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SAMPLING EVENT REPORT FOR POTENTIAL SOURCE OF CONTAMINATION 5 SHORELINE FILL WEST OF THE FUEL BARGE DOCK NAS JACKSONVILLE FL

4/1/1999

HARDING LAWSON ASSOCIATES

SAMPLING EVENT REPORT

POTENTIAL SOURCE OF CONTAMINATION 5
SHORELINE FILL WEST OF FUEL BARGE DOCK

NAVAL AIR STATION JACKSONVILLE
JACKSONVILLE, FLORIDA

Unit Identification Code: N00207

Contract No. N62467-89-D-0317/040

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April 1999

CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

The Contractor, Harding Lawson Associates, hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/040 are complete and accurate and comply with all requirements of this contract.

DATE: April 15, 1999

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(DFAR 252.227-7036)

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PMW.04.99

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
bls	below land surface
CompuChem	CompuChem Environmental Corporation
EDS	Environmental Data Services
FDEP	Florida Department of Environmental Protection
FRE	focused risk evaluation
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
μg/kg	micrograms per kilogram
μg/ℓ	micrograms per liter
NAS	Naval Air Station
NFESC	Naval Facilities Engineering Service Center
PARCC	precision, accuracy, representativeness, completeness, and comparability
pCi/g	picocuries per gram
pCi/ℓ	picocuries per liter
PSC	potential source of contamination
PCB	polychlorinated biphenyl
QA/QC	quality assurance and quality control
Ra	radium
RBC	risk-based concentration
RRDS	Remedial Response Decision System
SCG	soil cleanup goal
SER	sampling event report
SSW	site screening workplan
SVOC	semivolatile organic compound
TAL	target analyte list
TCL	target compound list
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

1.0 INTRODUCTION

Harding Lawson Associates, under contract to the Department of Navy (Contract No. N62467-89-D-0317, Task Order No. 040), is submitting this Sampling Event Report (SER) for Potential Source of Contamination (PSC) 5, the Shoreline Fill West of the Fuel Barge Dock at Naval Air Station (NAS) Jacksonville, Jacksonville, Florida (Figure 1-1). PSC 5 was used in the 1940s for disposal of an undetermined amount of concrete runway debris. The fill area, approximately 300 feet wide by 2,100 feet long, is located west of Catapult Road where the fuel barge dock begins (Figure 1-2).

This SER summarizes the methods and the results of the field investigation and transmits the field and analytical data.

1.1 PURPOSE AND SCOPE. The purpose of the sampling event at PSC 5 was to gather sufficient information to support the next phase of the Remedial Response Decision System (RRDS) process. The scope of the sampling event at PSC 5, detailed in the Site Screening Workplan ([SSW] ABB Environmental Services, Inc. [ABB-ES], 1997), included the following:

- Up to 10 soil samples were to be collected. Seven soil samples were to be widespread and collected from the 1- to 2-foot interval below land surface (bls). The remaining three soil samples were to be collected from the interval just above the water table during installation of downgradient monitoring wells.

- Four shallow monitoring wells were to be installed to intercept the water table (each well was to consist of a 9-foot screen installed from 1 to 10 feet bls). One groundwater sample was to be collected from each well. Three wells were to be placed downgradient near the shoreline, and one well was to be placed upgradient.

- Soil and groundwater samples were to be sent for laboratory analysis for U.S. Environmental Protection Agency (USEPA) target compound list (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), TCL pesticides and polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, and radiological parameters (gross alpha and gross beta).

Fieldwork for this sampling event was completed between June 3, 1997, and August 19, 1997.

1.2 SITE DESCRIPTION. The Shoreline Fill, which was identified as a PSC during the Initial Assessment Study (Fred C. Hart Associates, Inc., 1983), stretches along the shoreline of the St. Johns River west of the fuel barge dock and Catapult Road. PSC 5 is north of the flightline at NAS Jacksonville and is within the restricted area. There is a fence surrounding the flightline, and security personnel guard the gate 24 hours per day. A special pass is required to enter the flightline area. From within the flightline security area, PSC 5 is accessible by foot from Catapult Road where it meets the fuel barge dock. The

