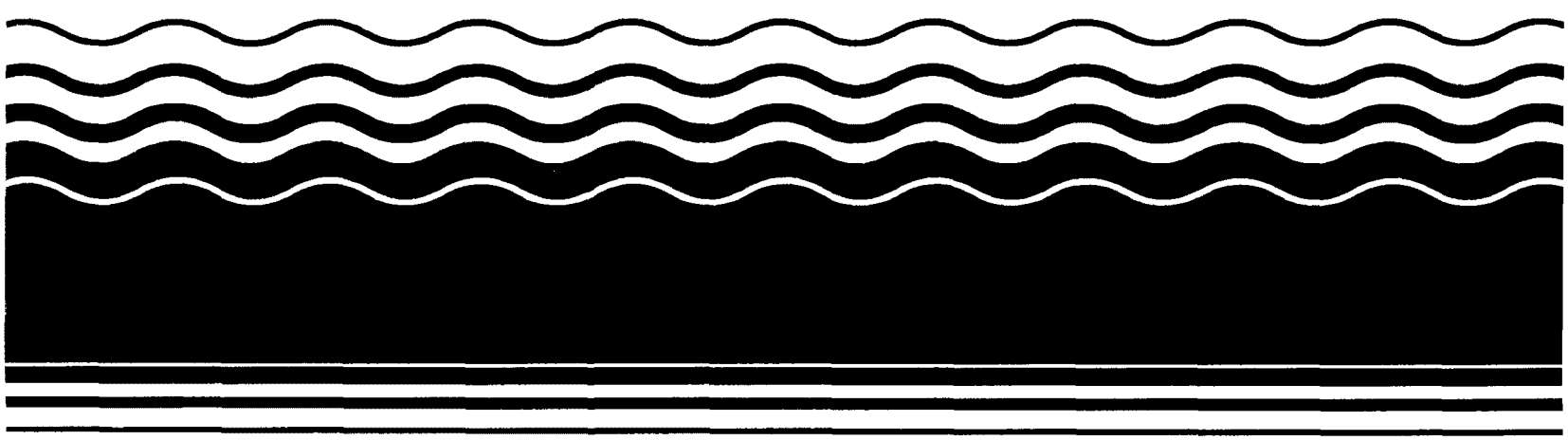
PB97-964019
EPA/541/R-97/095
January 1998

EPA Superfund Record of Decision:

Cecil Field Naval Air Station, OU 4
Jacksonville, FL
9/30/1997



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
100 ALABAMA STREET, S.W.
ATLANTA, GEORGIA 30303-3104

SEP 30 1997

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

4WD-FFB

Commanding Officer
Attn.: David Porter
Base Environmental Coordinator
DON, Southern Division
Naval Facilities Engineering Command
P.O. Box 190010
North Charleston,
South Carolina 20419-9010

Subject: Naval Air Station Cecil Field, Jacksonville, Florida
Record of Decision for Operable Unit 4

Dear Mr. Porter:

The Environmental Protection Agency (EPA) has received and reviewed the final Record of Decision (ROD) for Operable Unit 4 (OU 4). EPA concurs with the Navy's decision as set forth in the ROD dated September 1997. This concurrence is contingent with the understanding that the selection of no further remedial action at this site is protective of human health and the environment. Should new information indicate otherwise, the Navy is liable for any future actions as required.

NAS Cecil Field was listed on the National Priorities List as Cecil Field Naval Air Station in 1989. Prior to NPL listing and designation for closure, the Installation and Restoration Program identified 18 sites as needing further investigation. These 18 sites were grouped by usage and waste type to form eight operable units. OU 4 consists of site 10, which was a rubble disposal area. OU 4 is located in an area designated for forestry management and airport reserve per the NAS Cecil Field Final Reuse Plan, dated February 1996. Development of groundwater resources and construction of buildings at this location is not anticipated. The Remedial Investigation and Risk Assessment for OU 4 identified no unacceptable risks for any media, therefore no further action is being recommended at this time. However, any new information contradicting this finding may require further investigation or remedial actions.

EPA appreciates the coordination efforts of NAS Cecil Field and the level of effort that was put forth in the documents leading to this decision. EPA looks forward to continuing the excellent working relationship with NAS Cecil Field and Southern Division Naval Facilities Engineering Command as we move toward final cleanup of the NPL site. Should you have any questions, or if EPA can be of any further assistance, please contact Ms. Deborah Vaughn-Wright, of my staff, at the letterhead address or at (404) 562-8539.

Sincerely,

Richard D. Green
Acting Director
Waste Management Division

cc: Mr. James Crane, FL DEP
Mr. Eric Nuzie, FL DEP
Mr. Michael Deliz, FL DEP
Mr. Mark Davidson, SOUTHDIV

RECORD OF DECISION
OPERABLE UNIT 4

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Unit Identification Code: N60200

Contract No.: N62467-89-D-0317/090

Prepared by:

ABB Environmental Services, Inc.
2590 Executive Center Circle, East
Tallahassee, Florida 32301

Prepared for:

Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29418

Mark Davidson, Code 1879, Engineer-in-Charge

September 1997

CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

The Contractor, ABB Environmental Services, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/090 are complete and accurate and comply with all requirements of this contract.

DATE: September 2, 1997

NAME AND TITLE OF CERTIFYING OFFICIAL: Rao Angara
Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL: Dirk Brunner
Project Technical Lead

(DFAR 252.227-7036)

LIST OF FIGURES

Record of Decision, Operable Unit 4
Naval Air Station Cecil Field
Jacksonville, Florida

GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
bls	below land surface
BRA	baseline risk assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CPC	chemicals of potential concern
FDEP	Florida Department of Environmental Protection
FS	feasibility study
HHCPC	human health chemical of potential concern
HHRA	Human Health Risk Assessment
IROD	interim Record of Decision
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Contingency Plan
NOTW	Navy-owned wastewater treatment works
OU	operable unit
RAB	Restoration Advisory Board
RI	remedial investigation
ROD	record of decision
SVOC	semivolatile organic compound
TRPH	total recoverable petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
UZH	upper zone Hawthorne

1.0 DECLARATION FOR THE RECORD OF DECISION (ROD)

1.1 SITE NAME AND LOCATION. Operable Unit (OU) 4 is located approximately one mile southwest of the industrial area of the main base of Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. OU 4 consists of Site 10, the Rubble Disposal Area. Site 10 is located east of Rowell Creek near the west central boundary of Cecil Field and southwest of the east-west runway.

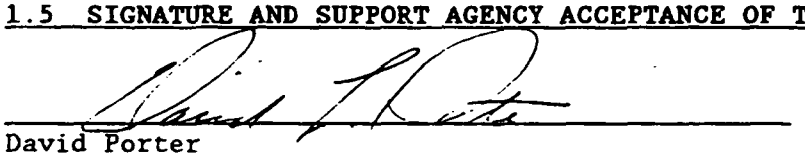
1.2 STATEMENT OF BASIS AND PURPOSE. This decision document presents the selected remedial action for OU 4, located at NAS Cecil Field, Jacksonville, Florida, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act of 1986 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP, 40 Code of Federal Regulations, 300). This decision document was prepared in accordance with the U.S. Environmental Protection Agency (USEPA) decision document guidance (USEPA, 1992). This decision is based on the Administrative Record for OU 4.

The USEPA and the State of Florida concur with the selected remedy.

1.3 DESCRIPTION OF THE SELECTED REMEDY. This ROD is the final action for OU 4 and is based on the results of the Remedial Investigation (RI) and Baseline Risk Assessment (BRA) completed for OU 4. The selected remedy for OU 4 is No Further Action. This remedy does not require any specific administrative, onsite actions, monitoring, or 5-year reviews to ensure there are no unacceptable exposures to potential hazards posed by conditions at the site. This remedy is consistent with the BRA conducted for conditions observed at the site. The assessment concluded that there is no imminent threat to public health or the environment.

