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NAS CECIL FIELD, FL
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PROPOSED PLAN FOR OPERABLE UNIT 10 (OU 10) SITE 21 GOLF COURSE
MAINTENANCE AREA NAS CECIL FIELD FL
7/1/2005
TETRA TECH NUS INC



INSTALLATION RESTORATION PROGRAM

July 2005



Proposed Plan for Operable Unit 10, Site 21 Naval Air Station Cecil Field Jacksonville, Florida

Facility Description

Naval Air Station (NAS) Cecil Field [United States Environmental Protection Agency (U.S. EPA) ID FL5 170 022 474] (see Figure 1) was established in 1941 and provided facilities, services, and material support for naval operations. It was added to the **National Priorities List (NPL)** in 1989. In July 1993, the Base Realignment and Closure (BRAC) Commission recommended the closure of the Air Station. On September 30, 1999, the Base was closed, and the majority of the flightline was transferred to the Jacksonville Airport Authority. In September 2000, most of the remainder of the Base was transferred to the City of Jacksonville.

Site Description

Operable Unit (OU) 10, Site 21, Golf Course Maintenance Area is located at the northern end of former I Avenue in the center of the golf course at NAS Cecil Field (see Figure 1). The site is a flat primarily unpaved area that covers approximately 1.5 acres and includes Buildings 238, 370, 371, 397, 398, and 874 (see Figure 2). Site 21 has been used as the golf course maintenance area since its construction in the 1950s and is located within a parcel slated for recreational use in the future. Site activities included the preparation of fungicide, insecticide, and herbicide solutions and the cleaning and rinsing of the equipment used to dispense these solutions.

Site activities have resulted in contamination of soil with several pesticides (DDT, chlordane, dieldrin, and toxaphene), arsenic (a component of some pesticides), and

total recoverable petroleum hydrocarbons (TRPH). Site activities have also resulted in contamination of the **surficial aquifer** groundwater with the pesticide chlordane.

Soils with concentrations of pesticides, arsenic, and **TRPH** in excess of the Florida Department of Environmental Protection (FDEP) Soil Cleanup Target Levels (SCTLs) for industrial land use were excavated and disposed off base (see Figure 2). Following the **removal actions**, soil with concentrations of arsenic that were too high for unrestricted site use and groundwater with chlordane concentrations in excess of the FDEP Groundwater Cleanup Target Level (GCTL) remain on site. The volumes of contaminated soil and groundwater remaining on site are estimated at approximately 624 cubic yards (yd³) and 13,100 gallons, respectively.

About This Document

In accordance with Section 117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)** and Section 300.430 (f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), this document summarizes the Navy's proposal for site cleanup to help the public understand and comment on the proposed alternatives. This Proposed Plan has been developed by the Navy and the U.S. EPA in consultation with FDEP. These agencies, in consultation with the **Restoration Advisory Board (RAB)**, will select a final remedy for **OU 10, Site 21** after public comments have been addressed. One

The Proposed Cleanup Plan

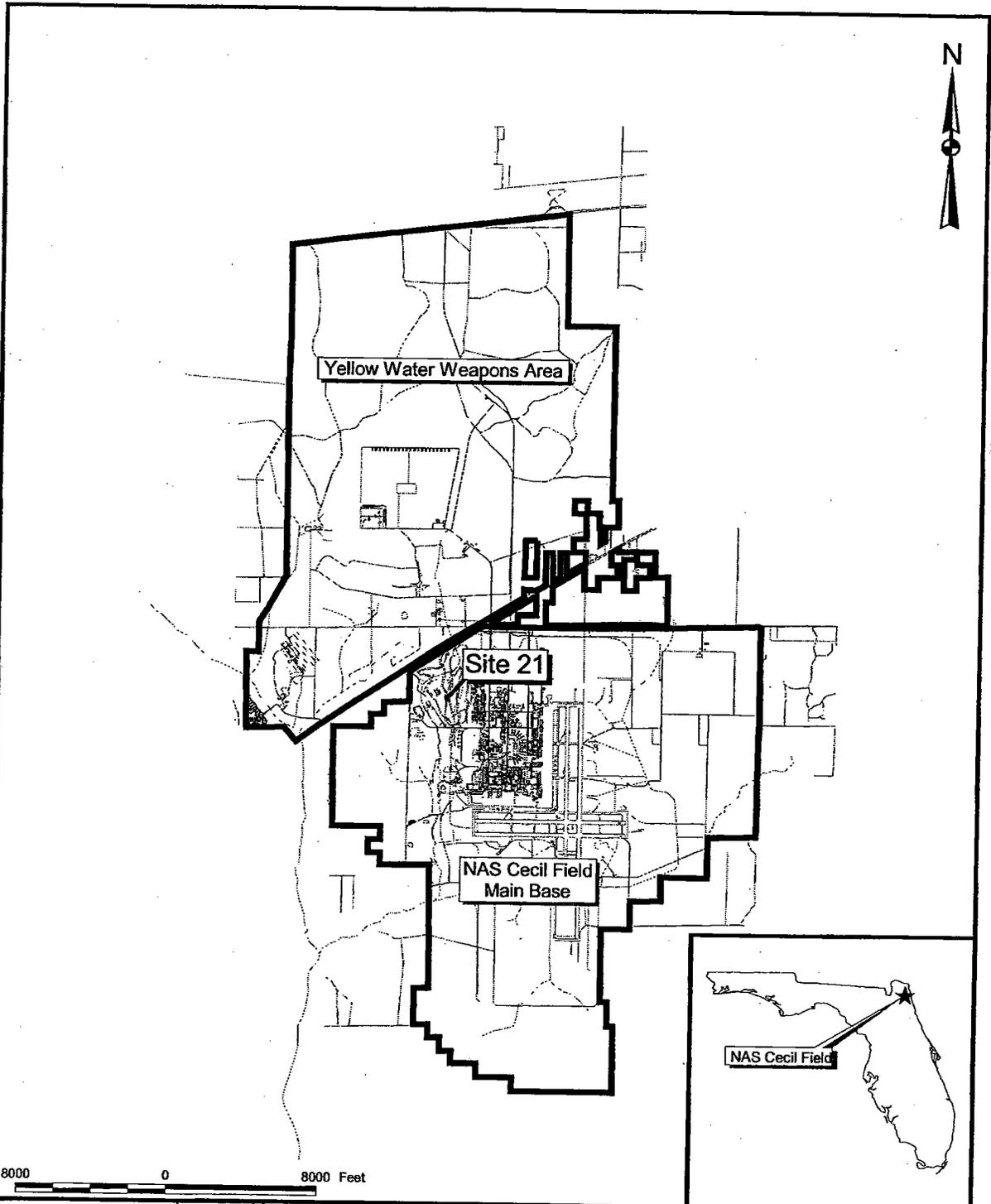
To address contaminated soil and groundwater at Site 21, the Navy and U.S. EPA, in consultation with the FDEP, propose the following:

