

**COMPREHENSIVE LONG-TERM  
ENVIRONMENTAL ACTION  
FINAL SAMPLING AND ANALYSIS PLAN  
FOR SITE 10  
COMMODORE'S POND  
NAVAL AIR STATION  
PENSACOLA, FLORIDA**

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ENVIRONMENTAL ACTION NAVY (CLEAN)  
NAVAL SUPPORT ACTIVITY  
NAVAL AIR STATION  
PENSACOLA, FLORIDA

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19. Abstract

This Sampling and Analysis Plan (SAP) is written for Site 10, Commodore's Pond. The purpose of this investigation is to delineate nature, extent and magnitude of contaminated soil and groundwater. In addition, a sediment sample will be collected to assess potential impact to Wetland 6.

Physical surveys to be conducted during the Preliminary Site Characterization include a well inventory, a contaminant source survey, and a habitat and biota survey. In addition, a geophysical survey will be conducted across the buried drum area, west of Site 10 to determine the extent of the area.

Field activities to be performed during the Preliminary Site Characterization include the completion of soil borings and monitoring wells, the collection of soil, groundwater and sediment samples, and a hydrologic and ecologic assessment. chemical analyses will be completed 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 U.S. Environmental Protection Agency (USEPA) Level IV protocol.

This SAP, in conjunction with the Comprehensive Sampling and Analysis Plan, will provide guidelines for sampling and analytical techniques to be used during the investigation and outline proper documentation procedure for the investigation.

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## List of Acronyms

The following **lists** contains many of the acronyms, initials, abbreviations, and **units** of measure used in this report.

bls	Below Land Surface
BNAs	Base-Neutral/Acid Extractable Organic Compounds
CLEAN	Comprehensive Long-Term <b>Environmental Action Navy</b>
CLP	Contract Laboratory <b>Program</b>
CSAP	Comprehensive Sampling and Analysis Plan
DQO	<b>Data Quality</b> Objective
E/A&H	EnSafe/Allen & Hoshall
<b>E&amp;E</b>	Ecology & Environment, Inc.
<b>FDEP</b>	<b>Florida</b> Department of <b>Environmental Protection</b>
<b>FS</b>	Feasibility Study
FSA	Full <b>Scan</b> of Analysis
GPS	Global Positioning System
<b>GS</b>	<b>Grain Size</b>
<b>HEX</b>	Hexavalent Chromium Analysis
IAS	<b>Initial</b> Assessment Study
<b>IDR</b>	Interim <b>Data</b> Report
<b>IWTP</b>	Industrial Wastewater Treatment Plant
msl	Mean <b>Sea</b> Level
NAS Pensacola	Naval <b>Air Station</b> Pensacola
NEESA	Naval Energy and <b>Environmental</b> Support Activity
OU	Operable Unit
PAHs	polynuclear aromatic <b>hydrocarbons</b>
PCBs	polychlorinated biphenyls
<b>PPS</b>	Physical <b>Parameters (Soil)</b>
PPW	Physical <b>Parameters (Water)</b>
PRGs	<i>preliminary</i> Remedial <b>Goals</b>
PVC	Polyvinyl Chloride
QA	<b>Quality</b> Assurance
QC	<b>Quality</b> Control
<b>RI</b>	Remedial Investigation
<i>SAP</i>	<b>Sampling and Analysis Plan</b>
<b>SOP/QAM</b>	<b>Standard Operating Procedures and Quality Assurance Manual</b>
SOUTHNAVFACENGCOM	Southern Division, U.S. Navy, Naval Facilities <b>Engineering</b> Command
ST	Shelby Tube
TAL	Target Analyte <b>List</b>
TCL	Target Compound <b>List</b>
<b>TKN</b>	Total Kjeldahl Nitrogen

TOC  
TRPHs  
USEPA  
VOCs

Top of Casing  
~~Total~~ Recoverable Petroleum Hydrocarbons  
~~United~~ States Environmental Protection Agency  
Volatile Organic Compounds

## EXECUTIVE SUMMARY

This Sampling and Analysis Plan (SAP) is written for Site 10, Commodore's Pond. The purpose of this investigation is to delineate nature, extent and magnitude of contaminated soil and groundwater. In addition, a sediment sample will be collected to assess potential impact to Wetland 6.

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Field activities to be performed during the Preliminary Site Characterization include the completion of soil borings and monitoring wells, the collection of soil, groundwater, and sediment samples, and a hydrologic and ecologic assessment. Chemical analyses will be completed 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 U.S. Environmental Protection Agency (USEPA) Level IV protocol.

