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NAS WHITING FIELD  
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RECORD OF DECISION FOR SURFACE AND SUBSURFACE SOILS AT SITE 12 NAS  
WHITING FIELD  
7/1/2000  
HARDING LAWSON ASSOCIATES

**RECORD OF DECISION  
SURFACE AND SUBSURFACE SOILS  
SITE 12, TETRAETHYL LEAD DISPOSAL AREA**

**NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA**

**EPA ID No. FL2 170023244**

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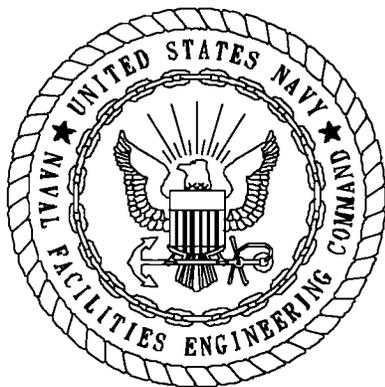
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**July 2000**



CERTIFICATION OF TECHNICAL  
DATA CONFORMITY (MAY 1987)

The Contractor, Harding Lawson Associates, hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/116 are complete and accurate and comply with all requirements of this contract.

DATE: July 17, 2000

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## GLOSSARY

AR	Administrative Record
ARAR	Applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CPC	Chemical of potential concern
ERA	Ecological risk assessment
FDEP	Florida Department of Environmental Protection
FS	Feasibility study
HHRA	Human health risk assessment
HI	Hazard index
HLA	Harding Lawson Associates
HQ	Hazard quotient
IR	Installation restoration
LUC	Land-use control
LUCIP	Land-use control implementation plan
mg/kg	Milligrams per kilogram
MOA	Memorandum of Agreement
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Contingency Plan
RA	Remedial action
RAO	Remedial action objective
RCRA	Resource Conservation and Recovery Act
RfD	Reference dose
RI	Remedial investigation
ROD	Record of Decision
SCG	Soil cleanup goal
SCTL	Soil cleanup target level
USEPA	U.S. Environmental Protection Agency

## **1.0 DECLARATION OF THE RECORD OF DECISION**

### **1.1 SITE NAME AND LOCATION.**

Site 12, Tetraethyl Lead Disposal Area, is less than 0.1 acre and is located along the southeastern facility boundary near the South Air Field at Naval Air Station (NAS) Whiting Field, Milton Florida.

### **1.2 STATEMENT OF BASIS AND PURPOSE.**

This decision document presents the selected remedial action (RA) for the surface and subsurface soils at Site 12 at NAS Whiting Field. This Record of Decision (ROD) is not the final remedy for groundwater which is being addressed as a separate site. Site 12 is one of several covered landfills which have been granted a site-specific industrial Soil Cleanup Target Level (SCTL) for arsenic that is different than cited in Chapter 62-777, Florida Administrative Code (FAC). The selected action was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Contingency Plan (NCP). The information supporting this RA decision is contained in the Administrative Record (AR) for this site. The Information Repository, including the AR, is located at the West Florida Regional Library, Milton Branch, 805 Alabama Street, Milton, Florida, (850) 623-5565.

The purpose of the RA at Site 12 is to implement land-use controls (LUCs) to minimize future predicted risks to soil exposure. The LUCs will establish controls limiting land use at the site to nonresidential use. These controls are specified in a written Memorandum of Agreement (MOA) between the Navy, the U.S. Environmental Protection Agency (USEPA), and Florida Department of Environmental Protection (FDEP) dated November 4, 1999. The USEPA and the State of Florida concur with the selected remedy.

Through the MOA, NAS Whiting Field, on behalf of the Department of the Navy, agrees to implement basewide, periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by NAS Whiting Field personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. Reasonable assurances will be provided to the USEPA and the FDEP as to the permanency of those remedies, including the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated herein by reference, the contemplated permanence of the remedy reflected herein shall be dependent upon the NAS Whiting Field's substantial good-faith compliance with the specific LUC maintenance commitments reflected therein. Should such compliance not occur or should the MOA be terminated, USEPA and FDEP reserve the right to reconsider the remedy and may require additional measures be taken to adequately ensure necessary future protection of human health and the environment at the site.

### **1.3 ASSESSMENT OF THE SITE.**

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present a current or potential threat to public health, welfare, or the environment. No human health risk was identified for Site 12 surface and subsurface soil when compared to USEPA carcinogenic and noncarcinogenic risk criteria. However, the FDEP target carcinogenic risk level of  $1 \times 10^{-6}$  was exceeded by the hypothetical future

resident exposure scenario of  $9 \times 10^{-6}$  due to the presence of arsenic in surface soil. The noncancer risk from exposure to surface soil was below the FDEP target hazard index of 1. A discussion of these potential threats by media (e.g., soil, sediment, etc.) is presented in this document in Section 2.6.

The results of the ecological risk assessment suggest that risks are not predicted for ecological receptor populations at Site 12.

#### **1.4 DESCRIPTION OF THE SELECTED REMEDY.**

This ROD is the final action for Surface and Subsurface Soils at Site 12 and is based on results of the Remedial Investigation (RI) and Feasibility Study (FS) completed for Site 12. The preferred RA at Site 12 is Alternative 2, LUCs, and includes 5-year site reviews. The LUCs will establish controls limiting land use at the site to nonresidential use. These LUCs will be incorporated into the MOA. The 5-year reviews will verify the selected alternative is protective of human health and the environment in future years.

Alternative 2 was selected to address principal threats and risks identified by soil exposure at Site 12. Implementing Alternative 2 would reduce current and future risks associated with contaminants present in the soil at Site 12. The Navy estimates Alternative 2 would cost \$135,000 (present day value) over a 30-year period. The selected action would be implemented for an indefinite period of time.

This ROD only addresses surface and subsurface soils located at Site 12. Consequently, this ROD does not address actual or potential groundwater contamination at the site. Groundwater has been identified as a separate site (Site 40) and will be addressed in a future RI/FS.

#### **1.5 DECLARATION STATEMENT.**

The RA selected for Site 12 is protective of human health, complies with Federal and State regulatory requirements legally applicable or relevant and appropriate requirements (ARARs) to the RA, and is cost effective. This remedy does not utilize a permanent solution to address contamination in surface and subsurface soils since soil contamination will remain in place. Alternative treatment technologies were evaluated for use in the FS. However, because treatment of the principal threats was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element.

Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted within five years of commencement of the RA to ensure the remedy continues to provide adequate protection of human health and the environment in accordance with NCP §300.430(f).

#### **1.6 SIGNATURE AND SUPPORT AGENCY ACCEPTANCE OF THE REMEDY.**

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Capt. D.W. Nelms  
Commanding Officer, NAS Whiting Field

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Date

## **2.0 DECISION SUMMARY**

### **2.1 SITE NAME, LOCATION, AND DESCRIPTION.**

Site 12, also known as the Tetraethyl Lead Disposal Area, is less than 0.1 acre and is located along the southeastern facility boundary near the South Air Field at NAS Whiting Field (Figure 2-1). The site is currently wooded with pine trees and scrub vegetation. Six earth-covered sludge mounds, ranging from 3 to 5 feet in height and 5 to 10 feet in diameter, are on the surface within a fenced area of approximately 100 feet by 25 feet. The "Y" drainage ditch is immediately south of Site 12 and receives surface water runoff from the site (Figure 2-2).

### **2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES.**

According to the Initial Assessment Study (Envirodyne Engineers, Inc., 1985), tank bottom sludge was disposed of at the site in May 1968. The sludge was generated from cleaning aviation gasoline (AVGAS) storage tanks and fuel filters. The sludge was placed in six piles on the surface, and each pile contained approximately 200 to 400 gallons of sludge. The piles were then covered with dirt. The sludge reportedly contained tetraethyl lead, a component of AVGAS.