- Implement **land use controls (LUCs)** to maintain the site for industrial uses only and to prevent residential uses. Continued implementation of the controls would be verified by regular site inspections.

- Implement **LUCs** to prevent use of the **surficial aquifer** groundwater until the **cleanup goal** has been met.
- Monitor groundwater quality to evaluate decreases in contaminant concentrations through naturally occurring processes and to verify that contamination is not migrating past selected compliance wells.

*This document summarizes the cleanup plan proposed by the Navy and U.S. EPA in consultation with FDEP. For detailed information on the options evaluated for OU 10, Site 21, consult the documents contained within the **Administrative Record**, which is available for review at the Information Repository located at the former Memorial Chapel, 6112 New World Avenue, Cecil Commerce Center, Jacksonville, Florida 32221, Telephone (904) 777-1900.*

Bolded terms throughout this Proposed Plan are explained in the Glossary of Terms presented on pages 12 and 13.



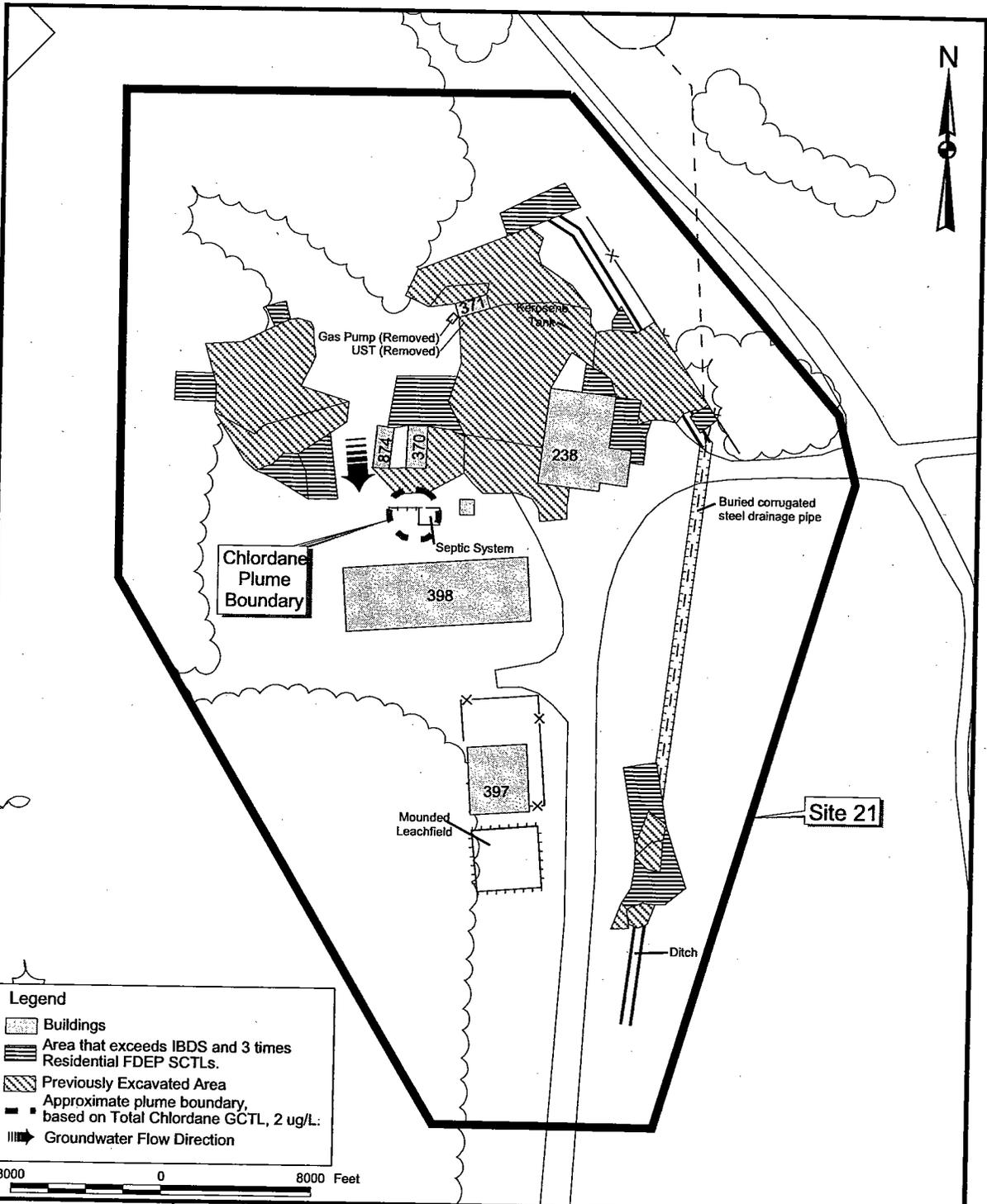
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SCALE AS NOTED	