This SAP, in conjunction with the Comprehensive Sampling and Analysis Plan, will provide guidelines for sampling and analytical techniques to be used during the investigation and outline proper documentation procedures for the investigation.

## 10 INTRODUCTION

As part of the U.S. Navy Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, a Preliminary Site Characterization will be completed by EnSafe/Allen & Hoshall (E/A&H) at Site 10 — the Commodore's Pond, located at the Naval Air Station Pensacola (NAS Pensacola), 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 (SOUTHNAVFACENGCOM) under Contract No. N62467-89-D-0318/070.

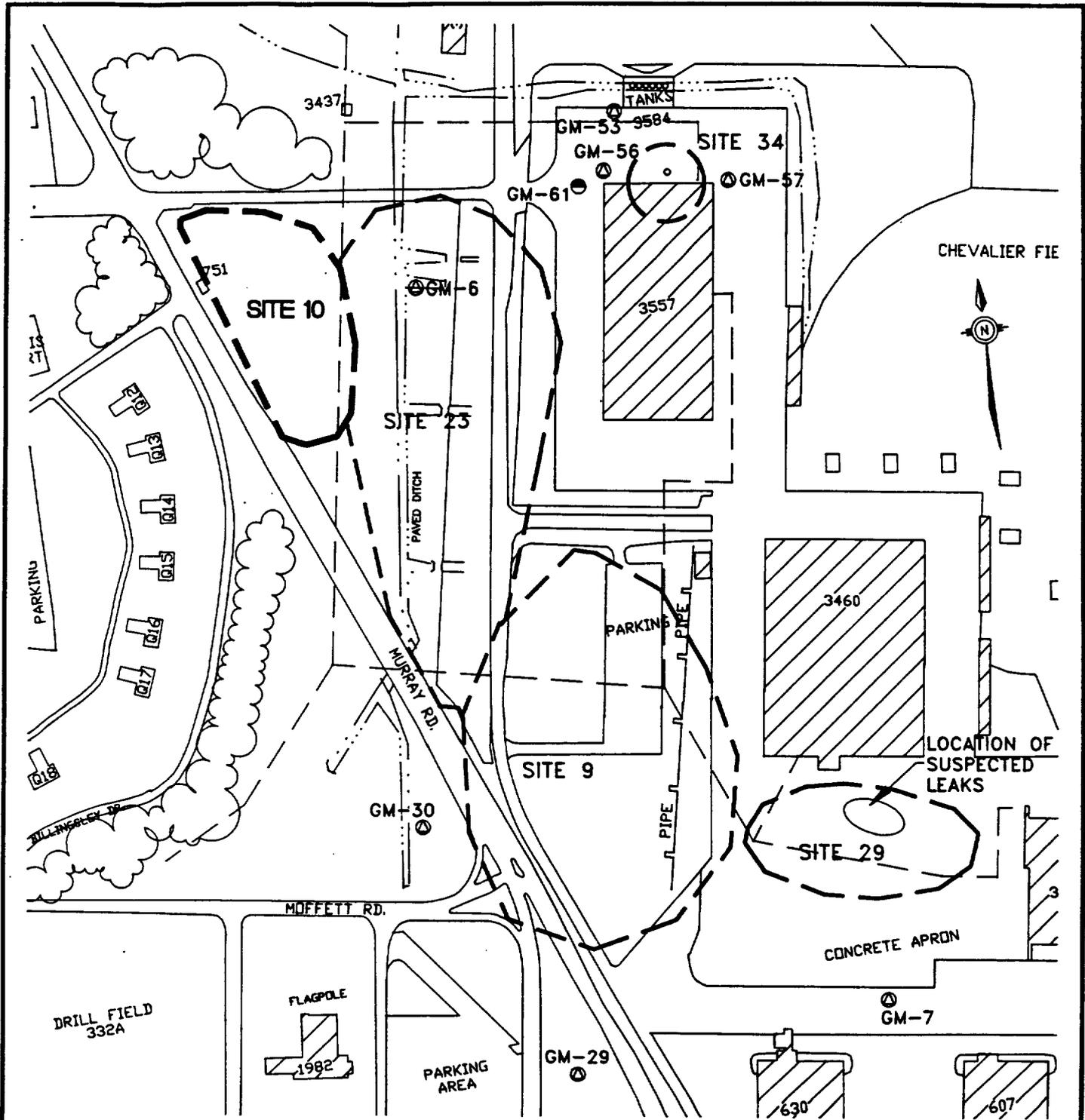
*Primary* references for this SAP include the *Comprehensive Sampling and Analysis Plan for Naval Air Station Pensacola* (CSAP) (E/A&H 1993), the United States Environmental Protection Agency (USEPA) Region IV *Standard Operating Procedures and Quality Assurance Manual* (SOP/QAM), and the *Contamination Assessment/Remedial Activities Investigation Work Plan — Group F* completed by Ecology & Environment, Inc. (E&E 1992). References to these documents are made throughout this plan. The investigation of Site 10 will be completed to fulfill requirements set forth in the E&E site work plan (1992) and this site-specific SAP. This investigation will be conducted in accordance with the SOP/QAM and CSAP.