Site 12 has undergone several phases of investigations since 1985. Table 2-1 presents a summary of these activities.

### **2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION.**

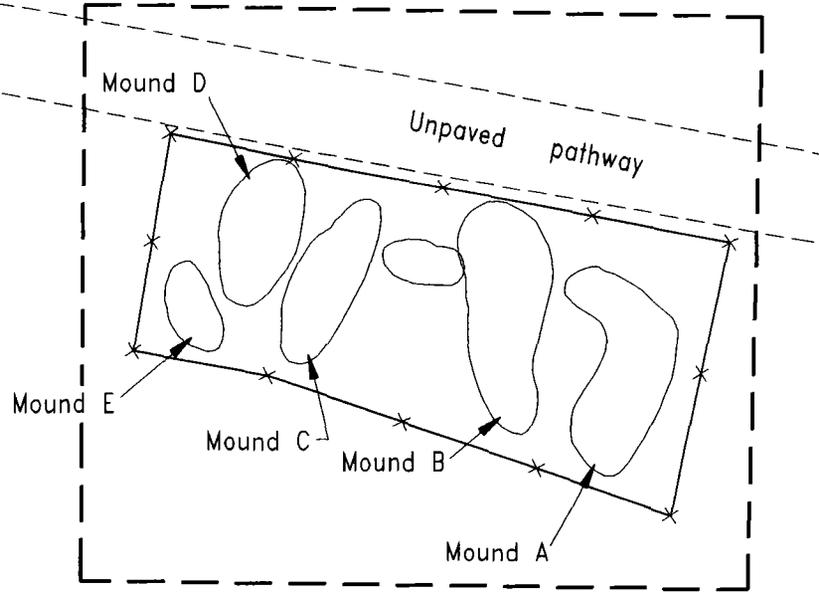
The RI report (Harding Lawson Associates [HLA], 1999a), the FS report (HLA, 1999b), and the Proposed Plan (HLA, 1999c) for Site 12 were completed and released to the public in June 1999. These documents, and other Installation Restoration (IR) program information, are contained within the Administrative Record in the Information Repository located at the West Florida Regional Library, Milton, Florida.

Publication of the notice of availability of the RI, FS, and Proposed Plan targeted the communities closest to NAS Whiting Field. The availability notice presented information on the RI/FS at Site 12 and invited community members to submit written comments and attend a public meeting on the Proposed Plan.

A public comment period on the Site 12 Proposed Plan was held from July 15, 1999 to August 15, 1999. In addition, a public meeting was held on August 5, 1999. Representatives from NAS Whiting Field, SOUTHNAVFACENCOM, USEPA, FDEP, and the Navy's environmental consultants presented information on the results of the Site 12 RI and FS, and solicited comments from the community. Comments received at the public meeting and during the public comment period are presented in the Responsiveness Summary in Attachment A. Responses to those comments are also included in the Responsiveness Summary.

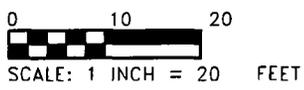
### **2.4 SCOPE AND ROLE OF REMEDIAL ACTION SELECTED FOR SITE 12.**

Investigations at Site 12 have indicated soil contamination at the site does not pose unacceptable risk to human and ecological receptors given a nonresidential land-use scenario and the implementation of LUCs. Therefore, the purpose of the RA for Site 12 is to maintain the use of the land for nonresidential purposes.



**SITE 12**

<b>LEGEND</b>	
	Outline of sludge pile
	Flow direction
	Approximate site boundary
	Naval Air Station
	Barbed wire fence

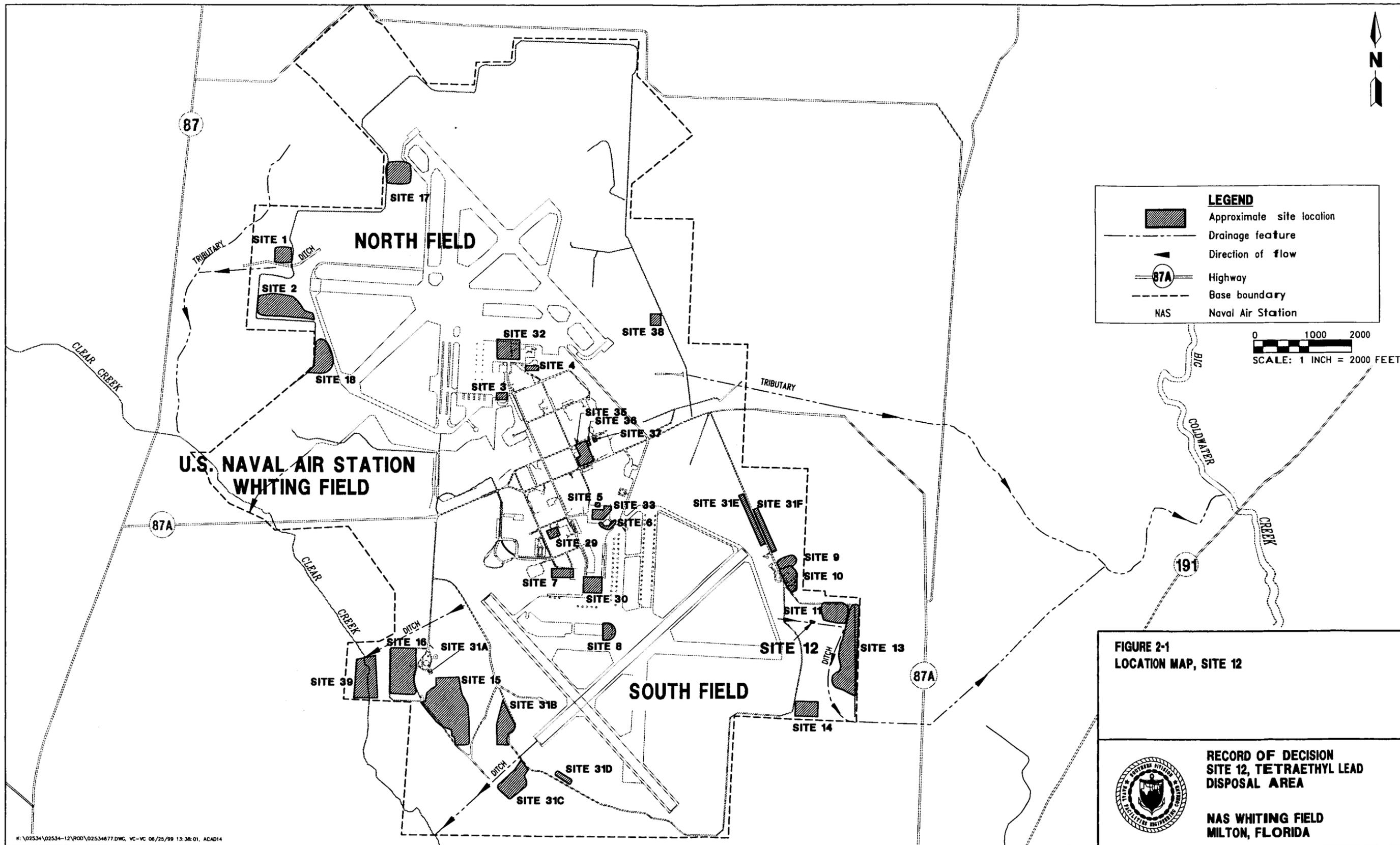


**FIGURE 2-2  
GENERAL FEATURES  
SITE 12**



**RECORD OF DECISION  
SITE 12, TETRAETHYL LEAD  
DISPOSAL AREA**

**NAS WHITING FIELD  
MILTON, FLORIDA**



**LEGEND**

- Approximate site location
- Drainage feature
- Direction of flow
- Highway
- Base boundary
- Naval Air Station

