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BACKGROUND SAMPLING PLAN NTC ORLANDO FL

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ABB ENVIRONMENTAL SERVICES, INC

BACKGROUND SAMPLING PLAN

NAVAL TRAINING CENTER ORLANDO
ORLANDO, FLORIDA

Unit Identification Code (UIC): N65928

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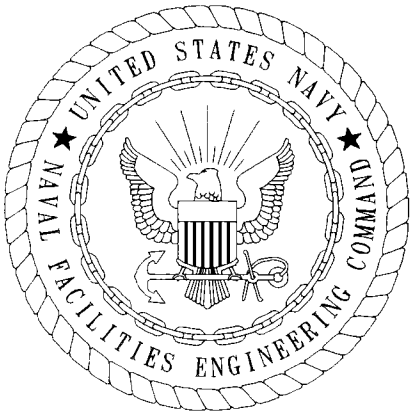
February 1995



CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

The Contractor, ABB Environmental Services, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/107 are complete and accurate and comply with all requirements of this contract.

DATE: February 14, 1995

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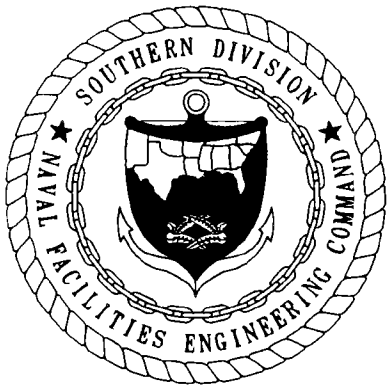

FOREWORD

To meet its mission objectives, the U.S. Navy performs a variety of operations, some requiring the use, handling, storage, or disposal of hazardous materials. Through accidental spills and leaks and conventional methods of past disposal, hazardous materials may have entered the environment in ways unacceptable by today's standards. With growing knowledge of the long-term effects of hazardous materials on the environment, the Department of Defense (DOD) initiated various programs to investigate and remediate conditions related to suspected past releases of hazardous materials at their facilities.

One of these programs is the Base Realignment and Closure (BRAC) Cleanup Program. This program complies with the Base Closure and Realignment Act of 1988 (Public Law (P.L.) 100-526, 102 Statute 2623) and the Defense Base Closure and Realignment Act of 1990 (P.L. 101-510, 104 Statute 1808), which require the DOD to observe pertinent environmental legal provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the 1992 Community Environmental Response Facilitation Act (CERFA), Executive Order 12580, and the statutory provisions of the Defense Environmental Restoration Program (DERP), the National Environmental Policy Act (NEPA), and any other applicable statutes that protect natural and cultural resources.

CERCLA requirements, in conjunction with corrective action requirements under Subtitle C of the Resource Conservation and Recovery Act (RCRA), govern most environmental restoration activities. Requirements under Subtitles C, D, and I, of RCRA, as well as the Toxic Substances Control Act (TSCA), the Clean Water Act (CWA), the Clean Air Act (CAA), the Safe Drinking Water Act (SDWA), and other statutes, govern most environmental mission or operational-related and closure-related compliance activities. These compliance laws may also be applicable or relevant and appropriate requirements (ARARs) for selecting and implementing remedial actions under CERCLA. NEPA requirements govern the Environmental Impact Analysis and Environmental Impact Statement preparation for the disposal and reuse of BRAC installations.

The BRAC program centers on a single goal: expediting and improving environmental response actions to facilitate the disposal and reuse of a BRAC installation, while protecting human health and the environment.

The Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), the USEPA, and the Florida Department of Environmental Protection (FDEP) collectively coordinate the cleanup activities through the BRAC Cleanup Team. This team approach is intended to foster partnering, accelerate the environmental cleanup process, and expedite timely, cost-effective, and environmentally responsible disposal and reuse decisions.

Questions regarding the BRAC program at NTC, Orlando should be addressed to the Southern Division's BRAC Environmental Coordinator, Mr. Wayne Hansel, Code 18B7, at (407) 646-5294 or Southern Division's Engineer-in-Charge (EIC), Ms. Barbara Nwokike, Code 1873, at (803) 743-0566.

EXECUTIVE SUMMARY

ABB Environmental Services, Inc. (ABB-ES), under contract to the Southern Division Naval Facilities Engineering Command, has prepared this Background Sampling Plan to collect data on naturally occurring compounds in soil and groundwater at Naval Training Center (NTC) Orlando under Base Realignment and Closure (BRAC) 1993. To ensure proper conduct of work, ABB-ES has also developed a Project Operations Plan (POP) (ABB-ES, 1994a). The POP, a companion document to this Background Sampling Plan, has been designed to incorporate the requirements of a Quality Assurance Project Plan (QAPP), Health and Safety Plan (HASP), and the elements of a Field Sampling Plan (FSP) related to sampling equipment, procedures, and sample handling and analysis. The POP provides much of the general information and procedures needed to conduct applicable field efforts at NTC Orlando.

This Background Sampling Plan establishes the purpose, objectives, and rationale for collecting facility-wide background soil and groundwater samples at NTC Orlando. FSP elements include sampling objectives and sample location and frequency.

The purpose of this background sampling is to provide a facility-wide database of background concentrations in soils and shallow groundwater. These data may be used for site characterization, public health and ecological risk assessment, evaluating remedial alternatives, treatability studies, remedial action, and monitoring.

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
BEC	BRAC Environmental Coordinator
BCT	BRAC Cleanup Team
bls	below land surface
BKGD	background
BRAC	Base Realignment and Closure
CIH	Certified Industrial Hygienist
CLP	Contract Laboratory Program
COC	chain-of-custody
DQOs	data quality objectives
EBS	Environmental Baseline Survey
ECBSOPQAM	Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual
FID	flame ionization detector
FOL	Field Operations Leader
FSP	Field Sampling Plan
HASP	Health and Safety Plan
IDW	investigation-derived waste
MCL	maximum contaminant level
msl	mean sea level
NTC	Naval Training Center
PAH	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyls
POP	Project Operations Plan
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
SIM	selective ion monitoring
SVOCs	semivolatile organic compounds
TAL	Target Analyte List
TCL	Target Compound List
TOM	Task Order Manager
TSS	total suspended solids
UIC	Unit Identification Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
VOCs	volatile organic compounds

1.0 INTRODUCTION

The following facility-wide background sampling program is proposed to provide site-specific data on naturally-occurring compounds at the Naval Training Center (NTC) Orlando. This plan documents the purpose, objectives, and rationale for conducting facility-wide sampling activities. The establishment of a background sampling program for NTC Orlando is coincident with establishment of site-screening sampling programs facility-wide. The appropriateness of the selected sample locations, the determination of representative site background concentrations, and the need for establishing background data for other environmental media will be evaluated and addressed as data become available. As such, this document is intended to provide a framework and a rationale for the background sampling and analysis program at NTC Orlando, subject to modification and expansion, if the need becomes apparent.

1.1 **OBJECTIVES**. The term "background sample" is defined in the United States Environmental Protection Agency (USEPA) Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual (ECBSOPQAM), February 1, 1991, as "a sample collected from an area, water body, or site similar to the one being studied, but located in an area known or thought to be free from pollutants of concern."

The purpose of this sampling program is to provide a facility-wide database of background concentrations in soils and shallow groundwater. Other environmental media (such as sediment and surface water) may be added to the background sampling program, based on the results of site screening investigations. Of particular interest are the natural variations of inorganics (metals) in soils. Inorganics are natural constituents of all soils and therefore will be detected in all soil samples, and to a lesser degree in suspended solids present in all water samples.

Also of concern are concentrations of organics often randomly detected in otherwise natural soils in developed areas. These include isolated pesticides or herbicides which represent residue from past use, but do not necessarily indicate a potential source of contamination, and polynuclear aromatic hydrocarbons (PAH) which are commonly found in soils along almost any roadside or developed area, as a combustion byproduct. The detection of these compounds does represent background concentrations, as they are not associated with any source area, are generally randomly distributed, and are common in any developed area.

Another group of compounds which may occur both naturally and as contaminants is radionuclides in groundwater and surface water. These compounds do occur naturally in the Orlando area, the source being sediments in the Hawthorn Formation, approximately 50 to 100 feet below the surface (Lichtler and others, 1968). However, they may also be present as potential contaminants, based on previous analytical results from groundwater samples at the North Grinder Landfill at the Main Base, as well as the landfill at the McCoy Annex Golf Course (Geraghty and Miller, 1986). As with sampling and analyses for inorganics and some organics, the purpose of sampling and analyses for radionuclides is to provide data that can be used to evaluate and identify concentrations resulting from contaminant releases.