GENERAL LOCATION MAP
 OU 10, SITE 21
 PROPOSED PLAN
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0039	
APPROVED BY	DATE
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Legend

- Buildings
- Area that exceeds IBDS and 3 times Residential FDEP SCTLs.
- Previously Excavated Area
- Approximate plume boundary, based on Total Chlordane GCTL, 2 ug/L.
- Groundwater Flow Direction

8000 0 8000 Feet

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COST/SCHEDULE-AREA	
SCALE AS NOTED	



SITE PLAN
 OU 10, SITE 21
PROPOSED PLAN
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0039	
APPROVED BY	DATE
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P:\GIS\NAS_CecilField\Site-21_ProposedPlan.spr 27Oct03 MJJ Site Location Map Layout

of the purposes of this Proposed Plan is to solicit the public's views and comments on the alternatives described. The Navy and the U.S. EPA, in consultation with FDEP, may modify the preferred alternatives that constitute the proposed cleanup plan or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all alternatives presented in this Proposed Plan. This plan highlights the key information from the **Remedial Investigation (RI)** and **Feasibility Study (FS)** reports, but is not a substitute for these documents. More complete information can be found in the **RI** and **FS** reports and other documents within the **Administrative Record** located at the Information Repository (see Page 14 for details).

What do you think?

The Navy, as the lead agency, is accepting formal public comments on this Proposed Plan from July 7 to August 8, 2005. You don't have to be a technical expert to comment. If you have a concern or preference, the Navy, U.S. EPA, and FDEP want to hear it before making a final decision on how to protect your community. To comment formally:

Offer oral comments during the comment portion of the public hearing, if such a hearing is requested (see Page 14 for details).

Send written comments postmarked no later than August 8, 2005 to:

Commander
Department of the Navy
Naval Facilities Engineering Field Division South
Attn: Mark Davidson (Code ES33)
2155 Eagle Drive
North Charleston, SC 29406
Tel: 843-820-5526

E-mail comments by August 8, 2005 to:

mark.e.davidson@navy.mil

Summary of Site Risks

The **Preliminary Risk Evaluation (PRE)** performed as part of the **RI** indicated that no unacceptable human health risks would result from direct exposure to the soil of Site 21 under the current and foreseeable future industrial land use scenario. However, under hypothetical future residential land use scenarios, adverse human health effects could result from direct exposure to soil and/or from ingestion of groundwater from the **surficial aquifer**. These potential adverse effects are associated with soil concentrations of arsenic greater than the NAS Cecil Field site-specific background value and with groundwater concentrations of chlordane greater than the FDEP GCTL.

The ecological risk assessment performed as part of the **RI** indicated that concentrations of pesticides at several soil locations exceeded the U.S. EPA Region 4 ecological screening values. However, most of these exceedances occurred in the central portion of Site 21 where ecological

Site History

Following is a brief environmental history of Site 21:

- 1994: During the BRAC investigation, Site 21 was first designated as **Area of Interest (AOI) 21**.
- 1997 - 1998: As part of the Phase II Investigation of **AOI 21**, soil and groundwater samples were collected and analyzed for various types of contaminants. As a result of the contamination detected in soil and groundwater during these investigations, **AOI 21** was re-designated as **Potential Source of Contamination (PSC) 21** in March 1999.
- 1999 - 2000: Investigation of **PSC 21**. Samples were collected and analyzed for previously detected contaminants to determine the extent of soil and groundwater contamination. The results of this investigation were used to identify areas of soil requiring excavation and off-site disposal. This investigation also identified an area of groundwater with concentrations of the pesticides DDD and chlordane greater than FDEP GCTLs. Because of the presence of these contaminants, **PSC 21** was re-designated as **Installation Restoration (IR) Site 21** in February 2000.
- 2000: Site 21 **RI**. Groundwater samples were collected and analyzed for previously identified contaminants to provide additional data for a **PRE** and to support the **FS**. Results of these analyses confirmed exceedances of chlordane but not of DDD. Soil samples were collected and analyzed for geotechnical parameters, and two existing wells were tested to estimate hydraulic conductivity and transmissivity in the shallow zone of the surficial aquifer.
- 2001: Site 21 **FS**. Based on the results of previous investigations, soil and groundwater **chemicals of concern (COCs)** were identified, and **cleanup goals** were established for soil and groundwater. Remedial technologies were screened, and remedial alternatives were assembled, analyzed, and compared against each other.
- 2001: A **removal action** was performed. Approximately 2,999 tons of soil with concentrations of pesticides, arsenic, and **TRPH** greater than the FDEP SCTLs for industrial land use were excavated and disposed off base.
- 2002: A second **removal action** was performed. Approximately 79 tons of arsenic-contaminated soil were excavated and disposed off base.
- 2003: The Site 21 **FS** was revised to reflect the removal of additional contaminated soil.

habitat is essentially absent. Therefore, the **RI** concluded that contamination at Site 21 resulted in negligible ecological risks.