0 1000 2000  
SCALE: 1 INCH = 2000 FEET

**FIGURE 2-1  
LOCATION MAP, SITE 12**

**RECORD OF DECISION  
SITE 12, TETRAETHYL LEAD  
DISPOSAL AREA**

**NAS WHITING FIELD  
MILTON, FLORIDA**



**Table 2-1  
Investigative History**

Record of Decision  
Surface and Subsurface Soils  
Site 12, Tetraethyl Lead Disposal Area  
Naval Air Station Whiting Field  
Milton, Florida

Date	Investigation Title	Activities	Findings
1985	IAS, NAS Whiting Field, Milton, Florida (Envirodyne Engineers, Inc.)	<ul style="list-style-type: none"> <li>• Review of historical records and aerial photographs.</li> <li>• Field inspections and personal interviews.</li> </ul>	<ul style="list-style-type: none"> <li>• In 1968, Site 12 was reportedly used for disposal of tank bottom sludge and fuel filters contaminated with tetraethyl lead.</li> <li>• Site 12 was recommended for additional investigation due to the type of the waste reportedly disposed of, the potential for off-site migration, and the presence of human and ecological receptors.</li> </ul>
1986	Verification Study, NAS Whiting Field, Milton, Florida (Geraghty & Miller)	<ul style="list-style-type: none"> <li>• collection of 2 composite surface soil samples.</li> <li>• installation of one groundwater monitoring well.</li> <li>• collection of groundwater sample</li> </ul>	<ul style="list-style-type: none"> <li>• Two soil samples analyzed for total lead and EP toxicity for lead. Total lead was 4 and 11 milligrams per kilogram. EP toxicity tests indicated lead below detection limit of 0.01 milligrams per liter.</li> <li>• One groundwater sample analyzed. Lead detected below Florida primary drinking water standards at the time. No organic compounds detected.</li> </ul>
1990-1999	Remedial Investigation Report, Site 12, NAS Whiting Field, Milton, Florida (HLA, 1999a)	<ul style="list-style-type: none"> <li>• Piezocone Penetrometer (PCPT) and BAT groundwater sampling.</li> <li>• Geologic assessment.</li> <li>• Hydrogeologic assessment.</li> <li>• Collection of 12 surface soil samples.</li> <li>• Collection of 10 subsurface soil samples.</li> <li>• Installation of one groundwater monitoring well.</li> <li>• Collection of groundwater samples.</li> <li>• Human Health Risk Assessment.</li> <li>• Ecological Risk Assessment.</li> </ul>	<ul style="list-style-type: none"> <li>• The groundwater flow direction is to the southeast towards Big Coldwater Creek.</li> <li>• The HHRA determined that the carcinogenic risk from exposure to surface and subsurface soil was within USEPA's acceptable risk range for current or future hypothetical future residents at Site 12.</li> <li>• The total ELCR associated with exposure to surface soil by a hypothetical future resident (<math>9 \times 10^{-6}</math>) exceeded FDEP's target level of concern (<math>1 \times 10^{-6}</math>) due to the presence of arsenic.</li> <li>• The noncancer risk associated with ingestion and direct contact of soil under current and hypothetical future land uses are below USEPA and FDEP target hazard index (HI) of 1.</li> <li>• The ERA does not predict risks to ecological receptors from surface soil.</li> <li>• Lethal and sublethal exposures to representative wildlife species are unlikely to result in adverse effects to reproduction and survival (hazard quotients are less than 1.0).</li> </ul>
<p>Notes: IAS = initial assessment study. NAS = Naval Air Station. EP = extraction procedure. HLA = Harding Lawson Associates. BAT = Bengt-Arne-Torstensson.</p>		<p>HHRA = human health risk assessment. USEPA = U.S. Environmental Protection Agency. FDEP = Florida Department of Environmental Protection. ELCR = excess lifetime cancer risk.</p>	

Based on previous investigations, remedial action objectives (RAOs) and chemical-specific action levels were identified. The primary chemicals of concern at the site are arsenic, iron, and vanadium in surface soil. Because Site 12, and several other sites at NAS Whiting Field, are disposal sites where the cover fill was most likely brought to the site from an off-site borrow source or subsurface soils on-site, the Navy requested the FDEP consider a site-specific soil cleanup goal for arsenic. The Navy recommended a soil cleanup goal for arsenic at NAS Whiting Field disposal sites (Sites 1, 2, 9, 10, 11, 12, 13, 14, 15, and 16) of 4.62 milligrams per kilogram (mg/kg) (HLA, 1998a). The FDEP and USEPA have concurred with the use of this goal at these disposal sites given the following conditions:

1. The sites may be used for activities involving less than full-time contact with the site. These may include, but are not limited to, a) parks, b) recreation areas that receive heavy use (such as soccer or baseball fields), or c) agricultural sites where farming practices result in moderate site contact (approximately 100 days per year or less).
2. The Navy must ensure adherence to the land use by incorporating the site and conditions in a legally binding LUC agreement.
3. The above soil cleanup goal shall not be utilized at any other site without specific FDEP approval.

The groundwater at NAS Whiting Field has been designated as a separate site (Site 40, Facility-wide Groundwater). If chemicals in the groundwater are found to pose a threat to human and/or ecological receptors, they will be evaluated as part of the Site 40 RI/FS; therefore, groundwater is not considered in this ROD.

The RAO for Site 12, establish and maintain a LUC plan for the site, was developed because the use of the FDEP approved site-specific soil cleanup goal (SCG) for arsenic required the implementation of LUCs. Under USEPA Region IV guidance, the use of LUCs as a remedy for contaminated sites requires the development of a LUC Assurance Plan, documented in a MOA, as well as a site-specific LUC Implementation Plan (LUCIP). This document details the actions required when LUCs are selected as a remedy for a site.

The MOA was developed for the entire facility where LUCs are necessary. In this case, a MOA was developed for NAS Whiting Field. This document indicates the Navy agrees to implement certain periodic site inspections, condition certifications, and agency notification procedures basewide to ensure the maintenance (by NAS Whiting Field personnel) of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of the MOA is the Navy's substantial good-faith compliance with the procedures called for in the MOA. Reasonable assurances will be provided to USEPA and FDEP as to the permanency of those remedies, including the use of specific LUCs (or development of LUCIPs). It is agreed by the Navy, USEPA, and FDEP that the contemplated permanence of the remedy will be dependent upon NAS Whiting Field's substantial good-faith compliance with the specific LUC maintenance commitments stated in the MOA. Should such compliance not occur or should the MOA be terminated, USEPA and FDEP reserve the right to reconsider the protectiveness of the remedy concurred upon in the ROD and USEPA and FDEP may require NAS Whiting Field take additional measures to adequately ensure necessary future protection of human health and the environment.

## **2.5 SITE CHARACTERISTICS.**

The goal of the RI conducted for Site 12 was to collect data to determine the nature and extent of releases of site-derived contaminants; identify potential pathways of migration via the vadose zone or soil; and evaluate

risks to human and ecological receptors. Other media (e.g., surface water, sediment, etc.) were not evaluated because they are not present at the site.

### **2.5.1 Aerial Photography Evaluation**

Historical aerial photographs, provided by the Navy at the Public Works Office, were evaluated during the planning phases of the RI. The objective of the evaluation was to determine the operational history of the site and to verify earlier historical accounts.

### **2.5.2 Background**

A background sampling program was completed for the main base of NAS Whiting Field to establish concentrations of inorganics naturally present in surface soil, subsurface soil, and groundwater.

The results of this background sampling program indicated detectable concentrations of various inorganic analytes in the aforementioned media. Background concentration for the contaminants of concern arsenic, iron, and vanadium in surface soil are 3.2 mg/kg, 8,832 mg/kg, and 21.8 mg/kg, respectively. Background concentrations for subsurface soil analytes arsenic and vanadium were 6.2 mg/kg and 45 mg/kg, respectively.