1.4 STATUTORY DETERMINATIONS. The selected remedy is protective of human health and the environment and is cost-effective. Although contaminants, pathways, and receptors were identified to be present at OU 4, the risks calculated for current or potential human and ecological receptors being exposed to the soil and groundwater did not exceed the USEPA acceptable risk criteria. According to USEPA guidance, if no risk to human health or the environment is identified, no further remedial action (including setting remedial action objectives and conducting an engineering feasibility study [FS] to evaluate remedial alternatives) is warranted at the site to ensure protection of human health and the environment.

1.5 SIGNATURE AND SUPPORT AGENCY ACCEPTANCE OF THE REMEDY.



4 Sep 1997

David Porter
Base Realignment and Closure
Environmental Coordinator

Date

2.0 DECISION SUMMARY

2.1 SITE AND OPERABLE UNIT NAME, LOCATION, AND DESCRIPTION. NAS Cecil Field occupies more than 31,000 acres and is located 14 miles southwest of Jacksonville, Florida. The majority of Cecil Field is located within Duval County; the southernmost part of the facility is located in northern Clay County (Figure 2-1).

The area surrounding NAS Cecil Field is rural and sparsely populated. The city of Jacksonville lies approximately 14 miles to the northeast. Surrounding land use is primarily forestry with some light agricultural and ranching use. Small communities and scattered dwellings associated with these activities are located in the vicinity. A small residential area on Nathan Hale Road, which abuts the NAS Cecil Field property to the west, typifies these rural communities. The nearest incorporated municipality is the town of Baldwin, whose center lies approximately 6 miles to the northwest of the main facility entrance.

To the east of NAS Cecil Field, the rural surroundings grade into a suburban fringe bordering the major east-west roadways. Low commercial use, such as convenience stores, and low density residential areas characterize the land use (ABB Environmental Services, Inc. [ABB-ES], 1992). A development called Villages of Argyle, when complete, is planned to consist of seven separate villages or communities that will ultimately abut NAS Cecil Field to the south and southeast. A golf course and residential area also border NAS Cecil Field to the east (Southern Division, Naval Facilities Engineering Command, 1989).

There is no housing in the immediate vicinity of OU 4. Bachelor enlisted quarters, family enlisted housing, and senior officer housing is more than 5,000 feet to the north. Children would be expected to reside only in the family enlisted housing or the senior officer housing areas.

NAS Cecil Field was established in 1941 and provides facilities, services, and material support for the operation and maintenance of naval weapons, aircraft, and other units of the operation forces as designated by the Chief of Naval Operations. Some of the tasks required to accomplish this mission over past years included the demolition and disposal of buildings, runways, and other infrastructure features of an operational facility.

OU 4, also known as Site 10, consists of a long, narrow demolition debris area (approximately 2,000 feet by 200 feet) located parallel to Rowell Creek and a flightline access road. A map of OU 4 layout is provided on Figure 2-2.

OU 4 is vegetated with brush and trees that have established amongst the piles of concrete and other demolition debris. The general area adjacent to OU 4 is wooded, showing no adverse stress to the vegetation from the demolition debris.

In 1985, and during the site visits conducted by ABB-ES in 1995, the ground surface exhibited no evidence (staining or absence of vegetation) of adverse effects from previous waste activities at the site.

Surface water flow from OU 4 is typically overland flow through wooded land toward Rowell Creek. To the north of the site, there is a small drainage swale

