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**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION
FINAL *SAMPLING AND ANALYSIS PLAN*
FOR SITE 1 — SANITARY LANDFILL
NAVAL AIR STATION
PENSACOLA, FLORIDA**



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



Prepared by:

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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 1 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 Remedial Investigation/Feasibility Study Comprehensive Sampling and Analysis Plan (CSAP) For Naval Air Station Pensacola (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-Group A*, 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 1 will fulfill requirements set forth in the work plan and the other references cited above.

This 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. Data collected during the Phase I has been presented as an Interim Data Report (IDR) **[(E&E 1991)]**. The work proposed for the RI has taken into consideration **all** previous work completed at Site 1, including Phase I activities.

Samples collected during the RI will include soil, groundwater, surface water and sediment. **[Chemical analyses will be completed by a laboratory that is approved by 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 SOUTHDIV summarizing the activities, results and conclusions of the investigation. The report will provide 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 outline proper documentation procedures for the investigation.

2.0 BACKGROUND INFORMATION

This section [briely describes] the site, previous work, and environmental setting.

2.1 Site 1 Description and History

The following description of Site 1 has been prepared from a more comprehensive version contained in Section 2, page 2-1 of the work plan [(E & E 1992a)]. Site 1 consists of an inactive landfill which was used from the early 1950s until 1976 [for disposal of] nearly all solid waste generated [at] NAS Pensacola, as well as waste from outlying Navy installations.

The site occupies approximately 80 acres and is located approximately 250 feet south of Bayou Grande, 500 feet north of Taylor Road, and 0.35 miles west of the golf course. Currently there are [15] groundwater monitoring wells in the vicinity of Site 1.

2.2 Previous Work Completed

This section [outlines] the studies completed to date for Site 1. Comprehensive versions of the[se summaries] may be found in Section 3, page 3-1 of the [E& E] work plan. Results of six previous studies listed below are currently available for Site 1.

Previous Studies:

- 1974 Study (Geraghty & Miller [G & M] 1986)
- a 1982 Site Survey (NEESA 1983)
- a 1983 Initial Assessment Study (IAS) (NEESA 1983)
- a 1984 Verification Study (G & M 1984)
- a 1986 Confirmation Study (G & M 1986)
- a 1991 Phase I Interim Data Report of the Contamination Assessment/Remedial Activities Work Plan (E & E 1991)

2.3 Environmental Setting

The environmental setting of Site 1, 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 1992a).

3.0 PHYSICAL SURVEY

[Various physical surveys have been conducted at Site 1 as part of **E&E's** Phase I activities. Results of these surveys are contained in Sections 3.2 through 3.7 of the **IDR (E&E 1991)**. Applicable information from these surveys have been taken into account during the planning of the RI.]

Habitat/Biota Survey

[A Phase I habitat/biota survey **will** be performed at Site 1 as outlined **in** Section 8 of the CSAP. Data obtained during the Site 1 **RI** investigation **will** also be used to help **assess** ecological risk. The Phase I habitat/biota survey **will** use the **information** collected during the previous **E&E** Site 1 investigation (**E&E 1991**). **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 1 after the Phase I survey, Phase **II** sampling **will** be implemented **as** outlined in Section 8 of the **CSAP.**]

[Containment Source Survey

A contaminant source survey **will** be performed at Site 1 as outlined **in** Section **14.21** of the **E & E work** plan.]

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, sediment, surface water, and groundwater samples using various techniques. Sampling and analytical requirements [are summarized] in Table 4-1.

Table 4-1 Site 1 RI Sampling and Analytical Requirements			
Medium	No. of Samples^a	[DQO Level]	Analytical Parameter
Surface Water	20 (4)	[IV]	FSA PPW
Sediment ^b	46 (4)	[IV]	FSA PPS
Soil ^c	[166] (4) [(10)]	[IV]	FSA PPS ST
Groundwater ^d	52 (6)	[IV]	FSA PPW
TOTAL	[284] [(101)] (8) [(10)]		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 sediment samples = 23 sample locations x 2 depth intervals = 46 samples.
- c Number of soil samples = **[34]** total boring locations **[(including 3 new background soil boring/shallow wells); 331** boring locations x 5 depth intervals (estimated), 1 boring location x 1 depth interval = 166 samples
- d Number of groundwater samples = **[15]** existing wells, **[28]** new onsite wells, 6 new background wells, and 3 existing supply wells = 52 samples.