These data may be used for site characterization, public health and ecological risk assessment, evaluating remedial alternatives, treatability studies, remedial action, and monitoring.

1.2 OVERVIEW OF DOCUMENT. The planning documents to support background sampling at NTC Orlando consist of the following:

- Background Sampling Plan
- Project Operations Plan for Site Investigations and Remedial Investigations, NTC Orlando (POP), Volume I (ABB Environmental Services, Inc. [ABB-ES], 1994a)
- Project Operations Plan, Volume II Health and Safety Plan (ABB-ES, 1994a)

Together these documents establish the background, rationale, and plans for site investigations. This Background Sampling Plan outlines the scope of work and includes the following chapters:

1.0 Introduction
2.0 Facility Background and Physical Setting
3.0 Sample Locations
4.0 Facility Soil Classifications
5.0 Sampling Plan
6.0 Sample Analysis Plan
7.0 Personnel Requirements
8.0 Project Schedule

The POP has been designed to incorporate the requirements of a Quality Assurance Project Plan (QAPP), Health and Safety Plan (HASP), and the elements of a Field Sampling Plan (FSP) related to sampling equipment, procedures, and sample handling and analysis. The POP provides much of the general information and procedures needed to conduct field programs at NTC Orlando and will be referenced throughout this document.

2.0 FACILITY BACKGROUND AND PHYSICAL SETTING

NTC Orlando is located in Orlando, Florida, and encompasses a total of 2,072 acres within Orange County. NTC Orlando consists of four discrete facilities: Main Base, Area "C", Herndon Annex, and McCoy Annex (Figure 2-1). NTC Orlando provides recruit training of enlisted personnel and advanced or specialized training for officer and enlisted personnel, of the regular Navy and Naval Reserve. In 1993 a bipartisan commission appointed by the President and confirmed by the Senate recommended the closure of NTC Orlando in accordance with the Defense Base Closure and Realignment Act of 1990.

The operational history of the four facilities dates back to 1940, and includes operation by the Army Air Corps and the Air Force. The Air Force ceased operations at the Main Base, Area "C", and Herndon Annex in 1968. The property was officially commissioned as the Naval Training Center Orlando in July 1968. The Navy acquired McCoy Annex from the Air Force in 1973. A more detailed installation history can be found in the POP, Volume I, Section 1.3 Facility Background (ABB-ES, 1994a).

The Main Base (Figure 2-2) is the largest of the four facilities. It is composed of operational and training facilities. The Main Base occupies 1,095 acres approximately 3 miles east of Interstate 4 and directly north of State Road 50. It is surrounded by urban development, including single and multi- family housing, schools, and commercial buildings. Herndon Public Airport is approximately 1.5 miles south of the Main Base. There are no industrial facilities adjacent to the Main Base, with the exception of auto repair facilities along Bennett Road on the southwest property line.

Area "C" (Figure 2-3) occupies 46 acres and is located approximately 1 mile west of the Main Base off Maguire Boulevard. Area "C" serves as a supply center for NTC Orlando, and includes a laundry and dry cleaner and the Defense Reutilization and Marketing Office. It is surrounded by urban development, including single and multi-family residential developments to the north and south; Lake Druid to the west; and an office park to the east. There are no industrial facilities adjacent to Area "C".

Herndon Annex (Figure 2-3) occupies 54 acres approximately 1.5 miles south of the Main Base. It is located within the confines of the general aviation Herndon Public Airport and on the fringe of a major residential area. Herndon Annex provides research, design, development, testing, evaluation, procurement, fabrication, maintenance, and logistic support for naval training devices and equipment. The Herndon Annex currently includes a computer center, flight-training building, uniform supply warehouse, and office buildings.

McCoy Annex (Figure 2-4) occupies 877 acres and is located 12 miles south of the Main Base. It serves primarily as a housing and community support activity for NTC Orlando. The Beeline Expressway forms the northern boundary. The Orlando International Airport is directly east of the McCoy Annex. The western boundary of the McCoy Annex is flanked by industrially zoned, sparsely populated property. The zoning allows heavy industry and aviation-related development. The property north of the Beeline and within 0.75 mile of the McCoy Annex is used primarily by businesses directly related to the airport, such as rental agencies, hotels,