The Site 10 Preliminary Characterization will assess the nature of any potential contamination identified during past and proposed field investigations. The results of the previous Phase I screening investigation are outlined in the *Interim Data Report (IDR), Contamination Assessment/Remedial Investigation, commodore's Pond (Site 10)* (E&E 1992). Before field activities begin, a well inventory, contaminant source survey, and habitat and biota survey will be conducted. Field activities to be performed during the Preliminary Site Characterization include the completion of soil borings and monitoring wells, the collection of soil, groundwater, and sediment samples, and a hydrologic and ecologic assessment. Chemical analyses will be

completed 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 USEPA Level IV protocol.

Upon completion of the investigative work and **laboratory** analysis, a [technical memorandum] will be submitted to the **Navy, USEPA,** and Florida Department of Environmental Protection (FDEP) summarizing the activities [and] results and conclusions of the investigation. [The report will provide supporting **data for** the completion of a baseline **risk** assessment. **This** memo will also compare analytical results to a **set of Preliminary** Remediation Goals (PRGs). **If** there are no analytical **results** above PRGs, a **Preliminary** Site Characterization Report will be submitted. **If contaminants** are present above **PRGs,** additional work will be outlined in the technical memorandum and will be sufficient to delineate the nature and extent of identified **contaminants**. The final investigative results will be submitted in either a Preliminary Site Characterization Report **or,** if warranted based on health risk, an RI report. **If** an RI report is **required,** a feasibility study report will be submitted to examine alternative remedies.]

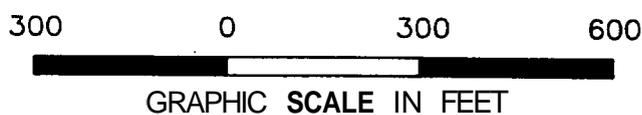
**This SAP,** in conjunction with the **CSAP,** will provide guidelines for sampling and **analytical** techniques to be used during the **Preliminary Site** Characterization and outline proper documentation procedures for the investigation.



SOURCE: ECOLOGY AND ENVIRONMENT, 1992

**LEGEND**

- ⊙ EXISTING SHALLOW MONITORING WELL
- EXISTING DEEP MONITORING WELL
- - - SITE BOUNDARY
- ▨ BUILDING
- - - INDUSTRIAL WASTE SEWER LINE



SAMPLING AND ANALYSIS PLAN  
 NAS PENSACOLA  
 PENSACOLA, FLORIDA

FIGURE 2-1  
 SITE MAP  
 SITE 10

DWG DATE 09/02/93      DWG NAME: 70SITE10

## **2.0 BACKGROUND INFORMATION**

### **2.1 Site Description**

Site 10 is located due west of Chevalier Field and occupies **portions** of an open field and a wooded **area** southeast of the intersection of Murray and Taylor Roads (**see** Figure 2-1). Building 751 is located adjacent to the northwest corner of the site boundary. Site 10 **also** encompasses **portions** of the Chevalier Field **Pipe Leak Area** (Site 23). **[West of Site 10, is an area containing buried drums (Figure 2-1). The extent and contents of the drums are not known.]**

Site 10 is an unpaved, fine-grained sandy tract covered with native **grasses**, live **oaks**, pines, and other native plant species. The land surface elevation is approximately **6** to **7** feet above mean sea level (msl) and slopes slightly downward toward the paved ditch to the east.

The northern **boundary** of Site 10 is adjacent to the **base** of an extensive escarpment, a wave-cut dune terrace which is the most prominent physiographic feature within the **NAS** Pensacola facility. The escarpment **rises** to more than **25** feet above mean sea level.

No groundwater monitoring wells **are** located on Site 10; however, **shallow** monitoring well GM-6 is located 200 feet east of the site. Monitoring well **construction details** are provided in Table 2-1.