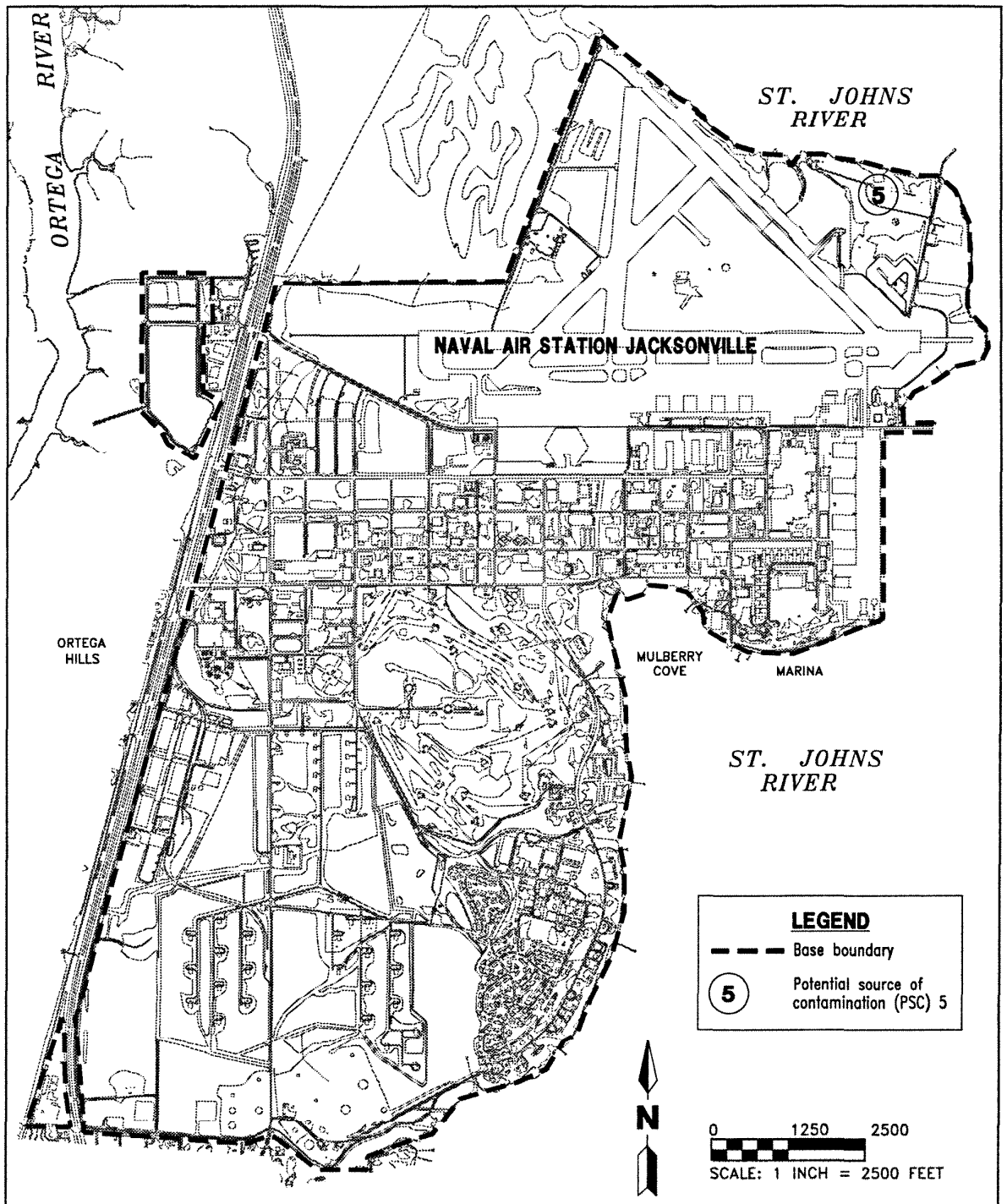

FIGURE 1-1
LOCATION OF PSC 5 AT
NAVAL AIR STATION JACKSONVILLE

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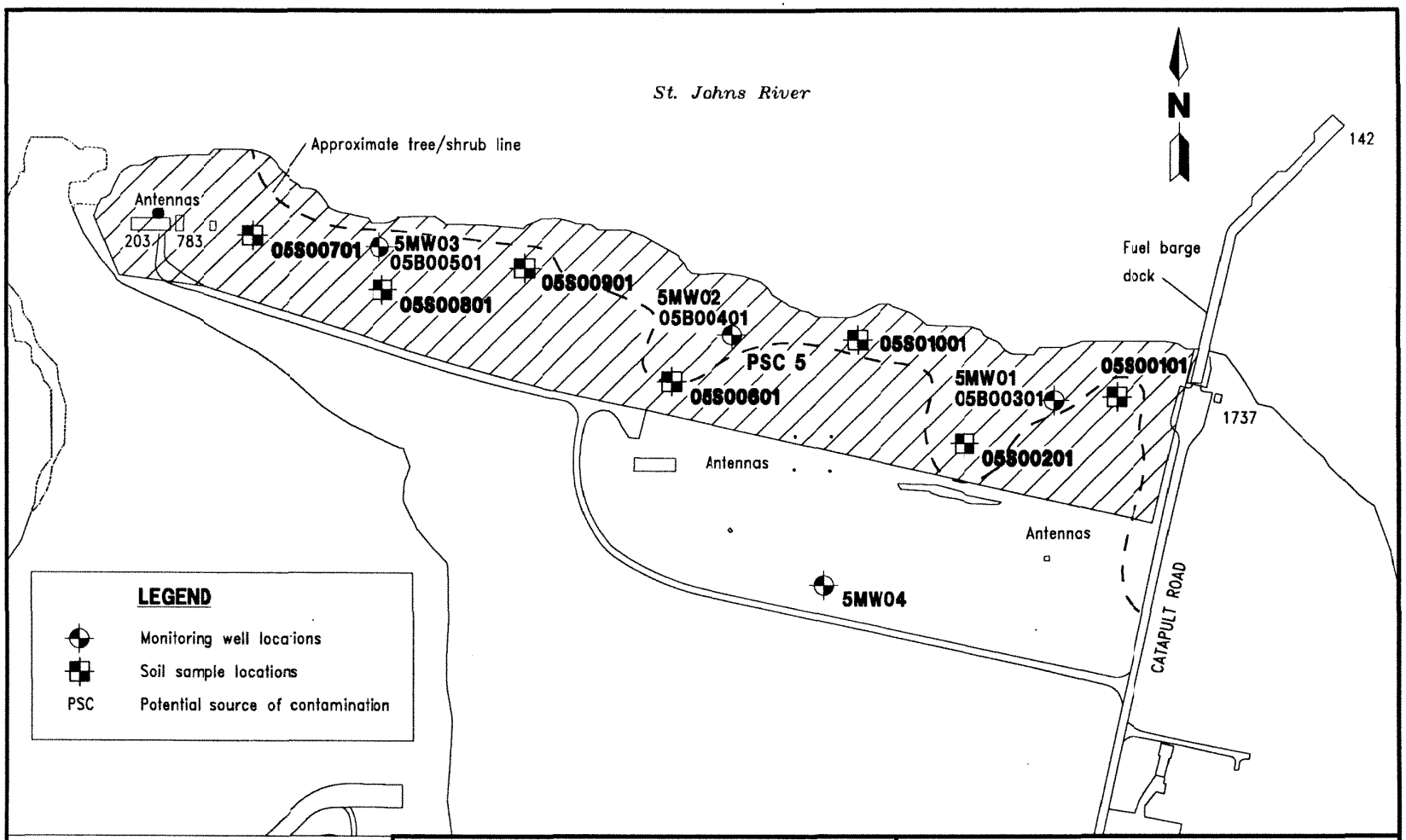
SAMPLING EVENT REPORT
PSC 5

NAVAL AIR STATION JACKSONVILLE
JACKSONVILLE, FLORIDA



0 150 300
SCALE: 1 INCH = 300 FEET

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FIGURE 1-2
SAMPLING LOCATIONS AT PSC 5
SHORELINE FILL AREA
WEST OF FUEL BARGE DOCK

SAMPLING EVENT REPORT
PSC 5

NAVAL AIR STATION JACKSONVILLE
JACKSONVILLE, FLORIDA

shoreline is flat and sandy but covered with concrete rubble. Approximately 10 to 20 feet inland, the ground rises steeply and is heavily vegetated. Most of PSC 5 is not maintained. Some of the grassy area near the antennas is cut with a tractor. Surface water runoff from PSC 5 is toward the north to the St. Johns River. PSC 5 receives run-on from the areas to the south.

Additional background information including the findings of previous studies at PSC 5 is presented in the SSW (ABB-ES, 1997).

2.0 SAMPLING APPROACH AND FIELD CHANGES

The work described herein was performed as presented in the SSW (ABB-ES, 1997). Exceptions to the proposed methods are described in this section.

Seven shallow soil samples, designated 05S00101, 05S00201, and 05S00601 through 05S01001, were collected from depths ranging from 0 to 2 feet bls (Figure 1-2). The three samples that were to be collected from near the water table were instead collected from 2-foot intervals ranging from 0 to 6 feet bls due to the coarse nature of the fill. These samples, 05B00301, 05B00401, and 05B00501, were collected 4 to 6 feet bls, 0.5 to 2.5 feet bls, and 0 to 2 feet bls, respectively.

Four "micro" wells were installed in the shallow groundwater. Three wells were installed in the downgradient portion of the site along the St. Johns River, and one well was installed as background along the access road (Figure 1-2). Because the "micro" wells were installed using direct-push methods from the surface, no reference soil samples were collected during the installation. Each of the wells was installed to a total depth of approximately 10.3 feet bls. The "micro" well screens are 9.0 feet long and surrounded by sand filter material to within 0.5 feet of the surface.

The soil and groundwater samples collected for laboratory analysis were sent by overnight carrier to the subcontract laboratory, CompuChem Environmental Corporation (CompuChem), Cary, North Carolina. The samples were analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL metals, gross alpha, and gross beta.

The Sample Tracking Log (Appendix A) includes validation status, analytical parameters, and laboratory identifiers for each sample. The complete laboratory analytical results are included in Appendix B and the detections are summarized in Appendix C.

3.0 QUALITY ASSURANCE AND QUALITY CONTROL

Field samples and associated quality assurance and quality control (QA/QC) samples were collected and analyzed according to USEPA Contract Laboratory Program and Naval Facilities Engineering Service Center (NFESC) requirements by an NFESC certified laboratory, CompuChem (Cary, North Carolina). The analytical data packages, submitted by sample delivery groups were independently validated by a subcontract data validation company, Environmental Data Services (EDS), (Concord, New Hampshire), in accordance with validation requirements contained in NFESC document *Navy Installation Restoration Laboratory Quality Assurance Guide* (NFESC, 1996). Other documents utilized in the data validation and review include the USEPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, 1994a) and the USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA, 1994b).

A detailed QA/QC evaluation can be found in the EDS report (EDS, 1997), which summarizes the results of the data quality assessment according to the precision, accuracy, representativeness, completeness, and comparability (PARCC) parameters for the entire site screening activity. The EDS report was issued as Appendix B of the SSW. The generated analytical data were found to be acceptable according to the PARCC criteria, with less than 5 percent of the data requiring qualification (primarily estimated "J" qualifier).

4.0 ANALYTICAL RESULTS

4.1 ANALYTICAL RESULTS FOR SURFACE SOIL SAMPLES. The complete validated analytical data are included in Appendix B. Appendix C presents a summary of the parameters detected in surface soil samples collected at PSC 5.

4.1.1 Volatile Organic Compounds Tetrachloroethene was detected at 4 micrograms per kilogram (μg/kg) in only one of the nine surface soil samples. Acetone, not considered a site-related VOC, was detected between 17 and 32 μg/kg in two of the nine samples.

4.1.2 Semivolatile Organic Compounds Twelve SVOCs were detected in three of the nine surface soil samples analyzed. Benzo(a)pyrene was detected in one sample at 160 μg/kg.

4.1.3 Pesticides and Polychlorinated Biphenyls Eleven pesticide and PCB compounds were identified in surface soil samples analyzed. However, all of the pesticides were detected at levels consistent with the stationwide application of pesticides for insect control. Aroclor-1254 was detected at a maximum concentration of 120 μg/kg.

4.1.4 Inorganic Parameters Twenty-one inorganic parameters were identified in surface soil samples analyzed. Lead was detected at 27 milligrams per kilogram (mg/kg). Aluminum and iron were detected at 6,910 and 7,750 mg/kg, respectively.

4.1.5 Radiological Parameters Gross alpha, ranging from 2.22 picocuries per gram (pCi/g) to 23.51 pCi/g, and gross beta, ranging from 5.93 pCi/g to 15.91 pCi/g, were detected in all nine surface soil samples.

4.2 ANALYTICAL RESULTS FOR SUBSURFACE SOIL SAMPLE. Appendix B contains the complete validated analytical data for the one subsurface soil sample (05B00301) collected at PSC 5. Appendix C presents a summary of the parameters detected in the subsurface soil sample collected at PSC 5.

4.2.1 Volatile Organic Compounds Acetone was detected at 25 μg/kg. This detection is likely a laboratory and/or field sampling artifact.

4.2.2 Semivolatile Organic Compounds No SVOCs were detected in subsurface soil.

4.2.3 Pesticides and Polychlorinated Biphenyls Dichlorodiphenyltrichloroethane and its metabolites dichlorodiphenyldichloroethane and dichlorodiphenyldichloroethene were detected at 1, 31, and 11 μg/kg, respectively. Dieldrin was detected at 2 μg/kg.

4.2.4 Inorganic Parameters Eighteen inorganic parameters were identified in the subsurface soil sample analyzed.

4.3 ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES. The complete validated analytical data are included in Appendix B. Appendix C presents a summary of the parameters detected in groundwater samples collected at PSC 5.

4.3.1 Volatile Organic Compounds One site related VOC, toluene, was detected in groundwater sample 05G00401. However, it was only detected at a concentration of 6 micrograms per liter ($\mu g/\ell$). Methylene chloride, detected in sample 05G00301 at 27 $\mu g/\ell$, may be a laboratory contaminant.

4.3.2 Semivolatile Organic Compounds One SVOC, 4-methylphenol at 4 $\mu g/\ell$, was detected in groundwater sample 05G00301.