Why is Cleanup Needed?

The Navy's studies of **OU 10**, Site 21 have resulted in the following conclusions:

- As a result of past activities, several chemicals that could potentially be harmful to human health were found in soil and groundwater at Site 21.
- Following the soil **removal actions**, arsenic still remains in soil at concentrations greater than the background value, and chlordane concentrations in **surficial aquifer** groundwater could result in unacceptable human health risk if the groundwater is used for drinking purposes.

It is the judgment of the Navy and the U.S. EPA, in consultation with FDEP, that the preferred remedy identified in this Proposed Plan is necessary to protect public health or welfare from actual or threatened releases of hazardous substances into the environment.

Final **Records of Decision (RODs)** have been approved for **OU 1** through **OU 4**; **OU 5**, Site 14, **OU 6** through **OU 8**; **OU 9**, Sites 36 and 37; **OU 10**, Site 25; **OU 11**, Site 45; and **OU 12**, Sites 32, 42, 44, and Old Golf Course. An **RI**, Baseline Risk Assessment (BRA), and **FS** have been prepared for **OU 5**, Site 15, but the **FS** is currently being re-evaluated. An **Engineering Evaluation/Cost Analysis (EE/CA)** was finalized for **OU 5**, Site 49 in February 2002. **RI** and **FS** reports were finalized for **OU 9**, Sites 57 and 58 in August and October 2002, respectively. An **RI** is in progress at **OU 9**, Site 59. Decision documents are forthcoming for Sites 49, 57 and 58, and 59.

What are the Cleanup Objectives and Levels?

Using the information gathered during the site investigations and the results of the **PRE**, the Navy and U.S. EPA, in consultation with FDEP, have identified the following **Remedial Action Objectives (RAOs)** at **OU 10**, Site 21:

- Prevent unacceptable risk from exposure to soil with concentrations of arsenic in excess of the site-specific **Inorganic Background Data Set (IBDS)** value.
- Prevent unacceptable risk from ingestion of groundwater with concentrations of chlordane in excess of the FDEP **GCTL**.
- Reduce concentrations of chlordane in groundwater to less than the **cleanup goal**.

Table 1 shows the **COCs** and **cleanup goals**.

Cleanup Alternatives for OU 10 Site 21

The **OU 10**, Site 21 **FS** report reviews the options that the Navy and U.S. EPA, in consultation with FDEP, considered for cleanup of Site 21. These options, referred to as "cleanup alternatives," are different combinations of plans to restrict access and to contain, remove, or treat contamination in order to protect public health and the environment. The preferred groundwater alternative is Groundwater Alternative 2: Natural Attenuation, **LUCs**, and Monitoring. The following summarizes all of the alternatives evaluated to address soil and groundwater contamination at **OU 10**, Site 21.

TABLE 1

COCs and Cleanup Goals			
Operable Unit 10, Site 21 – NAS Cecil Field			
COCs	Range of Detections	Cleanup Goal	Federal MCL
Soil (mg/kg)			
Arsenic	0.36 – 11	2.04 ⁽¹⁾	NA
Groundwater (µg/L)			
Chlordane	2.9 – 3.4	2.0 ⁽²⁾	2

NOTE:

- 1 NAS Cecil Field site-specific **IBDS**
- 2 Criterion from Florida Administrative Code (FAC) 62-777 **GCTLs**
- NA Not applicable

Soil Cleanup Alternatives

No Action

Soil Alternative 1: No Action

Evaluation of the No Action alternative is required by law as a basis for comparison with other alternatives. No remedial action would be conducted to reduce risks to human health and the environment and no restrictions on the use of the property would be imposed. Soil concentrations might eventually be reduced to **cleanup goals** through natural attenuation processes, but no monitoring would be performed that would verify and quantify this reduction.

Limited Action

Soil Alternative 2: **Land Use Controls**

Land Use Controls (LUCs) would be implemented to prevent residential development of Site 21 and restrict use to industrial/commercial uses only.

Removal and Disposal

Soil Alternative 3: Excavation and Off-Base Disposal

An estimated 624 yd³ of contaminated soil would be excavated to reduce the 95-percent **upper confidence level (UCL)** of the remaining concentrations of arsenic to less than the NAS Cecil Field site-specific **IBDS** value and to remove arsenic concentrations greater than 3 times the FDEP residential SCTL. The excavated areas would be backfilled with clean soil, and the excavated soil would be transported to an off-base permitted facility for disposal by **landfilling**. Prior to **landfilling**, the contaminated soil might require treatment by a process such as **chemical fixation**.

Groundwater Cleanup Alternatives

No Action

Groundwater Alternative 1: No Action

No remedial action would be conducted to reduce risks to human health and the environment, and no restrictions would prevent exposure to groundwater contamination. Concentrations of chlordane in groundwater might eventually be reduced to the **cleanup goal** through natural attenuation processes, but no monitoring would be performed that would verify and quantify this reduction.