Analytical Parameters

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

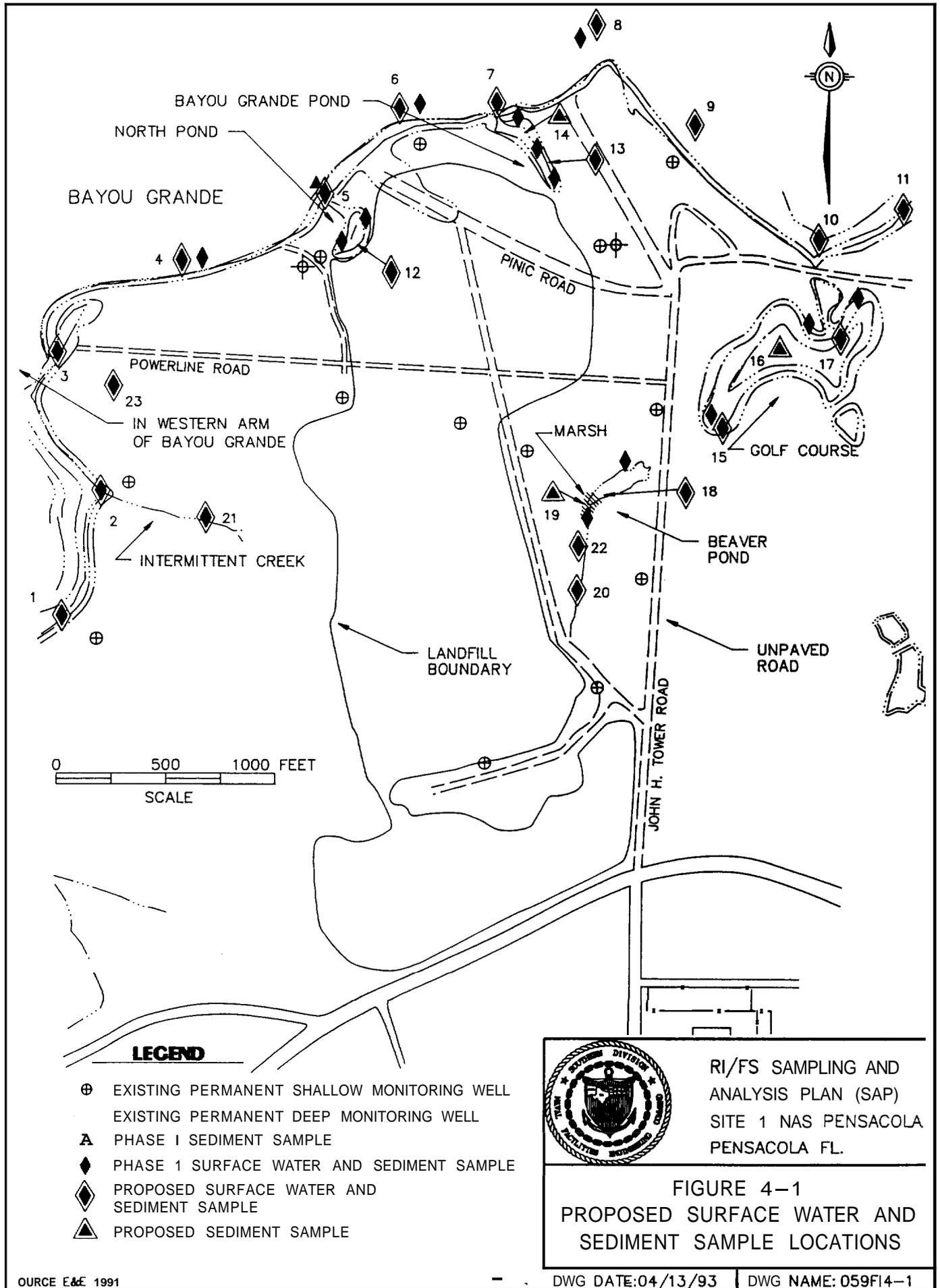
[Bold items enclosed in brackets denote changes to last version of document]

- 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
Sediment/Soil exchange (PPS) = Total phosphorus, nitrate-N, TKN, heterotrophic plate count, total organic carbon (TOC), cation capacity [(also to include bulk density, **particle size**, percent moisture, **specific gravity**, porosity, and permeability analysis performed on samples collected with Shelby tube or **stainless steel sleeves**)].
- Physical Parameters
Soil (ST) = [**Bulk density, particlesize, percent moisture, specific gravity, porosity, and permeability (collected)**] with Shelby tube).