4.3.3 Pesticides and PCBs One pesticide, delta-benzene hexachloride at 0.01 $\mu g/\ell$, was also identified in groundwater sample 05G00301.

4.3.4 Inorganic Parameters Seventeen inorganic parameters were identified in groundwater samples. Iron and manganese were detected at concentrations that ranged from 1,910 $\mu g/\ell$ to 51,600 $\mu g/\ell$ for iron and from 101 $\mu g/\ell$ to 893 $\mu g/\ell$ for manganese. These metals were detected in all four groundwater samples and may be related to the suspended solids naturally present in groundwater.

4.3.5 Radiological Parameters The radiological parameters, gross alpha and gross beta, were detected in all four groundwater samples. Gross alpha ranged from -1.85 picocuries per liter (pCi/ℓ) to 4.28 pCi/ℓ and gross beta ranged from 9.64 pCi/ℓ to 13.02 pCi/ℓ.

5.0 RISK ASSESSMENT

The purpose of performing focused risk evaluations (FREs) as part of the site screening evaluation is to assist in determining whether or not existing risk at a PSC: (1) supports a no further action decision; (2) indicates the need for an interim remedial action; or (3) requires additional investigation to make a decision. The documentation of the decision for PSC 5 may be found in the RRDS document for PSC 5 (ABB-ES 1995). An FRE is not intended to characterize "baseline" risk at a PSC, but rather is to be used as a decision-making tool.

5.1 SURFACE SOIL. As shown below in Table 5-1, only three contaminants exceeded screening values. The maximum detected concentrations of benzo(a)pyrene (160 µg/kg) and arsenic (2.4 mg/kg) exceeded the residential Florida Department of Environmental Protection (FDEP) Soil Cleanup Goals (SCGs) (FDEP, 1995) and the residential USEPA Region 3 Risk-Based Concentrations (RBCs) (USEPA, 1998). However, the benzo(a)pyrene and arsenic concentrations were below both the industrial SCGs and industrial RBCs. Beryllium, at 0.84 mg/kg, exceeded the residential SCG of 0.2 mg/kg but not the industrial SCG. Beryllium concentrations did not exceed the USEPA RBCs.

Table 5-1
Comparison of Selected Contaminants to Screening Values

Potential Source of Contamination 5
Shoreline Fill West of the Fuel Barge
Naval Air Station Jacksonville
Jacksonville, Florida

Analyte	Maximum Detected Concentration	FDEP SCG Residential	Region 3 RBC Residential	FDEP SCG Industrial	Region 3 RBC Industrial
Semivolatile Organic Compounds (µg/kg)					
Benzo(a)pyrene	160	100	87	500	780
Inorganic Analytes (mg/kg)					
Arsenic	2.4	0.8	0.43	3.1	3.8
Beryllium	0.84	0.2	160	1	4,100

Notes: FDEP = Florida Department of Environmental Protection.
SCG = soil cleanup goal.
RBC = risk-based concentration.
µg/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.

Gross alpha radiation was detected ranging from 2.22 pCi/g to 23.51 pCi/g and gross beta was detected ranging from 5.93 pCi/g to 15.91 pCi/g in all nine surface soil samples. The USEPA standard for radium (Ra) 226 is 5 pCi/g (Title 40, Code of Federal Regulations, Part 192.32). The gross alpha radiation readings are up to 4 times the USEPA standard for Ra. Because a likely source of the radiation is Ra-dial, a luminescent radium paint, this standard is appropriate for screening purposes.

5.2 SUBSURFACE SOIL. As shown in Appendix C, the one subsurface soil sample (05B00301) contained no contaminants above screening concentrations.

5.3 GROUNDWATER. As shown in Table 5-2, several compounds exceeded the FDEP Groundwater Guidance Concentrations and the USEPA Maximum Contaminant Levels (MCLs). However, the detected methylene chloride is likely a laboratory artifact rather than a site-related analyte, and the metals may be related to the suspended solids naturally present in groundwater samples.

Table 5-2
Comparison of Selected Compounds to Drinking Water Standards

Potential Source of Contamination 5
Shoreline Fill West of the Fuel Barge
Naval Air Station Jacksonville
Jacksonville, Florida

Analyte	Maximum Detected Concentration	FDEP GGC	p/s	USEPA MCL	p/s
Volatile Organic Compounds (μg/ℓ)					
Methylene chloride	27	5	p	5	p
Inorganic Analytes (μg/ℓ)					
Aluminum	237	200	s	200	s
Iron	51,600	300	s	300	s
Manganese	893	50	s	50	s

Notes: FDEP = Florida Department of Environmental Protection. USEPA = U.S. Environmental Protection Agency.
GGC = groundwater guidance concentration. MCL = maximum contaminant level.
p = primary standard. μg/ℓ = micrograms per liter.
s = secondary standard.

The radiological parameters, gross alpha and gross beta, were detected in all four groundwater samples. Gross alpha ranged from -1.85 pCi/ℓ to 4.28 pCi/ℓ, below the EPA standard of 15 pCi/ℓ (with Ra-226). Gross beta ranged from 9.64 pCi/ℓ to 13.02 pCi/ℓ, below the compliance standard of 50 pCi/ℓ for drinking water systems.

5.4 CONCLUSIONS. PSC 5 is located in an isolated area of the flightline at NAS Jacksonville. Because of engineering controls (a guarded gate to a fenced area) and natural vegetation, the site is almost inaccessible except by boat, except for the occasional site worker. There is no land use for PSC 5, and the adjacent area is limited to use as a fuel barge dock and location of antenna. The groundwater at PSC 5 is not used for drinking; there are no wells in the area. Therefore, screening surface soil against industrial screening values provides an appropriate level of safety for current land use. Residential screening values for surface soil and groundwater are appropriate for potential future land use.

Based on the inaccessibility of the site and the limited current land use and lack of groundwater used, there is no current risk to human health at PSC 5 unless site workers should come in contact with surface soil. If signs were

posted warning of the radioactive contamination, the limited potential for exposure should be eliminated. Should the land use change so that industrial activities were performed at PSC 5, further evaluation of the radioactive contamination would become necessary. Also, should the land use change to allow residential use of PSC 5, remedial activities of surface soil would become necessary.

6.0 REFERENCES

ABB Environmental Services, Inc. (ABB-ES). 1997. *Site Screening Workplan, Naval Air Station (NAS) Jacksonville, Jacksonville, Florida*. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAV-FACENGCOM), North Charleston, South Carolina.

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APPENDIX A

SAMPLE TRACKING LOG

Appendix A

PSC 5
OFFSITE SAMPLE TRACKING LOG
SITE SCREENING, NAS JACKSONVILLE

SDG	SAMPLE ID	SAMP DATE	UDEPTH (ft bls)	LDEPTH (ft bls)	MATRIX	TAL MET	TCL VOC	TCL SVOC	TCL PESTPCB	RAD	DRFL	TAT	DSTV	DRFV
0018S	05B00301	8/7/97	4	6	soil	X	X	X	X	X	10/6/97	48	10/6/97	10/17/97
0018S	05B00401	8/7/97	0.5	2.5	soil	X	X	X	X	X	10/6/97	48	10/6/97	10/17/97
0018S	05B00501	8/7/97	0	2	soil	X	X	X	X	X	10/6/97	48	10/6/97	10/17/97
0016W	05G00101	7/14/97	1	10	groundwater	X	X	X	X	X	8/12/97	29	8/12/97	8/15/97
0016W	05G00101MS	7/14/97	1	10	groundwater	X	X				8/12/97	29	8/12/97	8/15/97
0016W	05G00101MSD	7/14/97	1	10	groundwater	X	X				8/12/97	29	8/12/97	8/15/97
00016	05G00201	7/11/97	1	10	groundwater	X	X	X	X	X	8/13/97	33	8/13/97	8/15/97
00016	05G00201MS	7/11/97	1	10	groundwater		X				8/13/97	33	8/13/97	8/15/97
00016	05G00201MSD	7/11/97	1	10	groundwater		X				8/13/97	33	8/13/97	8/15/97
00016	05G00301	7/11/97	1	10	groundwater	X	X	X	X	X	8/13/97	33	8/13/97	8/15/97
00016	05G00301MS	7/11/97	1	10	groundwater				X		8/13/97	33	8/13/97	8/15/97
00016	05G00301MSD	7/11/97	1	10	groundwater				X		8/13/97	33	8/13/97	8/15/97
00016	05G00401	7/11/97	1	10	groundwater	X	X	X	X	X	8/13/97	33	8/13/97	8/15/97
00016	05G00401MS	7/11/97	1	10	groundwater			X			8/13/97	33	8/13/97	8/15/97
00016	05G00401MSD	7/11/97	1	10	groundwater			X			8/13/97	33	8/13/97	8/15/97
0016S	05S00101	7/14/97	0.1	0.8	soil	X	X	X	X	X	8/18/97	35	8/18/97	8/20/97
0016S	05S00101MS	7/14/97	0.1	0.8	soil	X		X	X		8/18/97	35	8/18/97	8/20/97
0016S	05S00101MSD	7/14/97	0.1	0.8	soil	X		X	X		8/18/97	35	8/18/97	8/20/97
0016S	05S00201	7/14/97	1	2	soil	X	X	X	X	X	8/18/97	35	8/18/97	8/20/97
0016S	05S00201MS	7/14/97	1	2	soil		X			X	8/18/97	35	8/18/97	8/20/97
0016S	05S00201MSD	7/14/97	1	2	soil		X			X	8/18/97	35	8/18/97	8/20/97
0018S	05S00601	8/19/97	1	2	soil	X	X	X	X	X	10/6/97	48	10/6/97	10/17/97
0018S	05S00701	8/19/97	0	0.8	soil	X	X	X	X	X	10/6/97	48	10/6/97	10/17/97
0018S	05S00801	8/19/97	1	1.5	soil	X	X	X	X	X	10/6/97	48	10/6/97	10/17/97
0018S	05S00901	8/19/97	1	2	soil	X	X	X	X	X	10/6/97	48	10/6/97	10/17/97
0018S	05S01001	8/19/97	1	2	soil	X	X	X	X	X	10/6/97	48	10/6/97	10/17/97