Limited Action

Groundwater Alternative 2: Natural Attenuation, **LUCs**, and Monitoring

Natural processes such as biological degradation, dispersion, dilution, and adsorption would reduce the concentration of chlordane in groundwater to its **cleanup goal**. **LUCs** would consist of restricting the use of the **surficial aquifer** groundwater until the **cleanup goal** has been met. Monitoring would consist of regularly sampling and analyzing groundwater to evaluate the decreases in chlordane concentrations and to verify that this chemical is not migrating.

Removal, Treatment, and Disposal

Groundwater Alternative 3: Extraction, On-Site Treatment, Surface Water Discharge, **LUCs**, and Monitoring

Groundwater would be pumped from the **surficial aquifer** through three extraction wells at the combined rate of 10 gallons per minute (gpm). The extracted groundwater would be treated by liquid-phase granular activated carbon (GAC) adsorption to remove chlordane prior to discharge to a nearby drainage ditch. **LUCs** and monitoring would be the same as for Groundwater Alternative 2.

Use of ARARs in the Evaluation Process

Applicable or relevant and appropriate requirements (ARARs) are federal and State environmental requirements used to evaluate the appropriate extent of site cleanup, to scope and formulate cleanup alternatives, and to control the implementation and operation of a selected cleanup plan. Potential chemical, location, and action-specific **ARARs** are defined in the NAS Cecil Field General Information Report (GIR). Each alternative has been evaluated to determine its compliance with **ARARs**. Chemical-, location-, and action-specific **ARARs** that apply to **OU 10, Site 21** are presented in Section 2.0 of the **FS**.

Detailed Analysis of Cleanup Alternatives

In accordance to **CERCLA**, a detailed analysis of each cleanup alternative must be performed by using nine evaluation criteria. These include two threshold criteria (Overall Protection of Human Health and the Environment and Compliance with **ARARs**), five balancing criteria (Long-Term Effectiveness and Permanence; Reduction of Toxicity, Mobility, and Volume through Treatment; Short-Term Effectiveness; Implementability; and Cost) and two modifying criteria (State Acceptance and Community Acceptance). An analysis of these criteria was performed for each cleanup alternative, and a summary comparison of that analysis is presented on Table 2 for the soil cleanup alternatives and on Table 3 for the groundwater cleanup alternatives. More

TABLE 2
SUMMARY OF COMPARATIVE ANALYSIS OF SOIL CLEANUP ALTERNATIVES
OU 10, SITE 21
NAS CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 1 OF 2

Evaluation Criteria	Soil Alternative 1: No Action	Soil Alternative 2: LUCs	Soil Alternative 3: Excavation and Off-Base Disposal
Overall Protection of Human Health and Environment	Would not be protective because residential development could occur that would result in unacceptable risks to human and ecological receptors.	Would be protective of human health and the environment by preventing residential development.	Would be most protective by eliminating the risk of exposure to soil with arsenic concentrations greater than the background value.
Compliance with ARARs : Chemical-Specific Location-Specific Action-Specific	Would not comply Would not comply Not applicable	Would comply with ARARs Would comply Would comply	Would comply Would comply Would comply
Long-Term Effectiveness and Permanence	Would have very limited long-term effectiveness and permanence because arsenic would remain on site. Any long-term effectiveness would not be known because monitoring would not occur.	Would be long-term effective and permanent. The prevention of residential development through LUCs would provide long-term effectiveness and permanence.	Would provide the most long-term effectiveness and permanence. Risks from exposure to contaminated soil under any land use scenario would be effectively and permanently eliminated through removal and disposal.
Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment	Would not achieve reduction of toxicity, mobility, or volume of contaminants through treatment but may achieve some reduction through natural processes.	Would not achieve reduction of toxicity, mobility, or volume of contaminants through treatment but may achieve some reduction through natural processes.	Approximately 624 yd ³ of contaminated soil containing an estimated 1.8 pounds of arsenic would be permanently removed from the site. Disposal would reduce mobility.

TABLE 2
SUMMARY OF COMPARATIVE ANALYSIS OF SOIL CLEANUP ALTERNATIVES
OU 10, SITE 21
NAS CECIL FIELD
JACKSONVILLE, FLORIDA
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Evaluation Criteria	Soil Alternative 1: No Action	Soil Alternative 2: LUCs	Soil Alternative 3: Excavation and Off-Base Disposal
Short-Term Effectiveness	Would not result in short-term risks to site workers or adversely impact the surrounding community and would also not achieve the soil RAO and cleanup goal .	Would result in slight risk to site workers during inspections. This risk would be reduced through the wearing of appropriate personal protection equipment (PPE) and compliance with site-specific health and safety procedures. The soil RAO would be achieved immediately upon implementation.	Would result in a significant risk of exposure to site workers to contaminated soil during the excavation and off-base disposal activities. This risk would be reduced through the wearing of appropriate PPE and compliance with site-specific health and safety procedures. The soil RAO would be achieved immediately upon implementation. The soil cleanup goal would be attained within 2 months.
Implementability	Would be simple to implement because no action would occur.	Would be easy to implement because the resources, materials, and equipment are readily available. Provisions will be incorporated into the property transfer documents to ensure the continuation of the LUCs when ownership of the site is transferred to the private sector.	Would be the most difficult to implement because contaminated soil would have to be excavated and transported off base for disposal. No LUCs or monitoring would be required. A construction permit and manifesting would also be required.
Costs:			
Capital	\$0	\$11,000	\$289,000
Operation & Maintenance	\$0	\$28,000	\$0
Net Present Worth	\$0	\$39,000	\$289,000
State Acceptance	FDEP concurs with the selection of Soil Alternative 2 as the Preferred Alternative.		
Public Acceptance	Public acceptance of Soil Alternative 2 as the Preferred Alternative will be determined following the period of public comment.		

