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NAS WHITING FIELD
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FINAL RECORD OF DECISION FOR SITE 30 NAS WHITING FIELD FL
9/13/2004
TETRA TECH NUS

RECORD OF DECISION
FOR
SURFACE AND SUBSURFACE SOIL AT
SITE 30, SOUTH FIELD MAINTENANCE HANGAR

NAVAL AIR STATION
WHITING FIELD
MILTON, FLORIDA
EPA ID No. FL2170023244

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:

Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

Submitted by:

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CONTRACT NO. N62467-94-D-0888
CONTRACT TASK ORDER 0028

SEPTEMBER 2004

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Naval Facilities Engineering Command

CERTIFICATION OF TECHNICAL DATA CONFORMITY

The Contractor, Tetra Tech NUS Inc., hereby certifies, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-94-D-0888 are complete, accurate, and comply with all requirements of this contract. The work and professional opinions rendered in this report were conducted or developed in accordance with commonly accepted procedures consistent with applicable standards of practice.

DATE: 13 September 2004

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ACRONYMS

APU	all-purpose universal (thinner)
ARAR	applicable or relevant and appropriate requirement
BaPEq	benzo(a)pyrene equivalent
bls	below land surface
CCI	CH2M HILL Constructors, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CG	cleanup goal
COC	constituent of concern
COPC	constituent of potential concern
cPAH	carcinogenic PAH
CSF	cancer slope factor
ECs	engineering controls
ELCR	excess lifetime cancer risk
ERA	ecological risk assessment
F.A.C.	*Florida Administrative Code*
FDEP	Florida Department of Environmental Protection
FSA	Feasibility Study Addendum
FS	Feasibility Study
HHRA	human health risk assessment
HI	Hazard Index
IR	Installation Restoration
LUC	land use control
MEK	methyl ethyl ketone
mg/kg	milligrams per kilogram
NAS	Naval Air Station
Navy	Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NPW	Net Present Worth
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
PAH	polynuclear aromatic hydrocarbon
PPE	personal protective equipment
PRG	Preliminary Remediation Goal
RA	remedial action
RAB	Restoration Advisory Board
RAO	remedial action objective
RBC	Risk-Based Concentration

RD	Remedial Design
RfD	reference dose
RI	remedial investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SCTL	soil cleanup target level
SSL	Soil Screening Level
SVOC	semivolatile organic compound
TBC	to be considered
TCE	trichloroethene
TEF	Toxicity Equivalency Factor
TRPH	total recoverable petroleum hydrocarbons
TSDF	treatment, storage, and disposal facility
TtNUS	Tetra Tech NUS, Inc.
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

1.0 DECLARATION OF THE RECORD OF DECISION

1.1 SITE NAME AND LOCATION

Site 30, South Field Maintenance Hangar, is a parcel of land approximately 4.3 acres in size and located at the South Field Industrial Area at Naval Air Station (NAS) Whiting Field, Milton, Florida (Figure 1-1). The site includes Building 1406, the adjacent wash rack area, and the location of four former waste oil/kerosene underground storage tanks (USTs) west of Building 1406.

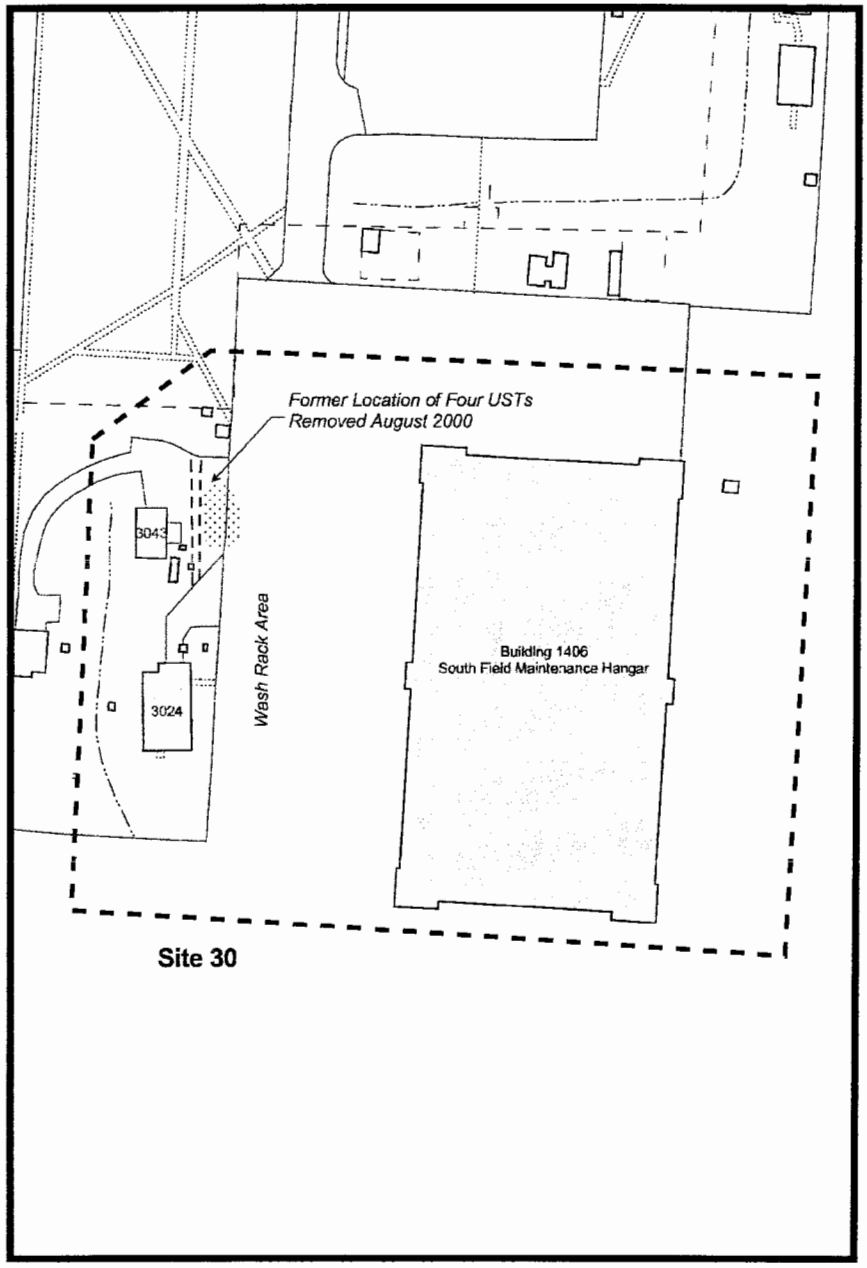
1.2 STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action (RA) for surface and subsurface soils at Site 30, NAS Whiting Field. Groundwater at NAS Whiting Field has been identified as a separate site (Site 40, Basewide Groundwater) and will be addressed in a future decision document. The selected action was chosen by the Navy and the United States Environmental Protection Agency (USEPA) in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The information supporting the selection of this RA is contained in the Administrative Record for this site. The NAS Whiting Field Information Repository, including the Administrative Record, is located at the West Florida Regional Library, Milton Branch, 805 Alabama Street, Milton, Florida, 32570, (850) 623-5565.

The Florida Department of Environmental Protection (FDEP) concurs with the selected remedy.

1.3 ASSESSMENT OF THE SITE

Prior to the removal of four USTs from the site in August 2000 [CH2M Hill Constructors, Inc. (CCI), 2001], investigation and evaluation of constituents present in the surface and subsurface soils at Site 30 identified six inorganic analytes and total recoverable petroleum hydrocarbons (TRPH) exceeding State of Florida (FDEP, 1999) or USEPA (USEPA, 1999) risk-based screening values for residential land-use. Approximately 232 cubic yards of TRPH-contaminated soil was excavated and disposed of off-site during the UST removal project. Post-removal soil sampling results, changed status of selected inorganic analytes, and changed USEPA screening criteria were evaluated in a Feasibility Study (FS) Addendum (FSA) [Tetra Tech NUS, Inc. (TtNUS), 2004]. The FSA identified one volatile organic compound [Trichloroethene (TCE)], one semivolatile organic compound [benzo(a)pyrene] and TRPH as exceeding the FDEP (FDEP, 1999) or USEPA (USEPA, 2002) risk-based screening values for residential land-use. Based on the anticipated future commercial/industrial use of the site the only surface soil constituent of concern (COC) identified in the FSA was TRPH. For subsurface soil, TRPH and benzo(a)pyrene [expressed in terms of benzo(a)pyrene equivalents (BaPEq)] were identified as COCs.



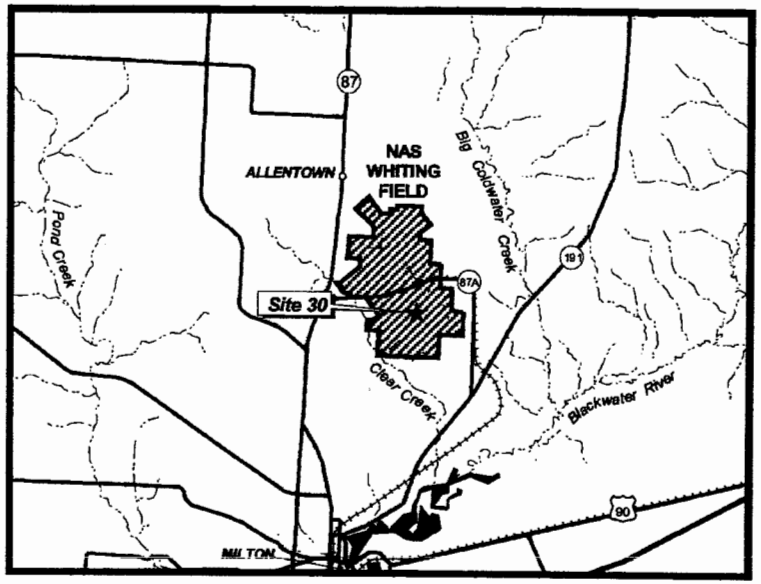


FIGURE 1-1
SITE 30 LOCATION AND AREA MAP
RECORD OF DECISION
NAS WHITING FIELD, MILTON, FLORIDA

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Risks for exposure to surface and subsurface soils at Site 30 were evaluated in a revised Human Health Risk Assessment (HHRA). A summary of human health risks is provided in Section 2.6.1 of this Record of Decision (ROD).

The results of the ecological risk assessment (ERA) presented in the Remedial Investigation (RI) indicate potential ecological risks at the site are acceptable, and further ecological study is unwarranted because the site is heavily industrialized and severely limited in the quantity and quality of habitat. Site 30 is characterized by mowed turfgrass surfaces, heavy human activity, and high vehicle/aircraft traffic. As a result of the heavy human activity and vehicle and aircraft noise, terrestrial wildlife is deterred from using the site. Most importantly, the site comprises only a small portion of the home ranges of most of the terrestrial wildlife species found on the base. A discussion of the potential ecological risk is presented in Section 2.6.2 of this ROD.

