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FINAL PROPOSED PLAN FOR OPERABLE UNIT 1 (OU 1) NTC ORLANDO FL
5/16/1997
ABB ENVIRONMENTAL

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May 16, 1997

Commanding Officer
SOUTHNAVFACENGCOM
P.O. Box 190010
2155 Eagle Drive
N. Charleston, S.C. 29419-9010

Attn: Ms. Barbara Nwokike, Code 187300

**Subject: NTC, Orlando, Orlando, Florida
Operable Unit 1, (OU1)
Final Proposed Plan
Contract; N62467-89-D-0317/CTO 107**

Dear Barbara:

Enclosed for your review is the Final Proposed Plan for OU1. The Proposed Plan details background information on environmental conditions at OU1, proposed remedial methods to address the contamination, and opportunities for public participation. All comments discussed during the April OPT meeting have been included as well as all formal comments from Mr. John Mitchell of the FDEP as stated in his April 24, 1997 letter. We will discuss the Proposed Plan during the public meeting at 7:00 p.m. on May 22, 1997. The public comment period is May 15 through June 16, 1997.

If you have any questions or comments, please do not hesitate to call me at (407) 895-8845 or Shannon Gleason at (703) 769-8181.

Very Truly Yours,
ABB ENVIRONMENTAL SERVICES, INC.


John P. Kaiser
Installation Manager

JK/cp

cc: W. Hansel (SDIV)
G. Whipple (NTC, Orlando)
J. Mitchell (FDEP)
N. Rodriguez (EPA)
M. McNeil (Bechtel)
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ABB Environmental Services Inc.

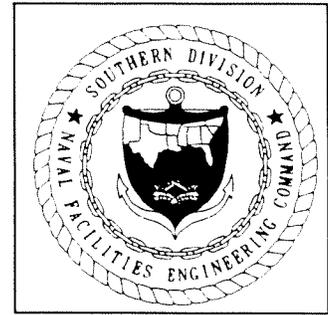


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P R O P O S E D P L A N

OPERABLE UNIT 1 GROUNDWATER MONITORING, LANDFILL INSPECTIONS, AND INSTITUTIONAL CONTROLS



NAVAL TRAINING CENTER
ORLANDO, FLORIDA

MAY 1997

THIS PROPOSED PLAN CONTAINS:

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- 2.0 Site Background 2
- 3.0 Remedial Method Selection
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*Terms that appear in italics are defined
in the glossary.*

A list of acronyms is given on page 13.

1.0 INTRODUCTION AND PURPOSE

This document provides information to the public on the proposed methods to address contamination at *Operable Unit* (OU) 1, the North Grinder Landfill, at the Naval Training Center (NTC), Orlando. This *Proposed Plan* is intended to encourage and facilitate community participation in the environmental restoration process at OU 1. The following information is presented in this document:

- background information on OU 1 conditions developed through records reviews, field investigations, and assessment of potential human and ecological risks (**Section 2**);

- the remedial methods proposed to address contamination at OU 1 (**Sections 3 - 5**); and
- opportunities for public participation (**Section 7**).

The proposed remedial methods for OU 1 were developed by the Navy, the *U.S. Environmental Protection Agency* (USEPA), and the *Florida Department of Environmental Protection* (FDEP). The Navy, USEPA, and FDEP will document the selected remedial methods for OU 1 in a document called a *Record of Decision* (ROD) after all public participation activities have been completed.

Public Meeting

May 22, 1997
7:00 p.m.
Orlando City Hall
400 South Orange Avenue
Orlando, Florida

Public Comment Period

May 15 through June 16, 1997

Public Participation

Community acceptance is a key element in selecting a remedy for the OU 1 site. Community members are encouraged to provide input on this Proposed

Plan during a public comment period that will be held from May 15 to June 16, 1997. Details on the public comment period are found on page 10 of this document.

A public meeting on the Proposed Plan will be held on May 22, 1997, at 7:00 pm at the Orlando City Hall. Environmental specialists will present an overview of the Proposed Plan, followed by an open floor question and comment period. Community members are encouraged to attend the public meeting and provide input at that time.

The Navy will summarize and respond to all comments received during the public meeting and comment period in a document called a *Responsiveness Summary*. The Responsiveness Summary will be issued as an appendix to the ROD for OU 1.

Further Information

Documents on environmental restoration activities at OU 1, including the Remedial Investigation (RI) report, are available for public review at the NTC, Orlando Information Repository in the Orange County Public Library in downtown Orlando. The library address and telephone number are found on page 11.

