sediment	16 (3)	FSA PPS	[IV] [IV]	
Soil ^b	21 (4) 3	FSA PPS ST	[IV] [IV] [IV]	—Shelby Tube
Groundwater ^c	10 (5)	FSA PPW	[IV] [IV]	— 3 from SWs — 2 from IWs
TOTAL	50 (12)			

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 = 7 boring location x 3 depth intervals = 21 samples; 1 depth interval from 3 intermediate wells = 3 samples.
- c** Number of groundwater samples = 7 shallow wells plus 3 intermediate depth wells = 10 samples.

Analytical Parameters

Full Scan of Analysis (FSA) = TCL VOCs; TCL base-neutral/acid extractable organic compounds (BNAs); TCL Analysis pesticides and TCL polychlorinated biphenyls (PCBs); TAL metals (total [i.e., unfiltered], water only); and TCL cyanide.

Physical Parameters		
Sediment/Soil (PPS)	—	Total phosphorus, nitrate-N, TKN, heterotrophic plate count, total organic carbon, cation exchange capacity.
Physical Parameters		
Soil (ST)	—	Permeability, porosity, bulk density, particle size, percent moisture, and specific gravity (taken with Shelby tube).
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.
NR	—	Not required
SW	—	Shallow well
IW	—	Intermediate depth well

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** of contaminant analysis. Sediment, soil and groundwater samples will be analyzed for the **full TAL/TCL list** with additional non-CLP analysis also being conducted.

Analyses proposed in this **SAP** have been organized differently than those in the work plan which **are** subdivided into "Suites **A** through **E**." **Proposed** analytical parameters **are** now organized into the four basic subdivisions listed below.

New Analytical Organization:

- **Full** Scan of Analysis (**FSA**) — These analyses will be performed on all samples collected for chemical analysis. **A full scan** consists of analysis for **TCL** VOCs, BNAs, PCBs, pesticides, cyanide and TAL metals (unfiltered). **If**, during the radiation survey, radioactivity is detected above background levels, **gamma** spectroscopic analysis will also be conducted.
- Physical Parameters, Water (PPW) — These analyses will be performed on only a portion of the groundwater samples collected at the site, and will be used to determine

the physical characteristics of this site medium [**and for completion of 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. Samples for these analyses **will be** collected at the same time and in addition to the samples collected for the FSA analyses. For groundwater, **PPW** samples will be **collected** from **all** aquifer zones sampled. The locations chosen for the **PPW** samples will **be** based on field observations, and will be intended to generally represent the physical conditions of site groundwater. **Areas** of likely contamination will be specifically targeted.

- **Physical Parameters, Sediment/Soil (PPS)** — These analyses will be performed on only a portion of the sediment and soil samples collected at the site, and **will be used** to determine the physical characteristics of these site media [**and for completion of the feasibility study**]. The parameters include total phosphorus, nitrate-N, **TKN**, heterotrophic plate count, total organic carbon (TOC), cation exchange capacity. Samples for these analyses will be collected at the same time and in addition to the samples collected for the FSA analyses. The locations chosen for the **PPS** samples will be based on field observations, and will be intended to generally represent the physical conditions of sediments and soils at the site. **Areas** of likely contamination will be specifically targeted.
- **Physical Parameters, Soil (ST)** — These analyses will be performed only on **soil** collected with a Shelby tube sampler from the first **confining/semiconfining** unit encountered at the site. It is anticipated that **this** unit exists at approximately 40 feet **below** land surface (**bls**), immediately below the surficial aquifer zone. These analyses will assess the physical characteristics of the confining unit matrix. Each Shelby tube

sample will be analyzed for **[bulk density, particle size, percent moisture, and specific gravity]** as well as permeability **and** porosity. Results of the analyses **will** be used to calculate the potential for contaminant migration between overlying and underlying aquifer zones.