Appendix A

PSC 5
OFFSITE SAMPLE TRACKING LOG
SITE SCREENING, NAS JACKSONVILLE

NOTES:	
SDG	Sample Delivery Group (defined group of 20 samples or less collected not more than 14 days of each other).
SAMPLE ID	Sample Identifier
UDEPTH, LDEPTH	Depths, upper (UDEPTH) and lower (LDEPTH)
MATRIX	Media Sampled
SAMP DATE	Date of Sample Collection
TAL MET	Target Analyte List Metals
TCL VOC	Target Compound List Volatile Organics
TCL SVOC	Target Compound List Semivolatile Organics
TCL PESTPCB	Target Compound List Pesticides and Polychlorinated Biphenyls
RAD	Radiological analyses (gross alpha and gross beta)
DRFL	Date Package Received from Laboratory
TAT	Turnaround Time (days)
DSTV	Date Package Sent to Validators
DRFV	Date Package Received from Validators

APPENDIX B

VALIDATED ANALYTICAL RESULTS

Appendix B-1

Validated Analytical Results
Surface Soil - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05S00101		05S00201		05B00401		05S00501		05S00601		05S00701		05S00801		05S00901		05S01001	
Sampling Date	7/14/97		7/14/97		8/7/97		8/7/97		8/19/97		8/19/97		8/19/97		8/19/97		8/19/97	
Volatile organics, ug/kg																		
1,1,1-Trichloroethane	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
1,1,2,2-Tetrachloroethane	11	UJ	11	UJ	12	U	12	UJ	10	UJ	13	UJ	14	UJ	11	UJ	11	UJ
1,1,2-Trichloroethane	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
1,1-Dichloroethane	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
1,1-Dichloroethene	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
1,2-Dichloroethane	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
1,2-Dichloroethene (total)	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
1,2-Dichloropropane	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
2-Butanone	11	UJ	11	UJ	12	UJ	12	UJ	10	UJ	13	UJ	14	UJ	11	UJ	11	U
2-Hexanone	11	UJ	11	UJ	12	UJ	12	U	10	UJ	13	UJ	14	UJ	11	UJ	11	U
4-Methyl-2-pentanone	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Acetone	11	UJ	11	UJ	17	J	16	UJ	32	J	13	UJ	14	UJ	11	UJ	11	U
Benzene	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Bromodichloromethane	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Bromoform	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Bromomethane	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Carbon disulfide	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Carbon tetrachloride	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Chlorobenzene	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Chloroethane	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Chloroform	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Chloromethane	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
cis-1,3-Dichloropropene	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Dibromochloromethane	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Ethylbenzene	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Methylene chloride	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Styrene	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Tetrachloroethene	11	UJ	11	UJ	4	J	12	U	10	U	13	U	14	U	11	U	11	U
Toluene	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
trans-1,3-Dichloropropene	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Trichloroethene	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Vinyl chloride	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U
Xylene (total)	11	UJ	11	UJ	12	U	12	U	10	U	13	U	14	U	11	U	11	U

Appendix B-1

Validated Analytical Results
Surface Soil - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05S00101		05S00201		05B00401		05B00501		05S00601		05S00701		05S00801		05S00901		05S01001	
Sampling Date	7/14/97		7/14/97		8/7/97		8/7/97		8/19/97		8/19/97		8/19/97		8/19/97		8/19/97	
Semivolatile organics, ug/kg																		
1,2,4-Trichlorobenzene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
1,2-Dichlorobenzene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
1,3-Dichlorobenzene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
1,4-Dichlorobenzene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
2,2'-oxybis(1-Chloropropane)	370	UJ	380	UJ	390	UJ	400	UJ	340	U	430	U	450	U	370	U	370	U
2,4,5-Trichlorophenol	940	U	950	U	970	U	1000	U	860	U	1100	U	1100	U	930	U	930	U
2,4,6-Trichlorophenol	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
2,4-Dichlorophenol	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
2,4-Dimethylphenol	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
2,4-Dinitrophenol	940	U	950	U	970	UJ	1000	UJ	860	U	1100	U	1100	U	930	U	930	U
2,4-Dinitrotoluene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
2,6-Dinitrotoluene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
2-Chloronaphthalene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
2-Chlorophenol	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
2-Methylnaphthalene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
2-Methylphenol	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
2-Nitroaniline	940	U	950	U	970	U	1000	U	860	U	1100	U	1100	U	930	U	930	U
2-Nitrophenol	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
3,3'-Dichlorobenzidine	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
3-Nitroaniline	940	U	950	U	970	U	1000	U	860	U	1100	U	1100	U	930	U	930	U
4,6-Dinitro-2-methylphenol	940	U	950	U	970	U	1000	U	860	U	1100	U	1100	U	930	U	930	U
4-Bromophenyl-phenylether	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
4-Chloro-3-methylphenol	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
4-Chloroaniline	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
4-Chlorophenyl-phenylether	370	UJ	380	UJ	390	U	400	U	340	U	430	U	450	U	370	U	370	U
4-Methylphenol	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
4-Nitroaniline	940	U	950	U	970	UJ	1000	UJ	860	U	1100	U	1100	U	930	U	930	U
4-Nitrophenol	940	UJ	950	UJ	970	UJ	1000	UJ	860	U	1100	U	1100	U	930	U	930	U
Acenaphthene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Acenaphthylene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Anthracene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Benzo(a)anthracene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	150	J	78	J
Benzo(a)pyrene	370	U	380	U	390	U	400	U	340	U	56	J	450	U	160	J	58	J

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Validated Analytical Results
Surface Soil - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05S00101		05S00201		05B00401		05B00501		05S00601		05S00701		05S00801		05S00901		05S01001	
Sampling Date	7/14/97		7/14/97		8/7/97		8/7/97		8/19/97		8/19/97		8/19/97		8/19/97		8/19/97	
Benzo(b)fluoranthene	370	U	380	U	390	U	400	U	340	U	96	J	450	U	290	J	120	J
Benzo(g,h,i)perylene	370	U	380	U	390	U	400	U	340	U	74	J	450	U	170	J	58	J
Benzo(k)fluoranthene	370	U	380	U	390	U	400	U	340	U	91	J	450	U	280	J	120	J
bis(2-Chloroethoxy)methane	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
bis(2-Chloroethyl)ether	370	UJ	380	UJ	390	U	400	U	340	U	430	U	450	U	370	U	370	U
bis(2-Ethylhexyl)phthalate	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Butylbenzylphthalate	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Carbazole	370	U	380	U	390	U	400	U	340	U	430	U	450	U	39	J	370	U
Chrysene	370	UJ	380	UJ	390	U	400	U	340	U	430	U	450	U	120	J	61	J
Di-n-butylphthalate	370	U	380	U	390	U	400	UJ	340	U	430	U	450	U	370	U	370	U
Di-n-octylphthalate	370	UJ	380	UJ	390	U	400	UJ	340	U	220	J	450	U	370	U	370	U
Dibenz(a,h)anthracene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Dibenzofuran	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Diethylphthalate	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Dimethylphthalate	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Fluoranthene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	260	J	130	J
Fluorene	370	U	380	U	390	UJ	400	UJ	340	U	430	U	450	U	370	U	370	U
Hexachlorobenzene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Hexachlorobutadiene	370	U	380	U	390	UJ	400	UJ	340	U	430	U	450	U	370	U	370	U
Hexachlorocyclopentadiene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Hexachloroethane	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Indeno(1,2,3-cd)pyrene	370	U	380	U	390	U	400	U	340	U	53	J	450	U	140	J	47	J
Isophorone	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
N-Nitroso-di-n-propylamine	370	UJ	380	UJ	390	U	400	U	340	U	430	U	450	U	370	U	370	U
N-Nitrosodiphenylamine (1)	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Naphthalene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Nitrobenzene	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Pentachlorophenol	940	U	950	U	970	U	1000	U	860	U	1100	U	1100	U	930	U	930	U
Phenanthrene	370	U	380	U	360	U	400	U	340	U	430	U	450	U	150	J	68	J
Phenol	370	U	380	U	390	U	400	U	340	U	430	U	450	U	370	U	370	U
Pyrene	370	U	380	U	390	U	400	U	340	U	49	J	450	U	180	J	110	J
Pesticides/PCBs, ug/kg																		
4,4'-DDD	3.7	U	3.7	U	3.8	U	0.28	J	3.4	U	4.3	U	4.4	U	3	J	3.7	U
4,4'-DDE	3.7	U	3.7	U	3.8	U	0.78	J	3.4	U	4.3	U	2.6	J	3.3	J	0.56	J