2.0 SITE BACKGROUND

OU 1, also known as the North Grinder Landfill, is located in the northwest corner of the Main Base at NTC, Orlando (Figure 1). Landfill operations reportedly began sometime between 1939 and 1947 and continued until the Air Force transferred the property to the Navy in 1968. Wastes were disposed of in trenches dug at the site and then burned and covered over with soil. Landfill wastes reportedly included film and photographic chemicals, paint thinner, mess hall garbage, medical waste, yard and construction debris, and waste from drycleaning operations known as *perchloroethylene (PCE) stillbottoms*. Figure 2 presents the approximate landfill boundary (or footprint) and surrounding site features.

Investigative History

Environmental studies of the North Grinder Landfill began in 1985. Findings from these studies and

from successive investigations are summarized below in chronological order.

Initial Assessment Study (IAS)

The IAS was conducted in 1985 by C.C. Johnson and Associates, Inc., to identify potentially contaminated sites at NTC, Orlando. The study included review of available records and a site walkover. At that time, an estimated 194,000 cubic yards of waste was thought to have been discarded at the North Grinder Landfill, of which approximately 1/3 had been excavated and removed to an unknown location during construction of recruit barracks in 1967.

Verification Study

In 1986, a study was conducted by Geraghty & Miller to evaluate whether or not groundwater at the site was contaminated. Four shallow monitoring wells were installed around the perimeter of the landfill and groundwater samples were collected and analyzed. This sampling showed that chemicals, including arsenic and *gross alpha radionuclides*, were present in groundwater at concentrations above regulatory limits (i.e., State of Florida maximum contaminant levels). Further investigation was required to more completely evaluate contamination at the site.

RI

Starting in March 1995, RI activities were conducted by ABB Environmental Services, Inc., to better determine the nature (which contaminants are at the site) and extent (where the contaminants are located) of contamination at OU 1.

The RI was completed in accordance with USEPA's guidance manual *Conducting Remedial Investigations and Feasibility Studies for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Landfill Sites*. CERCLA stands for the Comprehensive Environmental Response, Compensation, and Liability Act, and is more commonly known as the Superfund Act. Although NTC, Orlando is not a Superfund site, the RI for OU 1 was conducted in accordance with Superfund guidance to ensure a complete evaluation of site conditions.