TABLE 3

SUMMARY OF COMPARATIVE EVALUATION OF GROUNDWATER CLEANUP ALTERNATIVES
 OU 10, SITE 21
 NAS CECIL FIELD
 JACKSONVILLE, FLORIDA
 PAGE 1 OF 2

Evaluation Criteria	Groundwater Alternative 1: No Action	Groundwater Alternative 2: Natural Attenuation, LUCs, and Monitoring	Groundwater Alternative 3: Extraction, On-Site Treatment, Surface Discharge, LUCs, and Monitoring
Overall Protection of Human Health and Environment	Would not be protective because there would be a continued risk from human exposure to contaminated groundwater. Also, potential contaminant migration would remain unchecked.	Would be protective by preventing risk from exposure to contaminated groundwater through LUCs and monitoring.	Would be more protective than Alternative 2 by providing the same protective components plus eliminating risk from exposure to chlordane in groundwater through extraction and treatment of the contaminant plume .
Compliance with ARARs : Chemical-Specific Location-Specific Action-Specific	Would not comply Would not comply Not applicable	Would eventually comply Would comply Would comply	Would eventually comply Would comply Would comply
Long-Term Effectiveness and Permanence	Would not be effective and permanent in the long term since contaminants would remain on site. Any long-term effectiveness would not be known because monitoring would not occur.	Would be effective and permanent in the long term. Groundwater use restrictions and monitoring would effectively prevent unacceptable risk from exposure to contaminated groundwater.	Would be effective and permanent in the long term. Groundwater use restrictions and monitoring would effectively prevent unacceptable risk from exposure to contaminated groundwater.
Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment	Would not achieve reduction of toxicity, mobility, or volume of contaminants through treatment but might achieve some reduction through natural processes.	Would not achieve reduction of toxicity, mobility, or volume of contaminants through treatment but would achieve reduction through natural processes.	Would achieve reduction of contaminant toxicity, mobility, and volume through treatment.

TABLE 3
SUMMARY OF COMPARATIVE EVALUATION OF GROUNDWATER CLEANUP ALTERNATIVES
OU 10, SITE 21
NAS CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 2 OF 2

Evaluation Criteria	Groundwater Alternative 1: No Action	Groundwater Alternative 2: Natural Attenuation, LUCs, and Monitoring	Groundwater Alternative 3: Extraction, On-Site Treatment, Surface Discharge, LUCs, and Monitoring
Short-Term Effectiveness	Would not result in short-term risks to site workers or adversely impact the surrounding community and would also not achieve the groundwater RAO and cleanup goal .	Would result in slight risk of exposure to site workers during sampling of groundwater. This risk would be reduced through the wearing of appropriate PPE and compliance with site-specific health and safety procedures. The groundwater RAO would be achieved immediately upon implementation. The chlordane cleanup goal would be attained within approximately 49 months.	Would result in slight risk of exposure to site workers during the installation and operation of the groundwater extraction and treatment system and the sampling of groundwater. This risk would be reduced through the wearing of appropriate PPE and compliance with site-specific health and safety procedures. The groundwater RAO would be achieved immediately upon implementation. The chlordane cleanup goal would be attained within approximately 38 months.
Implementability	Would be simple to implement because no action would occur.	Would be easy to implement. Resources, materials, and equipment are readily available. Provisions will be incorporated into the property transfer documents to ensure the continuation of the LUCs and monitoring.	Would be slightly more difficult to implement than Alternative 2 because, in addition to LUCs and monitoring, a groundwater extraction and treatment system would have to be installed, operated, and maintained. Provisions would be incorporated into the property transfer documents to ensure the continuation of the LUCs and monitoring. A construction permit would be required.
Costs: Capital Operation & Maintenance Net Present Worth	\$0 \$0 \$0	\$26,000 \$62,000 (5-Year) \$88,000 (5-Year)	\$453,000 \$331,000 (5-Year) \$784,000 (5-Year)
State Acceptance	FDEP concurs with the selection of Groundwater Alternative 2 as the Preferred Alternative		
Public Acceptance	Public acceptance of Groundwater Alternative 2 as the Preferred Alternative will be determined following the period of public comment.		

detailed information is available in the **OU 10, Site 21 FS** report.

Based on information currently available, the preferred alternatives, Soil Alternative 2 and Groundwater Alternative 2, provide the best balance among alternatives with respect to the evaluation criteria.

State acceptance was secured during the **FS** review. During the upcoming public comment period, the Navy, U.S. EPA, and FDEP also welcome your comments on the proposed cleanup plan and on the other technical approaches that the BRAC Cleanup Team (BCT) evaluated.