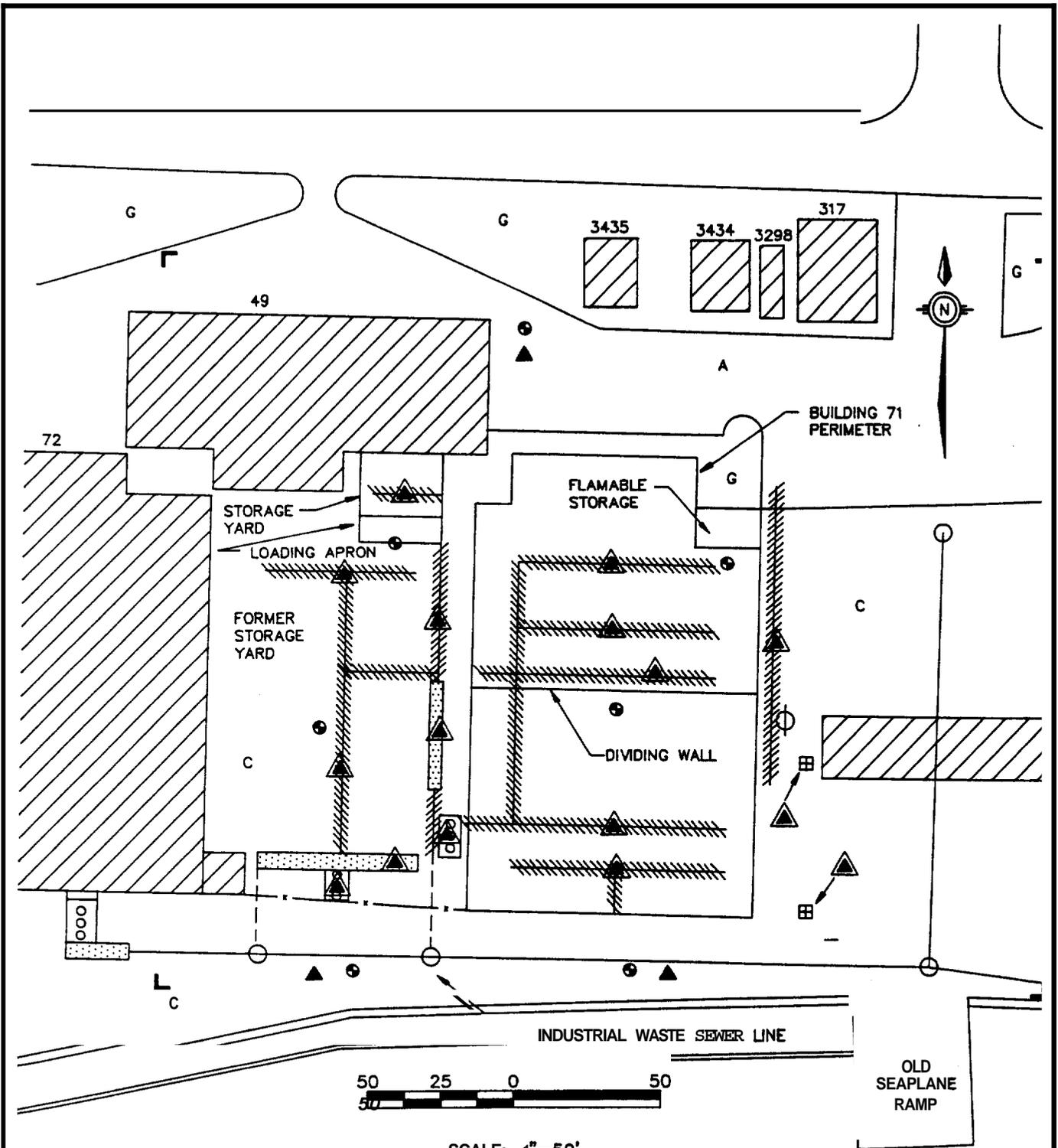
Changes were made to the proposed analyses to address CERCLA rather than RCRA requirements (i.e., the omission of Appendix IX analysis), to acquire additional information regarding the physical characteristics of site sediment, soil, and groundwater for the feasibility study, and for simplification. Therefore, certain parameters have been omitted from this SAP because they **are** either redundant to the comprehensive TAL/TCL analytical **method** or provide information that is not legally defensible, or of limited use.

Sample locations **are** presented on Figure 4-1 for Site **38**. These locations closely follow the sampling approach proposed in Phase I, Section 14.1.2 of the work plan, with minor modifications such as the addition of intermediate depth monitoring wells, (**see** Section 4.5.3). However, **as** the investigation progresses, the sampling approach may be modified to improve the data collection process (i.e., the addition/modification of sample locations).

As previously stated, FSA analysis will be conducted on all samples from locations shown on Figure 4-1, regardless of media type, except Shelby tube samples.

Sediment Samples — FSA analysis will be conducted on sediment samples **collected** from **16** sampling locations (**see** Figure 4-1).