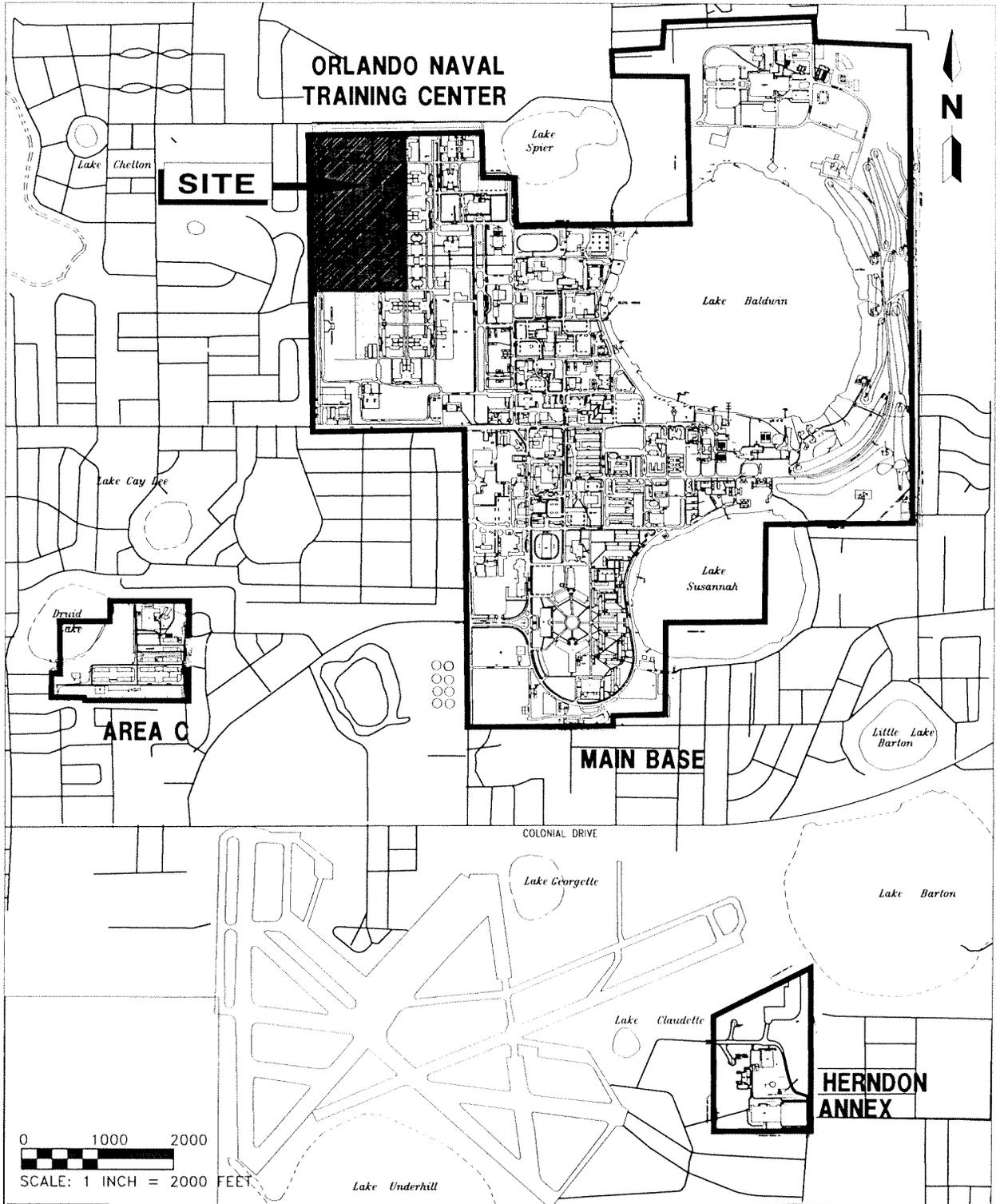
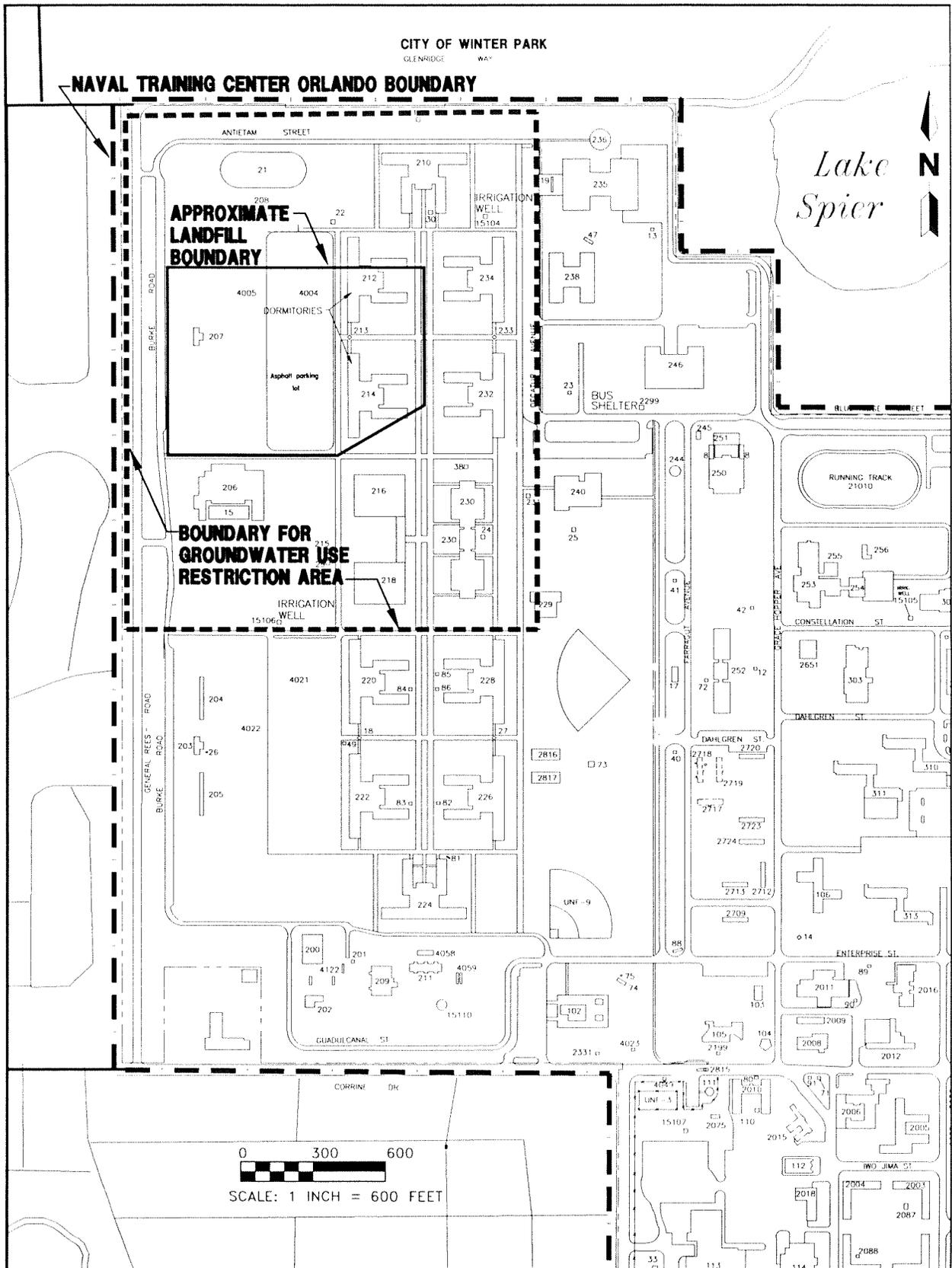