The response actions selected in this ROD are necessary to protect the public health, welfare, or the environment from actual or threatened releases of hazardous substances into the environment or of pollutants or contaminants from this site presenting a possible imminent and substantial endangerment to public health or welfare.

1.4 DESCRIPTION OF THE SELECTED REMEDY

This ROD presents the final action for surface and subsurface soils at Site 30 and is based upon the results of the following site-related documents: the RI (TtNUS, 1999); the FS (TtNUS, 2001a); the Proposed Plan (TtNUS, 2001b); and the FSA (TtNUS, 2004). This ROD addresses only surface and subsurface soils at Site 30.

Actual or potential groundwater contamination at NAS Whiting Field has been identified as a separate site (Site 40, Basewide Groundwater) and will be addressed in a future decision document. Sediment and surface water are not present at Site 30. The selected remedy for Site 30 is Alternative 2, Engineering Controls (ECs) and Land Use Controls (LUCs). The purpose of such controls is to prevent future exposures to both surface and subsurface soils posing possible unacceptable human health risks. The selected remedy was determined based on an evaluation of site conditions, site-related risks, reasonably anticipated future land use(s), applicable or relevant and appropriate requirements (ARARs), and remedial action objectives (RAOs).

The major components of the selected remedy are as follows:

- ECs in the form of existing concrete and asphalt cover areas on the site.
- LUCs prohibiting the digging into or disturbing of existing concrete or asphalt cover areas on the site.
- LUCs prohibiting future residential development of the site.

If the selected ECs and LUCs are shown to be ineffective in preventing unacceptable exposures to contaminated surface or subsurface soils, then other remedial approaches will be evaluated and may be implemented. Specific implementation and maintenance actions to ensure the viability of the selected remedy will be described in a Remedial Design (RD) document to be prepared in accordance with USEPA guidance. The document will be submitted to USEPA and FDEP for review and comment along with all other required post-ROD documents.

The Navy estimates the present worth cost of the selected remedy to be $82,000 over a 30 year period. The selected remedy must remain in place indefinitely, unless all contaminated surface and subsurface soils are removed or subsequent sampling demonstrates they meet then applicable criteria for unrestricted use of the site.

1.5 STATUTORY DETERMINATIONS

The remedy selected for surface and subsurface soils at Site 30 is protective of human health and the environment, complies with federal and state requirements legally applicable or relevant and appropriate to the RA, is cost effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

This remedy does not satisfy the statutory preference for treatment as a principal element of the remedy (i.e., reduction in the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants through treatment as a principal element) because contaminated soils will remain in place. Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on site above residential health-based levels, a statutory review will be conducted every five years after initiation of the RA to ensure the remedy continues to be protective of human health and the environment.

1.6 DATA CERTIFICATION CHECKLIST

The information required to be included in the ROD is summarized on Table 1-1. These data are presented in Section 2.0, Decision Summary, of this ROD. Additional information, if required, can be found in the NAS Whiting Field Administrative Record for Site 30.

1.7 AUTHORIZING SIGNATURES

Joan Platz

Joan Platz
Captain, United States Navy
Commanding Officer, NAS Whiting Field

25 Sep 2004
Date

Winston A. Smith

Winston A. Smith
Director, Waste Management Division
USEPA, Region IV

9-30-04
Date

2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION

Site 30, South Field Maintenance Hangar, is a parcel of land approximately 4.3 acres in size and located in the South Field Industrial Area at NAS Whiting Field (Figure 1-1). The site includes Building 1406, the adjacent wash rack area, and the location of the four former waste oil/kerosene USTs west of Building 1406 (Figure 2-1).

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.2.1 NAS Whiting Field History

NAS Whiting Field was placed on the National Priorities List (NPL) by the USEPA in June 1994. Following the listing of NAS Whiting Field on the NPL, remedial response activities have been completed pursuant to CERCLA.

The first environmental studies for the investigations of waste handling and/or disposal sites at NAS Whiting Field were conducted during the Initial Assessment Study (Envirodyne Engineers, Inc., 1985). The record search indicated, throughout its years of operation, NAS Whiting Field generated a variety of wastes related to pilot training, the operation and maintenance (O&M) of aircraft and ground support equipment, and facility maintenance programs.

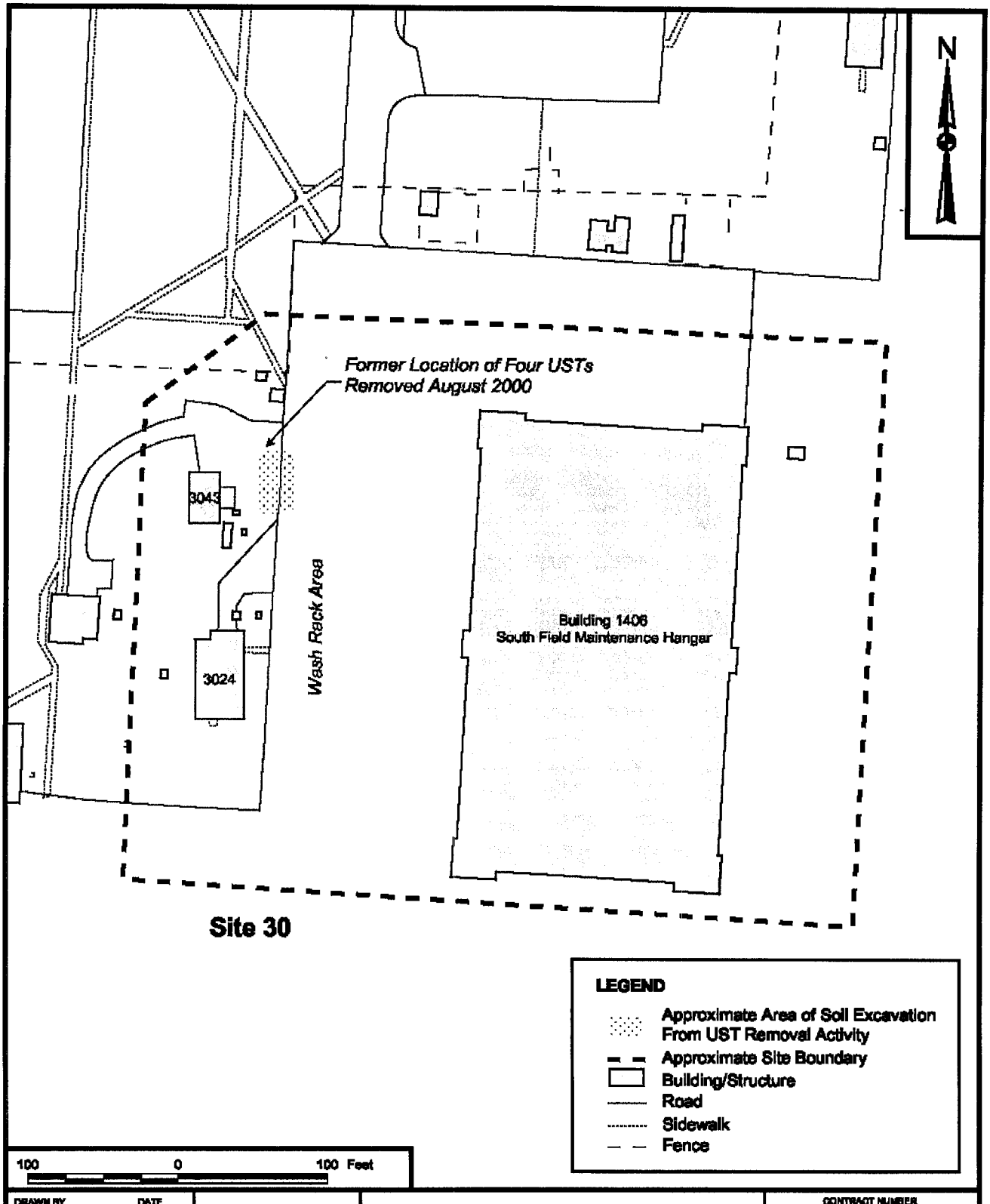
2.2.2 Site 30 History

The South Field Maintenance Hangar was constructed in the mid-1940s to support maintenance service to training aircraft. Activities at this site included engine maintenance, corrosion control, and aircraft cleaning. Maintenance activities generated waste engine oil, cleaning solvents, and paint stripping wastes. Other wastes generated by maintenance operations included mineral spirits, methyl ethyl ketone (MEK), hydraulic fluid, and all-purpose universal (APU) thinner. Waste oil from fixed-wing aircraft and helicopter maintenance was reportedly poured into the USTs located adjacent to the wash rack. The waste oil was periodically removed from the tanks by a contractor for off-base disposal. The four steel waste oil/kerosene USTs, ranging in size from approximately 850 to 1,850 gallons, were located on the site until their removal in August 2000 (CCI, 2001).

2.2.3 Site Investigations

Elevated concentrations of both organic and inorganic constituents were identified at Site 30 during various investigations as summarized in Table 2-1.

An FS (TtNUS, 2001a) was conducted to identify the best approach to address soil contamination identified in the RI. The FS identified estimated areas impacted by COCs and evaluated four remedial



DRAWN BY: J. LAMEY	DATE: 11/17/03	SITE 30 PLAN RECORD OF DECISION NAS WHITING FIELD, MILTON, FLORIDA	CONTRACT NUMBER: 0052
CHECKED BY:	DATE:		APPROVED BY: — DATE: —
COST/SCHEDULE-AREA			APPROVED BY: — DATE: —
SCALE: AS NOTED	NAVFAC		DRAWING NO.: FIGURE 2-1 REV: 0

TABLE 2-1

INVESTIGATIVE HISTORY
RECORD OF DECISION
SITE 30, SOUTH FIELD MAINTENANCE HANGAR
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA
PAGE 1 OF 2