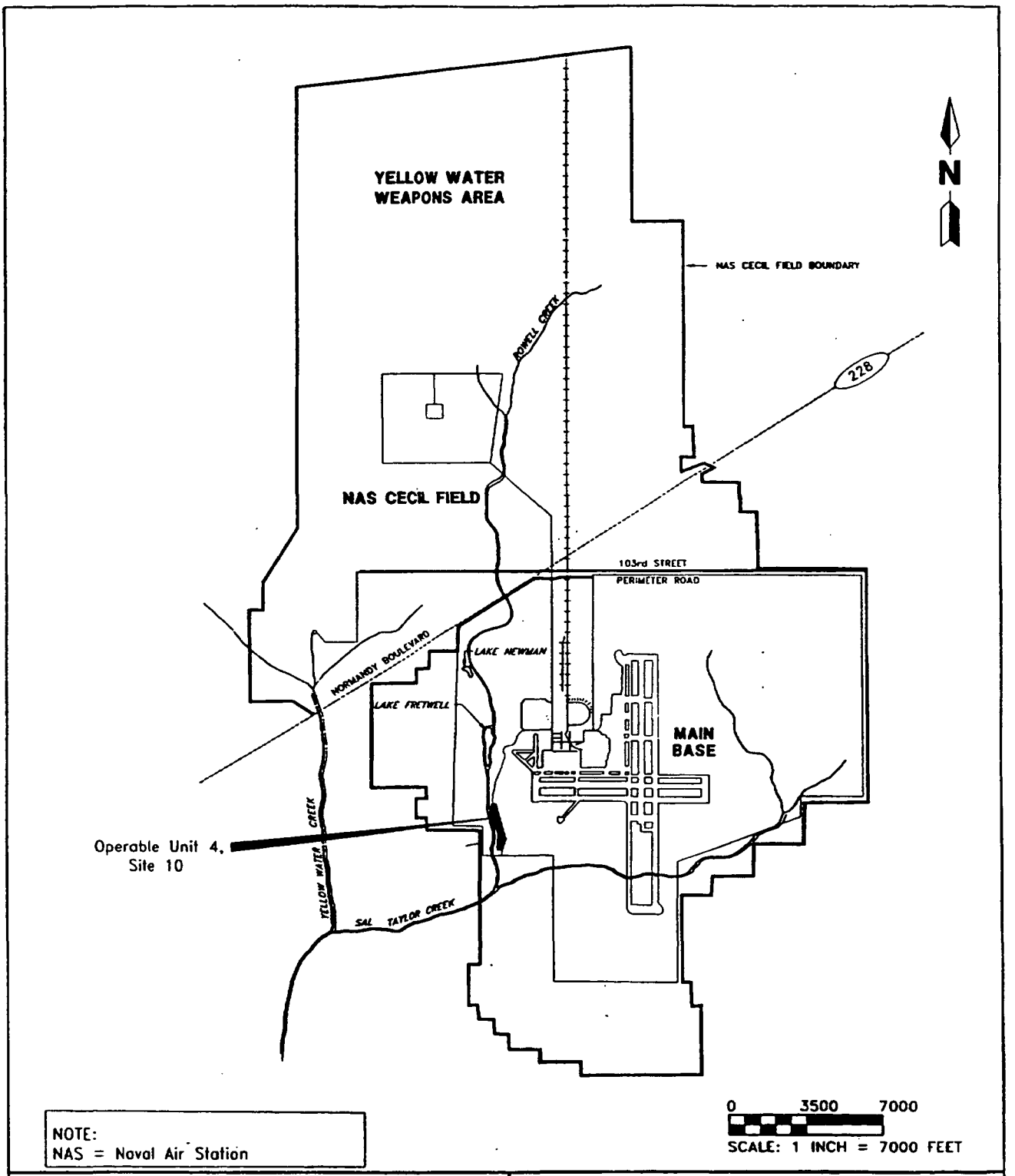


FIGURE 2-1
SITE LOCATION MAP

RECORD OF DECISION
OPERABLE UNIT 4

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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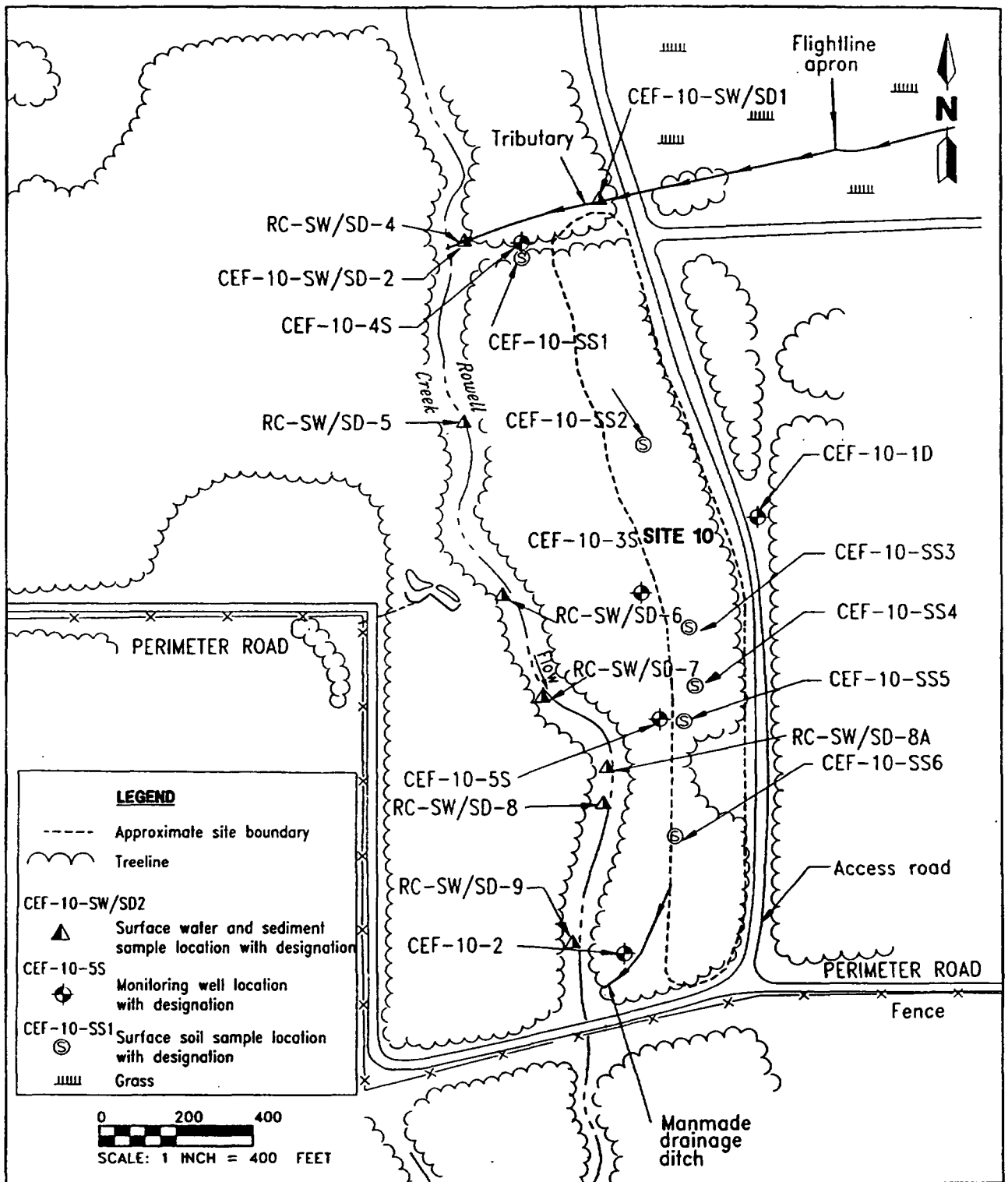

FIGURE 2-2
SITE FEATURES AND SAMPLING LOCATIONS

RECORD OF DECISION
OPERABLE UNIT 4

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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that drains water from wooded areas east of the site and from the gravel road and directs it toward Rowell Creek.

As NAS Cecil Field is planned to close in 1999, reuse plans have been developed to assist in property transfer and other closure activities. OU 4 is located in an area identified for Public Buildings and Facilities (Forestry Management/Airport Reserve). Residential land use is planned for other parts of the facility, but not at OU 4. Currently, there are plans for a new runway, which would prevent locating any buildings at OU 4. These plans reflect an anticipated industrial undeveloped use for OU 4.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES. OU 4 was used by the base Public Works Department as a rubble disposal area for a period of approximately 20 years during the 1950s and 1960s. Wastes disposed of at the site included building demolition debris, concrete, and other inert wastes such as tires, asphalt, and furniture. The wastes have reportedly been both buried, as suggested by the results of a geophysical survey conducted by Harding Lawson Associates, and deposited directly on the land surface, as evidenced by the six rubble piles and scattered debris that remains partially visible through thick vegetation. Documentation regarding the quantity of debris dumped on the site is not available. No reports or evidence of hazardous waste disposal at the site have been discovered.

Environmental investigations of Site 10 began in 1985. The following reports describe the results of investigations at OU 4 to date:

- Initial Assessment Study (Envirodyne Engineers, 1985)
- Resource Conservation and Recovery Act Facility Investigation (Harding Lawson Associates, 1988)
- Remedial Investigation Report, OU 4 (ABB-ES, 1996)
- Proposed Plan, OU 4 (ABB-ES, 1997)

2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION. The results of the RI and the BRA were presented to the NAS Cecil Field Restoration Advisory Board (RAB) (composed of community members as well as representatives from the Navy and State and Federal regulatory agencies) on November 19, 1996.

The public was invited to a RAB meeting on July 15, 1997, for a briefing on the results of the RI, the BRA, and the proposed plan, and to solicit comments on OU 4 from the community. Comments received during the public meeting are presented in the Responsiveness Summary in Attachment A. A 30-day comment period was held from July 21, 1997, through August 21, 1997. Comments received during the public comment period are also presented in Attachment A.

Public notices of the availability of the Proposed Plan were placed in the *Metro* section of the *Florida Times Union* on July 14, 1997. These local editions target the communities closest to NAS Cecil Field. The Proposed Plan and other documents are available to the public at the Information Repository, located at

the Charles D. Webb Wesconnett Branch of the Jacksonville Library, 6887 103rd Street, Jacksonville, Florida.

2.4 SCOPE AND ROLE OF OPERABLE UNIT. As with many Superfund sites, environmental concerns at NAS Cecil Field are complex. As a result, work has been organized into eight installation restoration OUs along with more than 100 other areas undergoing evaluation in the Base Realignment and Closure and underground storage tank programs.

Final RODs have been approved for OUs 1, 2, and 7. Interim Records of Decision (IRODs) were approved for OU 2, OU 6, and OU 7, which addressed the source (concentrated deposits of wastes in soil) areas of contamination. The other OUs are in various stages of the RI/FS process. IROD activities are complete at Site 17 of OU 2, at OU 6, and at OU 7. Final ROD remedial actions are underway at OUs 1, 2, and 7.

Investigations at OU 4, the subject of this ROD, indicated the presence of soil and groundwater contamination from past disposal practices. The purpose of remedial response actions is to investigate, assess, and eliminate or control unacceptable risks to human health and the environment. Exposure to surface soil, subsurface soil and groundwater at OU 4 poses no unacceptable risk to human health or the environment.

2.5 SUMMARY OF SITE CHARACTERISTICS.

Geology. Subsurface geologic materials recovered during drilling operations at OU 4 indicate that the site is underlain by approximately 90 feet of Holocene to Pliocene age fine-grained silty sand. This sand is typically brown to gray throughout and varies in shade from light to dark. Layers of clayey sand, sandy clay, and clay, ranging in thickness from less than an inch to 6 inches, were encountered throughout this lithologic strata. Beneath the sand is a layer of clay containing between 40 percent to 50 percent dolomite fragments. This clay is underlain by dolomite. The dolomite is typically gray, microcrystalline, moderately well cemented, moderately hard to soft, and contains mineral replacement of shell material.