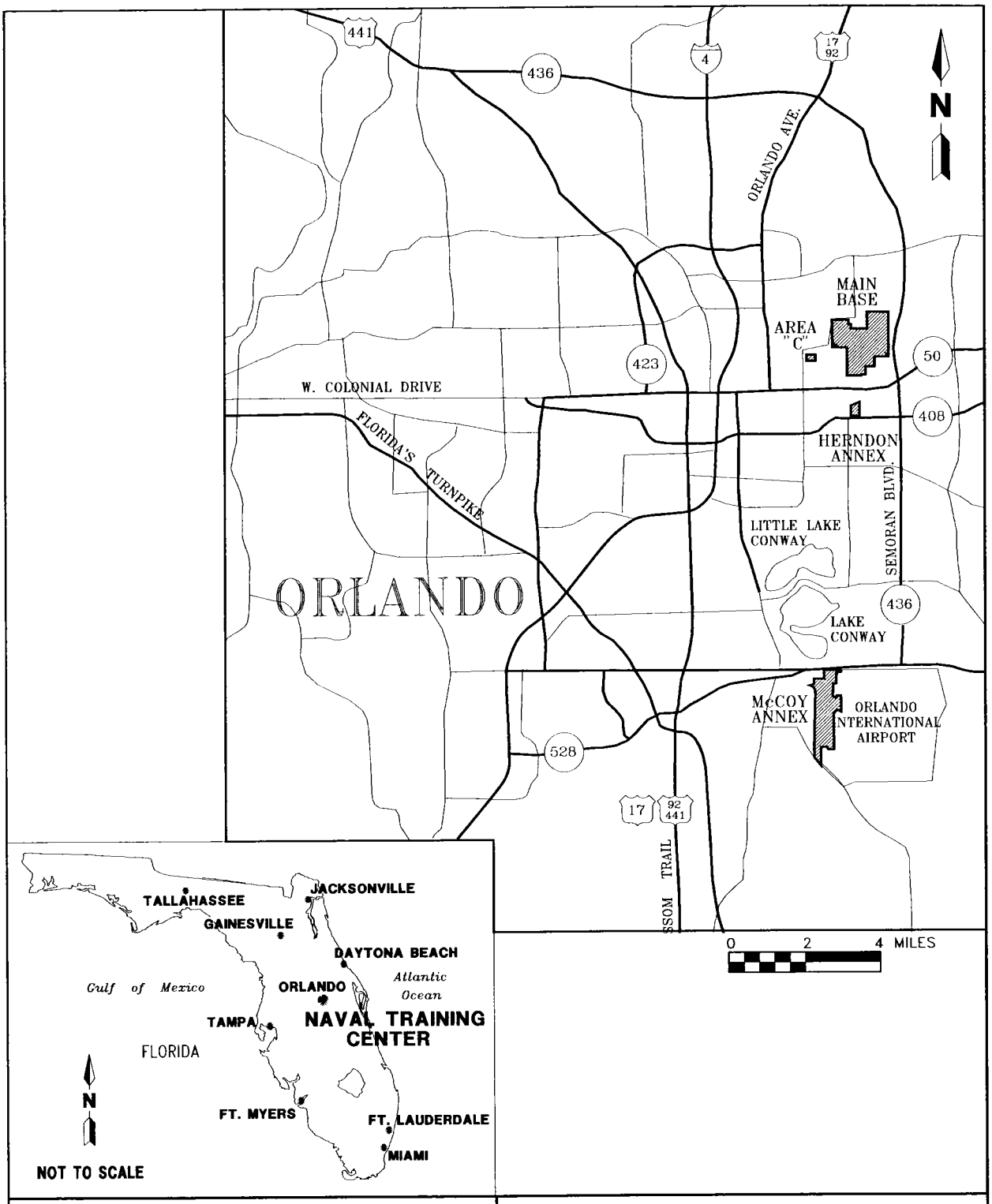

FIGURE 2-1
FACILITY LOCATIONS

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BACKGROUND SAMPLING PLAN

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

Figure 2-2 Background Sampling Locations - Main Base

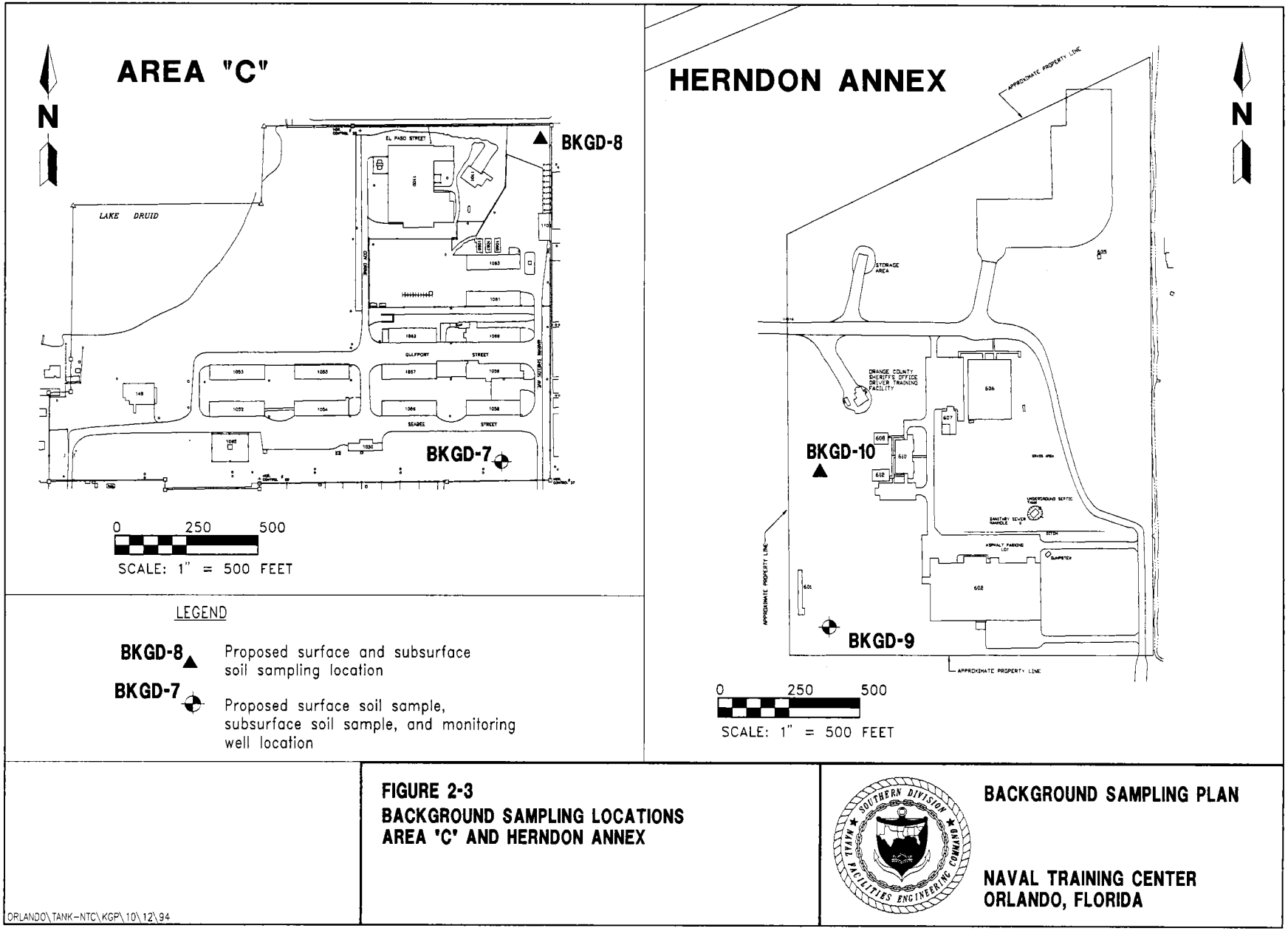

FIGURE 2-3
BACKGROUND SAMPLING LOCATIONS
AREA 'C' AND HERNDON ANNEX

BACKGROUND SAMPLING PLAN

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

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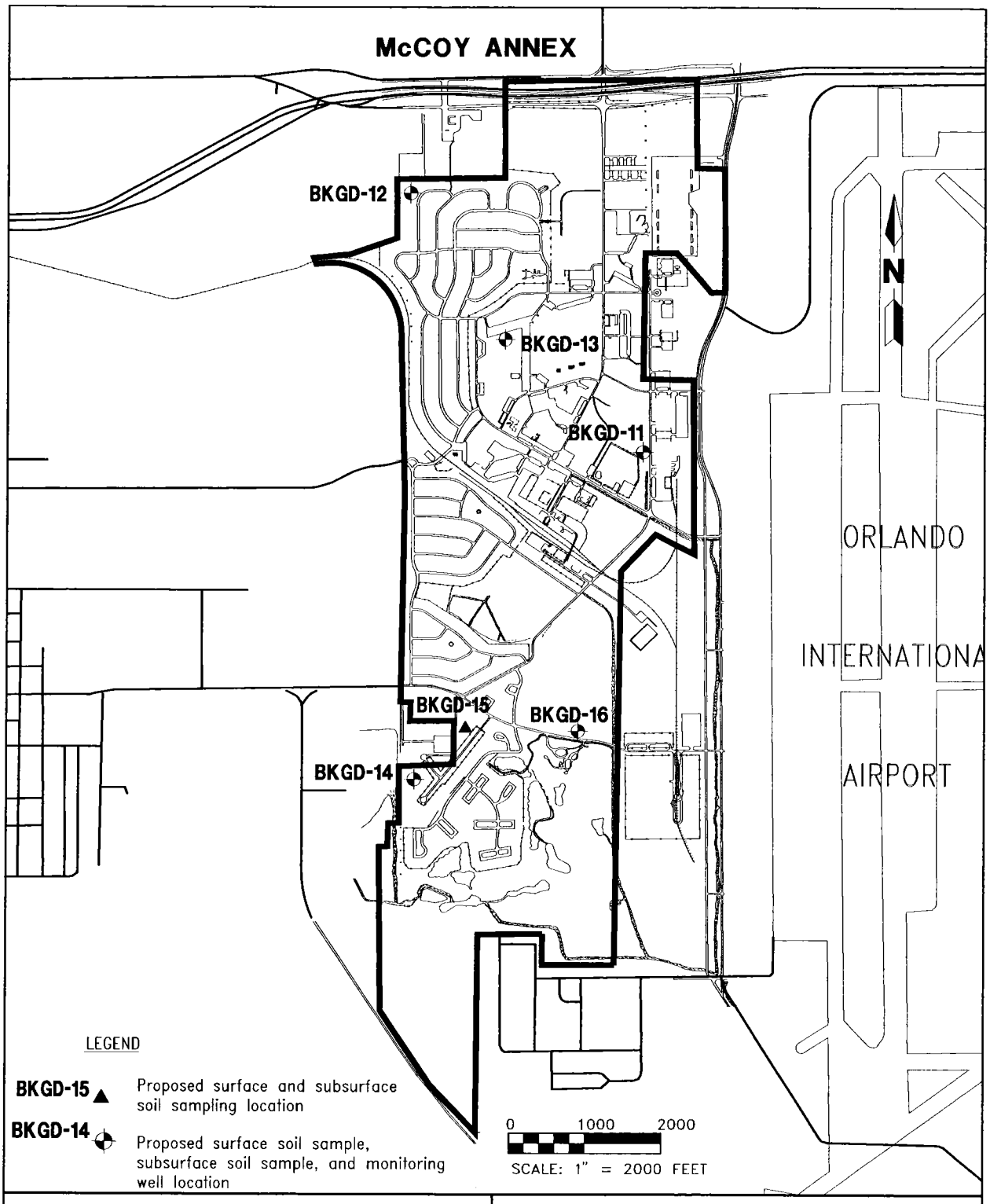

FIGURE 2-4
BACKGROUND SAMPLING LOCATIONS
MCCOY ANNEX

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BACKGROUND SAMPLING PLAN

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

and restaurants. Adjacent to the southern boundary are undeveloped woodlands and a former munitions storage complex.

Most of the city of Orlando, as well as the NTC Orlando facilities, are considered to be in the highland topographic region of the county, where elevations are generally greater than 105 feet above mean sea level (msl), but range from 50 feet to 225 feet above msl. The topography of this region is characterized by closed depressions and sinkhole lakes, which commonly facilitate groundwater recharge (Lichtler, et al, 1968). The topography in the immediate area of Orlando is generally flat, with elevations ranging from approximately 65 feet to 125 feet above msl. The lakes in the area are prone to flooding. Regional drainage is poorly developed, but generally flows toward the south. More detailed information on physical conditions at NTC Orlando may be found in the POP, Volume I (ABB-ES, 1994a).