Date of Field Activities	Investigation Title	Activities	Findings
1985	*Initial Assessment Study of Naval Air Station Whiting Field, Milton, Florida, Final Report* (Envirodyne Engineers, Inc., 1985)	• Review of historical records and personal interviews	• Maintenance activities at the South Field Maintenance Hangar generated waste engine oil, cleaning solvents, and paint stripping waste. • Waste oil from fixed-wing aircraft and helicopter maintenance was reportedly stored in USTs located adjacent to the wash rack.
Phase I - 1992 Phase II-A 1992 - 1994 Phase II-B 1994 - 1996 Phase II-C 1998	*Remedial Investigation Report for Surface and Subsurface Soil, Sites 3, 4, 6, 30, 32, and 33 Naval Air Station Whiting Field, Milton, Florida* (TtNUS, 1999)	• Field inspections and review of aerial photographs • Soil gas survey • Installation of soil borings • Collection and analysis of surface soil samples • Collection and analysis of subsurface soil samples • Installation and sampling of groundwater monitoring wells • HHRA • ERA	• The concentrations of aluminum, arsenic, chromium, iron, manganese, and TRPH in soil were found to exceed site-specific background concentrations and either USEPA Region III RBCs or Florida SCTLs. • The HHRA determined the carcinogenic risk from exposure to surface soil was within USEPA's acceptable risk range for current and future receptors at Site 30. • The total ELCR associated with exposure to surface soil by the older child trespasser (1.4E-06), adult trespasser (2.2E-06), occupational worker (6.3E-06), and hypothetical on-site resident (child/adult) (3.5E-05), exceeded FDEP's threshold level of 1.0E-06, primarily due to the presence of arsenic. • The non-carcinogenic HIs associated with ingestion and direct contact of soil under current and hypothetical future land uses are below the USEPA and FDEP target of 1.0, except for the on-site child resident, with an HI of 1.42. • The ERA does not predict unacceptable risks to plants or animals from chemicals present in surface soil at Site 30, due to the limited quantity and quality of habitat present at the site.
2000	*Project Completion Report, UST Removal at Sites 30, 32, and 33, Naval Air Station Whiting Field, Milton, Florida* (CCI, 2001)	• Excavation and removal of soil around the four previously abandoned USTs • Removal of four USTs • Collection and analysis of confirmation soil samples from bottom and sidewalls of excavation	• Excavation area was approximately 25 by 40 feet, 10 feet deep. Approximately 232 cubic yards of TRPH-contaminated soil were removed as nonhazardous waste. • Liquids and minor amounts of sand were found in the four abandoned Site 30 USTs. Approximately 3,050 gallons of hazardous waste and 1,200 gallons of nonhazardous fuel and water were disposed. • Confirmation soil samples showed exceedances of residential FDEP SCTLs for TRPH and four cPAH compounds.

TABLE 2-1

INVESTIGATIVE HISTORY
RECORD OF DECISION
SITE 30, SOUTH FIELD MAINTENANCE HANGAR
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA
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Date of Field Activities	Investigation Title	Activities	Findings
2001	*Feasibility Study for Surface and Subsurface Soil at Sites 3, 4, 6, 30, 32, and 33 NAS Whiting Field, Milton Florida (TtNUS 2001a)*	• Determined COCs for Site 30 • Estimated area and volume of contaminated soil • Evaluated Remedial Alternatives	• Surface Soil COCs identified as arsenic and TRPH. • Subsurface soil COC identified as TRPH. • Total estimated volume of contaminated soil is 3,429 cubic yards.
2001	*Proposed Plan, Site 30, South Field Maintenance Hanger, NAS Whiting Field, Milton, Florida (TtNUS, 2001b)*	• Established public comment period	• Preferred remedial action is LUCs. • No public comments received. • Arsenic no longer identified as a COC.
2003	*Feasibility Study Addendum for Surface and Subsurface Soil at Site 30, South Field Maintenance Hangar, Naval Air Station Whiting Field, Milton, Florida* (TtNUS, 2004)	• Revised COPCs and COCs based on Region IX PRGs and new subsurface data from UST removal. • Revised HHRA.	• Revised COC list includes TRPH in surface and subsurface soil; benzo(a)pyrene equivalents in subsurface soil. • Total estimated volume of contaminated soil is 2820 cubic yards. • ELCRs for hypothetical future resident, typical construction worker are 3.3E-05 and 9.6E-07, respectively.

Notes: CCI = CH2M HILL Constructors, Inc.
COC = Constituent of Concern
COPC = Constituent of Potential Concern
cPAH = carcinogenic Polynuclear Aromatic Hydrocarbon
ELCR = incremental lifetime cancer risk
ERA = Ecological Risk Assessment
FDEP = Florida Department of Environmental Protection
HHRA = Human Health Risk Assessment
HI = Hazard Index
PRGs = Preliminary Remediation Goals
RBCs = Risk-Based Concentrations
SCTL = Soil Cleanup Target Level
TRPH = total recoverable petroleum hydrocarbons
TtNUS = Tetra Tech NUS, Inc.
USEPA = United States Environmental Protection Agency
UST(s) = underground storage tank(s)

alternatives. Three of the four alternatives included the UST removal as a component. The Navy scope of work for CCI identified Sites 30, 32, and 33 as having abandoned in place USTs requiring remedial action/removal. Site 32, North Field Maintenance Hangar, and Site 33, Midfield Maintenance Hangar, are being addressed in separate RODs. Documentation of the waste oil UST removal for Site 30 is included in the Project Completion Report, UST Removal at Sites 30, 32, and 33 (CCI, 2001). The USTs, their contents, and a small amount of adjacent petroleum-contaminated soil were removed as a potential source of contamination.

An FSA (TtNUS, 2004) was conducted to address the following activities undertaken and determinations made since the original FS was submitted:

- UST Removal - In August 2000, the four USTs at Site 30 were removed along with a small amount of petroleum-contaminated soil (CCI, 2001). UST tank pit confirmation soil sampling identified the following contaminants at concentrations exceeding regulatory screening levels: naphthalene, 1,2,4-trimethylbenzene, 1-methylnapthalene, 2-methylnapthalene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and TRPH.
- Arsenic, originally identified as a COC, was determined to be naturally occurring at Site 30. Based on additional review of inorganic data from the facility and area soil geology in April 2001, the observed arsenic values were determined to represent naturally occurring levels (FDEP, 2001). Because the identified human health risks associated with arsenic are now considered to be due to naturally occurring levels, arsenic has not been retained as a COC, and remediation of arsenic in surface and subsurface soil is not required at Site 30.
- USEPA Region IX Preliminary Remediation Goals (PRGs) used as Screening Criteria - Over the course of the investigations at this site, USEPA Region IV changed its screening criteria for evaluation of hazardous waste-related sites from USEPA Region III Risk-Based Concentrations (RBCs) to USEPA Region IX PRGs (USEPA, 2002). Therefore, analytical results are now compared to the USEPA Region IX PRGs and FDEP soil cleanup target levels (SCTLs) (FDEP, 1999) for commercial/industrial exposure.
- The individual metal constituents, aluminum, iron, manganese and vanadium, have no direct evidence of site-related use at Site 30 and the process and procedures at this site did not likely contribute to the presence of these inorganic analytes in surface or subsurface soil. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and of naturally occurring levels throughout the southeastern United States. The RI for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field" presenting the technical basis for this determination. Considering the information presented above,

aluminum, iron, manganese and vanadium are not considered chemicals of potential concern (COPCs) for Site 30 surface and subsurface soils.

The FSA for this site included a revised HHRA and a revised COC selection. The revised COC list presented in the FSA includes benzo(a)pyrene, a constituent detected in soil confirmation samples from the UST removal project. Additionally, the FSA evaluated the impact of these changes on the remedial alternatives for surface and subsurface soils identified in the original FS. In summary, the addition of benzo(a)pyrene as a subsurface soil COC has resulted in no significant changes to the CERCLA evaluation of remedial alternatives for Site 30.

A Proposed Plan was published in June 2001 based on the findings of the RI and FS. This Proposed Plan for surface and subsurface soils proposed LUCs, an alternative evaluated in the FS and modified to eliminate arsenic remediation (surface soil removal) and the UST removal. Because conditions changed, risk screening criteria changed, and other determinations were made since the original FS was prepared, the Navy and USEPA determined a HHRA was necessary. The FSA presented the results of the revised HHRA. The FSA stated the selection of Alternative 2 (LUCs and ECs) as the preferred remedy for surface and subsurface soils at Site 30 remains unchanged.

Site 30 has undergone several phases of investigations since 1985. Table 2-1 presents a summary of these activities.

NAS Whiting Field presently consists of two air fields (North and South Fields) and serves as a naval aviation training facility providing support facilities for flight and academic training. No change is anticipated in the future land use for Site 30.

2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI report (TtNUS, 1999), the FS (TtNUS, 2001a), the Proposed Plan (TtNUS, 2001b) and the FSA (TtNUS, 2004) for Site 30 were made available to the public for review in July 2001 and August 2004. 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.

The notice of availability of site-related documents (RI, FS, and Proposed Plan) in the Pensacola News Journal and the Santa Rosa Press Gazette on 1 July and 30 June 2001, respectively, targeted the communities closest to NAS Whiting Field. The availability notice presented information on the site-related documents for Site 30 and invited community members to submit written comments on the Proposed Plan.

A public comment period was held from 12 July through 11 August 2001, to solicit comments on the Proposed Plan (TtNUS, 2001b). The comment period included an opportunity for the public to request a public meeting; however, a public meeting was not held because one was not requested. The site-related documents were placed in the Information Repository and were made available to the public for review. As indicated in Appendix A, Responsiveness Summary, no public comments were received and no public meeting was requested.

2.4 SCOPE AND ROLE OF REMEDIAL ACTION SELECTED FOR SITE 30

As with many Superfund sites, the problems are complex at NAS Whiting Field. Site 30, the subject of this ROD, addresses contamination in surface and subsurface soils and presents the final response action as ECs and LUCs. The groundwater at NAS Whiting Field has been designated as a separate site (Site 40, Basewide Groundwater) and is not addressed in this ROD.

2.5 SITE CHARACTERISTICS

Site 30 is approximately 4.3 acres in size and is characterized by concrete, asphalt, buildings, small areas of mowed turfgrass, and heavy human and aircraft activity. The site is flat, with very little topographical relief.

2.5.1 Nature and Extent of Contamination

Historical aerial photographs and engineering drawings, provided by the Navy, were evaluated during the planning phases of the RI. The objective of the evaluation was to determine the operational history of Site 30 and to verify earlier historical accounts.

As part of the RI conducted for Site 30, data were collected to determine the nature and extent of releases of site-derived contaminants in surface and subsurface soil, to identify potential pathways of migration in surface and subsurface soil, and to evaluate risks to human and ecological receptors. Investigations prior to the UST removal project at Site 30 indicated contamination at the site posed unacceptable risks to human receptors from exposure to soil for both commercial/industrial and residential land-use scenarios. Arsenic and TRPH were identified as the primary risk drivers. However, the FSA re-evaluated the human health risks based on changed conditions at the site, changed risk screening criteria, and changed status of selected inorganic analytes. A summary of those changed conditions and risk criteria presented in Section 2.2 of this ROD is listed below.

- Observed arsenic, aluminum, iron, manganese, and vanadium values were determined to represent naturally occurring levels at Site 30.
- Four USTs and approximately 232 cubic yards of TRPH contaminated soil were removed in August 2000.
- USEPA Region IX PRGs required as screening criteria.

Based upon activities undertaken and determinations made since the original FS was prepared, as discussed in Section 2.2, a revised HHRA was conducted. Based on the results of the revised HHRA, the FSA concluded Alternative 2, ECs and LUCs for surface and subsurface soils, remains the preferred remedy for Site 30. Therefore, this ROD documents the selected RA for Site 30 as ECs and LUCs for surface and subsurface soils. The groundwater at NAS Whiting Field has been designated as a separate site (Site 40, Basewide Groundwater) and is not addressed in this ROD.