### **2.5.3 Surface Soil**

Surface soil samples were collected to determine the nature and extent of contamination at the site, and to assess whether or not surface soil could potentially serve as an exposure pathway to human or ecological receptors. No VOCs or SVOCs exceeded the background or USEPA Risk-Based Concentrations (RBCs) and Florida SCTLs. Concentrations of arsenic, iron, and vanadium exceeded chemical specific criteria in the FS.

Arsenic was detected in Site 12 surface soil samples at concentrations ranging from 2.4 to 3.8 mg/kg. The maximum detected concentration equaled or exceeded applicable industrial standards (USEPA Region III RBC of 3.8 mg/kg, Florida SCTL of 3.7 mg/kg) and the background screening concentration of 3.2 mg/kg, but was less than the FDEP approved site-specific SCG of 4.62 mg/kg (HLA, 1998a).

Iron was detected in all six surface soil samples with a maximum concentration of 9,200 mg/kg (slightly above background concentration of 8,832 mg/kg). However, all the detections of iron were below the Florida residential SCTL (23,000 mg/kg) and USEPA Region III industrial RBC (61,000 mg/kg) (HLA, 1998a).

Vanadium was detected in four of six samples. The maximum concentration of 26.8 mg/kg was above the residential Florida SCTL of 15 mg/kg but was well below the Region III RBCs and the Florida industrial SCTL of 7,400 mg/kg.

### **2.5.4 Subsurface Soil**

Subsurface soil sampling was conducted to determine the vertical extent of contamination, and to assess whether or not subsurface soil could potentially serve as an exposure pathway to human or ecological receptors.

The analytes detected in ten subsurface soil samples collected at Site 12 were compared to the USEPA Region III RBCs and Florida residential and industrial SCTLs. Arsenic and vanadium were the only analytes exceeding the Florida residential SCTL.

Arsenic was detected in subsurface soil at concentrations ranging from 0.53 to 3.3 mg/kg, which exceed the residential RCB and SCTL, but are below the background screening concentration (6.2 mg/kg), and the industrial RBC (3.8 mg/kg) and SCTL (3.7 mg/kg).

Vanadium was detected in Site 12 subsurface soil samples at concentrations ranging from 10.3 to 38.1 mg/kg which were below the background screening concentration of 45 mg/kg. Several of the detections, however, exceeded the Florida residential SCTL of 15 mg/kg.

### **2.5.5 Groundwater**

Groundwater at NAS Whiting Field has been identified as a separate site (Site 40); therefore, it is being investigated separately from Site 12.

### **2.5.6 Migration Pathways**

Arsenic, iron, and vanadium detected in surface soil are the primary chemicals of concern at Site 12. The primary agents of migration acting on soil include wind, water, and human activity. Soil can also act as a source medium, allowing the chemicals of potential concern (CPCs) to be transported to other media.

Transport of the CPCs from soil via wind is not expected to be a major transport mechanism due to the presence of heavy vegetation at Site 12. Vegetative cover is an effective means of limiting wind erosion of soil.

Humans are effective at moving soil and can greatly affect the transport of soil-bound chemicals at hazardous waste sites. Under the current use of Site 12, human activity is not a major transport mechanism for the CPCs in soils. This condition could change based on the future use of Site 12.

Water can cause the transport of soil and, therefore, arsenic, iron and vanadium in soil, via the mechanisms of physical transport of soil or the leaching of constituents from the soil to groundwater. Soil erosion, the physical transport of soil via surface water runoff, is currently not considered a major mechanism for the transport of the CPCs in soil at Site 12 because of (1) the low grade (slope) of the land surface at the site, (2) the heavy vegetation at the site, and (3) the nature of the constituents remaining in the soil at the site.

During the time of reported active disposal at the Site 12 (May 1968), the potential for physical transport of both soil and arsenic via runoff could have been a potentially significant mechanism for transport. No significant transport of surface soil is expected since the revegetation of the Site 12 area.

Arsenic, iron, and vanadium in the soil at Site 12 are likely to remain attached to the soil because most metal analytes adsorb readily to or are natural constituents of clays and other minerals.

## **2.6 SUMMARY OF SITE RISKS.**

A risk assessment was completed for Site 12 to predict whether or not the site would pose current or future threats to human health or the environment, given the implementation of LUCs. Both a human health risk assessment (HHRA) and an ecological risk assessment (ERA) were performed for Site 12. The risk assessments evaluated the contaminants detected in site media during the RI and provided the basis for selecting the RAs.

### **2.6.1 Human Health Risk Assessment**

An HHRA was conducted to characterize the risks associated with potential exposures to site-related contaminants at Site 12 for human receptors. The HHRA is provided as Chapter 6.0 of the RI report (HLA, 1999a) with supporting documentation provided in Appendix C.

Five components of the HHRA were completed, including (1) data evaluation, (2) selection of human health CPCs, (3) exposure assessment, (4) toxicity assessment, and (5) risk characterization.

Data Evaluation. The data evaluation involved numerous activities, including sorting data by medium, evaluating analytical methods, evaluating quantitation limits, evaluating quality of data with respect to qualifiers and codes, evaluating tentatively identified compounds, comparing potentially site-related contamination with background, developing a data set for use in risk assessment, and identifying CPCs.

Human Health CPCs. Table 2-2 summarizes the human health CPCs selected for surface and subsurface soils at Site 12. These chemicals are the focus of the baseline risk assessment.

Exposure Assessment. Site 12 was evaluated to identify the populations potentially coming into contact with site-related chemicals and the pathways through which exposure might occur.

There are three potential media that may be sources of human exposure: surface soil, subsurface soil, and groundwater. Groundwater at Site 12 will be evaluated as part of the Site 40 facilitywide investigation. Under current land use, there is no exposure to subsurface soil. For future land use, it is assumed surface and subsurface soils are potential sources of exposure. Exposure assessments for these media are described below.

- Surface Soil No humans currently reside or work at Site 12. Currently, there are no plans for residential development. However, Site 12 may eventually be developed for residential land use; therefore, the residential receptor was evaluated as part of the potential future land-use scenario. Since there are no buildings present at the site, exposure of occupational workers was only considered as part of the future land-use scenario. Other possible future exposure scenarios included excavation activities, such as installation of utility lines, and site maintenance, such as mowing the grass. Site maintenance activities may also include occasional silviculture activities by a forestry worker.
- Subsurface Soil There are no current exposures to subsurface soil because no excavation or construction activities are ongoing at Site 12. However, if Site 12 is developed for residential use or if excavation activities occur in the future, a resident or an excavation worker could be exposed to contaminants in subsurface soil.

**Table 2-2  
Summary of Human Health Chemicals of Potential Concern**

Record of Decision  
Surface and Subsurface Soils  
Site 12, Tetraethyl Lead Disposal Area  
Naval Air Station Whiting Field  
Milton, Florida

Environmental Media	HHCCPs
Surface Soil	VOCs: None SVOCs: None Pesticides and PCBs: None Inorganic Analytes: Arsenic, iron, vanadium
Subsurface Soil	VOCs: None SVOCs: None Pesticides and PCBs: None Inorganic Analytes: None

Notes: VOC = volatile organic compound.  
SVOC = semivolatile organic compound.  
PCB = polychlorinated biphenyl.

Toxicity Assessment. The toxicity assessment is a two-step process whereby the potential hazards associated with the route-specific exposure to a given chemical are (1) identified by reviewing relevant human and animal studies, and (2) quantified through analysis of dose-response relationships. USEPA has calculated numerous toxicity values having undergone extensive review within the scientific community. These values (published in the Integrated Risk Information System and other journals) are used in the baseline evaluation to calculate both carcinogenic and noncarcinogenic risks associated with each CPC and rate of exposure.