### **2.2 Site History**

Site **10** is the location of a former small **surface** water body. In the **mid-1800s**, the pond was **used** for underwater storage of **shaped oak timbers**. **This** underwater storage method preserved the wood prior to its **use** for ship building. The original pond **is no** longer in existence and thus

**[Bold items enclosed in brackets denote changes to the first draft of document.]**

<b>Table 2-1 Construction Details of Monitoring Wells Near Site 10</b>					
<b>Well Designation</b>	<b>Surface Elevation (ft msl)</b>	<b>TOC Elevation (ft msl)</b>	<b>Total Depth Drilled (ft)</b>	<b>Screened Interval (ft)</b>	<b>Depth to Filter Pack (ft)</b>
GM-6	6.0	6.40	12.0	9.7 - 12.2	5.7

Source: Geraghty & Miller, Inc., 1984

Notes:

TOC = Top of Casing  
 msl = mean sea level

its exact dimensions are unknown (NEESA 1983). Site debris was unearthed in the late 1960s during trenching operations for the industrial wastewater treatment plant sewer system. Abandoned oak timbers were exhumed and reburied on Magazine Point. It is reported no hazardous materials were encountered during this effort.

An Initial Assessment Study (IAS) of potentially contaminated sites at NAS Pensacola was conducted by NEESA in June 1983. Based on field inspection, review of historical records, and interviews with NAS Pensacola personnel, NEESA concluded no further study of the site was necessary, and the site did not pose a threat to human health or the environment. No environmental sampling was performed onsite during the IAS to substantiate this conclusion. However, due to Site 10's proximity to the Chevalier Field Pipe Leak Area (Site 23), it is possible subsurface contamination exists.

E&E performed a Phase I screening investigation of Site 10 to identify [potential contaminants and areas of concern.] The investigation results are detailed in the E&E IDR (1992). Soil and

**[Bold items enclosed in brackets denote changes to the first draft of document.]**

groundwater samples were collected during the investigation and submitted for laboratory analysis. Metals (chromium, zinc, and lead), **total** recoverable petroleum hydrocarbons (TRPHs), polynuclear aromatic hydrocarbons (PAHs) and phenols were detected in the soil samples. Metals (chromium, cadmium, lead, and nickel) and phenols were detected in the groundwater samples. Additional assessment was recommended for Site 10.

### 2.3 Physical **Setting**

Climatology, biological resources, physiography, and hydrogeology for Site 10 and NAS Pensacola are detailed in Sections 4 through 7 of the E&E site work plan (1992).

### 3.0 **PHYSICAL SURVEY**

Various physical surveys have been conducted at Site 10 as part of E&E's Phase I screening activities. These include aerial photograph analysis, **site** reconnaissance, surface/particulate air emissions survey, a habitat and biota survey, radiation survey, and a geophysical survey. Results of the physical surveys are presented in Section 3 of the IDR (E&E 1992). Relevant information has been considered during the planning of this *preliminary* Site Characterization and will not be duplicated. Three surveys will be conducted before field activities begin: a well inventory survey, a contaminant source survey, and a habitat and biota survey. **[In addition, a geophysical survey will be conducted over the buried drum area identified west of Site 10.1**

#### **Well Inventory**

An inventory of existing monitoring wells will be completed in accordance with Section 3.1 of the CSAP.

### **Contaminant Source Survey**

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

The survey will include the identification of the following:

- Location of previous and current underground and overhead piping and utilities.
- ~~Past~~ and present chemicals **used** at the site.
- e Locations of any known surface ~~spills~~.
- e Locations of any known **historical** outfalls.
- Locations and contents of any known present or former underground storage tanks.

### **Habitat and Biota Survey**

A ~~Phase I~~ habitat and biota survey will **be** performed in accordance with Section **8** of the **CSAP**. Data obtained during the Site 10 **Preliminary** Characterization will **also be used to** help assess **ecological risk** to any onsite or surrounding terrestrial and aquatic habitats potentially **affected** by contaminant migration. **[The complete ecologic assessment of any adjacent wetland complex will be conducted as part of the RI of Site 41 (NAS Pensacola wetlands). If ecological impacts to wetland areas adjacent to Site 10 are suspected based on Phase I data, Phase II sampling will be performed during the Site 41 RI and in accordance with the Final RI/FS Work Plan for OU 41. If other ecological impacts (terrestrial) are suspected at Site 10 after the Phase I survey, Phase II sampling will be implemented as outlined in Section 8 of the CSAP.]**

[Geophysical Survey

A geophysical survey will be performed across the buried drum area west of Site 10 to determine the presence of buried metallic materials and to determine if the area is a potential source of contaminants for Site 10. The geophysical survey results will be used to aid in the selection of soil and groundwater sampling locations. Electromagnetic survey measuring terrain conductivity will be conducted. The surveys will be performed in accordance with Section 33 of the CSAP.