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Validated Analytical Results
Surface Soil - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05S00101		05S00201		05B00401		05B00501		05S00601		05S00701		05S00801		05S00901		05S01001	
Sampling Date	7/14/97		7/14/97		8/7/97		8/7/97		8/19/97		8/19/97		8/19/97		8/19/97		8/19/97	
4,4'-DDT	3.7	U	3.7	U	3.8	U	4	U	1.5	J	0.67	J	4.4	U	3.7	U	0.34	J
Aldrin	1.9	U	1.9	U	0.46	J	2	U	1.8	U	2.2	U	2.3	U	1.9	U	0.17	J
alpha-BHC	1.9	U	1.9	U	2	U	2	U	1.8	U	2.2	U	2.3	U	1.9	U	1.9	U
alpha-Chlordane	1.9	U	0.17	J	2	U	2	U	1.8	U	2.2	U	0.32	J	1.9	U	1.9	U
Aroclor-1016	37	U	37	U	38	U	40	U	34	U	43	U	44	U	37	U	37	U
Aroclor-1221	76	U	76	U	78	U	80	U	70	U	87	U	90	U	75	U	75	U
Aroclor-1232	37	U	37	U	38	U	40	U	34	U	43	U	44	U	37	U	37	U
Aroclor-1242	37	U	37	U	38	U	40	U	34	U	43	U	44	U	37	U	37	U
Aroclor-1248	37	U	37	U	38	U	40	U	34	U	43	U	44	U	37	U	37	U
Aroclor-1254	37	U	25	J	45	J	8	J	34	U	43	U	44	U	120		37	U
Aroclor-1260	37	U	37	U	38	U	40	U	34	U	43	U	44	U	37	U	37	U
beta-BHC	1.9	U	1.9	U	2	U	2	U	1.8	U	2.2	U	2.3	U	1.9	U	1.9	U
delta-BHC	1.9	U	1.9	U	2	U	2	U	1.8	U	2.2	U	2.3	U	1.9	U	1.9	U
Dieldrin	3.7	U	3.7	U	3.8	U	4	U	3.4	U	4.3	U	0.66	J	3.7	U	1.4	J
Endosulfan I	1.9	U	1.9	U	2	U	2	U	1.8	U	2.2	U	2.3	U	0.09	J	1.9	U
Endosulfan II	3.7	U	3.7	U	3.8	U	4	U	3.4	U	4.3	U	4.4	U	3.7	U	3.7	U
Endosulfan sulfate	3.7	U	3.7	U	3.8	U	4	U	3.4	U	0.27	J	0.65	J	3.7	U	3.7	U
Endrin	3.7	UJ	3.7	UJ	3.8	U	4	U	3.4	U	4.3	U	4.4	U	3.7	U	3.7	U
Endrin aldehyde	3.7	U	3.7	U	3.8	U	4	U	3.4	U	4.3	U	0.43	J	3.7	U	3.7	U
Endrin ketone	3.7	U	3.7	U	3.8	U	4	U	3.4	U	4.3	U	4.4	U	3.7	U	3.7	U
gamma-BHC (Lindane)	1.9	UJ	1.9	UJ	2	U	2	U	1.8	U	2.2	U	2.3	U	1.9	U	1.9	U
gamma-Chlordane	1.9	U	1.9	U	0.31	J	0.16	J	1.8	U	0.14	J	2.3	U	2.1		0.21	J
Heptachlor	1.9	U	1.9	U	2	U	2	U	1.8	U	2.2	U	2.3	U	1.9	U	1.9	U
Heptachlor epoxide	1.9	U	1.9	U	2	U	2	U	1.8	U	2.2	U	2.3	U	1.9	U	1.9	U
Methoxychlor	19	U	19	U	20	U	20	U	18	U	22	U	23	U	19	U	19	U
Toxaphene	190	U	190	U	200	U	200	U	180	U	220	U	230	U	190	U	190	U
Inorganics, mg/kg																		
Aluminum	1930	J	145	J	1150	J	2880	J	224	J	1160	J	6910	J	1550	J	2030	J
Antimony	0.39	U	0.39	U	0.38	UJ	0.41	UJ	0.35	UJ	0.44	UJ	0.46	UJ	0.36	UJ	0.4	J
Arsenic	1	U	0.62	U	0.6	U	0.81	J	0.56	U	0.7	U	2	J	0.58	U	2.4	
Barium	21	J	1.9	U	8.6	J	14.6	J	2.5	J	9.9	J	29.2	J	12.1	J	18.2	J
Beryllium	0.09	J	0.02	U	0.09	U	0.33	J	0.08	U	0.2	U	0.84	J	0.2	U	0.14	U
Cadmium	0.07	U	0.07	U	0.22	U	0.42	J	0.06	U	0.2	J	0.72	J	0.23	J	0.08	J
Calcium	4420		54.3	J	13600		9390		1550		54300		4560		23100		20500	

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Validated Analytical Results
Surface Soil - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05S00101		05S00201		05B00401		05B00501		05S00601		05S00701		05S00801		05S00901		05S01001	
Sampling Date	7/14/97		7/14/97		8/7/97		8/7/97		8/19/97		8/19/97		8/19/97		8/19/97		8/19/97	
Chromium	2.9		0.48	J	5.6		8.8		1.2	J	4.4		22.1		4		5.3	
Cobalt	0.28	U	0.14	U	0.13	U	0.78	J	0.12	U	0.35	J	1.6	J	0.48	J	0.58	J
Copper	2.3	J	1.8	U	2	J	4	J	0.57	J	5.3	J	8.5		3.9	J	3.6	J
Iron	3730	J	216	J	998	J	4750	J	390	J	1120	J	7100	J	1710	J	7750	J
Lead	6.2		1.5		7.9		16.1		1.5		10.4		21.2		27		27	
Magnesium	129	J	16.9	J	305	J	554	J	36.9	J	815	J	1310	J	310	J	292	J
Manganese	7.3		2.9	J	10.5		21.7		2.7	J	36.7		27.7		20.4		41	
Mercury	0.06	U	0.06	U	0.07	U	0.05	U	0.04	J	0.06	U	0.06	U	0.05	U	0.07	U
Nickel	0.21	U	0.21	U	0.88	J	3.6	J	0.2	J	5	J	5.1	J	1.1	J	1.9	J
Potassium	62	J	33.4	U	46	J	184	J	18.7	J	146	J	376	J	94.3	J	118	J
Selenium	0.65	U	0.64	U	0.62	U	0.68	U	0.58	J	0.73	U	1.2	J	0.6	U	0.63	U
Silver	0.09	U	0.09	U	0.09	U	0.1	U	0.08	U	0.1	U	0.14	J	0.09	U	0.09	U
Sodium	188	U	192	U	170	J	155	J	142	J	163	J	262	J	122	J	142	J
Thallium	1.1	U	1.1	U	1	U	1.1	U	0.97	U	1.2	U	1.3	U	1	U	1.1	U
Vanadium	6	J	1.2	J	2.9	J	6.9	J	1.4	J	4.7	J	12.3	J	4.4	J	6.6	J
Zinc	0.07	U	4.4	J	9.2		12.6		3.8	J	14		22.3		20.3		24.1	
Radiological, pCi/g																		
Gross alpha	4.92		7.01		2.75		2.22		23.51		4.45		8.89		4.25		6.57	
Gross beta	9.2		6.8		5.93		12.98		8.86		9.75		15.91		7.34		10.83	

Appendix B-2

Validated Analytical Results
Subsurface Soil - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05B00301	
Sampling Date	8/7/97	
Volatile organics, ug/kg		
1,1,1-Trichloroethane	12	U
1,1,2,2-Tetrachloroethane	12	U
1,1,2-Trichloroethane	12	U
1,1-Dichloroethane	12	U
1,1-Dichloroethene	12	U
1,2-Dichloroethane	12	U
1,2-Dichloroethene (total)	12	U
1,2-Dichloropropane	12	U
2-Butanone	12	UJ
2-Hexanone	12	UJ
4-Methyl-2-pentanone	12	U
Acetone	25	J
Benzene	12	U
Bromodichloromethane	12	U
Bromoform	12	U
Bromomethane	12	U
Carbon disulfide	12	U
Carbon tetrachloride	12	U
Chlorobenzene	12	U
Chloroethane	12	U
Chloroform	12	U
Chloromethane	12	U
cis-1,3-Dichloropropene	12	U
Dibromochloromethane	12	U
Ethylbenzene	12	U
Methylene chloride	12	U
Styrene	12	U
Tetrachloroethene	12	UJ
Toluene	12	U
trans-1,3-Dichloropropene	12	U
Trichloroethene	12	U
Vinyl chloride	12	U
Xylene (total)	12	U