Risk Characterization. In the final step of the risk assessment, the results of the exposure and toxicity assessments are combined to estimate the overall risk from exposure to site contamination. For cancer-causing chemicals, risk is estimated to be a probability. For example, a particular exposure to chemicals at a site may present a 1 in 1,000,000 (or  $1 \times 10^{-6}$ ) chance of development of cancer over an estimated lifetime of 70 years. For noncancer-causing chemicals, the dose of a chemical a receptor may be exposed is estimated and compared to the reference dose (RfD). The RfD is developed by USEPA scientists and represents an estimate of the amount of a chemical a person (including the most sensitive persons) could be exposed to over a lifetime without developing adverse effects. The measure of the likelihood of adverse effects other than cancer occurring in humans is called the hazard index (HI). An HI greater than 1 suggests adverse effects are possible.

Table 2-3 provides a summary of the predicted risks for current exposure scenarios, and Table 2-4 provides a summary of the predicted risks for future exposure scenarios. The ELCR for total risk to trespassers under the current land-use scenario is  $2 \times 10^{-7}$  and the risk to site maintenance workers is  $1 \times 10^{-7}$ . These are below the USEPA risk range and also below the FDEP risk target level. The ELCR under the future land use scenario for total resident is  $9 \times 10^{-6}$ . This is within the USEPA risk range, however, it is greater than the FDEP risk target level.

### **2.6.2 Ecological Risk Assessment (ERA)**

The purpose of the ERA for Site 12 was to evaluate the potential for adverse effects to ecological receptors at the Tetraethyl Lead Disposal Area. Components of the ERA include (1) site characterization, (2) hazard assessment and contaminants of potential concern, (3) exposure assessment, (4) effects assessment, and (5) risk characterization. Table 2-5 provides a summary of the CPCs selected for Site 12 to be evaluated for each medium.

The ERA completed for Site 12 evaluated exposure of terrestrial plants, terrestrial invertebrates, and wildlife to chemicals in surface soil at the site. Wildlife risks were evaluated by comparing the estimated doses for wildlife species (mammals and birds) to a reference toxicity dose representing the threshold at which lethal or sublethal effects may occur. Risks to terrestrial plants and soil invertebrates at Site 12 were evaluated based on the results of laboratory toxicity testing using earthworms and lettuce seeds.

All lethal and sublethal hazard quotients and Hazard Indices for the representative wildlife species are less than 1 indicating that reduction in survivability, growth, and reproduction of terrestrial wildlife populations at Site 12 is not expected. The results of the food web modeling suggest no risks to mammals and birds associated with the ingestion of ECPCs in the surface soil at Site 12.

**Table 2-3  
Risk Summary Current Land Use**

Record of Decision  
Surface and Subsurface Soils  
Site 12, Tetraethyl Lead Disposal Area  
Naval Air Station Whiting Field  
Milton, Florida

Land Use	Exposure Route	HI	ELCR
<b>Current Land Use</b>			
Surface Soil:			
Adult Trespasser:	Incidental ingestion	0.008	3x10 <sup>-7</sup>
	Dermal contact	0.02	2x10 <sup>-8</sup>
	Inhalation of particulates	ND	8x10 <sup>-11</sup>
	Total Adult Trespasser:	0.03	3x10 <sup>-7</sup>
Adolescent Trespasser:	Incidental ingestion	0.01	2x10 <sup>-7</sup>
	Dermal contact	0.02	1x10 <sup>-8</sup>
	Inhalation of particulates	ND	4x10 <sup>-11</sup>
	Total Adolescent Trespasser:	0.03	2x10 <sup>-7</sup>
	Total Risk to Trespasser (Adult and Adolescent) Exposed to Surface Soil:	NC	5x10 <sup>-7</sup>
Site Maintenance Worker:	Incidental ingestion	0.003	1x10 <sup>-7</sup>
	Dermal contact	0.01	1x10 <sup>-8</sup>
	Inhalation of particulates	ND	4x10 <sup>-10</sup>
	Total Site Maintenance Worker:	0.01	1x10 <sup>-7</sup>
Notes: HI = hazard index. * = receptor totals may vary from spreadsheets due to rounding algorithm. ELCR = excess lifetime cancer risk ND = No dose to response data for this exposure route were available for human health chemicals of potential concern in this medium. NC = Not calculated because child and adult HIs are not additive.			

**Table 2-4  
Risk Summary Future Land Use**

Record of Decision  
Surface and Subsurface Soils  
Site 12, Tetraethyl Lead Disposal Area  
Naval Air Station Whiting Field  
Milton, Florida

Land Use	Exposure Route	HI	ELCR
<b>Future Land Use</b>			
Surface Soil:			
Adult Trespasser:	Incidental ingestion	0.008	3x10 <sup>-7</sup>
	Dermal contact	0.02	2x10 <sup>-8</sup>
	Inhalation of particulates	ND	8x10 <sup>-11</sup>
	Total Adult Trespasser:	0.03	3x10 <sup>-7</sup>
Adolescent Trespasser:	Incidental ingestion	0.01	2x10 <sup>-7</sup>
	Dermal contact	0.02	1x10 <sup>-7</sup>
	Inhalation of particulates	ND	4x10 <sup>-11</sup>
	Total Adolescent Trespasser:	0.03	2x10 <sup>-7</sup>
Total Risk to Trespasser (Adult and Adolescent) Exposed to Surface Soil:		NC	5x10 <sup>-7</sup>
Adult Resident:	Incidental ingestion	0.06	3x10 <sup>-6</sup>
	Dermal contact	0.1	2x10 <sup>-7</sup>
	Inhalation of particulates	ND	3x10 <sup>-9</sup>
	Total Adult Resident:	0.2	3x10 <sup>-6</sup>
Child Resident:	Incidental ingestion	0.6	6x10 <sup>-6</sup>
	Dermal contact	0.2	6x10 <sup>-8</sup>
	Inhalation of particulates	ND	3x10 <sup>-9</sup>
	Total Child Resident:	0.8	6x10 <sup>-6</sup>
Total Risk to Resident (Adult and Child) Exposed to Surface Soil:		NC	9x10 <sup>-6</sup>
Occupational Worker:	Incidental ingestion	0.1	1x10 <sup>-6</sup>
	Dermal contact	0.005	5x10 <sup>-8</sup>
	Inhalation of particulates	ND	1x10 <sup>-9</sup>
	Total Occupational Worker:	0.1	1x10 <sup>-6</sup>
Site Maintenance Worker:	Incidental ingestion	0.003	1x10 <sup>-7</sup>
	Dermal contact	0.01	1x10 <sup>-7</sup>
	Inhalation of particulates	ND	4x10 <sup>-10</sup>
	Total Site Maintenance Worker:	0.01	1x10 <sup>-7</sup>
Excavation Worker:	Incidental ingestion	0.02	5x10 <sup>-8</sup>
	Dermal contact	0.01	6x10 <sup>-10</sup>
	Inhalation of particulates	ND	2x10 <sup>-11</sup>
	Total Excavation Worker:	0.03	5x10 <sup>-8</sup>
Total Risk to Resident (Adult and Child) Exposed to Surface Soil		NC	9x10 <sup>-6</sup>

Notes: HI = hazard index  
 \* = receptor totals may vary for spreadsheets due to rounding algorithm.  
 ELCR = excess lifetime cancer risk.  
 ND = No dose to response data for this exposure route were available for human health chemicals of potential concern in this medium.  
 NC = Not calculated because child and adult HIs are not additive.  
 NE = No carcinogenic risk because Human Health Chemical of Potential Concern were not identified.