Figure 1: Location of Operable Unit 1



RI Field Program

Fieldwork at OU 1 included the following:

- evaluation of historical aerial photographs to help define the landfill boundary;
- a *geophysical investigation* to more precisely determine the boundary of the landfill and locate potentially contaminated areas;
- a *Direct-Push Technology (DPT) survey* to identify areas of groundwater contamination; permanent monitoring well locations at the site were also selected based on DPT data;
- a *soil gas survey* to assess whether or not specific chemicals (such as volatile organic compounds) were present in soil and groundwater and to evaluate the presence of *methane* along the landfill perimeter;
- *soil borings* to understand the geology of the site and collect soil samples for chemical analyses;
- groundwater monitoring well installation and sampling to evaluate potential groundwater contamination at the site;
- surface soil sampling to determine if the soil covering the buried wastes was contaminated or if it provided a protective barrier to human and ecological (wildlife) exposure to buried wastes; and
- studies of shallow groundwater to determine what direction groundwater flows and at what rate.

RI Findings

RI data indicated the presence of pesticides, a *polychlorinated biphenyl (PCB)* compound, inorganic chemicals, and *polyaromatic hydrocarbons (PAHs)* in surface soil, and low levels of radiological chemicals in groundwater in the immediate vicinity of the landfill.

Low concentrations of pesticides were detected in surface soil at the site, indicating historic pesticide use in the area. One PCB compound was detected at a low concentration, and may be associated with the use of oil containing PCBs to control dust at the site.

Inorganic chemicals, including arsenic, calcium, chromium, copper, magnesium, and zinc, were also detected at the site. These materials are likely associated with historic use of pesticides and fertilizers on landfill cover material. In addition, these chemicals may have been in the landfill cover soil, which likely came from an offbase location.

PAHs in urban areas come primarily from sources such as automobile exhausts, fires, and boilers. PAHs present in surface soil at OU 1 may be related to Navy firefighting training activities that occurred at the site. The primary way for the PAHs to spread is from leaching, as might be caused by a rainfall event. PAHs are not easily mobilized by leaching and, therefore, do not appear to have been transported outside of the landfill.

The radiological chemicals (gross alpha and/or gross beta) detected in groundwater at the site are believed to be due to a change in groundwater chemistry at the landfill boundary. It is believed that as the landfill ages and groundwater continues to flow through the site, groundwater chemistry below the landfill will return to background levels. Additionally, human exposure to groundwater would be controlled with sufficient *institutional controls* (such as deed restrictions) in place.

The RI report recommended a groundwater monitoring program to observe changes in groundwater chemistry and contamination over time. RI findings also indicated that a *landfill cap* was not required because the existing soil cover over the landfill waste was sufficiently protective of human health and the environment based on a restrictive use (as nonresidential) of the land.

Risk Assessment

A risk assessment was conducted based on the RI field investigation results. This study evaluated risks to human health and the environment posed by

existing or potential future exposure to site contaminants. These evaluations were then considered in cleanup decision making for OU 1.

For the human health portion of the assessment, risks were estimated on the assumption that no action will be taken to cleanup the site. For OU 1, risks were evaluated for humans coming in contact with surface soil. Risks for humans coming in contact with groundwater were not evaluated because there is no existing route (or pathway) of human exposure to groundwater. It was also assumed that future groundwater use would be controlled by legal prohibitions on drinking water or irrigation wells at the site. The OU 1 risk assessment consisted of four steps. Each step is described below.

■ **Identify chemicals of potential concern -**

These are chemicals found at the site in concentrations above federal and state risk-screening levels and background levels. Chemicals of potential concern are identified for both human and ecological receptors.