PPS parameter analysis **will also** be conducted on ~~three~~ of the **[16]** sediment samples collected. The specific locations for the PPS samples will be determined in the field based on site



LEGEND

- ▲ PROPOSED INTERMEDIATE MONITORING WELL
- ▲ (with hatching) PROPOSED SEDIMENT SAMPLE LOCATIONS
- PROPOSED SHALLOW MONITORING WELL
- ⊞ DRAINAGE GRATE
- MANHOLE COVER
- ⊞ (with hatching) SEDIMENT TRAP
- ▨ SEDIMENT TRENCH
- C CONCRETE SURFACE
- A ASPHALT SURFACE
- G GRASS SURFACE
- ⌈ ⌋ CORNERS OF SOIL GAS GRID

SCALE: 1"=50'



SAMPLING AND ANALYSIS PLAN
 SITE 38
 NAS-PENSACOLA
 PENSACOLA, FLORIDA

FIGURE 4-1
 PROPOSED SOIL BORING, SEDIMENT SAMPLE, AND MONITORING WELL LOCATIONS

DATE: 04/08/93

DWG NAME: 048SIT38

observations (i.e., odors, **OVA** readings, visible **stains**) **so** that field personnel *can* identify locations that **are** most representative of site conditions, including **areas** of **contamination**.

Soil Samples — FSA parameter analysis will be conducted on **soil** samples collected from seven soil boring locations (see Figure 4-1). **All** boring locations will be sampled continuously from the land surface to the depth where the water table is encountered (see Section 4.5.2 for **soil** sampling procedures). For planning, the depth **to** water is estimated **to** be approximately **6 feet** bls. It is estimated that three depth intervals will **be** sampled per location yielding a total of 21 soil samples for FSA analysis.

PPS parameter analyses will also be conducted on four soil samples collected from the seven soil borings. The specific locations and depths for the **PPS** samples will **be** determined in the field based on site observations to allow field personnel to identify locations that represent site conditions best, including **areas** of contamination.

Groundwater Samples — **FSA** parameter analyses will be conducted on groundwater samples collected from a total of 10 monitoring wells (see Figure 4-1) — seven shallow and three intermediate depth wells.

PPW parameter analyses will also be conducted on five of the 10 groundwater samples collected — three shallow wells and two intermediate depth wells. The specific locations for **PPW** sample collection will be determined in the field during **FSA** groundwater sample collection, and **based** on site observations (**OVA** readings, **odors**, etc.). In **this** way, field personnel *can* identify locations that represent ambient groundwater conditions **best** and sample in **areas** of likely groundwater contamination.

ST parameter **analyses** will be conducted on samples collected with Shelby **tube** samplers **from** the first confining/semiconfining unit encountered during drilling (**see** Section 4.5.3 of this plan for monitoring **well** installation procedures). One Shelby **tube** sample will be collected **during** the installation of each of the three intermediate depth **monitoring** wells.

4.1 Sampling Objectives

[The objective of the field sampling plan **is** to outline a feasible **means** of sample collection for chemical and physical analysis.

Objectives of sampling plan:

- **To** delineate the extent of soil, sediment, groundwater, surface water, and air contamination.
- **To** delineate migration pathways of the **contaminants**.
- **To** identify potential receptors of the **contaminants**.]

4.2 General Sampling Requirements

General sampling requirements applicable to [Site 38 will be **performed** in accordance with Section **2.2** of the **CSAP**].

4.3 Sample Management

Sample management [will be performed in accordance with Section **12** of the **CSAP**].

4.4 Collection of Auxiliary Data

Auxiliary **data** [will be collected in accordance with Section **9** of the **CSAP**. Pumping tests (up to **48** hours) 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 Sampling Procedures

Sampling procedures proposed for the Site 38 RI [are presented in Sections 4, 6, and 7 of the CSAP]. All proposed modifications to [CSAP] procedures, or modifications to procedures contained in the Site 38 work plan will be discussed in the following subsections.

4.5.1 Sediment Sampling

Sediment samples will be collected from the sediment trench system and drainage grates at the 16 locations shown on Figure 4-1. Sampling procedures to be followed during these activities are outlined in [Section 7.2 of the CSAPJ.

4.5.2 Soil Sampling

soil samples will be collected during the installation of seven soil borings and three intermediate depth monitoring wells at Site 38. soil boring and monitoring well locations are shown on Figure 4-1. Drilling methods and soil sampling procedures to be followed during these activities are presented in [Section 4 of the CSAP]. However, as an exception to the these procedures, the soil boring locations for this investigation will not be based on soil gas survey results.

Modification to soil Sampling Procedures:

[The following] modification [is proposed for] the soil sampling procedures in the Site 38 work plan.

- One Shelby tube sample will be collected from the first confining/semiconfining unit encountered during the installation of each intermediate depth monitoring well [as

described in Section 4.6.2 of the CSAP.] This modification is proposed to collect information regarding the physical characteristics (i.e., permeability) of this unit. Additionally, soil sampling for chemical analysis (FSA) is not proposed during installation of intermediate depth wells because these wells will be nested with shallow wells (See Figure 4-1).