3.0 SAMPLE LOCATIONS

The proposed sampling locations are illustrated on Figures 2-2, 2-3, and 2-4. The approach used for selecting background locations consisted of:

- identifying the mapped soil types present at NTC Orlando, using Orange County soil survey maps prepared by the Soil Conservation Service for the U.S. Department of Agriculture (USDA, 1989);
- correlating areas included in site screening investigations (i.e., confirmed or suspected release sources) with soil types, using the soil maps and Environmental Baseline Survey (EBS) maps (ABB-ES, 1994b);
- targeting areas with those soil types that appeared to be representative of local background conditions, using aerial photographs and on-site visual inspection;
- identifying locations likely upgradient (based on calculated groundwater flow directions derived from ongoing site investigation activities) of known or suspected on-site contaminant sources; and
- appropriately distributing soil and groundwater sampling locations among the targeted areas.

The following criteria were also applied, to the extent possible given the urban setting, in the selection of sample locations:

- Avoid roads and railroads by at least 100 feet (or as far as possible);
- Avoid areas where current human activities may influence samples (e.g., runoff pathway from car wash, downwind of painting operations); and
- Avoid areas that appear stained, exhibit a chemical odor, or where the land surface has been obviously disturbed (i.e., depressions or uneven terrain, or debris at the land surface).

Following review of aerial photographs and visual inspection, it was determined that landfilling operations of unknown extent were conducted at Herndon Annex. Until the extent of the landfill at Herndon can be established, proposed background sample locations are tentative.

4.0 FACILITY SOIL CLASSIFICATIONS

The USDA 1989 Soil Survey for Orange County, Florida (USDA, 1989) indicates NTC Orlando contains two major soil map units; the Urban land-Tavares-Pomello uplands complex and the Urban land-Smyrna-Pomello flatwoods and low ridge complex. The Urban land-Tavares-Pomello map unit is described as nearly level to gently sloping, moderately well drained, sandy, with an organic subsoil at depth, and mostly modified for urban use. These soils occur on low ridges and knolls, and in the uplands and flatwoods areas. The Urban land-Smyrna-Pomello map unit is described as nearly level to gently sloping, poorly to moderately well drained, sandy with organic stained subsoils at depth, and mostly modified for urban use. These soils occur in broad flatwood areas, with shallow depressions and poorly defined drainageways scattered throughout.

Major map unit complexes are used to describe the region. The soils have also been mapped in more detail such that different soil phases or specific soil complexes have been delineated for the area. Table 4-1 summarizes the soil types mapped for each part of the NTC Orlando property, along with an estimate of the percentage of the total area for each facility in which the soil type occurs.

The distribution of these soil types has been compared to the location of known or suspected sources of on-site contamination. Background sample locations were concentrated in areas of soil types on which potential sources are located. The distribution of background soil sample locations relative to soil types is summarized in Table 4-2.

Table 4-1
Soil Sample Types

Background Sampling Plan
Naval Training Center Orlando
Orlando, Florida

Area	Soil Type	Percentage
MAIN BASE	Smyrna-Urban land	65 to 70 percent
	St. Lucie-Urban land	10 to 15 percent
	Pomello-Urban land	less than 5 percent
	Zolfo-Urban land	less than 5 percent
	Tavares-Urban land	less than 1 percent
	Sanibel Muck	less than 1 percent
McCOY ANNEX	Smyrna-Urban land	75 to 80 percent
	Basinger fine sand	10 to 12 percent
	Smyrna fine sand	5 to 7 percent
	Ona-Urban land	less than 5 percent
	Pomello fine sand	less than 1 percent
	Sanibel Muck	less than 1 percent
	Borrow Pits	less than 1 percent
	St. Johns fine sand	less than 1 percent
AREA "C"	Basinger fine sand	10 to 20 percent
	Urban land	75 to 80 percent
HERNDON ANNEX	St. Lucie-Urban land	90 to 95 percent
	Arents	5 to 10 percent

Table 4-2
Sample Summary and Corresponding Background Sampling Plan

Background Sampling Plan
Naval Training Center Orlando
Orlando, Florida

Proposed Sample Locations	Soil Type
Main Base	
BKGD 2, BKGD 3*, BKGD 6	Smyrna - Urban land complex: flatwood areas; black to grey fine sand; poorly drained
BKGD 1*, BKGD 5	St. Lucie - Urban land complex: upland areas; grey to white fine sand; very permeable
BKGD 4*	Zolfo - Urban land complex: slight upland areas; brown to grey fine sand; somewhat poorly drained
Area "C"	
BKGD 7*, BKGD 8	Urban land: 85 percent or more paved
Herndon Annex	
BKGD 9*, BKGD 10	St. Lucie - Urban land complex: upland areas; grey to white fine sand; very permeable
McCoy Annex	
BKGD 11*, BKGD 12*, BKGD 13*, BKGD 14*	Smyrna - Urban land complex: flatwood areas; black to grey fine sand; poorly drained
BKGD 15	Basinger fine sand, depressional: shallow depressions and sloughs, ponded; black to grey fine sand; very poorly drained
BKGD 16*	Smyrna fine sand: flatwood areas; black to grey fine sand; poorly drained

Notes: Sample locations noted with asterisk (*) will include groundwater samples also. Refer to Figures 2-2, 2-3, and 2-4 for locations.

BKGD = background

5.0 SAMPLING PLAN

Field work will be conducted in accordance with the procedures specifically identified in the POP, Volume I, Section 4.0 Field Program Procedures and Requirements (ABB-ES, 1994a). The tasks necessary to undertake and complete the field investigation program are described in the following subsections.

5.1 PRELIMINARY ACTIVITIES. ABB-ES will perform the following tasks prior to mobilization and initiation of field activities:

- subcontractor coordination;
- obtain appropriate permits, authorization, and site access; and
- clear utility locations.

These activities are described in more detail in the POP, Volume I, Section 4.4.1, Mobilization (ABB-ES, 1994a).

5.2 SOIL SAMPLING. A total of 16 background soil sampling locations have been selected; two each from Herndon Annex and Area "C", and six each from the Main Base and McCoy Annex (Figures 2-2, 2-3 and 2-4). At each location, one surface soil composite sample and one subsurface soil composite sample will be collected. Each surface soil sample will be collected from 0 to 12 inches below land surface (bls) using stainless steel hand augers, stainless steel spoons, and glass bowls, in accordance with methods as described in the POP, Volume I, Section 4.5.1.1, Surface Soil Sampling (ABB-ES, 1994a). If the sample is from beneath pavement, the sample interval will be lowered to 12 to 24 inches bls and care will be taken to screen asphaltic material from the sample; if the sample is from a landscaped area the material (such as sod) will be cut and removed prior to sampling; if the sample is collected from a wooded area, loose humic material will be scraped from the ground surface prior to sampling.

Each subsurface soil sample will be collected by compositing soil collected from the 2-foot interval directly above the water table, using a hand auger or split-spoon sampling device, in accordance with methods described in the POP, Section 4.5.1.3, Subsurface Soil Sampling (ABB-ES, 1994a). All soil samples submitted for volatiles analyses will be collected from a discrete interval, prior to compositing. Because of the shallow depth to groundwater in this area, subsurface soil samples will likely be collected using hand augers, except for those sampling locations which will be completed as monitoring wells. Monitoring well boreholes will be sampled using split-spoon devices.

5.3 MONITORING WELLS. Monitoring wells will be installed at ten locations: one each at Herndon Annex and Area "C", three at the Main Base, and five at McCoy Annex. The number of wells at each area were selected based on relative size of the facility and the relative locations of suspected source areas within each area. In general, monitoring well locations correspond to subsurface soil sample locations, with the exception that not every borehole will be converted into a monitoring well.

Depth to water across the site is expected to be very shallow (less than eight feet bls). Sampling from this surficial aquifer alone is appropriate at this time, as it corresponds with the sampling rationale for site screening investigations. Monitoring wells will be installed to a depth of approximately 15 feet, with 10 feet of slotted polyvinyl chloride (PVC) screen intercepting the water table. Monitoring wells will be flush-mounted with protective steel casing at ground surface. All wells are considered temporary pending the results of background sampling, and will be installed with a concrete pad measuring 2 feet by 2 feet by 3 inches thick.

Groundwater samples will be collected in accordance with the methods as described in the POP, Volume I Section 4.5.2.2, Groundwater Sampling (ABB-ES, 1994a).

Sampling equipment used to collect soil and groundwater samples will be decontaminated using the field procedures outlined in the POP, Volume I, Section 4.3.3, Field Decontamination Procedures (ABB-ES, 1994a).

5.4 CONTROL AND DISPOSAL OF INVESTIGATION-DERIVED WASTE. Although environmental media encountered during this sampling program are not expected to be contaminated or to require special handling as contaminated investigation-derived waste (IDW), all soils and groundwater generated during soil boring completion, well installation and development, and sampling activities will be field-screened to determine appropriate disposal methods. Soil and groundwater IDW will be screened for volatile organic compounds (VOCs) using a hand-held flame ionization detector (FID). Any media sample with total VOCs above background (ambient air) concentrations will be containerized and handled as IDW in accordance with procedures presented in the POP, Volume I, Section 4.10, Control and Disposal of IDW (ABB-ES, 1994a). Media with total VOCs below background concentrations will be disposed onsite in accordance with prescribed procedures (ABB-ES, 1994a).