■ **Conduct an exposure assessment -**

In this step, ways that humans and wildlife can come into contact with contaminants in the soil at OU 1 are considered:

- Under current conditions, adult and child trespassers could be exposed to soil at OU 1. This exposure may occur through direct contact with soil or by breathing in soil particulates such as dust.
- Under future conditions, soil exposure could occur for construction workers, and older children and adults (assuming the site was used as a recreational area, as proposed under the City of Orlando's reuse plan for NTC).
- For ecological receptors, small mammals, birds, plants, and soil invertebrates (worms, etc.) could be exposed to surface soil.

■ **Complete a toxicity assessment -**

At this step, possible harmful effects from exposure to the identified chemicals of potential concern are evaluated. Generally, these chemicals are separated into two groups: carcinogens (contaminants that may cause cancer) and noncarcinogens (contaminants that may cause adverse effects other than cancer).

■ **Characterize the risks -**

Lastly, exposure and toxicity assessment results are combined to estimate overall risks from exposure to site contaminants. For carcinogens, risk estimates are expressed in terms of probability. For example, exposure to a particular carcinogenic chemical may present a 1 in 10,000 chance of causing cancer over an estimated lifetime of seventy years.

For noncarcinogens, exposures are first estimated and then compared to a reference dose (RfD). The RfD is developed by USEPA scientists to estimate the amount of a chemical a person (including the most sensitive person) could be exposed to over a lifetime without developing adverse (noncancer) health effects. This measure is known as a hazard index. A hazard index greater than one suggests that adverse effects are possible.

Using USEPA risk criteria and a nonresidential land-use scenario at OU 1, humans are not at risk when exposed to surface soil. Using FDEP risk criteria, a slight cancer risk (3 in 1,000,000) may exist for humans coming into contact with surface soil. Noncancer effects are not indicated under either criteria.

Under current conditions, one pesticide detected in surface soil at OU 1 may contribute to the slight cancer risk calculated. However, the site is currently paved and, consequently, human exposure pathways to surface soil do not exist.

Under future (nonresidential use) conditions, the same pesticide chemical, plus two PAHs and one inorganic chemical, may contribute to the slight cancer risk of 3 in 1,000,000. However, the

concentrations of these chemicals used to calculate this risk estimate are less than the *FDEP Soil Cleanup Goals* for nonresidential use. These goals have been established to ensure protection of human health. Therefore, cleanup of surface soil at sites in compliance with these standards, such as OU 1, is not warranted.

The ecological risk assessment did not identify risks at OU 1 for mammals, birds, plants, or invertebrates.

3.0 REMEDIAL METHOD SELECTION FOR OU 1

To identify appropriate methods for addressing contamination at OU 1, the RI conclusions were reviewed, and pertinent requirements or regulations were evaluated.

First, the RI recommendations were considered. The RI recommended a groundwater monitoring program and institutional controls restricting the use of the land and groundwater at OU 1.

Second, relevant state and federal regulations for closure of landfill sites, such as OU 1, were reviewed. Guidance documents describing these regulations were also reviewed. However, federal and state landfill closure regulations are not directly applicable to OU 1 for the reasons listed below.

- Federal regulations on the closure of *hazardous waste* and *solid waste* landfills apply to sites that received such wastes after November 19, 1980, and October 9, 1993, respectively: all waste disposed of at OU 1 was received well before those dates.
- State of Florida regulations on hazardous and solid waste disposal are not applicable because the OU 1 landfill did not receive waste after July 1, 1983, the effective date of these regulations.

Although these regulations are not directly applicable to OU 1, their relevant sections and associated guidance documents were evaluated when determining remedial methods for OU 1. For example, the *Draft Technical Manual for Solid Waste Disposal Criteria* (a USEPA guidance document supporting

federal solid waste regulations) provides guidance on statistical evaluation of groundwater monitoring data. These methods will be used to identify whether or not the chemical concentrations in groundwater are changing appreciably over time.

Additional federal guidance provides information regarding closure of CERCLA landfills. Although NTC, Orlando is not a CERCLA site, this guidance was considered in identifying remedial methods for OU 1. The CERCLA guidance suggests consideration of the following techniques for long-term care of landfill sites:

- covers, which may be *permeable*, to prevent direct human contact with landfilled materials;
- long-term cover maintenance;
- groundwater monitoring; and
- institutional controls, as necessary.

At this time, the entire OU 1 landfill is covered with soil. Part of the landfill is also covered with asphalt. It is likely that the asphalt will be removed, given the proposed recreational use for the property. The soil cover alone will prevent direct contact with landfill materials. Therefore, no additional cover is recommended.

The other three components listed above are included in the proposed remedial methods for OU 1 and are described in the next section.