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

Sample locations for [Site 1] **are** presented on Figures **4-1** and **4-2**. [**These** locations are not expected to vary **as** they have been based on **data** collected during Phase I activities. **The** rationale for surface water, sediment, soil boring and monitoring **well** locations is **discussed** in Section 14.2.1 of the Site 1 work plan (E&E 1992a). However, **sampling** activities may be adjusted, expanded, and/or redirected if required to obtain the necessary amount of information regarding the nature and extent of potential site contamination. Before initiating the additional field activities, a field change request will be submitted to the Navy for approval, and the EPA and FDER will be notified.]

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



Organization of Analytical Parameters:

- Full Scan Analyses (FSA) 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, and gross alpha, beta, and gamma radioactivity. **If** gamma radiation is detected in a sample above background level, then a gamma spectroscopic analysis will also be conducted. The full scan for TAL metals in groundwater will [be performed on] unfiltered [samples].
- 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 water at Site 1 and for the 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**.

[Note: The following organization of PPS and ST analytical suites has been modified from the draft **SAP** due to logistical considerations affecting the collection and analysis of PPS and ST samples.]

- Physical Parameters, Sediment/Soil (PPS) will be run in addition to the **FSA** for selected locations where sediment **or** soil **is to** be sampled. [The PPS analyses will be used to determine the physical characteristics of the sediment and soil located in the vicinity of Site 1 and for completion of the feasibility study.] The parameters include total phosphorus, nitrate-N, TKN, heterotrophic plate count, total organic carbon (TOC), and cation exchange capacity. [At these same locations, an additional volume of sample will

be collected with a Shelby tube or similar stainless steel sleeve container capable of capturing and retaining an undisturbed sample and analyzed for bulk density, particle size, percent moisture, specific gravity, porosity, and permeability.]

- Physical Parameters, Soil (ST) Shelby tubes will be collected at selected [intermediate depth well] locations. Shelby tubes will be analyzed for [**bulk** density, particle size, percent moisture, specific gravity, porosity, and permeability.]

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 Analyses

FSA Analyses **will** be conducted for **all** sample locations, sample intervals, and sample **media** designated on Figures 4-1 and 4-2 [(except for **ST** samples collected from the low permeability/confining unit. **See** the discussion on ST analyses further in this section]. **At** Site 1, [284] FSA analyses are currently projected.

[Regardless of the media/matrix sampled one FSA duplicate sample **will** be collected for every 10 samples collected; One FSA matrix spike and matrix spike duplicate sample **will** be collected for every 20 samples.]

For sediments, FSA sampling will be conducted at locations 1 through 23 (**see** Figure 4-1). Two samples (**0.0** to 1.0 foot [beneath land surface] (bls) and **1.0** to **2.0** foot bls) will be taken from each location for a total of 46 samples.

For surface water, FSA sampling will be conducted at locations 1 to **13**, 15, 17, 18, and 20 to 23 total of 20 samples. See Figure 4-1.

For soil, FSA sampling will be conducted at locations 1 through 27, [**37**, **40**], 50 to 52, 55, and 56 for a total of [**34**] locations. See Figure 4-2. For planning purposes, the depth to groundwater is assumed to be 10 feet. All locations, except 56, will be sampled continuously from the ground surface to the top of the water table, **an** estimated five sample points per location. At location 56, [the uppermost 1-foot depth interval of native soil associated with a dry stream bed will be sampled. These native soils may be overlain by an unknown thickness of recent fill material]. The total number of soil samples for FSA analysis is therefore [**166**].