5.5 DATA EVALUATION. The facility-wide data generated by this sampling effort should form an initial database of concentrations of naturally occurring inorganic and organic compounds in the soil and groundwater that can be used as background data for all study areas at NTC Orlando. It is anticipated that the data collected during this initial background sampling program will be split into two subsets corresponding to the two distinct geographic settings of NTC Orlando: Main Base, Herndon Annex, and Area "C" comprising one subset, and McCoy Annex comprising the other. The appropriateness of this distinction will be determined during the data evaluation process. All background soil data (surface and subsurface) and groundwater data will be entered into a database to provide ranges of background concentrations for each constituent. These ranges will be used in data evaluation to determine whether study area-specific sample concentrations are within or outside background concentration ranges. These data are necessary to interpret site-specific concentrations with respect to human health and ecological risk evaluation.

6.0 SAMPLE ANALYSIS PLAN

In order to provide a basis for comparison to analytical data being collected from specific study areas, the background samples must be analyzed for the same suite of compounds as for site-screening and other investigations at NTC Orlando. Analytical methods and detection limits must also be the same as for other analytical programs being conducted.

6.1 ANALYTICAL PARAMETERS. All background surface and subsurface soil samples will be analyzed in accordance with USEPA Level IV Data Quality Objectives (DQOs) for the full suite of Contract Laboratory Program (CLP) Target Compound List/Target Analyte List (TCL/TAL) parameters, including volatile organics, semivolatile organics, pesticides, polychlorinated biphenyls (PCBs), herbicides, and inorganics, in accordance with the analytical methods as outlined in the POP, Volume I, Section 7.0, Analytical Procedures (ABB-ES, 1994a). All groundwater samples will be analyzed in accordance with USEPA Level IV DQOs for full suite TCL/TAL parameters including volatile and semivolatile organics, pesticides, PCBs, herbicides, and inorganics, as well as for radiological analysis of gross beta, gross alpha, and a gamma scan. All groundwater samples will be analyzed in accordance with the methods as outlined in the POP, Volume I, Section 7, Analytical Procedures (ABB-ES, 1994a). VOC analysis for groundwater and associated quality control (QC) samples will be by the low-level CLP method so that detection limits below Florida Department of Environmental Protection Maximum Contaminant Levels can be obtained. The background analytical program is summarized in Table 6-1.

6.2 QUALITY ASSURANCE/QUALITY CONTROL. All environmental sampling and analyses will be conducted in accordance with the requirements of the POP (ABB-ES, 1994a).

Duplicate samples will be collected and analyzed for 10 percent of all samples. Trip blanks will provide a basis for assessing the potential for contaminating samples with VOCs during sample collection or shipment, and will accompany all samples to be analyzed for VOCs. To address the potential for cross-contamination, rinsate blanks will be collected at a rate of one per day from equipment used in sampling all media. The rinsate blanks will be analyzed for the parameters of the respective samples collected with the sampler. Five percent matrix spike and matrix spike duplicates will be analyzed to characterize matrix effects on the basis of one per method per matrix. Detailed collection procedures and frequency of additional QC samples (such as field blanks and preservative blanks) are provided in the POP, Volume I, Section 9.0 Internal Quality Control (ABB-ES, 1994a).

Samples will be handled and conveyed to the subcontractor laboratory in accordance with specified chain-of-custody (COC) procedures. Sample management procedures including sample container and preservation requirements, COC program protocol and records, and sample tracking and shipping are described in the POP, Volume I, Section 5.0 Sample Handling and Custody Procedures (ABB-ES, 1994a).

While analyses are being conducted, the subcontractor laboratory quality assurance (QA) coordinator will provide the ABB-ES QA Manager with documentation specified in the POP. The subcontractor laboratory will communicate all corrective actions

Table 6-1
Analytical Program Summary

Background Sampling Plan
Naval Training Center Orlando
Orlando, Florida

Sample Identification	Quantity	CLP/TCL VOCs [1]	CLP/TCL SVOCs [2]	CLP/TAL Inorganics	Pesticides/-PCBs [3]	Herbicides	Radionuclides [4]	TSS
MAIN BASE								
BKGD 1								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
Groundwater	1	1	1	1	1	1	1	1
BKGD 2								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
BKGD 3								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
Groundwater	1	1	1	1	1	1	1	1
BKGD 4								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
Groundwater	1	1	1	1	1	1	1	1
BKGD 5								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
BKGD 6								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
AREA "C"								
BKGD 7								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
Groundwater	1	1	1	1	1	1	1	1
BKGD 8								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0

See notes at end of table

Table 6-1 (Continued)
Analytical Program Summary

Background Sampling Plan
Naval Training Center Orlando
Orlando, Florida

Sample Identification	Quantity	CLP/TCL VOCs [1]	CLP/TCL SVOCs [2]	CLP/TAL Inorganics	Pesticides/-PCBs [3]	Herbicides	Radionuclides [4]	TSS
HERNDON ANNEX								
BKGD 9								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
Groundwater	1	1	1	1	1	1	1	1
BKGD 10								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
McCOY ANNEX								
BKGD 11								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
Groundwater	1	1	1	1	1	1	1	1
BKGD 12								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
Groundwater	1	1	1	1	1	1	1	1
BKGD 13								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
Groundwater	1	1	1	1	1	1	1	1
BKGD 14								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
Groundwater	1	1	1	1	1	1	1	1
BKGD 15								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
BKGD 16								
Surface Soil	1	1	1	1	1	1	0	0
Subsurface Soil	1	1	1	1	1	1	0	0
Groundwater	1	1	1	1	1	1	1	1
Subtotal Soil/Groundwater	**42**	**42**	**42**	**42**	**42**	**42**	**10**	**10**

See notes at end of table

Table 6-1 (Continued)
Analytical Program Summary

Background Sampling Plan
Naval Training Center Orlando
Orlando, Florida

Sample Identification	Quantity	CLP/TCL VOCs [1]	CLP/TCL SVOCs [2]	CLP/TAL Inorganics	Pesticides/-PCBs [3]	Herbicides	Radionuclides [4]	TSS
McCOY ANNEX (Cont.)								
QUALITY CONTROL SAMPLES								
SOIL (32 Field Samples)								
QC Samples (Quantity Estimated)								
Trip	7	7	0	0	0	0	0	0
Rinsate	7	7	7	7	7	7	0	0
Duplicate	5	5	5	5	5	5	0	0
Matrix Spike	3	3	3	3	3	3	0	0
Matrix Spike Duplicate	3	3	3	3	3	3	0	0
GROUNDWATER (10 Field Samples)								
QC Samples (Quantity Estimated)								
Trip	5	5	0	0	0	0	0	0
Rinsate	5	5	5	5	5	5	1	0
Duplicate	3	3	3	3	3	3	1	3
Matrix Spike	1	1	1	1	1	1	1	0
Matrix Spike Duplicate	1	1	1	1	1	1	1	0
Totals for Water[5]	**39**	**39**	**27**	**27**	**27/27**	**27**	**14**	**13**
Totals for Soil	**43**	**43**	**43**	**43**	**43/43**	**43**	**0**	**0**

[1] Volatile organic compound (VOC) analyses for groundwater and associated quality control (QC) samples will be low level Contract Laboratory Program (CLP) method to attain detection limits below Florida maximum contaminant levels (MCLs).

[2] Semivolatile organic compound (SVOC) analyses for groundwater and associated QC samples will include U.S. Environmental Protection Agency (USEPA) Method 8310 for benzo(a)pyrene and selective ion monitoring (SIM) for bis(2-ethylhexyl)phthalate, pentachlorophenol, and hexachlorobenzene to attain detection limits below Florida MCLs for these compounds.

[3] Polychlorinated biphenyl (PCB) analyses for groundwater and associated QC samples will be performed to obtain detection limits below the Florida MCL (0.5 micrograms per liter [$\mu g/\ell$])

[4] Radionuclides analyses include Gross Alpha, Gross Beta (USEPA Method 9310), and a Gamma Scan (EPA Method 101.1).

[5] Totals for water include trip blanks and rinsates.

Notes: CLP = contract laboratory procedure.
TCL = target compound list.
VOCs = semivolatile organic compounds.
SVOCs = semivolatile organic compounds.
TAL = target analyte list.
PCBs = polychlorinated biphenyls.
TSS = total suspended solids.
BKG = background.
QC = quality control.

to ABB-ES. The subcontractor laboratory provides operational control of the laboratory; however, the ABB-ES QA Manager retains ultimate responsibility for data quality.