2.5.1.1 Surface Soil

Surface soil sampling was conducted at Site 30 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. Constituents detected in surface soil at Site 30 included volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), TRPH, pesticides, and inorganic analytes. A complete list of all constituents analyzed for during the RI activities and their detected concentrations in surface soil is available in the RI report (TtNUS, 1999).

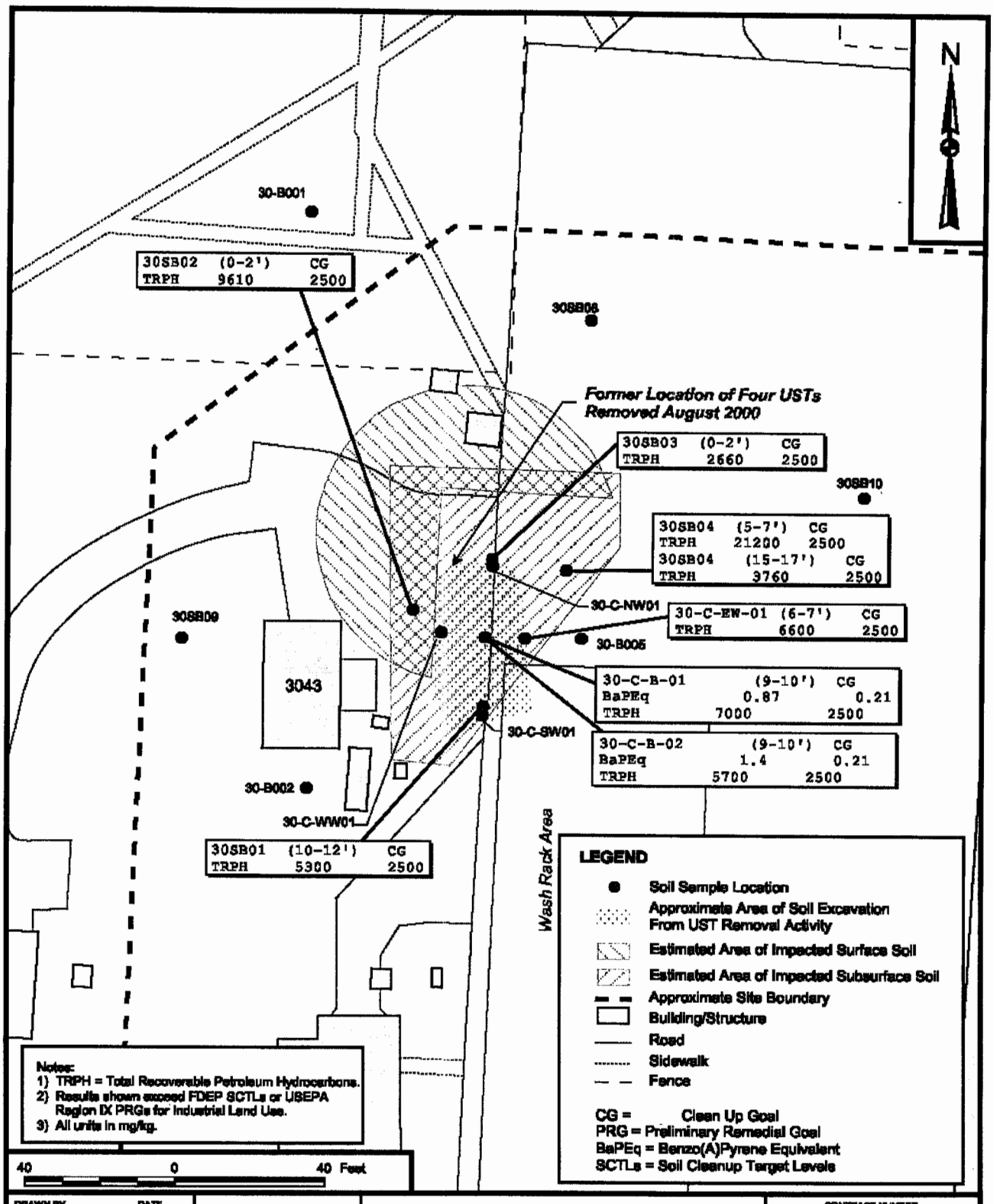
The FSA conducted a re-evaluation of the constituents in the surface soil using the post-removal analytical data and the RI data. The screening criteria used included the FDEP SCTLs and USEPA Region IX PRGs. This re-evaluation of the constituents present in the surface soil at Site 30 identified one organic compound (TCE) and TRPH as exceeding FDEP SCTLs (FDEP, 1999) or USEPA Region IX PRGs (USEPA, 2002) risk-based human health screening values for residential land use.

Of these constituents, only TRPH was identified in the FSA as a surface soil COC exceeding chemical-specific criteria for the current and anticipated future commercial/industrial use of the site. The sample locations are outside the area excavated during the UST removal project. Figure 2-2 shows the estimated extent of surface soil contamination exceeding the chemical-specific criteria for the current and anticipated future commercial/industrial use of the site.

2.5.1.2 Subsurface Soil

Subsurface soil sampling was conducted at Site 30 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. Constituents detected in subsurface soil at Site 30 included VOCs, SVOCs, TRPH, pesticides, and inorganic analytes. A complete list of all constituents analyzed for during the RI activities and their detected concentrations in subsurface soil is available in the RI report (TtNUS, 1999).

The FSA conducted a re-evaluation of the constituents in the subsurface soil using post-removal analytical data and the RI data. The screening criteria used included the FDEP SCTLs and the USEPA Region IX PRGs. Post-removal evaluation of the constituents present in the subsurface soil at Site 30 identified TRPH and benzo(a)pyrene as exceeding FDEP SCTLs or USEPA Region IX risk-based human


N
30-B001
30SB02 (0-2') CG
TRPH 9610 2500
30SB08
Former Location of Four USTs
Removed August 2000
30SB03 (0-2') CG
TRPH 2660 2500
30SB10
30SB04 (5-7') CG
TRPH 21200 2500
30SB04 (15-17') CG
TRPH 3760 2500
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30-C-EW-01 (6-7') CG
TRPH 6600 2500
30-B005
30SB09
3043
30-C-B-01 (9-10') CG
BaPEq 0.87 0.21
TRPH 7000 2500
30-C-SW01
30-C-B-02 (9-10') CG
BaPEq 1.4 0.21
TRPH 5700 2500
30-B002
30-C-WW01
30SB01 (10-12') CG
TRPH 5300 2500
Wash Rack Area
LEGEND
Soil Sample Location
Approximate Area of Soil Excavation From UST Removal Activity
Estimated Area of Impacted Surface Soil
Estimated Area of Impacted Subsurface Soil
Approximate Site Boundary
Building/Structure
Road
Sidewalk
Fence
CG = Clean Up Goal
PRG = Preliminary Remedial Goal
BaPEq = Benzo(A)Pyrene Equivalent
SCTLs = Soil Cleanup Target Levels
Notes:
1) TRPH = Total Recoverable Petroleum Hydrocarbons.
2) Results shown exceed FDEP SCTLs or USEPA Region IX PRGs for Industrial Land Use.
3) All units in mg/kg.
40 0 40 Feet
DRAWN BY J. LAMEY
DATE 8/2/04
CHECKED BY
DATE
COST/SCHEDULE-AREA
SCALE AS NOTED
NAVFAC
SITE 30 ESTIMATED AREAS IMPACTED BY
CONSTITUENTS OF CONCERN
IN SURFACE AND SUBSURFACE SOILS
RECORD OF DECISION
NAS WHITING FIELD, MILTON, FLORIDA
CONTRACT NUMBER 0052
APPROVED BY
DATE
APPROVED BY
DATE
DRAWING NO. FIGURE 2-2
REV 0

health screening values for commercial/industrial land use. TRPH and benzo(a)pyrene have been identified as subsurface soil COCs exceeding chemical-specific criteria for the current and anticipated future commercial/industrial use of the site. Benzo(a)pyrene was the principal carcinogenic polynuclear aromatic hydrocarbon (cPAH) detected; however, all cPAHs detected in the soil at Site 30 were regarded as a family of compounds and their concentrations were expressed in terms of BaPEqs. BaPEqs is now considered a COC for this site.

2.5.2 Ecological Habitat

Site 30 is severely limited in the quantity and quality of habitat for ecological receptors because it is heavily industrialized and is characterized by concrete, asphalt, buildings, small areas of mowed turfgrass, heavy human activity, high vehicle and aircraft traffic, and noise. Most importantly, the site comprises only a small portion of the home ranges of most of the terrestrial wildlife species found on the base.

2.5.3 Migration Pathways

TRPH and BaPEqs detected in soil are the primary COCs at Site 30. The primary agents of migration acting on soil include wind, water, and human activity. Soil can also act as a source medium, allowing the COCs to be transported to other media.

Transport of COCs from soil via wind is not expected to be a major transport mechanism due to the presence of vegetation and concrete/asphalt pavement at Site 30. Vegetative and concrete covers are an effective means of limiting wind erosion of soil. Contaminated fugitive dust generated by construction activities, however, is of potential concern.

Humans and, to a lesser extent, ecological receptors 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 30, human activity is not a major transport mechanism for the COCs in soil.

The transport of soil by water and, therefore, TRPH and BaPEq in soil, via the mechanisms of physical transport of soil or the leaching of constituents from the soil to groundwater, is a potential concern. Soil erosion—the physical transport of soil via surface water runoff—is currently not considered a major mechanism for the transport of the COCs in soil at Site 30 because of (1) the low grade (slope) of the land surface at the site; (2) the vegetation or concrete/asphalt covering the site; and (3) the nature of the constituents remaining in the soil at the site.

TRPH and BaPEq in the soil at Site 30 are likely to remain attached to the soil because they adsorb readily to soil. Leaching of constituents from the soil to the groundwater, if any, will be evaluated as part of the RI/FS for Site 40, Basewide Groundwater.

2.6 SUMMARY OF SITE RISKS

A risk assessment was completed for Site 30 to predict whether the site would pose current or future threats to human health or the environment if no action were taken. Both a HHRA and an ecological risk assessment (ERA) were performed for Site 30. The risk assessments evaluated the contaminants detected in site media during the RI and provided the basis for selecting the RA.

A revised HHRA was conducted to evaluate the changed conditions at the site and changes in the regulatory screening criteria. This section of the ROD summarizes the results of the ERA and the revised HHRA.

2.6.1 HHRA

An HHRA was conducted to characterize the risks associated with potential exposures to site-related contaminants at Site 30 for human receptors. Details of the HHRA are provided in Chapter 6.0 of the RI Report (TtNUS, 1999). Due to changed conditions at the site and changes in the regulatory screening criteria, a revised HHRA was conducted. Details of the revised HHRA are provided in Section 2.2 of the FSA (TtNUS, 2004).