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Appendix B-2

Validated Analytical Results
Subsurface Soil - TAL Metals and TCL Organics
FSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05B00301	
Sampling Date	8/7/97	
Semivolatile organics, ug/kg		
1,2,4-Trichlorobenzene	400	U
1,2-Dichlorobenzene	400	U
1,3-Dichlorobenzene	400	U
1,4-Dichlorobenzene	400	U
2,2'-oxybis(1-Chloropropane)	400	UJ
2,4,5-Trichlorophenol	1000	U
2,4,6-Trichlorophenol	400	U
2,4-Dichlorophenol	400	U
2,4-Dimethylphenol	400	U
2,4-Dinitrophenol	1000	UJ
2,4-Dinitrotoluene	400	U
2,6-Dinitrotoluene	400	U
2-Chloronaphthalene	400	U
2-Chlorophenol	400	U
2-Methylnaphthalene	400	U
2-Methylphenol	400	U
2-Nitroaniline	1000	U
2-Nitrophenol	400	U
3,3'-Dichlorobenzidine	400	U
3-Nitroaniline	1000	U
4,6-Dinitro-2-methylphenol	1000	U
4-Bromophenyl-phenylether	400	U
4-Chloro-3-methylphenol	400	U
4-Chloroaniline	400	U
4-Chlorophenyl-phenylether	400	U
4-Methylphenol	400	U
4-Nitroaniline	1000	UJ
4-Nitrophenol	1000	UJ
Acenaphthene	400	U
Acenaphthylene	400	U
Anthracene	400	U
Benzo(a)anthracene	400	U
Benzo(a)pyrene	400	U

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Appendix B-2

Validated Analytical Results
Subsurface Soil - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05B00301	
Sampling Date	8/7/97	
Benzo(b)fluoranthene	400	U
Benzo(g,h,i)perylene	400	U
Benzo(k)fluoranthene	400	U
bis(2-Chloroethoxy)methane	400	U
bis(2-Chloroethyl)ether	400	U
bis(2-Ethylhexyl)phthalate	400	U
Butylbenzylphthalate	400	U
Carbazole	400	U
Chrysene	400	U
Di-n-butylphthalate	400	UJ
Di-n-octylphthalate	400	UJ
Dibenz(a,h)anthracene	400	U
Dibenzofuran	400	U
Diethylphthalate	400	U
Dimethylphthalate	400	U
Fluoranthene	400	U
Fluorene	400	UJ
Hexachlorobenzene	400	UJ
Hexachlorobutadiene	400	U
Hexachlorocyclopentadiene	400	U
Hexachloroethane	400	U
Indeno(1,2,3-cd)pyrene	400	U
Isophorone	400	U
N-Nitroso-di-n-propylamine	400	U
N-Nitrosodiphenylamine (1)	400	U
Naphthalene	400	U
Nitrobenzene	400	U
Pentachlorophenol	1000	U
Phenanthrene	400	U
Phenol	400	U
Pyrene	400	U
Pesticides/PCBs, ug/kg		
4,4'-DDD	31	J
4,4'-DDE	11	J

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Appendix B-2

Validated Analytical Results
Subsurface Soil - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05B00301	
Sampling Date	8/7/97	
4,4'-DDT	1.1	J
Aldrin	2	U
alpha-BHC	2	U
alpha-Chlordane	2	U
Aroclor-1016	39	U
Aroclor-1221	80	U
Aroclor-1232	39	U
Aroclor-1242	39	U
Aroclor-1248	39	U
Aroclor-1254	39	U
Aroclor-1260	39	U
beta-BHC	2	U
delta-BHC	2	U
Dieldrin	2.3	J
Endosulfan I	2	U
Endosulfan II	3.9	U
Endosulfan sulfate	3.9	U
Endrin	3.9	U
Endrin aldehyde	3.9	U
Endrin ketone	3.9	U
gamma-BHC (Lindane)	2	U
gamma-Chlordane	2	U
Heptachlor	2	U
Heptachlor epoxide	2	U
Methoxychlor	20	U
Toxaphene	200	U
Inorganics, mg/kg		
Aluminum	1780	
Antimony	0.41	UJ
Arsenic	0.92	J
Barium	10.1	J
Beryllium	0.16	J
Cadmium	0.33	J
Calcium	10100	

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Appendix B-2

Validated Analytical Results
Subsurface Soil - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05B00301	
Sampling Date	8/7/97	
Chromium	8.1	
Cobalt	0.37	J
Copper	4.3	J
Iron	2710	J
Lead	25.2	
Magnesium	252	J
Manganese	24.3	
Mercury	0.07	U
Nickel	1.6	J
Potassium	104	J
Selenium	0.68	U
Silver	0.1	U
Sodium	172	J
Thallium	1.1	U
Vanadium	4.4	J
Zinc	15.5	
Radiological, pCi/g		
Gross alpha	0.0	
Gross beta	12.36	

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Appendix B-3

Validated Analytical Results
Groundwater - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05G00101		05G00201		05G00301		05G00401	
Sampling Date	7/14/97		7/11/97		7/11/97		7/11/97	
Volatile Organics, ug/L								
1,1,1-Trichloroethane	10	U	10	U	10	U	10	U
1,1,2,2-Tetrachloroethane	10	U	10	U	10	U	10	U
1,1,2-Trichloroethane	10	U	10	U	10	U	10	U
1,1-Dichloroethane	10	U	10	U	10	U	10	U
1,1-Dichloroethene	10	U	10	UJ	10	UJ	10	U
1,2-Dichloroethane	10	U	10	U	10	U	10	U
1,2-Dichloroethene (total)	10	U	10	U	10	U	10	U
1,2-Dichloropropane	10	U	10	U	10	U	10	U
2-Butanone	10	UJ	10	UJ	10	UJ	10	UJ
2-Hexanone	10	U	10	UJ	10	UJ	10	UJ
4-Methyl-2-pentanone	10	U	10	U	10	U	10	U
Acetone	10	UJ	10	UJ	10	UJ	10	UJ
Benzene	10	U	10	U	10	U	10	U
Bromodichloromethane	10	U	10	U	10	U	10	U
Bromoform	10	U	10	U	10	U	10	U
Bromomethane	10	U	10	U	10	U	10	U
Carbon disulfide	10	UJ	10	UJ	10	UJ	10	U
Carbon tetrachloride	10	U	10	U	10	U	10	U
Chlorobenzene	10	U	10	U	10	U	10	U
Chloroethane	10	U	10	U	10	U	10	U
Chloroform	10	U	10	U	10	U	10	U
Chloromethane	10	UJ	10	UJ	10	UJ	10	UJ
cis-1,3-Dichloropropene	10	U	10	U	10	U	10	U
Dibromochloromethane	10	U	10	U	10	U	10	U
Ethylbenzene	10	U	10	U	10	U	10	U
Methylene chloride	10	U	10	U	27		10	UJ
Styrene	10	U	10	U	10	U	10	U
Tetrachloroethene	10	U	10	U	10	U	10	U
Toluene	10	U	10	U	10	U	6	J
trans-1,3-Dichloropropene	10	U	10	U	10	U	10	U
Trichloroethene	10	U	10	U	10	U	10	U
Vinyl chloride	10	U	10	U	10	U	10	U
Xylene (total)	10	U	10	U	10	U	10	U

Appendix B-3

Validated Analytical Results
Groundwater - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05G00101		05G00201		05G00301		05G00401	
Sampling Date	7/14/97		7/11/97		7/11/97		7/11/97	
Semivolatile Organics, ug/L								
1,2,4-Trichlorobenzene	10	U	10	U	10	UR	10	U
1,2-Dichlorobenzene	10	U	10	U	10	UR	10	U
1,3-Dichlorobenzene	10	U	10	U	10	UR	10	U
1,4-Dichlorobenzene	10	U	10	U	10	UR	10	U
2,2'-oxybis(1-Chloropropane)	10	U	10	UJ	10	UJ	10	UJ
2,4,5-Trichlorophenol	25	U	25	U	25	UJ	25	U
2,4,6-Trichlorophenol	10	U	10	U	10	UJ	10	U
2,4-Dichlorophenol	10	U	10	U	10	UJ	10	U
2,4-Dimethylphenol	10	U	10	U	10	UJ	10	U
2,4-Dinitrophenol	25	U	25	U	25	UJ	25	U
2,4-Dinitrotoluene	10	U	10	U	10	UR	10	U
2,6-Dinitrotoluene	10	U	10	U	10	UR	10	U
2-Chloronaphthalene	10	U	10	U	10	UR	10	U
2-Chlorophenol	10	U	10	U	10	UJ	10	U
2-Methylnaphthalene	10	U	10	U	10	UR	10	U
2-Methylphenol	10	U	10	U	10	UJ	10	U
2-Nitroaniline	25	U	25	U	25	UR	25	U
2-Nitrophenol	10	U	10	U	10	UJ	10	U
3,3'-Dichlorobenzidine	10	U	10	U	10	UR	10	U
3-Nitroaniline	25	U	25	U	25	UR	25	U
4,6-Dinitro-2-methylphenol	25	U	25	U	25	UJ	25	U
4-Bromophenyl-phenylether	10	U	10	U	10	UR	10	U
4-Chloro-3-methylphenol	10	U	10	U	10	UJ	10	U
4-Chloroaniline	10	U	10	U	10	UR	10	U
4-Chlorophenyl-phenylether	10	U	10	U	10	UR	10	U
4-Methylphenol	10	U	10	U	10	UJ	4	J
4-Nitroaniline	25	U	25	U	25	UR	25	U
4-Nitrophenol	25	U	25	UJ	25	UJ	25	UJ
Acenaphthene	10	U	10	U	10	UR	10	U
Acenaphthylene	10	U	10	U	10	UR	10	U
Anthracene	10	U	10	U	10	UR	10	U
Benzo(a)anthracene	10	U	10	U	10	UR	10	U
Benzo(a)pyrene	10	U	10	U	10	UR	10	U