6.3 DATA VALIDATION. The laboratory Level IV deliverables will be validated in accordance with the procedures set forth in the POP, Volume I, Section 3.2, Data Quality Objectives (ABB-ES, 1994a).

7.0 PERSONNEL REQUIREMENTS

Background sampling at NTC Orlando will be completed by a team of ABB-ES personnel with support services provided by several subcontractors.

7.1 TASK ORDER STAFFING. The staffing requirements for background sampling, including the specific duties, functions, and responsibilities for key personnel, are detailed in the following paragraphs. Assigned personnel have been listed; staffing of other key roles is ongoing.

Task Order Manager (TOM). The TOM, Mr. Philip Georgariou, is responsible for:

- ensuring the appropriateness and adequacy of the technical or engineering services provided for a specific task;
- developing the technical approach and level of effort required to address each element of a task;
- supervising day-to-day conduct of the work, including integrating the efforts of all supporting disciplines and subcontractors for all tasks;
- overseeing the preparation of all reports and plans;
- providing for QC and quality review during the performance of the work;
- ensuring technical integrity, clarity, and usefulness of task work products;
- forming a task group with expertise in disciplines appropriate to accomplish the work;
- reviewing and approving sampling tests and QA plans, which include monitoring site locations, analyses methods to be used, and hydrologic and geophysical techniques;
- developing and monitoring task schedules;
- supervising task fiscal requirements (e.g., funds management for labor and materials), and reviewing and approving all invoicing actions; and
- providing day-to-day communication, both within the ABB-ES team and with the BRAC Cleanup Team (BCT) and others, on all task matters, including task status reporting.

Quality Assurance Manager. ABB-ES has established a corporate QA function to assure that appropriate protocols are followed and that QC plans are in place and implemented for each element of the task. Mr. Thomas Campbell is ABB-ES' QA Manager. He reports directly to the Program Manager but is responsible to the Task Order Manager in matters related to management of the QA/QC work element. The QA Supervisor has authority to stop work that is not in compliance with the POP, provided he has the concurrence of the Task Order Manager, the Program Manager, and the Contracting Manager.

Health and Safety Supervisor. Ms. Cindy Sundquist, Certified Industrial Hygienist (CIH), is ABB-ES' corporate health and safety supervisor. She has stop-work authority to prevent or mitigate any unacceptable health and safety risks to project personnel, the general public, or the environment. Responsibilities of this position include: ensuring that the project team and, in particular, field personnel, comply with the ABB-ES HASP; helping the Task Order Manager and Program Manager develop the site-specific HASP; making certain that the HASP is distributed to appropriate personnel; and informing the Task Order Manager in the specified manner when any health- or safety-related incident occurs.

Field Operations Leader (FOL). The FOL, Mr. Gerry Girardot, is responsible for conducting the field program in accordance with procedures outlined in the Background Sampling Plan and the POP. Responsibilities also include directing subcontractor activities and coordinating with on-site visitors and representatives.

8.0 PROJECT SCHEDULE

The overall project schedule for background sampling is as follows.

8.1 PROJECT IMPLEMENTATION SCHEDULE. On-site activities will be initiated following the Notice to Proceed and are expected to require 14 days to complete. Laboratory data deliverables from the last samples collected are due 30 days after the completion of the field program. Data validation activities will be initiated as soon as data deliverables are received from the contract laboratory and validation will be completed within 30 days of receipt of the final data deliverable package from the laboratory. The Draft Background Sampling Report will be delivered to the BCT for review 7 weeks after completion of the data validation. The Background Sampling Report will be issued as Final five weeks after receipt of BCT comments.

8.2 FIELD ACTIVITIES. Field activities as described in Section 5.0 of this Background Screening Plan will be initiated within one month after Notice to Proceed. The field program is estimated to require two weeks to complete. This schedule assumes that there will be no significant delays due to weather, site access, or other unforeseen issues.

REFERENCES

ABB-ES, 1994a, Project Operations Plan for Site Investigations and Remedial Investigations, Naval Training Center, Orlando, Florida.

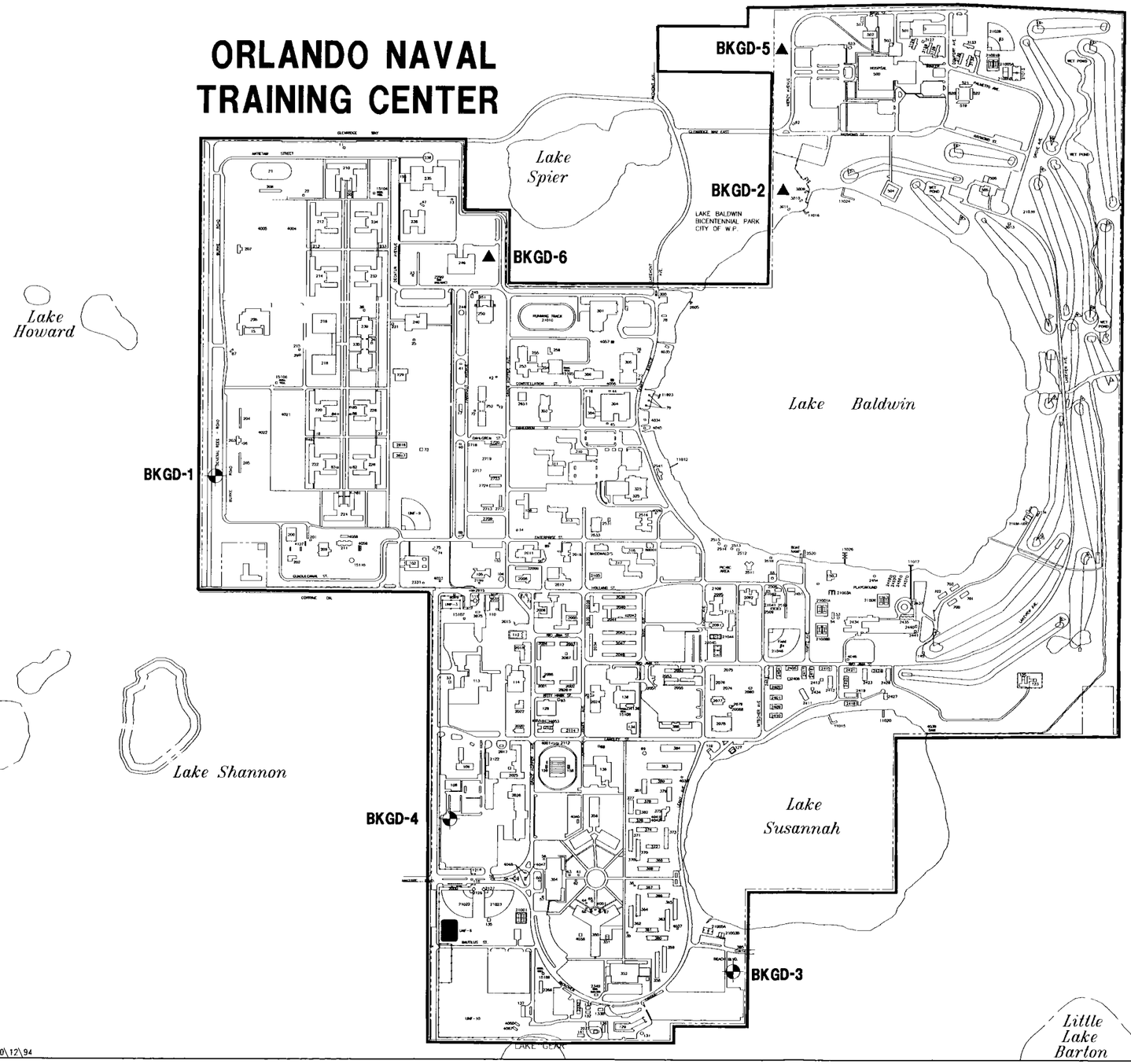
ABB-ES, 1994b, Final Draft Environmental Baseline Survey (EBS) Report, Naval Training Center, Orlando, Florida.

Geraghty & Miller, 1986, Verification Study, Assessment of Potential Soil and Ground-Water Contamination at Naval Training Center, Orlando, FL; Tampa, FL; December, 1986.

Lichtler, W.F., W. Anderson, and B.F. Joyner, 1968, Water Resources of Orange County, Florida: U.S. Geological Survey Report of Investigations No. 50, p. 150.

U.S. Department of Agriculture, 1989, Soil Conservation Service, Soil Survey of Orange County, Florida. August 1989.