The revised HHRA conservatively estimates the potential risk to human health considering historical data, recent UST removal analytical data, and selected inorganic analytes (arsenic, aluminum, iron, magnesium, and vanadium) being present at naturally occurring concentrations at Site 30. The new UST removal subsurface analytical data was combined with previous subsurface soil analytical data collected from 2 to 15 feet below land surface (bls) to evaluate human health risk due to subsurface soil. Additional surface soil analytical data was not collected during UST removal activities; therefore, human health risks due to surface soil were not recalculated. The human health risk due to surface soil remains the same as reported in the RI except the calculated risk due to arsenic is deleted since arsenic is present at naturally occurring concentrations. The major sections of the revised HHRA include: (1) identification of COCs; (2) exposure assessment; (3) toxicity assessment; and (4) risk characterization.

2.6.1.1 Human Health COCs

The human health COCs selected for subsurface soil at Site 30 were TRPH and BaPEq. These constituents were the focus of the revised risk assessment. The COC selected for surface soil was TRPH.

2.6.1.2 Exposure Assessment

Site 30 was evaluated to identify the populations potentially coming into contact with site-related constituents and the pathways where exposure might occur. Two potential media may be sources of human exposure: surface soil and subsurface soil.

The exposure assessment for the revised HHRA was conducted to identify the pathways of potential human exposure, the magnitude of potential exposure, and the frequency and duration of exposure. The regional and site-specific environmental setting of Site 30 is discussed in the RI (TtNUS, 1999). The site is nonresidential and is expected to remain nonresidential in the foreseeable future. Given the current and anticipated future use of the site, only an excavation worker (construction worker) is likely to be exposed to COCs in subsurface soil at Site 30. Future residential use of the site is not anticipated for military or non-military housing; however, the residential pathway was retained for completeness and comparison purposes.

The following exposure pathways were considered for the revised HHRA:

- Soil ingestion
- Dermal contact
- Inhalation of particulates and volatiles in air

2.6.1.3 Toxicity Assessment

Toxicity assessment is a two-step process whereby the potential hazards associated with route-specific exposure to a given constituent are (1) identified by reviewing relevant human and animal studies; and (2) quantified through analysis of dose-response relationships. The 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 non-carcinogenic risks associated with each COPC and rate of exposure.

In the revised human health risk screening assessment, the toxicity assessment incorporates those toxicity values used to derive the USEPA Region IX PRGs and FDEP SCTLs. The maximum concentration of each constituent was used as the exposure point concentration for the risk-screening. However, USEPA Region IV guidance (USEPA, 1995) was followed to determine a BaPEq concentration representative of total cPAHs in each sample by using a Toxicity Equivalency Factor (TEF) to convert each PAH concentration to a BaPEq concentration. As with other analytes, the maximum BaPEq concentration in an environmental media was used to estimate potential risks.

2.6.1.4 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 reasonable maximum exposure to site contamination. For cancer-causing constituents, risk is estimated to be a probability. For example, a particular exposure to constituents at a site may present a 1 in 1,000,000 (or 1.0E-06) chance of development of cancer over an

estimated lifetime of 70 years. The USEPA allowable carcinogen risk range is 1.0E-04 to 1.0E-06, and the FDEP acceptable excess lifetime cancer risk (ELCR) is 1.0E-06.

For non-carcinogenic constituents, the dose a receptor may be exposed to 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 1.0 suggests adverse effects are possible.

Risk characterization for the risk-screening of Site 30 consists of calculating a ratio between the maximum detected concentration of a chemical in an environmental medium and the PRG and soil screening levels (SSLs) developed for construction workers using methodology presented in Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites, December 2002, Office of Solid Waste and Emergency Response (OSWER) 9355.4-24. Carcinogenic and non-carcinogenic effects were evaluated separately. Ratios were calculated for both the residential land-use scenario and a construction worker land-use scenario. The human health risk estimates produced for the residential scenario are not reflective of actual current or reasonably anticipated future conditions at the sites under investigation because the current and anticipated land use at the sites is military industrial, and the only likely exposure to subsurface soil at Site 30 would be by a construction (excavation) worker. However, the risk characterization based on exposure assumptions reflect a residential land-use scenario is conservative and is helpful for information and comparison purposes.

2.6.2 ERA

The purpose of the ERA for Site 30 was to evaluate the potential for adverse effects to ecological receptors at the South Field Maintenance Hangar. A conservative screening level ERA was performed according to the most recent USEPA guidance. Components of the screening level ERA included (1) preliminary problem formulation; (2) preliminary ecological effects evaluation; (3) preliminary exposure estimate; and (4) preliminary risk calculation. In addition, Step 3A, Refinement of Chemicals of Potential Concern, was also performed in accordance with USEPA and Navy ERA guidance. The ERA completed for Site 30 considered exposure of terrestrial plants, terrestrial invertebrates, and wildlife receptors to chemicals in surface soil at the site. All constituents detected in surface soil at Site 30 including VOCs, SVOCs, TRPH, pesticides, and inorganic analytes were evaluated during the screening level assessment. A complete list of all constituents sampled during the RI and their concentrations in surface soil, if detected, is available in the RI report (TtNUS, 1999).

The site is severely limited in the quantity and quality of habitat because it is heavily industrialized and characterized by concrete, asphalt, buildings, small areas of mowed turfgrass, heavy human activity, and vehicle and aircraft traffic and noise. Most importantly, the site comprises only a small portion of the

home ranges of most of the terrestrial wildlife species found on the base. Therefore, reduction in growth, survival, and reproduction of small mammal and bird populations at and near the site due to chromium, lead, or other chemicals evaluated in the ERA is unlikely. For these reasons, potential risks are acceptable and further ecological study at Site 30 is unwarranted.

2.6.3 Risk Summary

2.6.3.1 HHRA

Actual or threatened releases of hazardous substances from Site 30 present a current and future potential threat to public health and welfare.

The ELCR calculated for the hypothetical future resident and the typical construction worker (based on PRGs and construction worker SSLs, respectively), are 3.3E-05 and 9.6E-07, respectively. The risk estimate for the construction worker does not exceed the USEPA target range often used to evaluate the need for environmental remediation, or the State of Florida benchmark of 1.0E-06 [Florida Administrative Code (F.A.C.) 62-780]. The risk estimate for the resident does exceed the State of Florida benchmark of 1.0E-06, although it is within the USEPA target risk range. It should be noted both the residential and construction worker risks were estimated using the maximum detected concentration; therefore, the risk may be overestimated. BaPEq is the main risk driver, responsible for 91 percent of the carcinogenic risk; however, benzo(a)pyrene and other cPAHs were detected in only 4 of 31 total samples.

The total HI exceeds unity (HI=1.68) for the hypothetical future resident. HIs calculated on a target organ specific basis for the resident do exceed 1.0 for adverse effects to bodyweight and nasal effects. The total HI for the construction worker (0.02) does not exceed unity, therefore no adverse or unacceptable non-carcinogenic effects are predicted to occur.

2.6.3.2 Uncertainty Analysis

Uncertainty in risk evaluation is discussed in the RI (TtNUS, 1999). Uncertainties associated with the revised HHRA for subsurface soil at Site 30 are discussed in the FSA (TtNUS, 2004). The following list summarizes uncertainties discussed in the revised HHRA:

- Overall site-related risks from soil may be overestimated by the background screening process.
- Potential risks are likely to be overestimated as a result of using the maximum concentration for the COC.
- The method used to calculate the BaPEq concentration for cPAHs overestimates the risk.
- There was no underestimation of risks by omission of exposure routes.

- Risk is likely overestimated for the general populations exposed to the chemicals in the environmental media at the site.

2.6.3.3 ERA

Site 30 is severely limited in the quantity and quality of habitat because the site is heavily industrialized, and the site comprises only a small portion of the home ranges of most of the terrestrial wildlife species found on the base. Potential risks are acceptable and further ecological study at Site 30 is unwarranted.

2.7 REMEDIAL ACTION OBJECTIVES

The RAOs for Site 30 are:

- To prevent residential development on the site.
- To protect the industrial worker from carcinogenic and non-carcinogenic risks associated with incidental ingestion of, inhalation of, and dermal contact with contaminated soils.
- To comply with federal and state ARARs and to be considered (TBC) guidance in accordance with accepted USEPA and FDEP guidelines.

The RAOs for this site are formulated based on the following criteria:

- Unacceptable human health risk exists for direct exposure to surface or subsurface soil based on the current and anticipated future commercial/industrial use of the site.
- FDEP SCTLs (commercial/industrial land use).
- USEPA Region IX PRGs (commercial/industrial land use).

The current and future use of the property at this site remains industrial, and the current and future receptors are occupational and construction workers in direct contact with the soil.

2.7.1 Cleanup Goals

Cleanup Goals (CGs) establish acceptable exposure levels protective of human health and the environment. The following soil CGs were established for the Site 30 COCs:

COC	CG
BaPEq	0.21 mg/kg(1)
TRPH	2,500 mg/kg(2)

(1) USEPA Region IX PRG for direct contact exposure, industrial
(2) FDEP SCTL for direct exposure, industrial

The CGs were used to determine the areas and volumes of surface and subsurface soil with the potential to impact human health under a commercial/industrial land-use scenario. The estimated area of TRPH-contaminated surface soil exceeding the CG is 3,000 square feet with an estimated volume of 220 cubic yards. The estimated area of TRPH- and BaPEq-contaminated subsurface soil exceeding the CGs is 9,500 square feet with an estimated volume of 2,600 cubic yards. A small amount (232 cubic yards) of TRPH-contaminated soil was removed during the UST removal project in August 2000 (CCI, 2001).

The estimated areas where surface soil has the potential to impact human health are shown on Figure 2-2. Because these areas are covered with concrete or asphalt, preventing exposure to contaminated soil, surface soil removal is not required.

2.8 DESCRIPTION OF ALTERNATIVES

As stated in the Proposed Plan (TtNUS, 2001b) and in previous sections of this document, no action will be taken to remediate the naturally occurring levels of arsenic in surface or subsurface soils at Site 30. The four abandoned USTs and a small amount of TRPH-contaminated soil at Site 30 were removed in August 2000. The FSA reevaluated the four remedial alternatives evaluated in the FS (TtNUS, 2001a) by modifying the original alternatives presented in the FS and deleting the UST removal and the arsenic remediation from Alternatives 2, 3, and 4. Cleanup alternatives were developed by the Navy, the USEPA, and the FDEP. The four remedial alternatives are listed below and summarized in Table 2-2.