The dolomite is of the Miocene (between 6 and 24 million years old) age Hawthorn Group. Locally, the uppermost layers of the Hawthorn Group include a continuous carbonate-rich unit of dolomite, a limestone or marble rich in magnesium carbonate, and/or shell hash. Historically, this unit has been called the "rock aquifer" or "secondary artesian aquifer." This unit is considered to be a water producing zone of the intermediate aquifer system.

Hydrogeology. In the area of investigation, there are three water-bearing systems. In descending order, these are the surficial aquifer, the intermediate aquifer (Upper Zone Hawthorne [UZH]), and the Floridan aquifer systems. Between each system is an aquitard (less permeable unit). At OU 4, only the surficial aquifer and the UZH were investigated.

The surficial aquifer is unconfined and composed of undifferentiated fine-grained sand with some clayey sand and silt. Thin clay lenses were encountered in two borings. These sediments extend to approximately 84 feet below land surface

(bls). The water table in the surficial aquifer is typically between 2 and 7 feet bls. Groundwater flow in the surficial aquifer is generally to the west-southwest, toward Rowell Creek.

The intermediate aquifer is encountered at the OU 4 source area at approximately 100 feet bls. In addition to its clay rich sediments, the Hawthorn includes near its top a locally continuous carbonate-rich unit of dolomite with significant secondary porosity. This carbonate-rich unit forms the historical "rock aquifer" or "secondary artesian aquifer," a water-bearing unit widely used in this region as a private drinking water source. In the NAS Cecil Field area, the unit is approximately 20 to 25 feet thick. The top of this unit is irregular and may represent an erosional unconformity. The groundwater flow in the intermediate aquifer at OU 4 is interpreted to be to the northeast.

The groundwater in the surficial, intermediate, and Floridan aquifers is classified by the State as potable, Class G-II (Florida Legislature, 1990).

Water obtained from the surficial aquifer system is primarily used for lawn irrigation and domestic purposes, including heat exchange units in heating and air conditioning systems. The yield of the wells is typically between 30 and 100 gallons per minute and water-use estimates for the surficial aquifer system are approximately 10 to 25 million gallons per day for the city of Jacksonville (Jacksonville Area Planning Board, 1980). The surficial aquifer level and flow directions have been altered over time because of increased water use and pumping rates.

The quality of water from the limestone, shell, and sand part of the UZH in the intermediate aquifer system is hard to very hard and has moderate dissolved solids levels. The iron content is variable and some areas contain hydrogen sulfide (Geraghty & Miller, 1985). At least 50,000 homes in the Jacksonville area obtain water from private wells in the UZH. The Florida Department of Health and Rehabilitative Services estimates that there are approximately 75 private wells located within a 2-mile radius of NAS Cecil Field, and they reportedly produce from within the UZH.

The Floridan aquifer system is one of the most productive aquifers in the world and is the primary source of water in the Jacksonville area. NAS Cecil Field obtains its potable water from five Navy potable water supply production wells cased in the Floridan aquifer system within the property boundary. These wells range in depth from 400 to 800 feet bls (NAS Cecil Field, 1990).

Contaminant Sources. At OU 4, the primary source of contamination would be the demolition and rubble debris resulting from infrastructure (e.g., roadways, buildings, etc.) demolition, rehabilitation, and replacement, including runway and taxiway pavement. Slabs of concrete are prevalent in the OU 4 area, along with metal office furniture. The historic record and physical debris do not indicate solvents, petroleum products, or other hazardous materials were deposited at the site.

Surface Soil Analytical Results. Review of laboratory analyses from six surface soil samples (Table 2-1) indicated the presence of methylene chloride, di-n-butyl phthalate, total recoverable petroleum hydrocarbons (TRPH) and nine metals, which were identified as chemicals of potential concern (CPCs) to ecological or human receptors (Figure 2-3). Under pending Florida Department of Environmental

Table 2-1
Surface Soil Contaminants

Record of Decision, Operable Unit 4
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range	Mean[2]	Background Screening Concentration[3]	Risk-based Concentration[4]	Florida Soil Cleanup Goals[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Volatile Organic Compounds (µg/kg)									
Methylene chloride*	1/6	6 to 14	3 J	3 J	NA	85,000	16,000	No	S, G
Semivolatile Organic Compounds (µg/kg)									
Di-n-butylphthalate*	5/6	380 to 480	21 J to [7]140	55.3	NA	780,000	7,300,000	No	S, G
Inorganic Analytes (mg/kg)									
Aluminum*	6/6	40	144 to 7,830	1,980	2,370	7,800	75,000	Yes	
Arsenic*	1/6	20	2.7	2.7	ND	[8]0.43	[8]0.8	Yes	
Barium*	1/6	40	10.3	10.3	9	550	5,200	No	S, G
Calcium	4/6	1,000	179 to 6,350	4,062	458	1,000,000	NSC	No	S
Chromium*	1/6	2	17	17	4.6	[9]39	[9]290	No	S, G
Cobalt*	1/6	10	0.67	0.67	ND	470	4,700	No	S, G
Iron	6/6	20	140 J to 9,150 J	2,180	648	2,300	NSC	Yes	
Lead*	6/6	0.6	1.3 J to 7.2	4.8	6.4	[10]400	500	No	S, G
Magnesium	6/6	1,000	15 to 115	78.7	108	460,468	NSC	No	S
Manganese*	6/6	3	1.8 to 11.7	5.4	8.6	39	370	No	S, G
Potassium	1/6	1,000	59.4	59.4	ND	1,000,000	NSC	No	S
Sodium	2/6	1,000	200 to 253 J	227	ND	1,000,000	NSC	No	S
Vanadium*	6/6	10	0.74 to 28.5	7	4.6	55	490	No	S, G
Total Recoverable Petroleum Hydrocarbons (TRPH) (mg/kg)									
TRPH*	6/6	12 to 15	26 J to 270 J	100	NA	NSC	[11]380	Yes	

See notes on next page.

Table 2-1 (Continued)
Surface Soil Contaminants

Record of Decision, Operable Unit 4
Naval Air Station Cecil Field
Jacksonville, Florida

[1] Frequency of detection is the number of samples in which the analyte was detected in relation to the total number of samples analyzed (excluding rejected values).
[2] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[3] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples.
[4] For all chemicals except the essential nutrients (calcium, magnesium, potassium, and sodium), U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) table for residential surface soil exposure per January 1993 guidance (*Selecting Exposure Routes and Contaminants of Concern by Risk-based Screening*, EPA/903/R-93-001) was used for screening. Actual values are taken from the USEPA Region III RBC tables dated October 4, 1995, which are based on an excess lifetime cancer risk of 10^{-6} and an adjusted hazard quotient of 0.1. For the essential nutrient, screening values were derived based on recommended daily allowances.
[5] Florida Department of Environmental Protection (FDEP) memoranda titled "Soil Cleanup Goals for Florida" dated September 29, 1995, and "Applicability of Soil Clean-up Goals for Florida" dated January 19, 1996.
[6] Analyte was included or excluded from the risk assessment for the following reasons:
B = the maximum detected concentration did not exceed twice the arithmetic mean of detected concentrations at background locations and will not be considered further.
S = the maximum detected concentration did not exceed the risk-based screening concentration and will not be considered further.
G = the maximum detected concentration did not exceed Florida soil cleanup goal concentration and will not be considered further.
[7] The value is the average of a sample and its duplicate. For duplicate samples having one nondetect value, 1/2 the contract-required quantitation limit/contract-required detection limit is used as a surrogate.
[8] The value is based on arsenic as a carcinogen.
[9] The value is based on hexavalent chromium form.
[10] The value for lead is based on the USEPA Office of Solid Waste and Emergency Response Directive No. 9355.4-12 "Revised Interim Recommended Soil Cleanup for Comprehensive Environmental Response, Compensation, and Liability Act and Resource Conservation and Recovery Act Sites." (USEPA, 1994)
[11] The screening value is from pending FDEP petroleum-contaminated soil regulations (Florida Administrative Code 62-770) dated July 1997.