ORLANDO NAVAL TRAINING CENTER



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LEGEND

BKGD-6 ▲ Proposed surface and subsurface soil sampling location

BKGD-1 ⌖ Proposed surface soil sample, subsurface soil sample, and monitoring well location

0 500 1000

APPROXIMATE SCALE: 1" = 1000'

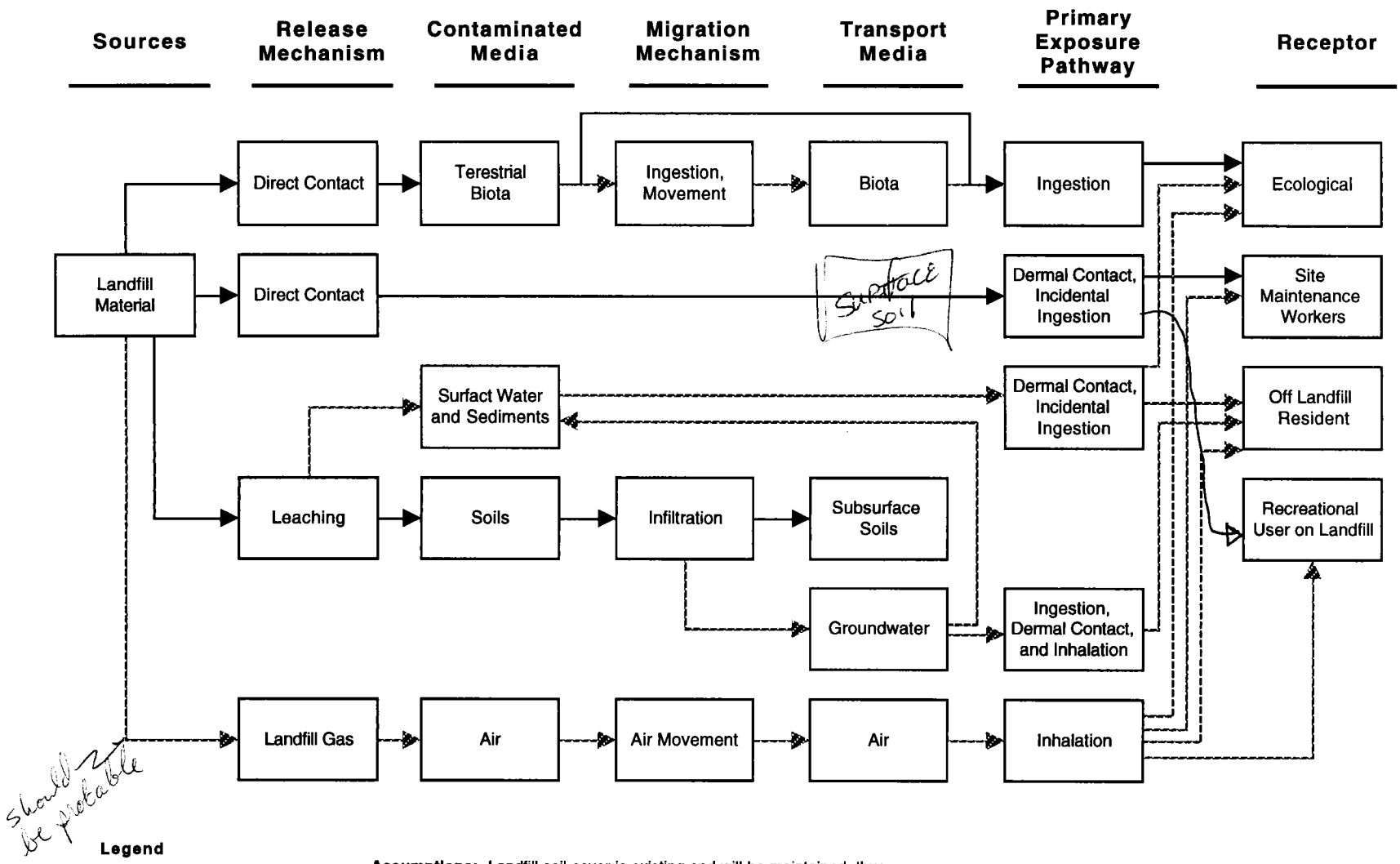
FIGURE 2-2
BACKGROUND SAMPLING LOCATIONS
MAIN BASE

BACKGROUND SAMPLING PLAN

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

ORLANDO\TANK-NTC\KGP\10\12\94

Conceptual Site Model
North Grinder Landfill, Operable Unit 1

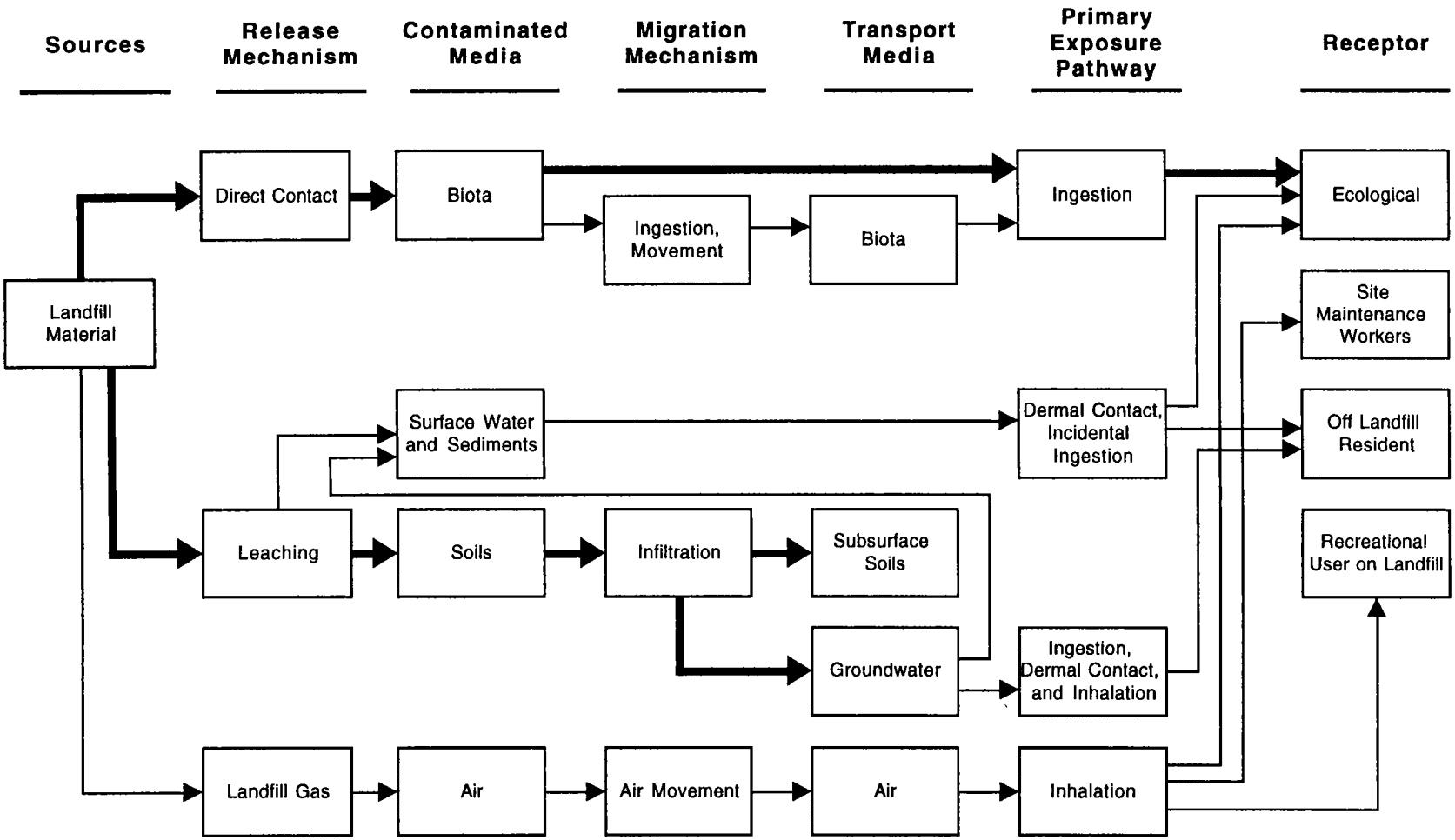


Legend

— Probable condition
--- Potential deviation

Assumptions: Landfill soil cover is existing and will be maintained, thus the site exposure scenarios are under institutional controls/industrial. This model represents current and future uses.

Conceptual Site Model
North Grinder Landfill, Operable Unit 1



Legend

- Probable condition
- Potential deviation

Assumptions: Landfill soil cover is existing and will be maintained and no utilities exist that are in contact with landfill waste. Thus the site exposure scenarios are under institutional controls/industrial. This model represents current and future uses.