**Table 2-5  
Summary of Ecological Chemicals of Potential Concern (ECPCs)**

Record of Decision  
Surface and Subsurface Soils  
Site 12, Tetraethyl Lead Disposal Area  
Naval Air Station Whiting Field  
Milton, Florida

Environmental Medium	ECPCs
Surface Soil	VOCs: None  SVOCs: bis(2-Ethylhexyl)phthalate  Pesticides and PCBs: None  Inorganic Analytes: vanadium  TRPH: Yes

Notes: VOC = volatile organic compound.  
SVOC = semivolatile organic compound.  
TRPH = total recoverable petroleum hydrocarbons.

**2.7 DESCRIPTION OF ALTERNATIVES.**

Three RAs were considered for Site 12. Cleanup alternatives were developed by the Navy, the USEPA, and the FDEP. The three alternatives are listed below and summarized on Table 2-6.

**Alternative 1:** No Action.

**Alternative 2:** Land Use Controls.

**Alternative 3:** Soil Disposal and Land Use Controls.

These alternatives were developed in consideration of site risks, the predicted future land use, and USEPA guidance for conducting an RI/FS at landfill sites. All the alternatives include a provision for five-year site reviews to verify that the selected alternative is protective of human health and the environment in future years. Five-year reviews are required when a permanent remedy is not utilized and contamination remains onsite.

**Alternative 1:** The No Action alternative, is required by CERCLA as a baseline for comparison with the other alternatives.

**Alternative 2:** LUCs, was considered because site risks, future land-use concerns, and the site-specific cleanup target level for arsenic would be addressed by LUCs. Five-year reviews are required since a permanent remedy is not utilized and contamination will remain onsite.

**Alternative 3:** One disposal alternative was developed to address potential physical hazards at Site 12. This consists of all components of Alternative 2 with the addition of off-site disposal of the soil mounds at Site 12. Under Alternative 3, prior to soil disposal, a portion of the site would be cleared and grubbed to allow access to the soil mounds. One composite would be collected from the soil mounds to characterize the soil for off-site disposal. Soil mounds at Site 12 would be removed and transported to a local landfill. The removal of sludge piles would eliminate infiltration of precipitation, surface water run-on and runoff. In addition, LUCs and 5-year reviews would be implemented as in Alternative 2.

**Table 2-6  
Summary of Remedial Alternatives Evaluated for Site 12**

Record of Decision  
Surface and Subsurface Soils  
Site 12, Tetraethyl Lead Disposal Area  
Naval Air Station Whiting Field  
Milton, Florida

Alternative	Description of Key Components	O&M Cost	Capital Costs	Present Day Cost	Duration <sup>1</sup>
<b>Alternative 1: No Action</b>	No remedial actions are taken at Site 12.  5-year site reviews.	\$5,000	--	\$19,000	30 Years+
<b>Alternative 2: Land-Use Controls</b>	Implementation of Land-Use Controls. MOA including LUC-IP (Appendix B), documents created to maintain the site for nonresidential purposes.  5-year site reviews.	\$12,000	\$12,000	\$135,000	30 Years+
<b>Alternative 3: Off-Site Disposal and Land-Use Controls</b>	Site preparation (clearing and grubbing).  Waste characterization soil sampling and analysis.  Soil removal, transport, and disposal at a local landfill.  Site restoration (vegetative support layer and vegetative cover).  Implementation of Land-Use Controls. MOA, including LUCIP, document created to maintain the site for nonresidential purposes.  5-year site reviews.	\$17,000	\$66,000	\$207,000	30 Years+

<sup>1</sup> A period of 30 years was chosen for costing purposes only. Under Comprehensive Environmental Response, Compensation, and Liability Act, remedial actions must continue as long as hazardous substances, pollutants, or contaminants remain at the site.

Notes: MOA = Memorandum of Agreement.  
LUCIP = Land-Use Control Implementation Plan.

## **2.8 SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES.**

In selecting the preferred alternative for Site 12, nine criteria were used to evaluate the alternatives developed in the FS. The first seven are technical criteria based on the degree of protection of the environment, cost, and engineering feasibility issues. The alternatives were further evaluated based on the final two criteria: acceptance by the USEPA and FDEP, and acceptance by the community. The nine criteria can be categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. The USEPA requires the alternative implemented must satisfy the threshold criteria. Primary balancing criteria weigh the major tradeoffs among alternatives. Modifying criteria are considered after public comment. Based on the evaluation of the alternatives against these criteria, Alternative 2 was selected as the preferred alternative for Site 12.

The following subsections discuss the three alternatives relative to the nine criteria.

### **2.8.1 Threshold Criteria**

Overall Protection of Human Health and the Environment. Alternative 1 would provide no form of protection to human receptors who may be exposed to soils at Site 12. If this alternative were selected, 5-year site reviews would be instituted. No adverse short-term or cross-media effects are anticipated with this no-action alternative.

Human receptors, namely residents, would be protected if Alternative 2 were implemented. Regulatory controls (i.e., LUCs) would prohibit potential future residents from exposure to the site because residential use of the site would be restricted under the proposed LUCs. By implementing this alternative, no adverse short-term or cross-media effects are anticipated.

Implementation of Alternative 3 would provide the highest standard of protection to human receptors. The removal of sludge piles would eliminate any physical hazards and regulatory controls (i.e., LUCs) would prohibit potential human receptors from coming into contact with the soils at Site 12. This alternative however may alter the native ecological habitat present at the site.

Compliance with ARARs. Alternative 1 does not comply with chemical-specific ARARs (e.g., Soil Cleanup Target Levels) in the short term. Alternatives 2 and 3 do comply with ARARs and meet the RAOs established for Site 12.

### **2.8.2 Primary Balancing Criteria**

Long-Term Effectiveness and Permanence. Human risks due to exposure to site soils would not be addressed if Alternative 1 was implemented. Administrative actions proposed in this alternative (e.g., 5-year site reviews) would provide a means of evaluating the effectiveness of the alternative, but would not provide a permanent remedy for the site.

Risks presented to the future resident based on exposure to surface soil at the site would be addressed via the LUCs provided in Alternative 2. The LUCs will establish controls limiting land use at the site for nonresidential use only. These controls will prohibit potential future residents from exposure to the site. The long-term effectiveness and permanence of these controls would be controlled by the facility under the MOA (including LUCIP) documents being developed for NAS Whiting Field. Administrative actions proposed in Alternative 2 (e.g., LUCs and 5-year site reviews) would provide a means of evaluating the effectiveness of the alternative. These administrative actions are considered to be reliable controls, as long as the facility maintains its MOA.

While Alternative 3 provides removal of contaminated soils, thereby providing a long term, permanent solution to the risk of human exposure to the contaminated soils, implementation of Alternative 3 would

include partial clearing and grubbing of existing vegetation at the site to allow access to the soil mounds. Consequently, existing vegetation would be removed, and ecological diversity may be reduced at Site 12. This ecological loss is not permanent; new vegetation would be planted on the final cover. However, this new vegetation would consist of mostly grasses and small brush, which are not as diverse as the natural vegetation currently existing. The clearing and grubbing of the existing vegetation can be viewed as a permanent long-term ecological impact.

Short-Term Effectiveness. Alternative 1 would not reduce human health risks in the short term because no land-use restrictions would be implemented.

Alternative 2 would reduce human health risks in the short term by reducing the potential exposure to Site 12 soils by human receptors. However, ecological receptors would not be affected by the implementation of this alternative.

If Alternative 3 were implemented, fugitive dust would be generated during removal and loading of the sludge piles. Standard construction dust suppression methods could be used to minimize these potential short-term risks.

Clearing and grubbing of vegetation at Site 12 may result in adverse impacts to the ecological receptors.

Implementability. Alternatives 1 and 2 do not require remedial construction for implementation. Other activities, such as LUCs and 5-year site reviews, are easily implemented for both scenarios.