To facilitate the geophysical survey, a 20-foot interval survey grid will be established across the site except at areas of obstruction (i.e., buildings). The two baselines of the grid will be established by E/A&H personnel using a hand level. The baselines will be flagged at 20-foot intervals. Geophysical measurements will be collected at each of the grid points. The baselines and other key elements of the grid will be documented using the global positioning system (GPS) for inclusion on report maps.]

#### **4.0 FIELD SAMPLING PLAN**

The field sampling plan describes sampling and field measurement procedures to be used during the preliminary Site Characterization. The field investigation includes advancing soil brings, installing groundwater monitoring wells, and collecting soil, groundwater [and sediment] samples using various techniques. A hydrologic and ecological assessment will also be conducted for Site 10.

##### **4.1 Sampling Objectives**

The objectives of the field sampling effort are to:

- Identify potential sources of contamination.
- Assess the nature of identified contaminants.

[Bold items enclosed in brackets denote changes to the first draft of document.]

- e Delineate the extent of **soil** and groundwater contamination.
- [• **Assess impact to Wetland 6.**]
- e Delineate migration pathways **of the contaminants.**
- e Identify potential receptors of the **contaminants.**

#### 4.2 Sampling and Analytical Requirements

The sampling and analytical requirements **are** summarized in Table 4-1 and discussed below. The proposed number of **soil, groundwater[, and sediment]** samples is **also** listed in Table 4-1. The Navy, **USEPA**, and **FDEP** will be apprised of any changes in the number of samples collected.

**Any** additional sources or previously undetected contamination **will** be investigated by the collection of additional samples from any given media, sampling additional media not included in this site-specific **SAP**, installation of additional monitoring wells **to** delineate the extent **and** depth of **contaminants**, and performance of additional aquifer response **tests** to characterize subsurface hydrologic conditions. Before additional field activities **begin**, a field change request **will** be submitted to the Navy for approval with notification to the **USEPA** and **FDEP**.

The **USEPA** CLP Target **Analyte** List/Target Compound **List** (TAL/TCL) will be used to provide a legally defensible full spectrum of contaminant analysis. **Soil** and groundwater **will** be analyzed for the full TAL/TCL **list** with additional non-CLP analysis **also** being conducted when warranted. **[Hexavalent chromium analysis will not be performed on collected samples due to the lack of previous detection during other investigations at NAS Pensacola (OU10, Site 1, Site 39).]**

<b>Table 4-1 Site 10 Sampling and Analytical Requirements</b>			
Medium	No. of Samples <sup>a</sup>	Analytical Parameter	DQO <sup>b</sup> Level
Soil <sup>c</sup>	[15]	FSA	IV
	[(2)]	PPS	IV
	[(2)]	GS	IV
Groundwater <sup>d</sup>	[6]	FSA	IV
	(2)	PPW	IV
[Sediment <sup>e</sup> ]	1	FSA	IV
	1	GS	IV]
TOTAL	[21]	FSA	IV
	[(4)]	PPS/PPW	IV
	[(2)]	GS	IV

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 — DQO = Data Quality Objective
- c — Total number of soil borings = **151**; 151 soil borings x 3 depth intervals = **[151]** samples.
- d — Total number of groundwater samples = 1 existing monitoring well + **[5]** proposed monitoring wells = **[6]** samples.
- e — **Total number of sediment sample locations = 1; 1 sediment location x 1 depth interval = 1 sediment sample.]**

FSA — Full Scan of Analysis

Target Compound List (TCL) volatile organic compounds, TCL base-neutral/acid extractable organic compounds (BNAs), TCL pesticides, TCL polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals (unfiltered), and TCL cyanide.

PPS — Physical Parameters, Soil

Total phosphorus, nitrate-N, total Kjeldahl nitrogen (TKN), heterotrophic plate count, total organic carbon, and cation exchange capacity.

GS - Grain Size Analysis

PPW — Physical Parameters, Water

5-day biological oxygen demand, chemical oxygen demand, hardness, total suspended solids, alkalinity, total phosphorus, nitrate-N, TKN, and heterotrophic plate count.

**[Bold items enclosed in brackets denote changes to the first draft of document.]**

Analyses proposed in this *SAP* have been *organized* different than in the E&E site work plan (1992) which were subdivided into "Suites **A** through **E**." Proposed analytical parameters are now **organized** into the [four] basic groups **listed** below.