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Media	Probable Condition	Base Action	Data Needs	Reasonable Deviation	Contingent Action	Additional Data Needs
Cover/Surface Soils	Soil Cover exists. Soil cover thickness is sufficient to prevent exposure from contaminants. Soil cover is maintained.	Institutional controls	Verify probable condition. Use GPR to evaluate soil cover thickness and distribution. Collect samples to evaluate composition of cap material. Data will support institutional controls evaluation.	Soil cover is sparse and insufficient to prevent exposure to receptors.	Install proper cap	Same as base action.
Sediment	Sediments in off-landfill water bodies have not been adversely affected by leachate from landfill.	No action	Verify probable condition through sampling sediments randomly. Sample surface water to evaluate leachability of sediments.	Sediments have been contaminated by leachate from landfill.	Evaluate containment or source removal.	Estimate approximate area and depth of sediment contamination. Conduct ecological characterization of aquatic organisms. Evaluate risks and exposures associated with contamination.
	Sediment in on-landfill water bodies has been contaminated by leachate from the landfill	Containment/source removal	Same as off-landfill	On-landfill sediments have not been adversely affected by leachate from the landfill.	None needed	No additional data needed
Groundwater	Contaminated groundwater has not migrated off-site.	Monitor/containment	Collect hydrologic and groundwater data to design and evaluate hydraulic controls and/or containment.	Contaminated groundwater has migrated off-site.	Source control or implement groundwater remedial system.	Conduct groundwater modeling to evaluate remedial systems. Conduct groundwater pumping test to calibrate model.
Air	Gases are not being generated by the landfill, thus no gas is migrating from the existing soil cover.	No action	Collect data to evaluate if soil gases are being generated and/or migrating through the soil cover.	Soil gas is migrating through soil cover.	Install proper cap, evaluate venting.	Same as base action.
Biota	Biota uptake does not pose a risk to human health due to current and future land uses.	No action	Same as Cover/Surface Soils	Terrestrial fauna are being exposed to contaminated material, thus producing a possible risk to the food chain.	Install and maintain proper cap.	No additional data needed.
	Aquatic organisms are being exposed to contaminated sediments. Additionally, adverse affects to biota via the food chain may be probable.	Containment/source removal	Same as sediments, conduct ecological characterization of aquatic organisms. Evaluate risks and exposures associated with contamination.	Aquatic organisms are not being adversely impacted by contaminated sediments.	None needed.	No additional data needed.

Site condition uncertainties and Data Needs

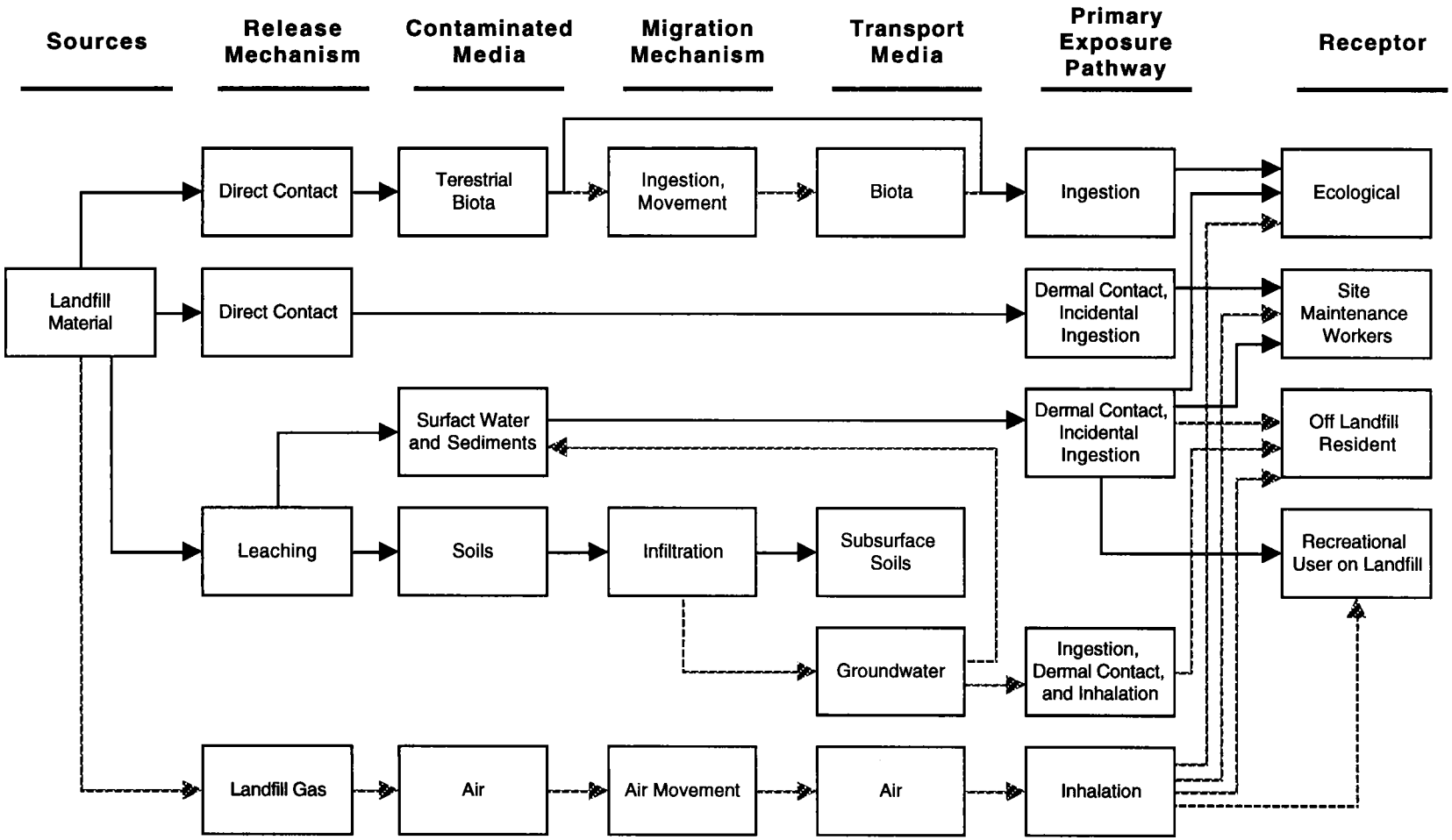
McCoy Annex Landfill, Operable Unit 2

Media	Probable Condition	Base Action	Data Needs	Reasonable Deviation	Contingent Action	Additional Data Needs
Cover/Surface Soils	Soil Cover exists. Soil cover thickness is sufficient to prevent exposure from contaminants. Soil cover is maintained.	Institutional controls	Verify probable condition. Use GPR to evaluate soil cover thickness and distribution. Collect samples to evaluate composition of cap material. Data will support institutional controls evaluation.	Soil cover is sparse and insufficient to prevent exposure to receptors.	Install proper cap	Same as base action.
Sediment	Sediments in off-landfill water bodies have not been adversely affected by leachate from landfill.	No action	Verify probable condition through sampling sediments randomly. Sample surface water to evaluate leachability of sediments.	Sediments have been contaminated by leachate from landfill.	Evaluate containment or source removal.	Estimate approximate area and depth of sediment contamination. Conduct ecological characterization of aquatic organisms. Evaluate risks and exposures associated with contamination.
Groundwater	Contaminated groundwater has not migrated off-site.	Monitor/containment	Collect hydrologic and groundwater data to design and evaluate hydraulic controls and/or containment.	Contaminated groundwater has migrated off-site.	Source control or implement groundwater remedial system.	Conduct groundwater modeling to evaluate remedial systems. Conduct groundwater pumping test to calibrate model.
Air	Gases are not being generated by the landfill, thus no gas is migrating from the existing soil cover.	No action	Collect data to evaluate if soil gases are being generated and/or migrating through the soil cover.	Soil gas is migrating through soil cover.	Install proper cap, evaluate venting.	Same as base action.
Biota	Biota uptake does not pose a risk to human health or terestrial fauna due to the soil cover and current and future land uses.	No action	Same as Cover/Surface Soils	Terrestrial fauna are being exposed to contaminated material, thus producing a possible risk to the food chain.	Install and maintain proper cap.	No additional data needed.

Site condition uncertainties and Data Needs

NORTH GRINDER LANDFILL, OPERABLE UNIT 1

Conceptual Site Model
McCoy Annex Landfill, Operable Unit 2



Legend

—— Probable condition
---- Potential deviation

Assumptions: Landfill soil cover is existing and will be maintained, thus the site exposure scenarios are under institutional controls/industrial. This model represents current and future uses.