Alternative 1: No Action
Alternative 2: ECs and LUCs
Alternative 3: Soil Venting and LUCs
Alternative 4: Surface and Subsurface Soil Removal and LUCs

These alternatives were developed in consideration of site risks, the anticipated future commercial/industrial land use, federal and state ARARs and guidance (see Table 2-7), and the very limited ecological habitat at Site 30. These alternatives primarily address protection of human health because, as discussed previously, potential risks to ecological receptors are to be acceptable. Alternatives 2, 3 and 4 include a provision for 5-year site reviews to verify the selected alternative continues to be protective of human health and the environment.

Alternative 1: The No Action alternative [estimated total net present worth (NPW) cost of $0] is required by CERCLA as a baseline for comparison with the other alternatives. The No Action alternative assumes no remedial action would occur and establishes a basis for comparison with the other alternatives. No remedial action, treatment, LUCs, or monitoring of site conditions would be implemented under the No Action alternative. Alternative 1 does not meet chemical-specific ARARs, and there are no action-specific ARARs for this alternative.

TABLE 2-2

**SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED
RECORD OF DECISION
SITE 30, SOUTH FIELD MAINTENANCE HANGAR
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA**

Alternative	Description of Key Components	Cost[1]	Duration[2]
Alternative 1: No Action	No remedial actions are performed at Site 30.	$ 0	30 Years
Alternative 2: ECs and LUCs	Post warning signs. Implementation of ECs and LUCs will address contaminants in soil above residential standards. An RD will be submitted to USEPA and FDEP and will detail the implementation plans to maintain current soil cover and to prohibit future residential use of the property.	$82,000	30 Years
Alternative 3: Soil Venting and LUCs	Develop project plans for in situ soil venting to include delineation/confirmatory sampling. Install, operate, and maintain an in situ soil venting system. Post warning signs. Implementation of LUCs will address contaminants in soil above residential standards. An RD will be submitted to USEPA and FDEP and will detail the implementation plans to maintain the site for nonresidential purposes.	$271,000	30 years
Alternative 4: Surface and Subsurface Soil Removal and LUCs	Develop project plans for excavation to include delineation/confirmatory sampling. Demolition and removal/disposal of asphalt and concrete pavement covering areas of soil exceeding CGs. Excavate surface and subsurface soils exceeding commercial/industrial land use CGs (including areas covered with concrete/asphalt). Backfill excavated areas with clean soil. Replace concrete or asphalt pavement removed to perform the soil excavation and provide a vegetative cover for nonpaved areas. Post warning signs. Implementation of LUCs will address contaminants in soil above residential standards. An RD will be submitted to USEPA and FDEP and will detail the implementation plans to maintain the site for nonresidential purposes.	$610,000	30 Years

[1] Net present worth costs rounded to the nearest thousand dollars.

[2] A period of 30 years was chosen for present worth costing purposes only. Under CERCLA, remedial actions must continue as long as hazardous substances, pollutants, or contaminants remain at a site.

Notes: CG(s) = Cleanup goal(s)
ECs = Engineering Controls to prohibit digging into or disturbing existing concrete or asphalt covered areas on the site
FDEP = Florida Department of Environmental Protection
LUC(s) = land use control(s)
RD = Remedial Design
USEPA = United States Environmental Protection Agency

Alternative 2: ECs and LUCs (estimated total NPW cost $82,000): ECs are to prohibit the disturbance of existing soil covers and LUCs are to prohibit future use of the site for residential purposes, precluding full-time human contact with contaminated surface or subsurface soils. Contaminated soil (contaminants exceeding commercial/industrial soil cleanup levels) covered with concrete or asphalt would not require soil removal because the existing cover material is a barrier and is considered an EC preventing exposure to the contaminated soil, as long as the concrete/asphalt remains in place and is properly maintained. Future and current land-use concerns are addressed by the LUCs. Alternative 2 achieves compliance with chemical-specific ARARs by implementing ECs and LUCs to prevent exposure to surface and subsurface soil exceeding CGs. Compliance with action-specific ARARs would be achieved by proper selection, implementation, and maintenance of LUCs. Alternative 2 includes an estimated present worth cost of $60,000 for O&M (over a 30-year monitoring period) and an estimated capital cost of $22,000.

Alternative 3: Soil venting and LUCs (estimated total NPW cost $271,000): installation of an in situ soil venting system to treat organics in subsurface soil and restriction on the use of the site to nonresidential activities involving less than full-time human contact with the soil. Current and future land-use concerns are addressed by LUCs. Alternative 3 achieves compliance with chemical-specific ARARs by treating organics in subsurface soil and implementing LUCs to prevent exposure to remaining surface and subsurface soil exceeding CGs; however, compliance for the relatively persistent BaPEq will take considerable time. Compliance with action-specific ARARs would be achieved by proper design and execution of RA activities and LUCs. Alternative 3 includes an estimated present worth cost of $163,000 for O&M (over a 30-year monitoring period) and an estimated capital cost of $108,000.

Alternative 4: Surface and subsurface soil removal and LUCs (estimated total NPW cost $610,000): removal and off-site disposal of surface and subsurface soil exceeding levels allowed for Florida commercial/industrial sites and LUCs, as described above. Alternative 4 meets chemical-specific ARARs for surface and subsurface soil. Compliance with action-specific ARARs would be achieved by proper design and execution of contaminated soil removal and off-site disposal activities. Alternative 4 includes an estimated present worth cost of $57,000 for O&M (over a 30-year monitoring period) and an estimated capital cost of $553,000.

2.9 SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

This section evaluates and compares each of the soil remedial alternatives with respect to the nine criteria outlined in Section 300.430(e) of the NCP. These criteria are categorized as threshold, primary balancing, and modifying and are further explained in Table 2-3. A detailed analysis was performed for each alternative using the nine criteria to select a remedy. Table 2-4 presents a summary comparison of these analyses.

TABLE 2-3

EXPLANATION OF DETAILED ANALYSIS CRITERIA
RECORD OF DECISION
SITE 30, SURFACE AND SUBSURFACE SOILS
SOUTH FIELD MAINTENANCE HANGAR
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

Criterion	Description
Threshold	**Overall Protection of Human Health and the Environment.** This criterion evaluates the degree each alternative eliminates, reduces, or controls threats to human health and the environment through treatment, engineering methods, or institutional controls (e.g., access restrictions). **Compliance with State and Federal Regulations.** The alternatives are evaluated for compliance with environmental protection regulations determined to be applicable or relevant and appropriate to the site conditions.
Primary Balancing	**Long-Term Effectiveness and Permanence.** The alternatives are evaluated based on their ability to maintain reliable protection of human health and the environment after implementation. **Reduction of Contaminant Toxicity, Mobility, and Volume Through Treatment**. Each alternative is evaluated based on how it reduces the harmful nature of the contaminants, their ability to move through the environment, and the amount of contamination. **Short-Term Effectiveness.** The potential risks to workers and nearby residents posed by implementation of a particular remedy (e.g., whether or not contaminated dust will be produced during excavation), as well as the reduction in risks resulting from controlling the contaminants, are assessed. The length of time needed to implement each alternative is also considered. **Implementability**. Both the technical feasibility and administrative ease (e.g., the amount of coordination with other government agencies needed) of a remedy, including availability of necessary goods and services, are assessed. **Cost.** The benefits of implementing a particular alternative are weighted against the cost of implementation.
Modifying	**USEPA and FDEP Acceptance.** The final Feasibility Study and the Proposed Plan, placed in the Administrative Record, represent a consensus by the Navy, USEPA, and FDEP. **Community Acceptance.** The Navy assesses community acceptance of the selected alternative by giving the public an opportunity to comment on the remedy selection process and the selected alternative and then responds to those comments.

TABLE 2-4

SUMMARY OF COMPARATIVE ANALYSIS OF SOIL REMEDIAL ALTERNATIVES
RECORD OF DECISION
SITE 30, SURFACE AND SUBSURFACE SOILS
SOUTH FIELD MAINTENANCE HANGAR
NAVAL AIR STATION WHITING FIELD
PAGE 1 OF 2

Evaluation Criteria	Soil Alternative 1: No Action	Soil Alternative 2: ECs and LUCs	Soil Alternative 3: Soil venting and LUCs	Soil Alternative 4: Surface and Subsurface Soil Removal and LUCs
Overall Protection of Human Health and Environment	Would not be protective to human receptors exposed to soils at the site.	Would be protective to human receptors. ECs and LUCs would prevent potential unacceptable exposure because of soil cover and residential use restrictions. LUCs would include maintenance of the existing asphalt/concrete cover.	Would be protective to human receptors. LUCs would prevent potential future residents from exposure because residential use would be prohibited. In situ treatment of petroleum hydrocarbons in subsurface soil would increase the overall protectiveness of human health and the environment. LUCs would be required to prevent exposure to soils exceeding residential standards.	Would be most protective because all surface and subsurface soil exceeding CGs (commercial/industrial standards) would be removed, eliminating the risk of exposure. LUCs would prevent potential residents from coming into contact with soil exceeding residential standards at the site. Would also provide protection to ecological receptors however, may end up altering the ecological habitat at the site.
Compliance with ARARs and TBCs: Chemical-Specific Location-Specific Action-Specific	 Would not comply Not applicable Not applicable	 Would comply Not applicable Would comply	 Would comply Not applicable Would comply	 Would comply Not applicable Would comply
Long-Term Effectiveness and Permanence	Would not have long-term effectiveness and permanence because contaminants would remain on site. Any long-term effectiveness would not be known since monitoring would not occur.	Would provide long-term effectiveness and permanence through EC cap protections and LUCs preventing residential development. LUCs would preclude the existing asphalt/concrete cover disturbance. Would require long-term management.	Would provide long-term effectiveness and permanence through in situ treatment of organic and LUCs preventing chemical residential development. Would require long-term management and 5-year reviews. LUCs would be administered by the facility through implementing an approved RD.	Would provide highest level of long-term effectiveness and permanence by active removal of all impacted soil exceeding commercial/industrial cleanup levels, reducing residual risk from impacted soil left at the site and by implementing LUCs to prevent residential development. Would require long-term management and 5-year reviews. LUCs would be administered by the facility through implementing an approved RD.
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.	Reduces volume and toxicity of organics in subsurface soil by soil venting, promoting volatilization and biodegradation of organic chemicals. May produce residuals from soil venting off-gas treatment.	Would permanently and significantly reduce mobility of contaminants by excavation, transport, and disposal of impacted soil in a secure, regulated landfill. Provides the greatest reduction of risk through soil removal and off-base disposal. Toxicity of excavated soil may be reduced by treatment at a TSDF.