### New Analytical Organization

- **Full Scan of Analysis (FSA)** — A full scan consists of analysis for TCL volatile organic compounds (VOCs), T U base-neutral/acid extractable organic compounds (BNAs), TCL pesticides, TCL polychlorinated biphenyls (PCBs), TAL **metals** (unfiltered), and TCL cyanide.
- **Physical Parameters, Soil (PPS)** — The parameters include total phosphorus, nitrate-N, total Kjeldahl nitrogen (TKN), heterotrophic plate count, total organic carbon, and cation exchange capacity. Additional sample volume will be **collected** for the PPS samples.
- **Grain Size Analysis (GS)**
- **Physical Parametem, Water (PPW)** — The parameters include 5-day biological oxygen demand, chemical oxygen demand, hardness, total suspended solids, **alkalinity**, total phosphorus, nitrate-N, TKN, and heterotrophic plate count. Additional sample volume will **be** collected for the PPW samples.

Modifications have **also** been made to the list of **remedial/physical characteristic parameters** proposed in the E&E site **work** plan (1992). **Changes** were made to the proposed **analyses** to address CERCLA rather than RCRA requirements (i.e., the omission of Appendix IX **analyses**) and to acquire additional information regarding the physical characteristics of site **soil** and groundwater if a feasibility study is **required**. Therefore, **certain** parameters have been omitted

**[Bold items enclosed in brackets denote changes to the first draft of document.]**

from **this SAP because** they are either redundant to the comprehensive TAL/TCL analytical methods, provide [information] not legally defensible, or have limited use.

#### 4.3 Sample Locations and Rationale

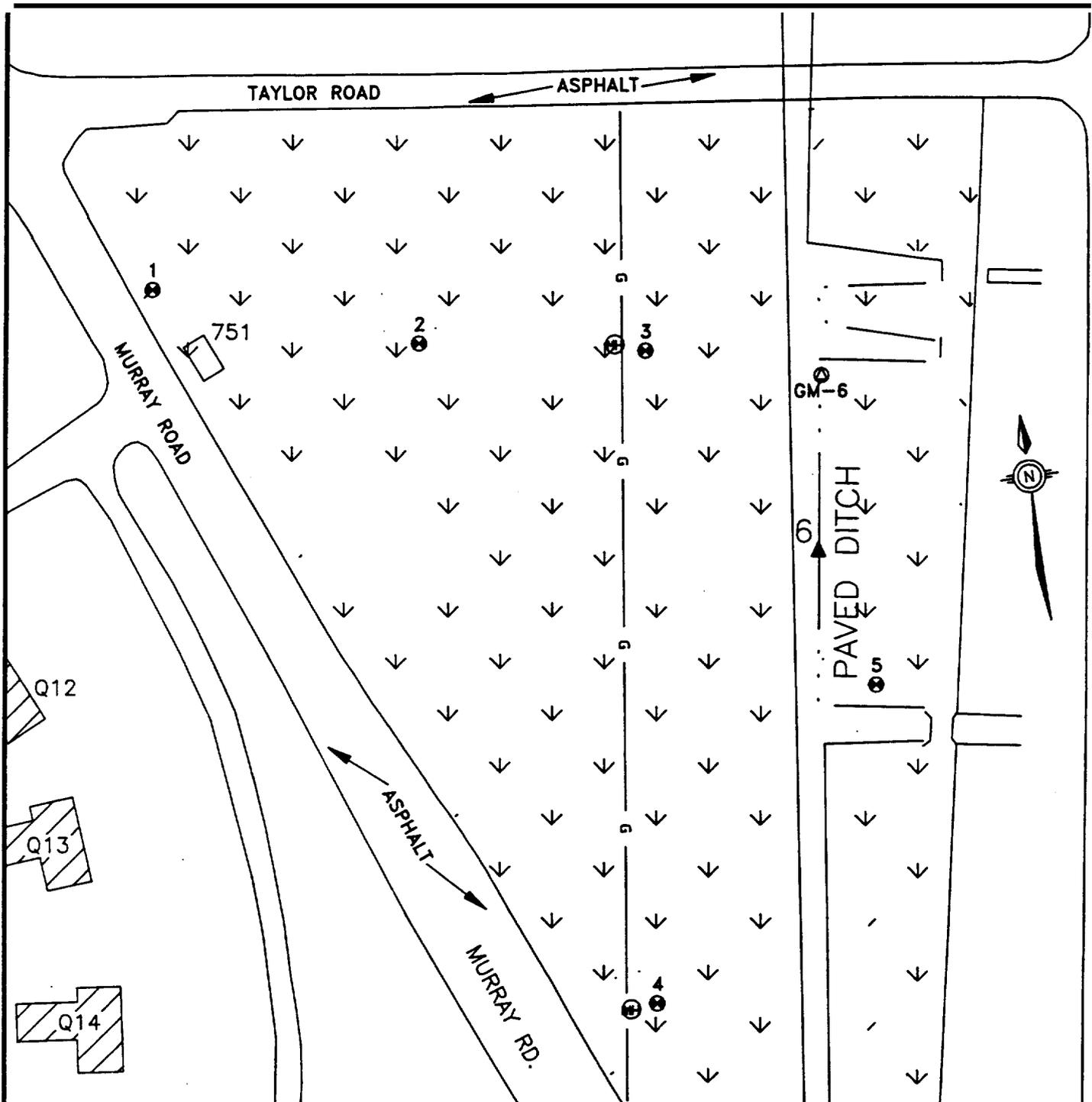
Proposed sample locations are presented on Figure 4-1. The sampling program and any proposed modifications to the E&E site work plan (1992) are described below.