[Soil Sampling Locations for FSA (34 total):

- 24 soil borings (locations 2-5, 7-11, 13-17, 19-22, 24-27, **55** and **56**).
- **7** soil borings/shallow monitoring wells (locations **1**, **6**, **12**, 18, **23**, 37 and **40**).
- 3 soil boring/shallow monitoring wells proposed offsite, one at each of the three existing supply well locations].

For groundwater, FSA sampling will be conducted at [**52**] groundwater wells (total of 50 samples). Locations are shown on Figure 4-2).

Groundwater Sampling Locations for FSA (**52** total):

[Note: Shallow monitoring well GM03 and deep monitoring well GM44 were located during the base-wide well inventory and will not need replacement by proposed locations 31 and **49**. However, shallow well GM40 was not located; therefore shallow well location **57** has been proposed to replace this well. Due to contaminant migration concerns associated with

penetrating the low permeability zone, deep monitoring well installation will not be performed until intermediate depth wells have been installed and sampled and groundwater quality in the intermediate depth zone can be evaluated across the site.]

a Twenty-[six] onsite monitoring wells have been proposed for the following locations:

— Eleven shallow wells at locations:

1 6 12 18 23
37 39 40 42 53 [57] [58]

— Eleven intermediate wells at locations:

28 30 32 35 36
38 41 43 44 46 48 [59]

— [Four] deep wells at locations:

29 34 45 54

• [Fifteen] existing onsite monitoring wells will be sampled.

a Three existing deep zone supply wells will be sampled (locations 50, **51**, and 52). See Figure 14-6 of the Site 1 work plan for locations]. These three wells will serve as background control of deep zone water quality for all other RI/FS investigations [at NAS Pensacola].

• One shallow well and one intermediate well will be clustered with each of the existing supply wells as a reference for groundwater quality in these aquifer zones. [The shallow and intermediate wells (locations **58** and 63) are not shown on Figures 4-1 and 4-2. The existing supply wells are locations **50**, **51**, and **52**.]

PPW Analysis

PPW analysis will be conducted at four surface water sampling locations (Figure 4-1) and **six** groundwater sample locations (Figure 4-2). Groundwater samples will be taken from two shallow wells, two intermediate wells, and two deep wells. 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 four sediment sampling locations (Figure 4-1) and four soil sample [(soil boring/shallow monitoring well)] locations (Figure 4-2). [Specific locations for PPS samples will be] determined as outlined above. [However, for sediments, all PPS samples will be collected from inland locations associated with Site 1 tidal inlets or creeks. At each sediment sampling location, PPS samples will be collected from **0.0** to **2.0** feet bls. At each soil sampling location, PPS samples will be composited from land surface to the water table; however the Shelby tube or stainless steel sleeve samples will be collected from the first unsaturated soil horizon most representative of the native vadose zone (**beginning** approximately 1 to 3 feet bls).]

ST Analysis

Two Shelby tube [samples will] be collected from the low permeability zone during the installation of [intermediate depth] wells at locations [**28**, 30, **35**, **44** and **48**]. At these locations, only **ST** analysis [will be performed on these samples] unless visual and/or other field evidence indicates that the samples may be contaminated. If evidence of contamination is present, FSA analysis will also be performed [on these samples].

4.1 Sampling Objectives

[The objective of the field sampling plan is to outline a feasible means of collecting samples for chemical and physical analysis. Specific objectives of the sampling plan are:

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

4.2 General Sampling Requirements

General sampling requirements applicable to this site are presented in [Section **2.2** of the CSAP.]

4.3 Sample Processing

Sample processing procedures to be followed [during the **RI**] are presented in [Section **12** of the CSAP].

4.4 Collection of Auxiliary Data

A discussion of ~~auxiliary data~~ collection applicable to this site is presented in [Sections **9.0**, **10.1**, and **14.1** of the CSAP].

4.5 Sampling Procedures

[Note: Section **4.5** has been revised to provide a more organized discussion of **sampling** procedures and address specific **EPA** comments on the draft Site **1 SAP**.]

Sampling procedures proposed for the Site **1RI** are detailed in Sections **4** through **9** of the CSAP. Where the procedures apply to this investigation, they will be referenced in the following subsections. All proposed modifications to CSAP procedures, or modifications

to procedures contained in the Site 1 work plan, will be discussed in the following subsections.]