Evaluation Criteria	Soil Alternative 1: No Action	Soil Alternative 2: ECs and LUCs	Soil Alternative 3: Soil venting and LUCs	Soil Alternative 4: Surface and Subsurface Soil Removal and LUCs
Short-Term Effectiveness	Would not result in short-term risks to site workers or adversely impact the surrounding community but would not achieve the soil RAOs and CGs.	Would not result in short term risks to site workers or adversely impact the surrounding community but would not achieve the soil CGs. Estimated time to reach RAOs is less than 1 year.	Would create potential short term risk to site workers during construction and operation of the in situ soil venting system. These risks are manageable by use of appropriate engineering and construction management controls (wearing of appropriate PPE and the compliance with site-specific health and safety procedures). Environmental impacts (fugitive dust and runoff) are expected to be minimal. Engineering controls would minimize any environmental impacts. The RAOs would be met within less than one year (as soon as the RD is implemented). The estimated time to reach CGs is three years.	Would create short-term risks of worker exposure and potential fugitive dust during excavation, transportation and/or soil cover construction. Would pose potential short-term risks to community members due to spills during transportation of contaminated soil to an off-site landfill. Environmental impacts (fugitive dust and runoff) are expected to be minimal. Engineering controls would minimize any environmental impacts. RAOs and CGs would be met within less than one year.
Implementability	Would be simple to implement because no action.	Would be easily implemented. Would require monitoring of the horizontal barriers for removal or other damage and potential exposure. Equipment, specialists, and materials for this alternative are readily available.	Would be easily implemented. Would require monitoring of the horizontal barriers for removal or other damage and potential exposure. This remedial technology is proven and reliable. Equipment, specialists, and materials for this alternative are readily available.	Would be easily implemented. This remedial technology is proven and reliable. Would require use of a TSDF, which are available and have sufficient capacity to meet the requirements of this alternative. Equipment, specialists, and materials for this alternative are readily available.
Cost: Capital NPW O&M (30 year) Total cost, NPW (30 year)	 $0 $0 $0	 $22,000 $60,000 $82,000	 $108,000 $163,000 $271,000	 $553,000 $57,000 $610,000

CG = Cleanup Goal
ECs = Engineering Controls to prohibit digging into or disturbing existing concrete or asphalt covered areas on the site
LUC = Land Use Control
NPW = Net Present Worth
PPE = Personal Protective Equipment
RAO = Remedial Action Objective
RD = Remedial Design
TSDF = Transport, Storage, and Disposal Facility

2.10 SELECTED ALTERNATIVE

2.10.1 Summary of Rationale for Remedy

The goals of the selected RA are to protect human health and the environment by eliminating, reducing or controlling hazards posed by the site and to meet ARARs. Based upon the consideration of the requirements of CERCLA, the NCP, the detailed analysis of alternatives, and FDEP and public comments, Alternative 2 was selected to address surface and subsurface soil contamination at Site 30.

This remedy was selected for the following reasons:

- Although concentrations of COCs remaining in soil (TRPH and BaPEq) exceed CGs, they do not present an unacceptable threat to human health or the environment assuming only future commercial or industrial uses are permitted at Site 30 and the existing asphalt/concrete cover is properly maintained.
- Potential ecological risks are acceptable. The site is very limited in quantity and quality of ecological habitat because the site is heavily industrialized and comprises only a small portion of the home ranges of most of the terrestrial wildlife species found on the base.
- The current and future use of the property at this site remains industrial, and the current and future receptors are occupational and construction workers in direct contact with the soil.
- Areas of surface soil contamination are covered with concrete or asphalt, preventing exposure as long as this barrier remains in place.

2.10.2 Remedy Description

The selected RA consists of two major components: (1) ECs and (2) LUCs.

2.10.2.1 Component 1: ECs

Contaminated surface and subsurface soils (contaminants exceeding CGs) covered with concrete or asphalt will not require soil removal because establishment of this EC will prevent exposure to the contaminated soil. Five-year site reviews will verify the selected alternative continues to be protective of human health and the environment.

The performance objectives of the ECs are:

- To prohibit digging into or disturbing existing concrete or asphalt cover areas on the site.
- To prevent the disturbance of the concrete/asphalt barriers in areas with contaminated surface and subsurface soils.

2.10.2.2 Component 2: LUCs

Soil contamination remains at Site 30 at concentrations precluding unrestricted reuse; therefore, the remedy includes LUCs to address unacceptable risk. These LUCs will be implemented to prohibit residential development and use precluding unacceptable risks from exposure to contaminated soil. The boundaries of Site 30 and the area to be covered by the LUCs are shown in Figure 2-3. The LUCs cover only surface and subsurface soils. The LUC performance objectives for Site 30 are:

- Maintain the integrity of any current or future remedial action.
- Prohibit the development and use of the property for residential housing, elementary and secondary schools, child care facilities, and playgrounds.

The LUCs will:

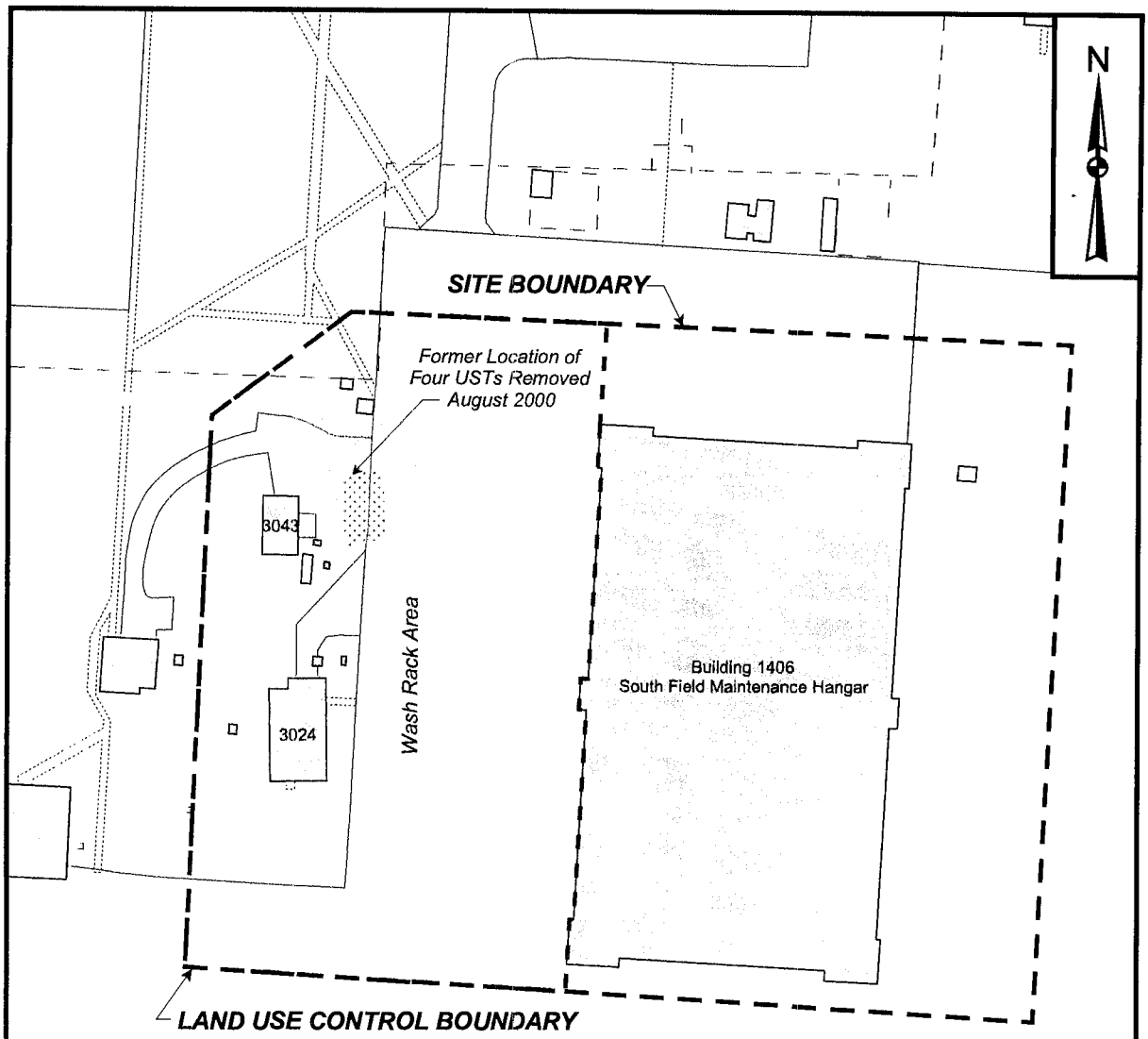
- Restrict future use of the site to nonresidential activities involving less than full-time human contact with surface and subsurface soils.

The LUCs shall be maintained for as long as they are required to prevent unacceptable exposures to contaminated soil or to preserve the integrity of the remedy. The Navy or any subsequent owners shall not modify, delete, or terminate any LUC without USEPA or FDEP concurrence. The LUCs shall be maintained until the concentrations of hazardous substances in the soils have been reduced to levels allowing for unlimited exposure and unrestricted reuse.

The Navy will be responsible for implementing, inspecting, reporting, and enforcing the LUCs described in this ROD in accordance with the approved LUC Remedial Design (RD). Although the Navy may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for remedy integrity. Should this LUC remedy fail, the Navy will ensure appropriate actions are taken to re-establish its protectiveness and may initiate legal action to either compel action by a third party(ies) and/or to recover the Navy's costs for remedying any discovered LUC violation(s).

The LUC RD will be prepared as the LUC component of the selected RA. Within 90 days of ROD signature, the Navy shall prepare in accordance with USEPA guidance and submit to the USEPA and FDEP, an RD containing LUC implementation and maintenance actions, including periodic inspections.

When the selected RA is implemented, predicted site risks will be minimized.



DRAWN BY: J. LAMEY	DATE: 8/25/04	SITE 30 SELECTED REMEDY PLAN FOR SURFACE AND SUBSURFACE SOILS RECORD OF DECISION NAS WHITING FIELD, MILTON, FLORIDA	CONTRACT NUMBER: 0052
CHECKED BY:	DATE:		APPROVED BY: — DATE: —
COST/SCHEDULE-AREA:			APPROVED BY: — DATE: —
SCALE: AS NOTED	NAVFAC		DRAWING NO.: FIGURE 2-3 REV: 0

P:\GIS\WHITINGFIELD_NAS\APR\ROD_SITE30.APR LUC BOUNDARY 8/25/04 JAL

2.10.3 Summary of Estimated Remedy Costs

The total estimated present worth cost of Alternative 2 is $82,000 over a 30-year period, based upon an annual discount rate of 6 percent. Table 2-5 summarizes the cost estimate data for Alternative 2. The information in the Table is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Major changes may be documented in the form of a memorandum in the Administrative Record file, an explanation of significant differences, or a ROD amendment. The estimate is an order-of-magnitude engineering cost estimate expected to be within a range of +50 to –30 percent of the actual project cost.

2.10.4 Expected Outcome of the Selected Remedy

Immediately upon implementation, Site 30 will be environmentally safe for its current and intended future use as a commercial/industrial facility, as long as the ECs and LUCs are in place and observed.