**Soil Samples** — A FSA will be conducted on approximately [15] soil samples collected from [five] soil boring locations. All boring locations will be sampled at the following intervals: 0 to 1 feet below land surface (bls), 1 to 3 feet bls, 3 to 5 feet bls, etc. from the land surface to the depth of the water table. The depth to water is estimated to vary from 5 to 20 feet bls.

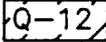
PPS analyses will be conducted on [two] soil samples for potential use in future feasibility studies. The PPS samples will be collected to represent both background and potentially contaminated conditions.

GS analysis will be conducted on [two] soil samples representative of the screened interval of two shallow wells. Results of the GS analysis will be used to calculate recovery well specifications if a groundwater remediation program is required.

Except for grain size, soil samples are not anticipated to be collected below the water table. If visual or olfactory evidence of contamination is observed below the water table, a sample will be collected for an FSA for characterization and delineation of potential contamination.



LEGEND

-  Q-12 - RESIDENTIAL QUARTERS
-  - MANHOLE
-  ASPHALT - ASPHALT PAVED AREA
-  - UNPAVED AREA
-  - SOIL BORING AND TEMPORARY SHALLOW MONITORING WELL
-  31 - LOCATION REFERENCE NUMBER
-  - G - INDUSTRIAL SEWER, GRAVITY LINE
-  ▲ - SEDIMENT SAMPLE

100 0 100

SCALE FEET



SAMPLING AND ANALYSIS PLAN  
 NAS PENSACOLA  
 PENSACOLA, FLORIDA

FIGURE 4-1  
 PROPOSED SAMPLING LOCATIONS  
 SITE 10

DWG DATE: 02/23/94 | DWG NAME: 70SAM10A

**Groundwater Samples** — A FSA will be conducted on groundwater samples collected from [six] monitoring wells (one existing well and [five] proposed wells). [Five] of the proposed wells will be completed to a target depth of 20 feet bls.

PPW analyses will be conducted on two groundwater samples for potential use in future feasibility studies. The PPW samples will be collected to represent both background and potentially contaminated conditions.

[Sediment Samples — A FSA will be conducted on a sediment sample collected from one sample location. The sample will be collected from a depth of 0 to 6 inches and will also be analyzed for GS.]

#### 4.4 Sampling Procedures

Proposed sampling procedures are presented in Sections 4, 5, and 6 of the CSAP. General sampling requirements will be performed in accordance with Section 2.2 of the CSAP with sample processing performed in accordance with Section 12. The sampling and any modifications to the CSAP or E&E site work plan (1992) are discussed below.

##### 4.4.1 Soil Sampling

Soil borings will be advanced using hollow-stem auger drilling techniques. Soil samples will be collected in accordance with Section 4.6.1 of the CSAP.

##### 4.4.2 Monitoring Well Installation and Development

Monitoring well borings will be advanced using hollow-stem auger drilling techniques. The drilling methods and monitoring well installations will be in accordance with Sections 5.2 and

5.3 of the CSAP. In accordance with Florida Administrative Code Chapter 40A-3, neat cement grout is required in all **monitoring well installations**.

**Because** of possible floating contaminants, shallow **monitoring wells** will be **installed so** the well screen brackets the water table. The drilling will [**consist of**] using hydraulic **rotary** or hollow-stem auger techniques to the completion depth of the monitoring well.

At least **24** hours after monitoring well **installation** is complete, the monitoring wells will be developed in accordance with **Section 5.4** of the CSAP. **monitoring wells will** be developed using peristaltic pumps following an initial purging of **coarse** sediment-laden water using centrifugal pumps.] Monitoring well development **will** continue **until** the water withdrawn is free of turbidity based **on** the geology of the area and **pH**, **temperature** and specific conductivity have stabilized. These measurements will be recorded in accordance with **Section 10.1** of the CSAP.