Equipment and materials are readily available to remove the sludge piles for Alternative 3. Site work would be completed in a relatively short period of time (e.g., approximately ten days), and would require standard construction expertise. Clean topsoil to support site restoration and vegetative growth will be obtained from an off-site borrow source. Given the small amount of soil required (5 cubic yards), it is expected that the soil can be obtained from a local source.

Reduction of Toxicity, Mobility, and Volume of Contaminants through Treatment. Alternatives 1 and 2 would not provide a reduction in contaminant mobility or volume because no active mitigation of contaminant mobility or reduction in volume is proposed. No treatment residuals would be produced if either alternative were implemented.

Alternative 3 does not include treatment of contaminants, and thus does not reduce the toxicity, mobility, and/or volume of contaminants through treatment. However, reduction of physical hazards at the site would be achieved through removal and off-site disposal of the soil mounds.

Cost. The total present-worth cost, calculated on a 30-year term at 6% rate of interest, of the three alternatives is presented below.

<b>Alternative 1:</b> No Action	\$19,000
<b>Alternative 2:</b> LUCs	\$135,000
<b>Alternative 3:</b> Soil Disposal and LUCs	\$207,000

### **2.8.3 Modifying Criteria**

State and Federal Acceptance. The FDEP and USEPA have concurred with the Navy's selection of Alternative 2 as the preferred alternative.

Community Acceptance. Community acceptance of the preferred alternative was evaluated at the end of the public comment period. The comments received during this period are addressed in a Responsiveness Summary included in Appendix A.

## **2.9 SELECTED ALTERNATIVE.**

Of the three alternatives evaluated, the selected RA for Site 12 is Alternative 2. Alternative 2 consists of LUCs and 5-year site reviews. The LUCs will establish restrictions limiting land use at the site to nonresidential uses. The 5-year site reviews will verify that the selected alternative is protective of human health and the environment in future years. The total cost of Alternative 2 is \$135,000 over a 30-year period. If this alternative were implemented, and the controls were maintained, predicted site risks would be minimized.

## **2.10 STATUTORY STATEMENT.**

The alternative selected for implementation at Site 12 is consistent with the Navy's IR program, CERCLA, and the NCP. This alternative incorporates the FDEP approved site-specific cleanup goal of 4.62 mg/kg for arsenic. The selected remedy is protective of human health and the environment. The selected remedy does not satisfy the statutory preference for treatment because it allows hazardous substances in concentrations above health based levels to remain onsite. However, the selected remedy does address the principal threat because it limits human exposure to contaminated soils through land use controls. Table 2-7 summarizes the comparison of the selected remedy to the nine criteria. Table 2-8 provides a summary of ARARs specific to the selected remedy.

Because Alternative 2 would result in hazardous substances remaining on the site, a review would be conducted within 5 years after commencement of the RA to ensure the remedy continues to provide adequate protection of human health and the environment. If soils at Site 12 are excavated or otherwise exposed, soil removal, treatment, and other disposal measures will need to be accomplished.

## **2.11 DOCUMENTATION OF SIGNIFICANT CHANGES.**

There are no significant changes in the selected alternative described in the Proposed Plan.

**Table 2-7  
Comparison of Selected Remedy with Nine Evaluation Criteria**

Record of Decision  
Surface and Subsurface Soils  
Site 12, Tetraethyl Lead Disposal Area  
Naval Air Station Whiting Field  
Milton, Florida

Evaluation Criteria	Assessment
Overall Protection of Human Health and the Environment	<p>Human receptors, namely residents, would be protected if this alternative were implemented. Regulatory controls (i.e., LUCs) would prohibit potential future residents from exposure to the site because residential use of the site would be restricted under the proposed LUCs. However, this alternative would not provide protection for ecological receptors at the site.</p> <p>By implementing this alternative, no adverse short-term or cross-media effects are anticipated.</p>
compliance with ARARs	This alternative would comply with chemical-specific ARARs or TBCs for soil.
Long-Term Effectiveness	<p>The risks presented to the future resident based on exposure to surface soil at the site would be addressed via the LUCs. The long-term effectiveness and permanence of these controls will be controlled by the facility under the MOA developed for NAS Whiting Field.</p> <p>Administrative actions proposed in this alternative (e.g., LUCs and 5-year site reviews) would provide a means of evaluating the effectiveness of the alternative. These administrative actions are considered to be reliable controls, as long as the facility maintains its MOA.</p>
Reduction of Toxicity, Mobility, and Volume	This alternative would not provide a reduction in contaminant mobility or volume because no active mitigation of contaminant mobility or reduction in volume is proposed. No treatment residuals would be produced if this alternative were implemented.
Short-Term Effectiveness	<p>This alternative would reduce human health risks in the short term by reducing the potential exposure to Site 12 soils by human receptors. However, ecological receptors would not be affected by the implementation of this alternative.</p> <p>This alternative does not pose a threat to workers through exposure to contaminated soils because only limited remedial construction activities (e.g., posting signs) are proposed under this alternative.</p>
Implementability	This alternative does not require remedial construction for implementation. Other activities, such as LUCs and 5-year site reviews, are easily implemented.
Cost	The total present worth cost of Alternative 2 is \$135,000.
Federal and State Acceptance	The USEPA and FDEP have concurred with the selected remedy.
Community Acceptance	The community has been given the opportunity to review and comment on the selected remedy. Comments received were addressed (see Appendix A) and did not alter the selected remedy proposed in the Proposed Plan.
<p>Notes: LUC = land-use control. ARAR = applicable or relevant and appropriate requirement. TBC = to be considered. MOA = Memorandum of Agreement. NAS = Naval Air Station. USEPA = U.S. Environmental Protection Agency. FDEP = Florida Department of Environmental Protection.</p>	

**Table 2-8  
Summary of Federal and State ARARs and Guidance Specific to Alternative 2**

Record of Decision  
Surface and Subsurface Soils  
Site 12, Tetraethyl Lead Disposal Area  
Naval Air Station Whiting Field  
Milton, Florida

Name and Regulatory Citation	Description	Consideration in the Remedial Action Process	Type
Occupational Safety and Health Act (29 Code of Federal Regulations [CFR] Part 1910)	Requires establishment of programs to ensure worker health and safety at hazardous waste sites.	<b>Applicable.</b> These requirements apply to response activities conducted in accordance with the National Contingency Plan. During the implementation of any remedial alternative for Site 12, these regulations must be attained.	Action-specific
Florida Hazardous Waste Rules (Chapter 62-730, Florida Administrative Code [FAC])	Adopts by reference, specific sections of the Federal hazardous waste regulations, including the section regulating hazardous waste landfills (40 CFR, Part 264, Subpart N) and makes additions to these regulations.	<b>Relevant and Appropriate.</b> These regulations are not applicable to Site 12 because they apply only to landfills receiving waste after 1983; however, the requirements may be used as guidance for developing a landfill inspection program.	Action-specific
Florida Soil Target Cleanup Levels (Chapter 62-777, FAC)	Establishes soil and groundwater cleanup criteria.	<b>Relevant and Appropriate.</b> Considered because these levels represent the FDEP's most current derivation of target levels.	Chemical-specific
Resource Conservation and Recovery Act (RCRA) Regulations, Landban (40 CFR, Part 264, Subpart 268)	Provide removal and disposal requirements for landfills containing hazardous waste.	<b>Relevant and Appropriate.</b> Considered because Alternative 3 considers soil removal. However, these regulations are not applicable to Site 12 because they apply only to landfills receiving waste after 1980.	Action-specific
Resource Conservation and Recovery Act (RCRA) Regulations, Landfills (40 CFR, Part 264, Subpart N)	Provides monitoring, inspection, closure and post-closure care requirements for landfills containing hazardous waste.	<b>Relevant and Appropriate.</b> These regulations are not applicable to Site 12 because they apply only to landfills receiving waste after 1980; however, the requirements may be used as guidance for developing a landfill inspection program.	Action-specific

Notes: ARAR = applicable or relevant and appropriate requirement.  
FDEP = Florida Department of Environmental Protection.