A Closer Look at the BCT's Proposed Cleanup Plan

- 1. Natural Attenuation of Contaminated Groundwater**
Within the groundwater **contaminant plume**, naturally occurring processes such as biological degradation, dispersion, dilution, and adsorption would be relied upon to reduce chlordane concentrations to its **cleanup goal**.
- 2. Land Use Controls**
LUCs such as deed restrictions would be prepared and implemented to limit land use to industrial purposes and prevent residential development. **LUCs** would also be prepared and implemented to restrict use of the **surficial aquifer** groundwater. Formal notice would be given to the St. Johns River Water Management District to prohibit the issuance of permits for the installation of wells that would draw water from the **surficial aquifer** at Site 21, until the chlordane **cleanup goal** has been met. Annual site inspections would be conducted to verify the continued implementation of these **LUCs**. The Navy would be responsible for the continued enforcement of **LUCs**, including the performance of annual site inspections.
- 3. Long-Term Monitoring**
Groundwater would be regularly sampled and analyzed to evaluate the decrease in concentrations of chlordane through naturally occurring processes such as biodegradation, dispersion, and dilution and to verify that this chemical is not migrating from the site.

If the results of any five-year review show that **LUCs** and natural attenuation have failed to provide proper protection from soil and groundwater contamination, additional active remedial measures would be evaluated and might be implemented. Potential contingency remedial measures could include additional excavation and off-site disposal of contaminated soil and extraction, on-site treatment, and surface discharge of contaminated groundwater.

Based on the information currently available, the Navy, U.S. EPA, and FDEP believe that the proposed cleanup plan meets the threshold criteria and provides the best balance of tradeoffs with respect to the balancing and modifying criteria.

The Navy, U.S. EPA, and FDEP expect the proposed cleanup plan to satisfy the following statutory requirements of **CERCLA** Section 121(b): (1) be protective of human health and the environment; (2) comply with **ARARs**; (3) be cost effective; (4) utilize permanent solutions to the maximum extent practical; and (5) satisfy the preference for treatment as a principal element.

What impacts would the cleanup have on the local community?

- Alternatives that involve the treatment and handling of soil and/or groundwater during construction and/or operation (Soil Alternative 3 and Groundwater Alternative 3) could pose a limited risk to construction workers or operating personnel. However, measures would be taken to minimize and control these risks.
- Alternatives that involve the transportation of contaminated soil or treatment residue for off-site disposal (Soil Alternative 3 and Groundwater Alternative 3) would pose a risk to nearby communities. However, measures would be taken to minimize and control these risks.
- Alternatives that do not immediately achieve **cleanup goals** (Soil Alternative 2 and Groundwater Alternatives 2 and 3) would include administrative action to restrict land and groundwater use until these **cleanup goals** have been reached.
- Alternatives that involve on-site treatment and/or site construction activities (Soil Alternative 3 and Groundwater Alternative 3) would occupy the site. This would limit use and/or development of the site for the duration of the cleanup.
- The No Action Alternatives (Soil Alternative 1, Groundwater Alternative 1) would not prevent exposure to site contaminants, resulting in unacceptable human health risks if residential development occurs and/or if groundwater from the **surficial aquifer** is used.

Why Does the BCT Recommend this Proposed Plan?

This remedy is recommended for the following reasons:

- Although concentrations of arsenic in soil exceed the background level, they do not present an unacceptable threat to human health or the environment under the current and foreseeable future uses of Site 21.
- Although chlordane was detected in groundwater at concentrations greater than the FDEP GCTL, detected concentrations were relatively low and do not present an unacceptable threat to human health or the environment under the current and foreseeable future site use scenarios.
- The size of the chlordane **contaminant plume** is small, and there is no evidence of ongoing contaminant migration.
- The proposed cleanup plan will achieve risk reduction through natural attenuation for groundwater and by imposing restrictions on access to contaminated soil and groundwater until **cleanup goals** are met.

Next Steps:

By September 2005, the Navy and U.S. EPA in consultation with FDEP expect to have reviewed comments and signed the **ROD** describing the chosen cleanup plan. The **ROD**, which includes a summary of responses to public comments, will then be made available to the public at the Information Repository at Building 907, the former Memorial Chapel, 6112 New World Avenue, Cecil Commerce Center, Jacksonville, Florida. The Navy and U.S. EPA in consultation with FDEP will also announce its decision through the local news media and the community mailing list.

Glossary of Terms

This glossary defines the terms used in this Proposed Plan. The definitions in this glossary apply specifically to this Proposed Plan and may have other meanings when used in different circumstances.

Administrative Record: The complete body of documents pertaining to the investigation and restoration of an environmental site. This body of document is kept at a location where it can be accessed by the general public.

Applicable or Relevant and Appropriate Requirements (ARARs): The federal, State, and local environmental rules, regulations, and criteria that must be met by the selected remedy under CERCLA.

Area of Interest (AOI): A location that was investigated based upon past indications of potential environmental impacts.

Chemical of Concern (COC): A substance detected at a concentration and/or in a location where it could have an adverse effect on human health and the environment.

Chemical fixation: Controlled mixing of contaminated materials (typically soil or sludge) with selected chemicals that bond contaminants within a solid matrix.

Cleanup goal: A numerical concentration agreed upon by the Navy and U.S. EPA, in consultation with FDEP, as having to be reached for a certain **chemical of concern** in order to meet one or more of the **Remedial Action Objectives**. A **cleanup goal** may be a regulatory-based criterion, a risk-based concentration, or even a background value.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law also known as "Superfund." This law was passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). This law created a special tax that goes into a trust fund to investigate and cleanup abandoned or uncontrolled hazardous waste sites.