2.11 STATUTORY STATEMENT

The alternative selected for implementation at Site 30 is consistent with the Navy's IR program, CERCLA, and NCP. The selected remedy for surface and subsurface soil is protective of human health and the environment.

The selected remedy eliminates, reduces, or controls risks by implementing ECs and LUCs to restrict future use of the site to nonresidential activities involving less than full-time human contact with surface and subsurface soil and maintain the existing concrete/asphalt barriers in areas with contaminated surface soil. No unacceptable short-term risks or cross-media impacts will be caused by implementation of the remedy. Comparison of the selected remedy to the nine USEPA evaluation criteria is summarized in Table 2-6.

The selected remedy achieves compliance with chemical-specific ARARs by implementing ECs and LUCs to prevent exposure to surface and subsurface soils exceeding PRGs. Compliance with action-specific ARARs will be achieved by the proper selection, implementation, and maintenance of ECs and LUCs. Table 2-7 provides a summary of ARARs and guidance documents specific to the selected remedy.

TABLE 2-5

SELECTED ALTERNATIVE COST ESTIMATE SUMMARY
RECORD OF DECISION
SITE 30, SOUTH FIELD MAINTENANCE HANGAR
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

CAPITAL COSTS		
Description		**Cost**
1. Project Planning		$3,634
2. Mobilization/Demobilization		$0
3. Decontamination		$0
4. Site Preparation		$0
5. Excavation/Backfill		$0
6. Off-site Transportation and Disposal		$0
7. Site Restoration		$0
8. EC and LUC Implementation		$15,160
	Subtotal	$18,794
Contingency Allowance (10%)		$1,879
Engineering/Project Management (5%)		$940
	Total Capital Cost	**$21, 613**

OPERATION AND MAINTENANCE COSTS	
Description	**Cost**
1. Total Operation and Maintenance Costs	**$60,573**
Total Net Present Worth Cost for Selected Alternative	**$82,186**

TABLE 2-6

SUMMARY EVALUATION OF SELECTED REMEDY
RECORD OF DECISION
SITE 30, SOUTH FIELD MAINTENANCE HANGAR
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

Evaluation Criteria	Assessment
Overall Protection of Human Health and the Environment	Human receptors, namely residents, will be protected if this alternative is implemented. Regulatory controls (i.e., ECs and LUCs) will prohibit potential future residents from exposure to the site because residential use of the site will be restricted under the proposed LUCs. ECs and LUCs will also maintain the concrete/asphalt barriers in areas with contaminated surface soil exceeding commercial/industrial soil cleanup criteria.
Compliance with ARARs	This alternative achieves compliance with chemical-specific ARARs and TBC guidance by implementing ECs and LUCs to prevent exposure to surface and subsurface soil exceeding CGs. It meets action-specific ARARs by proper selection and maintenance of the LUCs. Meets all other NAS Whiting Field requirements.
Long-Term Effectiveness	The risks to future workers based on exposure to surface and subsurface soil at the site is addressed by ECs and LUCs. The long-term effectiveness and permanence of these controls will be controlled by the installation through the implementation of an approved RD. Administrative actions proposed in this alternative (e.g., 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 implements the approved RD.
Reduction of Toxicity, Mobility, and Volume through Treatment	This alternative does not treat the soil contaminants and thus does not reduce the toxicity, mobility, or volume through treatment. A small amount (232 cubic yards) of TRPH-contaminated soil was removed from the site during the UST removal project and disposed at an approved landfill, thus removing a potential source of contamination.
Short-Term Effectiveness	The implementation of this alternative is estimated to take less than 1 year. No adverse impacts are expected as a result of implementing ECs and LUCs.
Implementability	Would be easily implemented. Would require monitoring of the horizontal barriers for remedial or other damage and potential exposure. Equipment, specialists, and materials for this alternative are readily available.
Cost	The total present worth cost of Alternative 2 is $82,000.
Federal and State Acceptance	The USEPA and the FDEP have concurred with the selected remedy.
Community Acceptance	The community was given the opportunity to review and comment on the selected remedy. No comments were received and no public meeting was requested (see Appendix A). Therefore, the selected RA presented in the Proposed Plan (TtNUS, 2001b) was not altered.

Notes: ARARs = applicable or relevant and appropriate requirements
CGs = Cleanup Goals
EC = Engineering Controls to prohibit digging into or disturbing existing concrete or asphalt covered areas on the site
FDEP = Florida Department of Environmental Protection
LUCs = land use controls
RA = remedial action
RD = remedial design
TBC = to be considered
TRPH = total recoverable petroleum hydrocarbons
USEPA = United States Environmental Protection Agency
UST = underground storage tank

TABLE 2-7

SUMMARY OF FEDERAL AND STATE ARARs AND GUIDANCE SPECIFIC TO ALTERNATIVE 2
RECORD OF DECISION
SITE 30, SOUTH FIELD MAINTENANCE HANGAR
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA
PAGE 1 OF 2

Authority	Requirement	Citation	Status / Type	Synopsis	Evaluation/Action To Be Taken
Federal Regulatory Requirement	USEPA Region IX Preliminary Remedial Goals (PRGs)		Relevant and Appropriate / Chemical-Specific	These guidelines aid in the screening of constituents in soil. USEPA has requested use of these PRGs as ARARs at NAS Whiting Field.	Will be used to identify constituents of concern (COCs) and for the development of soil cleanup goals at this site.
Federal Regulatory Requirement	Cancer Slope Factors (CSFs)		TBC / Chemical-Specific	Guidance values used to evaluate the potential carcinogenic hazard caused by exposure to contaminants.	Were considered for development of human health protection PRGs for soil at this site.
Federal Regulatory Requirement	Reference Doses (RfDs)		TBC / Chemical-Specific	Guidance values used to evaluate the potential noncarcinogenic hazard caused by exposure to contaminants.	Were considered for development of human health protection PRGs for soil at this site.
State Regulatory Requirement	Contaminant Cleanup Target Levels Rule [Soil Cleanup Target Levels (SCTLs)]	F.A.C. Chapter 62-777	TBC / Chemical-Specific	This rule provides guidance for soil cleanup levels developed on a site-by-site basis.	Will be used to identify COCs and for the development of soil cleanup goals at this site.
Federal Regulatory Requirement	Occupational Safety and Health Administration (OSHA), General Industry Standards	29 CFR Part 1910	Applicable / Action Specific	Requires establishment of programs to assure worker health and safety at hazardous waste sites, including employee-training requirements.	These regulations will apply to all soil remedial activities at Site 30.
Federal Regulatory Requirement	OSHA, Occupational Health and Safety Regulations	29 CFR Part 1910, Subpart Z	Applicable / Action Specific	Establishes permissible exposure limits for workplace exposure to a specific listing of chemicals.	Will be applied to control worker exposure to OSHA hazardous chemicals during remedial activities.
Federal Regulatory Requirement	OSHA, Recordkeeping, Reporting, and Related Regulations	29 CFR Part 1904	Applicable / Action Specific	Provides recordkeeping and reporting requirements applicable to remedial activities.	These requirements will apply to all site contractors and subcontractors and will be followed during all site work.
Federal Regulatory Requirement	OSHA, Health and Safety Standards	29 CFR Part 1926	Applicable / Action Specific	Specifies the type of safety training, equipment, and procedures to be used during the site investigation and remediation.	All phases of the remedial response project will be executed in compliance with these standards.
Federal Regulatory Requirement	CERCLA and the NCP Regulations	40 CFR, Section 300.430	Applicable / Action Specific	Discusses the types of institutional controls to be established at CERCLA sites.	These regulations may be used as guidance in establishing appropriate institutional controls at Site 30.
State Regulatory Requirement	Florida Rules on Hazardous Waste Warning Signs	F.A.C. Chapter 62-730	Applicable / Action Specific	Requires warning signs at NPL and FDEP-identified hazardous waste sites to inform the public of the presence of potentially harmful conditions.	This requirement will be met.

TABLE 2-7

SUMMARY OF FEDERAL AND STATE ARARs AND GUIDANCE SPECIFIC TO ALTERNATIVE 2
SITE 30, SOUTH FIELD MAINTENANCE HANGAR
RECORD OF DECISION
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA
PAGE 2 OF 2

Authority	Requirement	Citation	Status/Type	Synopsis	Evaluation/Action To Be Taken
Federal Regulatory Requirement	NA	NA	NA	NA	There are no Federal Location-Specific ARARs specific to this site.
State Regulatory Requirement	NA	NA	NA	NA	There are no State Location-Specific ARARs specific to this site.

Notes: NA = Not Applicable

The selected remedy is cost effective and provides a balance between cost and overall effectiveness in the protection of human health and the environment. Permanent solutions and treatment are used to the maximum practicable extent; however, the selected remedy does not provide for on-site treatment of contaminated material due to the nature of the contaminants and their location in an industrial area with heavy human and aircraft activity. Although the statutory preference for treatment is not met by the selected remedy, the remedy provides the best trade-off among the evaluated alternatives, with respect to the balancing and modifying evaluation criteria listed in Table 2-3.

Because Alternative 2 would result in hazardous substances remaining on site, a review would be conducted within five years after commencement of the RA to ensure the remedy continues to provide adequate protection of human health and the environment.

2.12 DOCUMENTATION OF SIGNIFICANT CHANGES

There are no significant changes in the selected alternative described in the Proposed Plan (TtNUS, 2001b).

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Navy (Department of the Navy), 1999. *Navy Policy for Conducting Ecological Risk Assessment.* Office of the Chief of Naval Operations, Washington, D.C. April 6.

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TtNUS, 2001a. *Feasibility Study for Surface and Subsurface Soil, Sites 3, 4, 6, 30, 32, and 33, Naval Air Station Whiting Field, Milton, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina. March.

TtNUS, 2001b. *Proposed Plan for Site 30, South Field Maintenance Hangar, Naval Air Station Whiting Field, Milton, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina. July.

TtNUS, 2004. *Feasibility Study Addendum for Site 30, South Field Maintenance Hangar, Surface and Subsurface Soil, Naval Air Station Whiting Field, Milton, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina. May.

USEPA (United States Environmental Protection Agency), 1995. *Supplemental Guidance to Risk Assessment Guidance for Superfund: Region 4 Bulletins, Human Health Risk Assessment.* Waste Management Division, Atlanta, Georgia.

USEPA, 1999. Region III Risk-Based Concentration Table. April 12.

USEPA, 2002. Region IX Preliminary Remediation Goals Table. October 1.

APPENDIX A

COMMUNITY RELATIONS RESPONSIVENESS SUMMARY

Responsiveness Summary
Site 30, South Field Maintenance Hangar
Naval Air Station Whiting Field
Milton, Florida

A public comment period on the Site 30 Proposed Plan was held from 12 July through 11 August 2001. No public comments were received, and because a public meeting was not requested, one was not held.