Notes: The average of a sample and its duplicate is used for all table calculations.
Samples include CEF10SS1, CEF10SS2, CEF10SS3, CEF10SS4, CEF10SS5, and CEF10SS6.
Duplicate samples include CEF10SS5D.
Background samples include CEFBSS05, CEFBSS06, CEFBSS07, CEFBSS08, CEFBSS09, CEFBSS09D (Duplicate), CEFBSS010, CEFBSS011, CEFBSS012, CEFBSS013, CEFBSS014, and CEFBSS015.

HHCPC = human health contaminants of potential concern.
µg/kg = micrograms per kilogram.
* = chemicals that represent ecological contaminants of potential concern.
J = indicates chemical identified by chemist, but quantity was estimated.
NA = not appropriate.
mg/kg = milligrams per kilogram.
ND = not detected.
NSC = no screening concentration available.

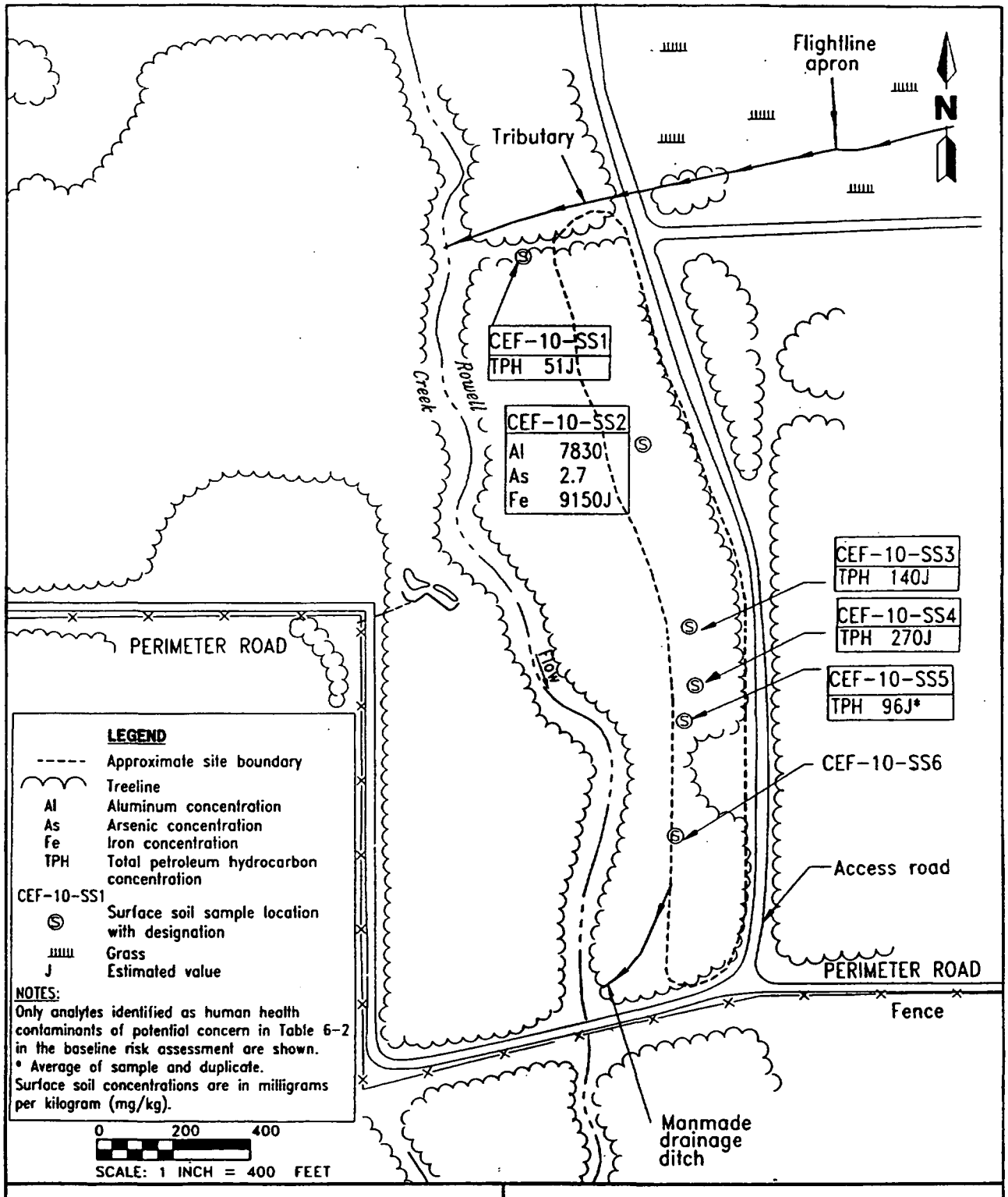

FIGURE 2-3
SURFACE SOIL HUMAN HEALTH CONTAMINANTS OF POTENTIAL CONCERN

REMEDIAL INVESTIGATION
OPERABLE UNIT 4

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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Protection (FDEP) regulations, the maximum TRPH observed in OU 4 surface soils would be less than the action level of 380 milligrams per kilogram for residential uses. The inorganic analytes aluminum, iron, and arsenic were selected as human health chemicals of potential concern (HHCPCs) because the maximum detected value exceeded the criterion of twice average background based on the current understanding of background conditions. The BRA (ABB-ES, 1996a) indicates that the compounds detected in surface soil do not pose an unacceptable risk to human or ecological receptors.

Groundwater Surficial Aquifer. Analytes detected in the surficial aquifer and the one intermediate (UZH) well, included semivolatile organic compounds (SVOCs) and inorganics. Those analytes identified as human health CPCs in the surficial aquifer are shown in Table 2-2 and on Figure 2-4 and included bis(2-ethylhexyl)-phthalate, aluminum, and iron. These analytes were also identified, along with manganese, as ecological CPCs.

The organic, bis(2-ethylhexyl)phthalate, was selected as an HHCPC because the maximum detected value exceeded the USEPA Region III health-risk screening criteria. No regulatory threshold was exceeded.

Aluminum, iron, and manganese were selected as HHCPCs because the maximum detected value exceeded aesthetic (not health-based) criteria established by the USEPA and FDEP.

The BRA (ABB-ES, 1996) indicated no unacceptable risks to human health or the environment from these CPCs.

Groundwater Intermediate Aquifer. Because no unacceptable risks were identified in the surficial aquifer, further evaluation and assessment of risk was not undertaken for the intermediate (UZH) aquifer.

Surface Water and Sediment. Surface water and sediment samples were collected from a drainage ditch north of the site (two samples) and from Rowell Creek (seven samples collected as part of the OU 1 remedial investigation). These ditches receive drainage from a woodland area and gravel access road east of the site. No organics were detected in surface water samples from the ditch. Organics detected in ditch sediments are listed in Table 2-3 and included volatile organic compounds, SVOCs, pesticides, and TRPH. Inorganics detected in the surface water and sediment of the ditch are listed in Table 2-4. While these samples were collected to characterize conditions in the vicinity of OU 4, topographic conditions do not provide a complete pathway from the site to the ditch. Detected inorganics and organics at these two sampling locations are more likely derived from the surface runoff collecting in the ditch from the runway and other land uses east of the site.