#### 4.4.3 Groundwater Sampling

Groundwater sampling will be **performed in** accordance with **Section 6** of the CSAP. [peristaltic pumps may be **used** in place of bailers. Purge and sample tubing **on** peristaltic pumps will be constructed of **Teflon**, and sample collection **will** take place **between** the pump and the well **as** outlined in **Section F.1.3** of SOP/QAM. **To** prevent potential degassing of volatiles, samples **collected** for VOCs **will** be collected by **disconnecting** the tubing from the pump, and allowing **the** water in the tube to **drain** into the sample vials. Groundwater samples collected with a peristaltic pump should **be** collected near the top of the water column and water should **be** clear **as** possible given the subsurface geology (generally between **10** and **30 NTUs**) **before** sampling.] Field measurements to **be** recorded

during groundwater sampling include pH, temperature, specific conductance, groundwater level, [turbidity] and organic vapor detection, in accordance with **Section 10.1** of the **CSAP**.

#### [4.4.4 Sediment Samples

Sediment samples will be collected using a **Ponar grab** sampler, hand auger or **stainless steel spoon** as described in **Section 7.2** of the **CSAP**.]

### 4.5 Hydrologic Assessment

A hydrologic assessment will be performed in accordance with **Section 9.6** of the **CSAP**. [An initial water level assessment will be performed to determine shallow groundwater elevations, shallow groundwater flow direction(s), and hydraulic gradient(s).] Slug tests and/or specific capacity tests will be performed at selected monitoring wells sufficient for site characterization. If groundwater remediation is **required**, the results of the slug and/or specific capacity tests will be used to design the appropriate pumping tests. The Navy will accept technical responsibility for the design and implementation of **these** tests. **The** Navy, USEPA, and FDEP will be kept apprised of the investigation as it progresses, and will be notified before conducting full-scale pumping tests. Pumping tests will be performed in accordance with the procedures provided in **Section 9.6.2** of the **CSAP**.

### 4.6 Ecological Assessment

A minimum of a **Phase I** habitat and biota survey will be conducted in accordance with **Section 8.1** of the **CSAP**.

### 4.7 Geodetic Survey

[The wellhead survey measurements will be collected using the **GPS** in accordance with manufacturer's specifications.]

#### **4.8 Decontamination**

Decontamination procedures will **be performed** in accordance with Section **11** of the CSAP.

#### **4.9 Investigation-Derived ~~Wastes~~**

Investigation-derived wastes will be **handled** in **accordance** with **Section 13** of the CSAP.

#### **4.10 Field Quality Assurance/Quality Control**

Field quality assurance/quality control (QNQC) samples will **be** collected in accordance with the frequency presented in Table **15-1** of the **CSAP**. QNQC procedures will **be** in accordance with Section **15.2** of the CSAP.

#### **5.0 QUALITY ASSURANCE PLAN**

The Quality **Assurance Plan** presented in Section **15** of the CSAP will **be** followed during the Site **10 Preliminary** Characterization.

#### **6.0 DATA MANAGEMENT PLAN**

The Data Management **Plan** presented in Section **14** of the CSAP will **be** followed during the Site **10 Preliminary** Characterization.

## 7.0 REFERENCES

- Ecology and Environment, Inc. (1992). *Contamination Assessment/Remedial Activities Investigation Work Plan — Group F, Naval Air Station Pensacoh, Pensacoh, Florida.* Ecology and Environment, Inc.: Pensacola, Florida.
- Ecology and Environment, Inc. (1992). *Interim Data Report, Contamination Assessment/Remedial Investigation, commodore's Pond (Site 10), Naval Air Station Pensacola, Pensacola, Florida.* Ecology and Environment, Inc.: Pensacola, Florida.
- EnSafe/Allen & Hoshall. (1993). *Comprehensive Sampling and Analysis Plan For Naval Air Station Pensacoh, Pensacoh, Florida — Draft Final .* EnSafe/Allen & Hoshall: Memphis, Tennessee.
- Naval Energy and Environmental Support Activity (NEESA). (1983). *Initial Assessment Study of Naval Air Station, Pensacoh, 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: Athens, Georgia.

**FLORIDA PROFESSIONAL GEOLOGIST SEAL**

I have read and approve of this Final Sampling and Analysis Plan for Site 10 — Commodore’s Pond and seal it in accordance with Chapter 492 of the Florida Statutes. In sealing this document, I **certify** the geological information contained in it is true to the best of my knowledge and the geological methods and procedures included herein are consistent with currently accepted geological practices.

Name: Steven J. Parker  
License Number: #1651  
State: Florida  
Expiration Date: July 31, 1996

  
\_\_\_\_\_  
Steven J. Parker

\_\_\_\_\_  
8/24/94  
Date