4.5.3 Monitoring Well Installation

Ten monitoring wells will be installed at Site 38. As a modification to the sampling approach outlined in Phase I of the work plan, intermediate depth monitoring wells are proposed during the RI to investigate the vertical extent of potential groundwater contaminants, particularly any dense non-aqueous phase liquids (DNAPLs). The proposed monitoring well locations are shown on Figure 4-1. Seven wells will be shallow, completed to a target depth of approximately 15 feet bls, and three wells will be completed to an intermediate target depth of approximately 40 feet bls. Drilling methods and monitoring well installation procedures to be followed during these activities are described in [Section 5 of the CSAP]. However, the modifications outlined below will be made to these procedures for the Site 38 RI.

Modifications to Monitoring Well Installation:

- Intermediate depth wells will be completed into the lower portion of the surficial aquifer zone, immediately above the first confining/semiconfining unit.
- Surface casing will not be used during the installation of intermediate depth monitoring wells. [This modification is proposed because of the lack of a confining unit between the shallow and intermediate zones. The auger will therefore act as a temporary surface casing to reduce the potential for drawdown of contaminants during well

installation. Surface casings are only proposed for the installation of deep wells penetrating the confining unit.]

4.5.4 Groundwater Sampling

Groundwater samples **will** be collected **from** the 10 newly installed **monitoring** wells at Site 38. Groundwater sampling procedures **are** presented in [Section **6** of the CSAP].

4.5.5 Hydrologic Assessment

A hydrologic assessment will be performed at Site 38 **as** described in [Section **9.6** of the **CSAP**]. However, the modifications outlined below will be made **to** these procedures for the Site 38 RI.

Modifications to Hydrologic Assessment:

- [Full-scale pumping tests (up to **48** hours) will be performed at all **sites** requiring groundwater remediation. 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**. The USEPA and FDER **will be kept** apprised of the investigation as it progresses, and will be notified prior to conducting full scale pumping tests. The Navy will take technical responsibility for the design and implementation of these tests. Pumping tests will be **performed** in accordance with the procedures provided in Section **9.6.2** of the Comprehensive Sampling and Analysis Plan (**CSAP**).]

- e The water level elevation of nearby surface water bodies (Pensacola Bay) will be **recorded** at approximately the same time that water levels **are measured** in the onsite

wells. Additionally, a **rain** gauge will be installed at or **near Site 38** to regularly monitor site precipitation.

4.5.6 [Cadastral] Survey

A **[cadastral]** survey will be performed at Site **38** **as** described in **[Section 3.5 of the CSAP]**.

4.6 Decontamination

Decontamination procedures to be followed during the Site **38** RI **are** described in **[Section 11 of the CSAP]**.

4.7 Sample Management

Sample management procedures to be followed during the Site **38** RI **are** described in **[Section 12 of the CSAP]**.

4.8 Sample Custody

Sample custody procedures to be followed during the Site **38** RI **are** described in **[Section 12.5 of the CSAP]**.

4.9 Investigation-Derived ~~Wastes~~

Procedures to be followed for handling of investigation-derived wastes during the **Site 38 RI** **are** described in **[Section 13 of the CSAP]**.

4.10 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) procedures to be followed during the investigation **are** described in **[Section 15.2 of the CSAP]**.

5.0 ANALYSIS

Quality assurance objectives for the collection of field measurements and laboratory analysis **[are discussed in the following sections.]**

5.1 Field Measurements

Field measurements will be collected at Site 38 in accordance with **[section 10.1 of the CSAP]**. Field measurements will include pH, temperature, specific conductance, salinity, groundwater level, well head survey, and organic vapor detection.

5.2 Laboratory Analysis

Laboratory analysis will be conducted in accordance with guidance ~~set forth~~ **in [Section 10.2 of the CSAP]**.

6.0 QUALITY ASSURANCE PLAN

The Quality Assurance Plan (*QAP*) [presented in Section 15 of the **CSAP**] will be used for the Site 38 RI.

7.0 DATA MANAGEMENT PLAN

The Data Management Plan (DMP) [presented in Section 14 of the **CSAP**] will be used for the Site 38 RI.

8.0 REFERENCES

Ecology and Environment, Inc. (1992). *Contamination Assessment/Remedial Activities Investigation Work Plan — Group P, Naval Air Station Pensacola, Pensacola, Florida.* Ecology & Environment, Inc.: Pensacola, Florida.

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

EnSafe/Allen & Hoshall (1992). *Draft Health and Safety Plan, Remedial Investigation/Feasibility Study, Site 38.* EnSafe/Allen & Hoshall: Memphis, Tennessee.

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

9.0 FLORIDA PROFESSIONAL GEOLOGIST SEAL

I have read and approve of the Final Sampling and Analysis Plan for the Site 38 — Building 71 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