According to the OU 1 Remedial Investigation report (ABB-ES, 1994), the Rowell Creek samples detected several organic and inorganic contaminants in surface water and sediment. Rowell Creek receives treated effluent from the Navy-owned wastewater treatment works (NOTW) and is also bordered on the west side opposite Site 10 by OU 1 (Sites 1 and 2) and upgradient by Site 3. These contaminants could have originated at any of these sites (Harding Lawson Associates, 1988) or from NOTW. Impairment of benthic macroinvertebrate community and sediment toxicity were also observed. However, the report did not identify OU 4 as a possible source or contributor to the presence of these contaminants or the

Table 2-2
Groundwater Contaminants

Record of Decision, Operable Unit 4
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range	Mean[2]	Background Screening Concentration[3]	Risk-based Concentration[4]	Florida Guidance Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Semivolatile Organic Compounds (µg/ℓ)									
bis(2-Ethylhexyl)phthalate	2/4	10	2 J to 6 J	4 J	NA	4.8	6	**Yes**	
Inorganic Analytes (µg/ℓ)									
Aluminum	2/4	200	669 to [7]1,059.5	864	776	3,700	200	**Yes**	
Barium	2/4	200	[7]16.45 to 18.5	17.5	41.2	260	2,000	No	B
Calcium	3/4	5,000	2,380 to [7]14,100	9,310	380	1,055,398	NSC	No	S
Chromium	1/4	10	[7]3.75	3.8	70	[8]18	[8]100	No	B
Iron	4/4	100	529 J to [7]2,180 J	1,140	450	1,100	300	**Yes**	
Magnesium	4/4	5,000	544 to 2,670	1,290	1,290	118,807	NSC	No	S
Manganese	1/4	15	[7]49.35	49.4	9.8	18	50	**Yes**	
Nickel	1/4	40	[7]13.45	13.5	32	73	100	No	B
Potassium	4/4	5,000	215 to 704	464	1,580	297,016	NSC	No	B
Sodium	4/4	5,000	2,710 to [7]5,570	4,360	1,150	396,022	160,000	No	S, G
Vanadium	2/4	50	2.7 to [7]4.4 J	3.5	96	26	49	No	B

See notes on next page.

Table 2-2 (Continued)
Groundwater Contaminants

Record of Decision, Operable Unit 4
Naval Air Station Cecil Field
Jacksonville, Florida

[1] Frequency of detection is the number of samples in which the analyte was detected in relation to the total number of samples analyzed (excluding rejected values).
[2] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[3] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples.
[4] For all chemicals except the essential nutrients (calcium, magnesium, potassium, and sodium), U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) table for tap water exposure per January 1993 guidance (*Selecting Exposure Routes and Contaminants of Concern by Risk-based Screening*, EPA/903/R-93-001) was used for screening. Actual values are taken from the USEPA Region III RBC tables dated October 4, 1995, which are based on an excess lifetime cancer risk of 10^{-6} and an adjusted hazard quotient of 0.1. For the essential nutrient, screening values were derived based on recommended daily allowances.
[5] The values are from Florida Department of Environmental Protection *Ground Water Guidance Concentrations*, June 1994.
[6] Analyte was included or excluded from the risk assessment for the following reasons:
B = the maximum detected concentration did not exceed twice the arithmetic mean of detected concentrations at background locations and will not be considered further.
S = the maximum detected concentration did not exceed the risk-based screening concentration and will not be considered further.
G = the maximum detected concentration did not exceed Florida's guidance concentration and will not be considered further.
[7] The value is the average of a sample and its duplicate. For duplicate samples having one nondetect value, 1/2 the contract-required quantitation limit/contract-required detection limit is used as a surrogate.
[8] The value is based on hexavalent chromium form.

Notes: The average of a sample and its duplicate is used for all table calculations.
Samples include CF10MW2, CF10MW3, CF10MW4, and CF10MW5S.
Duplicate samples include CF10MW5S.
Background samples include CFBKMW1S, CFBKMW2S, CFBKMW4S, CFBKMW4SD (Duplicate), CFBKMW5S, CFBKMW7S, and CFBKMW8S.

HHCPC = human health contaminants of potential concern.
$\mu g/\ell$ = micrograms per liter.
J = indicates chemical identified by chemist, but quantity was estimated.
NA = not appropriate.
NSC = no screening concentration available.

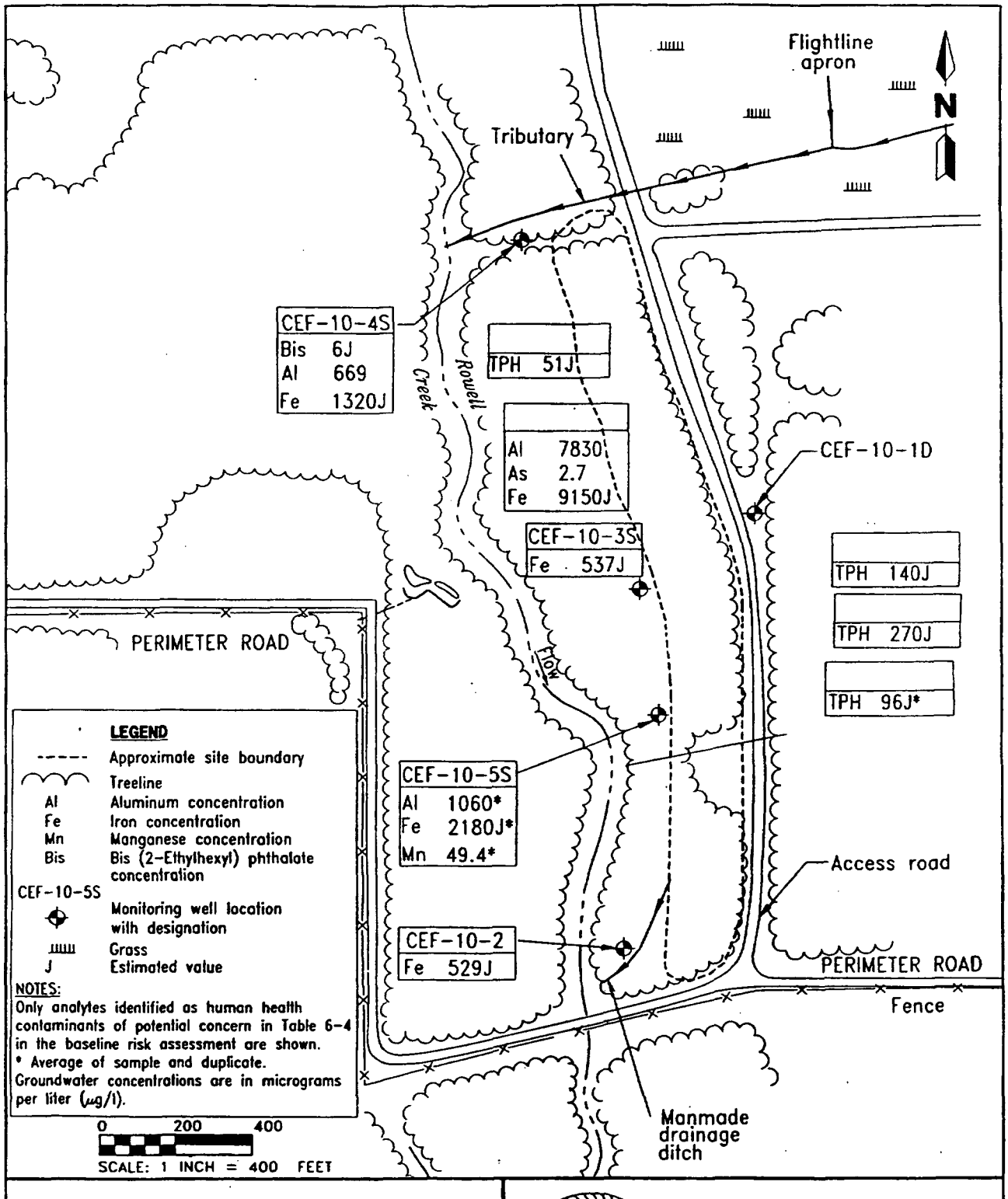

FIGURE 2-4
SURFICIAL AQUIFER
HUMAN HEALTH CONTAMINANTS OF POTENTIAL CONCERN

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REMEDIAL INVESTIGATION
OPERABLE UNIT 4