4.0 DESCRIPTION OF PROPOSED REMEDIAL METHODS FOR OU 1

The proposed remedial methods for OU 1 are listed below.

Groundwater monitoring

Groundwater monitoring is recommended to

- establish physical and chemical quality data for the groundwater;
- evaluate the chemical quality data, which may indicate continuing leachate release;

-
- evaluate changes in the water table, which may affect contaminant movement.

Under the monitoring program, groundwater will be sampled and analyzed for organic, inorganic, and radionuclide chemicals. These data will be used to determine if significant changes in concentrations of these chemicals are occurring over time.

All existing OU 1 monitoring well locations are shown on Figure 3. Well locations proposed for the monitoring program are highlighted. These include shallow, intermediate, deep, and back-ground wells.

The following sampling frequency is planned:

Year 1 **Quarterly sampling.** If at the end of Year 1, no appreciable changes in the groundwater chemical concentrations occur or if concentrations decrease, the sampling frequency will be adjusted accordingly in Year 2. If concentrations increase, then additional wells may be sampled and/or additional analyses conducted.

Year 2 **Annual sampling** (if no appreciable changes in groundwater chemical concentrations are detected in Year 1).

Year 3 **Annual sampling** (if no appreciable changes in groundwater chemical concentrations are detected in Year 2). If no appreciable changes are detected in Year 3, groundwater monitoring would be discontinued.

This plan is designed to adequately track changes in groundwater contamination over time, as recommended in the RI. At the end of the last monitoring period, a report will be prepared to summarize data collected. This report will recommend continued monitoring or no further action, whichever is appropriate. If no further action is warranted, monitoring wells at the site will be removed.

Landfill Inspections

Visual inspections of the landfill surface will be conducted during groundwater monitoring events. These inspections will periodically assess the adequacy of the landfill soil cover to prevent human

and ecological exposure to landfilled waste. The inspection area will include the landfill boundary shown on Figure 2.

Institutional Controls

These controls will be stipulated in property transfer documents and the deed for the site and will address areas within the transfer parcel boundary shown on Figure 2. The institutional controls will be implemented as deed and groundwater-use restrictions to notify future users of the site conditions listed below.

- The landfill contains undocumented waste, which may include, but is not limited to film and photographic chemicals; paint thinner; mess hall garbage; cardboard boxes, paper, and plastic; medical wastes; tree limbs and construction materials; and PCE stillbottoms from the base laundry.
- Potential health and safety issues are involved in excavation, drilling, construction, and repair of buried utilities within the landfill footprint. Such activities outside the landfill footprint, but within the parcel boundaries, should not pose risks to workers.
- Surficial aquifer groundwater under the landfill and potentially throughout the parcel contains concentrations of radiological chemicals, although some of these levels are similar to detected levels in uncontaminated aquifers located elsewhere in Florida and in similar geologic and hydrologic environments.
- Groundwater in the parcel boundary should not be used for drinking or irrigation.
- Landfill-cover materials (i.e., surface soil) may contain chemicals that are believed to be related to past pesticide use at the site, introduction of nonnative soil to the area, and combustion of fuel products.

The transfer documents for the parcel will also stipulate that future use of the land is restricted to industrial or recreational use.