## REFERENCES

- Envirodyne Engineers. 1985. *Initial Assessment Study, NAS Whiting Field, Milton, Florida, Final Report*. Prepared for Naval Energy and Environmental Support Activity, Port Hueneme, California.
- Florida Administrative Code, Chapter 62-777. 1999. *Florida Cleanup Target Levels*. (June).
- Florida Department of Environmental Protection, 1998. Letter from James H. Cason, Remedial Project Manager to Linda Martin, Department of Navy, Southern Division. Subject: Request for Site-Specific Arsenic Soil Cleanup Level: Covered Landfill Sites, NAS Whiting Field.
- Harding Lawson Associates, Inc. (HLA). 1999a. *Remedial Investigation for Site 12, Tetraethyl Lead Disposal Area, Naval Air Station Whiting Field, Milton, Florida*. Prepared for SOUTHNAVFAC-ENGCOM, North Charleston, South Carolina. (July).
- HLA. 1999b. *Feasibility Study for Site 12 Tetraethyl Lead Disposal Area, Naval Air Station Whiting Field, Milton, Florida*. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), North Charleston, South Carolina. (July).
- HLA. 1999c. *Proposed Plan for Site 12 Tetraethyl Lead Disposal Area Naval Air Station Whiting Field, Milton, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina. (July).
- U.S. Environmental Protection Agency (USEPA). 1993. *Presumptive Remedy for Comprehensive Environmental Response, Compensation, and Liability (CERCLA) Municipal Landfill Sites*. Office of Solid Waste and Emergency Response (OSWER) directive 9355.0-049FS.

**APPENDIX A**  
**COMMUNITY RELATIONS**  
**RESPONSIVENESS SUMMARY**

**Responsiveness Summary  
Site 12, Northwest Open Disposal Area  
Naval Air Station Whiting Field  
Milton, Florida**

No comments were received during the public comment period (July 15, 1999 to August 15, 1999).

**APPENDIX B**

**LAND-USE CONTROL IMPLEMENTATION PLAN**

**Land-Use Control Implementation Plan**  
**Site 12, Tetraethyl Lead Disposal Area**  
**Naval Air Station Whiting Field**  
**Milton, Florida**

**Site Description** Site 12, the Tetraethyl Lead Disposal Area, is less than 0.1 acre and is located along the southeastern facility boundary near the South Air Field at NAS Whiting Field (Figure 2-1). The site is currently wooded with pine trees and scrub vegetation. Six earth-covered sludge mounds, ranging from 3 to 5 feet in height and 5 to 10 feet in diameter, are on the surface within a fenced area of approximately 100 feet by 25 feet. The "Y" drainage ditch is immediately south of Site 12 and receives surface water runoff from the site (Figure 2-2).

**Site Location** Site 12 is located east of the South Air Field at NAS Whiting Field, along the southeastern facility boundary. The facility and site locations are shown on Figures 1-1 and 1-2 in the Remedial Investigation Report for Site 12, Tetraethyl Lead Disposal Area, Naval Air Station Whiting Field, Milton, Florida (HLA, 1999a).

**Land Use Control (LUC) Objective:** Land use at Site 12 is to remain non-residential. The Florida Department of Environmental Protection (FDEP) has agreed and U.S. Environmental Protection Agency (USEPA) has concurred with a Site-Specific Arsenic Soil Cleanup Goal of 4.62 mg/kg to be utilized at the site given the following conditions:

1. The sites may be utilized for activities involving less than full-time contact with the site. This may include, but is not limited to, a) parks, b) recreation areas receiving heavy use (such as soccer or baseball fields), or c) agricultural sites where farming practices result in moderate site contact (approximately 100 days per year or less).
2. The Navy has adhered to the land use by incorporating the site and restricted use conditions in a Memorandum of Agreement (MOA).
3. The above soil cleanup goal shall not be utilized at any other site without specific FDEP approval.

No further investigation of the soil under the Comprehensive Environmental Restoration Compensation and Liability Act (CERCLA) is warranted under non-residential site usage.

The LUC is based on the detection of arsenic in surface soil samples at concentrations that exceed residential and industrial soil cleanup target levels (SCTLs) established as guidance criteria by Chapter 62-777, F.A.C. (FDEP, 1999). Arsenic present at these concentrations could result in a total excess lifetime cancer risk of  $9 \times 10^{-6}$  by a hypothetical future resident,  $5 \times 10^{-7}$  for current and future site trespassers,  $1 \times 10^{-7}$  by a current and future site maintenance worker, and  $5 \times 10^{-8}$  by a hypothetical future excavation worker through the ingestion of surface soil. These risk levels exceed the FDEP target risk level of  $1 \times 10^{-6}$ .

No humans currently reside or work at Site 12. Currently, there are no plans for residential development. However, Site 12 may eventually be developed for residential land use; therefore, the residential receptor was evaluated as part of the potential future land-use scenario. Since there are no buildings present at the site, exposure of occupational workers was only considered as part of the future land-use scenario. Other possible future exposure scenarios included excavation activities, such as installation of utility lines, and site maintenance, such as mowing the grass. Site maintenance activities may also include occasional silvaculture activities by a forestry worker.

There are no current exposures to subsurface soil because no excavation or construction activities are ongoing at Site 12. However, if Site 12 is developed for residential use or if excavation activities occur in the future, a resident or an excavation worker could be exposed to contaminants in subsurface soil.

**LUC Implemented to Achieve Objective(s)**: Notation in the NAS Whiting Field geographic information system designating industrial use only at Site 12. Quarterly inspection to confirm conformance with the industrial land use.

Under CERCLA, the Site 12 Proposed Plan and Record of Decision mandate initial implementation and continued application of appropriate restrictions on future usage of the property encompassing Site 12 while it is owned by the Federal government. The LUC will apply until or unless site remediation is conducted to restore the site for unrestricted use.

**Decision Documents**: Below are the Site 12 decision documents.

Envirodyne Engineers, Inc. 1985. *Initial Assessment Study, Naval Air Station Whiting Field, Milton, Florida*. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), North Charleston, South Carolina.

ABB Environmental Services, 1998 *Remedial Investigation and Feasibility Study, General Information Report, Naval Air Station Whiting Field, Milton, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina. (June)

Florida Department of Environmental Protection, 1998. Letter from James H. Cason, Remedial Project Manager to Linda Martin, Department of Navy, Southern Division. Subject: Request for Site-Specific Arsenic Soil Cleanup Level: Covered Landfill Sites, NAS Whiting Field.

Florida Department of Environmental Protection, 1999. Chapter 62-777, Florida Administrative Code.

Harding Lawson Associates (HLA), 1999. *Remedial Investigation for Site 12, Tetraethyl Lead Disposal Area, Naval Air Station Whiting Field, Milton, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina. (July)

HLA, 1999. *Feasibility Study for Site 12, Tetraethyl Lead Disposal Area, Naval Air Station Whiting Field, Milton, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina. (July)

HLA, 2000. *Proposed Plan for Site 12, Tetraethyl Lead Disposal Area, Naval Air Station Whiting Field, Milton, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina. (May)

**Other Pertinent Information**: Groundwater contamination beneath Site 12 will be addressed under Site 40, Basewide Groundwater investigation.

Under the MOA for land use controls there are no stipulations precluding the use of the aquifer. However, because of the proximity to other industrial sites, and the detection of aluminum and iron at concentrations exceeding Federal and State maximum contaminant levels, it would not be advisable or prudent to use the resource as a potable or non-potable water supply. The Site 40 Basewide Groundwater investigation, in progress, should be reviewed prior to considering use, if any of groundwater beneath Site 12.