Contaminant plume: An area of groundwater with concentrations of one or more **COCs** greater than its **cleanup goal**.

Engineering Evaluation/Cost Analysis (EE/CA): A report that presents the development, analysis, and comparison of cleanup alternatives.

Feasibility Study (FS): A report that presents the development, analysis, and comparison of cleanup alternatives.

Inorganic Background Data Set (IBDS): A compendium of the concentrations of non-organic substances, mostly metals, typically detected in soil and groundwater in uncontaminated areas of NAS Cecil Field.

Installation Restoration (IR): A program established by the Navy for the investigation and cleanup of Superfund sites at their facilities.

Landfilling: Controlled burial of contaminated material at a facility specifically designed and permitted for this type of disposal.

Land Use Controls (LUCs): Administrative measures formulated and enforced to regulate current and future land use options. **LUCs** most often consist of property deed restrictions that prohibit residential development of an environmental site.

National Priorities List (NPL): The list of national Superfund sites.

Net Present Worth: A costing technique that expresses the total of initial capital expenditure and long-term operation and maintenance costs in terms of present day dollars.

Operable Unit (OU): A discrete entity that comprises an incremental step toward the comprehensive cleanup of one or more environmental sites. An **OU** may address a specific medium within a site (e.g., soil or groundwater), a geographical portion of the site, a specific site environmental concern, or the initial phases of an action. At NAS Cecil Field, **OUs** have often been organized to group multiple sites with similar characteristics and environmental concerns.

Potential Source of Contamination (PSC): An area where environmental contamination was identified but limited to the soil above the groundwater table (vadose or unsaturated zone).

Preliminary Risk Evaluation (PRE): A streamlined evaluation of current and future potential for adverse human health or environmental effects from exposure to site contaminants. This evaluation typically uses standard conservative criteria rather than site-specific evaluation parameters.

Record of Decision (ROD): An official document that describes the selected Superfund remedy for a specific site. The **ROD** documents the remedy selection process and is issued by the Navy and U.S. EPA following the public comment period.

Remedial Action Objective (RAO): A cleanup objective agreed upon by the Navy and U.S. EPA, in consultation with FDEP. One or more **RAOs** are typically formulated for each environmental site.

Remedial Investigation (RI): A report that describes the site, documents the type and distribution of environmental contaminants detected, and present the results of the risk assessment.

Removal action: An interim cleanup action performed to address an immediate environmental threat.

Restoration Advisory Board (RAB): A body of representatives from the general public that meets on a regular basis to be briefed by the Navy and their contractors on the progress of environmental investigations and cleanup activities for a given facility. The **RAB** provides the opportunity for the community to give input into the cleanup program before final decisions are made.

Surficial Aquifer: A layer of groundwater that is separated from deeper groundwater by a confining formation. At NAS Cecil Field, the surficial aquifer typically extends from approximately 5 feet below ground surface to approximately 90 feet below ground surface.

Total recoverable petroleum hydrocarbons (TRPH): A measurement of petroleum contamination in soil and water as defined by the State of Florida environmental regulations. This method measures the amount of petroleum compounds that have 8 to 40 carbon atoms.

Upper confidence limit (UCL): Statistical term used to define a numerical value that is greater than a certain percentage of the numerical values of a given data set. For example, the 95-percent **UCL** of a data set of concentrations expresses the concentration value that is greater than 95-percent of the individual concentration values of the data set.

What's a Formal Comment?



Formal comments are used to improve the cleanup proposal. During the 30-day formal comment period, the Navy, U.S. EPA, and FDEP will accept formal written comments and hold a hearing, if requested, to accept formal verbal comments.

To make a formal comment, you need to present your views during the public hearing or submit a written comment during the comment period. A request for a public hearing to present your formal comments must be made in writing. The request must be postmarked no later than August 8, 2005. Written comments and requests for a public hearing should be sent to

Commander
Department of the Navy
Naval Facilities Engineering Field Division South
Attn: Mr. Mark Davidson (Code ES33)
2155 Eagle Drive
North Charleston, SC 29406



Federal regulations require the Navy, U.S. EPA, and the FDEP to distinguish between "formal" and "informal" comments. While the Navy, U.S. EPA, and FDEP use both your comments and RAB comments throughout site investigation and cleanup activities, the team is only required to respond in writing to formal comments on the Proposed Plan. If a public hearing is requested, there will be no verbal response to your comments during the formal hearing portion of the meeting. After the formal hearing portion of the public meeting is closed, the Navy, U.S. EPA, and FDEP may respond to informal questions.

The Navy and U.S. EPA in consultation with FDEP will review the transcript of all formal comments received at the hearing and all written comments received during the formal comment period before making a final cleanup decision. They will then prepare a written response to all formal comments. The transcript of formal comments and the Navy, U.S. EPA, and the FDEP's written responses will then be issued in a document called a Responsiveness Summary when the team releases the final ROD.

For More Detailed Information

To help the public understand and comment on the proposal for the site, this publication summarizes a number of reports and studies. All the technical and public information publications prepared to date for the site are available at the following Information Repository:

The Former Memorial Chapel
6112 New World Avenue
Cecil Commerce Center
Jacksonville, Florida 32252
904-777-1900