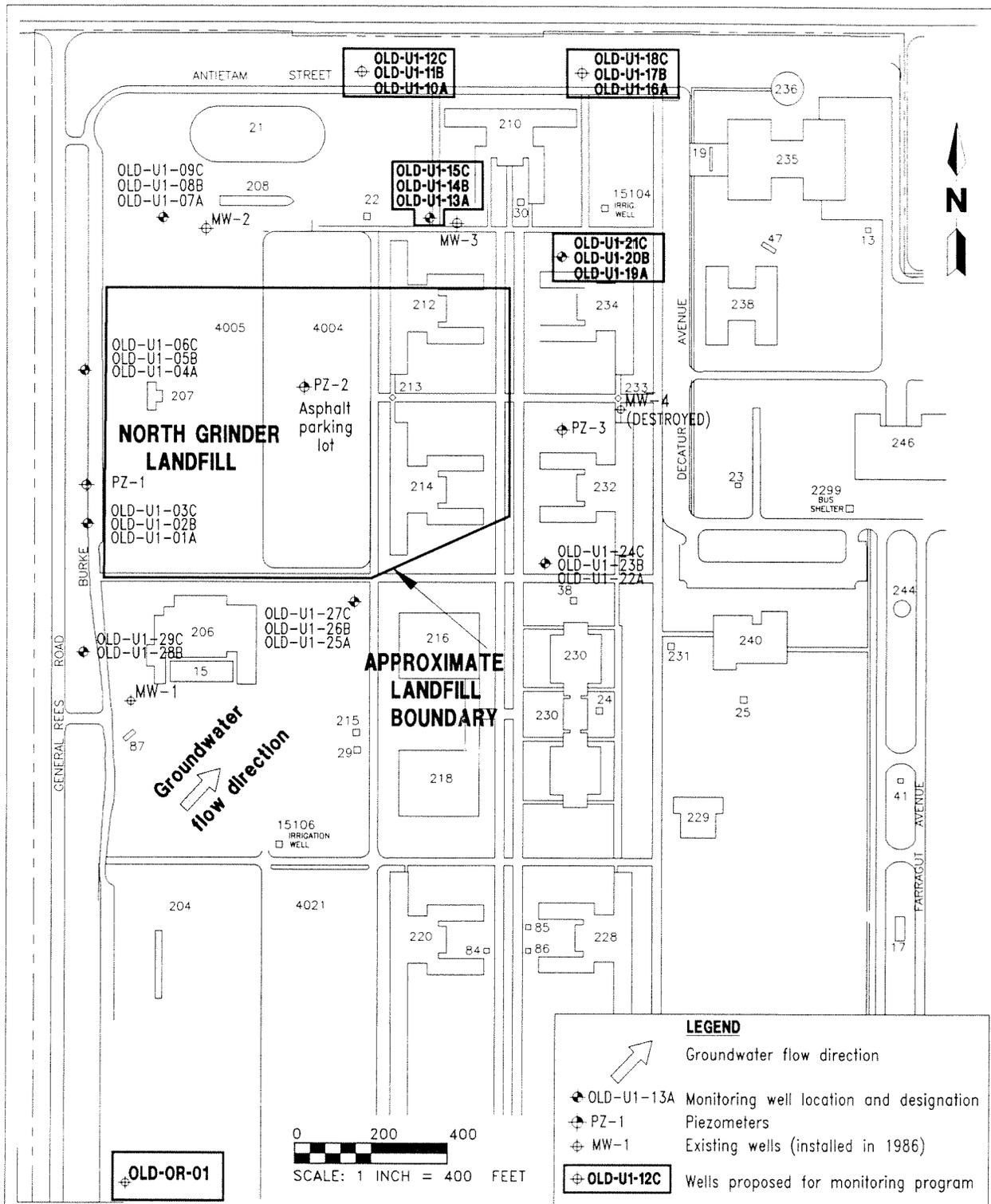


Figure 3: Existing Monitoring Wells and Monitoring Well Locations for the groundwater Sampling Program

5.0 BASIS FOR REMEDIAL METHOD SELECTION FOR OU 1

Selection of the proposed OU 1 remedial methods described in Chapter 4.0 was based on the RI findings and is supported by applicable guidance. These methods are recommended for the following reasons listed below.

- Soil covering the landfilled waste is adequate to protect human and ecological receptors from coming into contact with buried materials; therefore, additional cover over the landfill is not necessary.
- No risks to ecological receptors were predicted based on exposure to surface soil at the site.
- Risks predicted from human exposure to onsite surface soil are within the acceptable USEPA risk range and slightly exceed FDEP standards for acceptable risk. However, the concentrations of chemicals used in the risk assessment were less than the FDEP Soil Cleanup Goals for non-residential use.
- The use of groundwater for drinking or irrigation would be prohibited under an institutional control.
- The use of the landfill area would be restricted to recreational or nonresidential use under a deed restriction.

6.0 USEPA AND FDEP ACCEPTANCE

The USEPA and the FDEP have reviewed this proposed plan and agree with its recommendations. Their final evaluation will be made after consideration of input received during the public review and comment period.

7.0 UPCOMING PUBLIC INVOLVEMENT OPPORTUNITIES

Community acceptance of this Proposed Plan is the next step in the remedial process for OU 1. Public involvement opportunities to ensure this acceptance are discussed below in this chapter.

Public Comment Period

A public comment period will be held from May 15 through June 16, 1997. During this time, community members are encouraged to submit comments to Lieutenant Mehal, the NTC, Orlando Public Affairs Officer, at the address listed on the next page. **Comments must be postmarked by June 16, 1997.**

Send Public Comments To:

Lieutenant Robert S. Mehal
Public Affairs Officer
Naval Training Center
4551 Kitty Hawk Street
Orlando, Florida 32813-8360
(Fax) 407-646-5392

Public Meeting

Interested parties are encouraged to attend a public meeting to learn more about the Proposed Plan for OU 1. This meeting will provide another opportunity to ask questions and provide input on the Proposed Plan to the Navy. The meeting time and location are provided below.