4.5.1 Surface Water Sampling

[Surface water samples will be collected from the **20** locations shown on Figure 4-1. Sampling procedures to be followed during these activities are contained in Section **7.3** of the **CSAP**, except for the modifications outlined below.

Modifications to Surface Water Sampling:

- Sampling will be performed only once at each sampling location during periods of slack/low tide (while the tide is going out and tidal inlets are discharging to Bayou Grande) to avoid any inland tidal influx.
- At each surface water sampling location, sample collection time, water depth and tidal phase **as well as** water quality parameter measurements (temperature, **pH**, **specific conductivity**, salinity, dissolved oxygen, etc.) will be recorded during sample collection. Vertical profiling of water quality parameters will be performed when appropriate (**i.e.** when sampling non-flowing water more than 3 feet deep. Additionally, general observation of sample location conditions and setting (weather and wind direction, general current/flow directions, vegetation and bottom type, etc.) should be noted. However, specific measurements of current and wind velocities or directions will not be made during sample collection due to the subsequent investigation planned for Bayou Grande.]

4.5.2 Sediment Sampling

[Sediment samples will be collected from the **23** locations shown on Figure 4-1. Two sediment samples will be collected from each location using a coring type sampling device; one from a 0.0 to 1.0-foot bls depth interval, and the second from a 1.0 to 2.0- feet bls depth interval. Sampling procedures to be followed during these activities are contained in Section **7.2** of the **CSAP**.]

4.5.3 Soil Sampling

[Soil samples will be collected during the completion of **24** soil borings, and the installation of seven shallow and five intermediate depth monitoring wells at Site **1**. However, only **ST** samples are proposed from the low permeability zone during the installation of the five intermediate wells. Additionally, soil samples will be collected **during** the installation of the three shallow wells that are proposed for the existing supply well locations. Soil boring and monitoring well locations are shown on **Figure 4-2**. **The** drilling methods and soil sampling procedures for these activities are described in Sections **4** and **5** of the **CSAP**.]

Modifications to Soil Sampling:

- For soil samples to be collected during the completion of soil borings, it is proposed that soil sample intervals be changed from 0.0 to 1.0 foot bls, **1.0** to 2.5 feet bls and **2.5** to **5.0** feet bls, etc., to continuous split spoon sampling from ground surface to the water table at the following frequency: 0.0 to 1.0 feet bls, and then at discrete 2-foot intervals (1.0 to 3.0, 3.0 to **5.0** bls, etc.) until the water table is encountered.
- Except for Shelby tube samples, no soil samples will be collected below the water table. This modification is proposed because no conclusive information would be obtained from collecting saturated soil samples from below the water table for chemical analysis.

Samples from below the water table were the only type sample proposed for soil boring locations **37** and **40**; therefore, these locations have been deleted from Figure 4-2 and will not be sampled.

- Two consecutive Shelby tube samples will be collected from the first confining/semi-confining unit encountered during the installation of intermediate depth monitoring wells at the following five locations shown on Figure 4-2: **28, 30, 35, 44, and 48**. This modification is proposed to collect information regarding the physical characteristics (i.e., porosity, permeability) of this unit.

4.5.4 Monitoring Well Installation

[Thirty-two monitoring wells will be installed during the Site 1 RI. Twenty-six of these wells will be installed at Site 1 and six wells will be installed at off-site locations. **The** proposed Site 1 monitoring well locations are shown on Figure 4-2. These twenty-six wells will include eleven shallow wells completed to a target depth of approximately **20** feet bls, eleven intermediate wells completed to a target depth of approximately **45** feet bls, and four deep wells completed to a target depth of approximately **65** feet bls **will** be installed at Site 1. However, the four proposed deep monitoring wells will not be installed until existing and new intermediate wells have been sampled and site groundwater quality can be evaluated. The six off-site wells include one shallow and one intermediate depth well to be installed in clusters at each of the three existing **NAS** deep supply well locations. The drilling methods and monitoring well installation procedures for these activities are presented in Section 5.0 of the CSAP. Specifically, the installation methods outlined below will be employed during the Site 1 RI.