Appendix B-3

Validated Analytical Results
Groundwater - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05G00101		05G00201		05G00301		05G00401	
Sampling Date	7/14/97		7/11/97		7/11/97		7/11/97	
Benzo(b)fluoranthene	10	U	10	U	10	UR	10	U
Benzo(g,h,i)perylene	10	U	10	U	10	UR	10	U
Benzo(k)fluoranthene	10	U	10	U	10	UR	10	U
bis(2-Chloroethoxy)methane	10	U	10	U	10	UR	10	U
bis(2-Chloroethyl)ether	10	U	10	U	10	UR	10	U
bis(2-Ethylhexyl)phthalate	10	U	10	U	10	UR	10	U
Butylbenzylphthalate	10	U	10	U	10	UR	10	U
Carbazole	10	U	10	U	10	UR	10	U
Chrysene	10	U	10	U	10	UR	10	U
Di-n-butylphthalate	10	U	10	U	10	UR	10	U
Di-n-octylphthalate	10	U	10	U	10	UR	10	U
Dibenz(a,h)anthracene	10	U	10	U	10	UR	10	U
Dibenzofuran	10	U	10	U	10	UR	10	U
Diethylphthalate	10	U	10	U	10	UR	10	U
Dimethylphthalate	10	U	10	U	10	UR	10	U
Fluoranthene	10	U	10	U	10	UR	10	U
Fluorene	10	U	10	U	10	UR	10	U
Hexachlorobenzene	10	U	10	U	10	UR	10	U
Hexachlorobutadiene	10	U	10	U	10	UR	10	U
Hexachlorocyclopentadiene	10	U	10	U	10	UR	10	U
Hexachloroethane	10	U	10	U	10	UR	10	U
Indeno(1,2,3-cd)pyrene	10	U	10	U	10	UR	10	U
Isophorone	10	U	10	U	10	UR	10	U
N-Nitroso-di-n-propylamine	10	U	10	U	10	UR	10	U
N-Nitrosodiphenylamine (1)	10	U	10	U	10	UR	10	U
Naphthalene	10	U	10	U	10	UR	10	U
Nitrobenzene	10	U	10	U	10	UR	10	U
Pentachlorophenol	25	U	25	UJ	25	UJ	25	UJ
Phenanthrene	10	U	10	U	10	UR	10	U
Phenol	10	U	10	U	10	UJ	10	U
Pyrene	10	U	10	UJ	10	UR	10	UJ
Pesticides/PCBs, ug/L								
4,4'-DDD	0.09	U	0.1	U	0.1	U	0.1	U
4,4'-DDE	0.09	U	0.1	U	0.1	U	0.1	U

Appendix B-3

Validated Analytical Results
Groundwater - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05G00101		05G00201		05G00301		05G00401	
Sampling Date	7/14/97		7/11/97		7/11/97		7/11/97	
4,4'-DDT	0.09	U	0.1	U	0.1	U	0.1	U
Aldrin	0.05	U	0.05	U	0.05	U	0.05	U
alpha-BHC	0.05	U	0.05	U	0.05	U	0.05	U
alpha-Chlordane	0.05	U	0.05	U	0.05	U	0.05	U
Aroclor-1016	0.94	U	1	U	1	U	1	U
Aroclor-1221	1.9	U	2	U	2	U	2	U
Aroclor-1232	0.94	U	1	U	1	U	1	U
Aroclor-1242	0.94	U	1	U	1	U	1	U
Aroclor-1248	0.94	U	1	U	1	U	1	U
Aroclor-1254	0.94	U	1	U	1	U	1	U
Aroclor-1260	0.94	U	1	U	1	U	1	U
beta-BHC	0.05	U	0.05	U	0.05	U	0.05	U
delta-BHC	0.05	U	0.05	U	0.01	J	0.05	U
Dieldrin	0.09	U	0.1	U	0.1	U	0.1	U
Endosulfan I	0.05	U	0.05	U	0.05	U	0.05	U
Endosulfan II	0.09	U	0.1	U	0.1	U	0.1	U
Endosulfan sulfate	0.09	U	0.1	U	0.1	U	0.1	U
Endrin	0.09	U	0.1	U	0.1	U	0.1	U
Endrin aldehyde	0.09	U	0.1	U	0.1	U	0.1	U
Endrin ketone	0.09	U	0.1	U	0.1	U	0.1	U
gamma-BHC (Lindane)	0.05	U	0.05	U	0.05	U	0.05	U
gamma-Chlordane	0.05	U	0.05	U	0.05	U	0.05	U
Heptachlor	0.05	U	0.05	U	0.05	U	0.05	U
Heptachlor epoxide	0.05	U	0.05	U	0.05	U	0.05	U
Methoxychlor	0.47	U	0.5	U	0.5	U	0.5	U
Toxaphene	4.7	U	5	U	5	U	5	U
Inorganics, ug/L								
Aluminum	89.9	J	99.4	U	199	U	237	
Antimony	2.2	UJ	1.7	U	1.7	U	1.7	U
Arsenic	5	J	6.2	J	2.7	U	18	
Barium	50.9	J	49.2	J	78.4	J	53.4	J
Beryllium	0.19	U	0.1	U	0.1	U	0.34	U
Cadmium	0.56	U	0.43	U	0.63	U	0.65	U
Calcium	178000		126000		71600		214000	

Appendix B-3

Validated Analytical Results
Groundwater - TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05G00101		05G00201		05G00301		05G00401	
Sampling Date	7/14/97		7/11/97		7/11/97		7/11/97	
Chromium	2.3	J	1.4	J	3.1	J	9	J
Cobalt	0.6	U	0.6	U	0.6	U	2.1	J
Copper	2.5	J	3.8	J	3.4	J	5.5	J
Iron	51600		1910		6970		35900	
Lead	2.4	U	2.8	J	1.9	J	2.2	U
Magnesium	12600		9440		34800		23100	
Manganese	893		101		440		876	
Mercury	0.1	U	0.1	U	0.1	U	0.1	U
Nickel	2.4	U	3.3	J	2.5	J	8.6	J
Potassium	3240	J	6990	J	7240	J	6520	J
Selenium	2.9	J	2.8	U	2.8	U	3.1	J
Silver	0.4	U	0.4	U	0.4	U	0.4	U
Sodium	11000		28800		91200		149000	
Thallium	4.7	U	4.7	U	4.7	U	4.7	U
Vanadium	1.8	J	4.9	J	1	J	10.2	J
Zinc	18.4	J	19.1	J	38.5	J	14.4	J
Radiological, pCi/L								
Gross alpha	-1.85		3.69		2.35		4.28	
Gross beta	9.64		10.22		12.53		13.02	

Notes to Validated Analytical Results Tables
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

TAL = Target Analyte List
TCL = Target Compound List
Sample ID = Sample Identifier
Lab ID = Laboratory identifier

Units:

mg/kg	milligram per kilogram
ug/kg	microgram per kilogram
ug/L	microgram per liter
pCi/L	picocuries per liter
pCi/g	picocuries per gram

The following standard validation qualifiers have the following definitions:

U	The analyte/compound was analyzed for but was not detected above the reported sample quantitation limit The number preceding the U qualifier is the reported sample quantitation limit.
J	The analyte/compound was positively identified and the associated numerical value is an estimated concentration of the analyte/compound in the sample. For most detected analytes and compounds, the J qualifier is also used to indicate that the reported concentration is below the contract required detection or quantitation limit.
UJ	The analyte/compound was not detected above the reported sample quantitation limit. The reported quantitation limit, however, is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte/compound in the sample.
R	The sample results are rejected during data validation because of serious deficiencies in meeting quality control criteria.