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Table 2-3
Surface Water[1] and Sediment Organics

Record of Decision, Operable Unit 4
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	Frequency of Detection[2]	Range of Reporting Limits	Range of Detected Concentrations	Mean of Detected Concentrations[3]
Sediment				
Volatile Organic Compounds (µg/kg)				
2-Butanone	2/2	13 to 19	4 J to [4]6 J	5.2
Toluene	2/2	8 to 19	6 J to [4]8	7.3
Semivolatile Organic Compounds (µg/kg)				
Benzo(b)fluoranthene	1/2	440	46 J	46
Benzo(g,h,i)perylene	1/2	440	43 J	43
Benzo(a)pyrene	1/2	440	46 J	46
Di-n-butylphthalate	2/2	440 to 620	[4]78 J to 92 J	85
Indeno(1,2,3-cd)pyrene	1/2	440	40 J	40
Pesticides/PCBs (µg/kg)				
4,4-DDD	1/2	5 to 6	[4]1.5 J	1.5
4,4-DDE	1/2	6	[4]0.37 J	0.37
4,4-DDT	1/2	5	3.4 J	3.7
Total Recoverable Petroleum Hydrocarbons (TRPH) (mg/kg)				
TRPH	2/2	16 to 67	[4]250 to 710	480

[1] No organic analytes were detected in surface water samples.
[2] Frequency of detection is the number is samples in which the analyte was detected divided by the total number of samples analyzed (excluding rejected values).
[3] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected; it does not include those samples with a "U" or "UJ" validation qualifier for that analyte.
[4] Value is the average of a sample and its duplicate.

Notes: The average of a sample and its duplicate is used for all table calculations.

Samples include CF10SD1 and CF10SD2.
Duplicate sample CF10SD2D.

µg/kg = micrograms per kilogram.
J = chemical was identified by chemist but quantity was estimated.
PCBs - polychlorinated biphenyls.
DDD = dichlorodiphenyldichloroethane.
DDE = dichlorodiphenyldichloroethene.
DDT = dichlorodiphenyltrichloroethane.
TRPH = total recoverable petroleum hydrocarbons.
mg/kg = micrograms per kilogram.

Table 2-4
Surface Water and Sediment Inorganics

Record of Decision, Operable Unit 4
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limits	Range of Detected Concentrations
Surface Water Inorganics (µg/ℓ)			
Aluminum	2/2	200	340 to 1,030
Calcium	2/2	5,000	[2]10,200 to 14,000
Iron	1/2	100	330
Magnesium	2/2	5,000	[2]901 to 1,000
Manganese	2/2	15	10.7 to 12
Sodium	2/2	5,000	1,770 to [2]1,990
Vanadium	2/2	50	[2]1.8 to 3.9
Sediment Inorganics (mg/kg)			
Aluminum	2/2	40	[2]1,690 to 1,700
Barium	2/2	40	3.1 to [2]7.4
Calcium	2/2	1,000	186 to [2]1,680
Chromium	2/2	2	[2]2.8 J to 3.3
Iron	2/2	20	[2]518 J to 519
Lead	1/2	0.6	[2]5.0
Magnesium	1/2	1,000	[2]288
Manganese	2/2	3	4.3 to [2]9.8
Selenium	1/2	1	2.8 J
Sodium	2/2	1,000	293 J to [2]352
Vanadium	2/2	10	[2]4.7 to 5.1

[1] Frequency of detection is the number is samples in which the analyte was detected divided by the total number of samples analyzed (excluding rejected values).
[2] Value is the average of a sample and its duplicate.

Notes: The average of a sample and its duplicate is used for all table calculations.

Samples include CF10SW1/SD1 and CF10SW1/SD1.
Duplicate sample CF10SW2D/SD2D.

µg/ℓ = micrograms per liter.
mg/kg = milligrams per kilogram.
J = chemical was identified by chemist but quantity was estimated.

impaired benthic community. The OU 4 RI (ABB-ES, 1996) further supports that OU 4 is not a source of surface water or sediment contamination. More detail on these effects is provided in the OU 1 RI report (ABB-ES, 1994).

2.6 SUMMARY OF SITE RISKS. The BRA provides the basis for taking action and indicates the exposure pathways that need to be addressed by remedial action. It serves as the baseline indicating what risks could exist if no action were taken at the site. This section of the ROD reports the results of the BRA conducted for OU 4. The risk assessment identified no unacceptable human health or ecological risks at OU 4.

Human Health Risk Assessment (HHRA). The purpose of the HHRA was to characterize the risks associated with possible exposures to site-related contaminants for human receptors. Potential health risks were evaluated under current and assumed future land-use conditions for a subset of contaminants detected in surface soil and the surficial aquifer groundwater.

For receptors under assumed land uses, cancer and noncancer risks are estimated. The NCP establishes an acceptable cancer risk as the excess lifetime cancer risk, due to exposure to the human health CPCs at a site by each complete exposure pathway, of 1 in a million to 1 in 10,000 (USEPA, 1990) or a noncancer hazard index equal to or less than 1. Potential receptors assumed to be exposed to site contaminants included a future resident, site trespasser, and site worker. The results of the health risk assessment are depicted on Figures 2-5 and 2-6. Under the future resident assumptions, the estimated excess (incremental) lifetime cancer risk for a child/adult exposed to the surface soil, a risk of less than 1 in 100,000 was calculated. This falls well within the USEPA acceptance range. All other exposure assumptions did not pose an unacceptable cancer or noncancer risk.