Installation Methods:

- A Portland cement grout will be used to construct all monitoring wells, in accordance with Northwest Water Management District well installation regulations and **as** specified in Section 5.3 of the **CSAP**.
- To detect the presence of any floating product, shallow wells will be completed into the upper portion of the surficial zone in the Sand and Gravel Aquifer, so that the well screen brackets the water table.
- Intermediate depth wells will be completed into the lower portion of the surficial zone of the Sand and Gravel Aquifer, immediately above the first confining/semiconfining unit.
- Deep wells will be completed into the upper portion of the main producing zone of the Sand and Gravel Aquifer, immediately below the first confining/semiconfining unit.
- Given the absence of a significant confining unit separating the shallow and intermediate zone, surface casing will not be used during the installation of intermediate depth monitoring wells at Site 1. The hollow stem auger will act **as** a temporary casing during soil sample collection and monitoring well installation. However, surface casing will be used during the installation of deep wells penetrating the first confining/semiconfining unit .]

4.5.5 Groundwater Sampling

[Groundwater samples will be collected from the **34** monitoring wells installed during the Site 1 RI (see Section 4.5.4). In addition, the **15** existing Site **1** wells and the three existing supply wells will be sampled during the RI. Specific groundwater sampling procedures for these activities are presented in Section 6 of the CSAP.]

4.5.6 Hydrologic Assessment

[A hydrologic assessment will be performed at Site **1** in accordance with procedures described in Sections 9.6 of the CSAP and **14.2.3** of the work plan. However, the following modifications outlined below will be made to these procedures for the Site **1 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).]
- For all inland surface water bodies (tidal inlets and/or streams) on Site **1** in which flow is observed, velocity, discharge, and water level elevation data will be recorded during a high and low tide event, at approximately the same time that water levels **are measured** in the onsite wells during these events. Additionally, a rain gauge will **be** installed at or **near** Site

1 to regularly monitor site precipitation, as stated in Section 14.2.3 of the Site 1 work plan. However, specific measurements of current and wind velocities or directions in Bayou Grande will not be made during this RI due to the subsequent investigation planned for this water body.]

4.5.7 Cadastral Survey

[A cadastral survey will be performed at Site 1 as described in Section 3.4 of the CSAP.]

4.6 Decontamination

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

4.7 Sample Management

Sample management procedures to be followed during the RI **are** described in Section **[12.0 of the CSAP]**.

4.8 Sample Custody

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

4.9 Investigation-Derived Waste

Procedures **to** be followed for the handling of investigation-derived waste during the RI **are** described in Section **[13.0 of the CSAP]**.

4.10 Quality Assurance/Quality Control

Quality assurance/quality control [(QA/QC)] procedures to be followed **during the RI** are described in Sections [14 and 15 of the CSAP. Appropriate QA/QC samples] **will** be [collected] in accordance with Table [15-1 of the CSAP.]

5.0 ANALYSIS

Field measurements will be collected and laboratory analysis will be conducted as outlined in Section **[10]** of the **CSAP**. Refer to the sections listed below for specifics.

Field Measurements and Laboratory Analysis:

Field Measurements	Section [10.1]
Laboratory Analysis	Section [10.2]

6.0 QUALITY ASSURANCE PLAN

The comprehensive Quality Assurance Plan prepared for the **[CSAP]** will be used for this investigation. Refer to the Section **[15 of the CSAP for specific quality assurance information.]**

7.0 DATA MANAGEMENT PLAN

The comprehensive Data Management Plan prepared for the [CSAP] will **be** used for this investigation. Refer to the Section [**14 for specific data management information.**]

8.0 REFERENCES

Ecology & Environment, Inc. (1991). *Contamination Assessment/Remedial Activities Investigation Sanitary Landfill (Site 1) Interim Data Report*, Pensacola, Florida. October 1991: E & E, Inc. Pensacola, Florida.

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9.0 FLORIDA PROFESSIONAL GEOLOGIST SEAL

I hereby affix my seal to the Final Sampling and Analysis Plan for Site 1 Sanitary Landfill 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



Brian **E.** Caldwell

5 - 7 - 93

Date