APPENDIX C

SUMMARY OF DETECTIONS IN ANALYTICAL RESULTS

Appendix C-1

Summary of Detections in Surface Soil Analytical Results
TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	Soil Cleanup Goals		05S00101	05S00201	05B00401	05B00501	05S00601	05S00701	05S00801	05S00901	05S01001
Sampling Date	Residential	Industrial	14-Jul-97	14-Jul-97	7-Aug-97	7-Aug-97	19-Aug-97	19-Aug-97	19-Aug-97	19-Aug-97	19-Aug-97
Volatile organics, ug/kg											
Acetone	260000	1800000			17 J		32 J				
Tetrachloroethene	12000	28000			4 J						
Semivolatile organics, ug/kg											
Benzo(a)anthracene	1400	4900								150 J	78 J
Benzo(a)pyrene	100	500						56 J		160 J	58 J
Benzo(b)fluoranthene	1400	5000						96 J		290 J	120 J
Benzo(g,h,i)perylene	14000	50000						74 J		170 J	58 J
Benzo(k)fluoranthene	14000	48000						91 J		280 J	120 J
Carbazole	42000	120000								39 J	
Chrysene	140000	500000								120 J	61 J
Di-n-octylphthalate	1500000	32000000						220 J			
Fluoranthene	2900000	48000000								260 J	130 J
Indeno(1,2,3-cd)pyrene	1400	5000						53 J		140 J	47 J
Phenanthrene	1700000	21000000								150 J	68 J
Pyrene	2200000	41000000						49 J		180 J	110 J
Pesticides/PCBs, ug/kg											
4,4'-DDD	4500	17000				0.28 J				3 J	
4,4'-DDE	3000	11000				0.78 J			2.6 J	3.3 J	0.56 J
4,4'-DDT	3100	12000					1.5 J	0.67 J			0.34 J
Aldrin	60	200			0.46 J						0.17 J
alpha-Chlordane	800	3000		0.17 J					0.32 J		
Aroclor-1254	900	3500		25 J	45 J	8 J				120	
Dieldrin	70	300							0.66 J		1.4 J
Endosulfan I	390000	5900000								0.09 J	
Endosulfan sulfate	390000	5900000						0.27 J	0.65 J		
Endrin aldehyde	23000	480000							0.43 J		
gamma-Chlordane	800	3000			0.31 J	0.16 J		0.14 J		2.1	0.21 J

Appendix C-1

Summary of Detections in Surface Soil Analytical Results
TAL Metals and TCL Organics
FSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	Soil Cleanup Goals		05S00101		05S00201		05B00401		05B00501		05S00601		05S00701		05S00801		05S00901		05S01001	
Sampling Date	Residential	Industrial	14-Jul-97		14-Jul-97		7-Aug-97		7-Aug-97		19-Aug-97		19-Aug-97		19-Aug-97		19-Aug-97		19-Aug-97	
Inorganics, mg/kg																				
Aluminum	75000	1000000	1930	J	145	J	1150	J	2880	J	224	J	1160	J	6910	J	1560	J	2030	J
Antimony	26	220																	0.4	J
Arsenic	0.8	3.1							0.81	J					2	J			2.4	
Barium	5200	34000	21	J			8.6	J	14.6	J	2.5	J	9.9	J	29.2	J	12.1	J	18.2	J
Beryllium	0.2	1	0.09	J					0.33	J					0.84	J				
Cadmium	37	600							0.42	J			0.2	J	0.72	J	0.23	J	0.08	J
Calcium	ND	ND	4420		54.3	J	13600		9390		1550		54300		4560		23100		20500	
Chromium	290	430	2.9		0.48	J	5.6		8.8		1.2	J	4.4		22.1		4		5.3	
Cobalt	4700	110000							0.78	J			0.35	J	1.6	J	0.48	J	0.58	J
Copper	ND	ND	2.3	J			2	J	4	J	0.57	J	5.3	J	8.5		3.9	J	3.6	J
Iron	ND	ND	3730	J	216	J	998	J	4750	J	390	J	1120	J	7100	J	1710	J	7750	J
Lead	500	1000	6.2		1.5		7.9		16.1		1.5		10.4		21.2		27		27	
Magnesium	ND	ND	129	J	16.9	J	305	J	554	J	36.9	J	815	J	1310	J	310	J	292	J
Manganese	370	5500	7.3		2.9	J	10.5		21.7		2.7	J	36.7		27.7		20.4		41	
Nickel	1500	26000					0.88	J	3.6	J	0.2	J	5	J	5.1	J	1.1	J	1.9	J
Potassium	ND	ND	62	J			46	J	184	J	18.7	J	146	J	376	J	94.3	J	118	J
Selenium	390	9900													1.2	J				
Silver	390	9000													0.14	J				
Sodium	ND	ND					170	J	155	J	142	J	163	J	262	J	122	J	142	J
Vanadium	490	4800	6	J	1.2	J	2.9	J	6.9	J	1.4	J	4.7	J	12.3	J	4.4	J	6.6	J
Zinc	23000	560000			4.4	J	9.2		12.6		3.8	J	14		22.3		20.3		24.1	
Radiological, pCi/g																				
Gross alpha	ND	ND	4.92		7.01		2.75		2.22		23.51		4.45		8.89		4.25		6.57	
Gross beta	ND	ND	9.2		6.8		5.93		12.98		8.86		9.75		15.91		7.34		10.83	

Appendix C-1

Summary of Detections in Surface Soil Analytical Results
TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

NOTES:
TAL = Target Analyte List
TCL = Target Compound List

SCG = Soil Cleanup Goals for Florida (Florida Department of Environmental Protection memorandum, September 29, 1995).
Chromium values are for Chromium VI. Arsenic values are from a carcinogenic pathway
Aroclor-1254 value is from polychlorinated biphenyls.
ND = Not determined.
mg/kg = milligrams per kilogram.
ug/kg = micrograms per kilogram.
pCi/g = picocuries per gram
J = Reported concentration is an estimated quantity.
All inorganics results expressed in milligrams per kilogram (mg/kg) soil dry weight;
organics in micrograms per kilogram (ug/kg) soil dry weight.
Bold/shaded values indicate exceedance of FDEP industrial soil cleanup goal.
Blank space indicates analyte/compound was not detected at the reporting limit.

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Appendix C-2

Summary of Detections in Subsurface Soil Analytical Results
TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	05B00301	
Sampling Date	8/7/97	
Volatile organics, ug/kg		
Acetone	25	J
Pesticides/PCBs, ug/kg		
4,4'-DDD	31	J
4,4'-DDE	11	J
4,4'-DDT	1	J
Dieldrin	2	J
Inorganics, mg/kg		
Aluminum	1780	
Arsenic	0.92	J
Barium	10.1	J
Beryllium	0.16	J
Cadmium	0.33	J
Calcium	10100	
Chromium	8.1	
Cobalt	0.37	J
Copper	4.3	J
Iron	2,710	J
Lead	25.2	
Magnesium	252	J
Manganese	24	
Nickel	1.6	J
Potassium	104	J
Sodium	172	J
Vanadium	4.4	J
Zinc	15.5	
Radiological, pCi/g		
Gross Beta	12.36	

Appendix C-2

Summary of Detections in Subsurface Soil Analytical Results
TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

NOTES:

ND = Not determined.
mg/kg = milligrams per kilogram.
ug/kg = micrograms per kilogram.
pCi/g = picocuries per gram
J = Reported concentration is an estimated quantity.
All inorganics results expressed in milligrams per kilogram (mg/kg) soil dry weight;
organics in micrograms per kilogram (ug/kg) soil dry weight.
Blank space indicates analyte/compound was not detected at the reporting limit.

Appendix C-3

Summary of Detections in Groundwater Analytical Results
TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

Sample ID	FDEPGGC		FEDWCL		05G00101		05G00201		05G00301		05G00401	
Sampling Date					14-Jul-97		11-Jul-97		11-Jul-97		11-Jul-97	
Volatile organics, ug/L												
Methylene chloride	**5**	p	**5**	p					**27**			
Toluene	1000	p	1000	p							6	J
Semivolatile organics, ug/L												
4-Methylphenol	35	st	ND						4	J		
Pesticides, ug/L												
delta-BHC	50	st	ND						0.01	J		
Inorganics, ug/L												
Aluminum	200	s	200	s	89.9	J					**237**	
Arsenic	50	p	50	p	5	J	6.2	J			18	
Barium	2000	p	2000	p	50.9	J	49.2	J	78.4	J	53.4	J
Calcium	ND		ND		178000		126000		71600		214000	
Chromium	100	p	100	p	2.3	J	1.4	J	3.1	J	9	J
Cobalt	ND		ND								2.1	J
Copper	1000	s	1000	s	2.5	J	3.8	J	3.4	J	5.5	J
Iron	**300**	s	**300**	s	**51600**		**1910**		**6970**		**35900**	
Lead	**15**	p	ND				2.8	J	1.9	J		
Magnesium	ND		ND		12600		9440		34800		23100	
Manganese	**50**	s	**50**	s	**893**		**101**		**440**		**876**	
Nickel	100	p	100	p			3.3	J	2.5	J	8.6	J
Potassium	ND		ND		3240	J	6990	J	7240	J	5520	J
Selenium	50	p	50	P	2.9	J					3.1	J
Sodium	160000	p	ND		11000		28800		91200		149000	
Vanadium	49	st	ND		1.8	J	4.9	J	1	J	10.2	J
Zinc	5000	s	5000	s	18.4	J	19.1	J	38.5	J	14.4	J
Radiological, pCi/L												
Gross alpha	ND		15		-1.85		3.69		2.35		4.28	
Gross beta	ND		ND		9.64		10.22		12.53		13.02	

Appendix C-3

Summary of Detections in Groundwater Analytical Results
TAL Metals and TCL Organics
PSC 5

Naval Air Station, Jacksonville
Jacksonville, FL

NOTES:

FDEPGGC = Florida Department of Environmental Protection, Groundwater Guidance Concentrations, June 1994.
FEDMCL= Federal Maximum Contaminant Levels, Primary Drinking Water Regulations and Health Advisories, February 1996.

J = Reported concentration is an estimated quantity.

p = primary standard
s = secondary standard
st = systemic toxicant
c = carcinogen
ND = Not determined

ug/L = micrograms per liter
pci/L = picocuries per liter
Bold/shaded numbers indicate exceedance of groundwater guidance concentration.
Blank space indicates analyte/compound was not detected at the reporting limit.