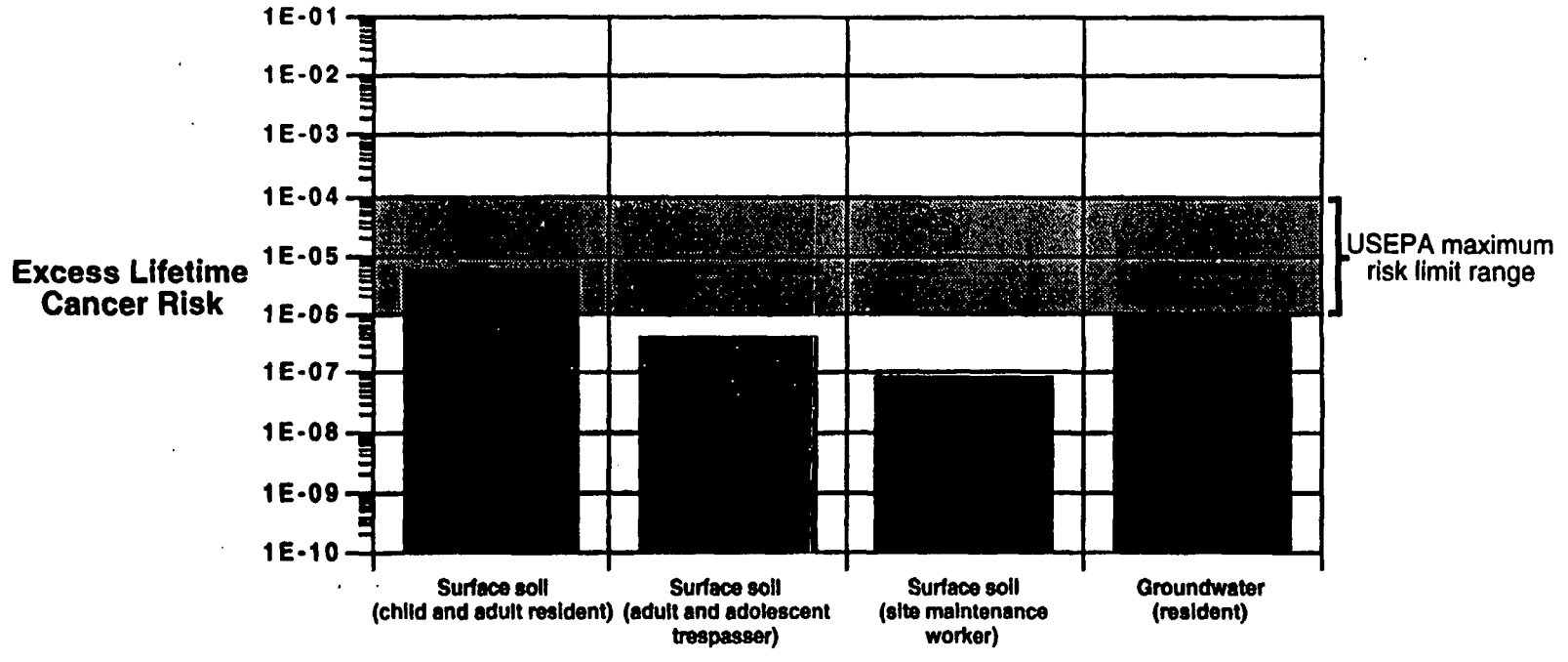
Ecological Assessment. The purpose of the ecological risk assessment was to characterize the risks associated with potential exposures to site-related contaminants at OU 4 for ecological receptors. Potential risks for ecological receptors were evaluated for selected contaminants detected in surface soil, surface water, sediment, and groundwater at OU 4.

Risks to wildlife, soil invertebrates, and plants were evaluated for exposures to selected contaminants in soil. No risks were identified for wildlife or invertebrates being exposed to OU 4 surface soil. Adverse effects to plants are unlikely considering site history, the conservative nature employed in selecting phytotoxicity benchmarks, and the sporadic detection of selected inorganics in OU 4 surface soil.

Sediment toxicity testing results indicate that no risks are present.

Risks were not identified for terrestrial wildlife resulting from exposures to selected contaminants in surface water and sediment within the drainage ditches.

Potential risks for aquatic receptors were evaluated for exposures to selected contaminants in groundwater. The maximum concentrations of selected contaminants in unfiltered groundwater, as they are discharged to Rowell Creek, were estimated. The risk characterization did not identify risks for aquatic



NOTE:
USEPA = U.S. Environmental Protection Agency
a = Excess lifetime cancer risk

FIGURE 2-5
CANCER RISK[a] SUMMARY,
FUTURE LAND USE

RECORD OF DECISION
OPERABLE UNIT 4

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

8544-773 FIG 2-5 072197MAW

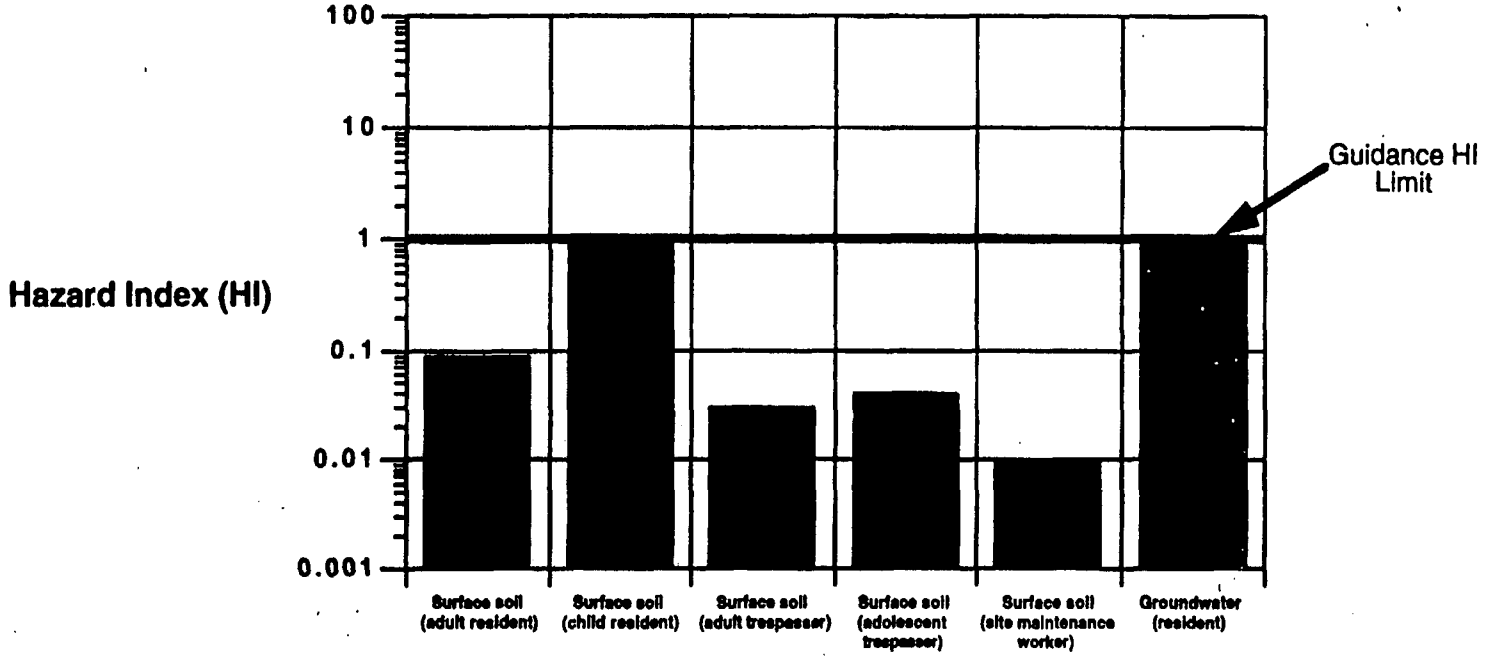


FIGURE 2-6
NONCANCER RISK SUMMARY,
FUTURE LAND USE

RECORD OF DECISION
OPERABLE UNIT 4

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

8544-77 FIG 2-6 0721976MAW

receptors in Rowell Creek that could be associated with exposures to selected contaminants in groundwater.

2.7 DESCRIPTION OF THE NO ACTION ALTERNATIVE. Based on the risk assessment, no unacceptable human health or ecological risks were identified at OU 4. Therefore, no action is needed and no other remedial alternatives were considered.

Under the No Action alternative, no treatment will be performed and rubble will be left in place. According to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations, Section 121, if no action is the preferred action, then no applicable or relevant and appropriate requirements apply to the OU.

Since OU 4 poses no unacceptable risk and the No Action alternative is warranted, it does satisfy the CERCLA criteria. The No Action alternative is intended to be the final action. This solution is meant to be permanent and effective in both the long and short term. The No Further Action decision is the least-cost option with no capital, operating, or monitoring costs and is protective of human health and the environment.

2.8 DOCUMENTATION OF SIGNIFICANT CHANGES. No significant changes have been made to this decision for No Further Action at OU 4.

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APPENDIX A

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

SUMMARY OF PUBLIC COMMENT AND AGENCY RESPONSE. Comments and questions raised during the public meeting are summarized below.

Audience question:	Can the debris left at OU 4 be recycled?
BCT Response:	Based on the risk assessment, there does not appear to be any human health or environmental basis for not recycling materials remaining at OU 4.