Public Meeting

Date: May 22, 1997
Time: 7:00 p.m.
Location: Orlando City Hall
Agenda Conference Room
2nd Floor
400 South Orange Avenue
Orlando, Florida

The ROD

Following consideration of public comments, the Navy, USEPA, and FDEP will prepare the official ROD for OU 1. The ROD will detail the remedial methods chosen for the site, and will include the Navy's response to comments received during the public meeting and comment period. Actions

described in this Proposed Plan can be implemented after the ROD is issued.

Ongoing Public Involvement Activities

NTC, Orlando is committed to keeping the local community involved in environmental restoration at OU 1 and elsewhere on the facility. A Restoration Advisory Board (RAB), composed of community and government agency representatives, meets regularly to discuss NTC's environmental program. At these meetings, community RAB members provide local input and offer suggestions on environmental program activities. Upcoming RAB meetings are publicized in local media and are open to the public.

NTC, Orlando also maintains a community mailing list for distributing information on the environmental program. If you would like to be added to the

mailing list, please contact Lieutenant Mehal at the address provided on page 10.

Available Information

Documents on OU 1 and on other aspects of the NTC, Orlando environmental program are available for public review at the NTC, Orlando Information Repository at:

Orange County Library System
Orlando Public Library
Social Sciences Department (Aisle 27)
Second Floor
101 East Central Boulevard
Orlando, Florida 32801

8.0 GLOSSARY

Direct-Push Technology (DPT): technology used to sample soil and groundwater and interpret geology by pushing or driving rods into the subsurface.

Florida Department of Environmental Protection (FDEP): The state agency that is involved in identifying and enforcing regulations and concurring with the preferred remedy at the site.

FDEP Soil Cleanup Goals: Values that, if concentrations of chemicals detected in soil are less, the state concurs that no further action or evaluation of soil is appropriate.

Geophysical investigation: investigation conducted with electrical instruments such as magnetometers, terrain conductivity meters, and ground-penetrating radar to determine subsurface conditions.

Gross alpha/beta radionuclides: the emission of alpha and beta particles in the decay of naturally-occurring and manmade radionuclides; there are several commonly found radionuclides in the soil at OU 1 that are capable of producing the observed levels of radioactivity.

Hazardous waste: a waste defined by regulation 40 Code of Federal Regulations (CFR) 261 that, in certain quantities, may be harmful to human health or the environment.

Institutional controls: a type of control set in legal documents for a piece of property that limits future uses of the land.

Landfill cap: a cover, consisting of soil, clay, or other material, that is placed over discarded wastes.

Methane: a gas that is typically emitted from landfills resulting from the decomposition of buried wastes.

Operable unit: grouping of sites based on types of waste disposed of and/or the suspected contaminants of concern.

PCE stillbottoms: residues, or sludges, from drycleaning operations that require tetrachloroethene

as a cleaning agent. Tetrachloroethene is also known as perchloroethylene or PCE. PCE is a chlorinated solvent often used in drycleaning operations.

Permeable: a soil layer that allows water to pass through it.

Polychlorinated biphenyl (PCB): a chemical compound commonly used as a heat suppressant and lubricant. In the past, PCB was also mixed with oil and used to control dust on roadways.

Polycyclic Aromatic Hydrocarbons (PAHs): chemical compounds such as benzo(a)pyrene, naphthalene, anthracene, and phenanthrene, which are usually byproducts of the combustion process.

Proposed Plan: a document that describes all the alternatives considered for addressing contamination at the site, including a description of the preferred remedial methods for cleanup of the site.

Record of Decision: the document, signed by the Navy, USEPA, and FDEP, that records the rationale and ultimate cleanup decision for a given site or operable unit.

Responsiveness Summary: a section of the ROD that presents the Navy's responses to public comments on the Proposed Plan.

Soil borings: a method by which subsurface soil samples (soil more than two feet below the ground surface) are collected.

Soil gas survey: surveys that monitor the gas in the subsurface for the presence of various chemical compounds. Various methods exist to conduct such a survey.

Solid Waste: a waste defined by regulation 40 CFR 261 that is most likely not harmful to human health or the environment.

U.S. Environmental Protection Agency: the federal agency responsible for identifying and enforcing regulations and concurring with the preferred remedy at a site.

LIST OF ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DPT	direct-push technology
FDEP	Florida Department of Environmental Protection
IAS	initial assessment study
NTC	Naval Training Center
OU	operable unit
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	perchloroethylene
RAB	Restoration Advisory Board
RI	remedial investigation
USEPA	U.S. Environmental Protection Agency